Appendix A

Notice of Preparation

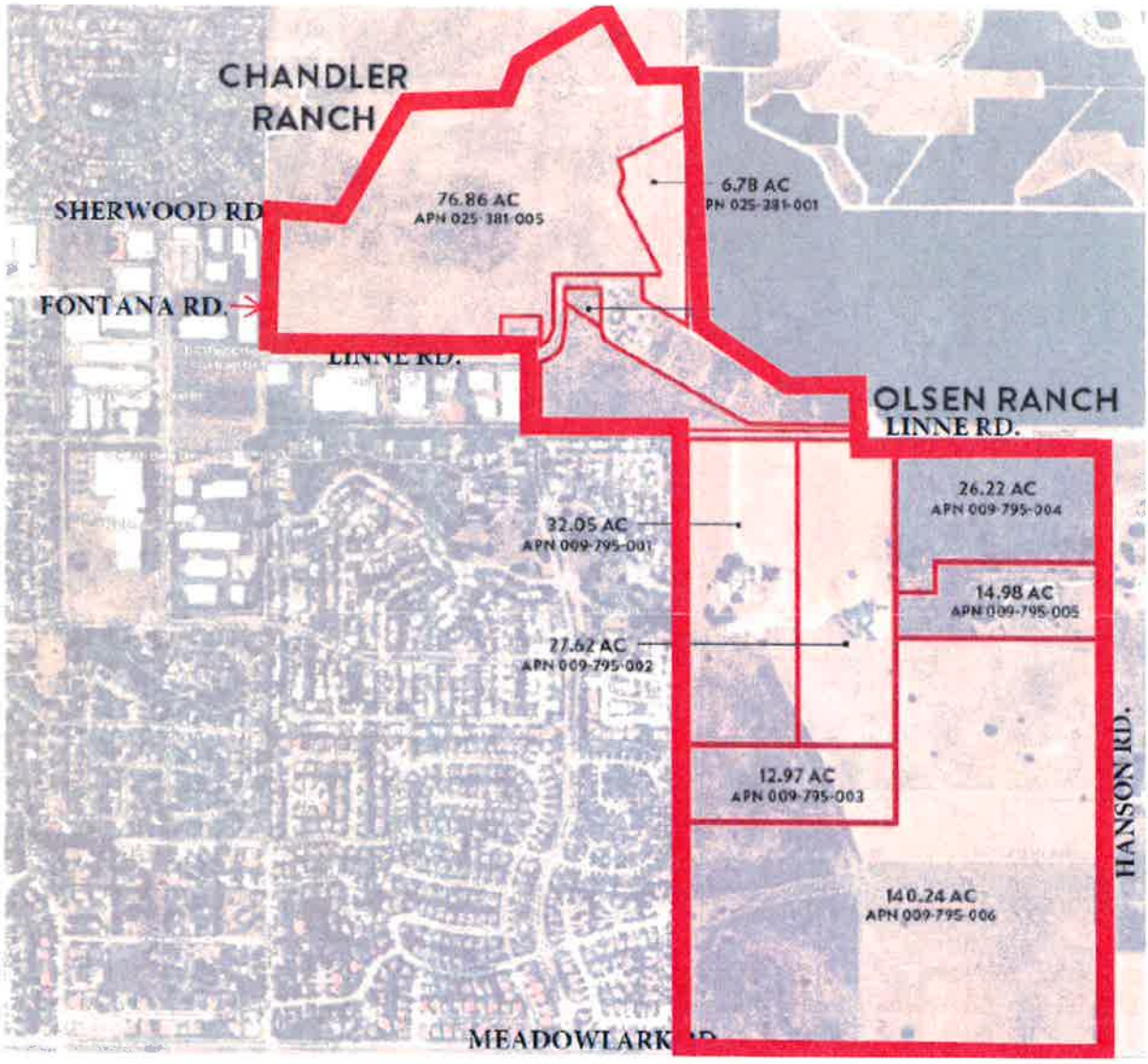
Reso A - Exhibit C2 (EIR Technical Appendix)

CITY OF PASO ROBLES
NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT (EIR)
EIR SCOPING MEETING AND INFORMATIONAL PUBLIC OPEN HOUSE
FOR THE OLSEN-SOUTH CHANDLER RANCH SPECIFIC PLAN
WEDNESDAY, JANUARY 30, 2019

NOTICE IS HEREBY GIVEN that the City of Paso Robles will hold an EIR scoping meeting for the EIR for the Olsen-South Chandler Specific Plan that would allow for the development of 1,233 dwelling units of various types, and 9,800 square feet of neighborhood commercial buildings on 356 acres. The project area is shown below and bounded between Sherwood Road, Fontana Road, Linne Road, Hanson Road and Meadowlark Road, in Paso Robles California.

WHEN: **Wednesday, January 30, 2019**
Public Information Open House: **12:00p.m. to 6:00p.m.**
EIR Scoping Meeting: **6:30p.m.**
WHERE: **Paso Robles City Council Chambers, 1000 Spring Street, Paso Robles**

LOCATION MAP

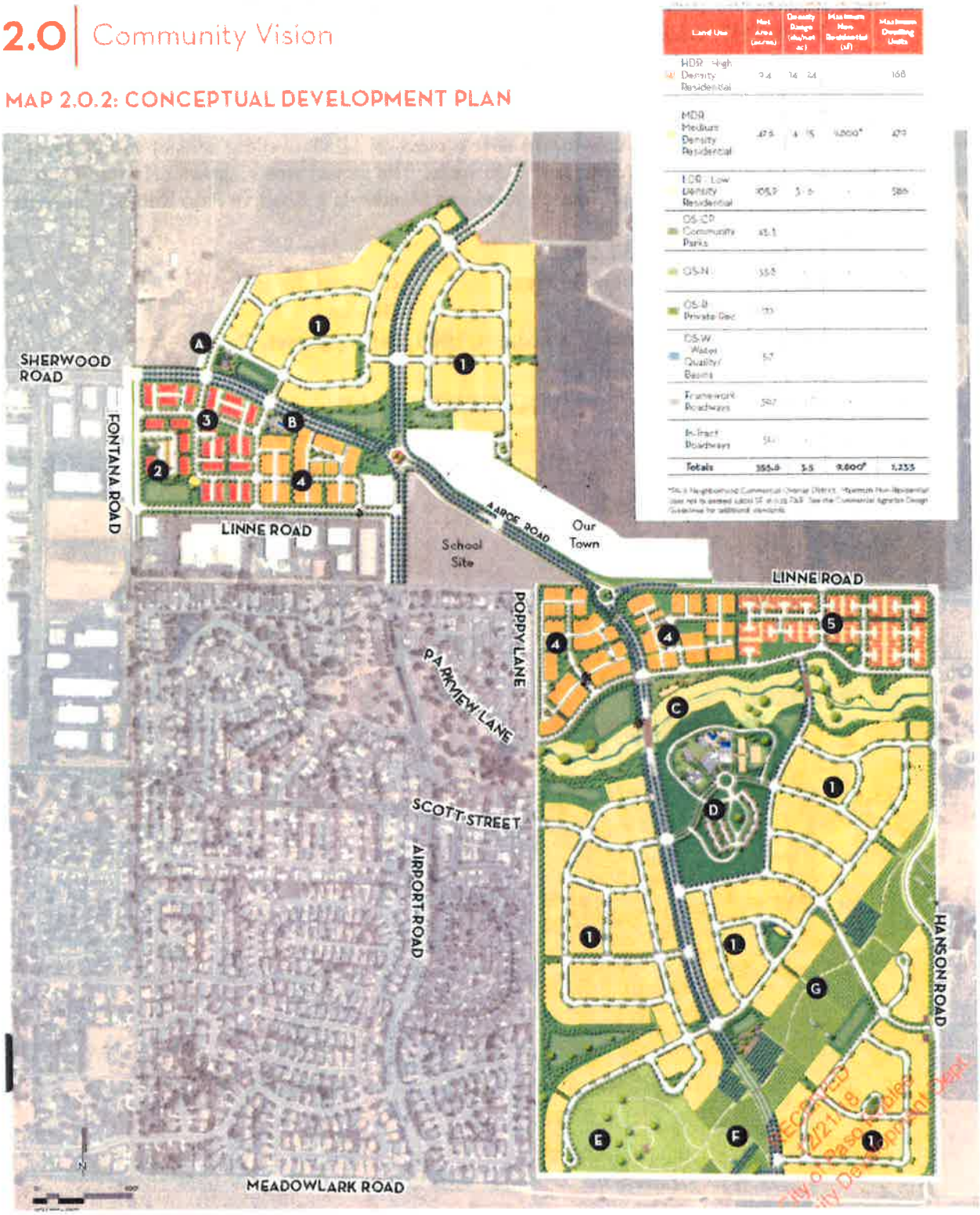


Reso A - Exhibit C2 (EIR Technical Appendix)

OLSEN-SOUTH CHANDLER SPECIFIC PLAN - NEIGHBORHOOD PLAN

2.0 | Community Vision

MAP 2.0.2: CONCEPTUAL DEVELOPMENT PLAN



Land Use	Net Area (acres)	Density Range (du/net ac)	Maximum New Residential (du)	Maximum Dwelling Units
HDR - High Density Residential	9.4	14 - 24		168
MDR - Medium Density Residential	47.5	4 - 15	9,000*	473
LDR - Low Density Residential	105.7	3 - 6	-	586
OS-CP Community Parks	45.1			
OS-N	55.5			
OS-P Private Rec	7.3			
OS-W Water Quality/ Basins	5.7			
Framework Roadways	58.7			
In-Tract Roadways	31.1			
Totals	**355.0**	**3.5**	**9,000***	**1,235**

*Max. Neighborhood Commercial Overlay District. Maximum Non-Residential uses not to exceed 9,000 SF in the D.B. See the Commercial Agrarian Design Guidelines for additional standards.

RECEIVED
4/21/18
City of Paso Robles
City Development Dept

If you have any questions, please contact Darren Nash, City Planner at (805) 237-3970, or email at dnash@prcity.com. A copy of the Notice of Preparation that provides more project details is available on the City website (www.prcity.com/357) If you have any questions, please contact the Community Development Department at (805) 237-3970.

Reso A - Exhibit C2 (EIR Technical Appendix)

Notice of Preparation

To: EIR & Notice of Preparation Mailing List

SUBJECT: Notice of Preparation of a Draft Environmental Impact Report

Lead Agency:	**Consulting Firm: (if applicable)**
Agency Name: City of Paso Robles	EIR to be prepared by:
Department Name: Community Development Department	Firm Name: Rincon Consultants, Inc.
Street Address: 1000 Spring Street	Street Address: 1530 Monterey Street, Suite D
City/State/Zip: Paso Robles, California 93446-2599	City/State/Zip: San Luis Obispo, CA 93401
Contact: Darren Nash, City Planner (805) 237-3970 MESM	Contact: Chris Bersbach,

The City of Paso Robles will be the Lead Agency under the California Environmental Quality Act (CEQA) and will prepare an Environmental Impact Report (EIR) for the project identified below.

The project description, location, and the potential environmental effects are summarized in the attachment. The City is requesting identification of environmental issues and information that you or your organization believes should be considered in the scope and content of the EIR. Due to the time limits mandated by State law, your response must be sent at the earliest possible date, but ***not later than 30 days*** after receipt of this notice.

Please send your response to the attention of Darren Nash, City Planner, in the City of Paso Robles Community Development Department at the address shown above.

Project Title: Olsen/South Chandler Ranch Specific Plan Project

Project Location: The Specific Plan area is located within the Paso Robles city limits on the east side of town and adjacent to unincorporated San Luis Obispo County lands. The planning area is approximately 356 acres and includes the Olsen Ranch property and southern portion of the Chandler Ranch property. The Land Use Plan is shown in the attached figure.

Project Description: The project includes a request for a General Plan amendment, a Specific Plan, a rezone, multiple tentative tract maps, oak tree removal permit, abandonment of portions of the Condict Boulevard public right-of-way spur in the Our Town development, a Development Agreement, and formation of a Community Facilities District. Because the City's General Plan currently identifies the Olsen Ranch and Chandler Ranch properties as separate Specific Plan areas, a General Plan amendment is necessary to integrate the combined planning area for this project and to re-designate the Business Park land use to residential on the Chandler Ranch property. A rezone is necessary to provide conformity between the zoning and any changes to the land use designations on the properties. Concurrent processing of tentative tract maps with other project entitlements is intended to expedite future development of the proposed Specific Plan area. The General Plan allocates a maximum density of 1,233 dwelling units, for an average gross density of 4.9 units/acre over all residential areas, with up to 9,800 square feet of neighborhood commercial development allowed on the Chandler Ranch property. The project area is currently zoned for single-family residential and planned industrial.

Date: 1/18/19

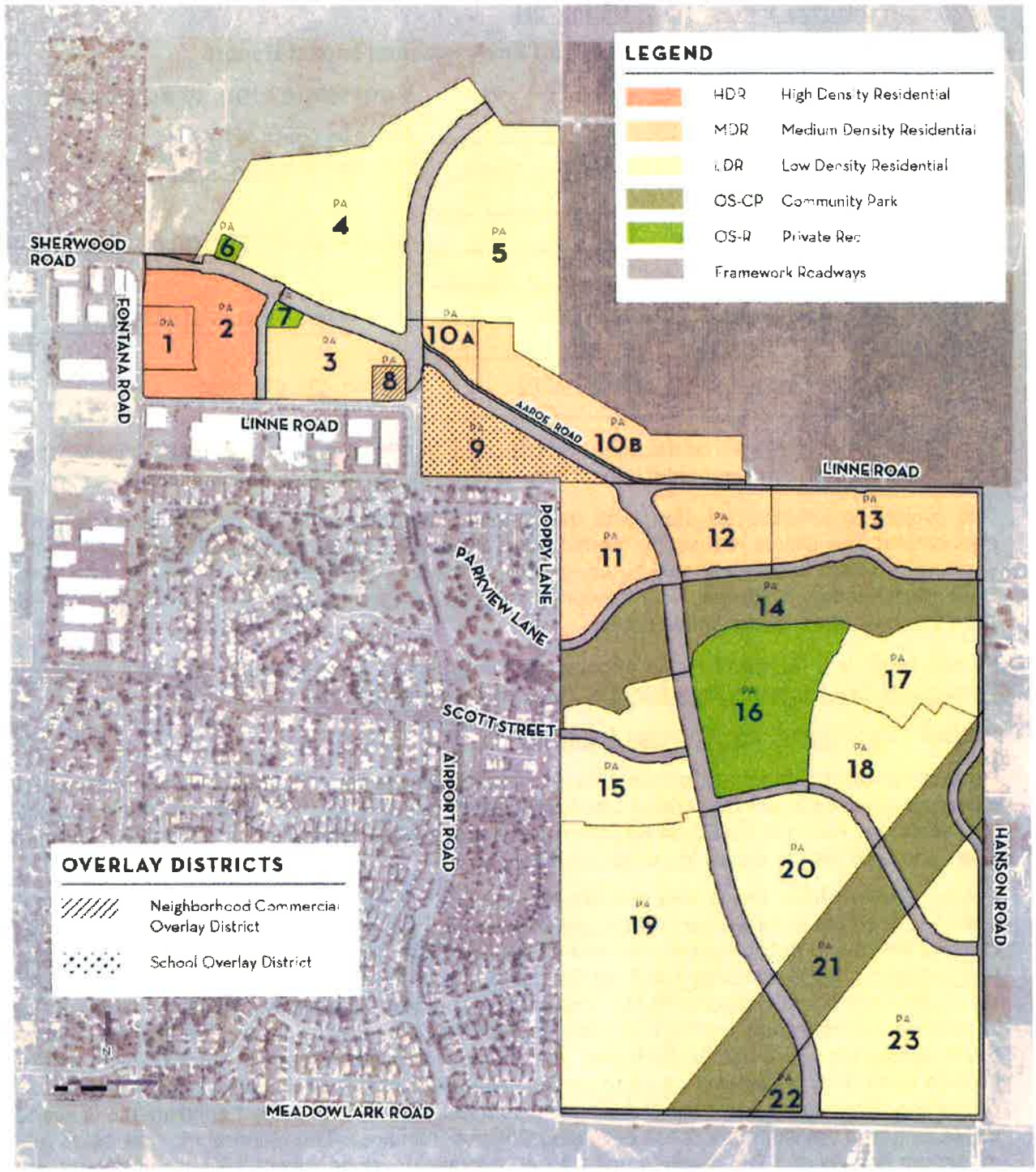
Signature:

Title: City Planner

Reference: California Administrative Code, Title 14 (CEQA Guidelines) Sections 15082(a), 15103, 15375

Reso A - Exhibit C2 (EIR Technical Appendix)

Land Use Plan



Notice of Preparation Attachment
Olsen/South Chandler Ranch Specific Plan Project

The City of Paso Robles, as Lead Agency under the California Environmental Quality Act (CEQA), is requesting comments on the environmental impact report (EIR) scope of work for the proposed project, described below and in the Notice of Preparation, and referred to as the Olsen/South Chandler Ranch Specific Plan Project. The detailed scope of work for issues that may be determined to be potentially significant are available for review upon request. Please contact Project Manager Darren Nash at (805) 237-3970.

Project Location and Setting

The Specific Plan area is located within the Paso Robles city limits on the east side of town and adjacent to unincorporated San Luis Obispo County lands.. The planning area is approximately 356 acres and includes the Olsen Ranch property and southern portion of the Chandler Ranch property.

The Olsen Ranch property is generally undeveloped with some existing rural residential units, and is bounded on the north by Linne Road and the Our Town community, on the west by Poppy Lane and existing residential development, on the south by Meadowlark Road, and on the east by Hanson Road. The southern portion of the Chandler Ranch property is undeveloped, and is bounded on the north by open rangeland on the northern portion of Chandler Ranch, on the west by Fontana Road and existing commercial development, on the south by Linne Road and the Our Town community, and on the east by agricultural vineyards. The planning area includes a school overlay district bounded by Aaroe Road to the northeast, and Linne Road to the west and south, and the Our Town community, which is bounded by Aaroe Road to the southwest, Chandler Ranch to the north, and agricultural vineyards to the northeast and east. The project area is currently zoned for single-family residential and planned industrial.

Project Description

The project includes a request for a General Plan amendment, a Specific Plan, a rezone, multiple tentative tract maps, oak tree removal permit, abandonment of portions of the Condict Boulevard public right-of-way spur in the Our Town development, a Development Agreement, and formation of a Community Facilities District. The Land Use Plan is shown in the attached figure. The Land Use Summary table shows the Specific Plan land uses.

Land Use Summary

Land Use	Gross Area (acres)	Density Range (units/gross acre)	Maximum Non-residential (square feet)	Maximum Dwelling Units
HDR – High-Density Residential	13.1	8-22	-	168
MDR – Medium-Density Residential	63.1	4-10	9,800[1]	479
LDR – Low-Density Residential	173.2	3-5	-	586
OS-CP – Community Parks	47.7	-	3,000±	-
OS-R – Private Recreation	18.8	-	28,000±	-
Framework Roadways	39.7	-	-	-
Totals	355.6	3.5	9,800	1,233

1. PA-8 Neighborhood Commercial Overlay District. Maximum Non-Residential Uses not to exceed 9,800 square feet at 0.25 floor-area ratio (FAR). See the Commercial Agrarian Design Guidelines for additional standards.

Discretionary Entitlements

In order to pursue development consistent with the mix of land uses shown in the project application, the following entitlements will need to be processed to implement development on the site:

1. General Plan Amendment
2. Rezone
3. Specific Plan
4. Tentative Tract Maps
5. Oak Tree Removal Permit (multiple trees proposed to be removed)
6. Street Abandonment of portions of Condict Boulevard
7. Development Agreement
8. Community Facilities District Formation/Annexation

1. **General Plan Amendment.** The project site would require a General Plan Amendment to integrate the separate Olsen Ranch and Chandler Ranch Specific Plan areas into a combined planning area for this project, and to re-designate the Business Park land use to residential on the Chandler Ranch property.

2. **Rezone.** The Specific Plan area will require a rezone to provide conformity between the zoning and any changes to the General Plan land use designations on the properties.

3. **Specific Plan.** The General Plan Land Use Element identifies Olsen Ranch and Chandler Ranch as Specific Plan Overlay areas and requires the adoption of a specific plan for these areas to define the scope of future development. A Specific Plan is proposed for future development on Olsen Ranch and the southern portion of the Chandler Ranch as one project (the Olsen/South Chandler Ranch Specific Plan area) consistent with guidance contained in Land Use Element Policy LU-2G.

4. **Tentative Tract Maps.** The project will include multiple large lot and small lot tentative tract maps to implement the provisions of the Specific Plan concurrent with other project entitlements to expedite future development of the proposed Specific Plan area. The tentative tract maps establishe the proposed lot lines and road right-of-ways to allow individual ownership of properties and to layout the required infrastructure and utilities.

5. **Oak Tree Removal Permit.** The decision on oak removal and protection will be part of the Specific Plan/Tentative Tract Maps. The project area includes 193 native oak trees of various size and condition. The total number of trees to be removed or impacted is not determined.

6. **Street Abandonment, Condict Boulevard.** The project will include a Street Abandonment of portions of Condict Boulevard public right-of-way spur in the Our Town development.

7. **Development Agreement.** The Development Agreement establishes certain development rights, but also commits the developer to construct or pay for certain amenities for the City's public benefit that are greater than the infrastructure and mitigations that are required to facilitate the development. Public benefits can include but not be limited to public infrastructure and services such as bike facilities, endowments to support public services such as open space, and/or other items of value. The Development Agreement is intended to reduce uncertainty in planning and to provide for the orderly development of the Project.

8. **Community Facilities District Formation.** To finance public facilities, public improvements and public services needed to serve the Specific Plan area, the City may form multiple Community Facilities Districts (CFD).

Other advisory bodies that will evaluate aspects of the project development include the Parks & Recreation Advisory Committee reviewing park proposals.

Probable Environmental Effects/Issues Scoped for EIR

Issue areas that may be determined to be potentially significant include:

- Aesthetics/Visual Resources
- Agriculture and Forestry Resources
- Air Quality
- Biological Resources
- Cultural and Tribal Cultural Resources
- Geology/Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology/Water Quality
- Land Use/Planning
- Noise
- Population/Housing
- Public Services
- Recreation
- Transportation/Traffic
- Utilities/Service Systems
- Energy

Development of a Reasonable Range of Alternatives

Factors determining alternative project configurations include considerations of project objectives, site suitability, economic viability, and availability of infrastructure, General Plan consistency, and a proponent's control over alternative sites. The EIR will discuss the rationale for selection of alternatives that are feasible and therefore, merit in-depth consideration, and which are infeasible (e.g., failed to meet Project objectives or did not avoid significant environmental effects) and therefore rejected. Project alternatives have yet to be finalized.

These alternatives will be general in nature since further environmental issue area analyses would be necessary before more specific project alternatives can be identified. The need for project redesign would be determined during the course of environmental review.

Public Scoping Meeting

A public scoping meeting has been scheduled to allow for any interested persons to supply input on issues to be discussed in the EIR:

Date: **Wednesday January 30, 2019**
Time: **6:30 p.m.**
Location: **Paso Robles City Hall – City Council Chamber (Library Conference Room)**

The meeting is an opportunity for City and consultant staffs to gather information from the public regarding the potential environmental impacts of the project that need to be evaluated in the EIR. It is not intended to be a hearing on the merits of the project. Therefore, members of the public should keep their comments focused on potential significant changes to the environment that may occur as a direct result of project development.

City of El Paso de Robles
Community Development Department

Olsen-South Chandler Ranch Specific Plan
Notice of Preparation of EIR
Project Comments

Date: 1-30-2019 **Name:** Cathy David

Mailing Address: 14305 El Monte, Atascadero, 93422

Email Address sassycate@gmail.com

Please complete the contact information if you want to be notified of future meetings

Project Comments:

Use of common areas such as pools, tennis and pickleball courts. Community vs. home owners.

Think about use.

Comments can be submitted to the Planning Department at: City Hall, 1000 Spring St., Paso Robles, California 93446
or emailed to: Planning@PRCity.com

City of El Paso de Robles
Community Development Department

Olsen-South Chandler Ranch Specific Plan
Notice of Preparation of EIR
Project Comments

Date: 1/30/19 **Name:** LARRY WERNER

Mailing Address: 741 ORCHARD DRIVE PASO ROBLES

Email Address larrywernerconsulting@gmail.com

Please complete the contact information if you want to be notified of future meetings

Project Comments:

(1) I THINK IT IS A GOOD IDEA TO DO PICKLEBALL COURTS WHERE THE TENNIS COURTS ARE NOW SHOWN. 8 PICKLEBALL PRACTICE COURTS & 2 TOURNAMENT LEVEL COURTS

(2) THE PICKLEBALL COURTS SHOWN DOWN BY THE CREEK SHOULD RUN NORTH/SOUTH NOT EAST WEST AND THE FENCE SHOULD BE AT LEAST 8', NOT 4' AS SHOWN ON EXHIBIT.

(3) THERE SHOULD BE A WAY TO ALLOW THE PUBLIC & PICKLEBALL CLUBS PLAY ON THE COURTS AND PAY A FEE TO PLAY.

Comments can be submitted to the Planning Department at: City Hall, 1000 Spring St., Paso Robles, California 93446
or emailed to: Planning@PRCity.com

City of El Paso de Robles
Community Development Department

Olsen-South Chandler Ranch Specific Plan
Notice of Preparation of EIR
Project Comments

Date: 1/30/19 **Name:** GRACE PICHOLA

Mailing Address: 1001 PIONEER TRAIL RD PASO ROBLES

Email Address Grojsik@AOL.com.

Please complete the contact information if you want to be notified of future meetings

Project Comments:

I'm living just on the corner this future project.
I thing it is great idea to built this area. This land is so empty. Future will bring lotof new piople they will move in this city with money and new idea.
City it's growing and we need people with money, and to change city in beauty, new look.

Grace

Comments can be submitted to the Planning Department at: City Hall, 1000 Spring St., Paso Robles, California 93446
or emailed to: Planning@PRCity.com

City of El Paso de Robles
Community Development Department

Olsen-South Chandler Ranch Specific Plan
Notice of Preparation of EIR
Project Comments

Date: _____ **Name:** _____

Mailing Address: _____

Email Address _____

Please complete the contact information if you want to be notified of future meetings

Project Comments:

We need more workforce housing — or housing for real people who work here & can't find a place to rent or buy. Driving up housing costs w/ large homes in a resort community doesn't help Paso Robles. Please be thoughtful about what you build here. We care.

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or emailed to: Planning@PRCity.com

City of El Paso de Robles
Community Development Department

Olsen-South Chandler Ranch Specific Plan
Notice of Preparation of EIR
Project Comments

Date: 1/30/19 **Name:** SYLWIA KROTKE

Mailing Address: 314 PRIMROSE LN, PASO ROBLES

Email Address INFO @ ZAPPY INTERIORS. COM

Please complete the contact information if you want to be notified of future meetings

Project Comments:

We are very exited for the new development. The plans look great.
The new housing development is much needed in Paso. It will attract a lot of new people with good income.
New development will also beautify Paso.
I'm an Interior Designer and I'm always excited for such projects.
Feel free to contact me if you need any interior design services.

Sylwia Krotke

Comments can be submitted to the Planning Department at: City Hall, 1000 Spring St., Paso Robles, California 93446
or emailed to: Planning@PRCity.com

City of El Paso de Robles
Community Development Department

Olsen-South Chandler Ranch Specific Plan
Notice of Preparation of EIR
Project Comments

Date: 1-30-19 **Name:** John Long

Mailing Address: 1742 Eastview, PR 93446

Email Address jlong50@yahoo.com

Please complete the contact information if you want to be notified of future meetings

Project Comments:

My property backs up to area around Scott St to the 40' buffer walk way.
Concerned about: A - fencing between my property and project. Are there plans to re-build consistent, attractive and functional fence?
B - Street lighting that will not impact Sierra Bonita lots. Kept at lower height and Shaded to direct light down only.
C - Security - 40' buffer walkway will invite criminal, vandilism to Sierra Bonita residence with minimal fencing currently in place. Private access now but with development will come public access. A common, consistent, attractive, and functional fence would eliminate a possible security issue.

Comments can be submitted to the Planning Department at: City Hall, 1000 Spring St., Paso Robles, California 93446
or emailed to: Planning@PRCity.com

City of El Paso de Robles
Community Development Department

Olsen-South Chandler Ranch Specific Plan
Notice of Preparation of EIR
Project Comments

Date: JAN 30, 2019 **Name:** PERRY DESTRO

Mailing Address: 922 SALIDA DEL SOL DR. - PASO ROBLES

Email Address

Please complete the contact information if you want to be notified of future meetings

Project Comments:

1. In general, looks very nice

2. Concerns as usual would be:
   (a) Traffic Impacts in the northwest quadrant
   (b) Fire and police infrastructure impacts
   (c) How development would be phased in (when would the community center be built?)

Comments can be submitted to the Planning Department at: City Hall, 1000 Spring St., Paso Robles, California 93446
or emailed to: Planning@PRCity.com

City of El Paso de Robles
Community Development Department

Olsen-South Chandler Ranch Specific Plan
Notice of Preparation of EIR
Project Comments

Date: 1-30-19 **Name:** Sherri Rahn

Mailing Address: 932 Salida del Sol Dr.

Email Address sherrijrahn@gmail.com

Please complete the contact information if you want to be notified of future meetings

Project Comments:

Interesting proposal:

1. Traffic design & impacts are a must currently the two bridges are level "F" morning & afternoons

2. Open space and Recreation Facilities need to be developed and planned as dev. grows.

3. Water is a significant impact on a limited resource. How will supply be addressed?

4. The Proposal must pay its own way with Dev. impact fees. Must Community wide covers All impacts.

Comments can be submitted to the Planning Department at: City Hall, 1000 Spring St., Paso Robles, California 93446
or emailed to: Planning@PRCity.com

City of El Paso de Robles
Community Development Department

Olsen-South Chandler Ranch Specific Plan
Notice of Preparation of EIR
Project Comments

Date: 1-30-19 **Name:** Scott Mathews

Mailing Address:

Email Address Scott @ oakviewproperties.NET

Please complete the contact information if you want to be notified of future meetings

Project Comments:

as a RE Broker I can say we need The Project and The homes. We need homes Locals can buy and as proposed it seems we have good mix.

Comments can be submitted to the Planning Department at: City Hall, 1000 Spring St., Paso Robles, California 93446
or emailed to: Planning@PRCity.com

City of El Paso de Robles
Community Development Department

Olsen-South Chandler Ranch Specific Plan
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Project Comments

Date: _____ **Name:** _____

Mailing Address: _____

Email Address _____

Please complete the contact information if you want to be notified of future meetings

Project Comments:

Traffic —
NOTE: Paso Robles high school.
road: 4 lanes — always crowded
in am + pm.
Can location of proposed school be changed
** Water — drought?

Construction impact? how do
current residents navigate to
town Through construction
traffic?

Comments can be submitted to the Planning Department at: City Hall, 1000 Spring St., Paso Robles, California 93446
or emailed to: Planning@PRCity.com

City of El Paso de Robles
Community Development Department

Olsen-South Chandler Ranch Specific Plan
Notice of Preparation of EIR
Project Comments

Date: 1/30/2019 **Name:** Melinda Sterling

Mailing Address:

Email Address sterling1203@gmail.com

Please complete the contact information if you want to be notified of future meetings

Project Comments:

Speed control on Airport and Meadowlark is ESSENTIAL. Even now there are not enough stop signs, and speed limit on Meadowlark should be decreased.

Comments can be submitted to the Planning Department at: City Hall, 1000 Spring St., Paso Robles, California 93446
or emailed to: Planning@PRCity.com

City of El Paso de Robles
Community Development Department

Olsen-South Chandler Ranch Specific Plan
Notice of Preparation of EIR
Project Comments

Date: Jan 30, 2019 **Name:** Merry Diaz

Mailing Address: 2731 Stonebrook Circle Paso Robles 93446

Email Address merry293@yahoo.com

Please complete the contact information if you want to be notified of future meetings

Project Comments:

1. Roadways going in - how will you improve on what we have.
2. Construction equipment - how will they get in & out?
3. Water?
4. Schools
5. Markets

We need these items addressed

Comments can be submitted to the Planning Department at: City Hall, 1000 Spring St., Paso Robles, California 93446
or emailed to: Planning@PRCity.com

City of El Paso de Robles
Community Development Department

Olsen-South Chandler Ranch Specific Plan
Notice of Preparation of EIR
Project Comments

Date: 1-30-19 **Name:** Deana Lowry

Mailing Address: 1832 Southview Cir

Email Address Ideana.lowry@gmail.com

Please complete the contact information if you want to be notified of future meetings

Project Comments:

Concerns

Streets - plans show only Scott St will be access road along with Lenne & Airport.

Water - we have been rationing - now water is paid for for new buildings

Traffic - Where are all these cars going to sit in & out of new housing

Freeway access
There are only 2 bridges & Hwy 46
Might want to construct another bridge or roadways BEFORE building

Sierra Bonita & Quail Run & 55+ housing will be added in the middle of these communities

Comments can be submitted to the Planning Department at: City Hall, 1000 Spring St., Paso Robles, California 93446
or emailed to: Planning@PRCity.com

City of El Paso de Robles
Community Development Department

Olsen-South Chandler Ranch Specific Plan
Notice of Preparation of EIR
Project Comments

Date: 1/30/19 **Name:** JIM STERN

Mailing Address: 976 Vista Cerro Dr.

Email Address JimSTERN@Hotmail.com

Please complete the contact information if you want to be notified of future meetings

Project Comments:

- Water demands AND City's Ability to provide water without impacting existing city residents. (We already have rationed water AND increasing water rates)
- Traffic Impacts on Neblick and Creston - Impact on 101 bridges. What off site improvements will be required? How will service levels be impacted for development and ultimate build-out?
- Impact on Schools
- Parking for developments Should not impact public streets.
- How is City going to Assure low cost housing?
- What will be the cost to maintain the proposed Landscaping and facilities proposed. Will it be affordable to residents. Landscape maintenance districts?
- Noise Impacts Associated with event center (EXAM)
- Will there be ANY financial Impact on existing City residents or will development pay ALL the costs? Including on-going maintenance costs?
- Does the City have sewer capacity. Will improvements be paid by developer AND maintenance

Comments can be submitted to the Planning Department at: City Hall, 1000 Spring St., Paso Robles, California 93446
or emailed to: Planning@PRCity.com

City of El Paso de Robles
Community Development Department

Olsen-South Chandler Ranch Specific Plan
Notice of Preparation of EIR
Project Comments

Date: 1-30-2018 **Name:** Dennis Camp

Mailing Address: 110 Hanson Road Paso Robles, Ca 93446

Email Address dennismcamp@hotmail.com

Please complete the contact information if you want to be notified of future meetings

Project Comments:

Nice design
Traffic concern on roundabout to handle Large Truck
Flooding East side of Hanson Road
creek area needs to be kept as is

Comments can be submitted to the Planning Department at: City Hall, 1000 Spring St., Paso Robles, California 93446
or emailed to: Planning@PRCity.com

City of El Paso de Robles
Community Development Department

Olsen-South Chandler Ranch Specific Plan
Notice of Preparation of EIR
Project Comments

Date: 1/30/2019 **Name:** PAT TAYLOR

Mailing Address:

Email Address REN4TREE@gmail.com

Please complete the contact information if you want to be notified of future meetings

Project Comments:

Where's the Solar?
This going to BE Hot! Most of the time!

Heating? Natural Gas?

Comments can be submitted to the Planning Department at: City Hall, 1000 Spring St., Paso Robles, California 93446
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City of El Paso de Robles
Community Development Department

Olsen-South Chandler Ranch Specific Plan
Notice of Preparation of EIR
Project Comments

Date: 1/30/19 **Name:**

Mailing Address:

Email Address

Please complete the contact information if you want to be notified of future meetings

Project Comments:

Traffic is a concern
I understood Airport Road would be extended to Hwy 46. That relieve the Traffic on Sherwood & Scott

Comments can be submitted to the Planning Department at: City Hall, 1000 Spring St., Paso Robles, California 93446
or emailed to: Planning@PRCity.com

City of El Paso de Robles
Community Development Department

Olsen-South Chandler Ranch Specific Plan
Notice of Preparation of EIR
Project Comments

Date: 1-30-19 **Name:** Gayleen Smoot

Mailing Address: 1743 Eastview Pl, Paso Robles, CA 93446

Email Address raygaysmoot@gmail.com

Please complete the contact information if you want to be notified of future meetings

Project Comments:

My wish is that Scott St. would not be used as an entrance to the project. We are a senior community that has some vulnerable citizens. Increased traffic would cause extra stress in our peaceful, senior "village." (Sierra Bonita)

I appreciate your consideration.

Thank you

Comments can be submitted to the Planning Department at: City Hall, 1000 Spring St., Paso Robles, California 93446
or emailed to: Planning@PRCity.com

City of El Paso de Robles
Community Development Department

Olsen-South Chandler Ranch Specific Plan
Notice of Preparation of EIR
Project Comments

Date: 1/30/19 **Name:** Nick Gardner

Mailing Address: 179 Niblick Rd #126 Paso Robles, CA 93446

Email Address nickgard@verizon.net

Please complete the contact information if you want to be notified of future meetings

Project Comments:

Please add me to email/mail address

Main comment: Extending airport road north to 46 critical to alleviating/mitigating sure traffic congestion

Comments can be submitted to the Planning Department at: City Hall, 1000 Spring St., Paso Robles, California 93446
or emailed to: Planning@PRCity.com

City of El Paso de Robles
Community Development Department

Olsen-South Chandler Ranch Specific Plan
Notice of Preparation of EIR
Project Comments

Date: 1-30-19 **Name:** LISA WALTER

Mailing Address: 1117 PARKVIEW LANE

Email Address

Please complete the contact information if you want to be notified of future meetings

Project Comments:

TRAFFIC ON PARKVIEW + CREST DR/NIBLICK WOULD SEEM TO BE HUGELY IMPACTED BY THIS PROJECT AND IS ALREADY HORRIBLE DURING VARIOUS TIMES OF DAY.

WATER!! WE ARE NOT OUT OF DROUGHT SO HOW DO WE HAVE ENOUGH WATER FOR THIS

Comments can be submitted to the Planning Department at: City Hall, 1000 Spring St., Paso Robles, California 93446
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City of El Paso de Robles
Community Development Department

Olsen-South Chandler Ranch Specific Plan
Notice of Preparation of EIR
Project Comments

Date: 1-30-19 **Name:** Ken & Kathy Oster

Mailing Address: 2455 Winding Brook Rd. Paso

Email Address KSOster@charter.net

Please complete the contact information if you want to be notified of future meetings

Project Comments:

1. What degree of grading will be done behind the homes on Winding Brook? Will the hill with the Oaks remain?

2. ~~who pays for the amenities~~

We are pleased with buffer & trees between Winding Brook & the new homes, & but other homes on this street

Comments can be submitted to the Planning Department at: City Hall, 1000 Spring St., Paso Robles, California 93446
or emailed to: Planning@PRCity.com

City of El Paso de Robles
Community Development Department

Olsen-South Chandler Ranch Specific Plan
Notice of Preparation of EIR
Project Comments

Date: 1/30/19 **Name:** Dale Morris

Mailing Address: 1712 Skyview Dr

Email Address dale.jademoon@gmail.com

Please complete the contact information if you want to be notified of future meetings

Project Comments:

While I have major concerns re: water, traffic + the bridges — I am impressed with your sports —

I hope you keep in mind that this city need a legal olympic sized pool that can have swim meets. If you are going to build one - build one that can make you $ and host swim meets.

Thanks

Comments can be submitted to the Planning Department at: City Hall, 1000 Spring St., Paso Robles, California 93446
or emailed to: Planning@PRCity.com

City of El Paso de Robles
Community Development Department

Olsen-South Chandler Ranch Specific Plan
Notice of Preparation of EIR
Project Comments

Date: 1/30/19 **Name:** Karen Coleman

Mailing Address: 1037 Pioneer Trail Rd

Email Address truelight1111@gmail.com

Please complete the contact information if you want to be notified of future meetings

Project Comments:

Water
Traffic
Housing Affordability
and Since it was agricultural land it would be nice to keep some of that like community gardens to grow fruits and Vegetables etc.

Comments can be submitted to the Planning Department at: City Hall, 1000 Spring St., Paso Robles, California 93446
or emailed to: Planning@PRCity.com

City of El Paso de Robles
Community Development Department

Olsen-South Chandler Ranch Specific Plan
Notice of Preparation of EIR
Project Comments

Date: 1/30/19 **Name:** Barbara Wiehart

Mailing Address: 209 Turtle Creek

Email Address wisehartb@charter.net

Please complete the contact information if you want to be notified of future meetings

Project Comments:

Where will these potential homeowners work. If there is no work in the area - the homes will remain unsold and the value of existing homes will be lessened. The unsold homes will be available and buyers will have much more options. Existing selling prices will be lowered.

Please find a way to lessen traffic on Niblic & 13th.

Comments can be submitted to the Planning Department at: City Hall, 1000 Spring St., Paso Robles, California 93446
or emailed to: Planning@PRCity.com

City of El Paso de Robles
Community Development Department

Olsen-South Chandler Ranch Specific Plan
Notice of Preparation of EIR
Project Comments

Date: Jan. 30, 2019 **Name:** Ann Dorgan

Mailing Address: 1735 Northview Pl., Paso Robles

Email Address annandjoedorgan@att.net

Please complete the contact information if you want to be notified of future meetings

Project Comments:

I live on Northview Place, a cul-de-sac in Sierra Bonita bordered by Scott St. & Airport Rd. My concern is that Scott St. is the only outlet for my area to access Airport Rd. Excess traffic on Scott St. will make access to my home very difficult, thus jeopardizing health & welfare of the elderly. What other access roads will be built to alleviate traffic congestion on Scott St.?

Thank you for this opportunity,
Ann Dorgan

Comments can be submitted to the Planning Department at: City Hall, 1000 Spring St., Paso Robles, California 93446
or emailed to: Planning@PRCity.com

Reso A - Exhibit C2 (EIR Technical Appendix)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

IN REPLY REFER TO:
08EVEN00-2019-CPA-0036

February 11, 2019

RECEIVED
02/11/19
City of Paso Robles
Community Development Dept.

Darren Nash
City of Paso Robles
1000 Spring Street
Paso Robles, California 93446-2599

Subject: Comments on the City of Paso Robles Notice of Preparation for the Olsen/South Chandler Ranch Specific Plan Project, San Luis Obispo County, California

Dear Mr. Nash:

We have reviewed the Notice of Preparation for the Olsen/South Chandler Ranch Specific Plan Project (Project) for the City of Paso Robles, to be located between Sherwood, Fontana, Linne, Hanson, and Meadowlark Roads, Paso Robles. We provide the following comments for your consideration.

The mission of the U.S. Fish and Wildlife Service (Service) is working with others to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people. To assist in meeting this mandate, the Service provides comments on public notices issued for projects that may have an effect on those resources, particularly federally listed plants and wildlife. The Service's responsibilities also include administering the Endangered Species Act of 1973, as amended (Act). The Act prohibits the unpermitted "take" of listed species [16 U.S.C. 1538(a)(l)(B)]. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. Such taking may be authorized by the Service in two ways: through interagency consultation for projects with Federal involvement pursuant to section 7, or through the issuance of an incidental take permit under section 10(a)(1)(B) of the Act.

There are three records of vernal pool fairy shrimp (*Branchinecta lynchi*) in the California Natural Diversity Database (CNDDB) that are within 2 to 3 miles of the Project site. According to the United States Department of Agriculture Web Soil Survey, the Project site contains clay soils, which often provide habitat for vernal pool fairy shrimp. The Project site also contains other soil types that are present in nearby known locations of vernal pool fairy shrimp. Therefore, it is possible that vernal pool fairy shrimp are present on the Project site and may be affected by Project activities.

There are two records of San Joaquin kit fox (*Vulpes macrotis mutica*) within a mile of the Project site in CNDDB. These observations are from 1990 and 1991. San Joaquin kit fox prefer grassland and shrubland vegetation, which is present on the Project site. Additionally, the Project site is within about 8 miles of more recent San Joaquin kit fox records from 2014. San Joaquin kit fox can disperse up to twenty miles, therefore it is possible they are present at the Project site and may be affected by project activities.

Based on this information, we recommend surveying the Project site for all listed species that may occur in the area, especially vernal pool fairy shrimp and San Joaquin kit fox, to determine presence or absence of species. The Service can provide guidance on surveying for listed species.

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03/14/19
City of Paso Robles
Community Development Dept.

Should the City of Paso Robles conclude that there is potential for take of listed species, we recommend including in the assessment an analysis of the potential impacts to the species, and conservation measures to minimize those impacts. The Service is happy to assist with these elements of the assessment through the consultation process. Thank you for reaching out to the Service for comments on your project. Please contact Danielle Fagre at (805) 677-3339 or by electronic mail at danielle_fagre@fws.gov if you have questions regarding this letter or to arrange a meeting to discuss this issue further.

Sincerely,

Leilani Takano
Assistant Field Supervisor

California
Department of Conservation
Division of Oil, Gas, and Geothermal Resources

Gavin Newsom, Governor
David Shabazian, Director

RECEIVED
2/13/19
City of Paso Robles
Community Development Dept.

February 13, 2019

VIA U.S. MAIL AND EMAIL

Darren Nash, City Planner
City of Paso Robles, Development Center
1000 Spring Street
Paso Robles, CA 93446-2599

Dear Mr. Nash,

SCH # 2019011065 OLSEN/SOUTH CHANDLER RANCH SPECIFC PLAN PROJECT NOTICE OF PREPARATION, CITY OF PASO ROBLES

The Division of Oil, Gas, and Geothermal Resources (Division) appreciates the opportunity to submit comments on the Olsen/South Chandler Ranch Specific Plan Project (Project).

The Division of Oil, Gas, and Geothermal Resources (Division) authority is set forth in Division 3 of the Public Resources Code (PRC), and Title 14 of the California Code of Regulations (CCR). PRC § 3208.1 establishes well re-abandonment responsibility when a previously plugged and abandoned well may be impacted by planned property development or construction activities. Local permitting agencies, property owners, and/or developers should be aware of, and fully understand, that significant and potentially dangerous issues may be associated with development near oil, gas, or geothermal wells.

The Division has received and reviewed the Notice of Preparation for the above referenced Project, dated January 28, 2019. To assist local permitting agencies, property owners, and developers in making wise land use decisions regarding potential development near oil, gas, or geothermal wells, the Division provides the following well evaluation.

The Project is in San Luis Obispo county, outside of any recognized oil, gas or geothermal field boundaries. Our records indicate there is **one** known oil, gas, or geothermal well located within the Project boundary.

The well listed below is not plugged and abandoned to current Division requirements as prescribed by law, and based upon information provided, plots where proposed construction may impede access to the well. **It is the opinion of the Division that this well requires abandonment or re-abandonment.**

Reso A - Exhibit C2 (EIR Technical Appendix)

RECEIVED
2/13/2019
City of Paso Robles
Community Development Dept.

Well	*Status*
Oryx Energy Company "Harper" 1 API 079-00497 Abandoned: 2-7-1949	The record review process shows that the subject well **is not** plugged and abandoned consistent with current PRC and CCR requirements as of February 13, 2019. Based on well records: 1. Base of freshwater plug is inadequate (CCR § 1723.2). 2. Casing shoe plug is not present (CCR § 1723.3). 3. Surface plug is not present (CCR § 1723.5).

The Division categorically advises against building over, or in any way impeding access to, oil, gas, or geothermal wells. Access is considered the ability for a well servicing unit and associated necessary equipment to reach a well from a public street or access way, solely over the parcel on which the well is located. A well servicing unit, and any necessary equipment, should be able to pass unimpeded along and over the route, and should be able to access the well without disturbing the integrity of surrounding infrastructure. Items that can affect well access include, but are not limited to, buildings, housing, fencing, hardscape, landscape, trees, pools, patios, sidewalks, roadways, parking lots, waterways or channels, and decking. Impeding access to a well could result in the need to remove any structure or obstacle that prevents or impedes access.

There are no guarantees a well abandoned in compliance with current Division requirements will not start leaking in the future. It always remains a possibility that any well may start to leak oil, gas, and/or water after abandonment, no matter how thoroughly the well was plugged and abandoned. The Division acknowledges wells plugged and abandoned to the most current standards have a lower probability of leaking in the future, however there is no guarantee that such abandonments will not leak.

The Division advises that all wells identified on the development parcel prior to, or during, development activities be tested for liquid and gas leakage. Surveyed locations should be provided to the Division in Latitude and Longitude, NAD 83 decimal format. The Division expects any wells found leaking to be reported to it immediately.

Failure to plug and re-abandon a well may result in enforcement action, including an order to perform re-abandonment well work, pursuant to PRC § 3208.1, and 3224.

PRC § 3208.1 gives the Division the authority to order or permit the re-abandonment of any well where it has reason to question the integrity of the previous abandonment, or if the well is not accessible or visible. Responsibility for re-abandonment costs may be affected by the choices made by the local permitting agency, property owner, and/or developer in considering the general advice set forth in this letter. The PRC continues to define the person or entity responsible for re-abandonment as:

Reso A - Exhibit C2 (EIR Technical Appendix)

RECEIVED
2/13/19
City of Paso Robles
Community Development Dept.

1. **The property owner** - If the well was plugged and abandoned in conformance with Division requirements at the time of plugging and abandonment, and in its current condition does not pose an immediate danger to life, health, and property, but requires additional work solely because the owner of the property on which the well is located proposes construction on the property that would prevent or impede access to the well for purposes of remedying a currently perceived future problem, then the owner of the property on which the well is located shall obtain all rights necessary to re-abandon the well and be responsible for the re-abandonment.

2. **The person or entity causing construction over or near the well** - If the well was plugged and abandoned in conformance with Division requirements at the time of plugging and abandonment, and the property owner, developer, or local agency permitting the construction failed either to obtain an opinion from the supervisor or district deputy as to whether the previously abandoned well is required to be re-abandoned, or to follow the advice of the supervisor or district deputy not to undertake the construction, then the person or entity causing the construction over or near the well shall obtain all rights necessary to re-abandon the well and be responsible for the re-abandonment.

3. **The party or parties responsible for disturbing the integrity of the abandonment** - If the well was plugged and abandoned in conformance with Division requirements at the time of plugging and abandonment, and after that time someone other than the operator or an affiliate of the operator disturbed the integrity of the abandonment in the course of developing the property, then the party or parties responsible for disturbing the integrity of the abandonment shall be responsible for the re-abandonment.

To view PRC § 3208.1 in its entirety, please visit:
ftp://ftp.consrv.ca.gov/pub/oil/laws/PRC10.pdf

No well work may be performed on any oil, gas, or geothermal well without written approval from the Division. Well work requiring written approval includes, but is not limited to, mitigating leaking gas or other fluids from abandoned wells, modifications to well casings, and/or any other abandonment or re-abandonment work. The Division also regulates the top of a plugged and abandoned well's minimum and maximum depth below final grade. CCR §1723.5 states well casings shall be cut off at least 5 feet but no more than 10 feet below grade. If any well needs to be lowered or raised (i.e. casing cut down or casing riser added) to meet this regulation, a permit from the Division is required before work can start.

The Division makes the following additional recommendations to the local permitting agency, property owner, and developer:

Reso A - Exhibit C2 (EIR Technical Appendix)

RECEIVED
2/15/19
City of Paso Robles
Community Development Dept.

1. To ensure that present and future property owners are aware of (a) the existence of all wells located on the property, and (b) potentially significant issues associated with any improvements near oil or gas wells, the Division recommends that information regarding the above identified well(s), and any other pertinent information obtained after the issuance of this letter, be communicated to the appropriate county recorder for inclusion in the title information of the subject real property.

2. The Division recommends that any soil containing hydrocarbons be disposed of in accordance with local, state, and federal laws. Please notify the appropriate authorities if soil containing significant amounts of hydrocarbons is discovered during development.

As indicated in PRC § 3106, the Division has jurisdictional authority over the drilling, operation, maintenance, and abandonment of oil, gas, and geothermal wells, and attendant facilities, to prevent, as far as possible, damage to life, health, property, and natural resources, damage to underground oil, gas, and geothermal deposits, and damage to underground and surface waters suitable for irrigation or domestic purposes. In addition to the Division's authority to order work on wells pursuant to PRC §§ 3208.1 and 3224, it has authority to issue civil and criminal penalties under PRC §§ 3236, 3236.5, and 3359 for violations within the Division's jurisdictional authority. The Division does not regulate grading, excavations, or other land use issues.

If during development activities any wells are encountered that were not part of this review, a Division engineer in the Coastal District - Orcutt office is to be notified immediately, and an amended site plan with well casing diagrams for Division review shall be filed. After appropriate review, the District office will send a follow-up well evaluation letter to the property owner, applicant, and local permitting agency.

Thank you for considering the Division's comments. If you have any questions, please contact our district office at (805) 937-7246 or via email at DOGGRCoastal@conservation.ca.gov.

Sincerely,

Patricia A. Abel
Coastal District Deputy

cc: State Clearinghouse
OLRA, Christine Hansen/Vanessa Adame/Naveen Habib
CEQA, Jan Perez
CEQA - Unit
CSWR File
Chrono
Well File

California
Department of Conservation
Division of Oil, Gas, and Geothermal Resources

Gavin Newsom, Governor
David Bunn, Director

February 13, 2019

VIA U.S. MAIL AND EMAIL

Darren Nash, City Planner
City of Paso Robles, Development Center
1000 Spring Street
Paso Robles, CA 93446-2599

RECEIVED
FEB 19 2019
City of Paso Robles
Community Development Dept.

Dear Mr. Nash,

SCH # 2019011065 OLSEN/SOUTH CHANDLER RANCH SPECIFC PLAN PROJECT NOTICE OF PREPARATION, CITY OF PASO ROBLES

The Division of Oil, Gas, and Geothermal Resources (Division) appreciates the opportunity to submit comments on the Olsen/South Chandler Ranch Specific Plan Project (Project).

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RECEIVED
02/19/19
City of Paso Robles
Community Development Dept.

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02/13/19
City of Paso Robles
Community Development Dept.

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RECEIVED
02/19/19
City of Paso Robles
Community Development Dept.

1. To ensure that present and future property owners are aware of (a) the existence of all wells located on the property, and (b) potentially significant issues associated with any improvements near oil or gas wells, the Division recommends that information regarding the above identified well(s), and any other pertinent information obtained after the issuance of this letter, be communicated to the appropriate county recorder for inclusion in the title information of the subject real property.

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If during development activities any wells are encountered that were not part of this review, a Division engineer in the Coastal District - Orcutt office is to be notified immediately, and an amended site plan with well casing diagrams for Division review shall be filed. After appropriate review, the District office will send a follow-up well evaluation letter to the property owner, applicant, and local permitting agency.

Thank you for considering the Division's comments. If you have any questions, please contact our district office at (805) 937-7246 or via email at DOGGRCoastal@conservation.ca.gov.

Sincerely,

Patricia A. Abel
Coastal District Deputy

cc: State Clearinghouse
OLRA, Christine Hansen/Vanessa Adame/Naveen Habib
CEQA, Jan Perez
CEQA - Unit
CSWR File
Chrono
Well File

RECEIVED
02/19/19
City of Paso Robles
Community Development Dept.

Reso A - Exhibit C2 (EIR Technical Appendix)

City of El Paso de Robles
Community Development Department

Olsen-South Chandler Ranch Specific Plan
Notice of Preparation of EIR

Project Comments

Date: 2-18-19 **Name:** Ralph Greenup

Mailing Address: 1706 Kings Drive PR

Email Address ralphgreenup@att.net

Please complete the contact information if you want to be notified of future meetings

Project Comments:

Concerned about Noise. We have too many outdoor event centers with amplified noise. Please keep the urban noise out of the neighborhoods.

Scott Street is not & should not be a main artery. Increasing motor Traffic Through a park playground and a quiet senior neighborhood is a bad idea.

Why is green such a dominant color on the conceptual plan? Where is the water To Keep all That space green. PR is paying people to reduce water consumption Then charging outrageous price for The little water we do use.

RECEIVED
FEB 19 2019
BUILDING DIVISION

Comments can be submitted to the Planning Department at: City Hall, 1000 Spring St., Paso Robles, California 93446
or emailed to: Planning@PRCity.com

NATIVE AMERICAN HERITAGE COMMISSION
Cultural and Environmental Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691 Phone (916) 373-3710
Email: nahc@nahc.ca.gov
Website: http://www.nahc.ca.gov
Twitter: @CA_NAHC

RECEIVED
FEB 19 2019
City of Paso Robles
Community Development Dept.

February 12, 2019

Darren Nash
City of Paso Robles
1000 Spring Street
Paso Robles, CA 93446-2599

RE: SCH# 2019011065 Olsen/South Chandler Ranch Specific Plan, San Luis Obispo County

Dear Mr. Nash:

The Native American Heritage Commission (NAHC) has received the Notice of Preparation (NOP), Draft Environmental Impact Report (DEIR) or Early Consultation for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code §21000 et seq.), specifically Public Resources Code §21084.1, states that a project that may cause a substantial adverse change in the significance of a historical resource, is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit.14, §15064.5 (b) (CEQA Guidelines §15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an Environmental Impact Report (EIR) shall be prepared. (Pub. Resources Code §21080 (d); Cal. Code Regs., tit. 14, § 5064 subd.(a)(1) (CEQA Guidelines §15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources within the area of potential effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a separate category of cultural resources, "tribal cultural resources" (Pub. Resources Code §21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. (Pub. Resources Code §21084.2). Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code §21084.3 (a)). **AB 52 applies to any project for which a notice of preparation, a notice of negative declaration, or a mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements**. If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. §800 et seq.) may also apply.

The NAHC recommends consultation with California Native American tribes that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments.

Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a lead agency shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:
   a. A brief description of the project.
   b. The lead agency contact information.
   c. Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code §21080.3.1 (d)).
   d. A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code §21073).

2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A lead agency shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code §21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or Environmental Impact Report. (Pub. Resources Code §21080.3.1(b)).
   a. For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code §65352.4 (SB 18). (Pub. Resources Code §21080.3.1 (b)).

3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:
   a. Alternatives to the project.
   b. Recommended mitigation measures.
   c. Significant effects. (Pub. Resources Code §21080.3.2 (a)).

4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:
   a. Type of environmental review necessary.
   b. Significance of the tribal cultural resources.
   c. Significance of the project's impacts on tribal cultural resources.
   d. If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code §21080.3.2 (a)).

5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code §6254 (r) and §6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code §21082.3 (c)(1)).

6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:
   a. Whether the proposed project has a significant impact on an identified tribal cultural resource.
   b. Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code §21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code §21082.3 (b)).

7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:
    a. The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or
    b. A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code §21080.3.2 (b)).

8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code §21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code §21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code §21082.3 (a)).

9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code §21084.3 (b). (Pub. Resources Code §21082.3 (e)).

10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:
    a. Avoidance and preservation of the resources in place, including, but not limited to:
        i. Planning and construction to avoid the resources and protect the cultural and natural context.
        ii. Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
    b. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
        i. Protecting the cultural character and integrity of the resource.
        ii. Protecting the traditional use of the resource.
        iii. Protecting the confidentiality of the resource.
    c. Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.
    d. Protecting the resource. (Pub. Resource Code §21084.3 (b)).
    e. Please note that a federally recognized California Native American tribe or a non-federally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code §815.3 (c)).
    f. Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code §5097.991).

11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An Environmental Impact Report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:
    a. The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code §21080.3.1 and §21080.3.2 and concluded pursuant to Public Resources Code §21080.3.2.
    b. The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.
    c. The lead agency provided notice of the project to the tribe in compliance with Public Resources Code §21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code §21082.3 (d)).

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf

SB 18

SB 18 applies to local governments and requires local governments to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code §65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code §65352.3 (a)(2)).
2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.
3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code §65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code §5097.9 and §5097.993 that are within the city's or county's jurisdiction. (Gov. Code §65352.3 (b)).
4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:
    a. The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
    b. Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: http://nahc.ca.gov/resources/forms/

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (http://ohp.parks.ca.gov/?page_id=1068) for an archaeological records search. The records search will determine:
    a. If part or all of the APE has been previously surveyed for cultural resources.
    b. If any known cultural resources have already been recorded on or adjacent to the APE.
    c. If the probability is low, moderate, or high that cultural resources are located in the APE.
    d. If a survey is required to determine whether previously unrecorded cultural resources are present.

2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
    a. The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
    b. The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

3. Contact the NAHC for:
    a. A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.
    b. A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.

4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.
    a. Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, §15064.5(f) (CEQA Guidelines §15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.
    b. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.
    c. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code §7050.5, Public Resources Code §5097.98, and Cal. Code Regs., tit. 14, §15064.5, subdivisions (d) and (e) (CEQA Guidelines §15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

If you have any questions or need additional information, please contact me at my email address:

Steven.Quinn@nahc.ca.gov.

Sincerely,

for Steven Quinn
Associate Governmental Program Analyst

cc: State Clearinghouse

heal slo
HEALTHY EATING ACTIVE LIVING
San Luis Obispo County

February 25, 2019

COALITION PARTNERS:

Air Pollution Control District
Bike SLO County
Cal Poly University
City and Regional Planning
Food Science & Nutrition Department
Kinesiology Department
Cal Trans
CenCal Health
Community Action Partnership of SLO County
Dairy Council of California
Diringer Associates
First 5 Commission of SLO
Home Share
Rideshare – Safe Routes to School
San Luis Sports Therapy
SLO Council of Governments
SLO County Health Commission
SLO County Office of Education
SLO County Parks
SLO County Planning and Building
SLO County Public Health
SLO Food Bank Coalition
The Community Foundation SLO County
UC Cooperative Extension
YMCA of SLO County

Darren Nash
City Planner
City of Paso Robles, Community Development Department
1000 Spring St.
Paso Robles, CA 93446

RE: City of Paso Robles
Olsen/South Chandler Ranch Specific Plan Project

Dear Mr. Nash,

HEAL SLO is a coalition working to enhance the health and well-being of all San Luis Obispo County residents through policy, behavioral and environmental changes. In carrying out that mission, since 2012, a subcommittee called the Healthy Communities Work Group has provided responses to County Planning staff from a healthy community's perspective on proposed land development projects, ordinance and general plan amendments. In recent years, the Work Group has also begun collaborating with local jurisdictions, providing comments on proposed projects and general plan updates.

The Healthy Communities Work Group has reviewed the EIR Notice of Preparation for the Olsen/South Chandler Ranch Specific Plan Project. Although our group generally supports the addition of housing units, we have concerns, and feel that this specific plan could better align with healthy community principles.

Attached you will find the Healthy Communities Work Group Specific Plan Assessment tool. This "checklist" outlines indicators of a healthy community. Based on these indicators, we see opportunities for improvement in the proposed specific plan in the following areas:

- **Public transportation and active transportation**: Our current transportation system has many direct health consequences: pollution-related asthma, steep declines in physical activity, and the associated rise in obesity and chronic illnesses are just a few examples[1]. Our Work Group wonders how

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public and active transportation will be addressed in this specific plan to support and enhance the health of the community.

- **Multi-generational housing:** Multi-generational living arrangements can increase psychological, social, and financial capital – all of which are associated with improvements in health and longevity[3]. The Healthy Communities Work Group urges for the inclusion of alternative housing types, not just single-family residential, in this specific plan.

- **Integration of the affordable housing units into the mixed-rate housing units:** In a 2013 report published by the Pew Charitable Trusts' Economic Mobility Project, it was found that areas with higher economic segregation are subject to less economic mobility[2].

- **Increased density:** Increasing density reduces the distances between housing, workplaces, retail businesses, and other frequented destinations. This, in turn, increases pedestrian and bicycling opportunities and reduces auto dependency[4]. The Healthy Communities Work Group hopes to see an alternative proposal to increase density with creative planning.

The Healthy Communities Work Group looks forward to learning more about this specific plan as planning progresses. Thank you for the opportunity to provide comments.

Sincerely,

S Teaford

Stephanie Teaford
Chair
Healthy Communities Work Group

---

[1]*Healthy, Equitable Tranportation Policy: Recommendation and Research*. PolicyLink. http://www.policylink.org/resources-tools/healthy-equitable-transportation-policy-recommendations-and-research
[2]*Mobility and the Metropolis.* The Pew Charitable Trust, 2013. https://www.pewtrusts.org/en/research-and-analysis/reports/0001/01/01/mobility-and-the-metropolis
[3]*Living with parents or grandparents increases social capital and survival.* SSM Population Health, 2018. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5769098/
[4]*Built Environment Correlates of Walking: A Review.* 2008. https://www.ncbi.nlm.nih.gov/pubmed/18562973

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Project Checklist for Healthy Communities Work Group

[D] Specific Plan

Project Information

Project name:	*Name of project*	**Number of housing units:**	*## units*
Project location:	*Location of project*	**Non-residential square footage:**	*###,### sq. ft.*
Jurisdiction:	*Jurisdiction of project*	**Acreage of residential development:**	*##.# acres*
Application #:	*2016-###*	**Gross residential density (Net residential density):**	*## du/acre (## du/acre)*
Project Developer:	*Name of developer*	**Acreage of non-residential development:**	*##.# acres*
		Estimated new employment:	*### employees*
		Employment density:	*## employees/acre*
		Number of required parking spaces:	*### spaces (required)*
		Number of parking spaces:	*### spaces (proposed for project)*

HEALTHY COMMUNITY INDICATORS

Section 1. Proximity to services		*Points available*	*Points awarded*	*Yes*	*No*	*N/A*	*Notes*
1-a	Project is within 1/2-mile walking distance of local fixed-route transit service	*5*					
1-b	Project is within 1/2-mile walking distance of local fixed-route transit service with 30-minute frequency	*5*					
1-c	Project is within 1/2-mile walking distance of regional transit service	*5*					
1-d	Project is within 1-mile walking distance of an existing Class I bike/ped path	*5*					
1-e	Project is within 1-mile walking distance of existing Class II bike lanes	*5*					
1-f	Project is within 3-mile driving distance of a grocery store and shopping center	*5*					
1-g	Project is within 1-mile walking distance of a neighborhood market	*5*					
1-h	Project is within 1-mile walking distance of a school	*10*					
1-i	Project is adjacent to a safe (walking or biking) route to school	*5*					
1-j	Project is within 1/2-mile walking distance of a community park	*5*					
1-k	Project is within 1-mile walking distance of an open space area or a hiking trailhead	*5*					
1-l	Project is within 2-mile walking distance of a regular farmers market	*5*					
	Points for Section 1:	**65**	**0**				

Section 2. Amenities within development		*Points available*	*Points awarded*	*Yes*	*No*	*N/A*	*Notes*
2-a	Presence of recreational amenities within development	*5*					
2-b	Presence of sidewalks and other pedestrian amenities within development	*5*					
2-c	Presence of bicycle amenities such as bike racks	*5*					
2-d	Project includes amenities in common areas, such as green space, benches, trails, aerobic workout equipment, safe places for kids to play, and pet areas	*5*					
	Points for Section 2:	**20**	**0**				

Section 3. Neighborhood design		*Points available*	*Points awarded*	*Yes*	*No*	*N/A*	*Notes*
3-a	Presence of complete sidewalk network adjacent to development	*5*					
3-b	Average lot size is less than 6,000 square feet (small-lot single-family housing product) *(or, average density is 7.25 dwelling units per acre [du/ac] or greater)*	*10*					
3-c	Presence of community gardens and other common areas within walking distance of subdivision	*5*					
3-d	All residential areas and recreation facilities are located more than 500 feet from a major road	*5*					
3-e	Development has a floor area ratio (FAR) greater than 0.5 *(i.e., total building floor area is 50 percent of total area of property)*	*5*					
3-f	Development has a floor area ratio (FAR) greater than 1.0	*5*					
3-g	Development has fewer parking spaces than required *(based on having spaces designated for carpools and/or vanpools)*	*20*					
3-h	Development offers space for multiple tenants and multiple uses *(i.e., retail, office, personal services, etc.)*	*5*					
3-i	Development offers direct walking and/or biking connections to adjacent developments	*5*					
3-j	Development includes energy efficient design aspects	*5*					
	Points for Section 3:	**70**	**0**				

Project Checklist for Healthy Communities Work Group

[D] Specific Plan

heal slo
Healthy Communities Month
BRINGING PEOPLE TOGETHER FOR A HEALTHY FUTURE

Project Information

Project name:	*Name of project*	**Number of housing units:**	*## units*
Project location:	*Location of project*	**Non-residential square footage:**	*###,### sq. ft.*
Jurisdiction:	*Jurisdiction of project*	**Acreage of residential development:**	*##.# acres*
Application #:	*2016-###*	**Gross residential density (Net residential density):**	*## du/acre (## du/acre)*
Project Developer:	*Name of developer*	**Acreage of non-residential development:**	*##.# acres*
		Estimated new employment:	*### employees*
		Employment density:	*## employees/acre*
		Number of required parking spaces:	*### spaces (required)*
		Number of parking spaces:	*### spaces (proposed for project)*

HEALTHY COMMUNITY INDICATORS

Section 4. Housing type and affordability		*Points available*	*Points awarded*	*Yes*	*No*	*N/A*	*Notes*
4-a	Project includes affordable housing units	*20*					
4-b	Project includes rental housing *(including duplex, triplex, apartment complex, mobile home)*	*15*					
4-c	Project includes a variety of housing types *(single-family attached or condo, multi-family housing; not just single-family detached)*	*10*					
4-d	Project includes secondary housing units or accessory dwelling units	*5*					
	Points for Section 4:	**50**	**0**				

Section 5. Employee commute and transportation demand management		*Points available*	*Points awarded*	*Yes*	*No*	*N/A*	*Notes*
5-a	Presence of dedicated parking for carpools and/or vanpools	*10*					
5-b	Presence of secure bike parking (bike racks and/or bike lockers)	*10*					
5-c	Developer coordinates with SLO Regional Rideshare to develop a Trip Reduction Plan to offer commute choices	*20*					
5-d	Presence of shower facilities for employee use (accommodate commute or lunchtime exercise)	*5*					
5-e	Presence of kitchen facilities for employee use (accommodate light lunchtime cooking, healthy meals, etc.)	*5*					
	Points for Section 5:	**50**	**0**				

Section 6. Employment variety/type		*Points available*	*Points awarded*	*Yes*	*No*	*N/A*	*Notes*
6-a	Project likely will accommodate a mix of job types and income levels	*20*					
6-b	Most new jobs in development are within key regional economic clusters	*15*					
	Points for Section 6:	**35**	**0**				

Section 7. Policy consistency with local and regional plans		*Points available*	*Points awarded*	*Yes*	*No*	*N/A*	*Notes*
7-a	Project is located within *city limits* or *county urban reserve line (URL)*	*2*					
7-b	Project is consistent with jurisdiction's general plan and zoning ordinance	*2*					
7-c	Project is located within one of SLOCOG's 55 *target development areas (TDAs)*	*2*					
7-d	Project is consistent with SLOCOG's Sustainable Communities Strategy (2014 RTP/SCS)	*2*					
7-e	Project is consistent with the healthy community policies of the HEAL-SLO Healthy Communities Work Group	*2*					
	Points for Section 7:	**10**	**0**				
	Total Points for all sections:	**300**	**0**				

DEPARTMENT OF TRANSPORTATION
CALTRANS DISTRICT 5
50 HIGUERA STREET
SAN LUIS OBISPO, CA 93401-5415
PHONE (805) 549-3101
FAX (805) 549-3329
TTY 711
www.dot.ca.gov/dist05/

Making Conservation a California Way of Life.

February 26, 2019

SLO 46 PM 31.31
SCH# 2019011065

Darren Nash, City Planner
City of Paso Robles
1000 Spring Street
Paso Robles, CA 93446-2599

COMMENTS FOR THE NOTICE OF PREPARATION (NOP) OF THE DRAFT ENVIRONMENTAL IMPACT REPORT (EIR) FOR THE OLSEN – SOUTH CHANDLER RANCH SPECIFIC PLAN

Dear Mr. Nash:

The California Department of Transportation (Caltrans) appreciates the opportunity to review the Notice of Preparation (NOP) of the draft Environmental Impact Report (EIR) for the Olsen – South Chandler Ranch Specific Plan. Caltrans has reviewed the project and offers the following comments:

1. Caltrans supports local planning efforts that are consistent with State planning priorities intended to promote equity, strengthen the economy, protect the environment, and promote public health and safety. We accomplish this by working with local jurisdictions to achieve a shared vision of how the transportation system should and can accommodate interregional and local travel.

2. Projects that support smart growth principles which include improvements to pedestrian, bicycle, and transit infrastructure (or other key Transportation Demand Strategies) are supported by Caltrans and are consistent with our mission, vision, and goals.

3. The traffic study should include information on existing traffic volumes within the study area, including the State transportation system, and should be based on recent traffic volumes less than two years old. Counts older than two years cannot be used as a baseline. Caltrans request the methodology used for the analysis, Synchro Model, and calculations be provided to us for review.

4. Caltrans had the opportunity to review and provide early comment (see enclosed email) on the scope of work for the Olsen-South Chandler Ranch Specific Plan traffic impact study in October 2018. Please make sure to address those comments in the EIR.

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5. At any time during the environmental review and approval process, Caltrans retains the statutory right to request a formal scoping meeting to resolve any issues of concern. Such formal scoping meeting requests are allowed per the provisions of the California Public Resources Code Section 21083.9 [a] [1].

6. Please be aware any work within the State's right-of-way will require an encroachment permit from Caltrans and must be done to our engineering and environmental standards, and at no cost to the State. The conditions of approval and the requirements for the encroachment permit are issued at the sole discretion of the Permits Office, and nothing in this letter shall be implied as limiting those future conditioned and requirements. For more information regarding the encroachment permit process, please visit our Encroachment Permit Website at: http://www.dot.ca.gov/trafficops/ep/index.html.

We look forward to continued coordination with the City on this project. If you have any questions, or need further clarification on items discussed above, please contact me at (805) 549-3432 or Jenna.Schudson@dot.ca.gov .

Sincerely,

Jenna Schudson
Development Review Coordinator
District 5, LD-IGR South Branch

Enclosure

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Reso A - Exhibit C2 (EIR Technical Appendix)

Schudson, Jenna@DOT

From: Schudson, Jenna@DOT
Sent: Friday, October 5, 2018 2:46 PM
To: 'DAthey@prcity.com'
Subject: Olsen-Chandler Specific Plan TIS Scope of Work Comments

Good afternoon David,

Thank you for the opportunity to review and comment on the Olsen-Chandler Specific Plan TIS Scope of Work. This is a review of the scope of work only and not an approval of any traffic analysis that has been included with the scope of work. Caltrans retains the right to provide additional comments at a later date including during the public review comment period.

General Comments:

Task 3 is proposed as the Project Trip Generation and Distribution. This task includes the Memorandum of Assumptions, as well as the Trip Generation and Distribution. This should be Task #1. It is difficult to determine which intersections need to be studied without knowing the type of land uses and development proposed, where the proposed trips will be going on the roadway network and what intersections will be impacted.

This scope represents a portion of what has been previously presented as a larger development, where the Chandler portion reached north to Union Road. This project should evaluate all the same intersections as the larger project will be required to study to allow for trip redistribution evaluation and impacts when the rest of the larger area is developed.

The Beechwood and Olsen-Chandler projects should study the same locations with the same requirements. Please update Beechwood as necessary to match all study requirements.

Given the projects location, all new trips should be considered Primary Trips to and from the State Right-Of-Way. For the local internal network, the methodology for Pass-by and Diverted-Link trips needs to be developed and reviewed. The ITE Trip Generation Handbook 3rd Edition documentation (Calculations, site map with driveway locations, the +/- trip distribution map, etc.) should be required.

It is anticipated that the Beechwood and Olsen-Chandler Traffic Impact Studies will be coordinated.

Scope of work Specific Comments: (The following comments are based off the task numbering as proposed in the draft Scope of Work)

Task 1- Data Collection

Please, include a map with all the study area intersections marked.

The intersections should be counted for 24 hours. The traffic counts provided by the Beechwood Traffic Impact Memorandum showed intersections in this area have A.M. and P.M. peak hours that do not fall between the typical A.M. and P.M. commuter peak hours. Clarify the hours of data collection.

The following intersections need to be added:

- SR 46 E/Buna Vista Drive
- SR 46 E/Airport Road
- SR 46 E/Mill Road

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The US 101 Segments need to be studied using ADT volumes to match the data collect on the local roads and roadway segments.

The following US 101 segments need to be added:

- US 101 NB at SR 46 W (on and off ramps)
- US 101 SB at SR 46 W (on and off ramps)
- US 101 SB at Riverside Avenue/Pine Street (Off Ramp)

The correct data collected for analysis needs to include:

- Queuing on ramps
- Impacts to ramp metering

Task 2 – Existing Model Review and Calibration

What software is the model in? Does it include the Caltrans intersections and segments? Include in the scope that Caltrans will be able to review the preliminary model.

Task 3 – Project Trip Generation and Distribution

Is there a current site plan and project description? If so, provide to determine if any additional scoping is required.

The ITE Trip Generation Manual User's Guide should provide the guidance for trip generation, using the fitted curve or weighted average. Additionally, the Peak Hour Generator should be used for trip generation, not the adjacent street traffic generator.

Task 4 – Existing and Existing Plus Project Conditions

Update scope to include that the highway segments will be evaluated using the Caltrans requirements.

Task 5 – Near Term and Near Term Plus Project Conditions

Include the pending and proposed project list, and the planned roadway network changes with the Memorandum of Assumptions.

Task 6 – Cumulative and Cumulative Plus Project Conditions

Clarify if the planned roadway network changes will be different from the Near Term roadway network changes.

Clarify the last sentence, "Despite the General Plan buildout assumptions, the Cumulative no project scenario will not include any dwelling units on the project site."

Task 7 – Deficiency and Mitigation Analysis

Any changes to intersection control within Caltrans Right-of-Way will require an Intersection Control Evaluation per Caltrans requirement. It is suggested that multiple warrants are evaluated before proposing a signal as a mitigation.

Task 8 – Site Access and On-Site Circulation

Clarify if the circulation of the Chandler portion has been master planned. Previous studies, the entire parcel had access to Union Road. That future access will need to be addressed and documented.

Task 9 – Documentation

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The model and synchro should be provided for review at the draft stage.

Thank you, and we look forward to continued coordination on this project.

Jenna Schudson
Associate Transportation Planner
Caltrans, District 5
805-549-3432

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PASO ROBLES
JOINT UNIFIED SCHOOL DISTRICT
THE DISTRICT OF EXCELLENCE

INTERIM SUPERINTENDENT: JULIAN CROCKER
800 NIBLICK ROAD
PASO ROBLES, CA 93446
Tel: (805) 769-1000 Fax: (805) 237-3339
WWW.PASOSCHOOLS.ORG

February 26, 2019

Mr. Darren Nash
City Planner
City of Paso Robles
1000 Spring Street
Paso Robles, CA 93446

RE: Notice of Preparation of Draft Environmental Impact Report – Olsen-South Chandler Ranch Specific Plan

Dear Mr. Nash,

The Paso Robles Joint Unified School District ("School District") is in receipt of the Notice of Preparation ("NOP") for the Draft Program Environmental Impact Report ("Draft EIR") associated with the Olsen-South Chandler Ranch Specific Plan ("Project"). Based on our review of the initial information contained in the NOP, the School District—as the agency that would provide kindergarten through 12th grade education to the Project—has identified concerns with the Project that if not properly mitigated would result in significant negative impacts to the environment.

Potential Student Enrollment Impacts

The School District understands the Plan includes up to 1,233 residential units and up to 9,800 square feet of commercial development. To understand the potential student enrollment impacts from the Plan, the School District utilized student generation factors ("SGFs") contained in its "Residential Development School Fee Justification Study" ("Residential Study") dated May 9, 2006, which are summarized below.

Student Generation Factors

School Level	Single Family Detached Units	Multi-family Attached Units
Elementary School	0.2179	0.2684
Middle School	0.1095	0.1108
High School	0.1615	0.1234
Total	**0.4889**	**0.5026**

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2/26/19
City of Paso Robles
Community Development Dept.

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PASO ROBLES
JOINT UNIFIED SCHOOL DISTRICT
THE DISTRICT OF EXCELLENCE

INTERIM SUPERINTENDENT: JULIAN CROCKER
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Assuming the 1,065 residential units identified as "Low-Density Residential" and "Medium-Density Residential" are single family detached units and the 168 units identified as "High-Density Residential" are multifamily attached units, multiplying the SGFs by the residential units would result in the creation of 606 additional students as summarized below by school level.

School Level	Projected Student Enrollment
Elementary School	277
Middle School	136
High School	193
Total	**606**

The School District does not have sufficient capacity to accommodate this student enrollment in its existing facilities and would be required to build additional school facilities and/or expand existing school facilities to accommodate such enrollment growth.

School Fee Mitigation

While the School District understands that the developers of the Plan will be required to pay school impact fees at the time of building permit issuance, such fees are inadequate to construct the necessary facilities. As identified in the Residential Study, each residential unit has a cost impact to the School District of $19,913 in order to fund the construction of necessary facilities. The School District, however, is limited to collecting fees in the current amount of $2.63 per square foot. Please note, as this is not the current State maximum fee, the School District may in the future elect to increase its fees to an amount it can justify up to the current maximum established by the State Allocation Board.

Assuming a weighted average unit size of 2,000 square feet, which translates into a fee per unit of $5,260. Each unit, therefore, is producing an unmitigated impact of $14,653 on the School District in order to provide adequate school facilities. Across the Plan's 1,233 residential units, that translates into an unmitigated impact of $18,067,149.

Without sufficient funding, the School District will be unable to construct adequate facilities to accommodate student enrollment growth from the Plan. Instead, the School District would be limited to expanding the existing facilities that serve the area included in the Plan.

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Negative Impacts

Aside from the negative impacts of inadequate school capacity, if the Plan is not properly mitigated to fund the construction of adequate school facilities, there would be significant negative impacts to traffic, pollution and noise resulting from the Plan.

The addition of 476 students would create a substantial number of car trips in the area around the Plan as students are transported to and from school and at the impacted schools, the impacts to traffic would negatively impact the existing communities.

Recommended Mitigation

The School District notes the presence of a planned school site within the Plan and it wishes to continue those discussions with the City to ensure that the site is included within the Plan to better mitigate the impact. In addition, the School District would welcome discussions with the developer of the Plan to identify any additional mitigation that could be made to ensure adequate funds for the School District to construct the necessary facilities to accommodate growth from this Plan.

We welcome the opportunity to discuss our thoughts and work together to reach a solution that will provide quality school facilities for the families residing within the Plan. I can be reached at 805.769.1000 or via email at bpawlowski@pasoschools.org.

Sincerely,

Brad Pawlowski
Chief Business Officer

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Community Development Dept.

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Appendix B

Draft Specific Plan

VIÑEDO
PASO ROBLES
SPECIFIC PLAN
APRIL 2019
2ND CITY SUBMITTAL

COMMUNITY DEVELOPMENT

CITY OF EL PASO DE ROBLES

COMMUNITY DEVELOPMENT DIRECTOR

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PROJECT PLANNER

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CITY OF EL PASO DE ROBLES

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Reso A - Exhibit C2 (EIR Technical Appendix)

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CHAPTER 1
INTRODUCTION

1.0 Statement of Intent

The purpose of the Viñedo Specific Plan is to guide and encourage the development of a high-quality and unique community that integrates context-sensitive site planning and design with innovative and indigenous architecture, resulting in an aesthetically pleasing and active new community.

NEIGHBORHOOD CHARACTER

- Create a community of high-quality architecture, landscape, open spaces and amenities;
- Create homes in contextually appropriate architectural styles to provide a variety of options for home-buyers;
- Emphasize the relationship between the indoors and the outdoors through site planning and architectural design.

CONNECTIVITY & MOBILITY

- Accommodate multi-modal transportation systems that allow pedestrians, bicycles and vehicles to travel safely and efficiently; consistent with the City's Bicycle Pedestrian Master Plan (BPMP) adopted 12/18/18;
- Create a walkable community that provides a high-quality pedestrian experience through streetscape, landscape and architecture;
- Prioritize pedestrian and bicycle connections both throughout the community and between Viñedo and the neighboring communities;
- Create a network of sidewalks, pathways and trails that connect each home in the community to neighborhood amenities including parks and other civic spaces.

OPEN SPACE & RECREATION

- Create a greenbelt park and trail system that provides pedestrian and bicycle linkages between Viñedo and the adjacent neighborhoods;
- Include outdoor furniture, recreational structures and equipment, art, and other amenities in open space areas to encourage both active and passive recreation;
- Ensure that open spaces and outdoor amenities are accessible to people of all ages and abilities;
- Celebrate the natural features of the site by enhancing and protecting wildlife habitats, resources, views, native oak trees and native plants.

SUSTAINABILITY AND ENVIRONMENTAL SENSITIVITY

- Incorporate best practices in environmentally sustainable development;
- Encourage water conservation through the use of drought tolerant landscaping, rain water capture, etc;
- Replant native oak species in an effort to celebrate the meaning and history of Paso Roble's name (Pass of the Oaks).

ATTAINABLE HOUSING OPPORTUNITIES

- Provide a wide-range of housing opportunities;
- Implement the City's Housing Element goals and programs.

1.1 Document Organization

This document is Part 1 of a simultaneous two-part submittal.

Part 1 is the Viñedo Specific Plan that defines the regulatory framework for the community.

Part 2 is the Design Submittal. This package demonstrates one potential outcome of the proposed Specific Plan and is intended to be an initial submittal package for all structures within the project, both residential typologies as well as amenity structures.

Together, these two documents convey the comprehensive vision and methods of execution for the Viñedo project.

The detailed Design Package will help to ensure that a high-level of design is achieved consistently throughout the community in order to create a more cohesive sense of place.

To date, the predominate existing pattern of development within the City is quite fragmented and is typically of a much smaller scale. This larger assemblage of land, and thorough approach to design, provides a unique opportunity for the City of Paso Robles, uncommon in recent history.

The Viñedo Specific Plan defines the vision and guiding principles for the future development of the site. The Specific Plan is arranged into five chapters:

CHAPTER 1: INTRODUCTION:

This Chapter describes the purpose and intent of the Specific Plan and Guidelines, the site location, its context and overall design framework.

CHAPTER 2: COMMUNITY DEVELOPMENT PLAN:

This Chapter provides an overview of the vision for the Viñedo community, a summary of land uses, thoroughfare network, grading and utility plans.

CHAPTER 3: DEVELOPMENT STANDARDS:

This Chapter includes specific development standards that will be applied to all new development in Viñedo.

CHAPTER 4: COMMUNITY DESIGN PRINCIPLES:

This Chapter includes specific landscape and architectural design principles intended to guide and promote high-quality development. The Design Submittal package represents one potential outcome of these principles and standards.

CHAPTER 5: IMPLEMENTATION & PHASING:

This Chapter includes the Financing Plan and Financing and Maintenance Plan Summary.

1.2 Authority & Relationship to Other Regulatory Documents

The Viñedo Specific Plan is intended to serve as the link between the goals and policies of the Paso Robles General Plan and the development plan for the Viñedo property. This Specific Plan implements the General Plan within the boundaries of the Specific Plan area and functions as a regulatory document.

Policy 1.2.1 All future development plans and entitlements for the Viñedo property shall be consistent with the regulations set forth in this Specific Plan document and all applicable City regulations.

This Specific Plan identifies site-specific design requirements applicable within the Viñedo property and, as such, adherence to this Specific Plan will ensure that new development meets or exceeds City standards for environmental safety, infrastructure and site planning while providing provisions for maintenance, aesthetic quality and community identity.

Policy 1.2.2 To the extent any regulation in this document conflicts with the City's Zoning Code, the regulation set forth herein shall prevail.

The City's General Plan was updated/readopted in 2003 and 2011. The Circulation Element was updated again in early 2019. The Land Use Element was adopted in 2003 and amended in 2014 and governs the land uses planned for the Specific Plan area.

The Viñedo Specific Plan Area encompasses a portion of an area previously designated as the Chandler Ranch Specific Plan and the Olsen Ranch / Beechwood Area Specific Plan in the City's 2003 General Plan. Resolution No. 17-021 later authorized the split of the Chandler Ranch Specific Plan into two separate specific plans (North and South Chandler Ranch).

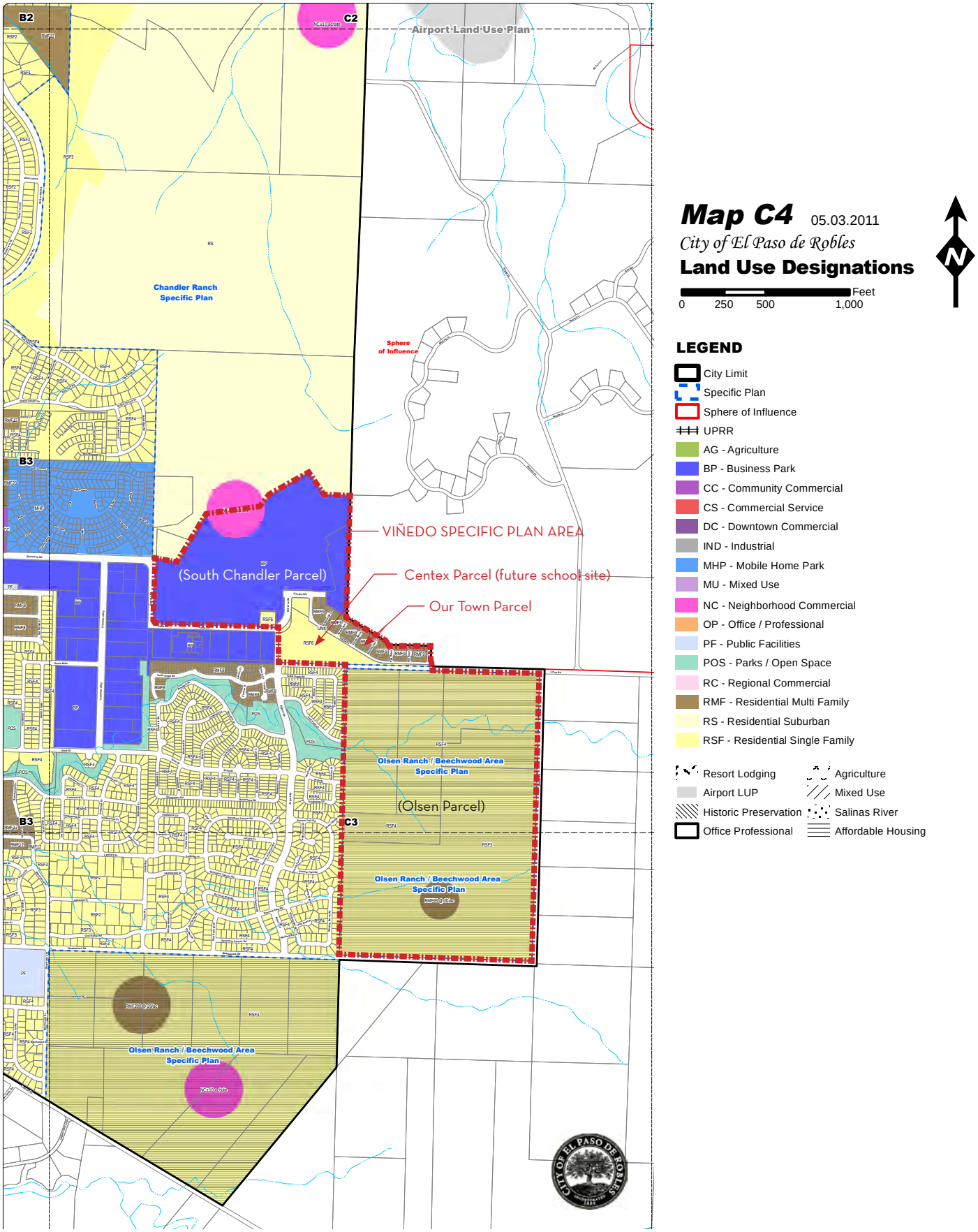
The Viñedo Specific Plan Area is comprised of the former northern portion of Olsen Ranch / Beechwood Area Specific Plan (Olsen parcel) and the southern portion of the former Chandler Ranch Specific Plan area (South Chandler parcel). It also includes the existing Our Town subdivision and triangular parcel just to the South, often referred to as the Centex parcel or future school site.

The existing land uses designated for the Southern Chandler Ranch portion of the Viñedo Specific Plan Area include Neighborhood Commercial (NC), Business Park (BP), Residential Single Family (RSF), and Residential Multi Family. The land uses designated for the Olsen parcel area of the Viñedo Specific Plan include Residential Single Family (RSF) and Residential Multi Family. The Olsen parcel is within the Affordable Housing Overlay. (See Figure 1.2.A: Paso Robles General Plan).

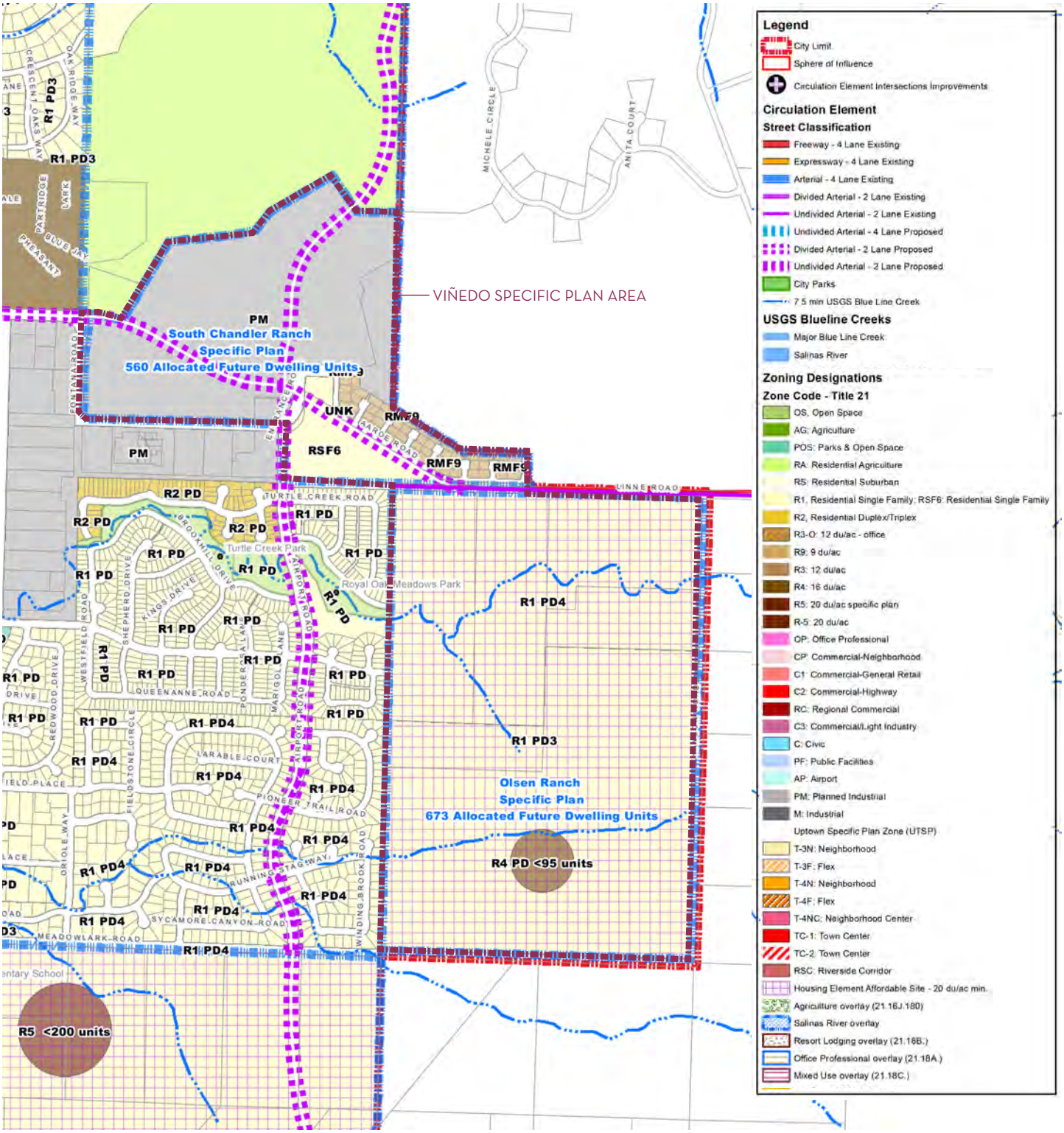
The existing zoning of the Viñedo Specific Plan Area is predominately Residential Single Family (R1 PD3 and R1 PD4). A portion of the Olsen parcel specifies R4 PD < 60 units. There are a total of 673 allocated future dwelling units in the Olsen parcel.

The South Chandler parcel of the Specific Plan Area is zoned Residential Single Family (RSF6), Residential Multi Family (RMF9) and PM (Planned Industrial). There are 560 allocated future dwelling units in the South Chandler parcel area. (See Figure 1.2.B: Paso Robles Zoning Map).

Combined, the entire Viñedo Specific Plan Area allows for a maximum density of 1,233 dwelling units, of which 1,028 are allocated to the Olsen and South Chandler parcels.


B2
C2
Airport Land Use Plan
Chandler Ranch Specific Plan
Sphere of Influence
B3
VIÑEDO SPECIFIC PLAN AREA
(South Chandler Parcel)
Centex Parcel (future school site)
Our Town Parcel
Olsen Ranch / Beechwood Area Specific Plan
(Olsen Parcel)
C3
B3
Olsen Ranch / Beechwood Area Specific Plan
Olsen Ranch / Beechwood Area Specific Plan
Map C4 05.03.2011
City of El Paso de Robles
Land Use Designations
Feet
0 250 500 1,000
N
LEGEND
City Limit
Specific Plan
Sphere of Influence
UPRR
AG - Agriculture
BP - Business Park
CC - Community Commercial
CS - Commercial Service
DC - Downtown Commercial
IND - Industrial
MHP - Mobile Home Park
MU - Mixed Use
NC - Neighborhood Commercial
OP - Office / Professional
PF - Public Facilities
POS - Parks / Open Space
RC - Regional Commercial
RMF - Residential Multi Family
RS - Residential Suburban
RSF - Residential Single Family
Resort Lodging
Airport LUP
Historic Preservation
Office Professional
Agriculture
Mixed Use
Salinas River
Affordable Housing

1.2.B PASO ROBLES ZONING MAP



1.3 Project Location & Context

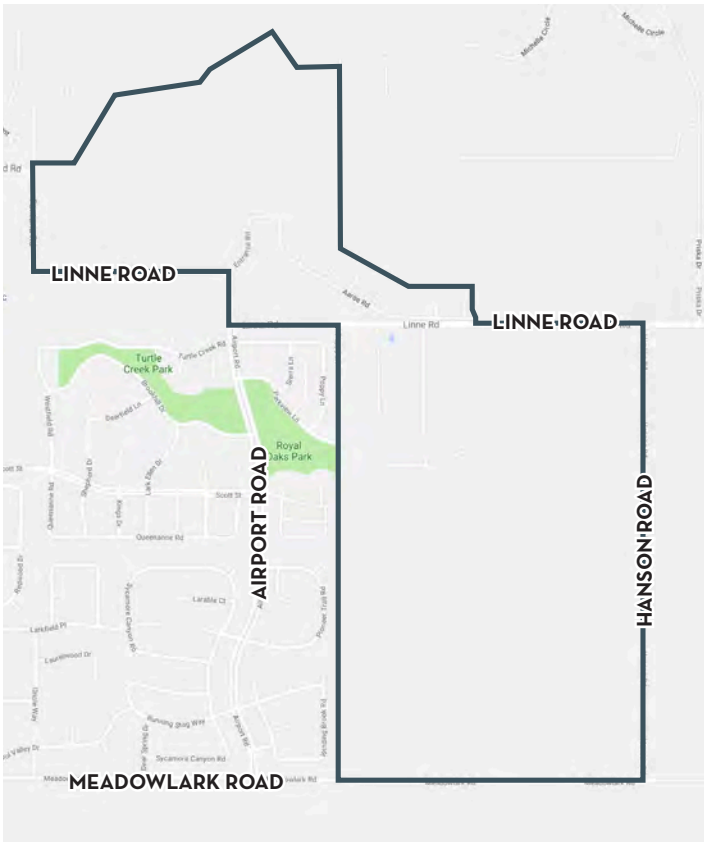
Located in the Central Coast region of California, Viñedo is ideally situated nearly equidistant from San Fransisco and Los Angeles. With a very mild, temperate climate, the Paso Robles region is internationally renown for both it's vineyards and pastoral landscapes.

The Viñedo Specific Plan area is located along the eastern boundary of the City of Paso Robles. This area is characterized by its rolling hills and vineyards.

The Specific Plan area is comprised of portions of the former Chandler Ranch Specific Plan (South Chandler parcel), the Olsen/Beechwood Specific Plan (Olsen parcel), Our Town and the Centex parcel/future school site.

The Our Town area is approximately 15 acres of existing single family residential lots just North of Linne Road. These lots are the last remaining portion of a former age-restricted development that dates back the 1960s. The Viñedo Specific Plan does not propose any modification to these existing lots and has been planned to conform to their existing configuration.

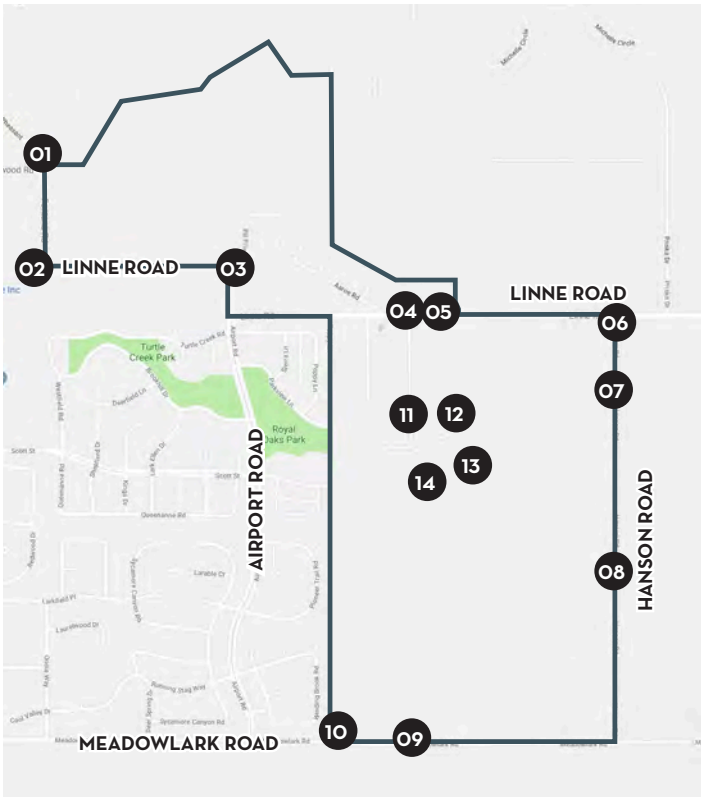
1.2.C SPECIFIC PLAN BOUNDARY



Regional Location

1.4 Site Photos

KEY PLAN



1.4 Site Photos

1.5 Opportunities & Constraints

The following is a list of opportunities and constraints that were encountered in the land use plan design for the Specific Plan. (See Figure 1.4: Opportunities and Constraints Map). A comprehensive analysis of all environmental factors related to this Specific Plan will be conducted in EIR No. 2019-011065.

1.5.1 EDGE CONDITIONS

The Viñedo Specific Plan Area is a multi-sided property and contains over four miles of edge conditions that interact with existing development within the City limits. The Specific Plan area includes a variety of edge conditions along each of its boundaries.

The western boundary of the South Chandler parcel is bordered by existing light industrial uses to the west and south. It is bordered by existing agricultural lands and vineyards to the north and east.

The western edge of the Olsen parcel is adjacent to existing residential. The north, eastern and southern edges of the Olsen parcel are bound by existing agricultural lands, presenting numerous opportunities for long views out to the farms and vineyards beyond.

Where new development is proposed to occur directly adjacent to previously developed areas, these areas will be designed to provide adequate landscaping buffers and compatible interfaces.

Much of the Olsen parcel perimeter is bordered by existing roads which provide for good access to the Viñedo Specific Plan area. Efforts will be made to tie into existing adjacent thoroughfares whenever possible.

1.5.2 VIEWSHEDS

The northern portion of the Olsen parcel includes an area of raised topography from which there are views to the southwest, northwest and northeast. This area presents an ideal opportunity for a community facility.

1.5.3 EXISTING VEGETATION

There is an existing drainage area across the northern portion of the Olsen parcel. Along this corridor are a number of quality native oak trees. This east-west line of existing vegetation provides an opportunity for a continuation of Turtle Creek/Royal Oaks Park to the west. In addition, there is a knoll in the southwest corner of the property with approximately 6 or 7 oak trees atop it.

While there are a few existing native oak trees scattered across the remainder of the Olsen parcel, the vast majority of the property is comprised of grazing grasslands of gently rolling topography.

In total, there are approximately 140 oak trees in varying states of health across the Olsen property. The native species of oaks include blue, blue oak hybrids and valley oaks.

There are no oaks present on the South Chandler property.

1.5.4 PG&E UTILITY EASEMENT

The PG&E transmission line utility easement presents both a constraint and an opportunity across the southeast portion of the specific plan area.

1.5.5 PUBLIC DESIGN CHARRETTE

During the Spring of 2018, the ownership conducted a public design charrette to develop the framework of the land plan for the Specific Plan area. Over the course of a week, the team conducted over two dozen stakeholder meetings to collect public feedback on all aspects of the project. These desires and concerns were then transformed into the final land plan and design principles that guided the creation of this Specific Plan.

1.5.6 PROPERTY OWNERSHIP

There are three main ownership entities that control land within the Specific Plan area. Olsen Ranch 212, LLC controls all of the Olsen parcel as well as the majority of the S. Chandler parcel. The Our Town parcels are owned by the members of the Condict family and the School/Centex parcel is controlled by the Fuentez Family.

1.5 OPPORTUNITIES & CONSTRAINTS MAP

CHAPTER 2

COMMUNITY DEVELOPMENT PLAN

2.0 Community Vision

The Land Use Plan for Viñedo evolved from the Charrette process into the following basic objectives:

- Design a Plan that blends seamlessly into the fabric of the surrounding existing community.
- Develop a Plan that responds to and works with the unique natural features of the site including topography, viewsheds and vegetation.
- Provide a mix of neighborhoods, housing product types, residential lot sizes, and architecture to serve the needs of future residents.
- Incorporate amenities, open spaces, trails and public facilities throughout the entire Plan.

Within the Viñedo community, residents will enjoy an integrated system of trails, sidewalks, parks, and bike lanes to access a variety of neighborhoods and recreational amenities. Streets are planned to function as multi-modal thoroughfares and will feature drought-resistant landscaping, sidewalks and safe bicycle facilities.

The Viñedo Land Use Plan is divided into individual Planning Areas, or PA's, each having it's own unique reference number.

Policy 2.0.1 Land Use Table & Map

The Viñedo Land Use Tables and Maps define the allowable uses and intensities/densities for land uses across the Specific Plan Area.

Policy 2.0.2 Specific Plan Zoning Map

The Viñedo Zoning Map establishes the areas in which each of the zoning categories are applied within the Specific Plan Area.

Policy 2.0.3 Overlay Districts

Overlay Districts establish areas that have an additional layer of allowable uses within the Viñedo Specific Plan Area. The two Overlay Districts within the Viñedo Specific Plan are:

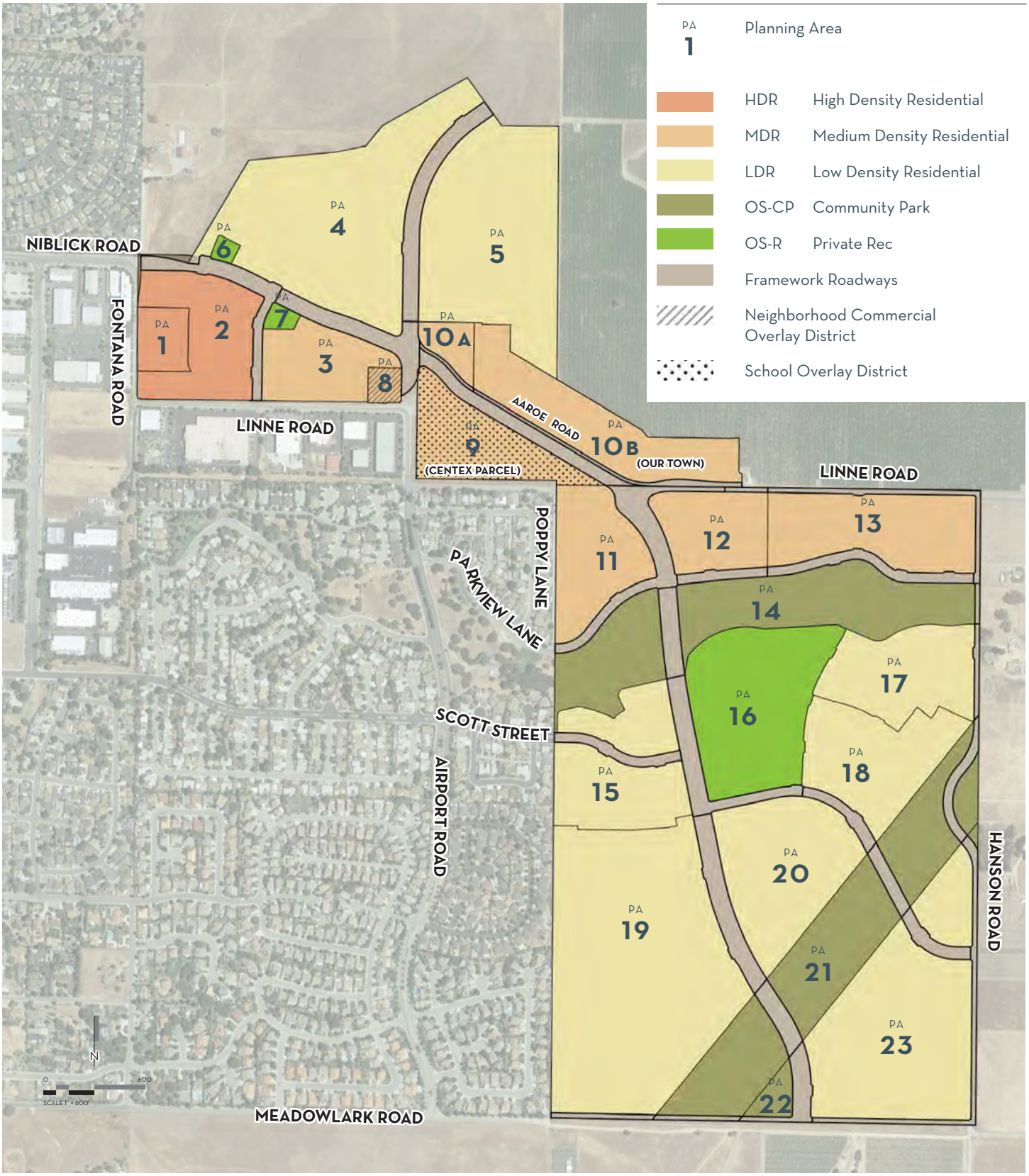
- Neighborhood Commercial Overlay District
- School Overlay District

TABLE 2.0.1 - LAND USE SUMMARY (GROSS ACREAGE)

Land Use	Gross Area (acres)	Density Range (du/ gross ac)	Maximum Non-Residential (sf)	Maximum Dwelling Units
HDR - High Density Residential	13.1	8 - 22	-	168
MDR - Medium Density Residential	63.1	4 - 10	9,800*	479
LDR - Low Density Residential	173.2	3 - 5	-	586
OS-CP - Community Parks	47.7	-	-	-
OS-R - Private Rec	18.8	-	-	-
Framework Roadways	39.7	-	-	-
Totals	**355.6**	**3.5**	**9,800***	**1,233**

*PA-8 Neighborhood Commercial Overlay District. Maximum Non-Residential Uses not to exceed 9,800 SF at 0.25 FAR. See the Commercial Agrarian Design Guidelines for additional standards.

FIGURE 2.0.1 : LAND USE PLAN (GROSS ACREAGE)



2.0 Community Vision

The Detailed Land Use Plan depicts the net acreage of land uses and an additional level of information not shown on the Gross Acreage Land Use Plan. Neighborhood open space facilities and in-tract roadways have been added to better explain the proposed land use plan.

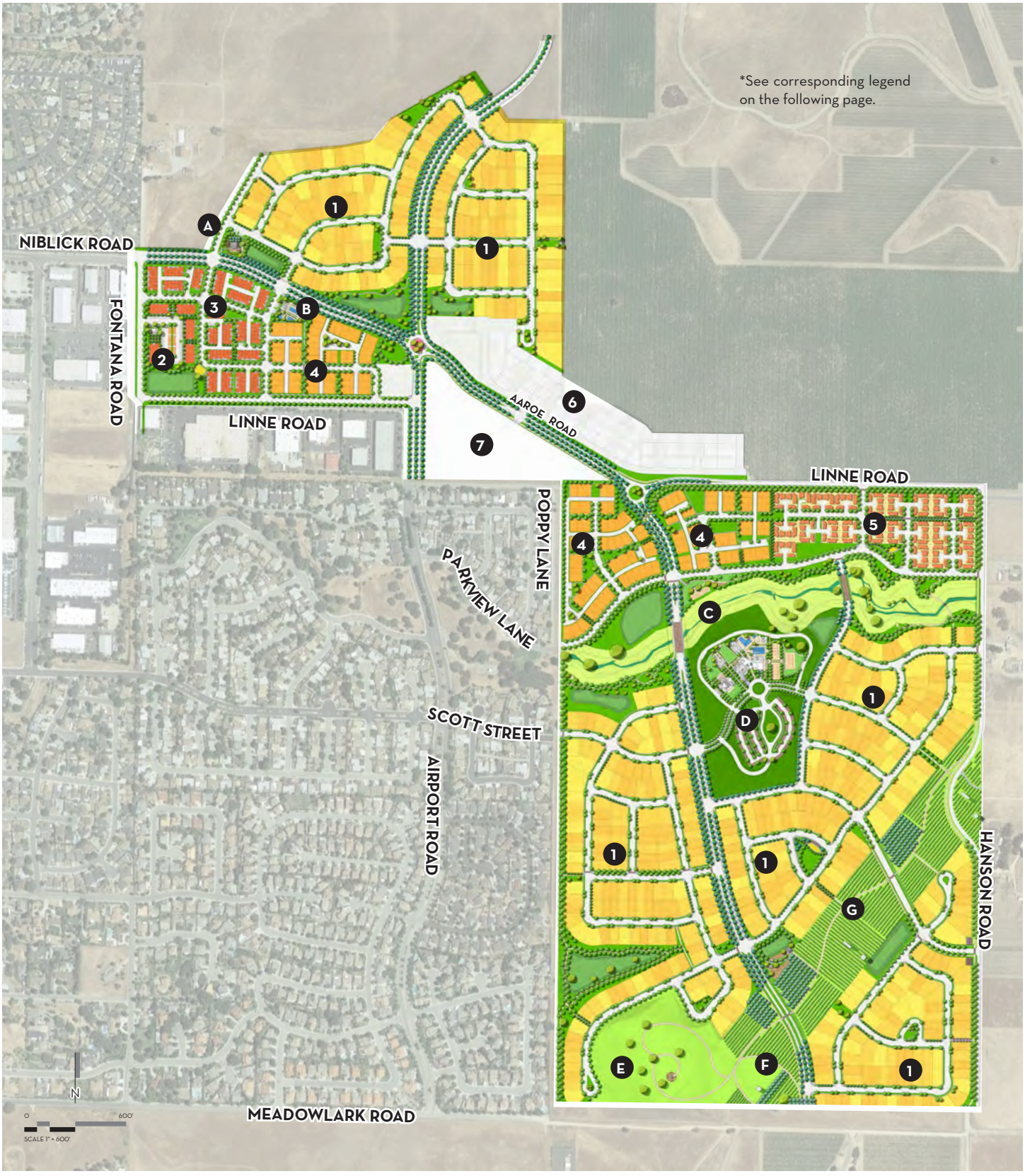
TABLE 2.0.2 - LAND USE SUMMARY (NET ACREAGES)

Land Use	Net Area (acres)	Density Range (du/net ac)	Maximum Non-Residential (sf)	Maximum Dwelling Units
HDR - High Density Residential	9.4	14 - 24	-	168
MDR - Medium Density Residential	47.6	4 - 15	9,800*	479
LDR - Low Density Residential	105.9	3 - 6	-	586
OS-CP - Community Parks	45.3	-	-	-
OS-N - Neighborhood Open Space	33.8	-	-	-
OS-R - Private Recreation	17.1	-	-	-
OS-W - Water Quality/ Basins	5.7	-	-	-
Framework Roadways	39.7	-	-	-
In-Tract Roadways	51.1	-	-	-
Totals	**355.6**	**3.5**	**9,800***	**1,233**

*PA-8 Neighborhood Commercial Overlay District. Maximum Non-Residential Uses not to exceed 9,800 SF at 0.25 FAR. See the Commercial Agrarian Design Guidelines for additional standards.

FIGURE 2.0.2 : DETAILED LAND USE PLAN (NET ACREAGES)

GUIDELINE ILLUSTRATION 2.0.3 : CONCEPTUAL DEVELOPMENT PLAN



LEGEND

Guideline Illustration 2.0.3 : Conceptual Development Plan

HOUSING TYPOLOGIES & PARCEL AREAS

1. CONVENTIONAL SFD LOTS (50, 60, 70 x 110s)
2. MULTI-FAMILY
3. TOWNHOMES
4. 40x80 SFD GREENCOURTS
5. SFD MOTORCOURTS
6. OUR TOWN
7. CENTEX PARCEL/ SCHOOL SITE

COMMUNITY AMENITIES

A. THE FARMSTAND
B. THE POOLHOUSE
C. OLSEN CREEK PARK
D. THE OVERLOOK
E. OAK KNOLL PARK
F. MEADOWLARK PARK
G. THE VINES

The Conceptual Development Plan depicts an illustrative concept of one possible outcome of the Viñedo Specific Plan. The Viñedo development will be comprised of a series of interconnected neighborhoods linked by a woven pattern of streets, multi-modal paths and trails.

The Conceptual Development Plan illustrates a combination of land uses that could be implemented under the provisions of this Specific Plan. The Plan is illustrative in nature and the final lot placement and street alignment will be determined during the Development Plan process. Chapter 3, Development Standards contains specific development standards that would apply.

2.0 The Farmstand

KEY PLAN

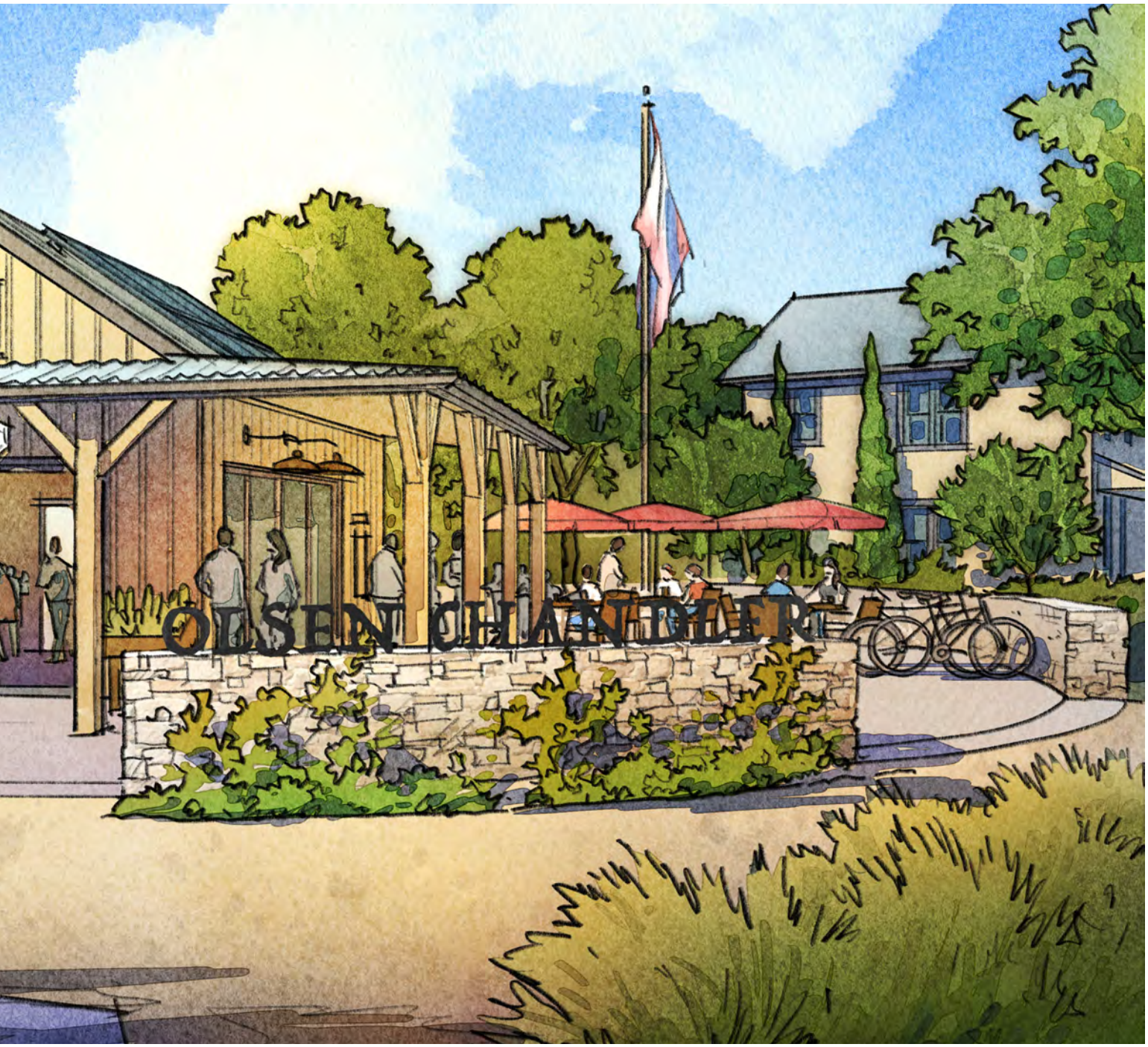
THE FARMSTAND

This building, located at the western entrance to the community, will evolve throughout the development of the Viñedo community.

The Farmstand will begin as an information and sales center providing visitors and potential home-buyers with an introduction to the community and its offerings.

Later, it will be converted to a community farmstand and community-supported agriculture (CSA) office. The farmstand will be surrounded by a one-acre CSA farm that will produce fresh fruits and vegetables to be sold on site or offered as part of a neighborhood delivery service.

The main room can be used as a privately operated meeting space for community events, scout groups, gardening clubs, homeowners' meetings, and more.



Artist's illustration. Landscaping, colors, materials, walls, gates and fencing subject to change based on final designs.

2.0 Viñedo Multi-Modal Path Network

KEY PLAN

NIBLICK TRAIL & BLVD.

Viñedo is designed with over eight miles of paths and trails, providing residents with a variety of options to move between neighborhoods and community amenities.

The Niblick Road extension, running north-south through the site, will be a multi-modal boulevard separated by a landscaped median. Multi-modal paths will weave throughout the plan, providing pedestrians, bicyclists and neighborhood electric vehicles (NEVs) with off-street circulation options throughout the community.

The edges of these paths will be planted with vines to reinforce the agrarian character of the Viñedo community.

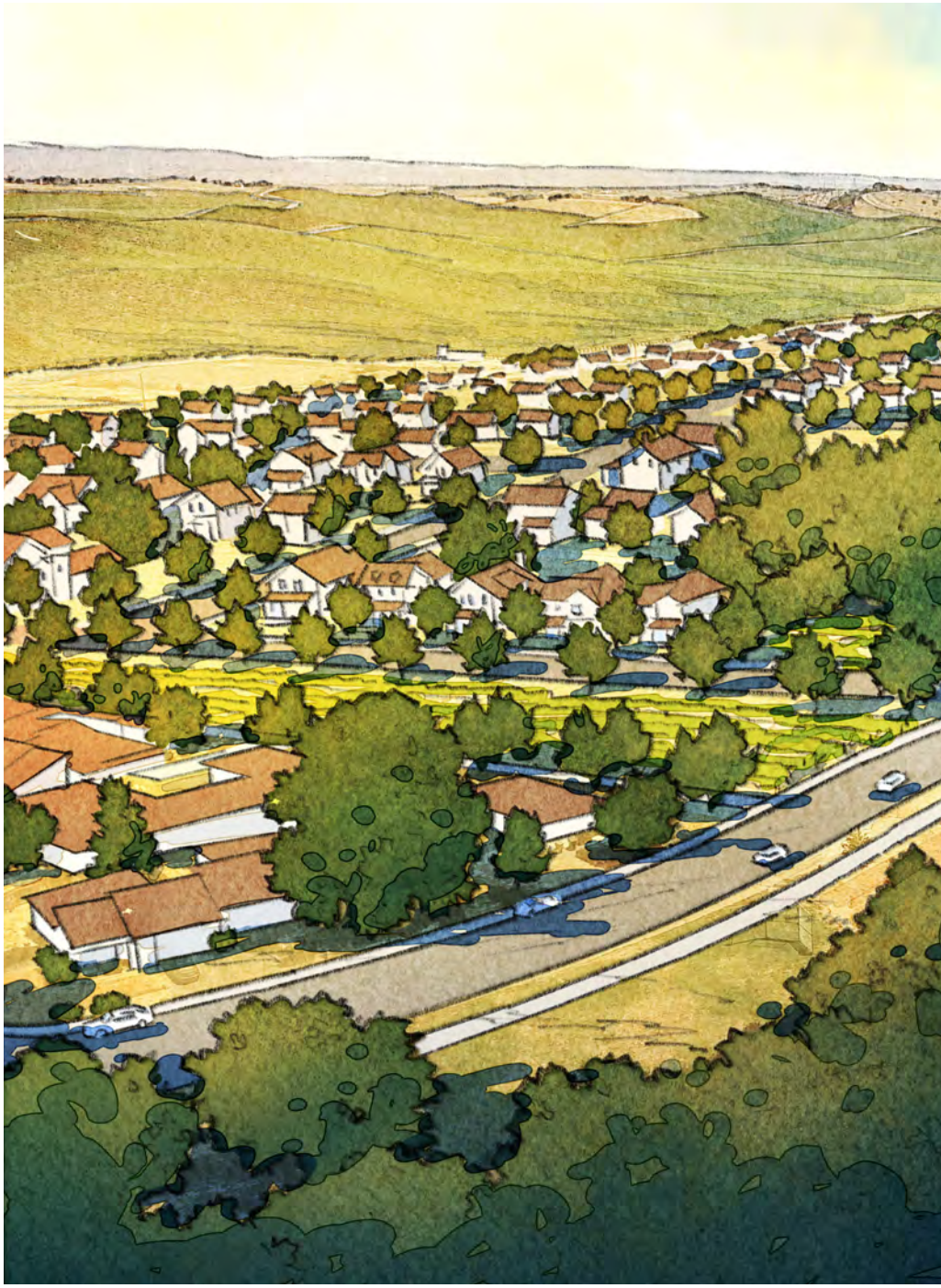
Artist's illustration. Landscaping, colors, materials, walls, gates and fencing subject to change based on final designs.

2.0 Turtle Creek Park

KEY PLAN

TURTLE PARK VIEW

This birds-eye view looking northeast across the site illustrates how new development will integrate seamlessly with the existing Parkview Road Extension along Turtle Creek Park. On the right, the park serves as a primary open space, linked to a number of paths, trails, and greenways. In the distance, The Overlook sits atop the knoll with long views to the vineyards beyond.



Artist's illustration. Landscaping, colors, materials, walls, gates and fencing subject to change based on final designs.

2.0 Typical Neighborhood Streetscape

KEY PLAN

TYPICAL STREETSCAPE

Viñedo will feature multi-modal, pedestrian-oriented streetscapes with sidewalks and features that ensure a comfortable walking experience. Sidewalks and front porches facing the street will promote social interaction between neighbors. A variety of architectural styles and drought-tolerant landscaping will add interest to the streetscape.

All of Vinedo's local streets will accommodate neighborhood electric vehicles (NEVs) to further enhance connectivity and promote sustainability.

Artist's illustration. Landscaping, colors, materials, walls, gates and fencing subject to change based on final designs.

2.0 The Overlook & Hilltop Club

KEY PLAN

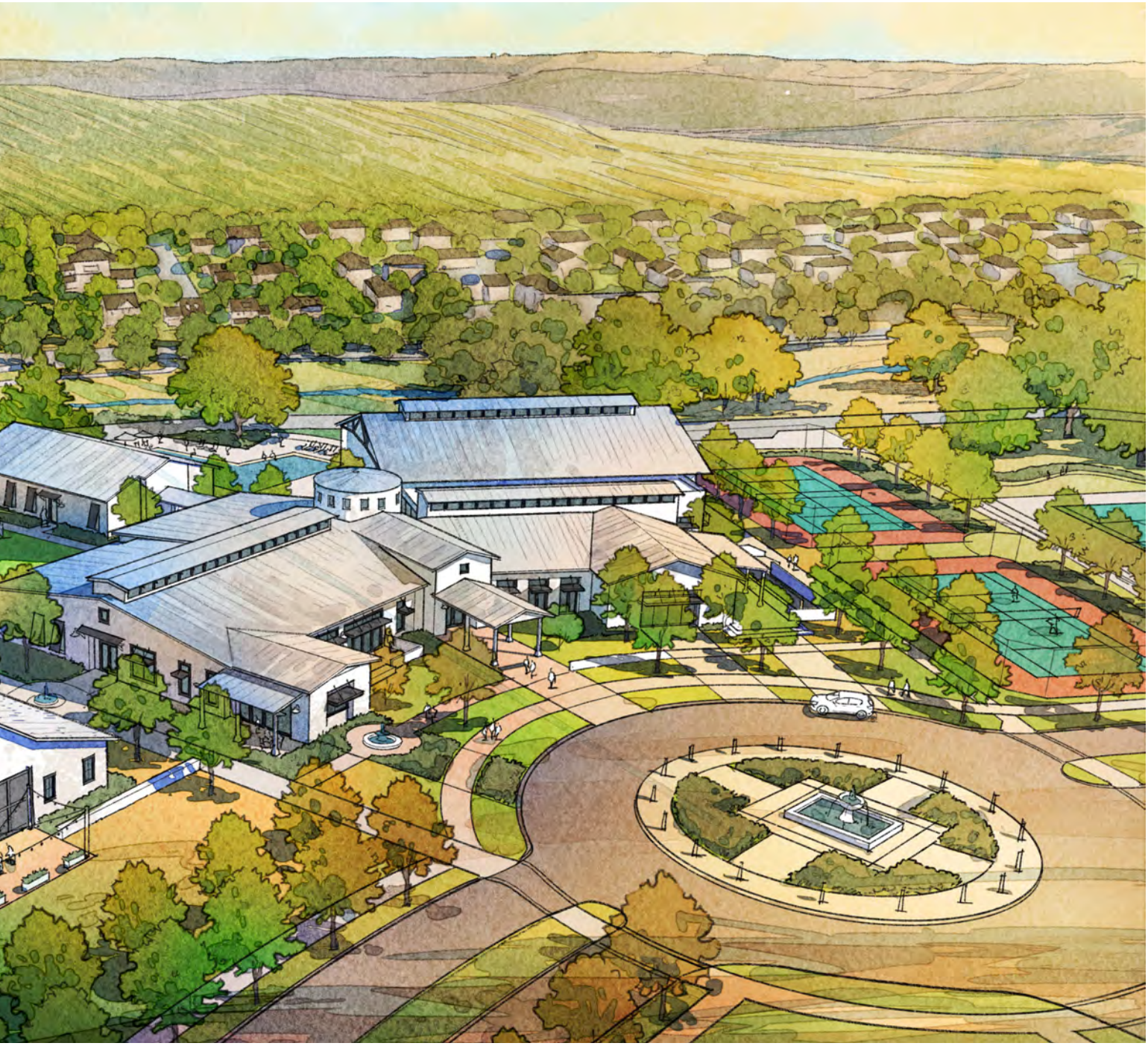
THE OVERLOOK

This view illustrates Vinedo's primary recreation facility perched atop the knoll overlooking Turtle Creek Park. The recreation center will be encircled with vineyards and orchards, enhancing it's natural setting.

The facility's Commercial Agrarian architecture celebrates the surrounding rural and agricultural history of the region.

An extensive architectural program will focus on health, wellness and socialization. From the Events Barn to the demonstration kitchen, the outdoor bar and terrace, the Overlook will provide numerous opportunities to celebrate the local wine culture Paso Robles is known for.

The fitness club will feature up to eight training and two competition Pickleball courts in addition to a lap pool, gym and yoga/spin studio.



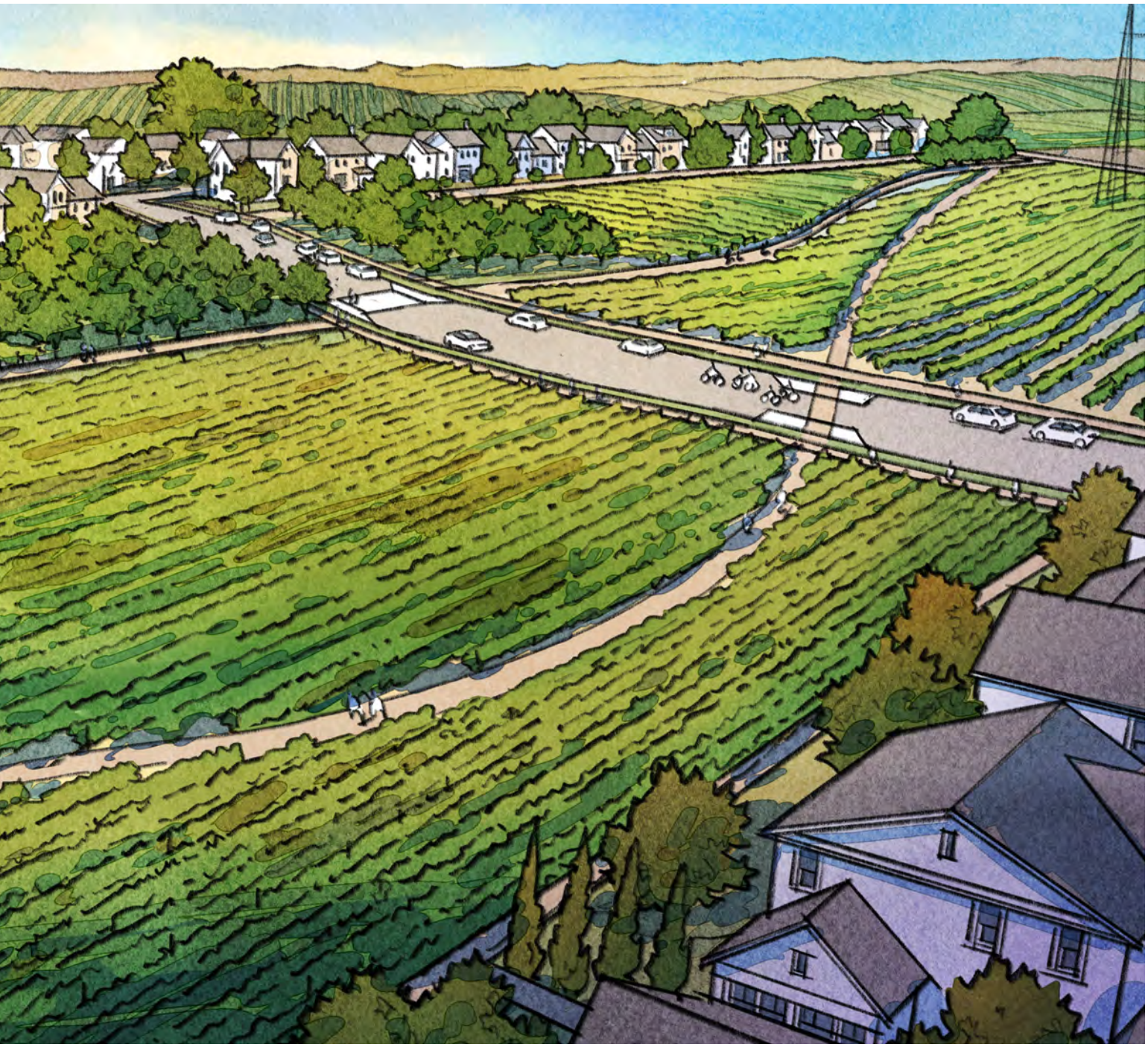
Artist's illustration. Landscaping, colors, materials, walls, gates and fencing subject to change based on final designs.

2.0 The Vines: Easement Park & Trail

KEY PLAN

EASEMENT & VINEYARD TRAIL

A major focal point of the Viñedo plan is the existing PG&E utility easement running through the southern portion of the property. While unsuitable for structures, this area is ideal for walking trails, vineyards and informal open spaces. Other allowed uses include: playgrounds, parks, tennis courts, basketball courts and barbecue pits, but require special PG&E review and approval.



Artist's illustration. Landscaping, colors, materials, walls, gates and fencing subject to change based on final designs.

2.1 Zoning Framework

2.1.A RESIDENTIAL LAND USES

Residential land uses account for approximately 70% of the entire Specific Plan area, with nearly 30% preserved as active and passive open space.

A total of 1,233 homes are allowed, for an average gross density of 4.4 du/ac over all residential areas.

Policy 2.1.1 The R1 land use classification includes conventional single-family detached homes on lot sizes varying between approximately 5,500 and 10,000 square feet. Lot widths vary from 50' to 70' to add visual interest and create diversity along the streetscape. The minimum front yard setback of 18' allows for well landscaped yards along the streescape. Lot depths in this land use classification are a minimum of 110' deep, allowing for generous rear yards. Private yard space is concentrated on the side and rear of the home. Homes in this zone should be designed to maximize indoor-outdoor living relationships.

Policy 2.1.2 The R2 land use classification includes small lot single-family residential typologies including lot sizes of at least 3,200 square feet, alley-loaded homes as well as single family detached motorcourts. These typologies are designed to achieve higher densities while still creating high-quality streetscapes and public spaces. The densities in the R2 land use range between 4 and 10 units per acre.

Policy 2.1.3 The R3 land use classification includes townhomes. While higher in density, townhomes in this land use category are designed to address the street while still creating some semi-private outdoor space in the form of courtyards.

Policy 2.1.4 The R5 land use classification includes multi-family residential with densities above 20 units per acre. This density is consistent with the Housing Element of the General Plan and the sixty units proposed satisfy the affordable housing requirement therein.

In addition to these residential land uses, accessory dwelling units (ADUs) are also highly encouraged. ADUs can either be attached to or detached from the primary structure on a lot. These units do not count against density limits and can help to provide opportunities for affordable housing.

TABLE 2.1.A: ZONING AND DENSITY ALLOCATION TABLE

Land Use			Units	Gross AC	Gross Density
(Minimum Lot Sizes)					
	R1-SP1	7,700 sf lots	100	185.4*	3.2*
	R1-SP2	6,600 sf lots	231	185.4*	3.2*
	R1-SP3	5,500 sf lots	255	185.4*	3.2*
	R2-SP-AL	3,200 sf lots	145	32.2	4.5
	R2-SP-CY	SFD Motorcourts	129	16.3	7.9
	R2-SP-OT	Our Town SFD	53	14.5	3.7
	R2-SP-CX	Centex MDR	152	15.1	10.1
	R3-SP-TH	Townhomes	108	12.9	8.4
	R5-SP-APT	Apartments	60	2.9	20.5
		Total	**1,233**	**279.3**	**4.4**

*7,700, 6,600 and 5,500 sf lots are totaled together to allow for variable width plotting and the flexibility to refine plotting patterns during the VTTM process. Density stated is an average across all R1 - Conventional SFD Residential uses.

TABLE 2.1.B - DENSITY ALLOCATION TABLE

Planning Area	Product	Units	Gross AC	Gross Density
PA-1	Apartments	60	2.9	20.5
PA-2	Townhomes	108	12.9	8.4
PA-3	40x80s	48	10.5	4.6
PA-4	SFD	86	31.4	2.7
PA-5	SFD	87	24.8	3.5
PA-8*	MDR	12	1.1	10.1
PA-9**	MDR	119	11.8	10.1
PA-10A	MDR	53	14.5	3.7
PA-10B	Our Town SFD	21	2.1	10.1
PA-11	40x80s	55	13.2	4.1
PA-12	40x80s	42	8.5	5.0
PA-13	Motorcourts	129	16.4	7.9
PA-15	SFD	55	14.7	3.8
PA-17	SFD	53	13.6	3.9
PA-18	SFD	43	10.1	4.3
PA-19	SFD	108	45.0	2.4
PA-20	SFD	59	16.3	3.6
PA-23	SFD	95	29.5	3.2
Totals		**1,233**	**279.3**	**4.4**

*PA-8 Neighborhood Commercial Overlay District. Maximum Non-Residential Uses not to exceed 9,800 SF at 0.25 FAR. See the Commercial Agrarian Design Guidelines for additional standards.

**PA-9 School Site Overlay District.

MAP 2.1.A: RESIDENTIAL DENSITY AND LOT PATTERN

2.1 Proposed Land Uses

2.1.B NEIGHBORHOOD STRUCTURE

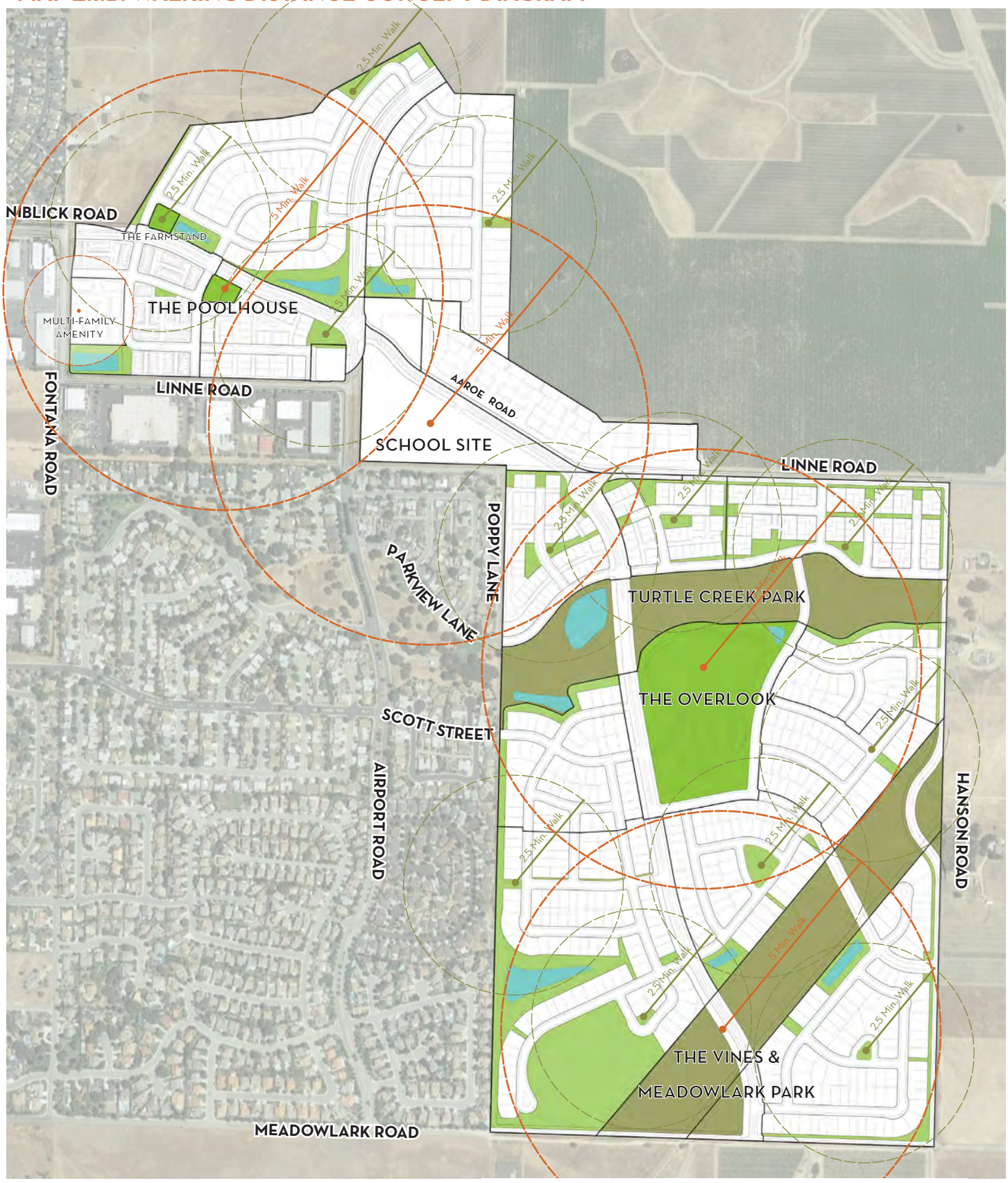
Every residence in Viñedo is located within a 2.5-minute walk of at least one neighborhood park. Residents can easily reach one of the three larger community amenity centers (The Poolhouse, The Overlook or The Vines & Meadowlark Park) within a 5-minute walk along the extensive network of neighborhood paths and trails.

As seen in Map 2.1.B - Walking Distance Concept Diagram, Viñedo is designed as a series of smaller neighborhood districts, each arranged around a neighborhood gathering space. The diagram at right depicts a series of 2.5 minute pedestrian sheds around each neighborhood district. The larger, 5-minute pedestrian sheds are centered on the community-wide amenities.

In all, there are over a dozen neighborhood parks planned in Viñedo along with two regional park systems (the extension of Turtle Creek Park) and The Vines trail park within the PG&E easement. Both of these parks will link into the larger regional system of trails and bike networks.

When built, the school will also be within a 5-minute walk of many of the residents of Viñedo. Conveniently and centrally situated, it is located along the multi-modal path that links the S. Chandler and Olsen parcels making it easy for parents to get their children to and from school.

MAP 2.1.B: WALKING DISTANCE CONCEPT DIAGRAM



2.1.C NEIGHBORHOOD COMMERCIAL USE OVERLAY

PLANNING AREA 8

Policy 2.1.5 The Neighborhood Commercial land use designation within the Specific Plan is an overlay to the underlying MDR (Medium Density Residential) zoning. Allowable uses within this Overlay District are limited to those of the CP - Neighborhood Commercial uses listed in Table 21.16.200 of the City's Zoning Code and are subject to the Commercial Agrarian standards set forth in the Design Guidelines listed in Chapter 4.

The intent of the overlay is to allow neighborhood-scale commercial uses that are compatible with the surrounding residential fabric of the community. Such uses should provide useful services or create a "third-place" gathering node for residents of Viñedo and the surrounding community.

2.1 Proposed Land Uses

2.1.D SCHOOL SITE OVERLAY

PLANNING AREA 9

The School Site land use designation within the SP, is an overlay to the underlying MDR (Medium Density Residential) zoning. This District to subject to the uses listed below as well as the Commercial Agrarian standards set forth in the Design Guidelines.

Policy 2.1.6 Acquisition of the site for a public school use shall be the responsibility of the Paso Robles Joint Unified School District (PRJUSD). The underlying residential use may be developed if the site is not acquired for a public school.

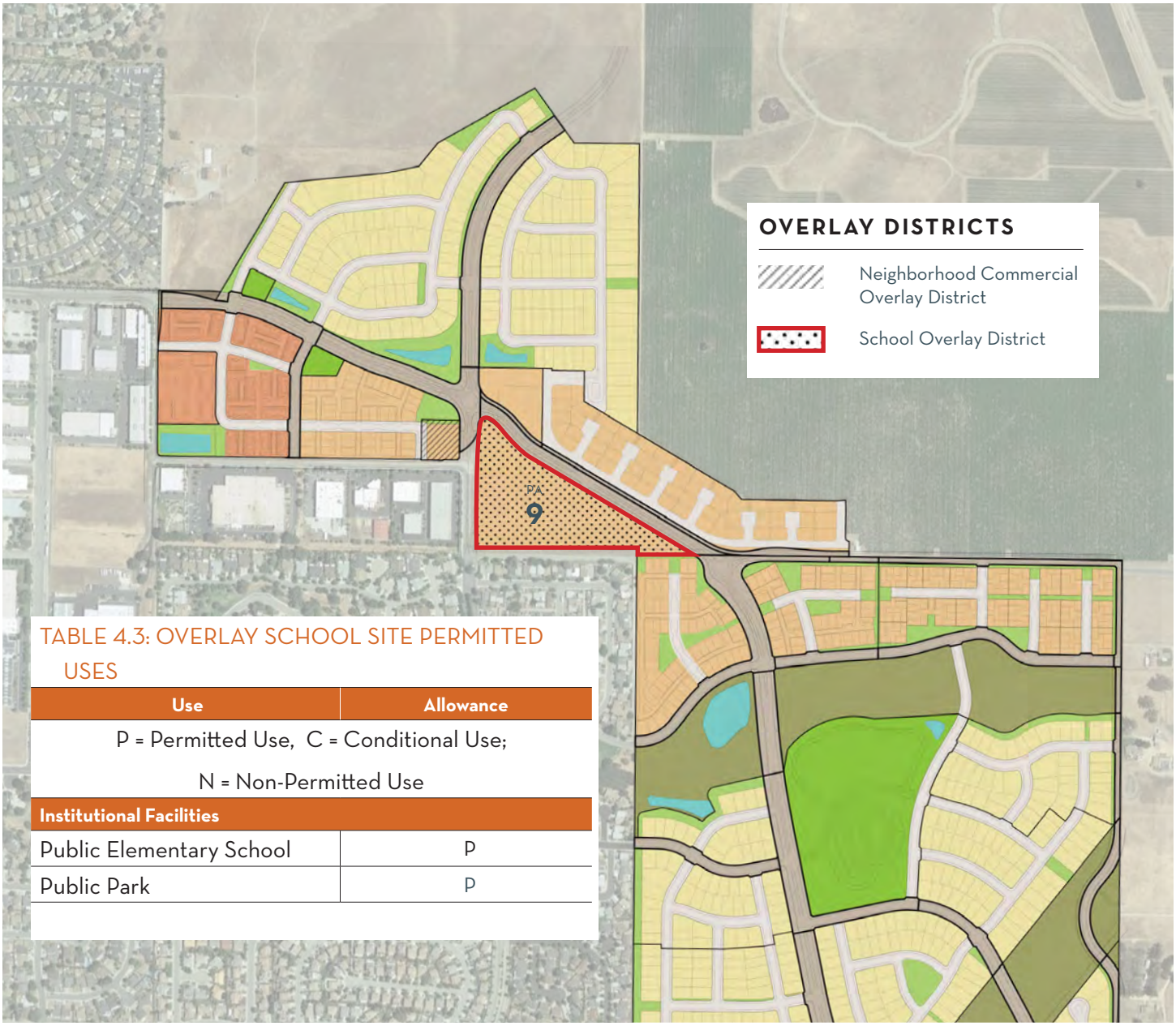


TABLE 4.3: OVERLAY SCHOOL SITE PERMITTED USES

Use	Allowance
P = Permitted Use, C = Conditional Use; N = Non-Permitted Use	
Institutional Facilities	
Public Elementary School	P
Public Park	P

2.1.E RECREATIONAL USES

Enhancing the quality of life for residents of Viñedo, the Specific Plan includes an extensive network of parks and open space including an extension of the regional Turtle Creek Park, The Vines (Trail and Easement Park), Meadowlark Park (a passive park atop the southern oak knoll) and several Water Quality/Detention areas. Turtle Creek Park will be enhanced with (4) four public Pickle-ball courts and Meadowlark Park will have (3) three public Tennis courts for active recreation. The Vines Park will feature a series of trails woven throughout a producing vineyard and orchards in addition to a dog park and washing station for residents.

Policy 2.1.7 Two private recreational centers will also be provided. The Poolhouse recreation center will be the central gathering spot for residents of the S. Chandler parcel. This recreation amenity will feature an all-age pool, spa and kiddy pool or splash pad for children in addition to bbq and shade structures for residents.

Designed around health, wellness, fitness and socialization, the main recreational facility will be located atop the central knoll of the Olsen parcel. Overlooking Turtle Creek Park, The Overlook will feature an events barn, a spa, a seasonal outdoor bar with demonstration kitchen and an extensive clubhouse with a fitness center, deli and coffee shop, community gathering spaces as well as a communal business center. Some of these program elements (i.e coffee shop, the events barn, the spa, the seasonal outdoor bar, etc.) will be open to the public during specified events and/or times. Final determination shall be made at building plan submission.

Policy 2.1.8 In addition to the two private recreation centers, a community farm and Farmstand will be located near the western boundary of the S. Chandler parcel. The Farmstand will initially serve as a central information and sales center for the community and will transition into an HOA multi-purpose space and CSA (Community Supported Agriculture) office to oversee agricultural cultivation across the project (i.e. along The Vines Park and around The Overlook recreation facility).

These different types of open spaces are further described in Chapter 4 of this Specific Plan. Included there are conceptual plans of the open space and recreation areas to represent initial designs that could be included in future design proposals.

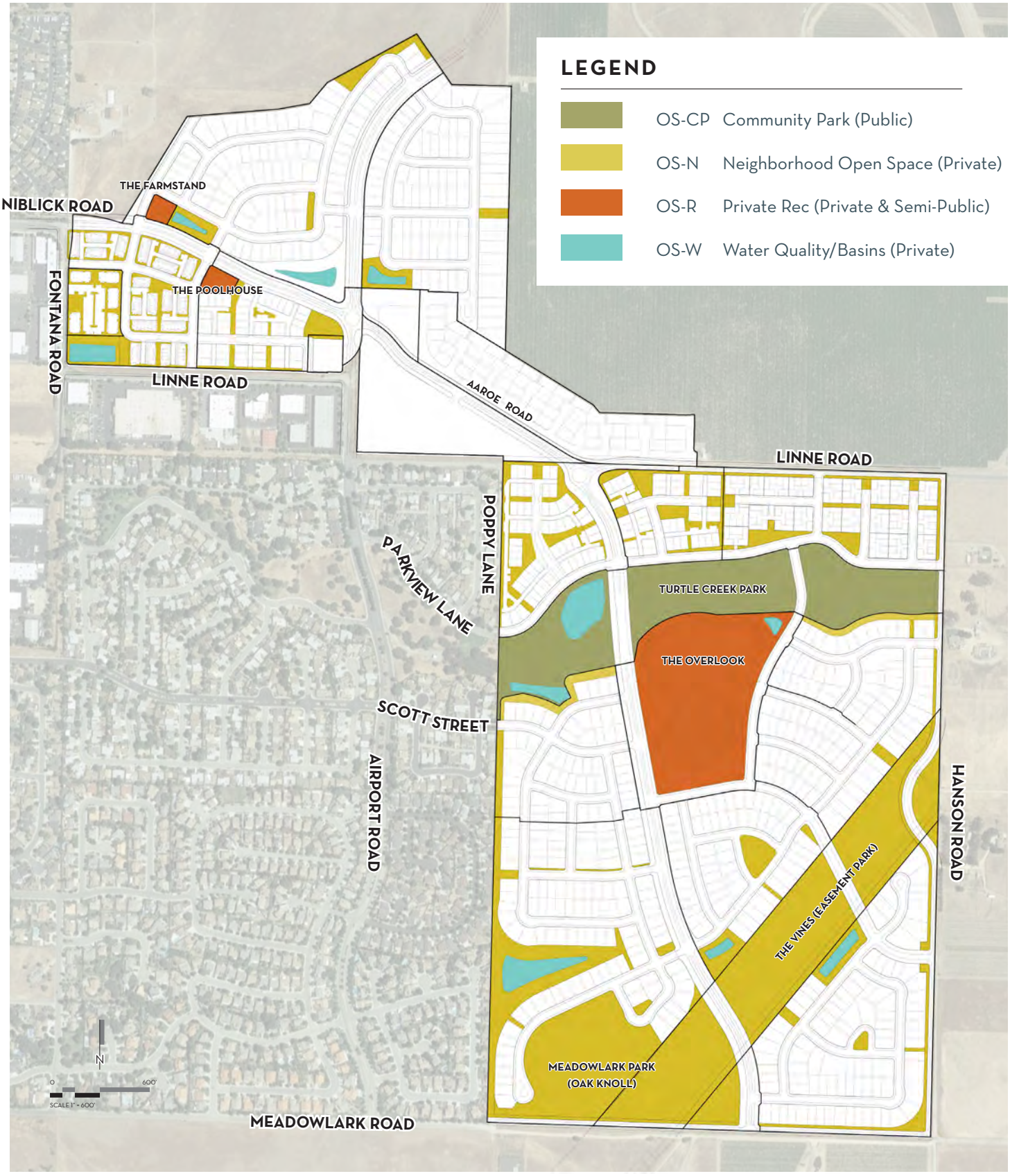
The following series of maps depict the character, access and maintenance of all open spaces throughout the Specific Plan.

TABLE 2.1.C: RECREATIONAL USES LAND USE SUMMARY

Specific Use	Ownership	Access	Acres
OS-CP Community Parks	City	Public	24.2
OS-N Neighborhood Open Space	HOA	Private & Public	60.7
OS-R Private Rec	HOA	Private & Semi-Public	22.0
OS-W Water Quality/Basin	HOA*	Private	5.7
Total			**112.6**

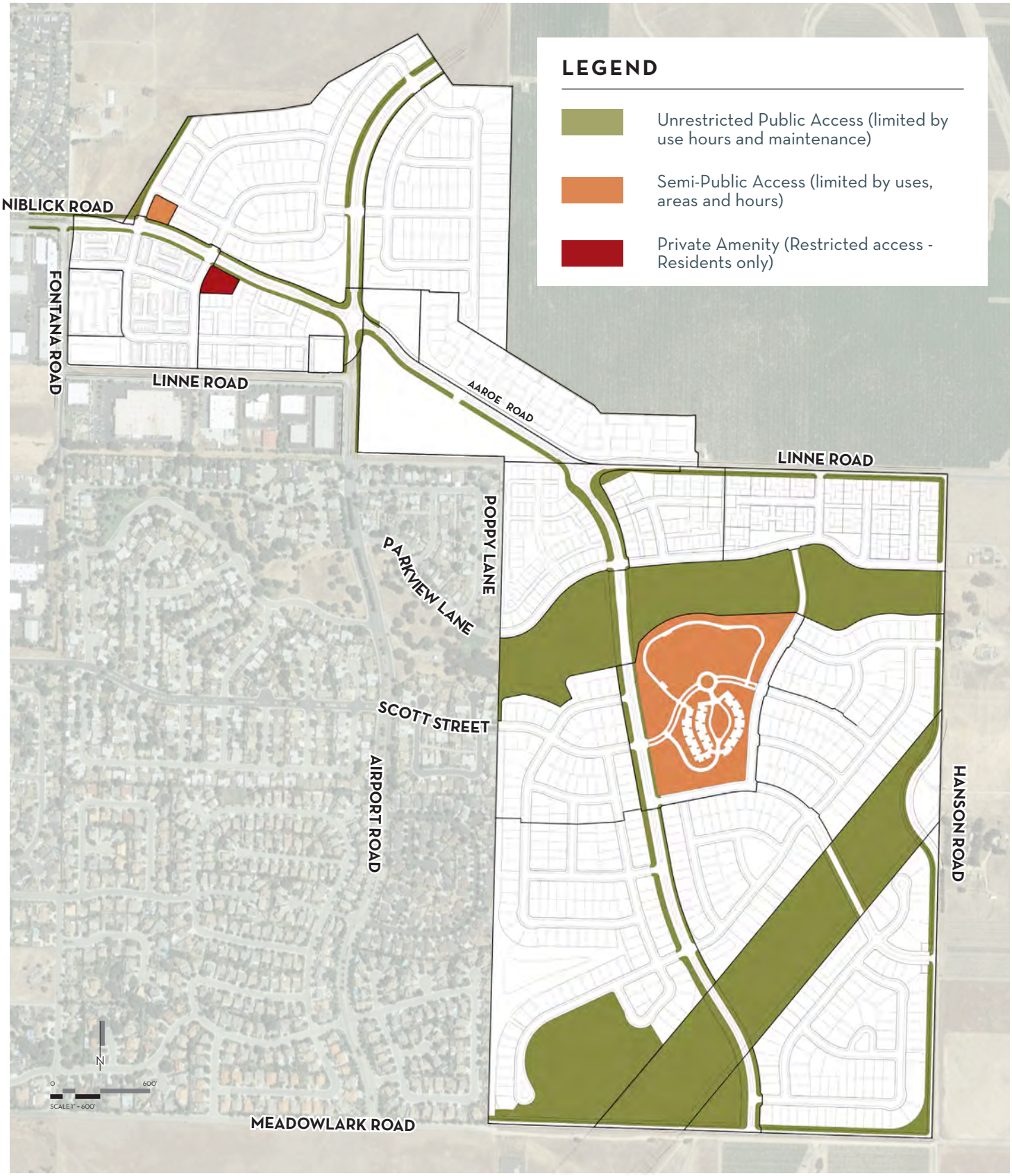
*(2) Basins located within Turtle Creek Park will be owned by the City but Maintained by the HOA.

MAP 2.1.E: RECREATIONAL LAND USE MAP

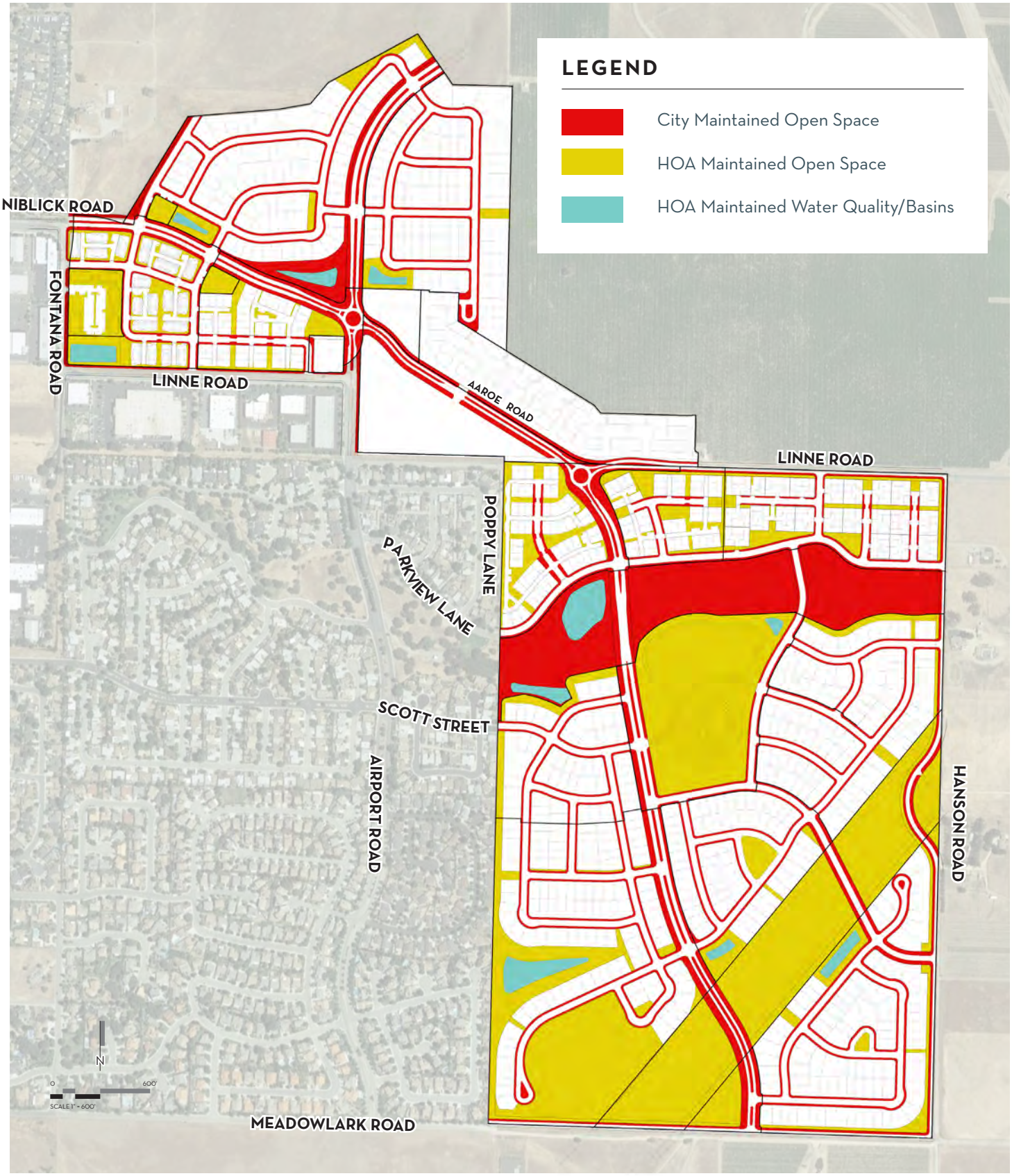


Reso A - Exhibit C2 (EIR Technical Appendix)

MAP 2.1.F: OPEN SPACE ACCESS MAP



MAP 2.1.G: OPEN SPACE MAINTENANCE MAP



2.2 Circulation Plan

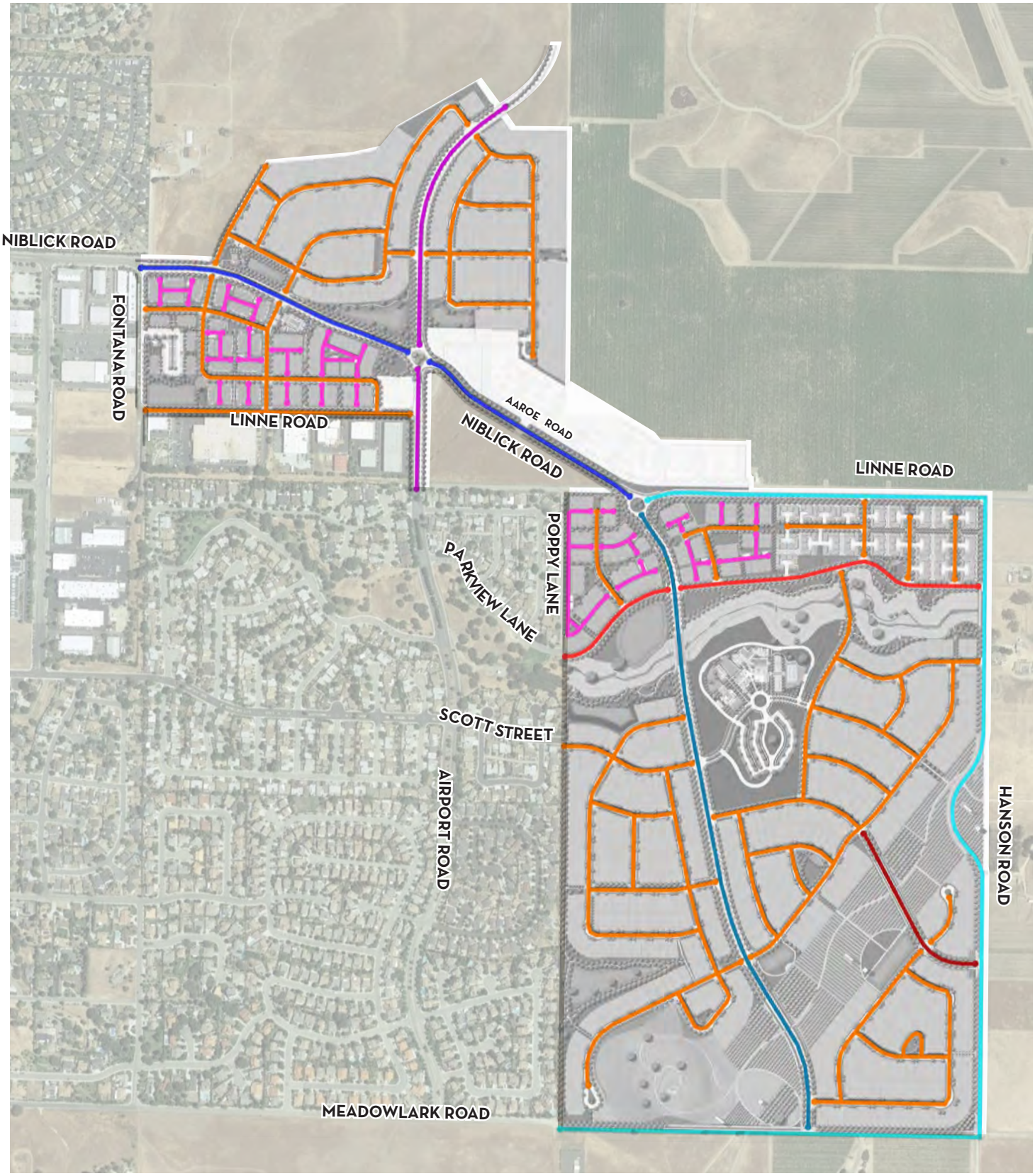
2.2.A VEHICULAR CIRCULATION

The existing circulation around the Specific Plan consists of Niblick, Linne, Hanson and Meadowlark Roads.

The circulation of the Specific Plan is intended to be an extension of this existing network. The Specific Plan features an open network of internal circulation to better distribute vehicle trips and to facilitate faster emergency response times. This network not only extends Niblick Road to Meadowlark as a ceremonial boulevard that traverses the entire Specific Plan, but also ties into the existing neighborhoods to the west with the extension of Parkview Lane and Scott Street.

Policy 2.2 All thoroughfares are designed as multi-modal thoroughfares to equitably facilitate pedestrians, bicyclists and vehicles. Streetscapes shall have parkways planted with street trees and sidewalks on both sides.

2.2.A VEHICULAR CIRCULATION MAP



2.2 Circulation Plan

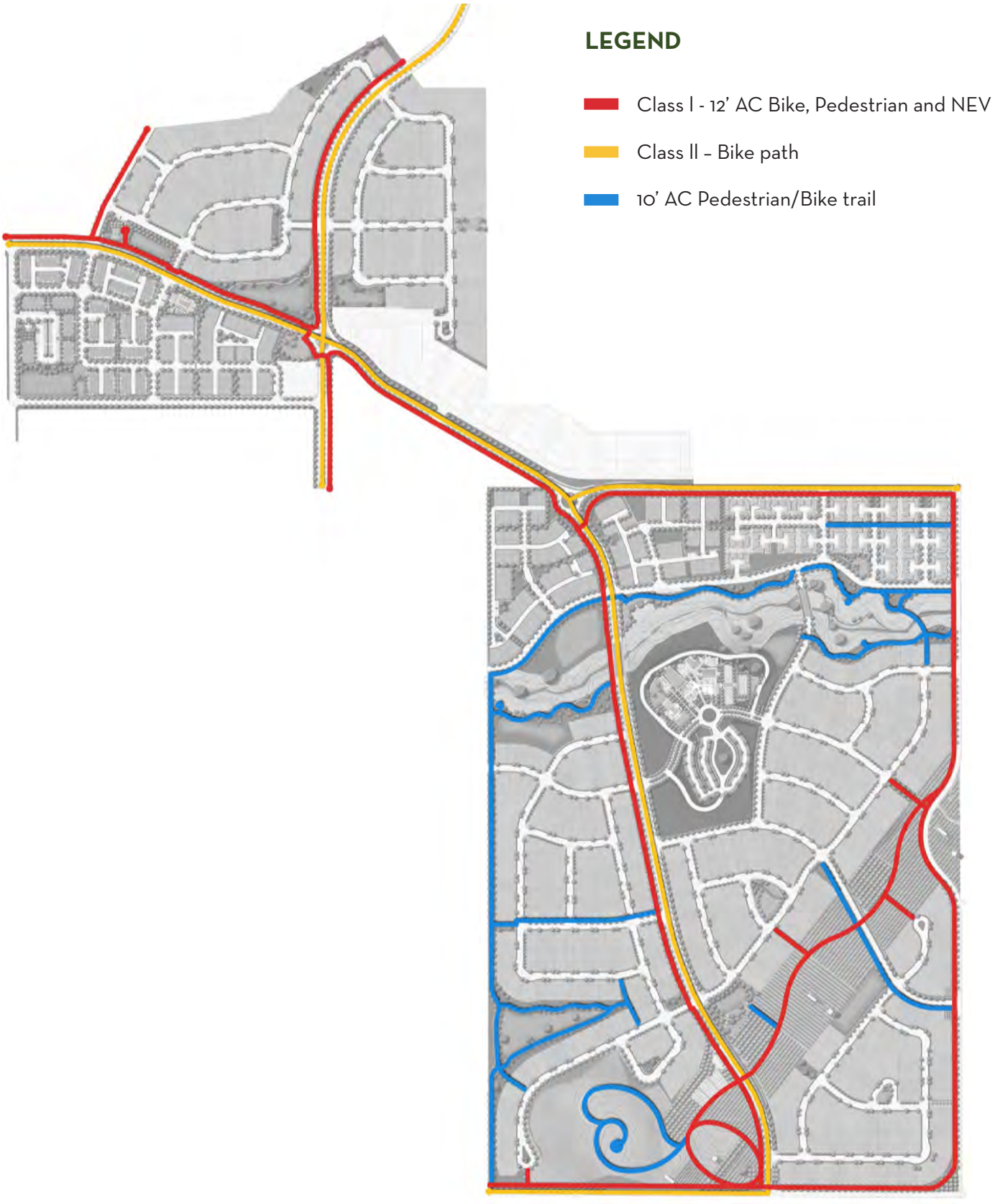
2.2.B MULTI-MODAL NETWORK

The multi-modal network of the Specific Plan is intended to be both an extension of the thoroughfare network and to function independently from it so residents can easily access it and circulate throughout the community without the need to travel along streets.

The multi-modal network is woven through the open spaces of the community, connecting the numerous amenity centers throughout. The extensive network of bike lanes and pedestrian trails also link into the regional system around Paso Robles.

2.2 Circulation Plan

2.2.B MULTI-MODAL NETWORK MAP (N.E.V, BIKE, PED PATHS & TRAILS)



2.2 Circulation Plan

2.2.C PASO ROBLES CITY GATEWAY

Featuring a heritage oak tree and meadow grasses, the Paso Robles City gateway (at the Linne and Niblick Road roundabout) creates a simple yet elegant transitional threshold between the County and City.

KEY PLAN

Artist's illustration. Landscaping, colors, materials, walls and fencing subject to change based on final designs.

2.3 Grading Plan

2.3.A EXISTING TOPOGRAPHY AND PROPOSED GRADING

The proposed Viñedo Specific Plan consists of four parcels of land, two of which will be subdivided into residential developments. These include the South Chandler Ranch parcel and the Olsen Ranch parcel. South Chandler Ranch consists of approximately 83.7 acres and is located north of Linne Road, east of Fontana Road. The site is currently undeveloped with gently sloping terrain on the north half transitioning to a much flatter grade toward Linne Road to the south. Existing vegetation is annual grasses.

At the time of development, the parcel will be intersected by Airport Road in a north-south direction and bisected by the Niblick Road extension in an east-west direction. Proposed land uses will consist of a variety of residential units from apartments and townhomes to single-family residential units ranging in size from 3,200 to 7,700 square foot lots. The large lots are located north of Niblick Road on terrain with an average slope between 3.0 and 6.0%. The multi-family and small lot units are located on the flatter portion of parcel south of Niblick Road on slopes ranging from 1.0 to 1.5%.

Olsen Ranch consists of approximately 242.5 acres and is located south of Linne Road, west of Hanson Road and north of Meadowlark Road. There is an existing subdivision to the west. The site is currently undeveloped with gently sloping terrain on the south half transitioning to a much flatter grade toward Linne Road to the north. A natural drainage is located at the foot of the hilly terrain and a broad flood exists northward to Linne Road. Existing vegetation is annual grasses with scattered oaks. A large PG&E electrical easement crosses a portion of the site from the southwest to the northeast.

The parcel is bisected Niblick Road from Linne Road to Meadowlark Road. A drainage way known as Turtle Creek flows east to west through the northern half of the site from Hanson Road to the western boundary. Proposed land uses will consist of a variety of residential units from apartments and townhomes to single-family residential lots ranging in size from 3,200 to 7,700 square feet. The large lots are located south of Turtle Creek within the rolling hills with an average slope between 1 and 12%. The small lot residential units are located on the flatter portion of the parcel north of Turtle Creek and south of Linne Road on slopes range from 0.5 to 1.5%.

The proposed land plan was designed in an effort to utilize the contours of the existing terrain and minimize the grading of existing knolls to the maximum extent possible while maintaining design standards for roadway horizontal and vertical alignments and preliminary design of the individual single-family lots. Preliminary earthwork calculations combining both the South Chandler and Olsen Parcels reveal that approximately one million yards of earth will be moved.

The overall cut ranges from a few inches to about 22.5 feet on the Chandler parcel with a maximum fill of 24 feet. The average fill across the site is approximately 1.7 feet. The overall cut ranges from a few inches to about 24 feet on the Olsen parcel with a maximum fill of 20 feet. The average cut across the site is approximately 1.4 feet. The total quantity of earth to be moved in the development of this Specific Plan is roughly one million cubic yards. It is anticipated that the future Niblick Road right-of-way between Airport Road and Linne Road will be used as a haul route to move the dirt.

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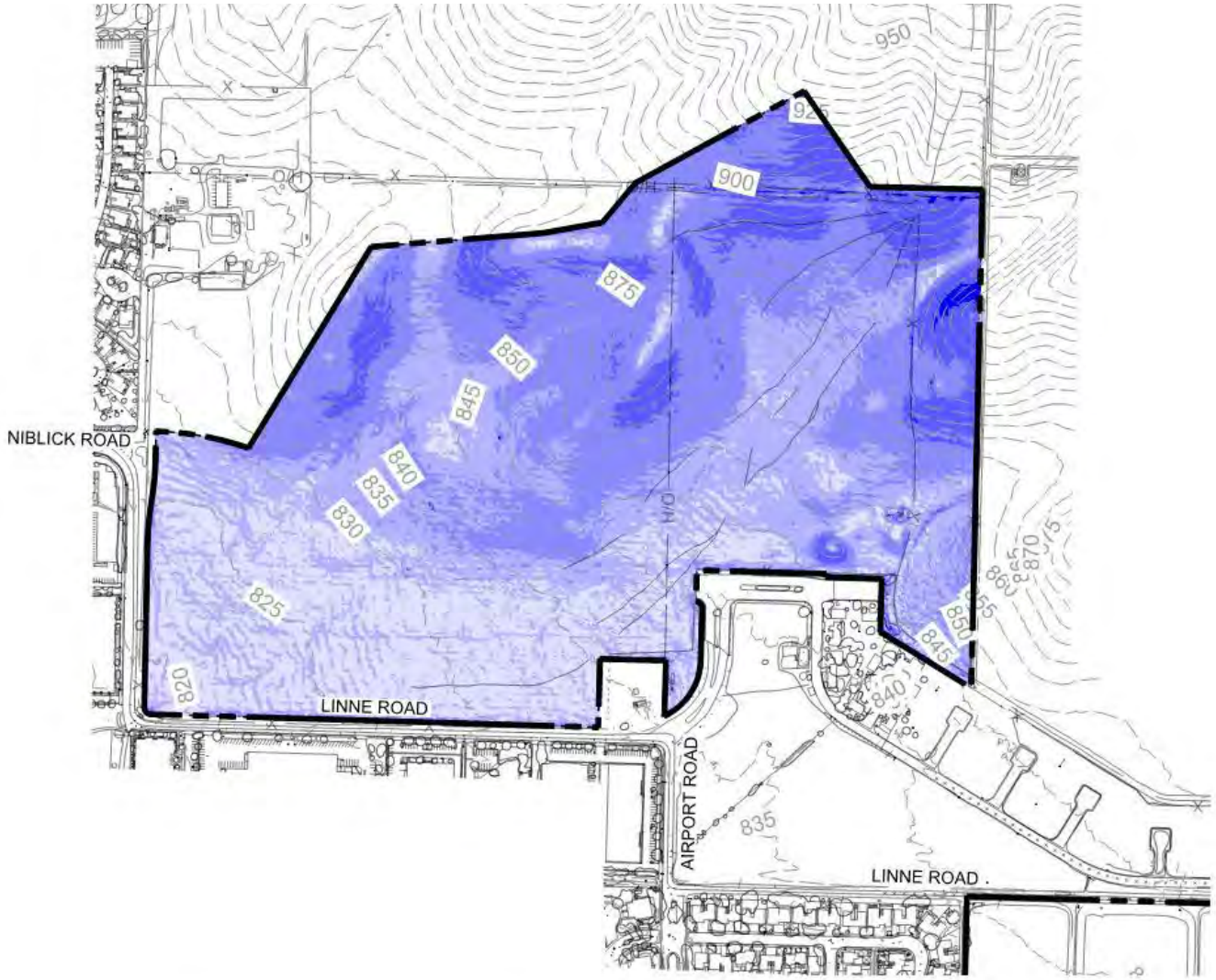
2.3 Grading Plan

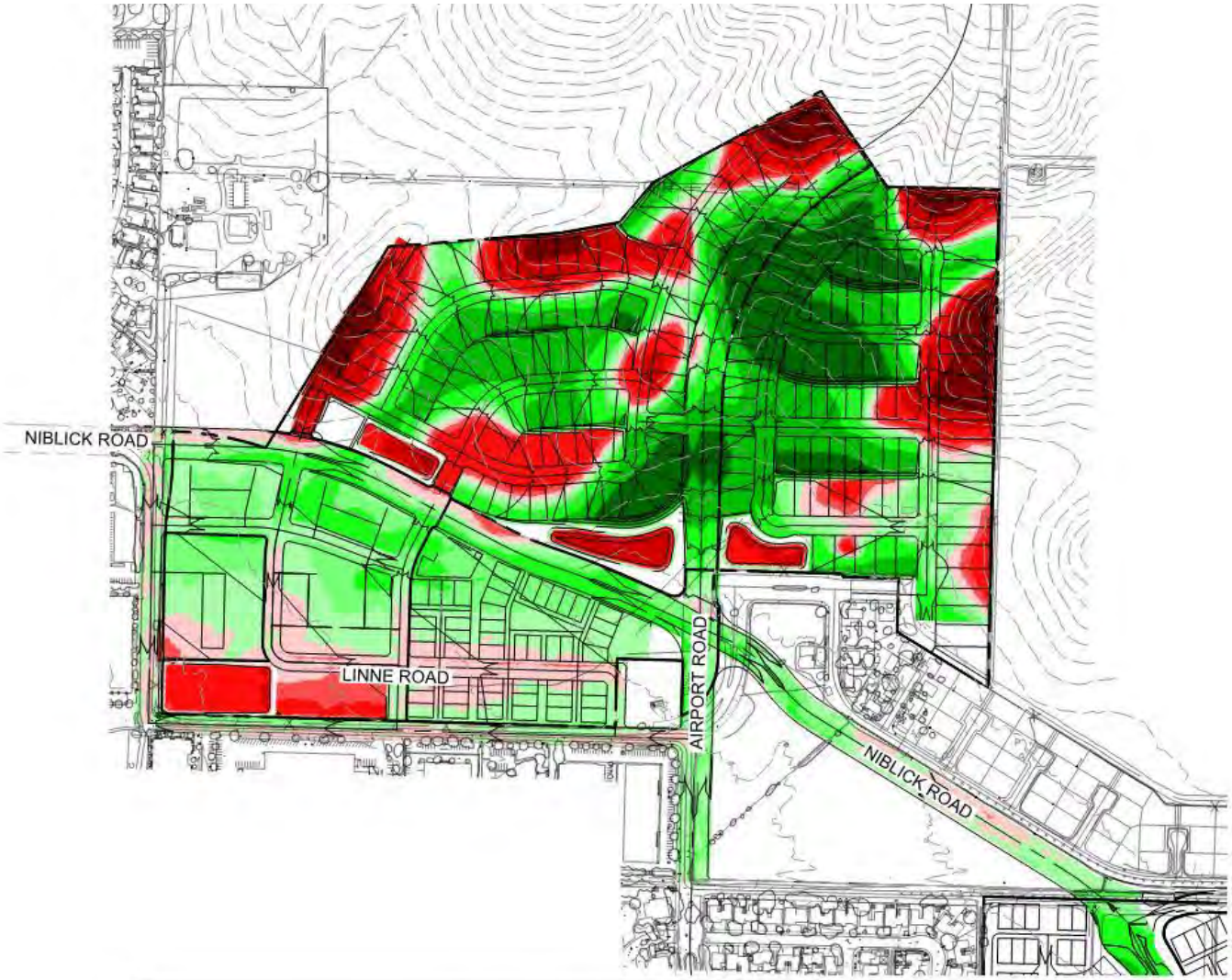
2.3.A EXISTING TOPOGRAPHY - S. CHANDLER PARCEL



Slopes Table				
Number	Minimum Slope	Maximum Slope	Area	Color
1	0.00%	2.00%	775392.18	
2	2.00%	5.00%	1228353.31	
3	5.00%	10.00%	1231293.75	
4	10.00%	20.00%	394739.35	
5	20.00%	30.00%	13201.34	
6	30.00%	100.00%	575.77	

2.3 Grading Plan

2.3.B PROPOSED GRADING - S. CHANDLER PARCEL



Elevations Table				
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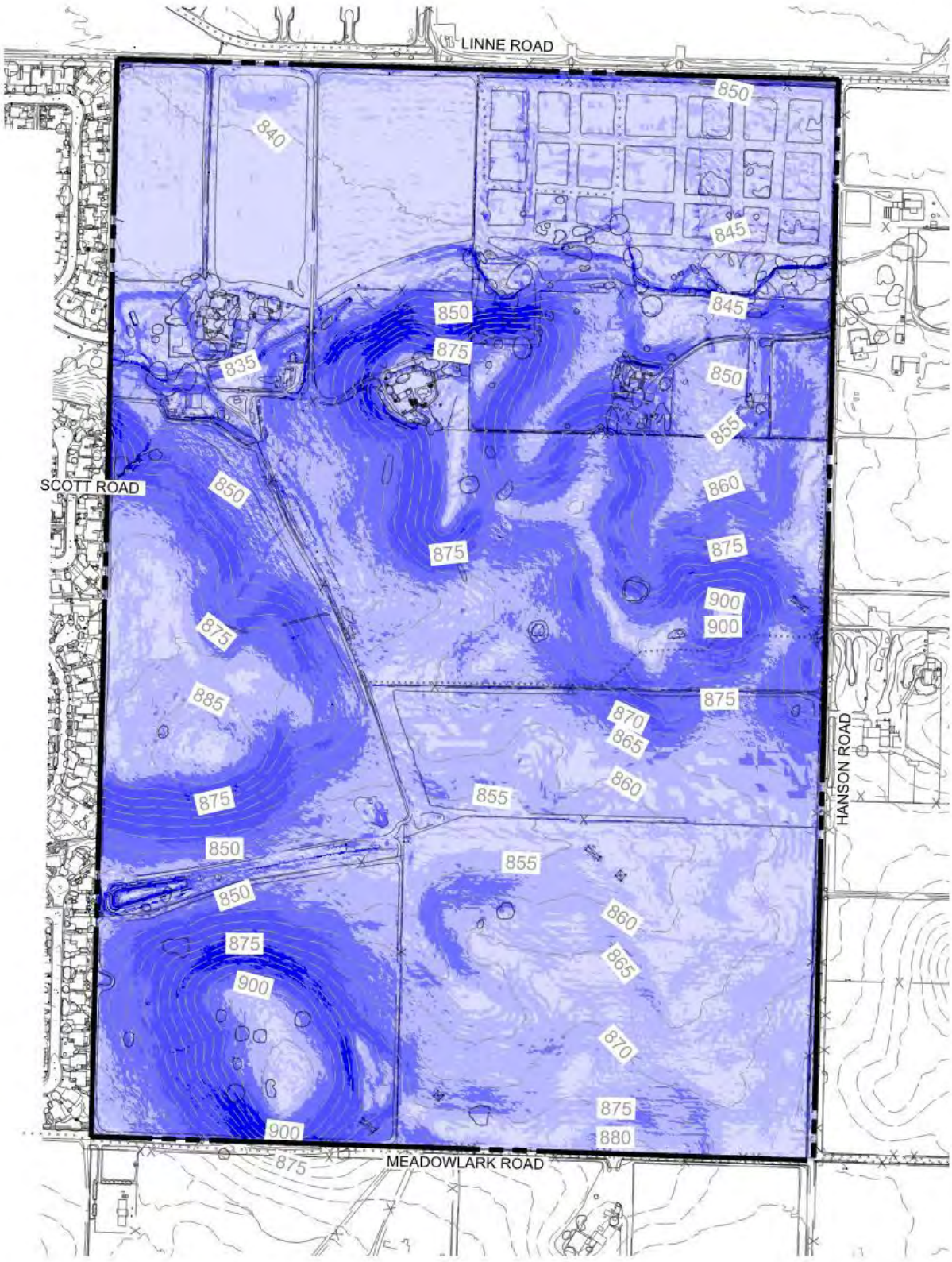
1	−22.31	−10.00	113002.03	
2	−10.00	−5.00	259441.79	
3	−5.00	−2.00	425145.37	
4	−2.00	−1.00	193929.79	
5	−1.00	0.00	531186.28	
6	0.00	1.00	745777.59	
7	1.00	2.00	561243.84	
8	2.00	5.00	624661.79	

2.3 Grading Plan

2.3.C EXISTING TOPOGRAPHY - OLSEN PARCEL

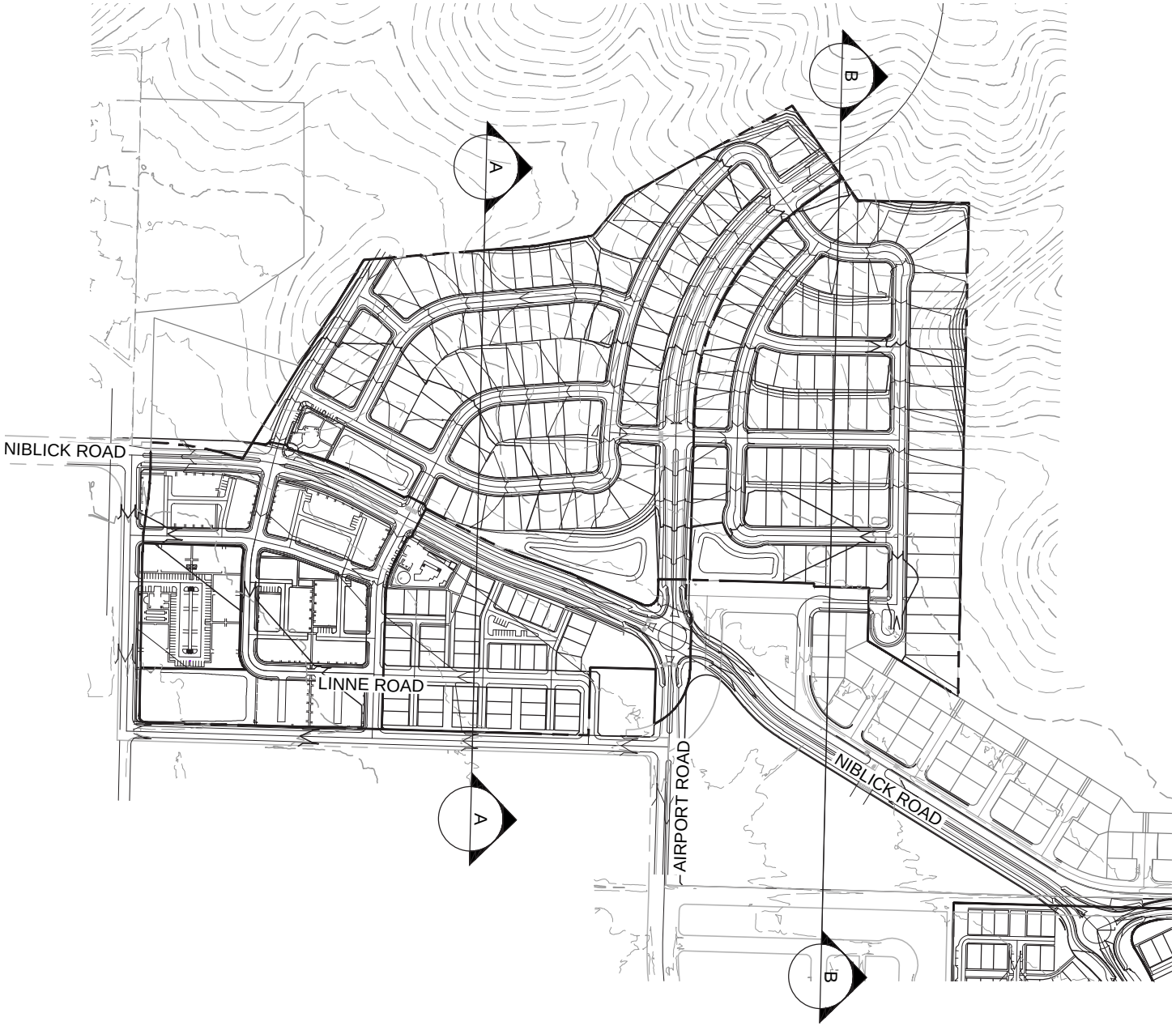


2.3 Grading Plan

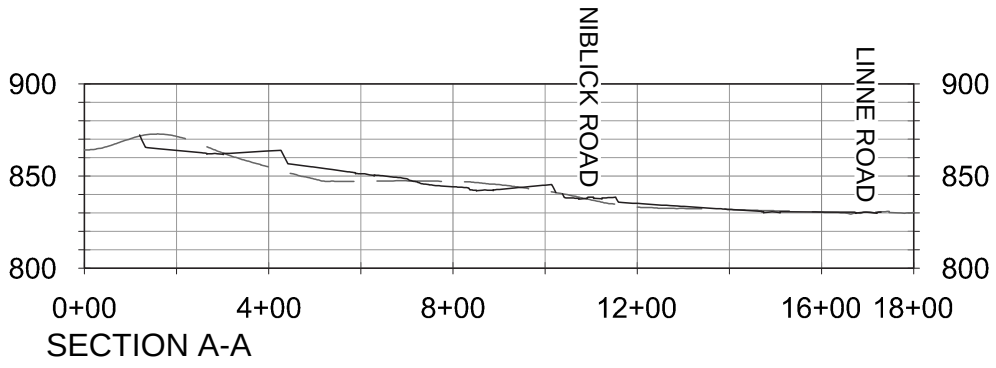
2.3.D PROPOSED GRADING - OLSEN PARCEL

2.3 Grading Plan

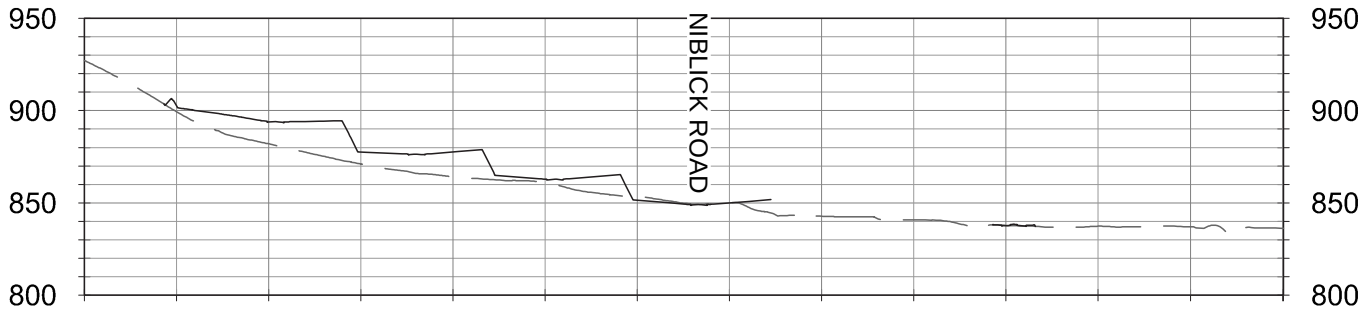
2.3.E SOUTH CHANDLER PROPOSED PRELIMINARY GRADING PLAN CROSS SECTION LOCATIONS



2.3.F SOUTH CHANDLER PROPOSED PRELIMINARY GRADING PLAN CROSS SECTIONS



SECTION A-A

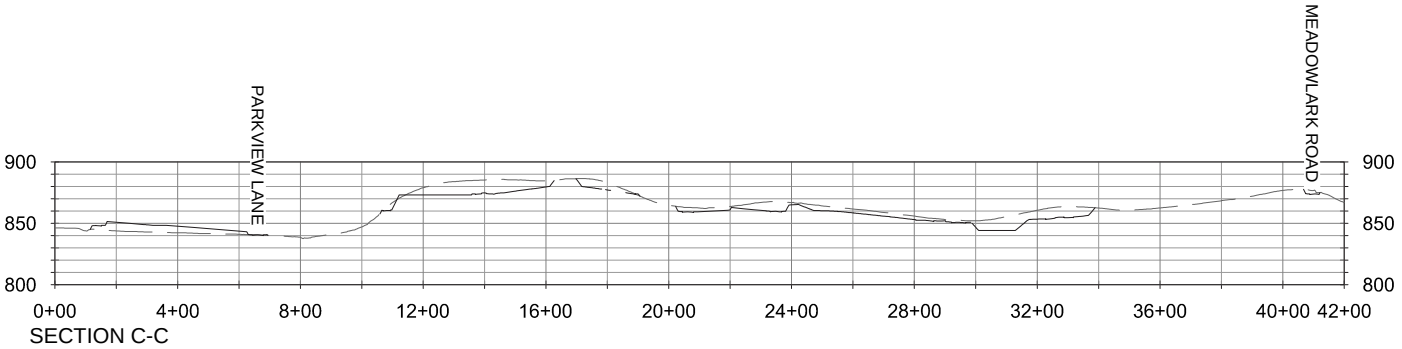


SECTION B-B

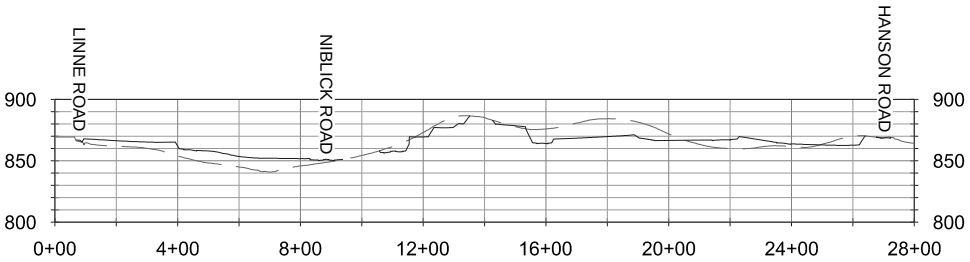
2.3 Grading Plan

2.3.G OLSEN PROPOSED PRELIMINARY GRADING PLAN CROSS SECTION LOCATIONS

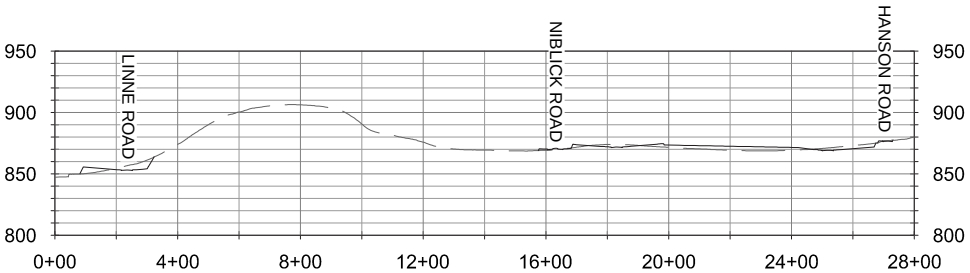
2.3.H OLSEN PROPOSED PRELIMINARY GRADING PLAN CROSS SECTIONS



SECTION C-C



SECTION D-D



SECTION E-E

2.4 Tree Plan

Policy 2.4.1 All development activity impacting existing native oaks on site shall be in accordance with the City's Oak Tree Preservation Ordinance in Chapter 10.01.050.

Policy 2.4.2 Whenever reasonably possible, native oaks should be incorporated into the community design and featured in the landscape. When avoidance is not possible, heathly, specimen oaks should be relocated and featured in meaningful locations within the community. Examples of this can be seen in the images below:

2.5 Utilities Plan

2.5.1 WATER DISTRIBUTION

The City of Paso Robles is currently in the process of updating the City's Water Master Plan which will include both the Viñedo and the Beechwood Specific Plan areas. The report shows that the current infrastructure is capable of providing water to the Viñedo Specific Plan area with the implementation of a booster pump station located within the South Chandler Ranch, just west of Our Town.

Water distribution for the development will be provided through the extension of the existing City infrastructure. Connection points for the South Chandler parcel may be at NIBLICK and Fontana, Linne Road and Fontana, Airport Road and Linne Road. Connection points for the Olsen parcel will be at Parkview Lane and Scott Road. The water mains will be 8- and 10-inch diameters in size.

2.5.2 SANITARY SEWER COLLECTION

Sanitary sewer collection for the Viñedo Specific Plan will be provided through the extension of the existing City infrastructure. Connection points for South Chandler Ranch will be at the Niblick Road and Fontana Road intersection, as well as the Linne Road and Fontana Road intersection. Olsen Ranch is divided into two drainage areas. The northern portion of Olsen Ranch will utilize the existing sanitary sewer system within Parkview Lane. Sanitary sewer flows from both the South Chandler Ranch and northern portion of Olsen Ranch discharge into the Commerce Road and Scott Road sanitary sewer system. These systems are currently at capacity and will require upgrades prior to the Phase 1 development at South Chandler Ranch and north Olsen Ranch. Upgrades will consist of replacing the existing 12-inch VCP line within Scott Road with an 18-inch PVC main, and replacing the 10-inch VCP line in Commerce Street with a 15-inch PVC main.

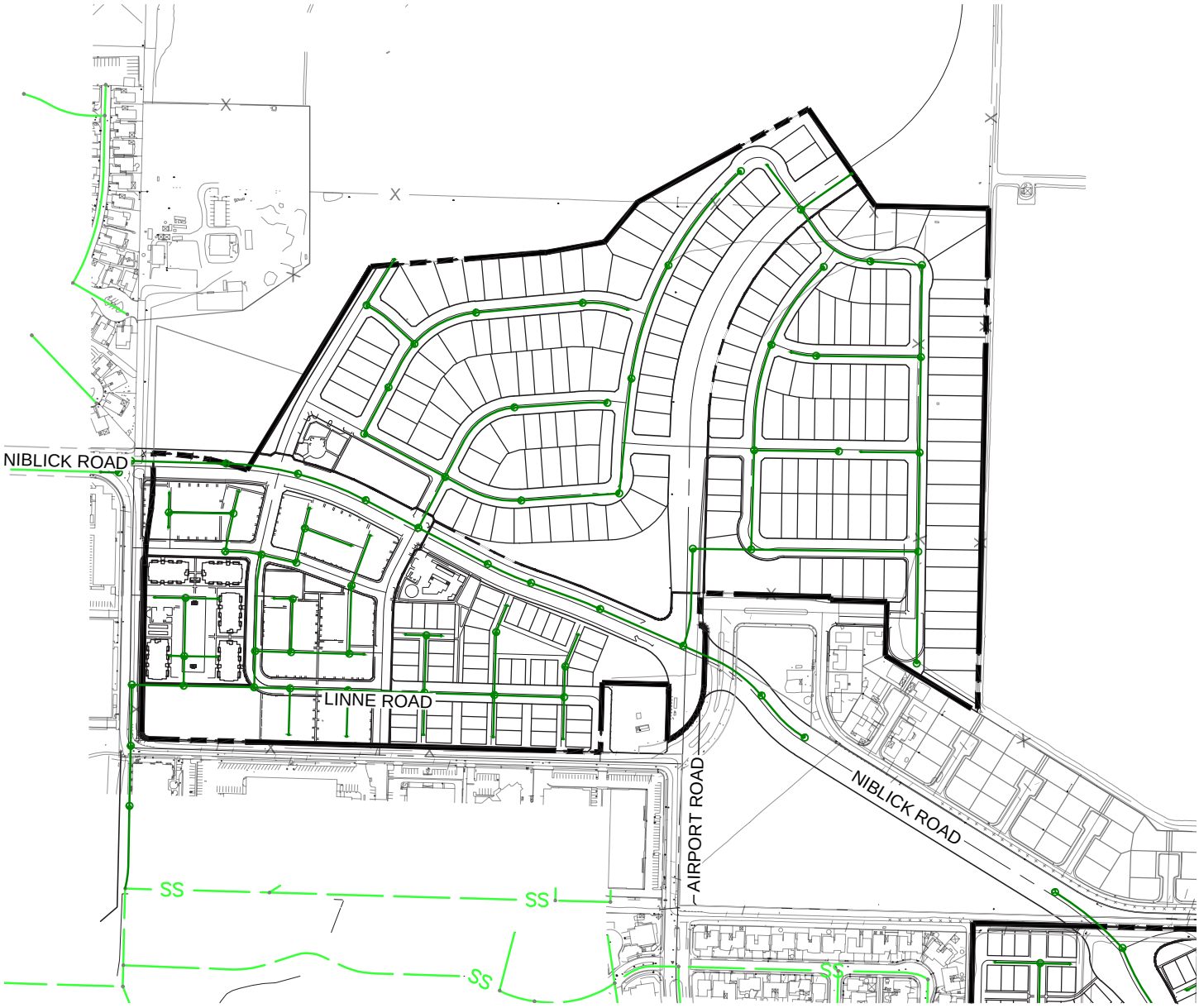
The southern portion of Olsen will discharge sanitary flows to Running Stag Way and will flow into the Beechwood sanitary sewer lift station. Pump upgrades are anticipated with proposed additional flows.

2.5.3 RECYCLED WATER

The project will utilize the City's new recycled water system and will connect to the City's system within Airport Road at the northern boundary of the Chandler parcel. The recycled water main is proposed to be 10-inch in diameter and will be installed within Airport Road, Niblick Road and the internal subdivision Road 'A' Road to Meadowlark Road. The recycled water will be utilized to irrigate all common areas such as pocket park and landscape areas as outlined within the landscape plan. The natural open space areas will not be irrigated and individual homes will not utilize the system.

2.5 Utilities Plan

2.5.A SEWER PLAN - S. CHANDLER PARCEL

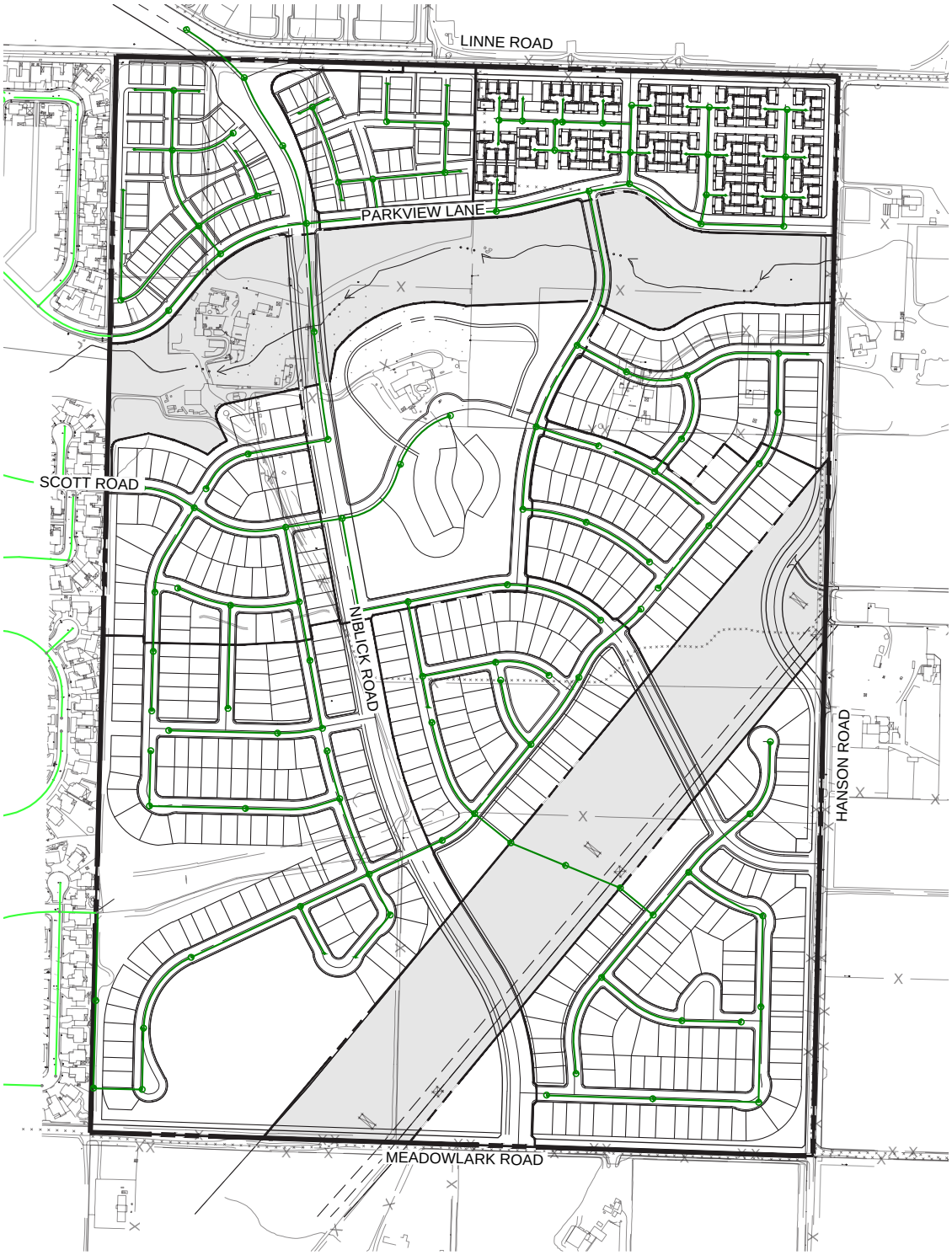


PROPOSED SEWER MAIN

EXIST. SEWER MAIN

2.5 Utilities Plan

2.5.B SEWER PLAN - OLSEN PARCEL

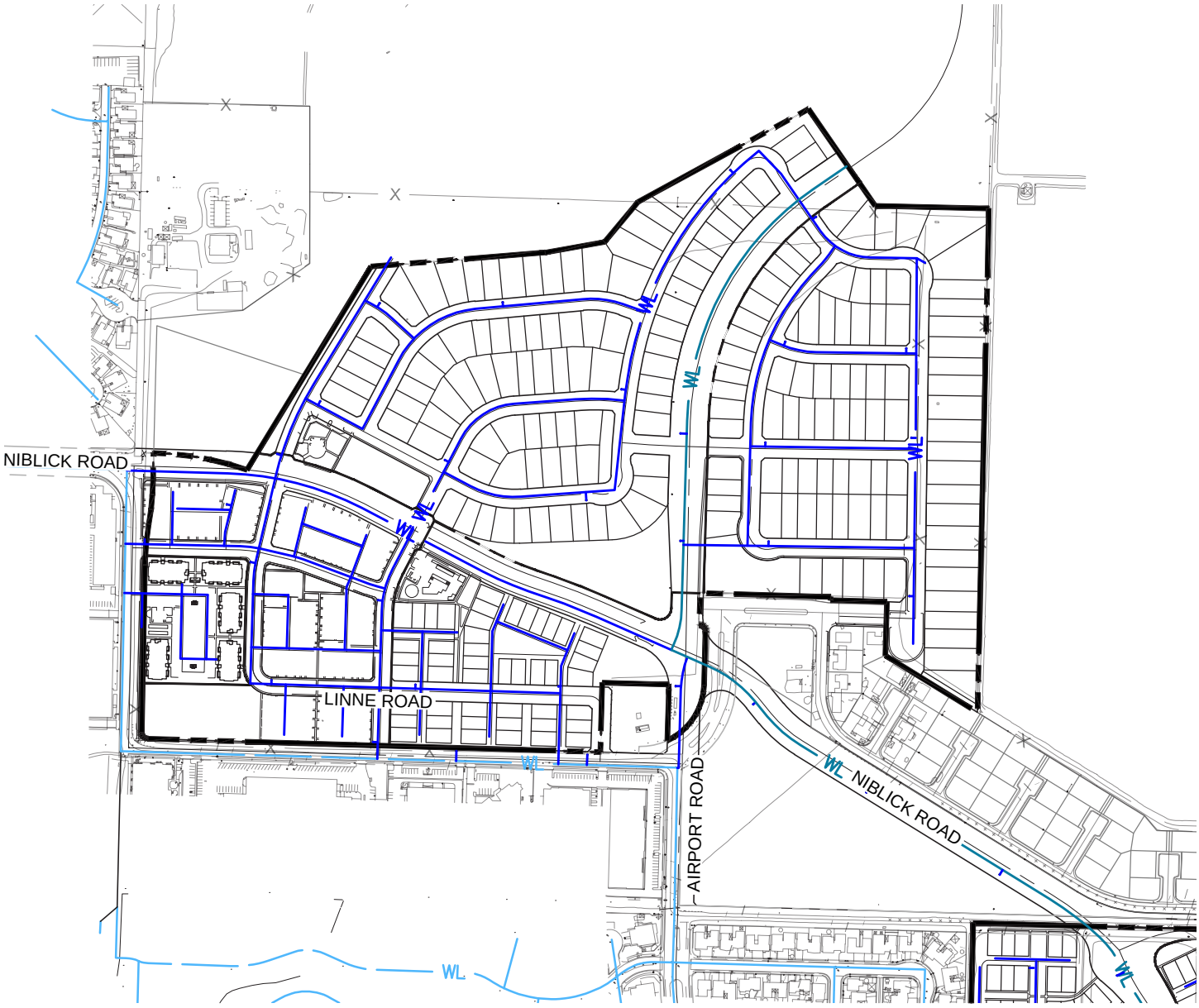


PROPOSED SEWER MAIN

EXIST. SEWER MAIN

2.5 Utilities Plan

2.5.C WATER PLAN - S. CHANDLER PARCEL



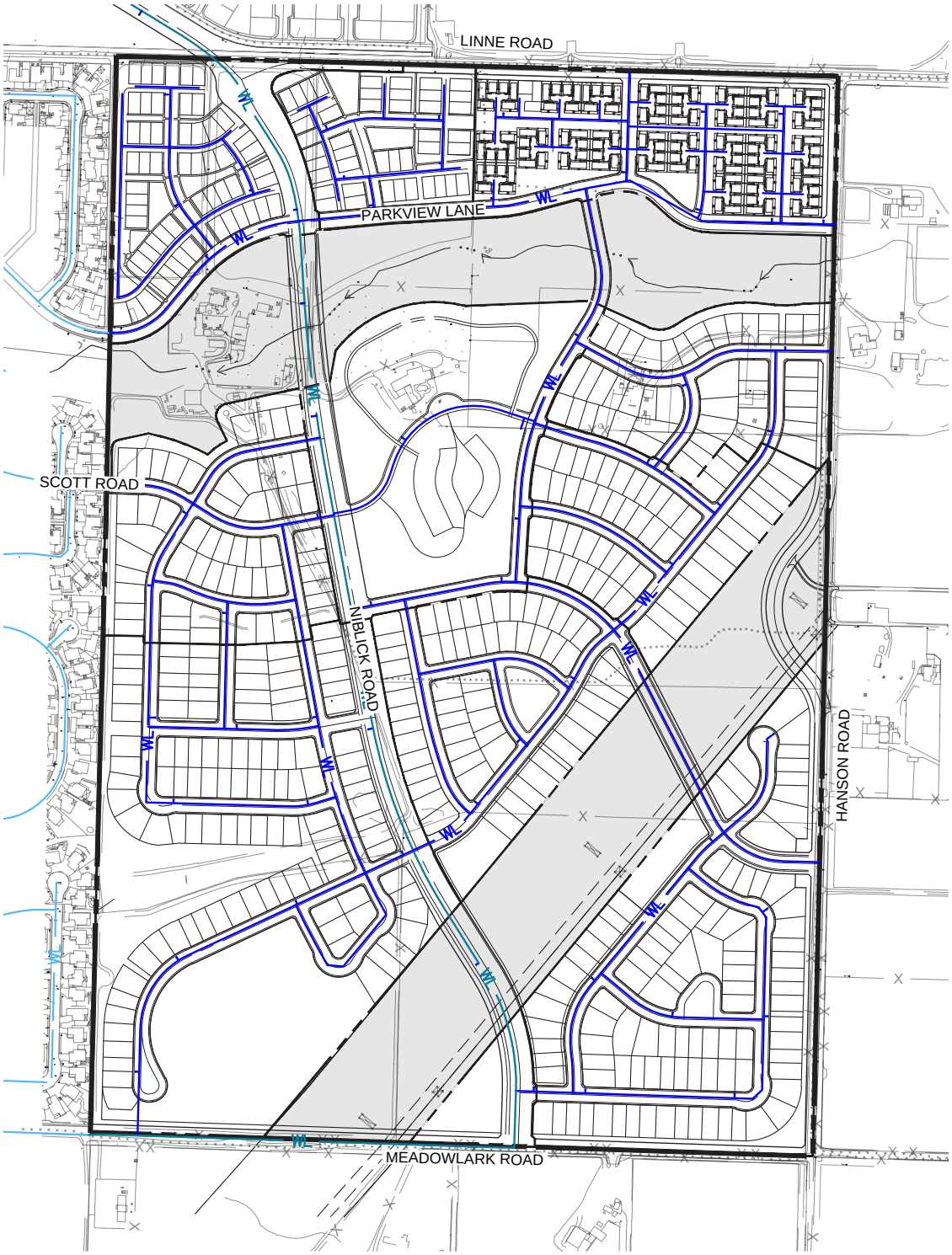
PROPOSED 12" WATER MAIN

PROPOSED WATER MAIN

EXIST. WATER MAIN

2.5 Utilities Plan

2.5.D WATER PLAN - OLSEN PARCEL

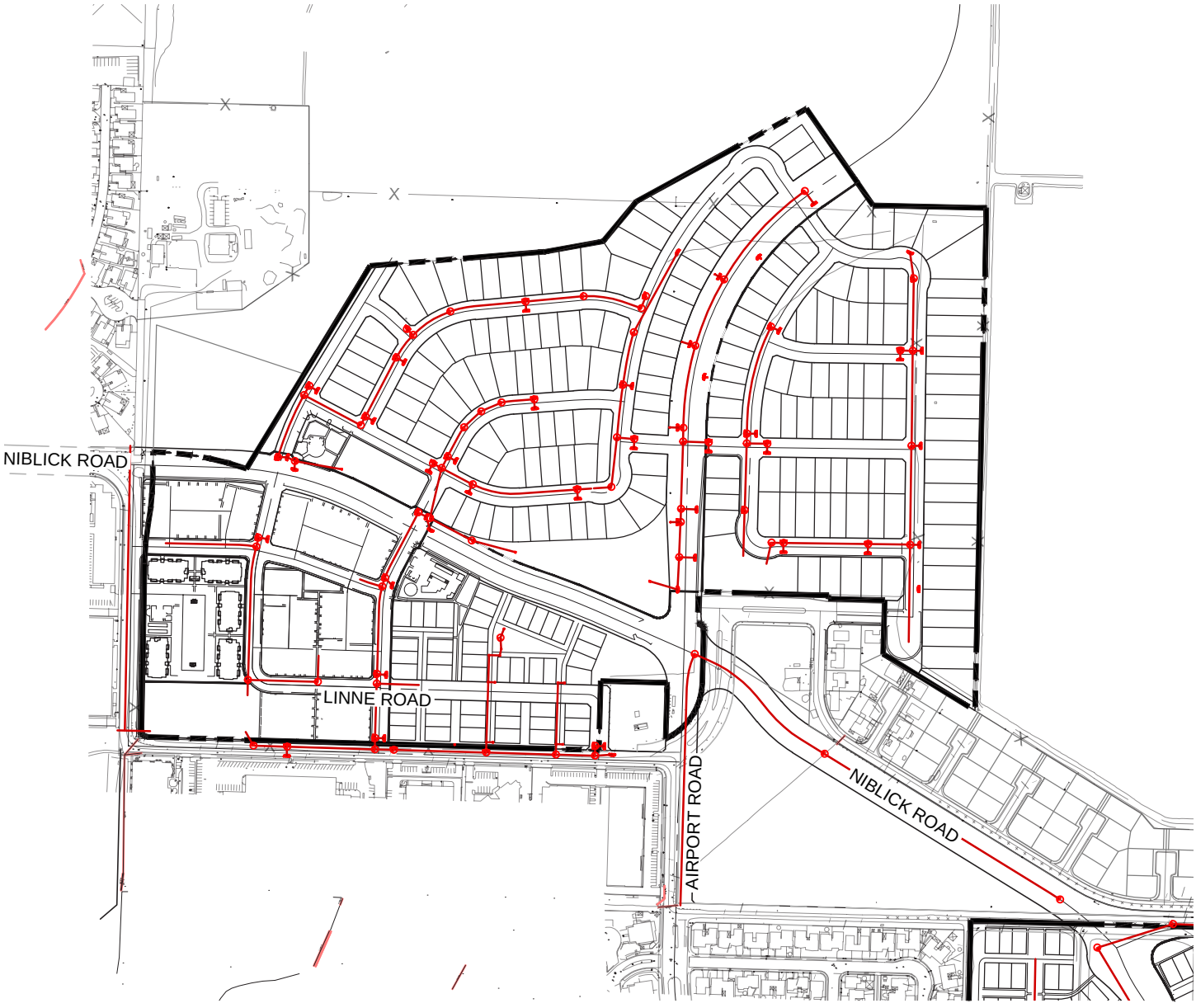


PROPOSED 12" WATER MAIN

PROPOSED WATER MAIN

2.5 Utilities Plan

2.5.E STORM DRAIN PLAN - S. CHANDLER PARCEL

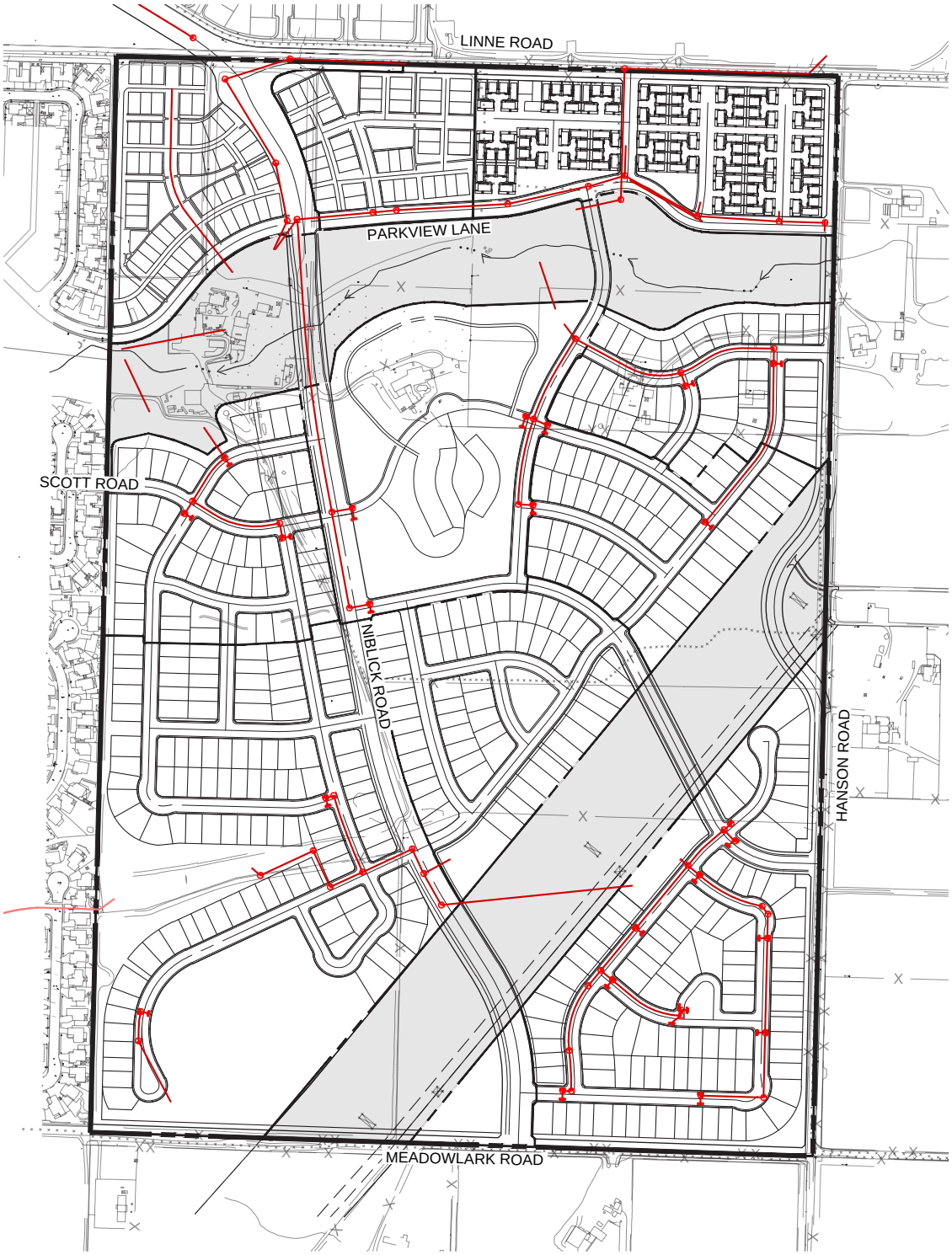


PROPOSED STORM DRAIN

EXIST. STORM DRAIN

2.5 | Utilities Plan

2.5.F STORM DRAIN PLAN - OLSEN PARCEL

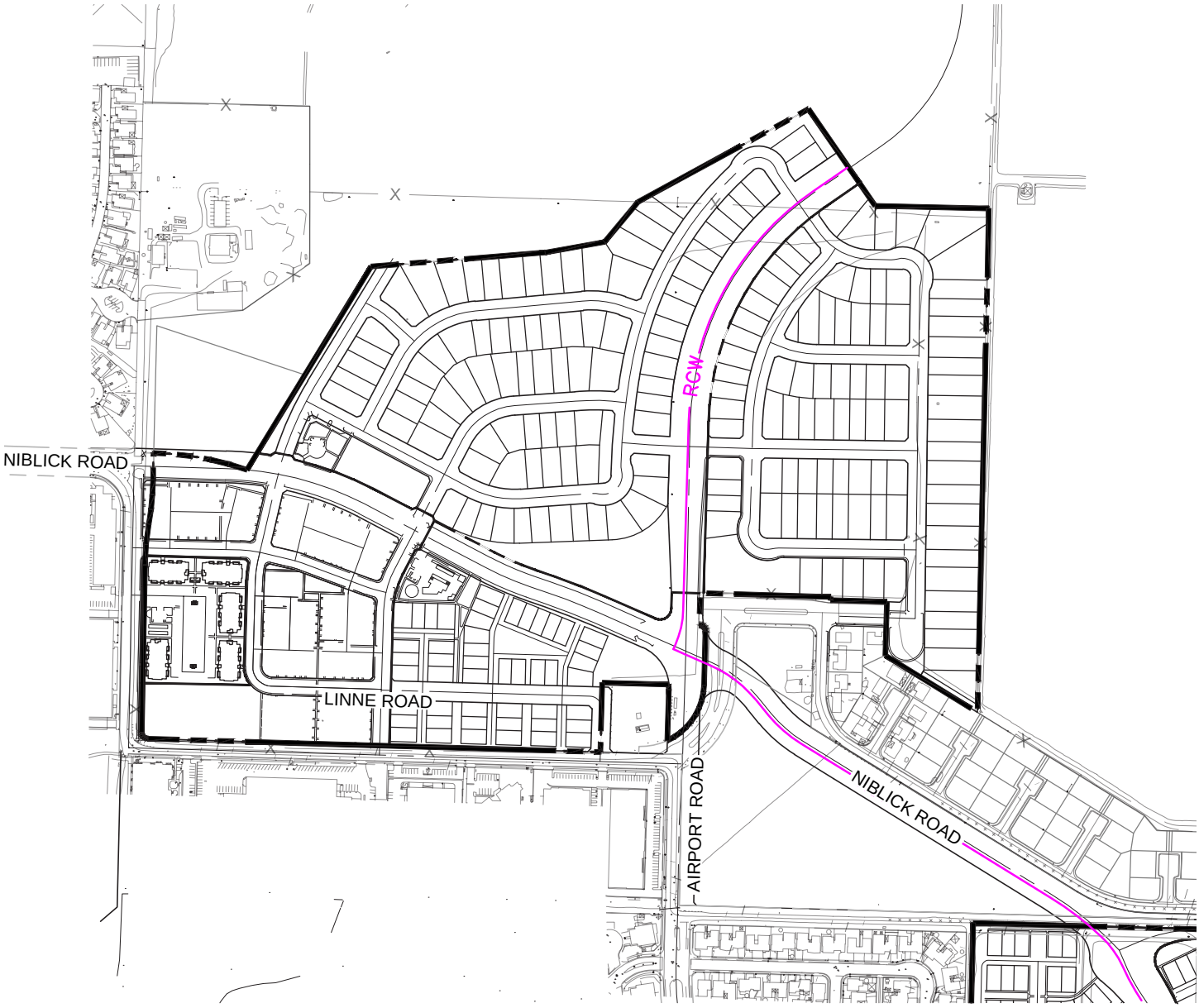


PROPOSED STORM DRAIN

EXIST. STORM DRAIN

2.5 Utilities Plan

2.5.G RECYCLED WATER PLAN - S. CHANDLER PARCEL



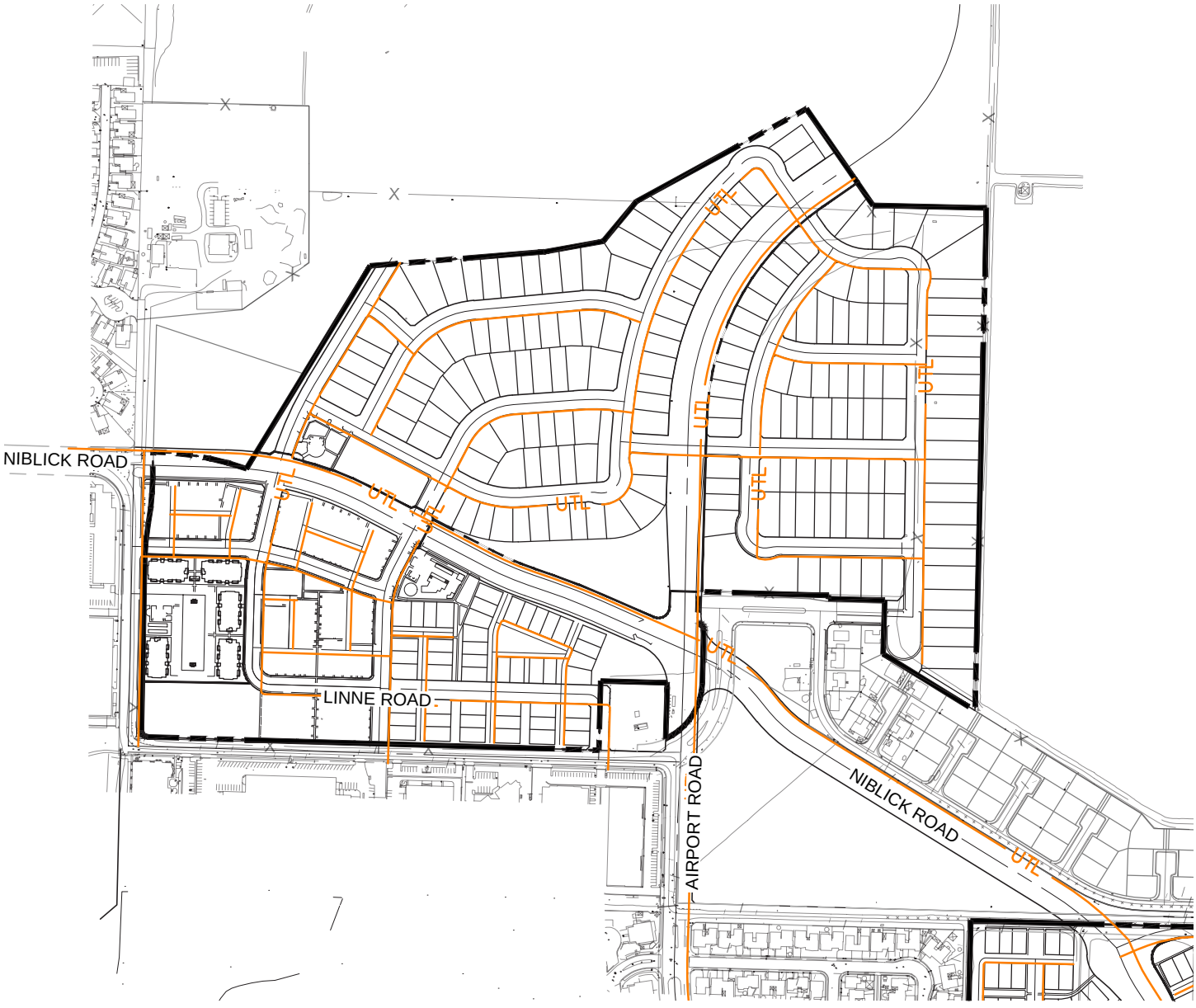
PROPOSED RECYCLED WATER MAIN

2.5.H RECYCLED WATER PLAN - OLSEN PARCEL

PROPOSED RECYCLED WATER MAIN

2.5 Utilities Plan

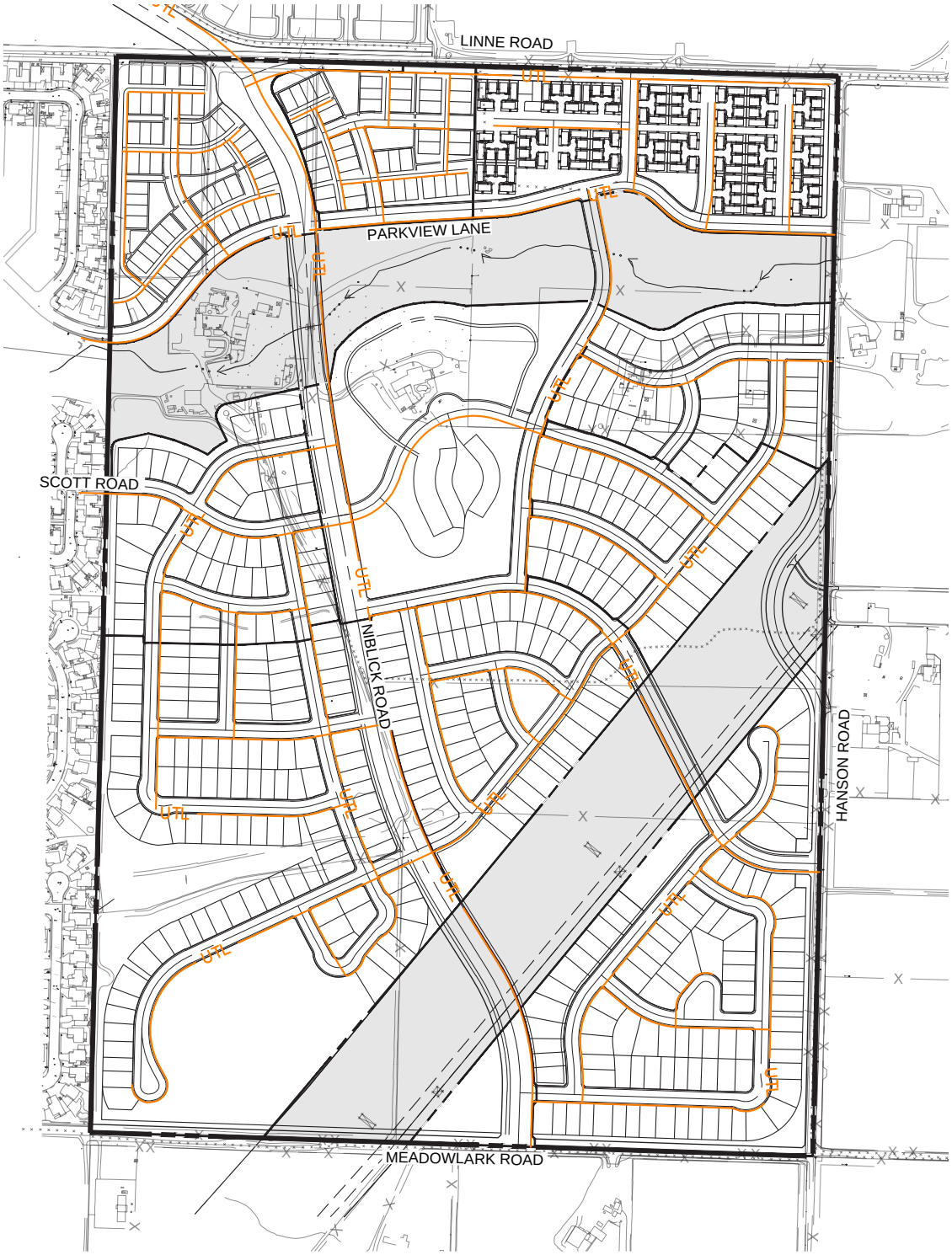
2.5.1 WIRE AND FIBER PLAN - S. CHANDLER PARCEL



PROPOSED GAS, ELECTRIC & TELCOM WIRE AND FIBER UTILITIES

2.5 Utilities Plan

2.5.J WIRE AND FIBER PLAN - OLSEN PARCEL



PROPOSED GAS, ELECTRIC & TELCOM WIRE AND FIBER UTILITIES

2.5.4 DRAINAGE AND STORMWATER MANAGEMENT

The Viñedo Specific Plan lies within three major watersheds that confluence approximately 1.4 miles west of Olsen Ranch, ultimately discharging into the Salinas River. These include the Northern, Central and Southern Watersheds. The Northern Watershed encompasses approximately 537 acres including South Chandler Ranch. The Central Watershed encompasses approximately 863 acres including the northern two thirds of Olsen Ranch. The Southern Watershed encompasses approximately 109 acres and includes the lower third of Olsen Ranch.

The Northern Watershed is divided into the Easterly and Westerly Sub-watersheds. The Easterly Sub-watershed consists of the Gran Cielo Vineyard development, the Our Town development and undeveloped property (including the Centex Parcel) east of Airport Road. It is anticipated that stormwater runoff generated within the eastern portion of the Easterly Sub-watershed will overtop Linne Road and flow into the Central Watershed as it has historically from major storm events, flowing into to Turtle Creek within the northern portion of Olsen Ranch.

Runoff from the westerly portion of the Eastern Sub-watershed upstream of the Our Town development will sheet flow to the development's deteriorating roadway (Aaroe Road) with a curb and gutter section capable of conveying flows northwest to an existing low point. Flows impacting this low point are conveyed across the Centex Parcel in a relatively flat undefined channel to the intersection of Linne Road and Airport Road. A small amount of flow from the Easterly Sub-watershed is conveyed westward within a small ditch along Linne Road. These flows confluence with runoff from the westerly portion of the Easterly Sub-watershed at the intersection of Airport Road and Linne Road. The combined flow then discharges through a culvert and into an existing earthen channel behind the NIBLICK Industrial Park. The earthen channel is approximately 24 feet wide at the top, 5-feet deep and has a 2:1 side slope.

The Westerly Sub-watershed consists of the South Chandler Ranch property. Stormwater runoff from this area sheet flows to roadside ditches along Fontana Road and Linne Road and confluence at the roadway intersection. Stormwater runoff is then conveyed underground to an open channel located approximately 300 feet south of the Linne Road and Fontana Road intersection, where this runoff confluences with flows from the Easterly Sub-watershed.

The Central Watershed encompasses approximately 864 acres including the northern portion of Olsen Ranch. Stormwater runoff from this area is conveyed within Turtle Creek across the Olsen Ranch property. Stormwater runoff continues to flow offsite within Turtle Creek in a defined channel. Runoff from the Central Watershed confluences with runoff from the Northern Watershed within the earth lined channel located west of Turtle Creek Road and Brookhill Drive.

The Southern Watershed consists of 109 acres and encompasses the southern portion of Olsen Ranch. Runoff from this watershed currently flows into a man-made stock pond where flows from small rain events are retained. A storm drain system within Running Stag Way has been extended to the Olsen Ranch boundary to intercept storm flows and convey them to the west.

A fourth watershed exists south of the Olsen parcel that appears to discharge flows within Meadowlark Road at the southwest corner of the Olsen Parcel. The drainage area within Olsen Ranch contributing runoff to this point is approximately 11.4 acres. This small onsite basin contributes flow to the larger 212-acre watershed south of the project site. According to the City, the proposed Beechwood Specific Plan area south of Meadowlark Road will mitigate for this offsite flow and reduce any flooding potential at this location.

Stormwater runoff from the developed condition of both the Chandler and Olsen parcels will be intercepted by onsite storm drain systems and discharged into retention/detention ponds for each proposed development parcel. Flows will be controlled with the use of retention/detention basins. Runoff from storm events greater than the 95th percentile will be detained back to historic levels to help ensure the existing City storm drain infrastructure functions as it does today. The storm drain system is designed to convey the 25-year storm event and detention basins will be sized to detain flows up to the 100-year storm event back to historic peak flow rates for flood control purposes.

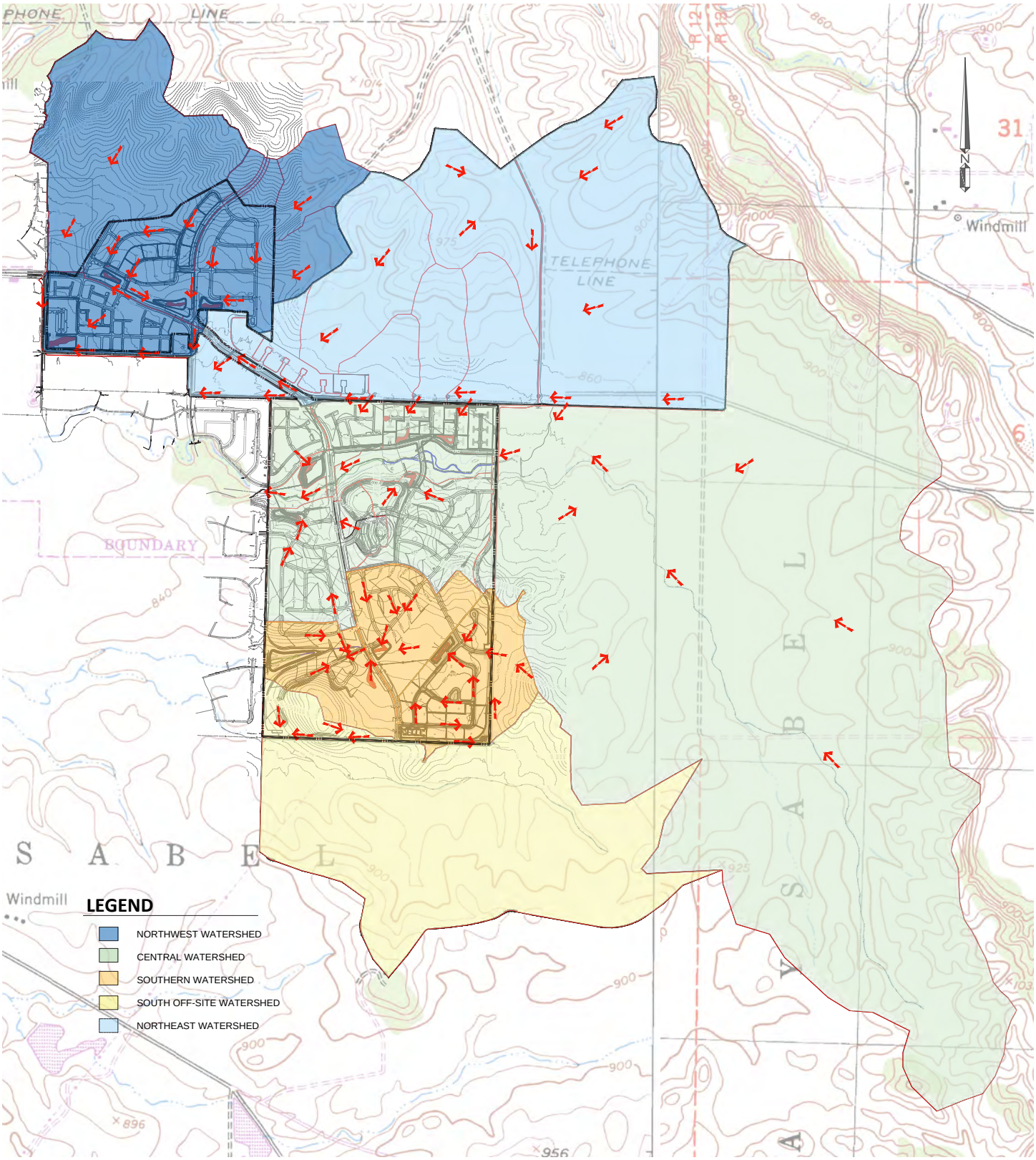
The portion of the natural creek at the western edge of

2.5 Utilities

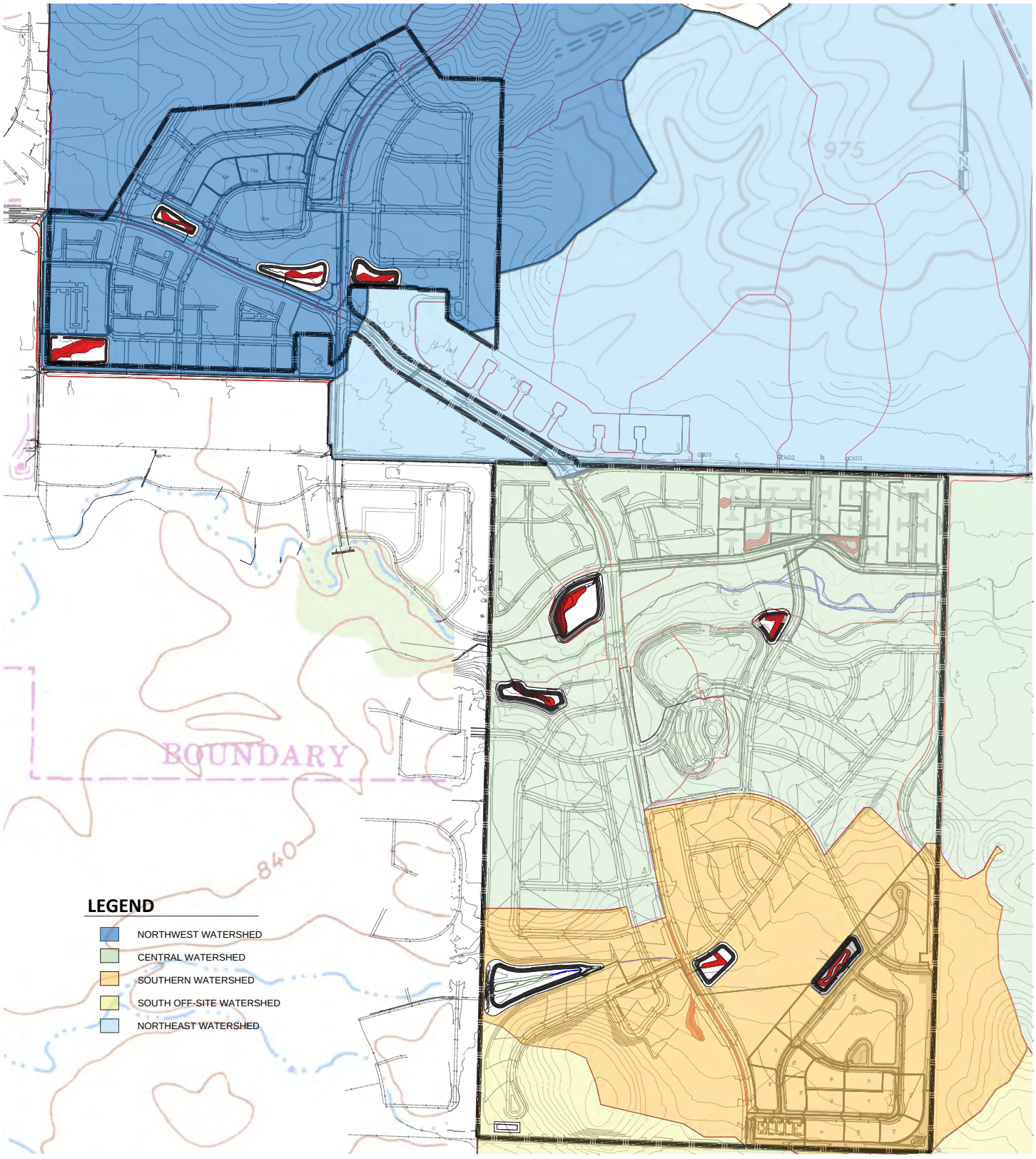
Olsen Ranch lies within a designated Federal Emergency Management Agency (FEMA) Flood Hazard Zone A as shown on the Flood Insurance Rate Map (FIRM) Panel No. 06079C0607G, effective date November 16, 2012. The current land plan proposes lots that will be impacted by this mapped flood zone, therefore modification of the Zone A area will be required. An application for a Letter of Map Revision (LOMR) will be submitted to FEMA to modify the creek's current flood zone for the existing non-developed condition in order to accurately delineate the creek's floodplain. Upon acceptance of this existing conditions LOMR from FEMA, a Conditional Letter of Map Revision (CLOMR) that defines impacts to the creek created by the development's proposed grading adjacent to the creek will be submitted to FEMA for review and acceptance. A final LOMR will then be submitted to FEMA for approval after grading has been completed and certified.

2.5 Utilities Plan

2.5.K REGIONAL WATERSHED PLAN



2.5.L LOCAL WATERSHED PLAN



2.6 Low Impact Development Standards (LID)

Policy 2.6.1 Stormwater quality control will be managed by the City of Paso Robles Stormwater Regulations and in accordance with the requirements outlined within the Central Coast Regional Water Quality Control Board's (RWQCB) Resolution R3-2012-0032 and the City of Paso Robles Engineering Design Standards. Stormwater management will be based on land area of disturbance and amount of impervious area. The Stormwater Quality Design Standards function on a four-tier system that is based on the amount of new and upgraded impervious area. The four tiers of stormwater management are as follows:

Tier 1: Low Impact Development (LID)

Tier 2: Water Quality

Tier 3: Stormwater Retention of the 95th Percentile Storm Event

Tier 4: Peak Flow Management

The LID Standards address the following objectives and goals:

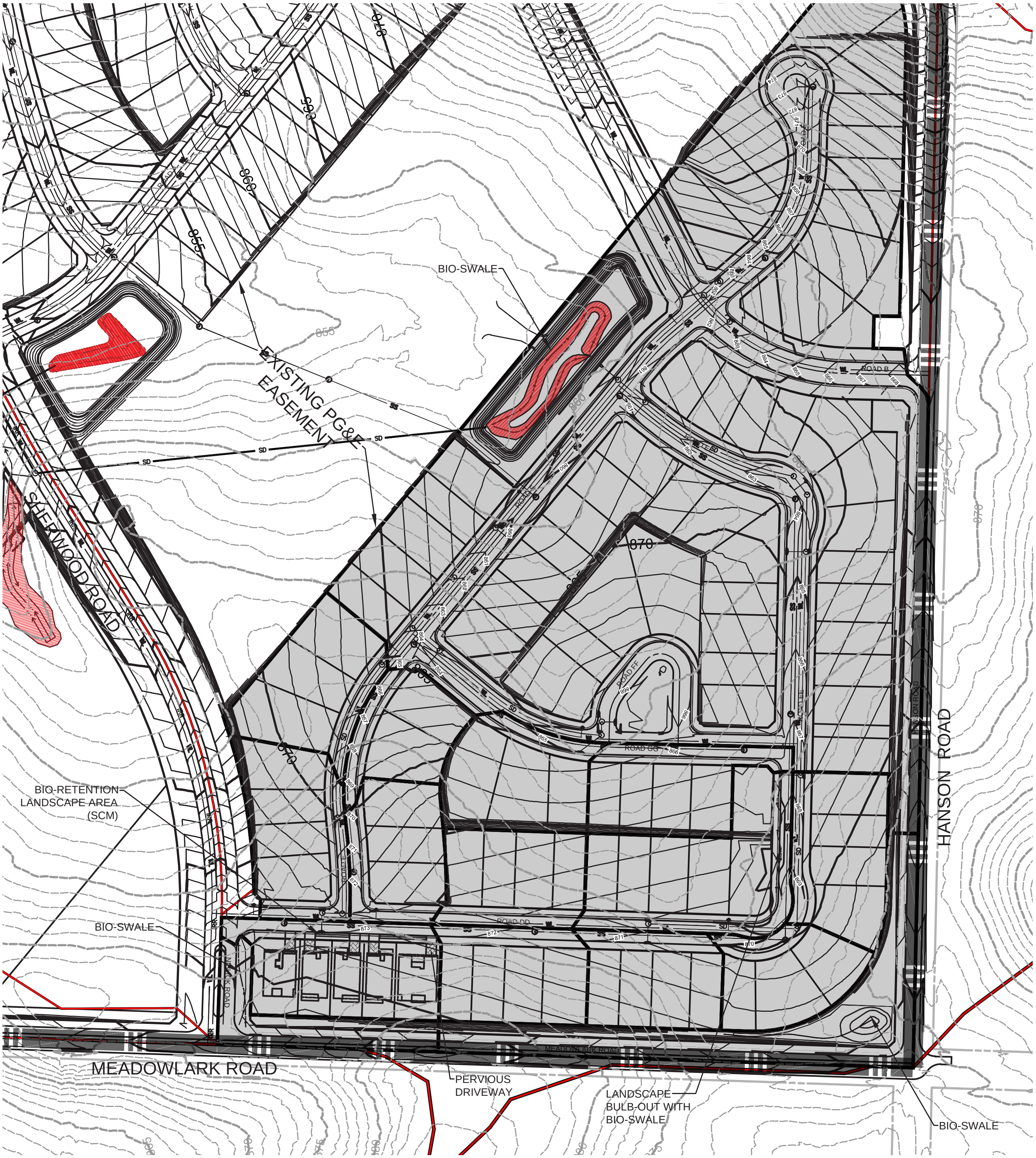
- Decrease the adverse impacts of stormwater runoff from development and urban runoff on natural drainage systems, receiving waters, and other water bodies;
- Minimize pollutant loadings from impervious surfaces by requiring development projects to incorporate properly-designed, technically-appropriate best management practices and other LID strategies
- Minimize erosion and other hydrologic impacts on natural drainage systems by requiring development projects to incorporate properly-designed, technically appropriate hydromodification control development principles and technologies.

The goal of the RWQCB is to treat stormwater at its source in the hope to infiltrate the 95th percentile rainfall event. Bio-retention swales and pervious pavers are proposed throughout the residential developments to help capture and treat the 95th percentile event. There are also design considerations, details and specifications as well as operation and maintenance requirements for items such as permeable pavement, vegetative biofiltration, and retention basins.

Peak flow management must be adhered to in order to ensure that downstream properties are free from inundation during major storm events. The 2-year and the 10-year storm events are required to be detained back to historic levels. In addition to the RWQCB post construction requirements for stormwater management, the detention basins will be sized to detain up to the 100-year storm event back to historic levels for flood control.

2.6 Low Impact Development Standards (LID)

2.6.A SAMPLE LID FEATURES



2.7 Public Services

The closest police station to serve the site is located at 900 Park Street in downtown Paso Robles. The nearest fire station to serve the Specific Plan area is Fire Station No. 2 near the intersection of Santa Fe and Creston Roads.

2.8 Schools

Future residents of the Viñedo development would be served by the Paso Robles Joint Unified School District.

Elementary school students would attend the new Elementary School proposed at the Centex site in the Specific Plan. If the new school is not constructed before Viñedo residents start to move in, students would attend the Winifred Pifer or Virginia Peterson Elementary Schools, both of which are within 3 miles of the community.

If the School District does not acquire the Centex site, the City should consider facilitating a property transfer between landowners elsewhere in the City.

Middle school students would attend Daniel E. Lewis Middle School, approximately 2.5 miles northwest of the Specific Plan area. High school students would attend Paso Robles High School located approximately 2 miles west northwest of the Specific Plan area.

Reso A - Exhibit C2 (EIR Technical Appendix)

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CHAPTER 3

DEVELOPMENT STANDARDS

3.0 Community-Wide Development Standards

3.0.A MAXIMUM DEVELOPMENT

Policy 3.0.1 The Maximum development shall not exceed the total unit count and square footage shown on Table 2.0: Land Use Summary.

Policy 3.0.2 Each Planning Area contains a projected number of dwelling units based on preliminary planning studies.

Policy 3.0.3 During the site plan and vesting tentative tract map stage of the development process, the final number of dwelling units for each planning area may differ from those identified in the Specific Plan, so long as the density falls within the range specified by the land use designation. In no event shall the total number of residential dwelling units in the Viñedo Specific Plan exceed 1,233.

3.0.B MAINTENANCE

Policy 3.0.4 Common areas identified in the Specific Plan shall be owned and maintained as follows.

A Home Owners Association (HOA) shall be established for the Specific Plan area, to assume ownership and maintenance responsibility for all private common recreation, open space, circulation systems and landscaped areas including drainage facilities, fencing, walls, tract signage and trails as outlined in Map 2.1.G: Open Space Maintenance Map. All public parks and streets shall be maintained by the City as outlined in Map 2.1.G: Open Space Maintenance Map.

Unless otherwise provided for in these standards, common areas shall be conveyed to the HOA as implementing development is approved or any subdivision is recorded. The maintenance organization shall be determined prior to or concurrent with recordation of any final subdivision map.

3.0.C GRADING

Policy 3.0.5 All grading activities shall conform to City of Paso Robles standards and shall be in substantial conformance with the Figures in section 2.3 Grading Plans and shall implement any grading-related mitigation measures specified in the final EIR.

3.0.D TREE PRESERVATION

Policy 3.0.6 Efforts shall be made to preserve healthy, existing vegetation on site where possible. All tree removal and relocation activities shall conform to City of Paso Robles standards. Tree protection and mitigation measures shall be using during grading and construction.

3.0.E LIGHTING

Policy 3.0.7 All lighting shall comply with the following regulations and provisions:

- The HOA shall define and adopt Dark Sky lighting standards to minimize light pollution and maintain the rural character of the area;
- Visible lighting fixtures shall be consistent with the architectural style they are affixed or adjacent to ; and
- All lighting within public right of ways and dedicated public easements shall be designed to City standards.

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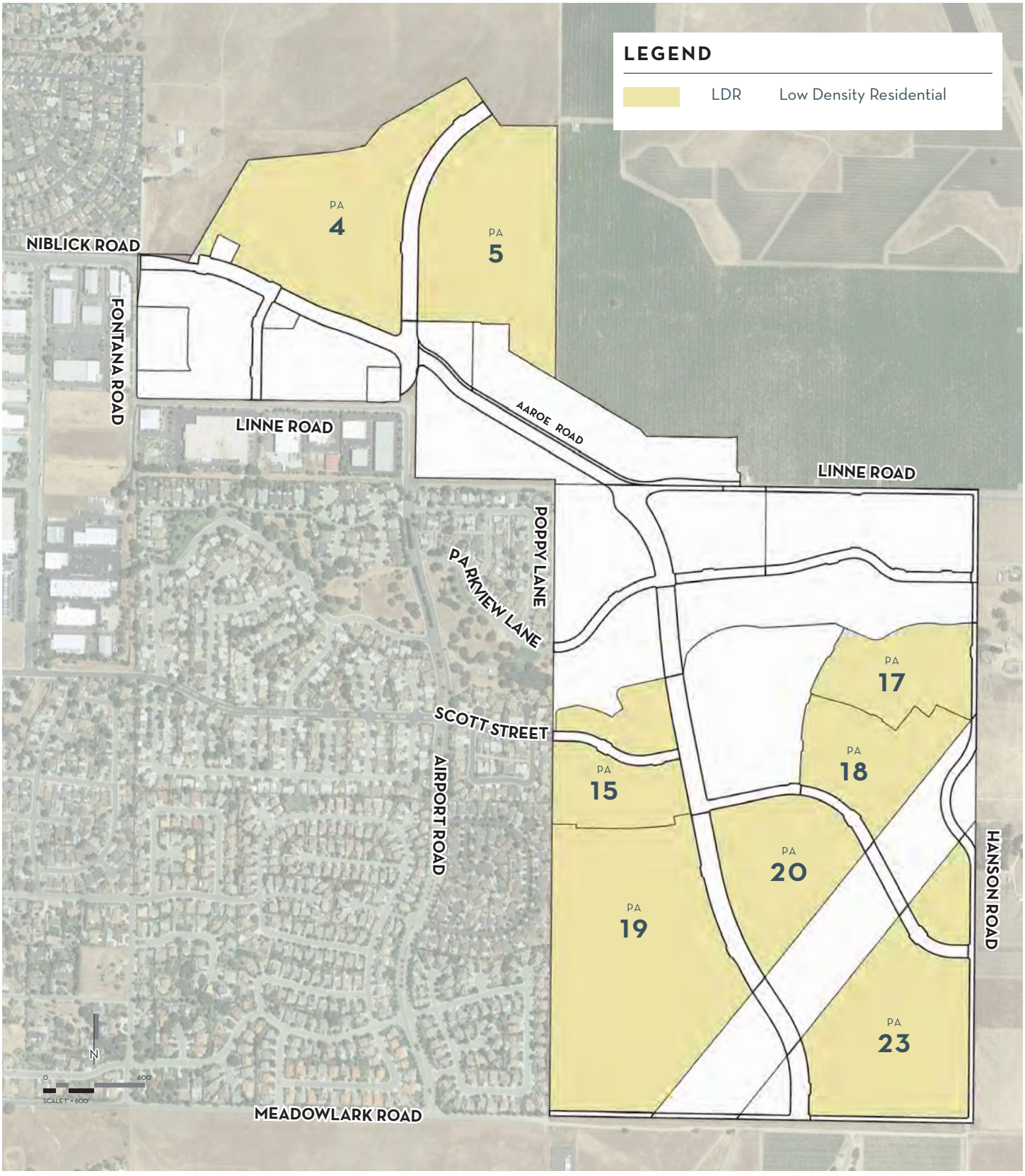
Reso A - Exhibit C2 (EIR Technical Appendix)

3.1 | Low Density Residential (LDR)



3.1 Low Density Residential (LDR)

3.1.A PERMITTED & ACCESSORY USES LDR

Allowable uses within the Low Density Residential (LDR) zone are limited to those of the R1 - Residential Single Family uses listed in Table 21.16.200 of the City's Zoning Code and are subject to the standards set forth in the Design Guidelines listed in Chapter 4.

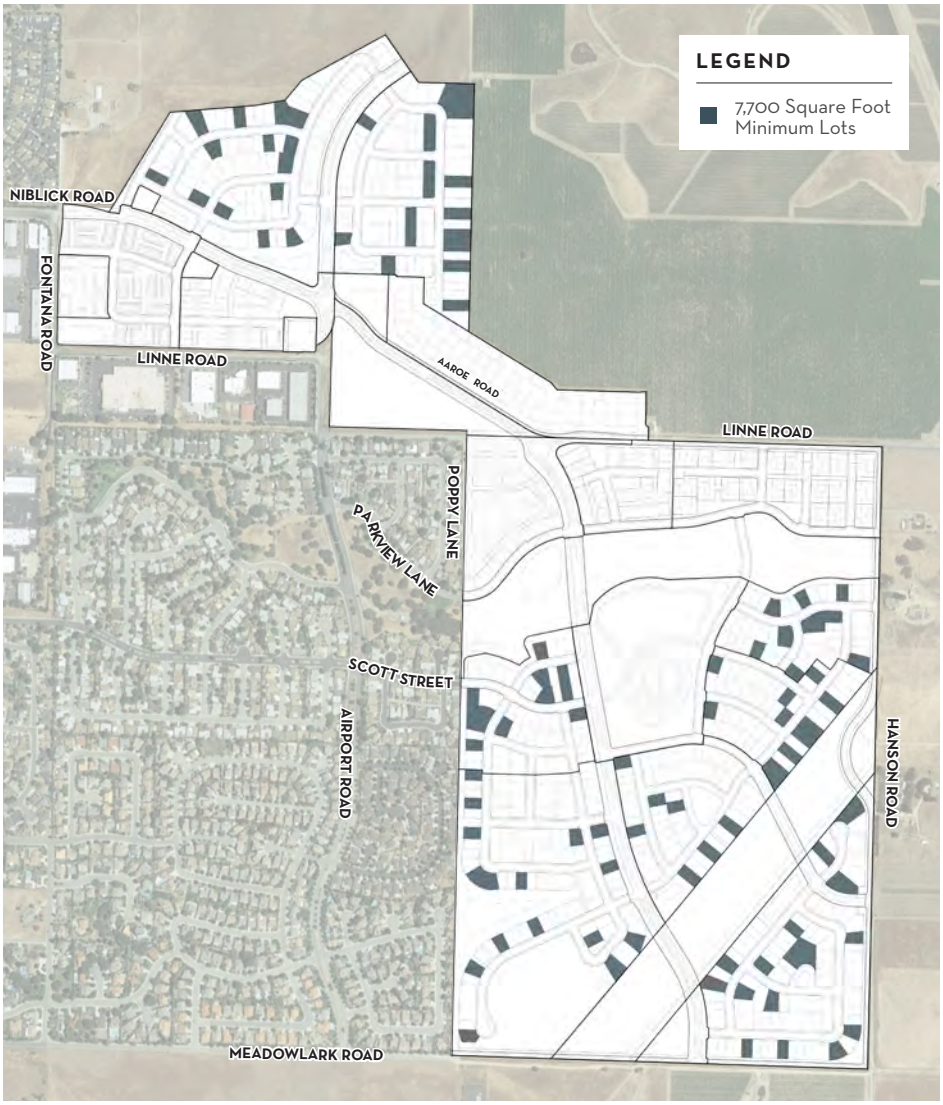
TABLE 3.1: RESIDENTIAL PERMITTED USES

Use	Notes
P = Permitted Uses; C = Conditional Uses; N = Non-Permitted Use	
Principal Permitted Uses	
Single-Family Dwellings,	P
Accessory Permitted Uses	
Accessory Dwelling Units (ADUs),	P
Temporary real estate sales offices,	P
Utility facilities,	C
Swimming pools and spas,	C
Neighborhood Parks/Open Space,	P
Landscaped common areas, and	P
Water Quality/Basins	P
Other Accessory Uses as determined by the Director to be substantially compatible with a principle permitted residential use.	TBD

LAND USE SUMMARY (SIMPLIFIED)

	Land Use	Gross Area (acres)	Density Range (du/ gross ac)	Maximum Non-Residential (sf)	Maximum Dwelling Units
	LDR - Low Density Residential	173.2	3 - 5	-	586

3.1 Low Density Residential (LDR)



70'X110' STREETSCENE (TYP.)

3.1 Low Density Residential (LDR)

3.1.B.1 DEVELOPMENT STANDARDS: 7,700 SQUARE FOOT MINIMUM LOTS

DEVELOPMENT STANDARDS

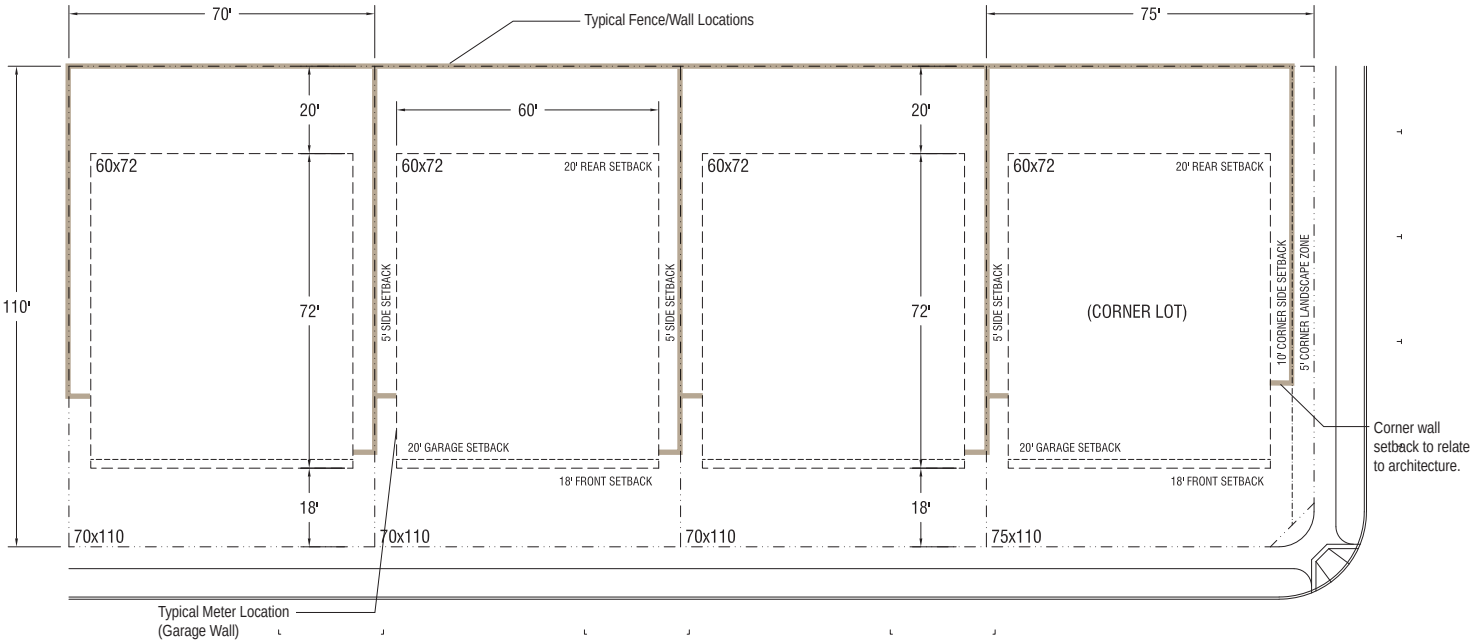
	7,700 S.F. LOTS
Typical Lot Width	70' min. and above
Minimum Lot Size	7,700 s.f.
Minimum Street Frontage width @ cul-de-sac/knuckles	40'
Maximum Lot Coverage (roof wall)	55% one-story 45% two-story
Maximum Building Height	35'
Maximum Stories	2
Minimum Front Yard Setbacks	
Living Area	18'
Porch/Patio	10'
Garage (front facing)	20'
Garage (side facing)	12'
Accessory Dwelling Unit (ADU)/ Casita	12'
Architectural Encroachments*	2' max. into setback

*Architectural Encroachments are allowed to encourage articulation and shall not exceed 30 sf in plan on any elevation.

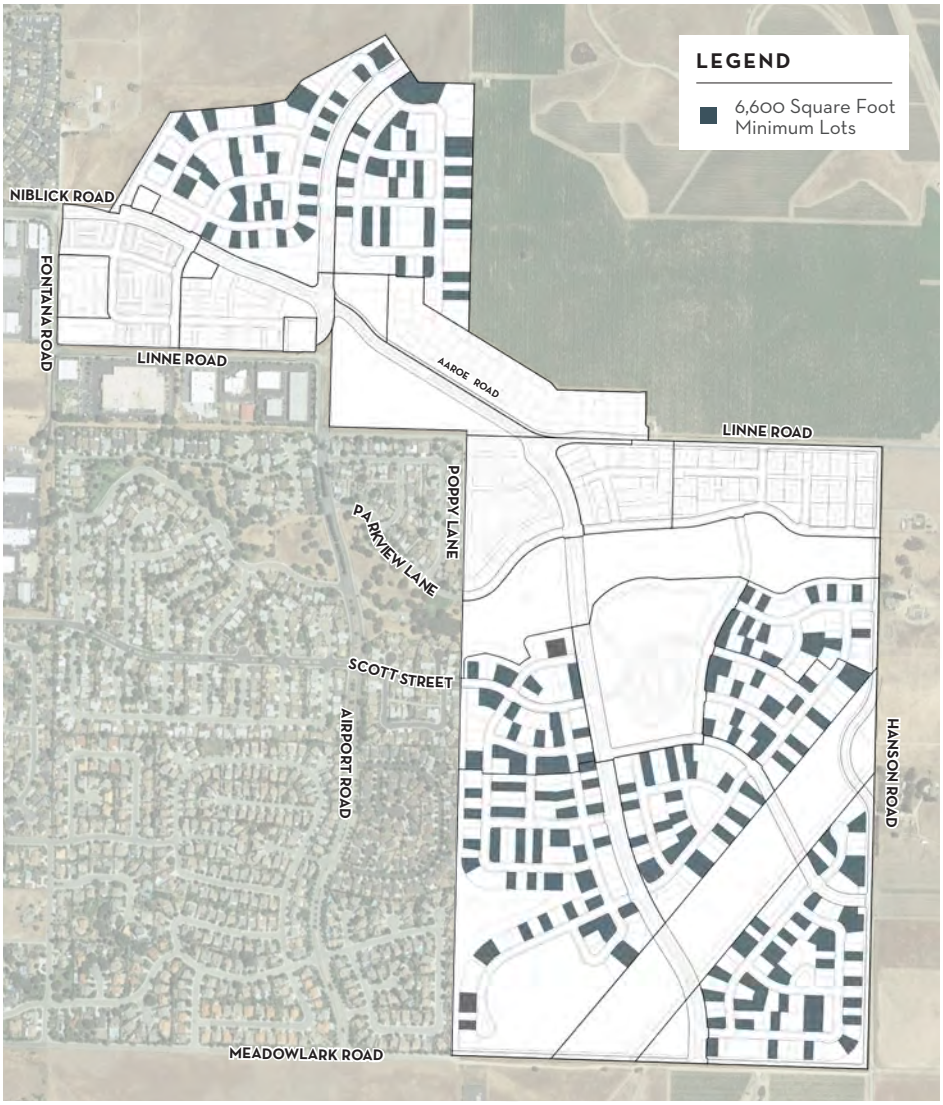
**Utility meters are prohibited on corner lot side street elevations.

	7,700 S.F. LOTS
Minimum Side Yard Setbacks	
Interior Lot	5'
Corner Lot	10'
Architectural Encroachments*	2' max. into setback
Minimum Rear Yard Setbacks	
Living Area	20'
California Room (Covered Patio)	15'
Architectural Encroachments*	2' max. into setback
Parking	
Required Covered Parking	2 spaces
Fencing (*see Typical Planting Plans in Design Submittal Package that depict typical wall/fence and gate locations.)	
Front Yard Fencing/Walls	42" maximum height (min. 2' from back of sidewalk for landscaping)
Interior Side Yard Fencing/Walls	6' maximum height (must be set back min. 2' from front facade)
Corner Side Yard Fencing/Walls	6' maximum height (min. 5' from back of sidewalk for landscaping)
Rear Privacy Fence/Walls	6' maximum height

70'X110' TYPICAL LOTTING DIAGRAM



3.1 Low Density Residential (LDR)



60'X110' STREETSCENE (TYP.)

3.1.B.II DEVELOPMENT STANDARDS: 6,600 SQUARE FOOT MINIMUM LOTS

DEVELOPMENT STANDARDS

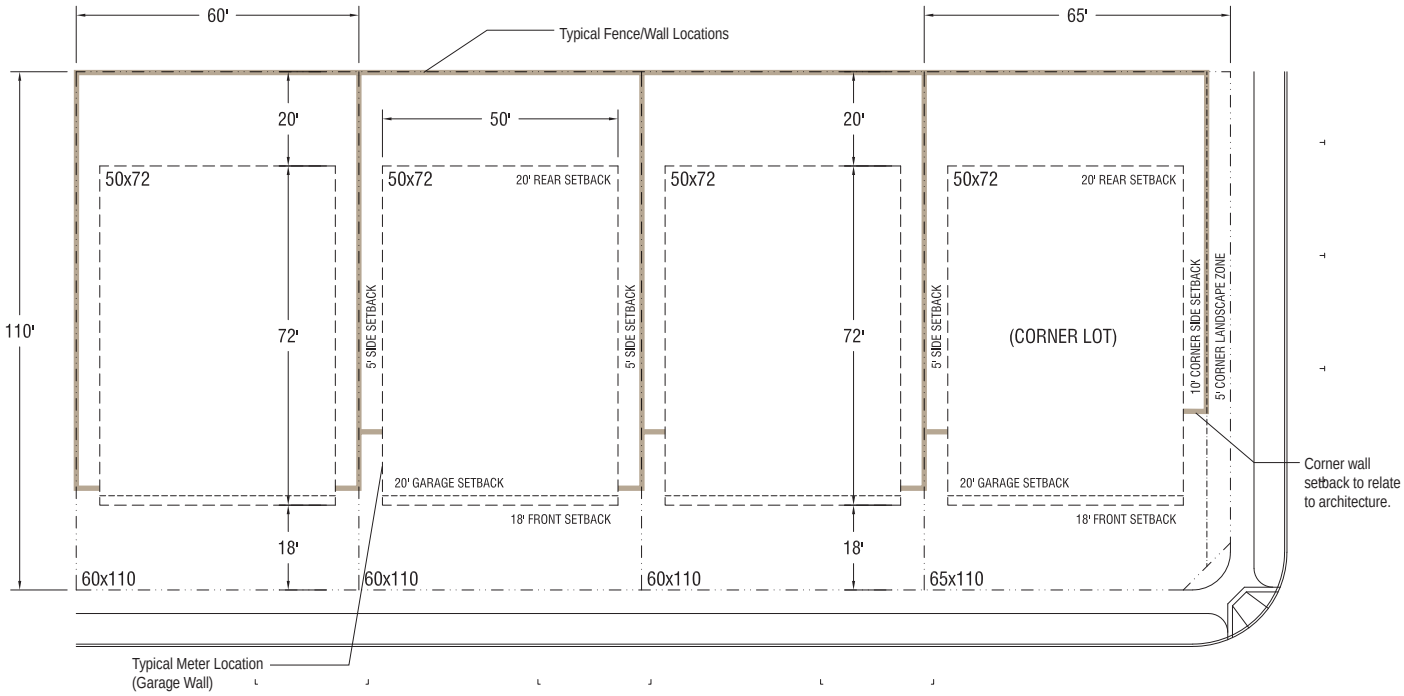
	6,600 S.F. LOTS
Typical Lot Width	60' min. and above
Minimum Lot Size	6,600 s.f.
Minimum Street Frontage width @ cul-de-sac/knuckles	35'
Maximum Lot Coverage (roof wall)	55% one-story 45% two-story
Maximum Building Height	35'
Maximum Stories	2
Minimum Front Yard Setbacks	
Living Area	18'
Porch/Patio	10'
Garage (front facing)	20'
Garage (side facing)	12'
Accessory Dwelling Unit (ADU)/ Casita	12'
Architectural Encroachments*	2' max. into setback

*Architectural Encroachments are allowed to encourage articulation and shall not exceed 30 sf in plan on any elevation.

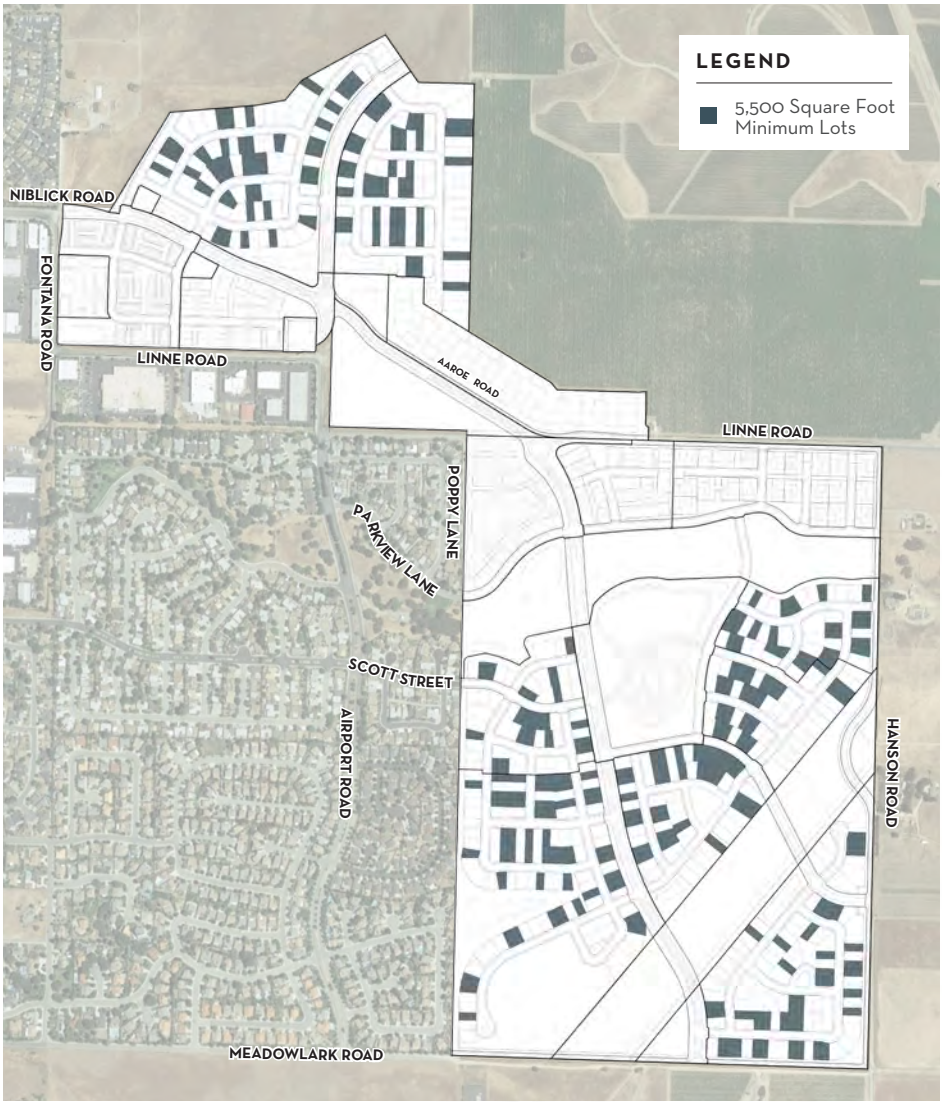
**Utility meters are prohibited on corner lot side street elevations.

	6,600 S.F. LOTS
Minimum Side Yard Setbacks	
Interior Lot	5'
Corner Lot	10'
Architectural Encroachments*	2' max. into setback
Minimum Rear Yard Setbacks	
Living Area	20'
California Room (Covered Patio)	15'
Architectural Encroachments*	2' max. into setback
Parking	
Required Covered Parking	2 spaces
Fencing (*see Typical Planting Plans in Design Submittal Package that depict typical wall/fence and gate locations.)	
Front Yard Fencing/Walls	42" maximum height (min. 2' from back of sidewalk for landscaping)
Interior Side Yard Fencing/Walls	6' maximum height (must be set back min. 2' from front facade)
Corner Side Yard Fencing/Walls	6' maximum height (min. 5' from back of sidewalk for landscaping)
Rear Privacy Fence/Walls	6' maximum height

60'X110' TYPICAL LOTTING DIAGRAM



3.1 Low Density Residential (LDR)



50'X110' STREETSCENE (TYP.)

3.1.B.III DEVELOPMENT STANDARDS: 5,500 SQUARE FOOT MINIMUM LOTS

DEVELOPMENT STANDARDS

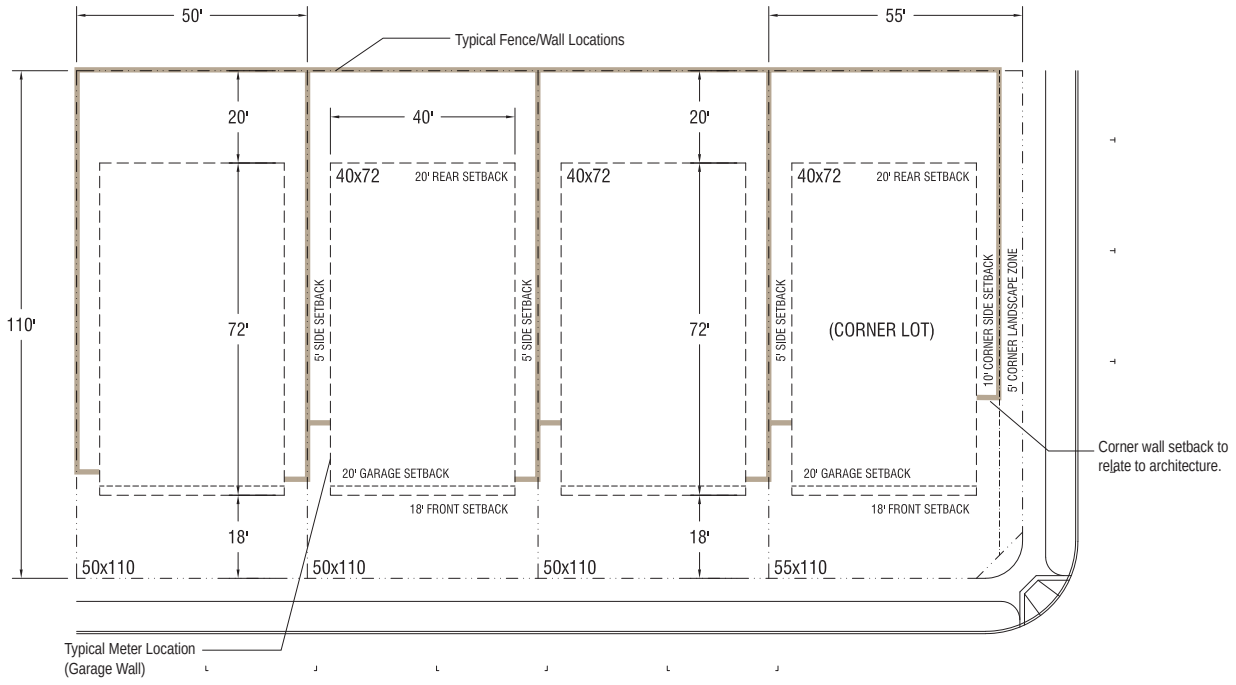
	5,500 S.F. LOTS
Typical Lot Width	50' min. and above
Minimum Lot Size	5,500 s.f.
Minimum Street Frontage width @ cul-de-sac/knuckles	30'
Maximum Lot Coverage (roof wall)	55% one-story 45% two-story
Maximum Building Height	35'
Maximum Stories	2
Minimum Front Yard Setbacks	
Living Area	18'
Porch/Patio	10'
Garage (front facing)	20'
Garage (side facing)	12'
Accessory Dwelling Unit (ADU)/ Casita	12'
Architectural Encroachments*	2' max. into setback

*Architectural Encroachments are allowed to encourage articulation and shall not exceed 30 sf in plan on any elevation.

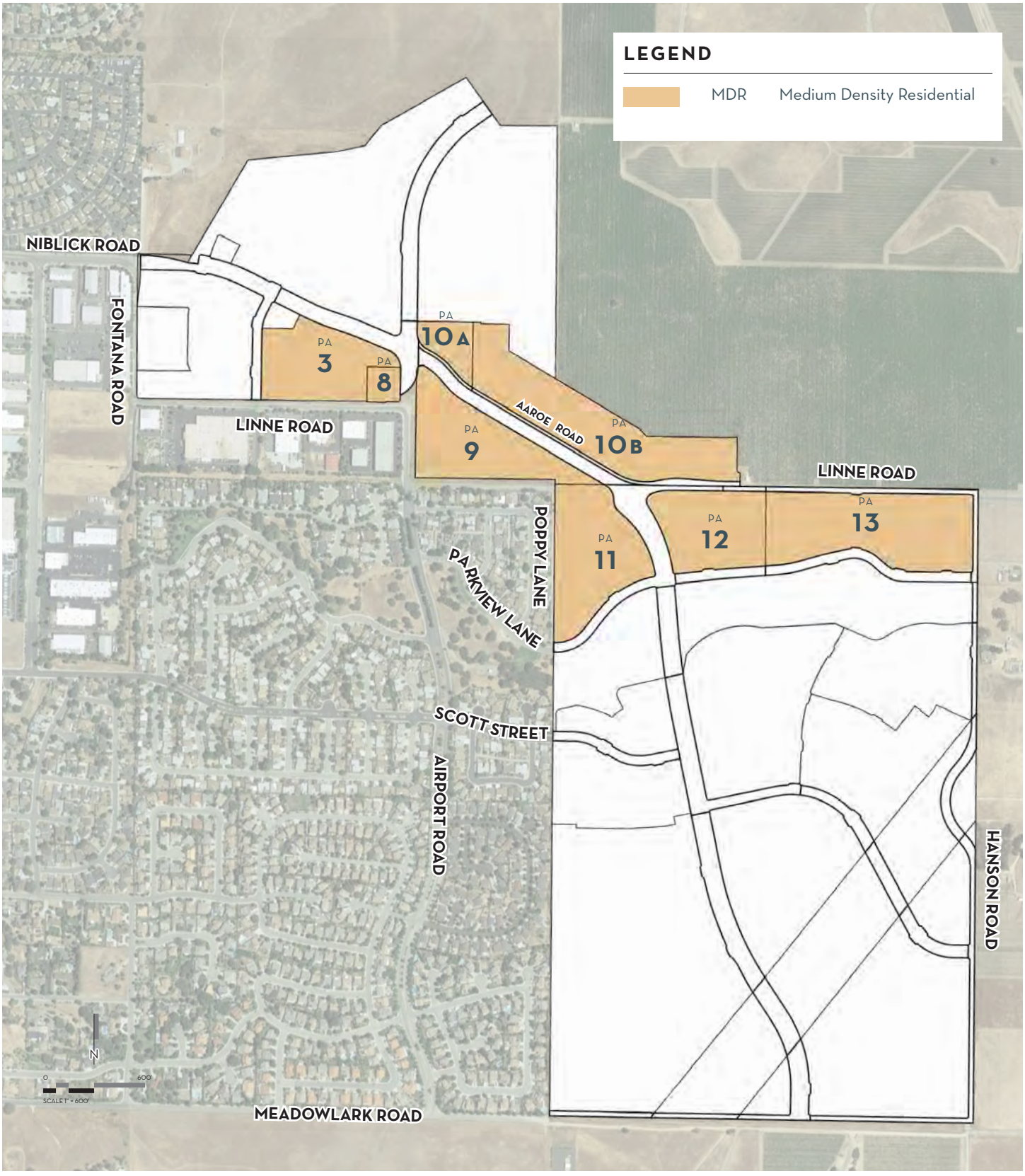
**Utility meters are prohibited on corner lot side street elevations.

	5,500 S.F. LOTS
Minimum Side Yard Setbacks	
Interior Lot	5'
Corner Lot	10'
Architectural Encroachments*	2' max. into setback
Minimum Rear Yard Setbacks	
Living Area	20'
California Room (Covered Patio)	15'
Architectural Encroachments*	2' max. into setback
Parking	
Required Covered Parking	2 spaces
Fencing (*see Typical Planting Plans in Design Submittal Package that depict typical wall/fence and gate locations.)	
Front Yard Fencing/Walls	42" maximum height (min. 2' from back of sidewalk for landscaping)
Interior Side Yard Fencing/Walls	6' maximum height (must be set back min. 2' from front facade)
Corner Side Yard Fencing/Walls	6' maximum height (min. 5' from back of sidewalk for landscaping)
Rear Privacy Fence/Walls	6' maximum height

50'X110' TYPICAL LOTTING DIAGRAM



3.2 Medium Density Residential (MDR)



3.2 Medium Density Residential (MDR)

3.2.A PERMITTED & ACCESSORY USES MDR

Allowable uses within the Medium Density Residential (MDR) zone are limited to those of the R2 - Residential Duplex/Triplex uses listed in Table 21.16.200 of the City's Zoning Code and are subject to the standards set forth in the Design Guidelines listed in Chapter 4.

TABLE 3.1: RESIDENTIAL PERMITTED USES

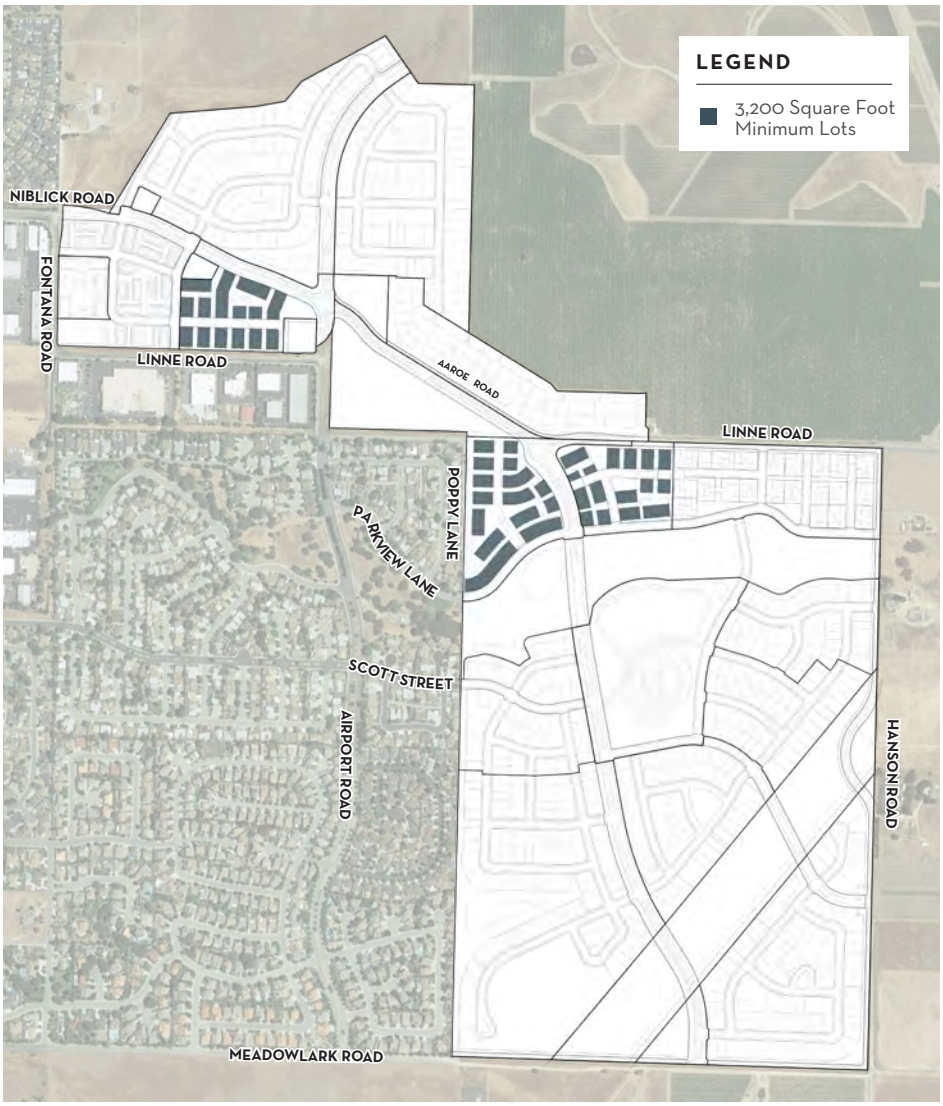
Use	Notes
P = Permitted Uses; C = Conditional Uses; N = Non-Permitted Use	
Principal Permitted Uses	
Single-Family Dwellings,	P
Multi-Family Dwellings	P
Accessory Permitted Uses	
Accessory Dwelling Units (ADUs),	P
Temporary real estate sales offices,	P
Utility facilities,	C
Swimming pools and spas,	C
Neighborhood Parks/Open Space,	P
Landscaped common areas, and	P
Water Quality/Basins	P
Other Accessory Uses as determined by the Director to be substantially compatible with a principle permitted residential use.	TBD

LAND USE SUMMARY (SIMPLIFIED)

	Land Use	Gross Area (acres)	Density Range (du/ gross ac)	Maximum Non-Residential (sf)	Maximum Dwelling Units
	MDR - Medium Density Residential	63.1	4 - 10	9,800*	479

*PA-8 Neighborhood Commercial Overlay District. Maximum Non-Residential Uses not to exceed 9,800 SF at 0.25 FAR. See the Commercial Agrarian Design Guidelines for additional standards.

3.2 | Medium Density Residential (MDR)



40'X80' SFD GREENCOURT STREETSCENE (TYP.)

3.2 Medium Density Residential (MDR)

3.2.B.I DEVELOPMENT STANDARDS: 3,200 SQUARE FOOT MINIMUM LOTS

DEVELOPMENT STANDARDS

	3,200 S.F. LOTS
Typical Lot Width	40' min.
Minimum Lot Size	3,200 s.f.
Maximum Lot Coverage (roof wall)	60%
Maximum Building Height	40'
Maximum Stories	2 + 500 sf max. 3rd story pop-up
Roof Decks	Permitted
Minimum Front Yard Setbacks	
Living Area	10'
Porch/Deck	3'
Architectural Encroachments*	2' max. into setback
Minimum Side Yard Setbacks	
Interior Lot	5'
Corner Lot	10'
Architectural Encroachments*	2' max. into setback

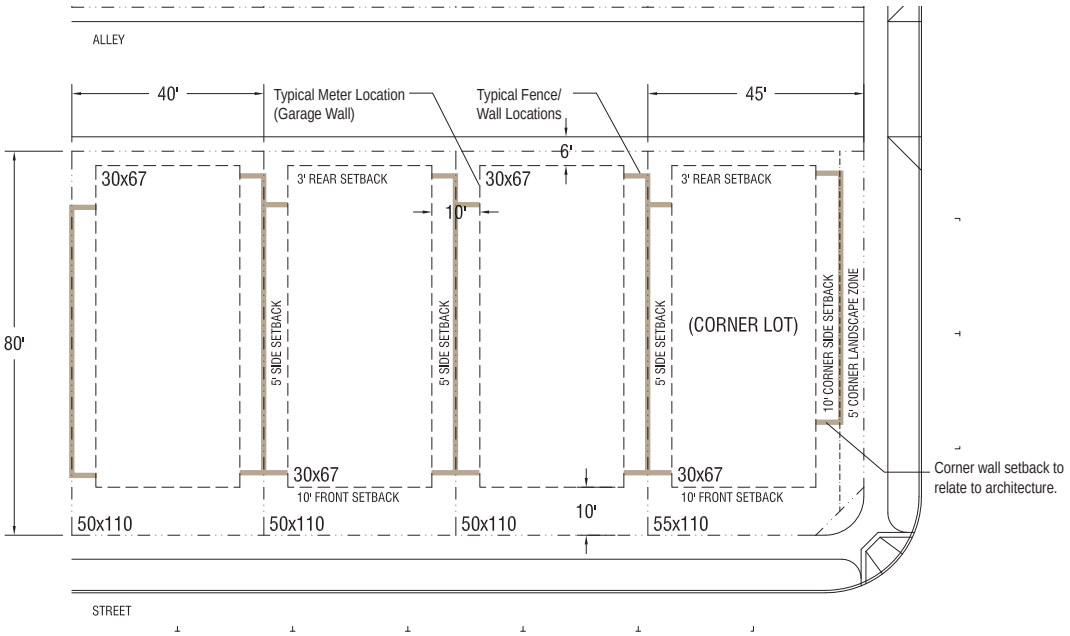
	3,200 S.F. LOTS
Minimum Rear Setbacks	
Garage (driveway apron from alley)	3' min. and 7' max.
Architectural Encroachments*	2' max. (eave only)
Parking	
Required Covered Parking	2 spaces
Guest Parking**	0.25 spaces
Fencing (*see Typical Planting Plans in Design Submittal Package that depict typical wall/fence and gate locations.)	
Front Yard Fencing/Walls	42" maximum height (min. 2' from back of sidewalk for landscaping)
Interior Side Yard Fencing/Walls	6' maximum height (must be set back 2' from front facade)
Corner Side Yard Fencing/Walls	6' maximum height (min. 5' from back of sidewalk for landscaping)
Rear/Alley Privacy Fence/Walls	6' maximum height (must be set back 2' from garage facade)

*Architectural Encroachments are allowed to encourage articulation and shall not exceed 30 sf in plan on any elevation.

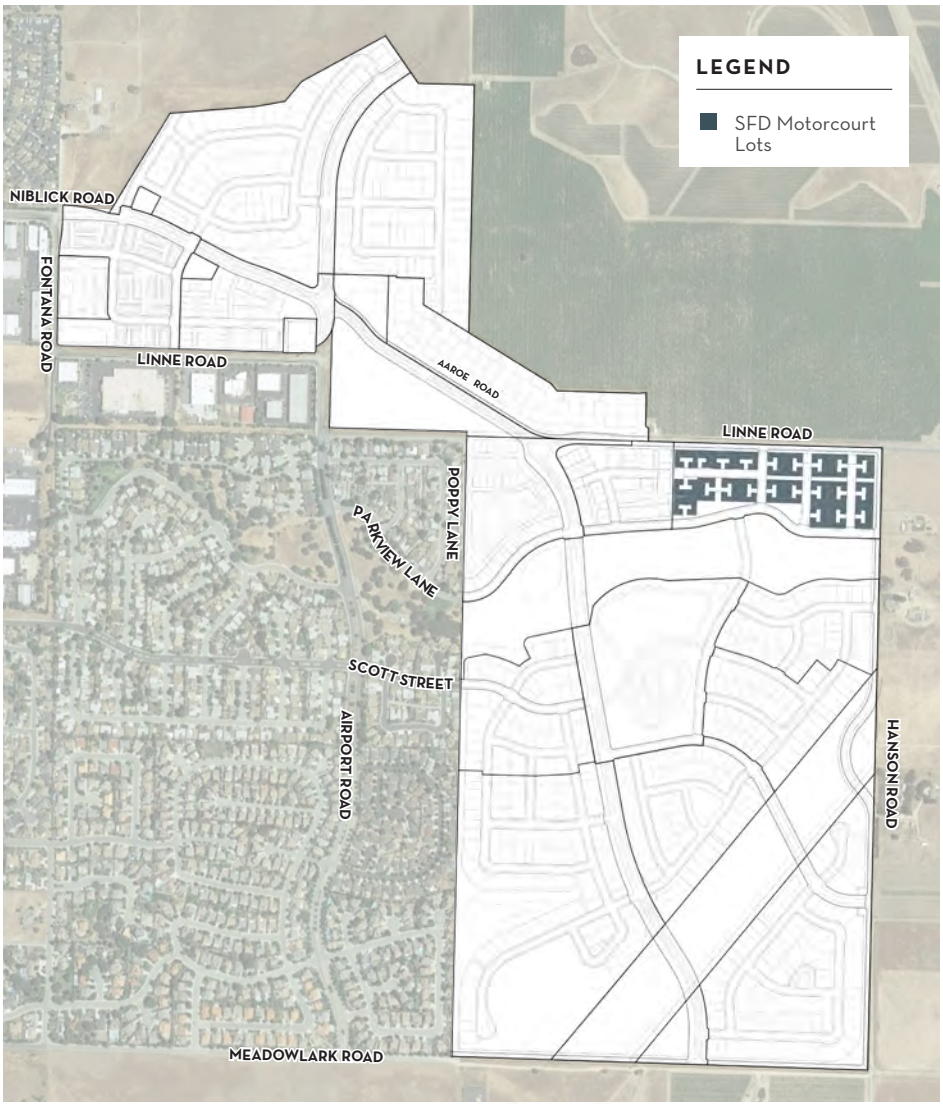
**On-Street parking within 200' can be counted towards guest parking requirements.

***Utility meters are prohibited on corner lot side street elevations.

40'X80' SFD GREENCOURT TYPICAL LOTTING DIAGRAM



3.2 Medium Density Residential (MDR)



SFD MOTORCOURT STREETSCENE (TYP.)

3.2.B.II DEVELOPMENT STANDARDS: SFD MOTORCOURT LOTS

DEVELOPMENT STANDARDS

	SFD MOTORCOURT LOTS
Minimum Lot Size	2,000 s.f.
Maximum Lot Coverage (roof wall)	60%
Maximum Building Height	35'
Maximum Stories	2
Minimum Front Yard Setbacks	
Living Area	8'
Porch/Patio	3'
Architectural Encroachments*	2' max. into setback
Minimum Side Yard Setbacks	
Interior Lot	5'
Corner Lot	8' to Front Facade 13' to Rear Facade
Architectural Encroachments*	2' max. into setback

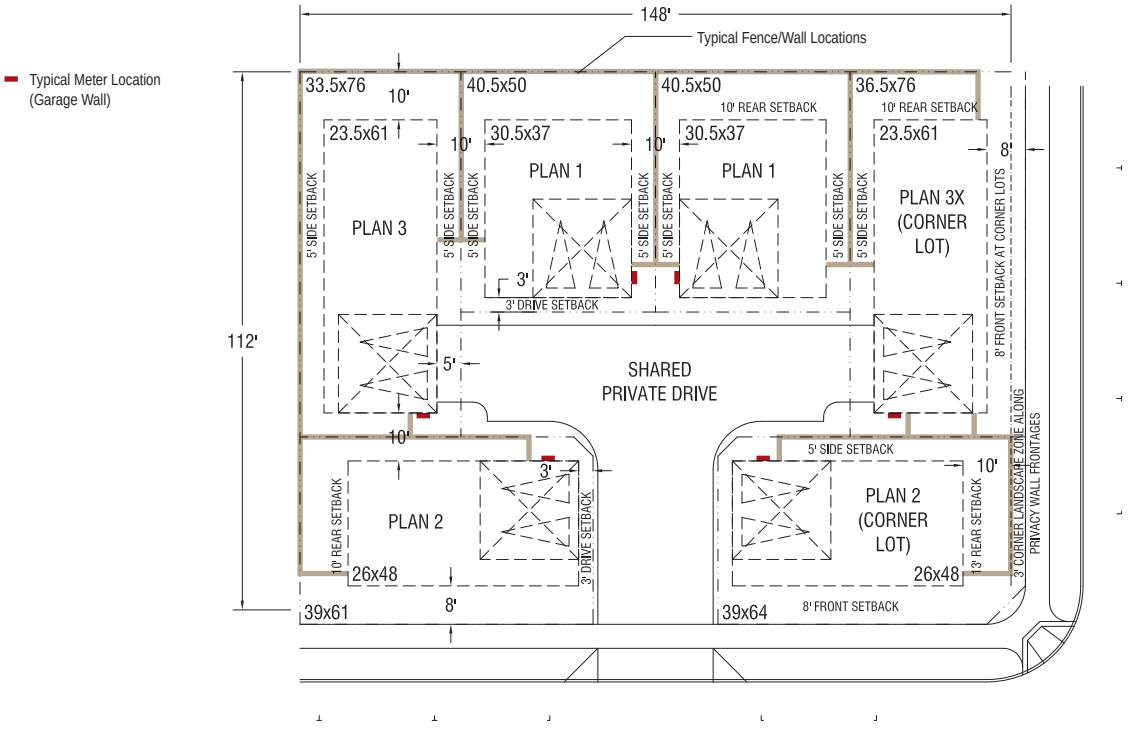
	SFD MOTORCOURT LOTS
Minimum Rear Setbacks	
Living Area	10'
Architectural Encroachments*	2' max. into setback
Parking	
Required Covered Parking	2 spaces
Guest/Driveway Parking**	0.25 spaces
Fencing (*see Typical Planting Plans in Design Submittal Package that depict typical wall/fence and gate locations.)	
Front Yard Fencing/Walls	42" maximum height (min. 2' from back of sidewalk for landscaping)
Interior Side Yard Fencing/Walls	6' maximum height (must be set back 2' from front facade)
Corner Side Yard Fencing/Walls	6' maximum height (min. 3' from back of sidewalk for landscaping)
Rear Privacy Fence/Walls	6' maximum height

*Architectural Encroachments are allowed to encourage articulation and shall not exceed 30 sf in plan on any elevation.

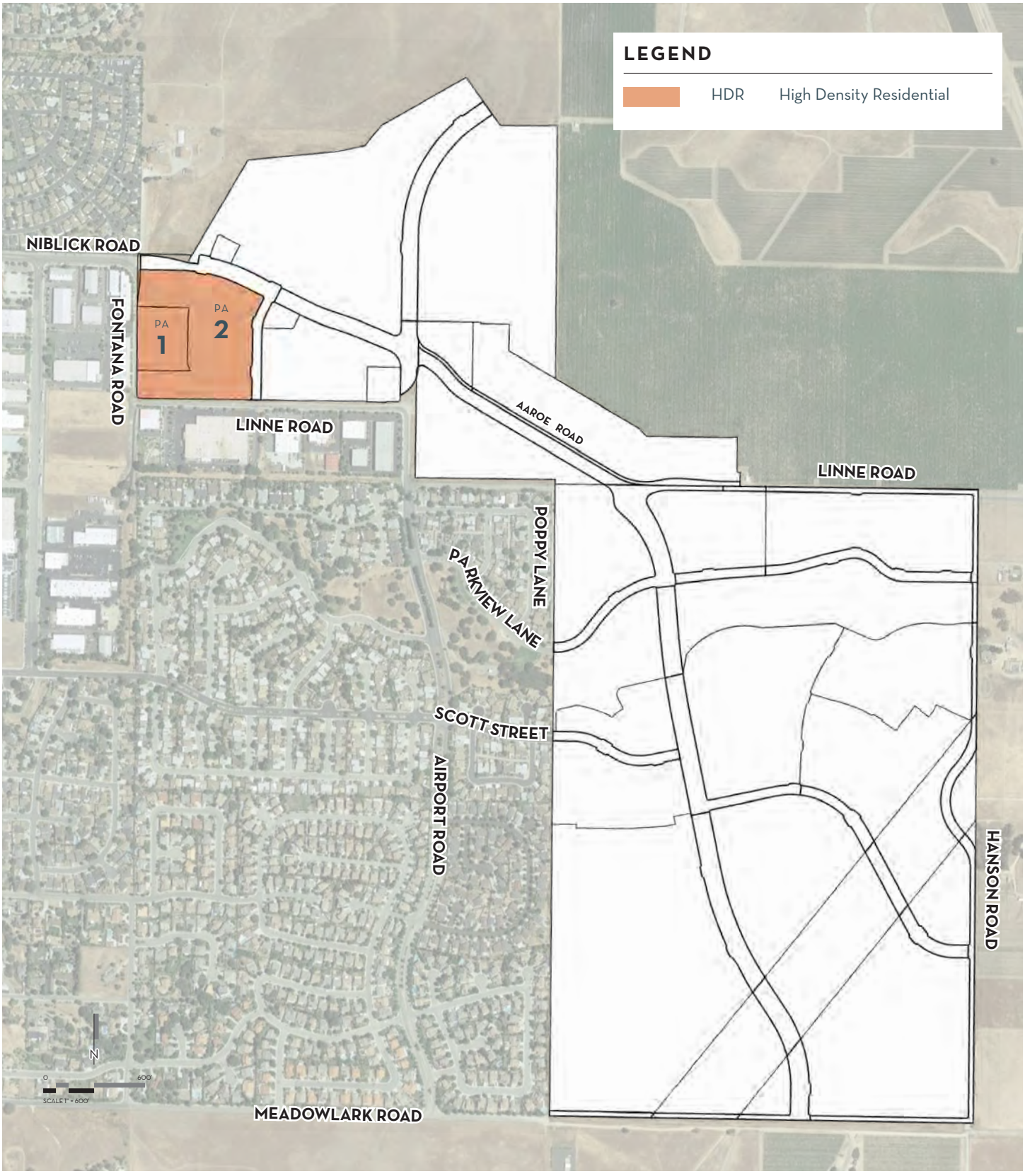
**On-Street parking within 200' can be counted towards guest parking requirements. (1) Driveway space per Plan 3 may be counted towards guest parking requirements.

***Utility meters are prohibited on street frontage elevations.

SFD MOTORCOURT TYPICAL LOTTING DIAGRAM



3.3 High Density Residential (HDR)



3.3 High Density Residential (HDR)

3.3.A PERMITTED & ACCESSORY USES HDR

Allowable uses within the High Density Residential (HDR) zone are limited to those of the R3 and R5 - Residential Apartment uses listed in Table 21.16.200 of the City's Zoning Code and are subject to the standards set forth in the Design Guidelines listed in Chapter 4.

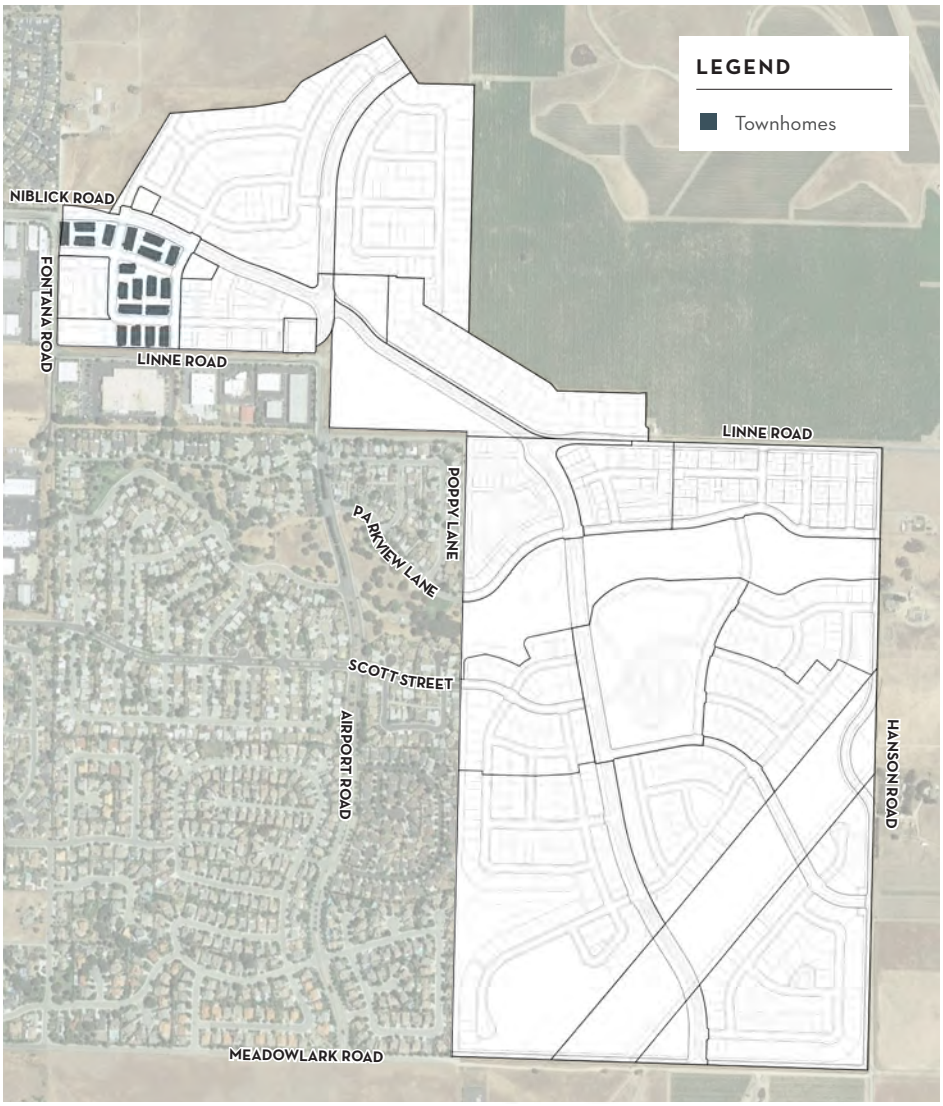
TABLE 3.3: RESIDENTIAL PERMITTED USES

Use	Notes
P = Permitted Uses; C = Conditional Uses; N = Non-Permitted Use	
Principal Permitted Uses	
Single-Family Dwellings,	P
Multi-Family Dwellings	P
Accessory Permitted Uses	
Accessory Dwelling Units (ADUs),	P
Temporary real estate sales offices,	P
Leasing Office/ Rec Facility,	P
Utility facilities,	C
Swimming pools and spas,	C
Neighborhood Parks/Open Space,	P
Landscaped common areas,	P
Playground,	C
Dog Park, and	C
Water Quality/Basins	P
Other Accessory Uses as determined by the Director to be substantially compatible with a principle permitted residential use.	TBD

LAND USE SUMMARY (SIMPLIFIED)

	Land Use	Gross Area (acres)	Density Range (du/ gross ac)	Maximum Non-Residential (sf)	Maximum Dwelling Units
	HDR - High Density Residential	13.1	8 - 22	-	168

3.3 High Density Residential (HDR)



TOWNHOME BUILDING STREET ELEVATION (TYP.)

3.3.B DEVELOPMENT STANDARDS: TOWNHOMES

DEVELOPMENT STANDARDS

	TOWNHOMES
Maximum Building Height	40'
Maximum Stories	2 + 500 sf max. 3rd story pop-up
Roof Decks	Permitted
Minimum Front Setbacks	
Living Area	8'
Porch/Patio	5'
Architectural Encroachments*	2' max. into setback
Minimum Side Setbacks	
Building Separation	15' min.
Corner	8' to Living Area
Porch/Patio	5'
Architectural Encroachments*	2' max. into setback

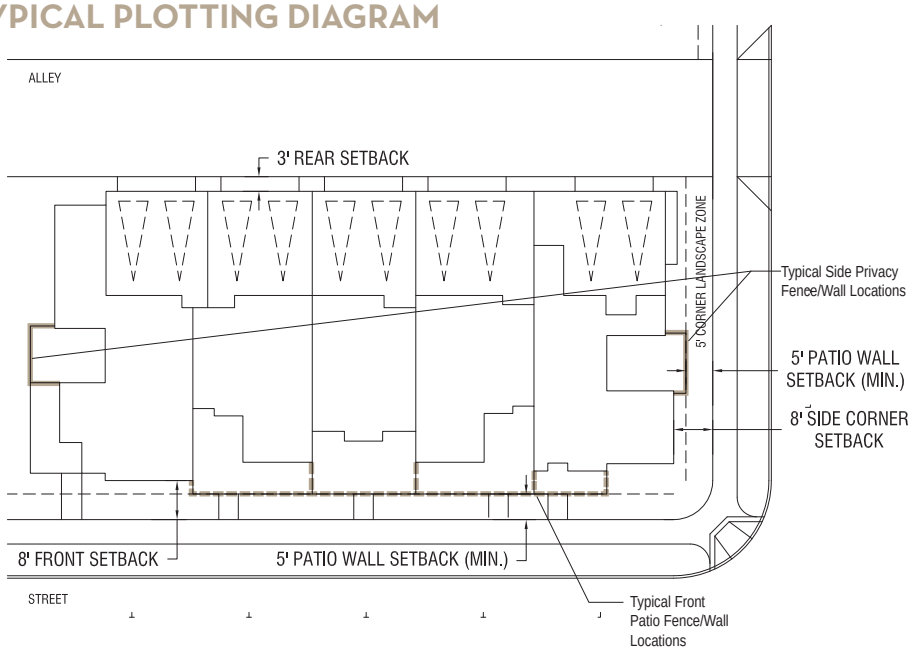
	TOWNHOMES
Minimum Rear Setbacks	
Garage (driveway apron from alley)	3' min. and 7' max.
Architectural Encroachments*	2' (eave only)
Parking	
Required Covered Parking	1 space per 1 BD unit 2 spaces per 2+ BD unit
Guest Parking**	0.2 spaces
Fencing (*see Typical Planting Plans in Design Submittal Package that depict typical wall/fence and gate locations.)	
Front Patio Fencing/Walls	42" maximum height (min. 2' from back of sidewalk for landscaping)
Side Patio Privacy Fencing/Walls	6' maximum height

*Architectural Encroachments are allowed to encourage articulation and shall not exceed 30 sf in plan on any elevation.

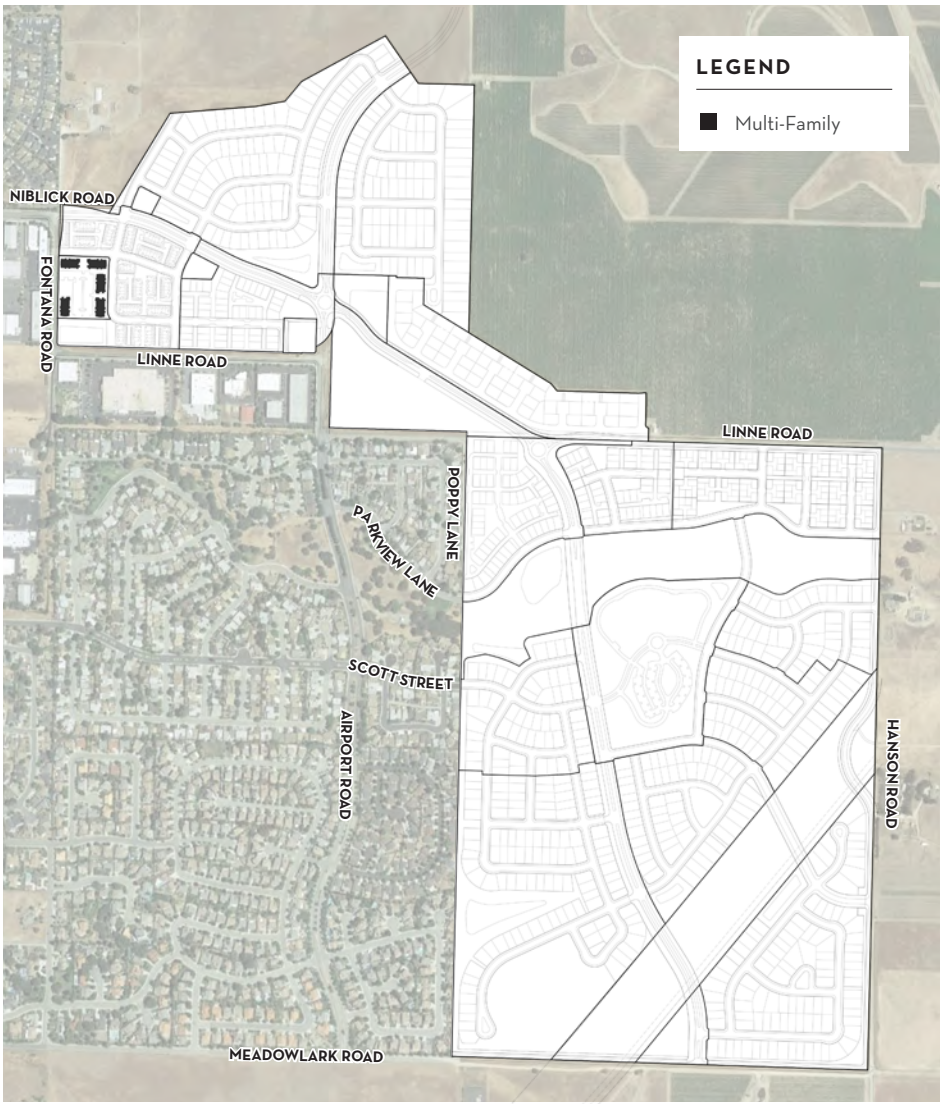
**On-Street parking within 200' can be counted towards guest parking requirements.

***Exposed utility meters are prohibited on street frontage elevations; howeve, screened uitility closets are permitted.

TOWNHOME TYPICAL PLOTTING DIAGRAM



3.3 High Density Residential (HDR)



MULTI-FAMILY BUILDING STREET ELEVATION (TYP.)

3.3.C DEVELOPMENT STANDARDS: MULTI-FAMILY

DEVELOPMENT STANDARDS

	MULTI-FAMILY
Maximum Building Height	45'
Maximum Stories	3
Required Amenities	
Community Recreation & Leasing Facility	1,200 sf min. (20 sf per unit)
Tot Lot	6 pieces of play equipment min. (slides, swings, etc.)
BBQ area, picnic area, etc.	1 min.
Laundry (washer/dryer hook-ups)	Required in each unit
Storage	250 cubic sf per unit (located outside of unit)
Minimum Setbacks	
Living Area	12'
Porch/Deck/Patio	5'
Building Separation	15'
Architectural Encroachments*	2' max. into req'd. setback
Minimum Setback to Parking	
Living Area	12'

	MULTI-FAMILY
Parking	
Required Parking^	1.5 spaces per studio or 1 BD unit^^ 2 spaces per 2+ BD units
Guest Parking^^^	0.2 spaces
Bicycle Parking	2 rack spaces per 10 units

*Architectural Encroachments are allowed to encourage articulation and shall not exceed 90 sf in plan on any elevation.

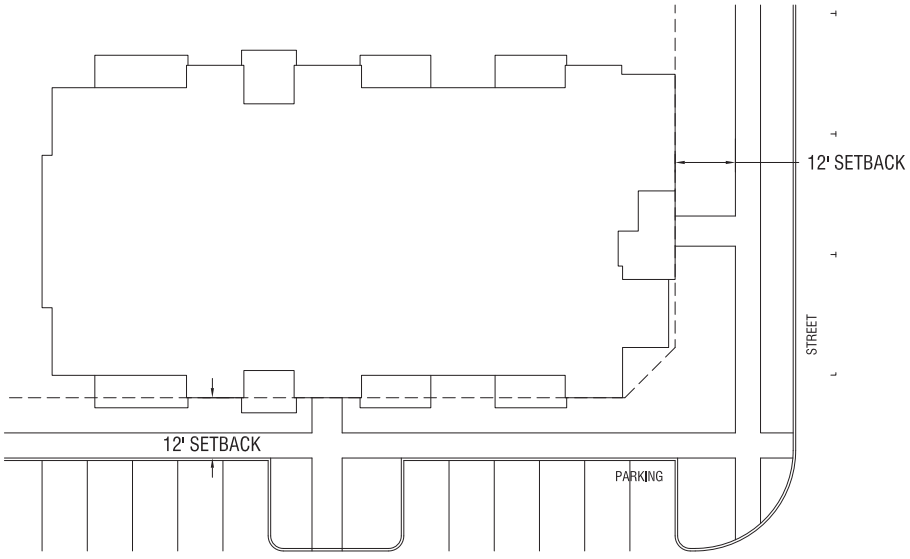
**Exposed utility meters are prohibited on public street frontage elevations. Screened uitility closets are permitted.

^For parking lots that require twenty or more parking spaces, a five percent reduction in parking spaces shall be allowed in exchange for providing four bike rack spaces.

^^Ratio may be reduced to 1 space per studio or 1 bedroom unit 1 if the parking space surface is constructed from porous concrete or porous pavement.

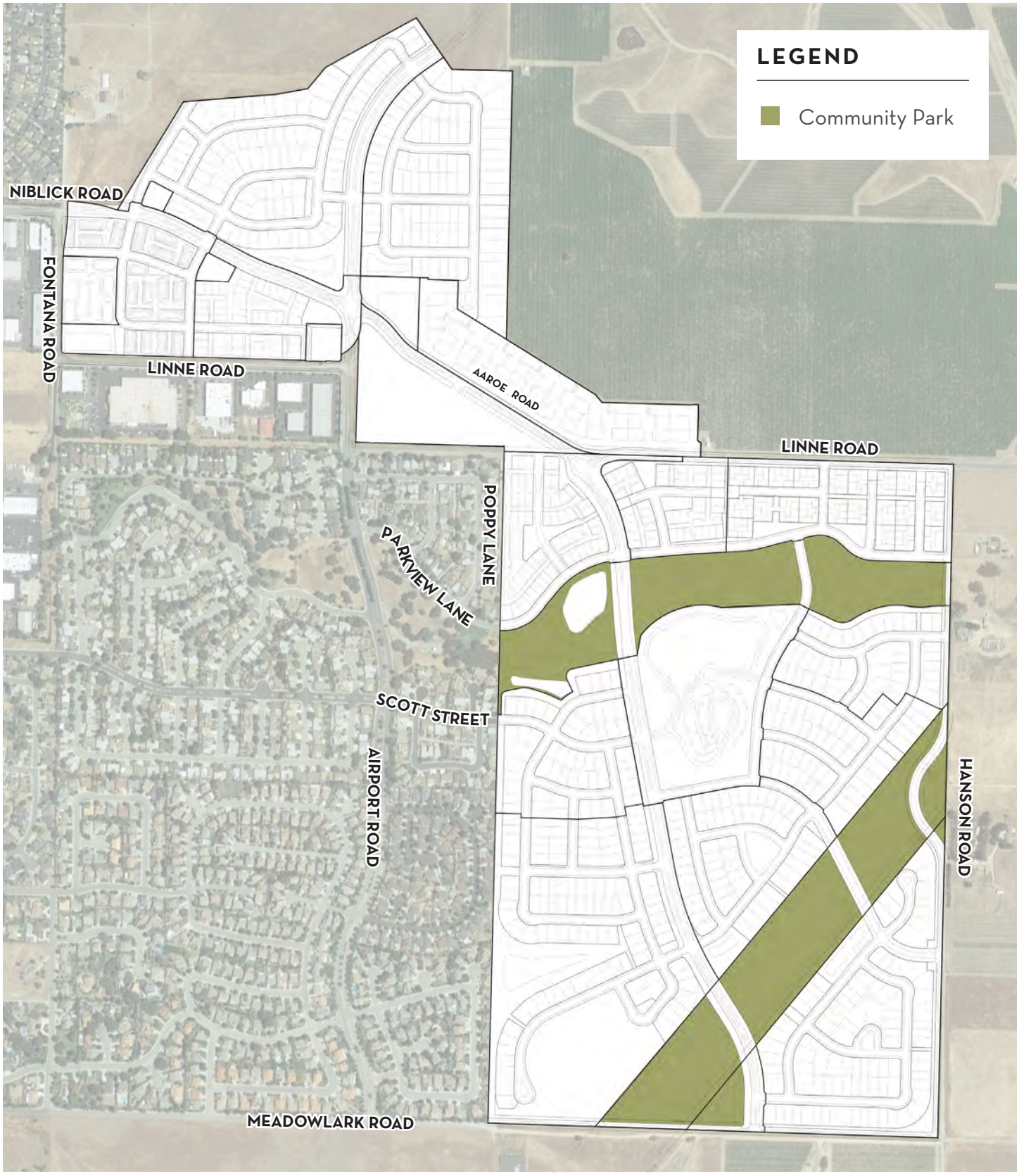
^^^On-Street parking within 200' can be counted towards guest parking requirements.

MULTI-FAMILY TYPICAL PLOTTING DIAGRAM



Reso A - Exhibit C2 (EIR Technical Appendix)

3.4 | Open Space - Community Park (OS-CP)



3.4 Open Space - Community Park (OS-CP)

3.4 PERMITTED & ACCESSORY USES OS-CP

TABLE 4.5: OPEN SPACE PERMITTED USES TABLE - OS-CP

Use	
P = Permitted Uses; C = Conditional Uses; N = Non-Permitted Use	
Principal Permitted Uses	
Public or private parks;	P
Public or private playgrounds;	P
Athletic fields and hard courts;	P
Dog parks;	P
Agricultural cultivation & maintenance (CSA shed)	P
Accessory Permitted Uses	
Utility facilities;	P
Recreation facilities;	P
Trails;	P
Shade structures; and	P
Other accessory uses as determined by the Director to be substantially compatible with a principal permitted open space recreation/ park use.	P

3.5 Neighborhood Open Space (OS-N)

3.5 Neighborhood Open Space (OS-N)

3.5 PERMITTED & ACCESSORY USES OS-N

TABLE 4.6: OPEN SPACE PERMITTED USES TABLE - OS-N

Use	
P = Permitted Uses; C = Conditional Uses; N = Non-Permitted Use	
Principal Permitted Uses	
Unrestricted open space;	P
Utility facilities;	P
Active recreation;	P
Dog parks;	P
Playgrounds;	P
Agricultural cultivation.	P
Accessory Permitted Uses	
Trails, and	P
Other accessory uses as determined by the Director to be substantially compatible with a principal permitted open space conservation use.	P

3.6 Open Space - Private Recreation Center (OS-R)

3.6 Open Space - Private Recreation Center (OS-R)

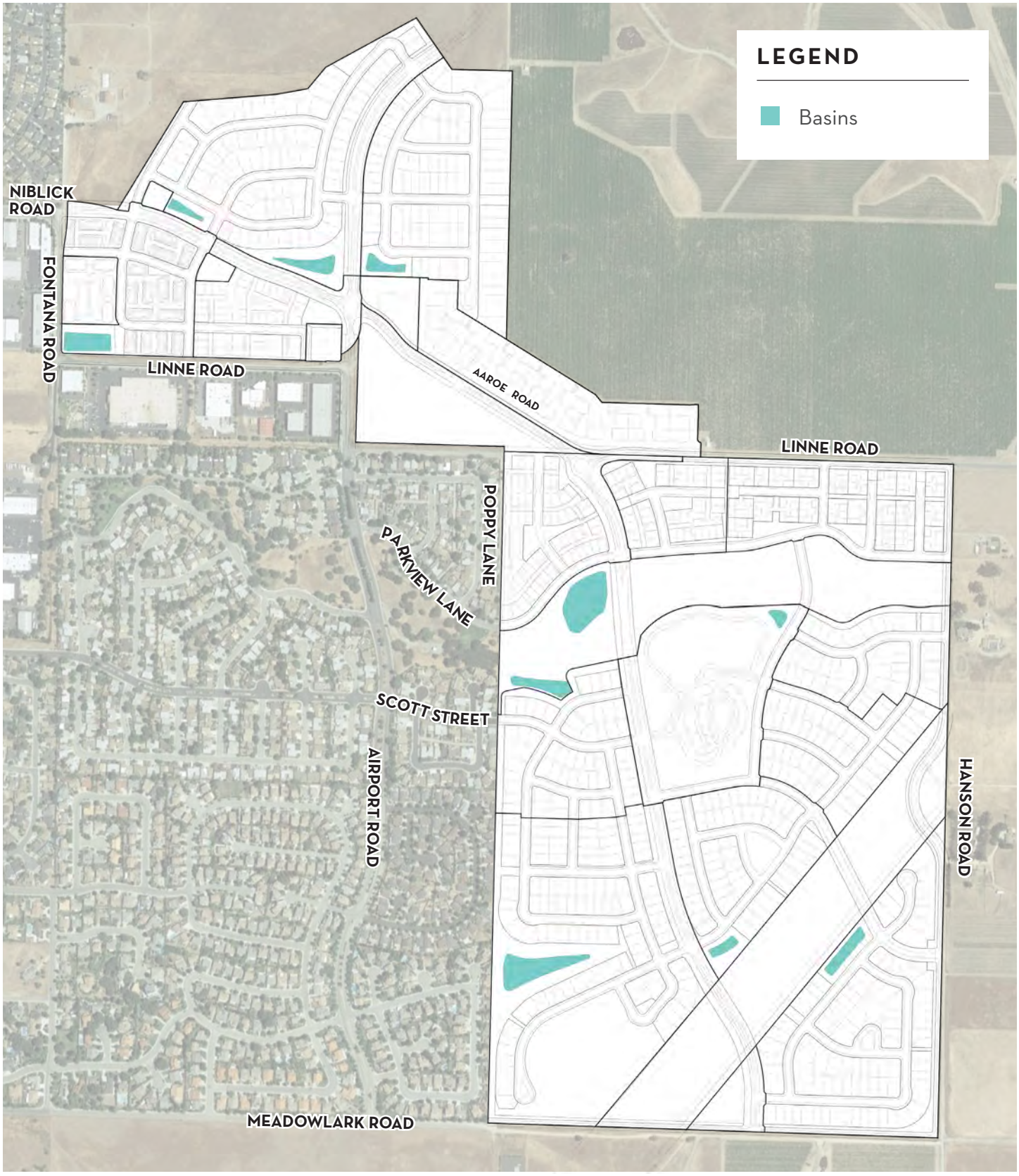
3.6 PERMITTED & ACCESSORY USES OS-R

TABLE 4.7: OPEN SPACE PERMITTED USES TABLE - OS-REC

Use	
P = Permitted Uses; C = Conditional Uses; N = Non-Permitted Use	
Principal Permitted Uses	
Public or private parks;	P
Public playgrounds;	P
Athletic fields and hard courts;	P
Private club;	P
Retail sales;	P
Gym/fitness;	P
Restaurants/bars;	P
Spas;	P
Wine tasting rooms;	P
Demonstration kitchens;	P
Year-round and seasonal stands with sales of agricultural products;	P
Meeting Rooms/ business center;	P
Art/ potting/ gardening studios;	P
Event venue/weddings/catering;	P
Agricultural cultivation.	P
Accessory Permitted Uses	
Utility facilities;	P
Seasonal events;	P
Recreation facilities;	P
Trails;	P
Shade structures; and	P
Other accessory uses as determined by the Director to be substantially compatible with a principal permitted open space recreation/ park use.	P

Reso A - Exhibit C2 (EIR Technical Appendix)

3.7 | Open Space - Water Quality/Detention (OS-W)



3.7 Open Space - Water Quality/Basin (OS-W)

3.7 PERMITTED & ACCESSORY USES OS-W

TABLE 4.7: OPEN SPACE PERMITTED USES TABLE - OS-W

Use	Notes	
P = Permitted Uses; C = Conditional Uses; N = Non-Permitted Use		
Principle Permitted Uses		
Detention facilities, and	P	
Water quality treatment facilities.	P	
Accessory Permitted Uses		
Landscape and irrigation for basins that doesn't interfere with drainage facilities.	P	

CHAPTER 4

DESIGN GUIDELINES

Reso A - Exhibit C2 (EIR Technical Appendix)

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4.0 Community Design Principles

4.0.A LANDSCAPE VISION

The intent of these Design Guidelines in to create a palette or "pattern book" of design elements for the use of all builders, architects, landscape architects, engineers and other design professionals engaged to develop neighborhoods within Viñedo.

These guidelines are written to inspire innovative and creative architectural and landscape designs. Unless otherwise specified herein, they are not intended to be a literal set of rules. The basic concepts found in these guidelines are flexible in their structure, but are intended to communicate the developer's vision and design expectations, against which, all builder plans and architecture will be evaluated and approved.

DESIGN REVIEW & APPROVAL PROCESS

The Master Developer shall develop a detailed Master Landscape Plan as part of their final engineering package submittal that conforms to the design intent contained herein. This plan shall be submitted to the City for review and approval.

Following approval from the City, each Builder shall first submit landscaping plans to the Master Developer for substantial conformance review. Once approved by the Master Developer, the plans may be submitted to the City for final site plan review and approval.

PHASING, INSTALLATION & ONGOING MAINTENANCE

Open Spaces shall be completed as the adjacent residential parcels are developed. Initially either the Master Developer or Builder shall construct and install the improvements as outlined in the Development Agreement. Additionally, the responsibilities of ongoing maintenance shall be specified in the Development Agreement.

LANDSCAPE FRAMEWORK: PARKWAYS AND MEDIANS

The intent of the overall landscape design echoes the agrarian roots of the land. Orchards, vines, row crops, fields of wheat are all familiar landscape forms. Where the community gateways and neighborhood entries occur, these agrarian forms will be repeated, such as groves or bosques of trees and layered rows of accent shrubs. In between these parkway or median accent areas a "less is more" approach is intended with ornamental grasses, shrubs and groundcovers with crushed rock mulches in between. Alternative paving materials such as decomposed granite paving for trails and walks helps complete the rustic yet elegant nature of the landscape.

PARKS & OPEN SPACE

A series of interconnected trails and internal park spaces allow pedestrians and bicyclists access through and around the entire community. These areas will include small orchards, vineyards, gardens with edible plants, drought tolerant landscape, public art "surprises", seating and dining areas, and way finding signage that direct safe passage through the community.

SUSTAINABLE LANDSCAPE PRINCIPLES

In addition, there are low impact development techniques through the use of swales and landscape treatments that direct and filter storm water within the community, and use recycled water for all common landscape.

MATERIALS

Simple and time honored materials that reflect the agricultural vernacular; rusted and galvanized metal, wood timber and siding, natural stone, crushed rock, decomposed granite or gravel.

LANDSCAPE RESPONSIBILITY

The Master Association will maintain all neighborhood parks and publicly accessible slopes except Turtle Creek Park which will be maintained by the City.

Sub-Association maintained landscape shall only occur at attached products (i.e. Multi-Family, Townhomes, etc.). Cost Centers will be utilized for HOA maintained front yard landscaping. Landscape that is intended to be maintained

by a Sub-Association should be separate from the Master Homeowner's Association plan sets.

All private yards contained within privacy or patio fencing/ walls shall be maintained by the homeowner.

The City shall maintain all medians and parkways contained within public Right of Ways.

Additional ongoing maintenance agreements shall be outlined in the Development Agreement.

4.0.B COMMON AREA LANDSCAPE CRITERIA

LANDSCAPE CHARACTER

The landscape character and design of the community in intended to embrace the regional and site specific context associated with Viñedo. Viñedo will employ a unified landscape character for multiple uses associated with the site. Elements which will provide additional cohesion to the site development will include row planting groves and vines, organic planting drifts including flowering shrubs and perennials that echo the agricultural heritage of the site.

COMMON AREA LANDSCAPE

Water conservation is an important component of the landscape design. In addition, storm water infiltration and energy conservation practices shall be incorporated where possible to encourage a sustainable landscape and shall comply with all City water ordinance requirements.

PLANTING DESIGN CRITERIA

- Plant material forms and heights shall respond to the form, scale and style of the architecture.
- Ultimate tree and shrub sizes should be considered to insure that the neighborhood scale is maintained.
- All trees and shrubs shall be used with regard to climate, water usage and maintenance needs.
- Energy conservation is encouraged with regard given to planting deciduous trees next to buildings and along streets to reduce ambient temperature, reduce heat gain, and to allow for cool, natural ventilation.
- Natural turf is only permitted in areas of active use and is subject to the City's turf and water conservations standards. Decorative natural turf is prohibited.
- Refer to subsequent Community Plant Palette.

TREES

- Trees shall be placed so as to soften and enhance the architecture.
- Trees are to be evergreen combined with a maximum of 30% deciduous.
- Tree sizes are to be a combination of a minimum of 60% 24" box, 30% 36" box, and 10% 48" box excluding parkways. The 48" box trees are to occur at focal points and neighborhood entries.
- Root barriers are to be utilized where trees are within 5' of a hardscape surface.
- Refer to the Community Plant Palette.

SHRUBS

- Layers of planting should be used to soften building masses.
- A double layer of shrubs is encouraged in narrow planting zones with lower ground covers in the foreground and small shrubs behind.
- Locate plants with higher water demands in shady areas.
- Group plants with similar water requirements to allow more effective use of irrigation.
- Shrubs areas are to be planted with a minimum of 10% 15-gal., 60% 5-gal., and 30% 1-gal.

- At internal auto courts and alleys, planter pockets with 5-gal. vines and trellises over garages are encouraged. If trellises aren't used, 15-gal. vertical shrubs on both sides of the garage doors are required (except where not allowed for Fire code.)

- All shrubs areas are to have a minimum 2" layer of bark mulch.

- Refer to the Community Plant Palette.

PARKWAYS

- Parkways are to be planted with ornamental grasses, dwarf shrubs and groundcover with a minimum 24" box trees at a maximum spacing per the Master Landscape Plan.

IRRIGATION

- All common area landscape shall have a smart irrigation system with moisture sensors.

- The Master Homeowner's Association irrigation controllers shall comply with City water ordinance requirements.

- Drip irrigation required for all shrub and groundcover areas.

- Overhead spray irrigation in parks and parkways over 10' with turf.

- Drip irrigation systems are recommended to include fertilization injection to minimize maintenance and promote healthy soil and plant growth.

4.1 Landscape Design Guidelines

4.1.A COMMUNITY AMENITY PLAN

As identified in the Landscape Vision, the landscape echoes the agrarian roots of the land. Orchards, vines, row crops, fields of wheat are all familiar landscape forms. Where the community gateways and neighborhood entries occur, these agrarian forms will be repeated, such as groves or bosques of trees and layered rows of accent shrubs. In between these parkway or median accent areas a "less is more" approach is intended with ornamental grasses, shrubs and groundcovers with crushed rock mulches in between. Alternative paving materials such as decomposed granite paving for trails and walks helps complete the rustic yet elegant nature of the landscape.

LEGEND

1. The Farmstand
2. The Poolhouse
3. Turtle Creek Park
4. The Overlook
5. Oak Knoll Park
6. The Vines (PG&E easement park)
7. Meadowlark Park
8. Dog Park
9. City of Paso Robles Gateway
10. Neighborhood Park
11. Community Trail
12. Ponding Basin
13. Turtle Creek Bridge

4.1 | Landscape Design Guidelines

4.1 | Landscape Design Guidelines

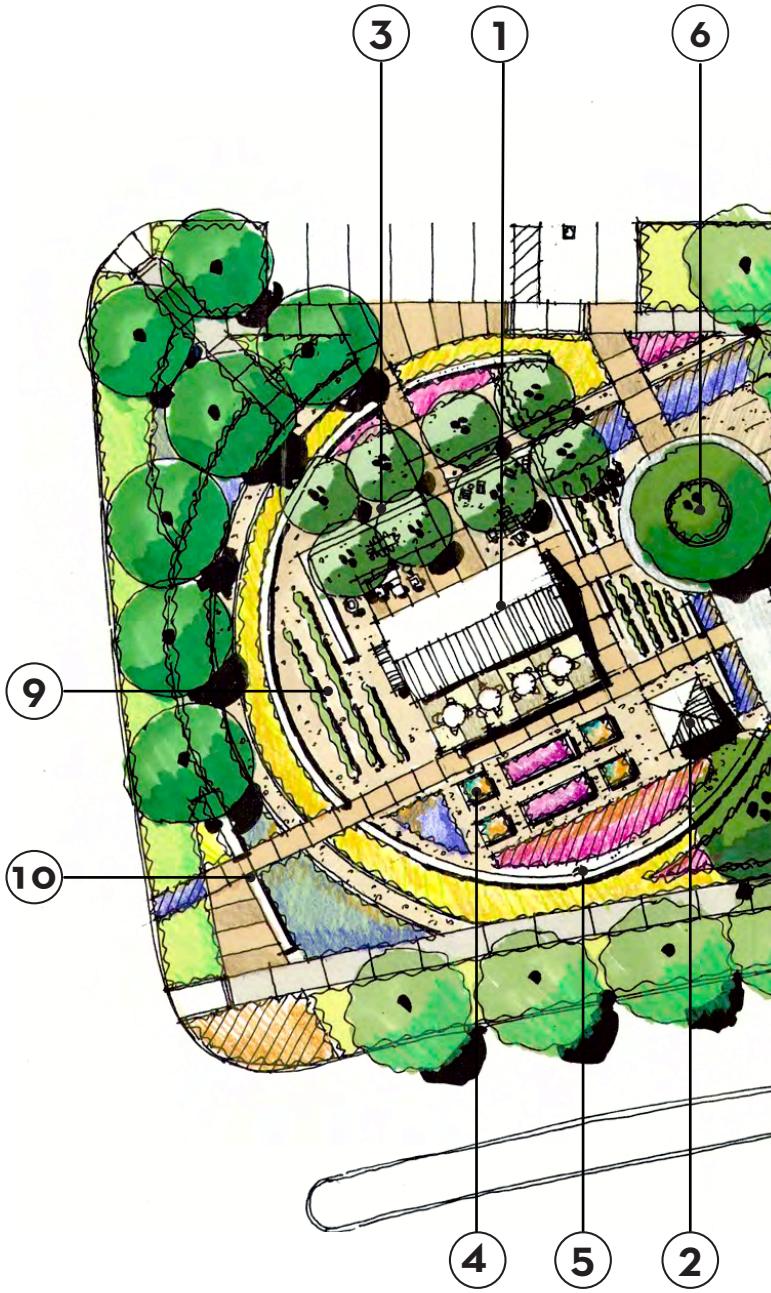
4.1.B THE FARMSTAND

The Farmstand is the gateway into the community from the West and includes a trail head destination. The converted agrarian structure and water tower create an iconic visual anchor and will set the tone for the community architecture.

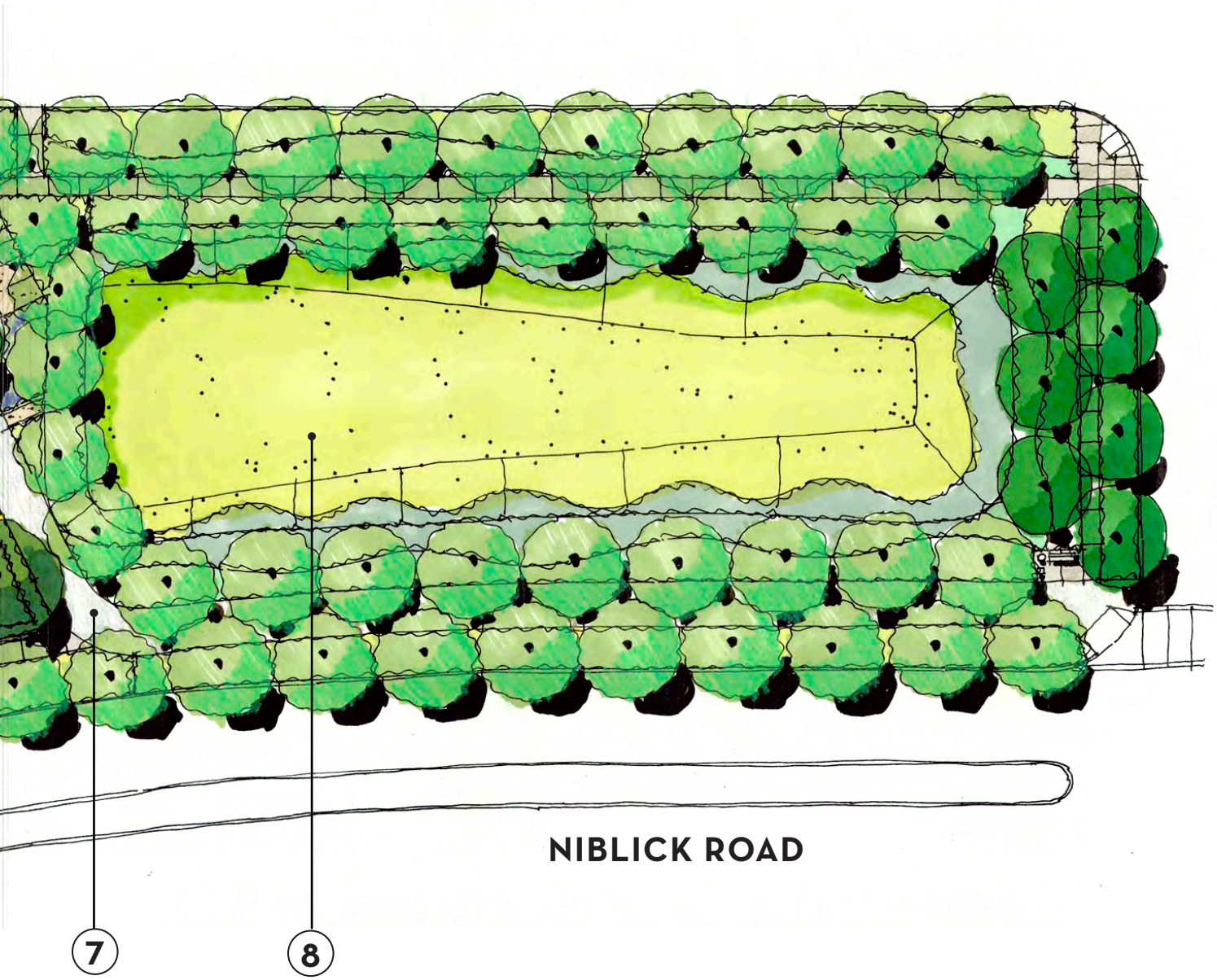
This destination could ultimately host a weekly farmers market, house the CSA management office and provide space for outdoor classes on gardening and viticulture. The site is well suited for informal outdoor dining and respite under the trees or shaded patio after a walk, run or bike ride on the trail.

LEGEND

1. The Farmstand
2. Water Tower
3. Olive Grove & Dining/Event Space
4. Raised Farm Garden
5. Stone Wall
6. Specimen Oak at Trailhead
7. 12' Trail - Multi-Modal
8. Ponding Basin
9. Vineyard
10. Community Project Monument Sign



KEY PLAN


NIBLICK ROAD
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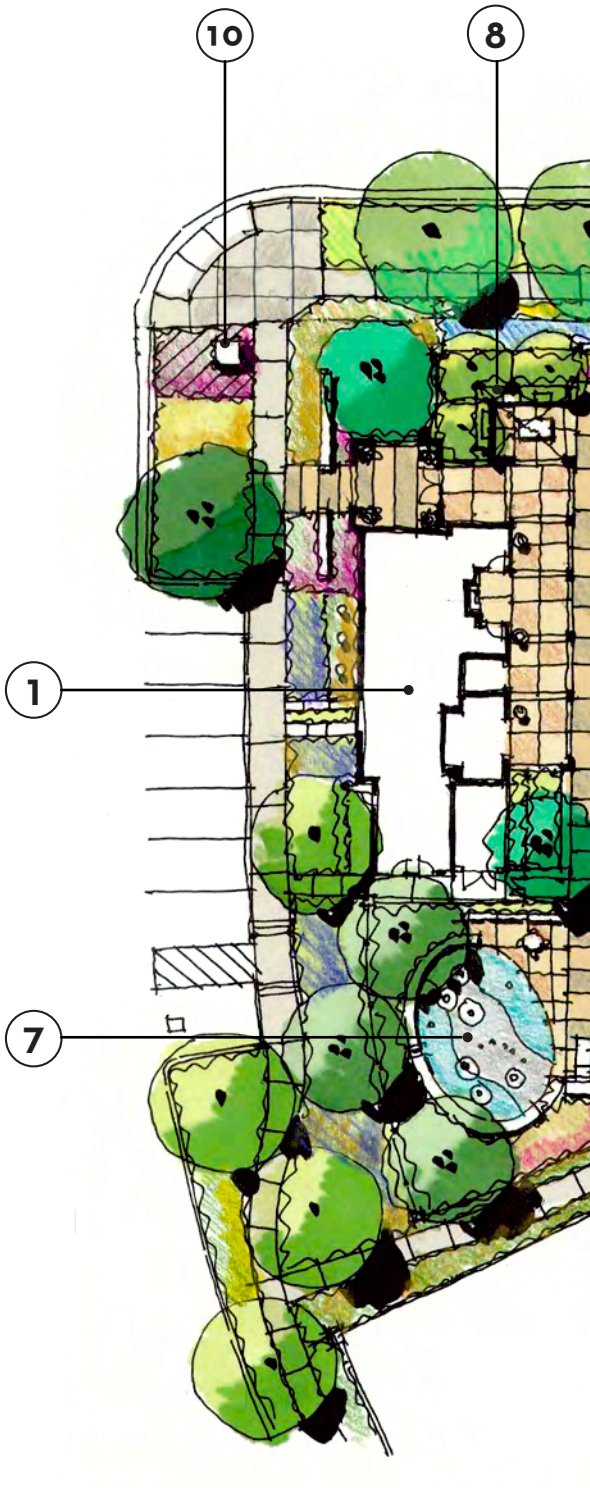
4.1 Landscape Design Guidelines

4.1.C THE POOLHOUSE

The Pool house is a local community amenity on a smaller scale. The program includes a larger recreation pool, family pool with beach entry and spa. The family area includes a splash pad that provides cooling off for people of all ages.

Ample shaded areas for lounging by the pool or dining. An outdoor kitchen and gathering space completes this community destination space.



LEGEND

1. Pool House
2. Trellis Lounge
3. Cabanas
4. Spa Pavillions
5. Spa
6. Rec Pool
7. Splash Pad
8. Outdoor Dining & Kitchen
9. Beach Entry Pool
10. Community Project Monument Sign

KEY PLAN

NIBLICK ROAD
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NORTH

4.1 Landscape Design Guidelines

4.1.D TURTLE CREEK PARK

Turtle Creek Park anchors the western section of this linear park and is the pedestrian and bike gateway along the creek off Niblick Rd.

This park is primarily passive in nature but at this location enjoys both pickle ball courts and par course equipment as part of an exercise routine. Benches dot the pedestrian and bike trail that meanders through the park towards Royal Oaks park to the west and the trail adjacent Hanson Rd. to the east.

The landscape vernacular provides for both open turf and layered planting of ornamental grasses and shrubs reflecting the movement of the creek.

LEGEND

1. Park Monument Wall
2. Concrete Seatwall
3. Pickleball Court w/ 4' ht Fencing
4. Pedestrian/ Bike Trail
5. Par Course Circuit w/ Drinking Fountain and DG Paving
6. Park Bench @ Trail
7. Open Turf
8. Specimen Oak

KEY PLAN

4.1 | Landscape Design Guidelines

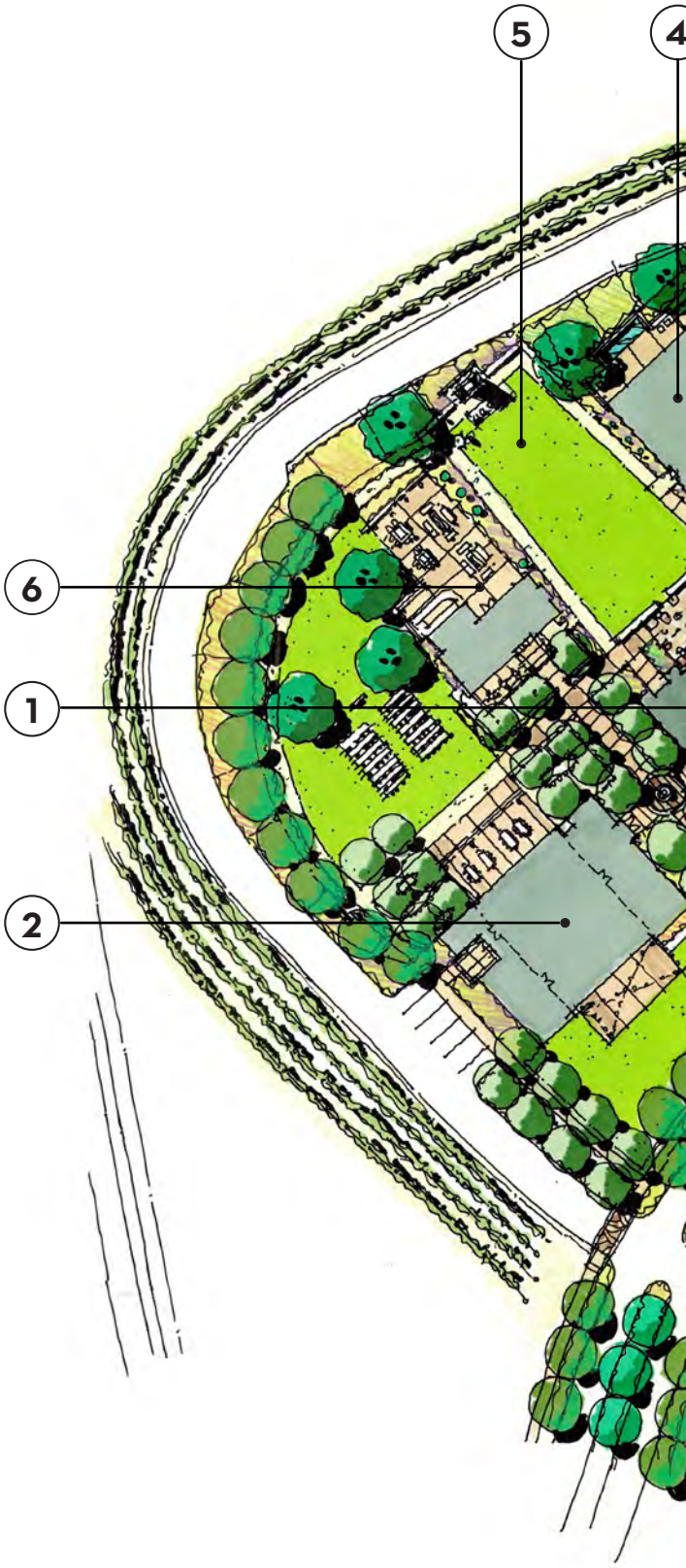
4.1 | Landscape Design Guidelines

4.1.E THE OVERLOOK (MAIN REC)

The Overlook represents the connecting hub of the community for gatherings, play and recreation. As well, it offers stunning views to the vineyards and adjacent agriculture. The building layout enables multiple activities and gatherings to occur simultaneously woven together with contemporary agrarian architecture.

The community spaces are large enough for a gala and intimate for wine tasting and dinner for two. The amenities include a family pool for hanging out and a recreational pool for a rigorous workout. Tennis and indoor gym with a yoga-pilates studio round out the active program. For the ultimate in relaxation a club spa is available with massage and outdoor soaking infinity edge pool with views to the hillside vineyards.

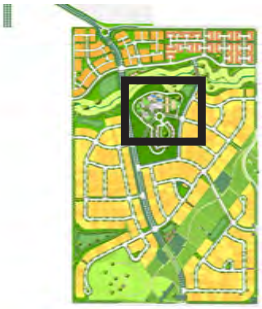
The landscape evokes the regional agricultural heritage with an emphasis on viticulture. Vineyards surround the site and welcome you as you drive up to the Overlook.



LEGEND

1. The Club
2. Event Barn
3. Pool Barn
4. Spa with Inifinity Pool
5. Great Lawn & Fireplace
6. The Overlook
7. Pool Equipment
8. Entry Fountain
9. Club Pool
10. Club Spa
11. Pickleball Courts
12. Vineyard

KEY PLAN



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NORTH

4.1.F OAK KNOLL PARK

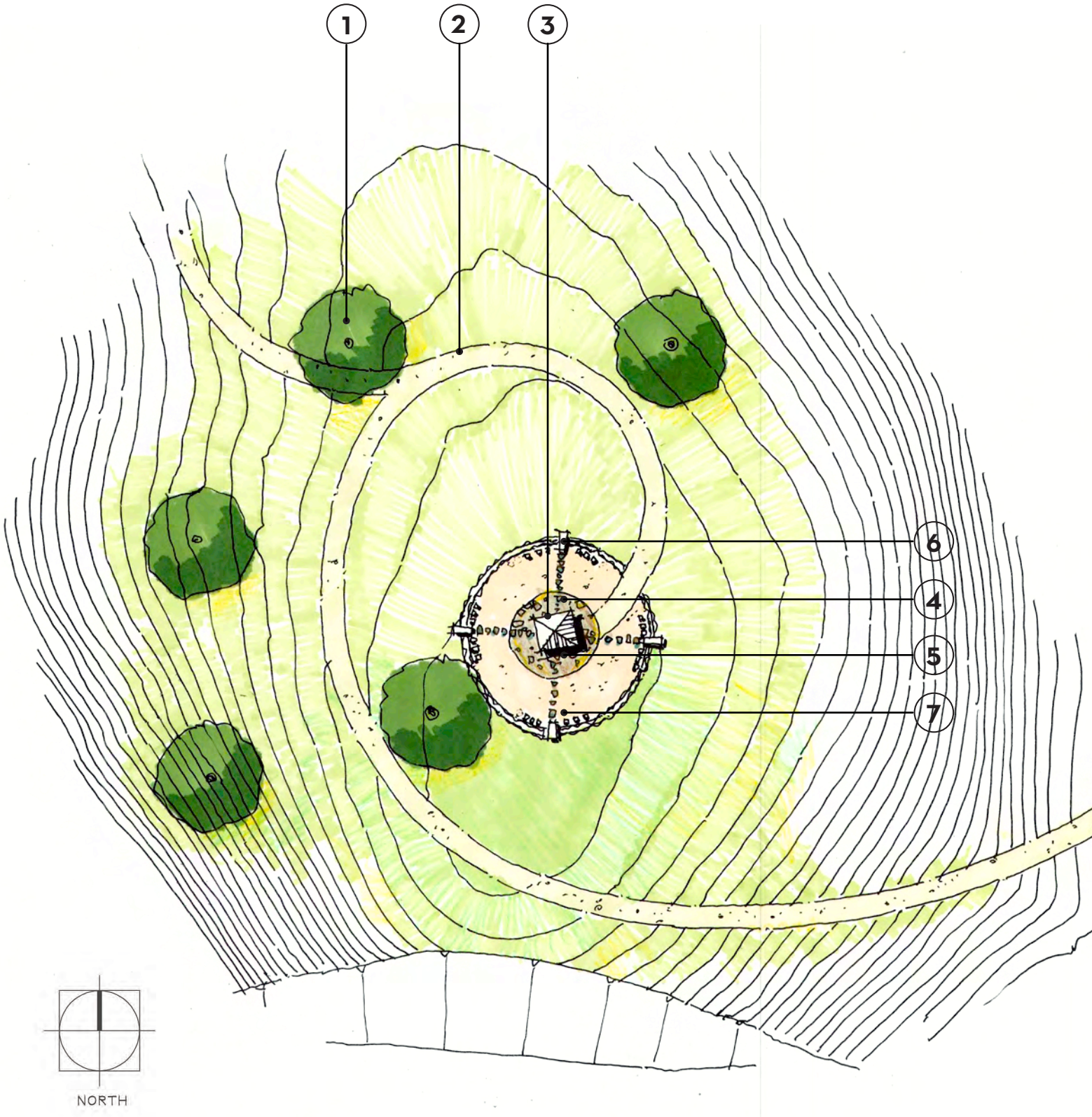
Oak Knoll Park is one of the highest points of the project allowing for 360 views and hosts several majestic oak trees indigenous to the site. The access to the overlook is by the 10' pedestrian and bike trail that connects to the overall community trails network. This particular trail could be native or decomposed granite which blends into the natural landscape environment.

At the summit a solid roof pavilion and patio space provides a resting space and small gathering area. A locally sourced limestone stone wall (30" in height) is used to enclose the area together with stone compass monuments that orient the visitor.

LEGEND

1. Native Heritage Oaks
2. 10' Pedestrian / Bike Trail
3. Knoll Outlook Pavilion
4. Stone Patio
5. Stacked Limestone Wall
6. Compass Point Stone Monuments
7. 3/4" Crushed Rock Surfacing

KEY PLAN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NORTH

4.1.G THE VINES PG&E EASEMENT PARK

The PG&E easement park allows for several community amenities that include a pedestrian bike trail network with linkages to the adjacent neighborhoods, open play turf, agricultural vignettes of orchards and vines together with an access to the dog park adjacent the easement area.

LEGEND

1. Vineyards
2. Remnant Orchards of Stone Fruit
3. 10' Pedestrian/Bike Trail
4. Dog Park & CSA Maintenance Building
5. Open Play
6. PG&E Towers
7. Tennis Courts & Restrooms

KEY PLAN

4.1 | Landscape Design Guidelines

4.1 Landscape Design Guidelines

4.1.H MEADOWLARK PARK

The community entry is intended to reflect the agricultural heritage of the site with the use of grove plantings of trees and entry monument and community identity materials of stone and cor-ten metal.

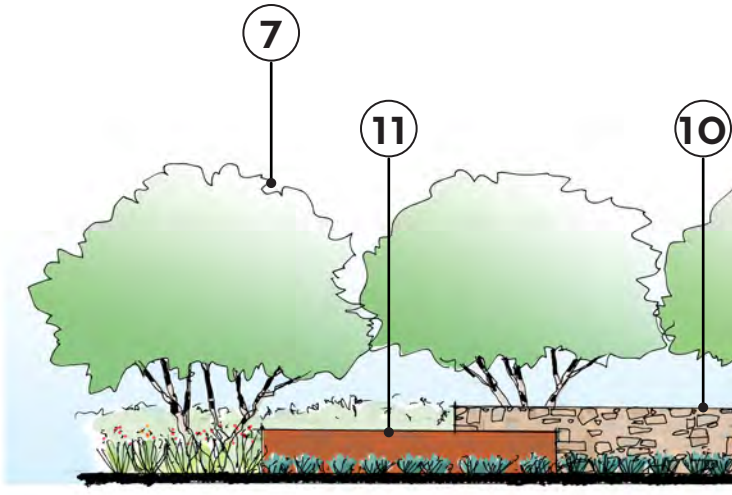
The stone wall forms are typical of many vineyards and orchards, used as property delineators and entry points to the farm.

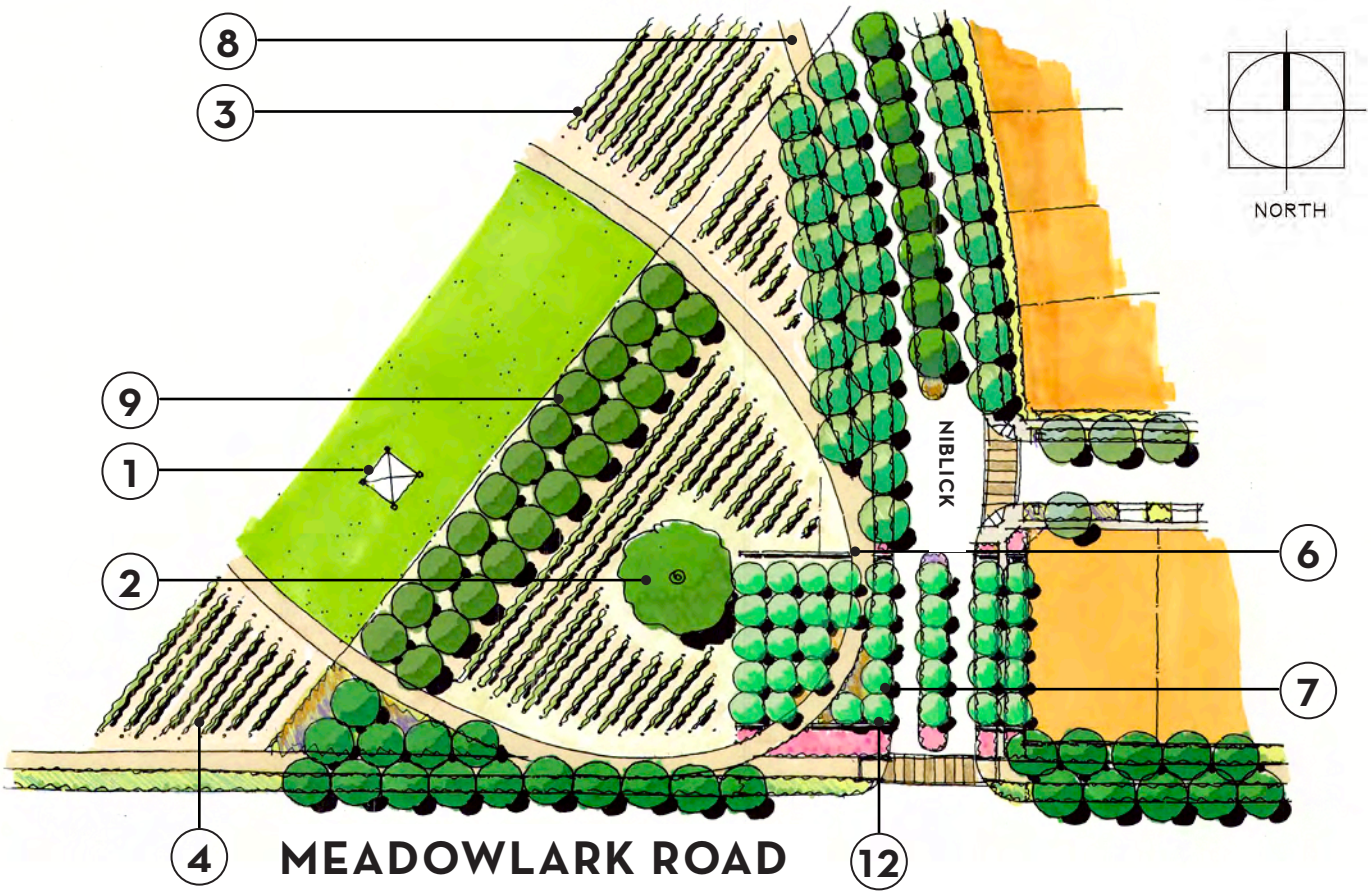
The community monumentation and identification materials will be consistent throughout the project including the use of metal backlit letters to illustrate the monument text.

LEGEND

1. PG&E Tower
2. Heritage Oak Protected in Place
3. Vineyard
4. Pedestrian/BikeTrail
5. Community Entry
6. Stone Wall @ Orchard
7. Entry Olive Orchard
8. Multi Modal Trail
9. Orchard Alle
10. Community Entry Monument
11. Corten Steel Panel
12. Entry Monumentation

KEY PLAN

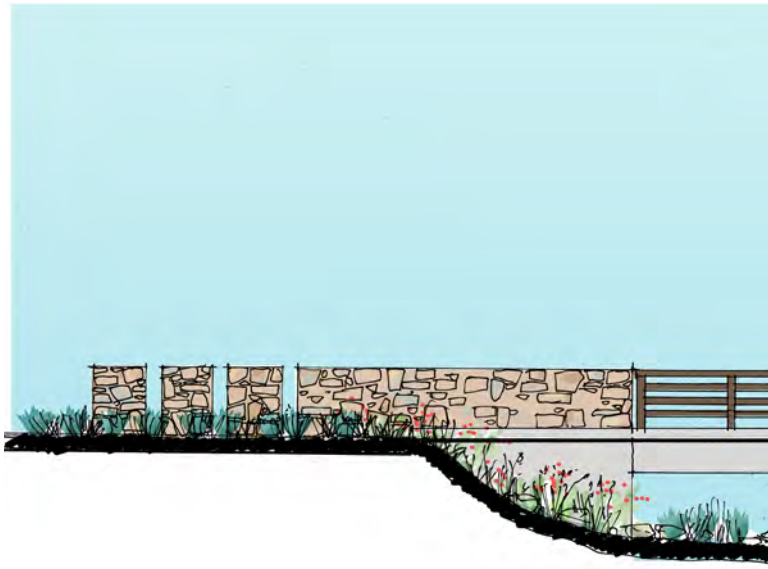




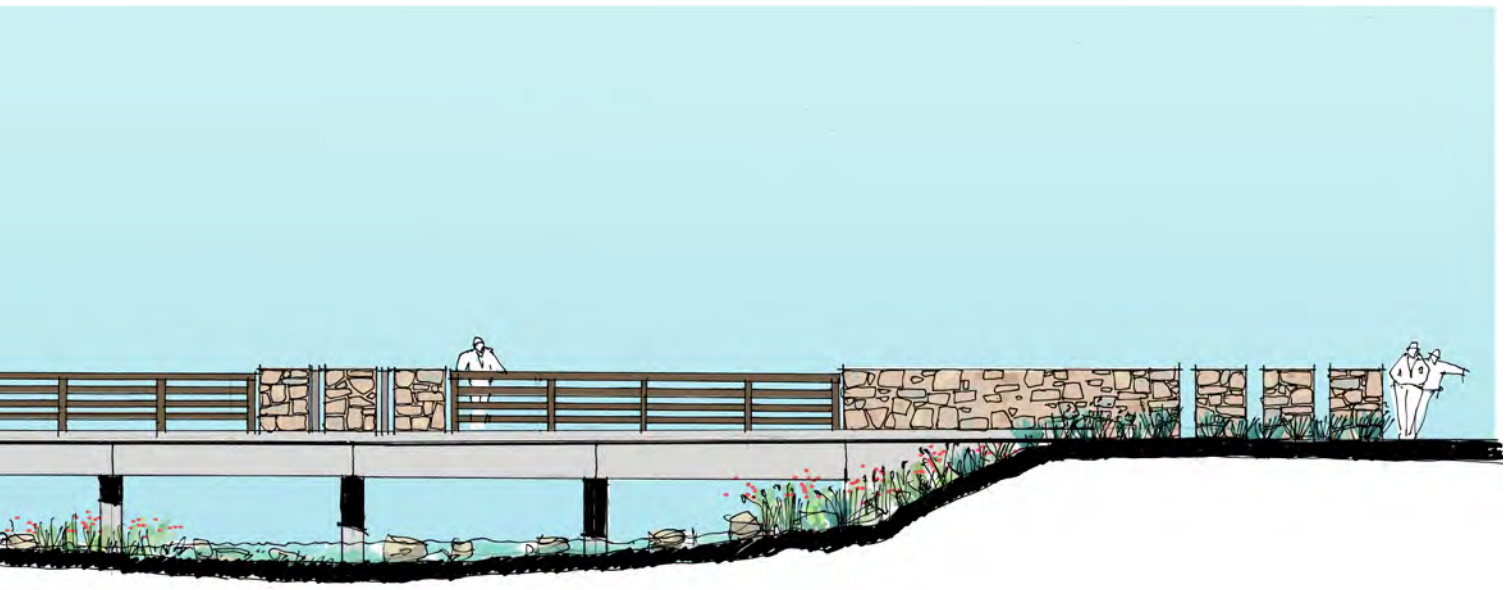
ENTRY ELEVATION

4.1 | Landscape Design Guidelines

4.1.1 TURTLE CREEK BIDGE CONCEPT



KEY PLAN

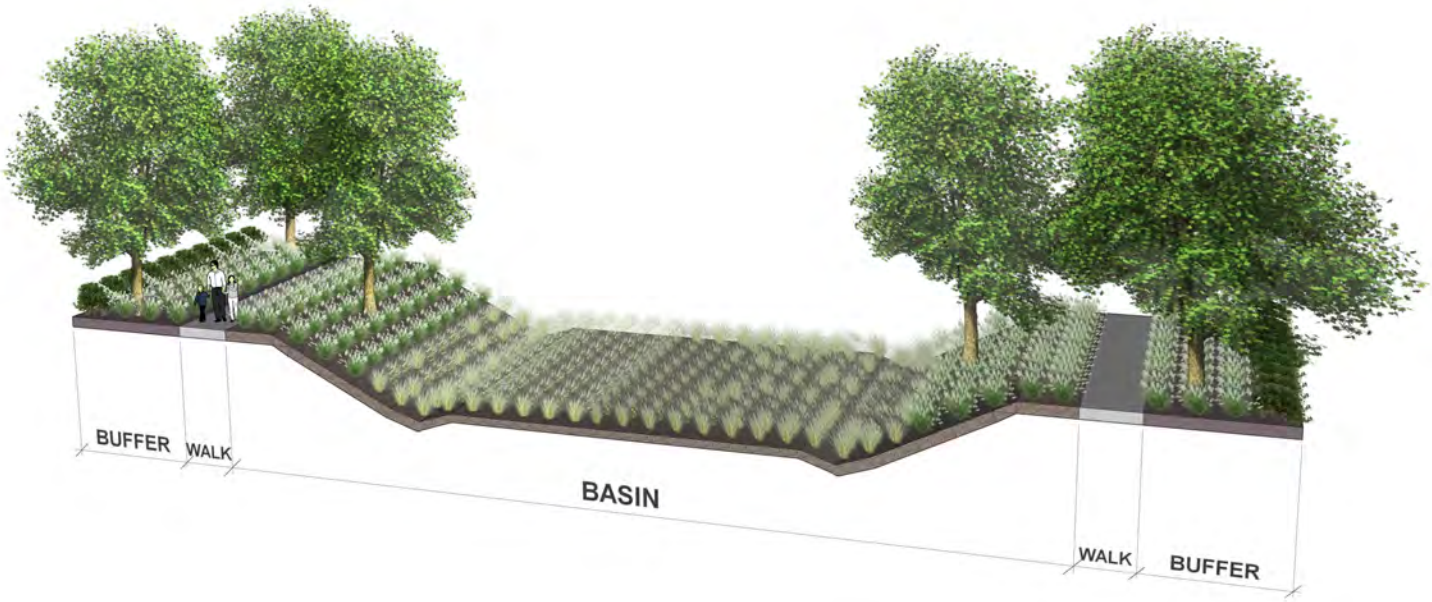


TURTLE CREEK BRIDGE ELEVATION CONCEPT

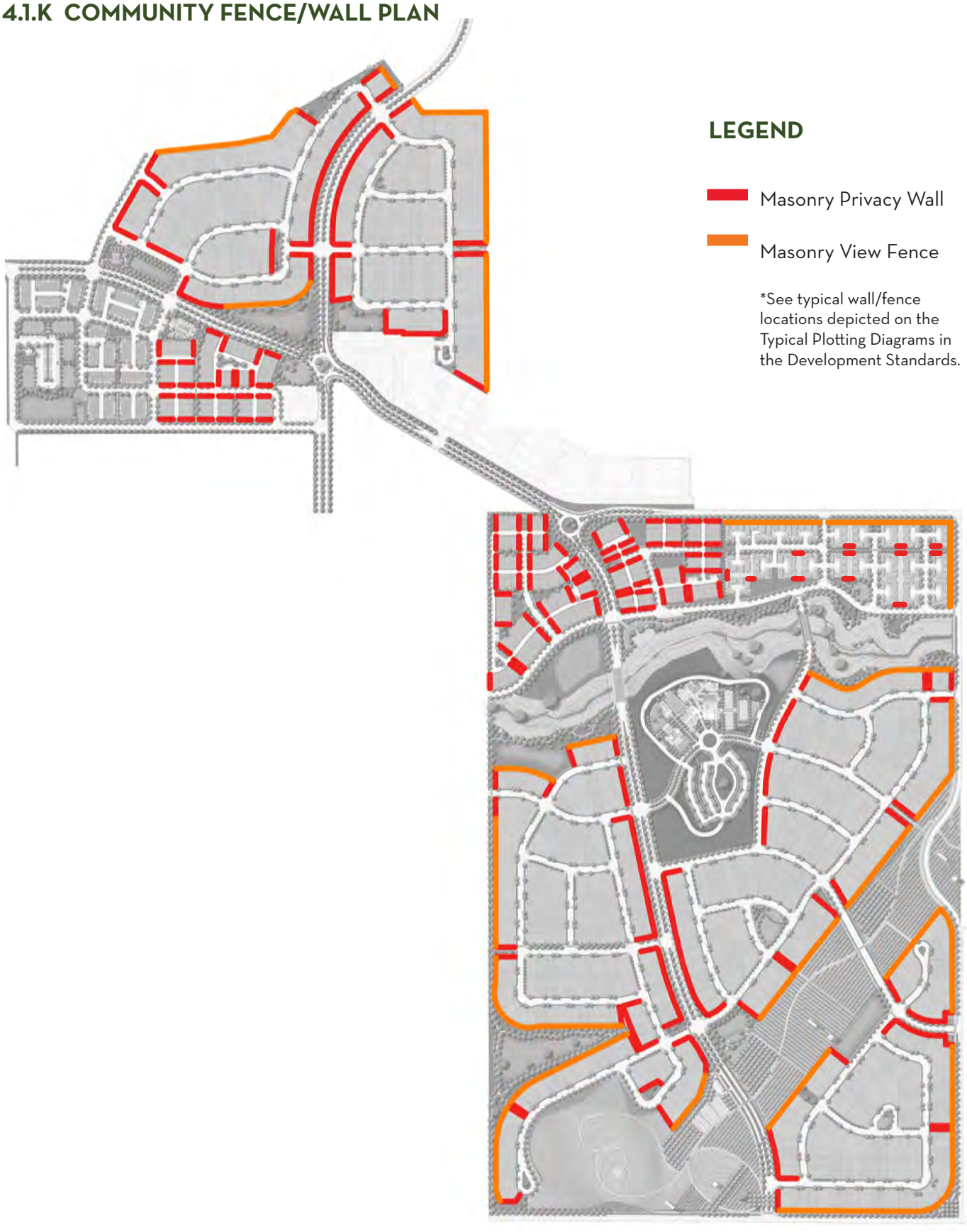
4.1 Landscape Design Guidelines

4.1.J TYPICAL BASIN LANDSCAPE

The basin landscape includes trees and ornamental shrub plantings (based upon the design guideline plant palate) to the upper half of the slope measured from the toe. The purpose is to blend the basin landscape with adjacent landscape areas and yet provide for peak storm water storage.



4.1.K COMMUNITY FENCE/WALL PLAN



LEGEND

Masonry Privacy Wall

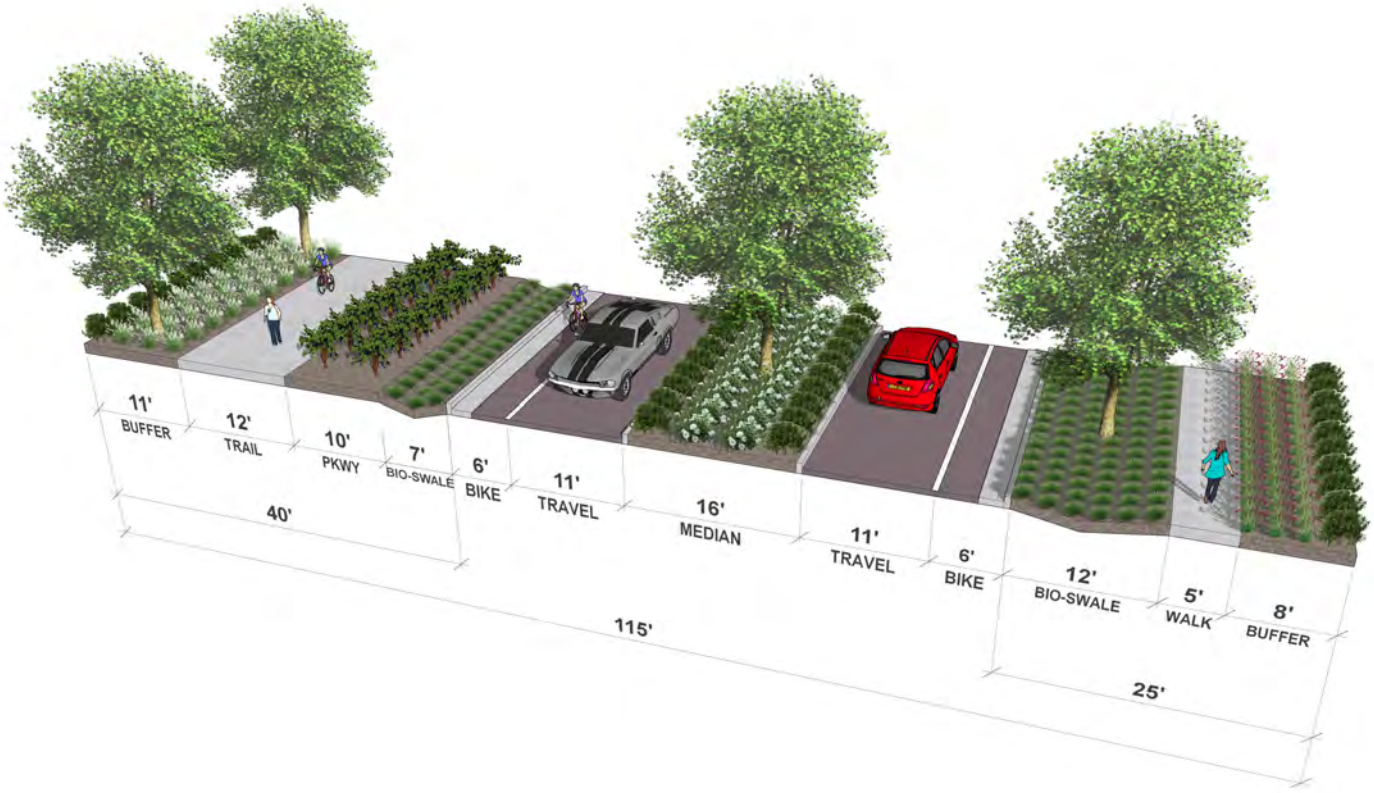
Masonry View Fence

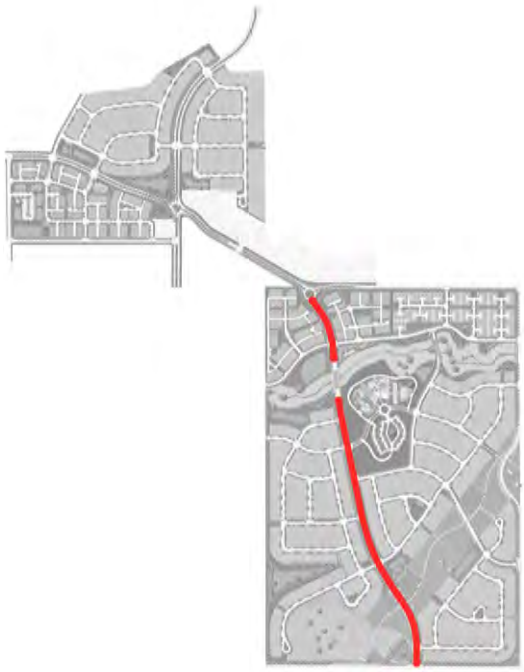
*See typical wall/fence locations depicted on the Typical Plotting Diagrams in the Development Standards.

4.1 | Landscape Design Guidelines

4.1.L STREETSCAPES

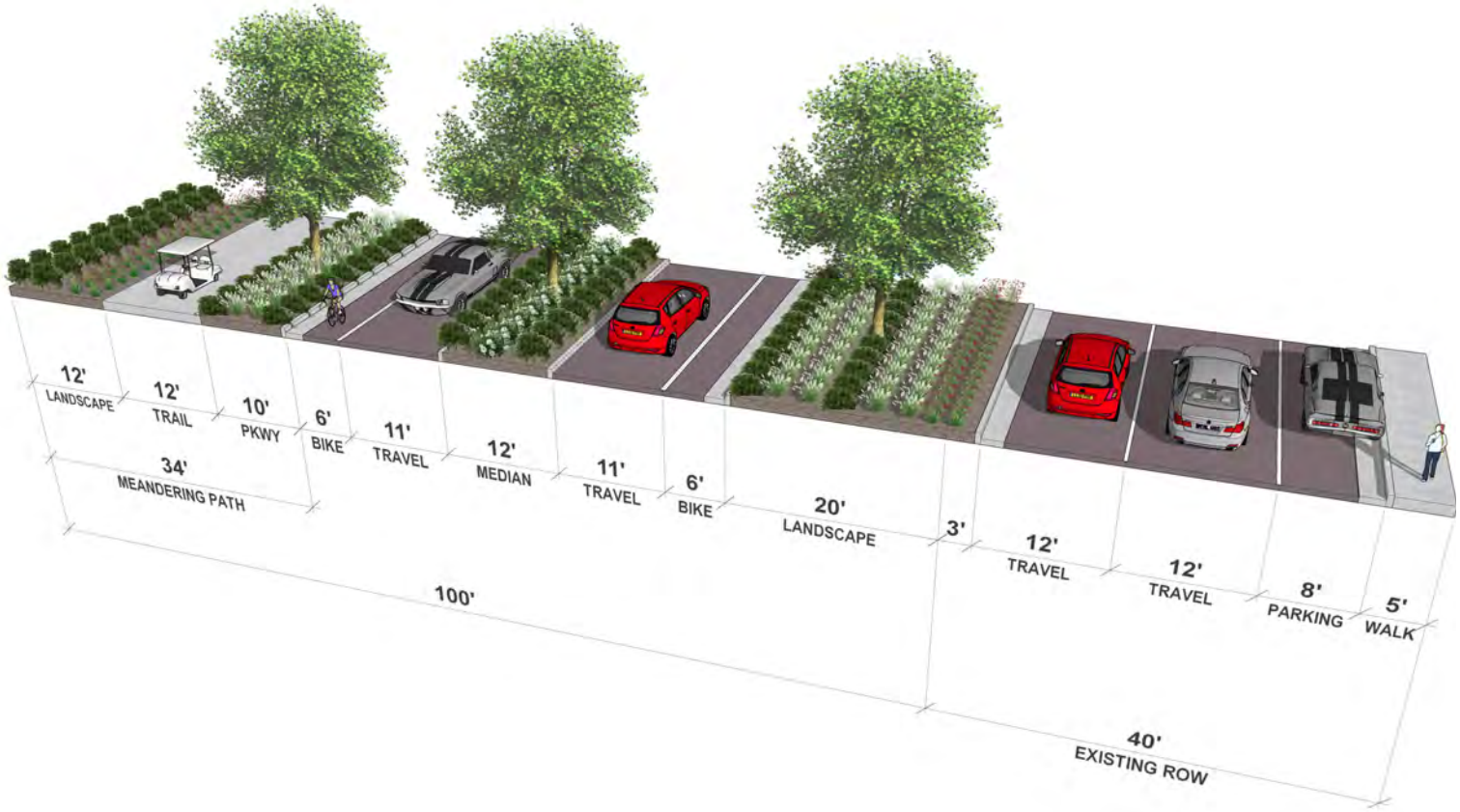
NIBLICK ROAD - MEADOWLARK TO SCOTT





4.1.L STREETSCAPES

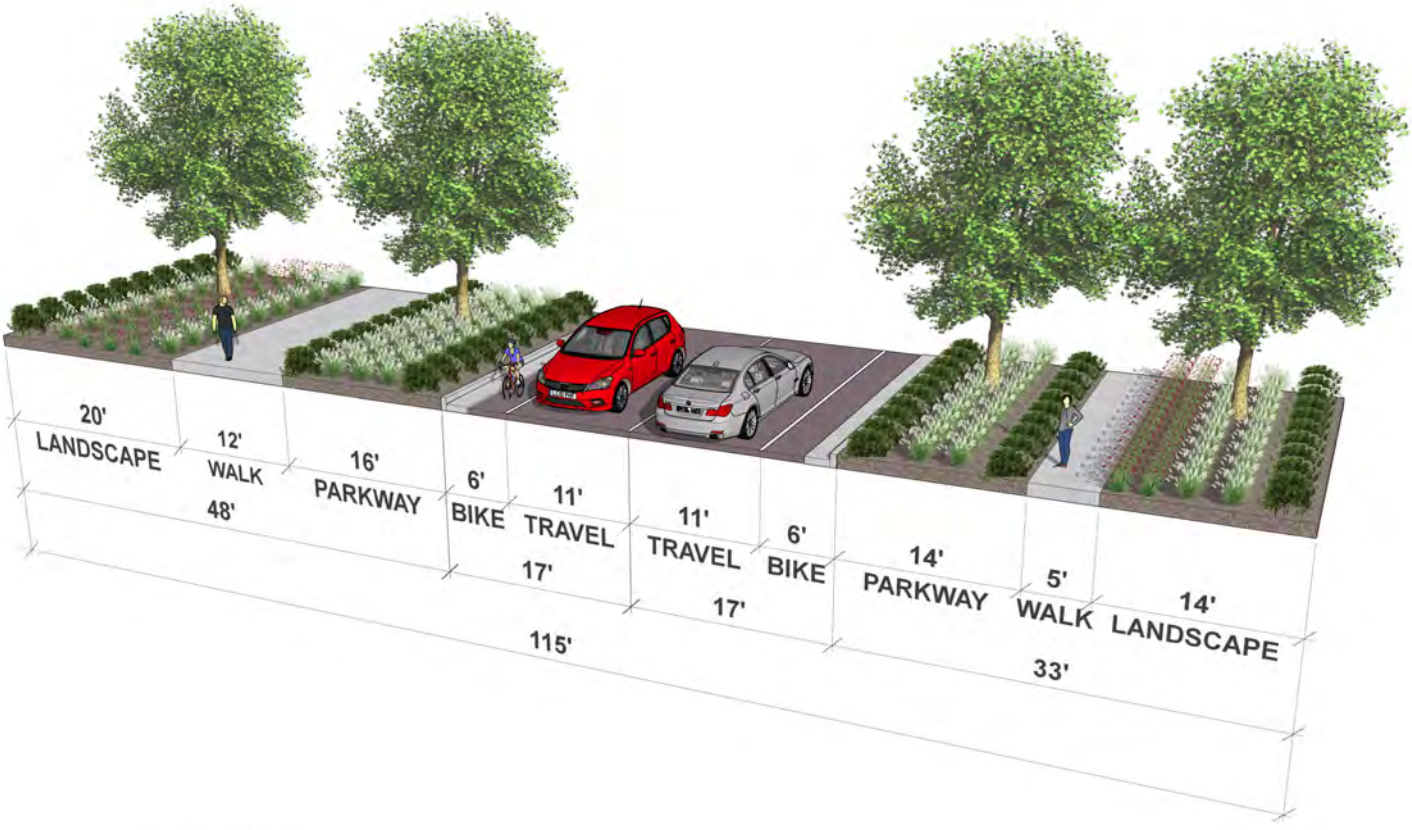
NIBLICK ROAD - WITH OUR TOWN FRONTAGE



4.1 | Landscape Design Guidelines

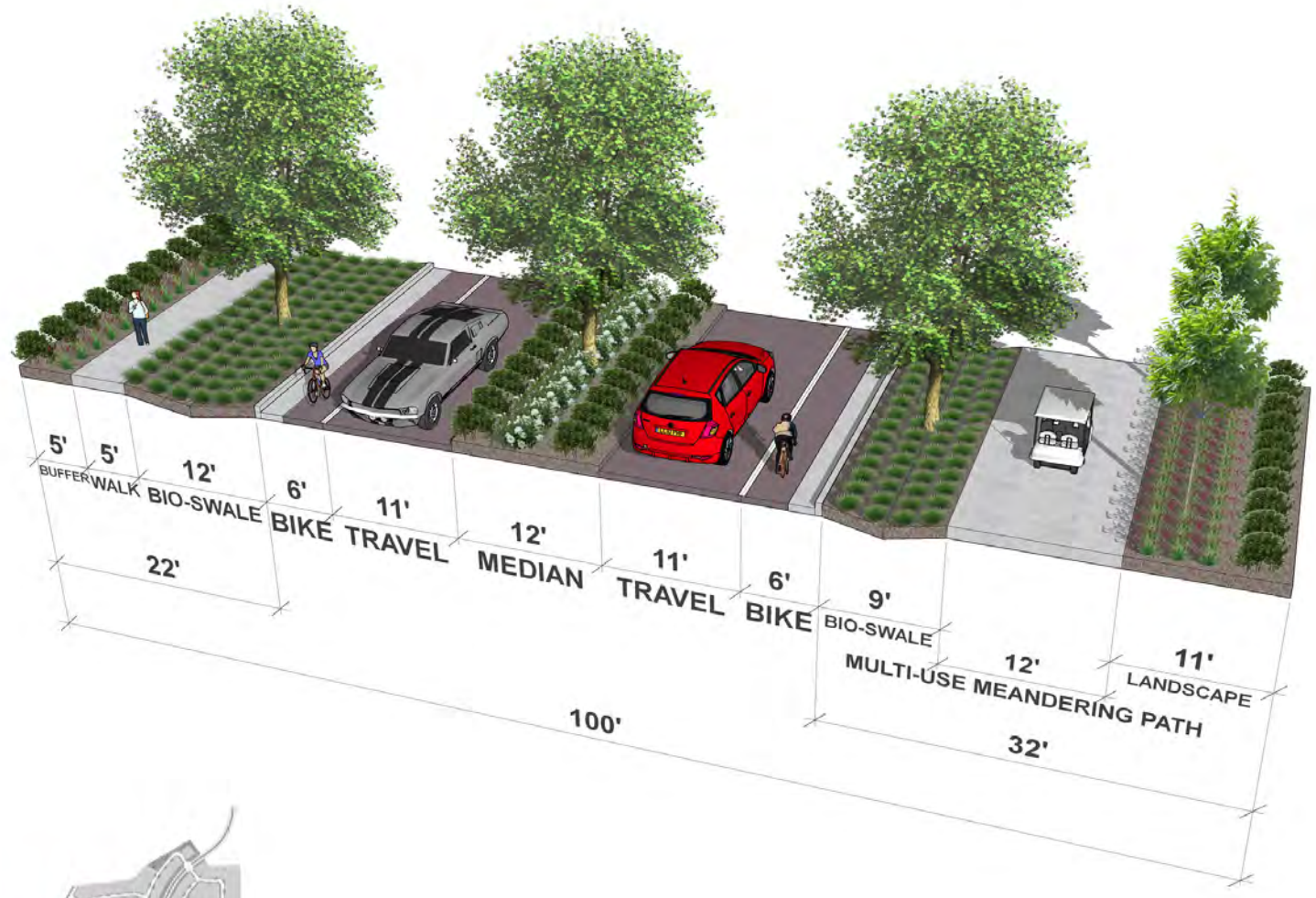
4.1.L STREETSCAPES

NIBLICK ROAD - AT TURTLE CREEK CROSSING



4.1.L STREETSCAPES

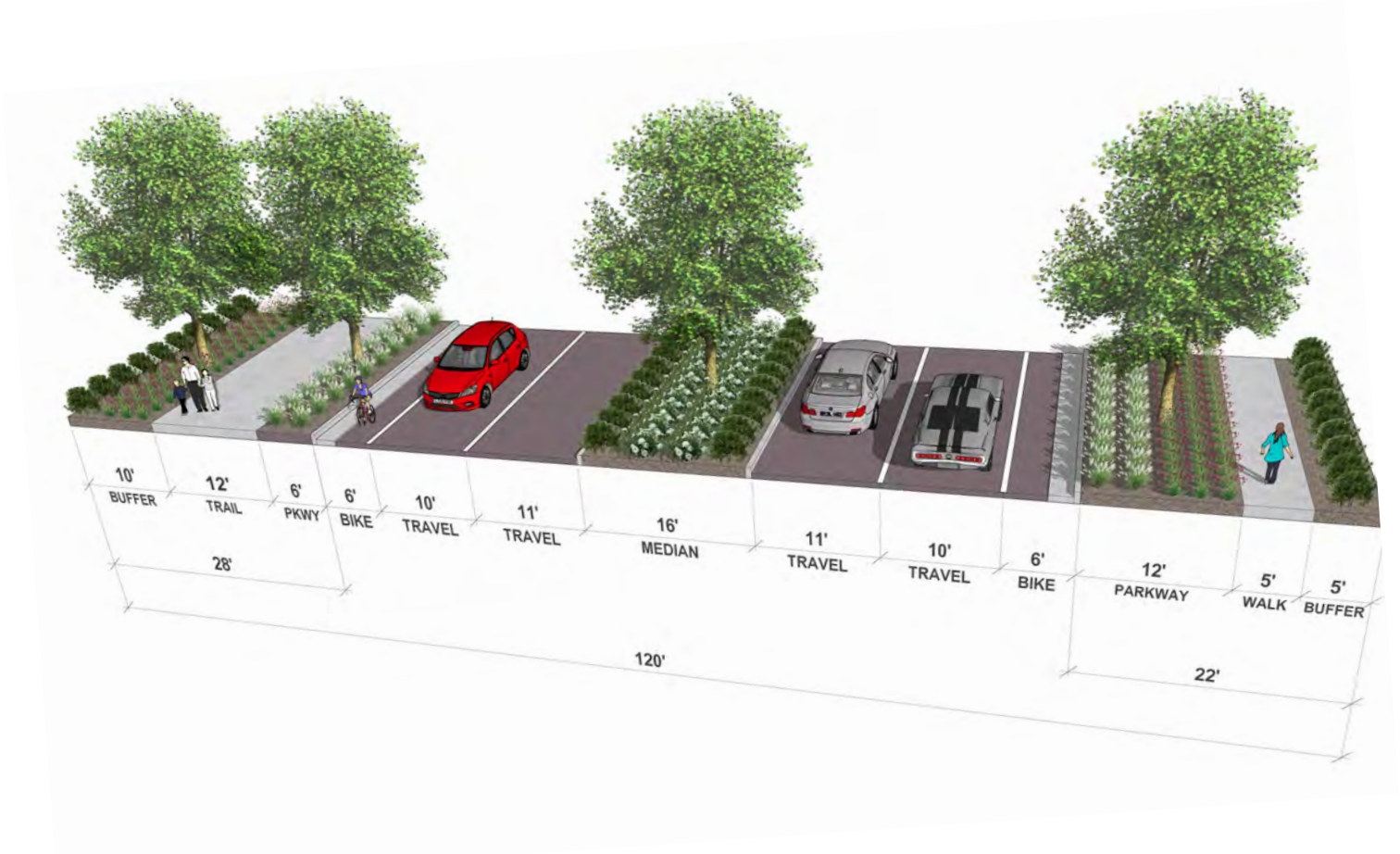
NIBLICK ROAD - AIRPORT RD. TO FONTANA RD.

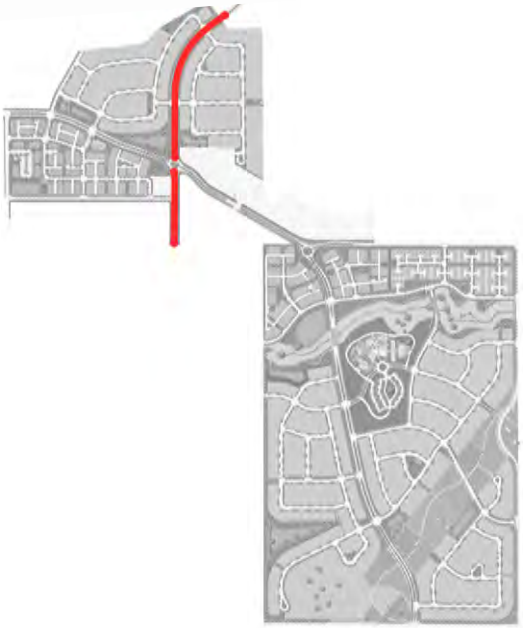


4.1 | Landscape Design Guidelines

4.1.L STREETSCAPES

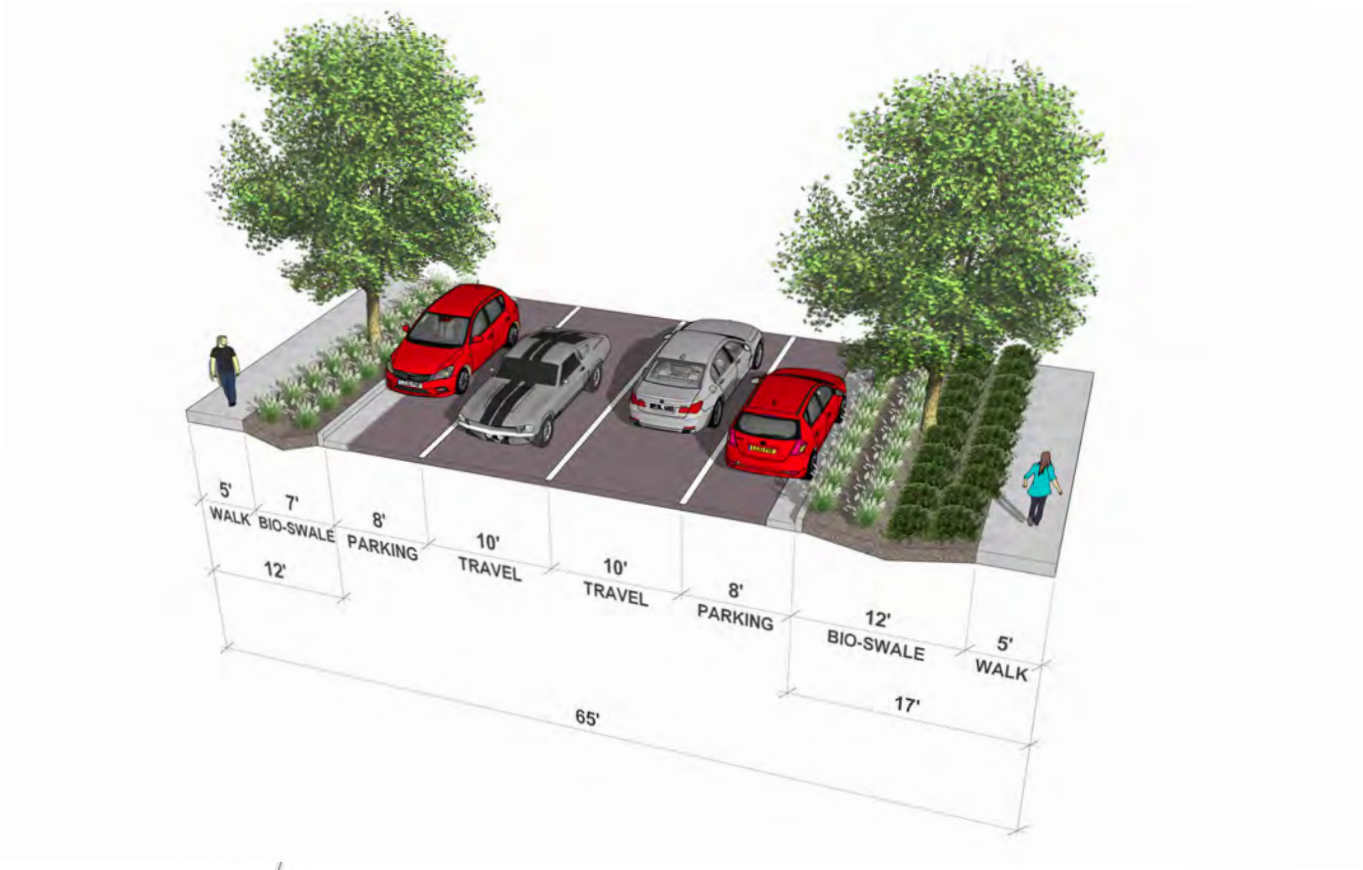
AIRPORT ROAD





4.1.L STREETSCAPES

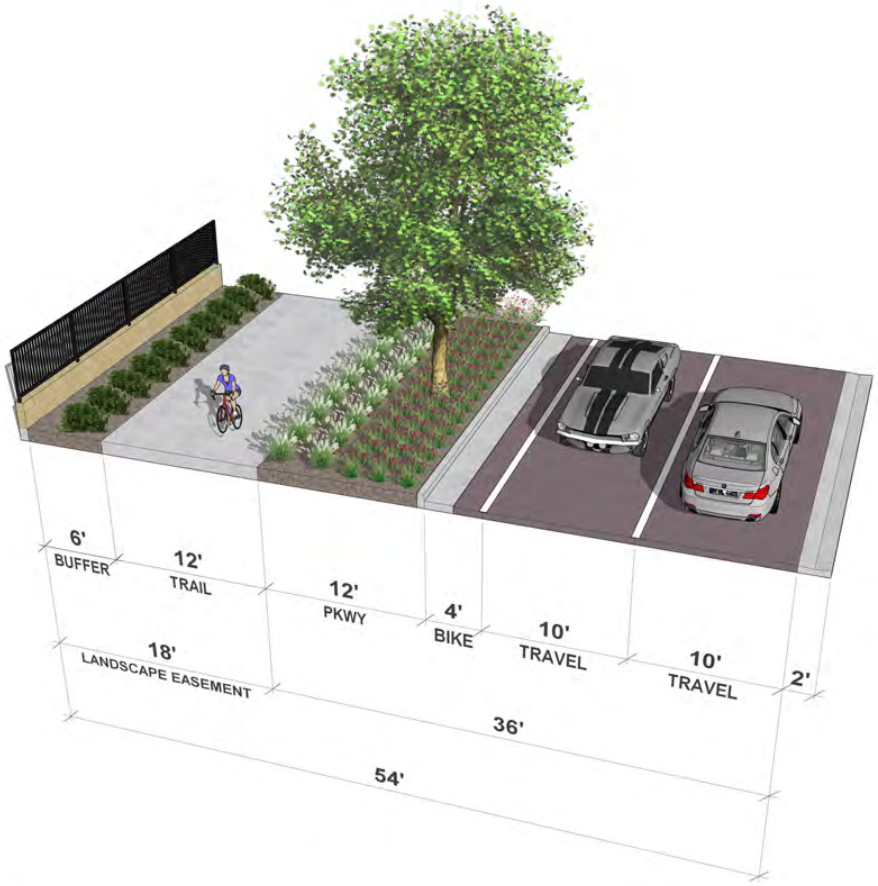
PARKVIEW STREET EXTENSION



4.1 | Landscape Design Guidelines

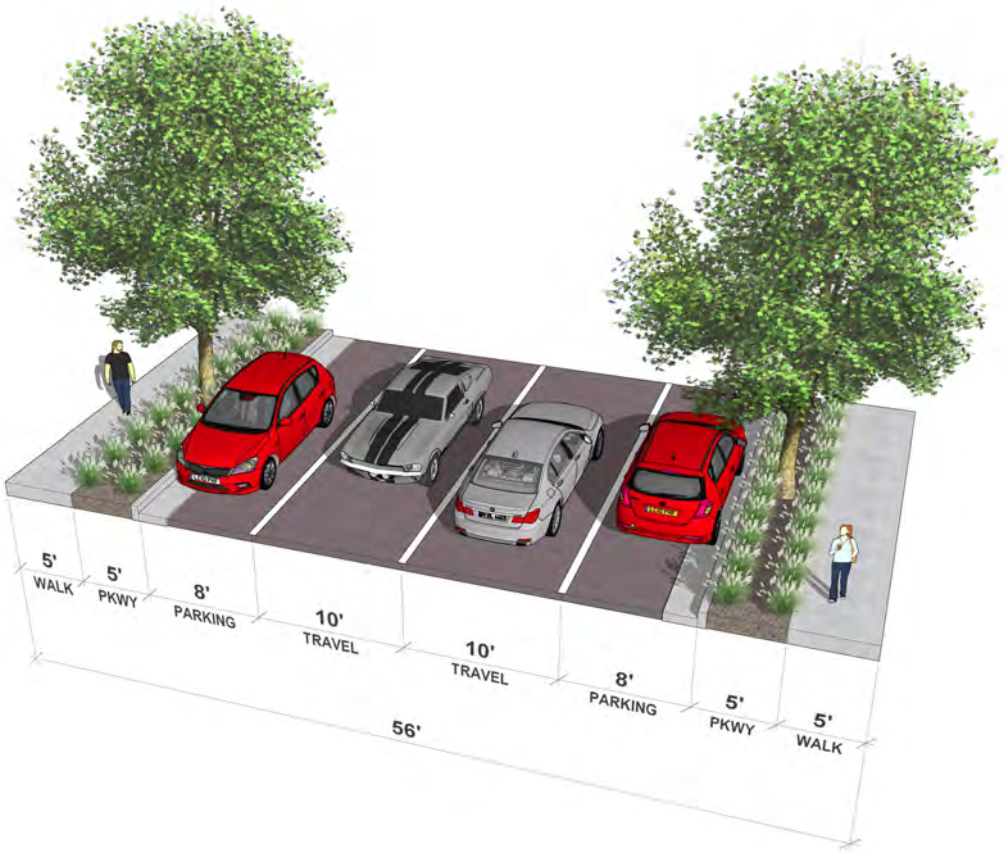
4.1.L STREETSCAPES

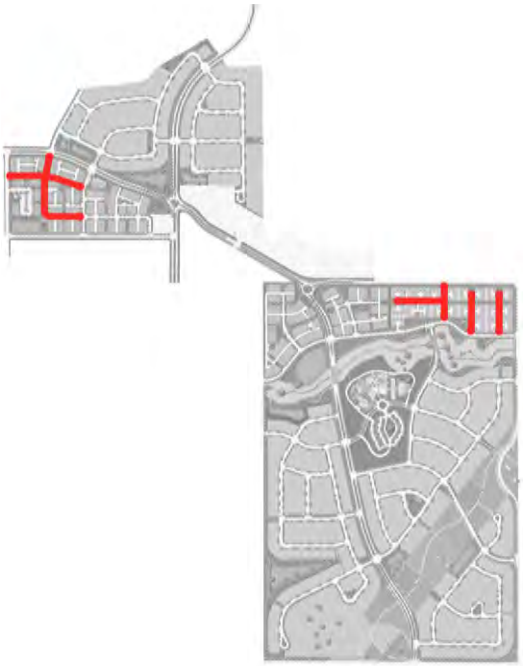
PERIMETER ROAD



4.1.L STREETSCAPES

LOCAL ROAD - MOTORCOURT & TOWNHOMES



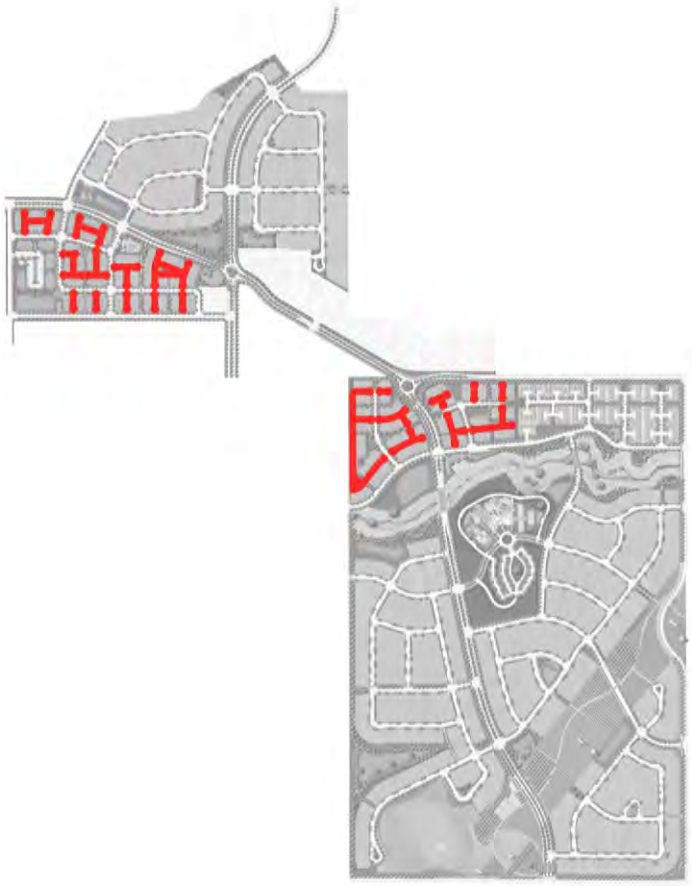


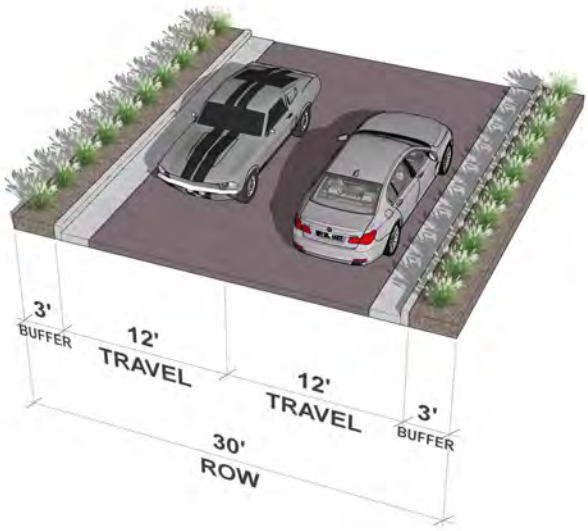
4.1 | Landscape Design Guidelines

4.1.L STREETSCAPES

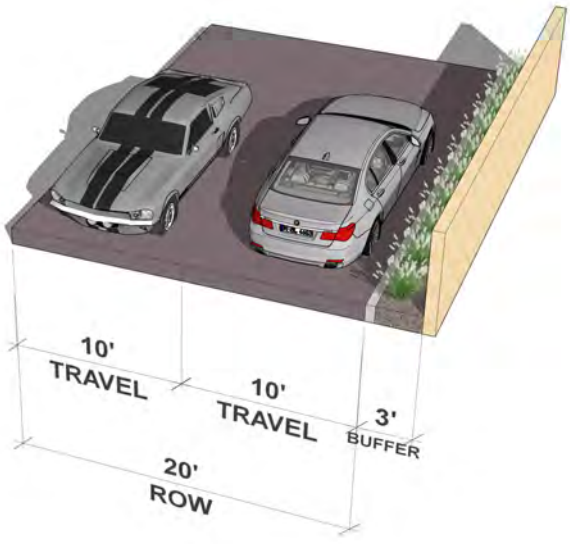
LOCAL ROAD - TYPICAL

4.1.L STREETSCAPES





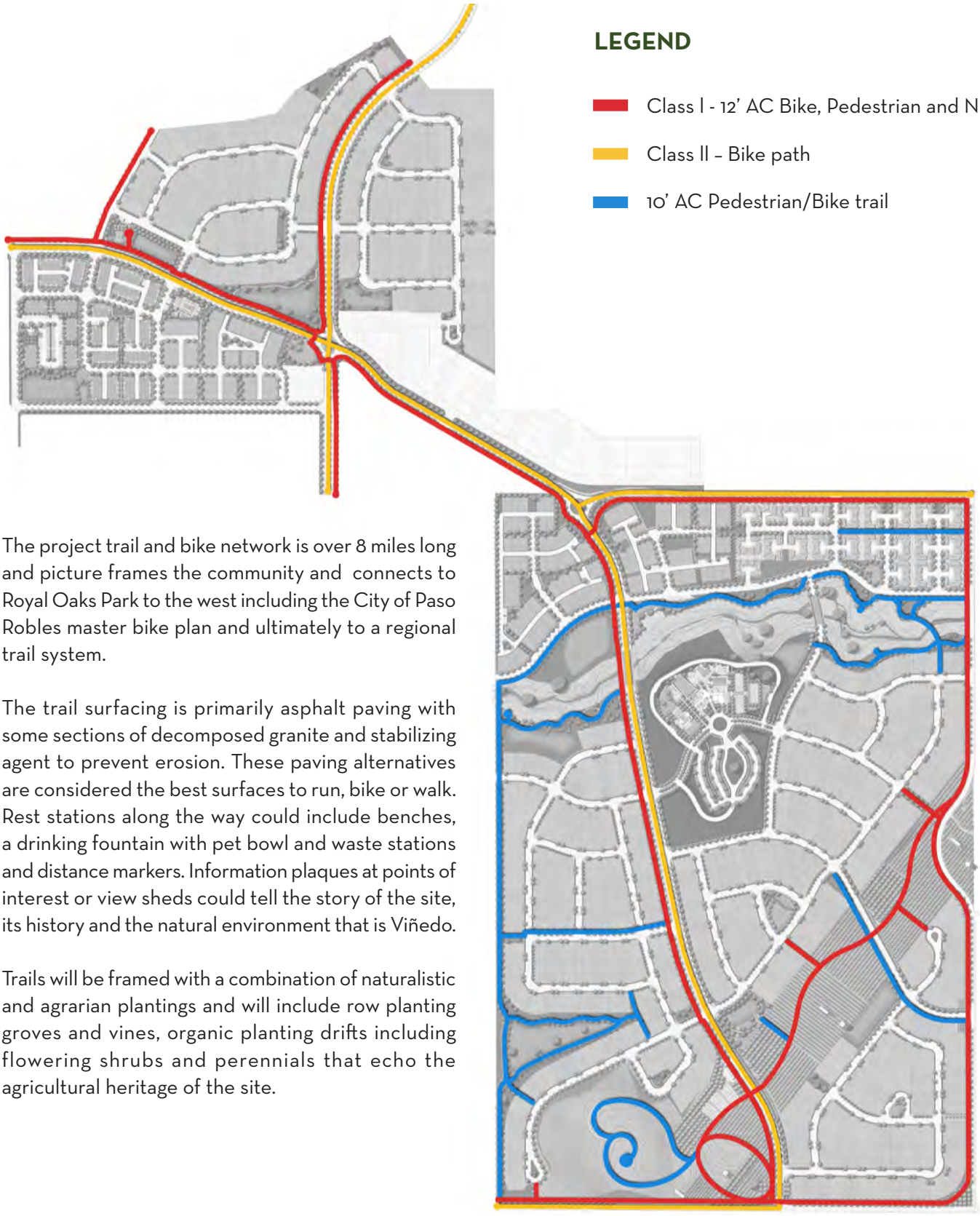
PUD ALLEY



POPPY LANE

4.1 Landscape Design Guidelines

4.1.M TRAIL PLAN

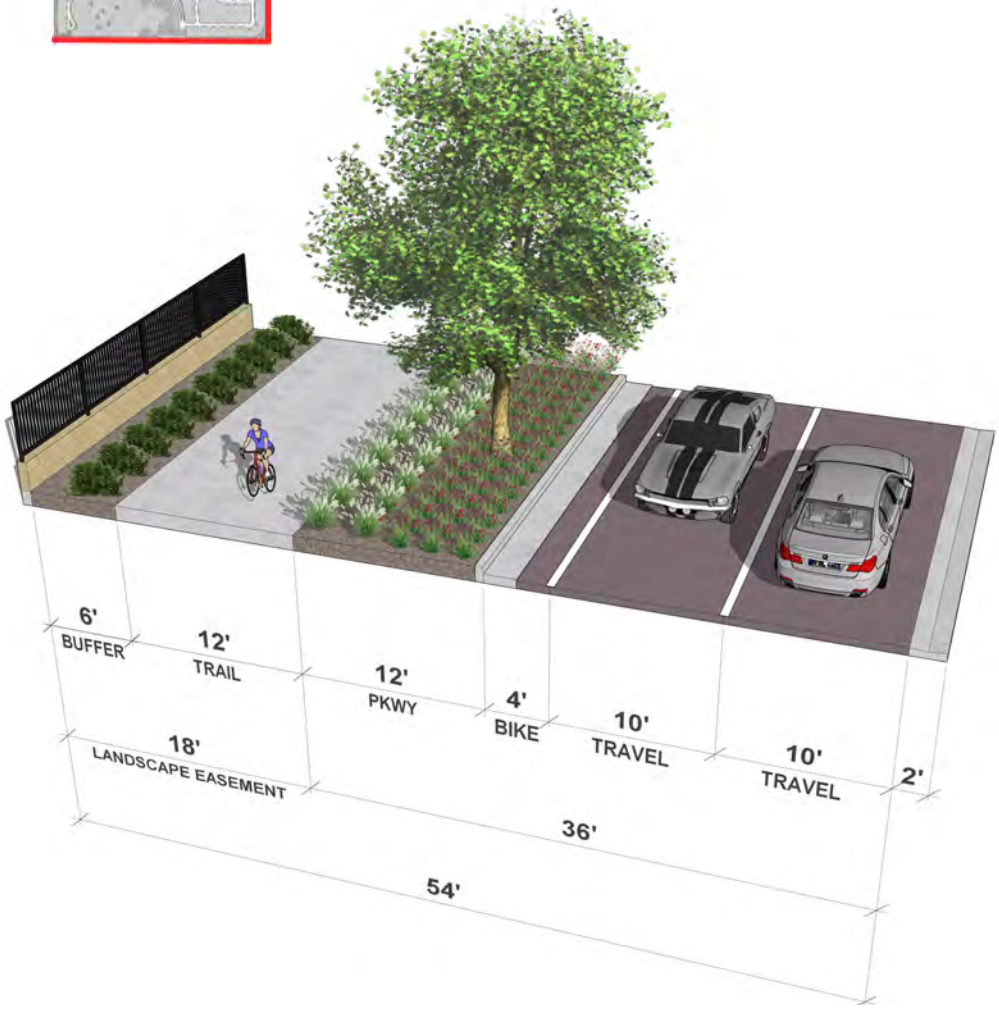


The project trail and bike network is over 8 miles long and picture frames the community and connects to Royal Oaks Park to the west including the City of Paso Robles master bike plan and ultimately to a regional trail system.

The trail surfacing is primarily asphalt paving with some sections of decomposed granite and stabilizing agent to prevent erosion. These paving alternatives are considered the best surfaces to run, bike or walk. Rest stations along the way could include benches, a drinking fountain with pet bowl and waste stations and distance markers. Information plaques at points of interest or view sheds could tell the story of the site, its history and the natural environment that is Viñedo.

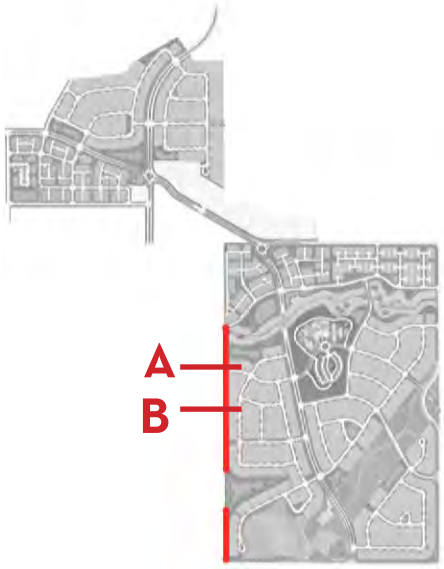
Trails will be framed with a combination of naturalistic and agrarian plantings and will include row planting groves and vines, organic planting drifts including flowering shrubs and perennials that echo the agricultural heritage of the site.

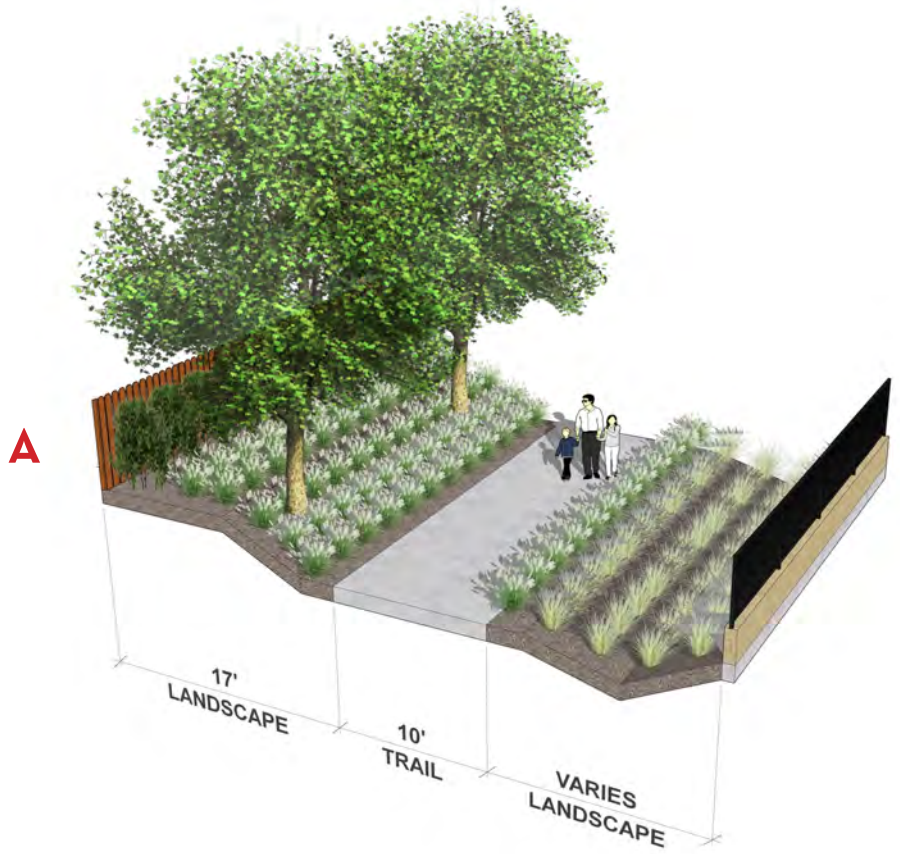
4.1.N PERIMETER TRAIL

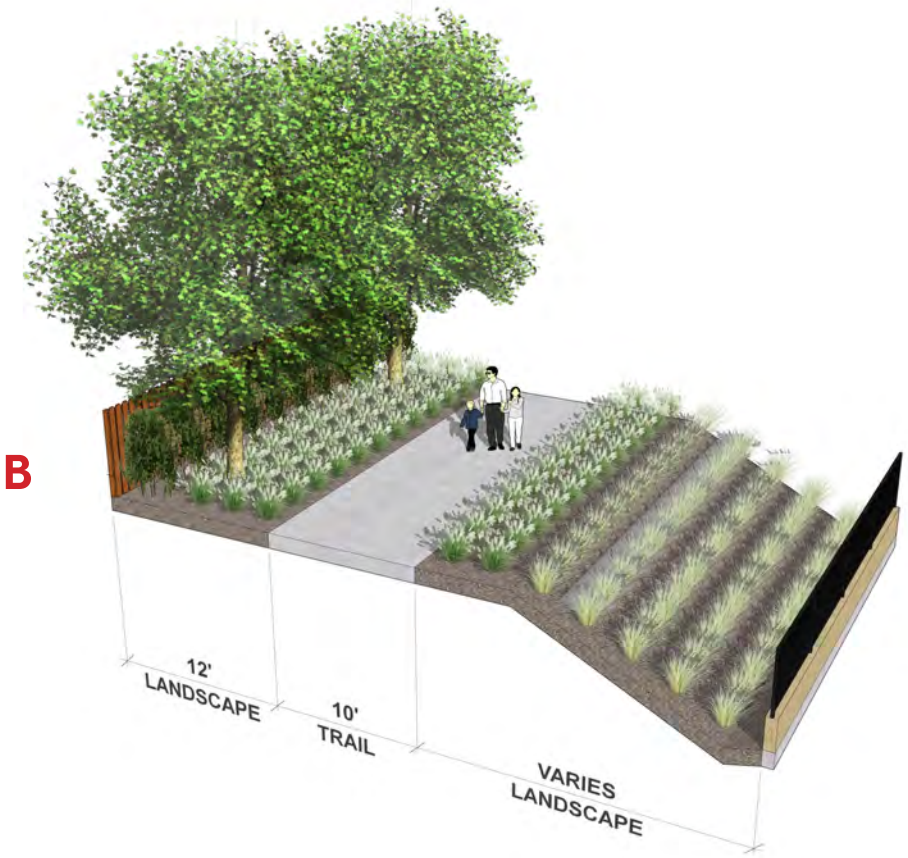


4.1 | Landscape Design Guidelines

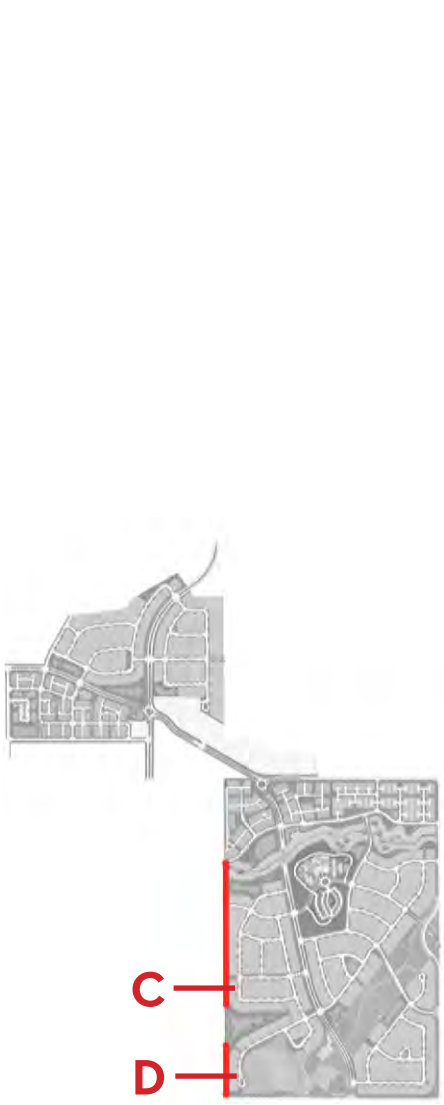
4.1.O EXISTING RESIDENTIAL INTERFACE

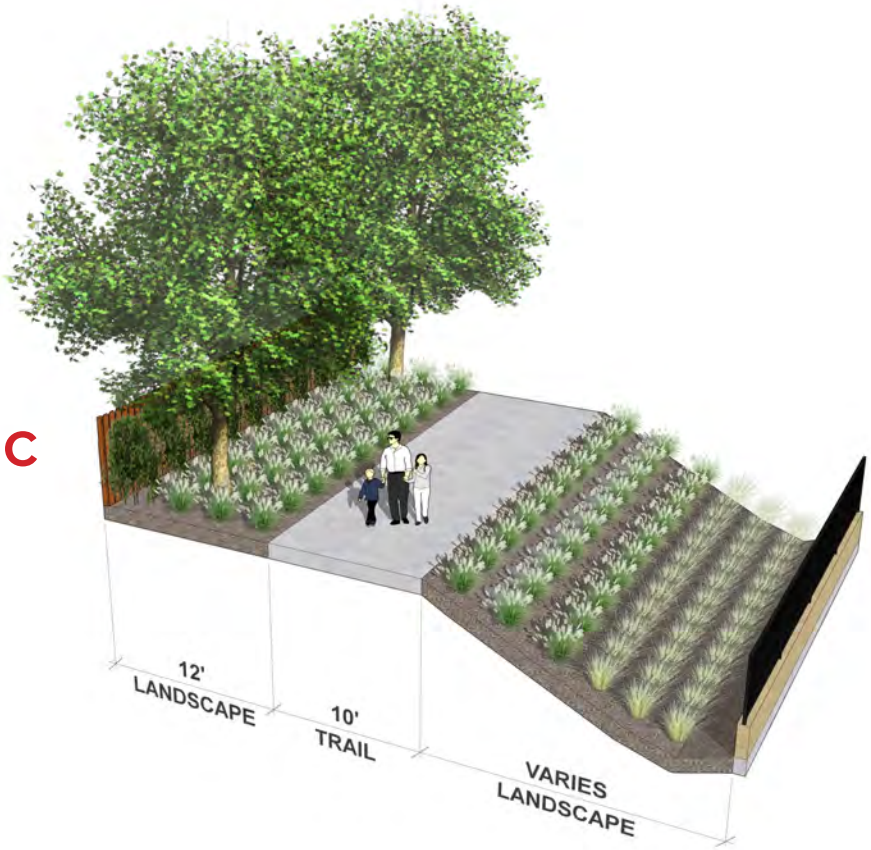


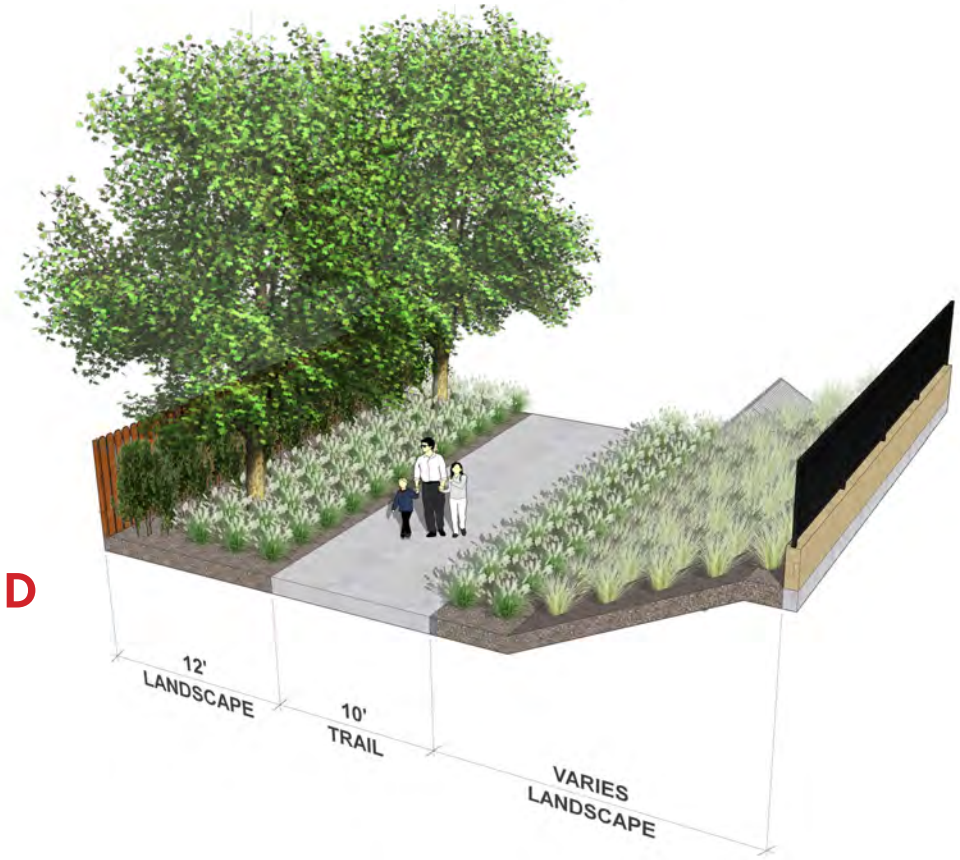




4.1.O EXISTING RESIDENTIAL INTERFACE







4.1 Landscape Design Guidelines

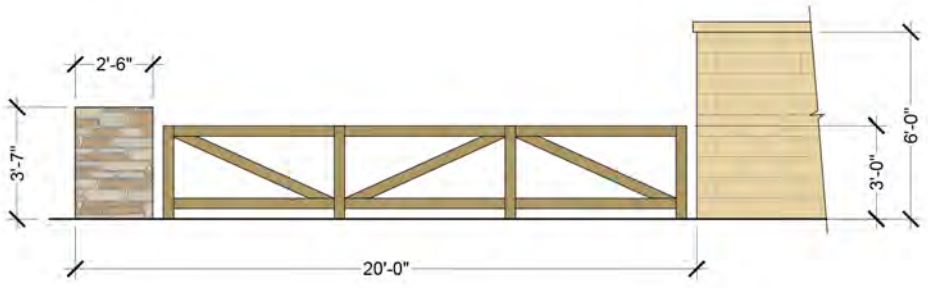
4.1.P WALLS & FENCING

The builder is responsible for all interior walls and fences.

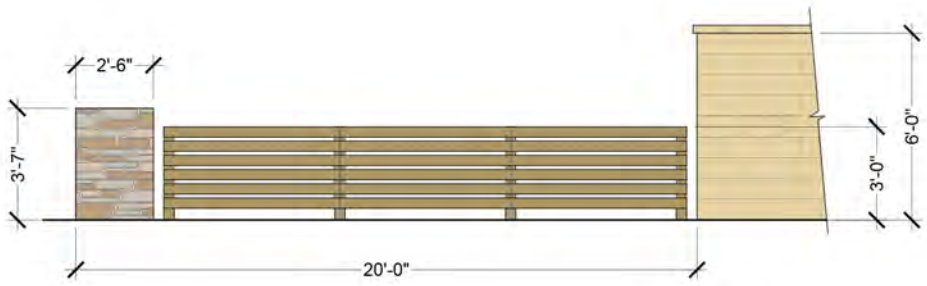
- The builder is to coordinate the design and location of all retaining and freestanding walls/fencing so that they become an integral part of both the architecture and the site design concept.
- Limit retaining walls to 5' as measured from the top of grade in front of the wall to top of wall cap.
- Where retaining conditions require walls to be higher than 5', the wall shall be separated into two or more walls with a minimum of 3' between each wall for screen planting. Side yard retaining walls will be 6'.
- Retaining walls are to comply with the City of Paso Robles' standards.
- View fencing shall be metalized steel, trap fencing or trail/park fencing .
- Side yard walls shall have a minimum of 5' setback from any sidewalks or curbs (Motorcourt side yard walls can be setback 3').
- Courtyard walls, fences, and gates may vary to reflect the architectural style.
- Courtyard walls, fences, and gates shall be located a minimum of 2' from back of sidewalk.

MATERIALS

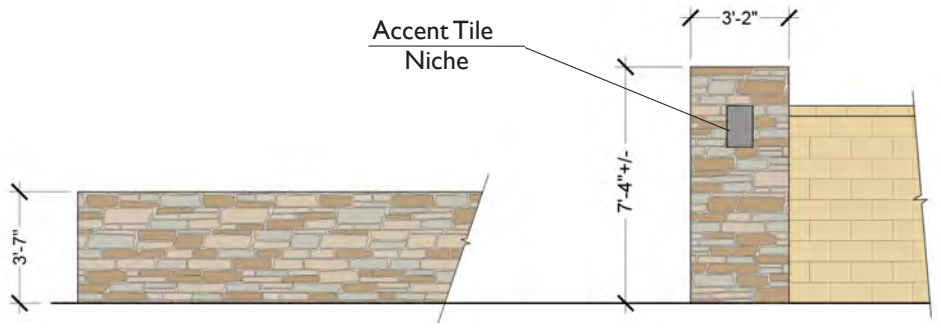
- Stone Veneer: Natural or Faux, to be selected
- Stone Pilasters at neighborhood entries will receive a community accent tile
- Masonry Block & Cap: Smooth Texure or Split-face Block, Smooth Texture Block Cap
- Fences: Wood or Concrete
- Trap fencing may be a combination of metal and wood. Colors should reflect adjacent building color palette
- Metal View Fence: Dark Bronze color



SIDEYARD OPEN FENCE WITH PILASTER

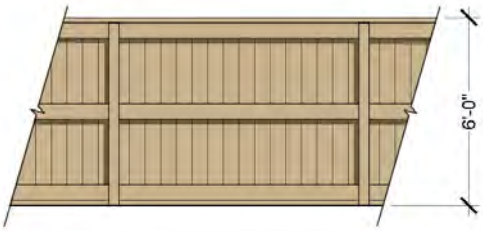


SIDEYARD HORIZONTAL FENCE WITH PILASTER

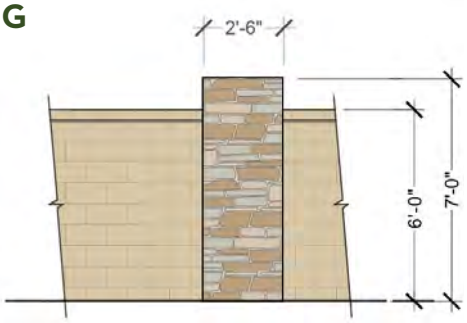


LOW STONE WALL **STONE PILASTER**

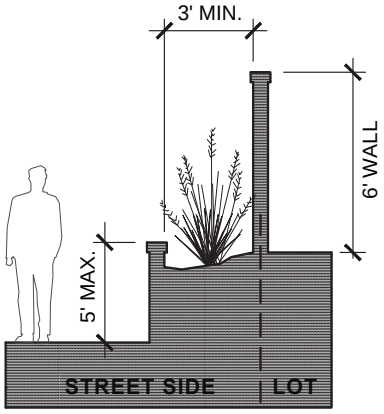
4.1.P.I EXAMPLE WALLS & FENCING



WOOD PRODUCTION FENCE
(Painted where exposed to Street)

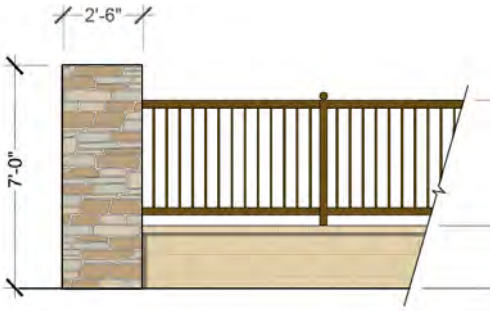


MASONRY WALL WITH CAP
& INTERVAL PILASTER
(MIN. 75' to 100' O.C. to)



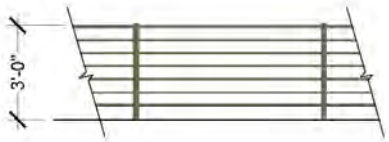
RETAINING WALL DETAIL

VIEW FENCE - OPT A

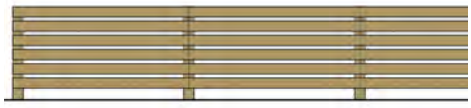


VIEW FENCE - OPT B

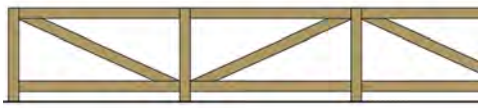
COURTYARD MASONRY WALL WITH CAP



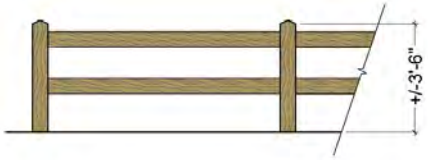
TRAP FENCE



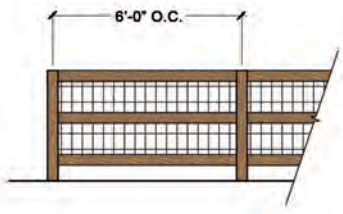
FRONT YARD FENCE (3' HT.) - OPT. A



FRONT YARD FENCE (3' HT.) - OPT. B



CONCRETE SPLIT RAIL TRAIL FENCE



TRAIL / PARK FENCE

4.1 | Landscape Design Guidelines

4.1.P.II SIDEYARD GATES

The builder is responsible for all gates:

- Pedestrian gates shall be designed appropriate to the architecture style and incorporate features consistent with the style.
- Side yard gates are to be solid to screen views into the yards.
- In neighborhoods where gates are maintained by the Homeowner's Association, side yard gate designs are to be consistent. The colors may vary to match the Architecture.

GATE EXAMPLES

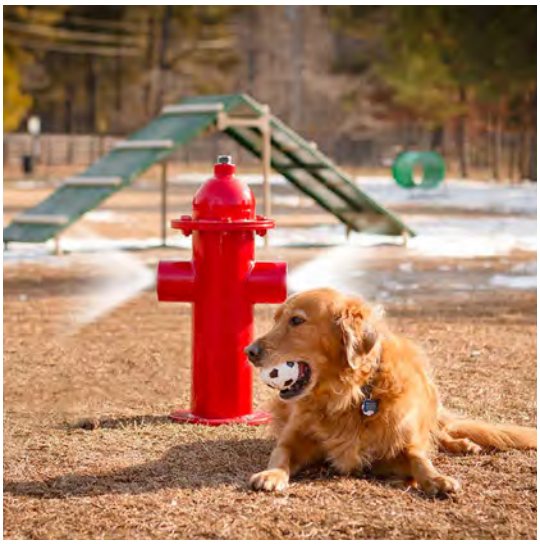
4.1 Landscape Design Guidelines

4.1.Q PARK & STREETSCAPE FURNISHINGS

Site furniture is a critical element in creating a visually pleasing pedestrian scaled community and neighborhood. Furnishings should be located and designed to reinforce the character of community.

- The use of street furniture such as benches, pots, litter receptacles, and permanent decorative elements is encouraged. In order to insure consistency within the five knolls community, matching amenities are encouraged.
- Material: Furniture shall be constructed of high quality, durable materials.
- Locations: Furniture shall be permanently mounted, and be located near areas of outdoor public use and gathering. Furniture shall not obstruct access to buildings or impede handicap accessibility.
- Benches and chairs TBD
- Litter and recycling receptacles are TBD

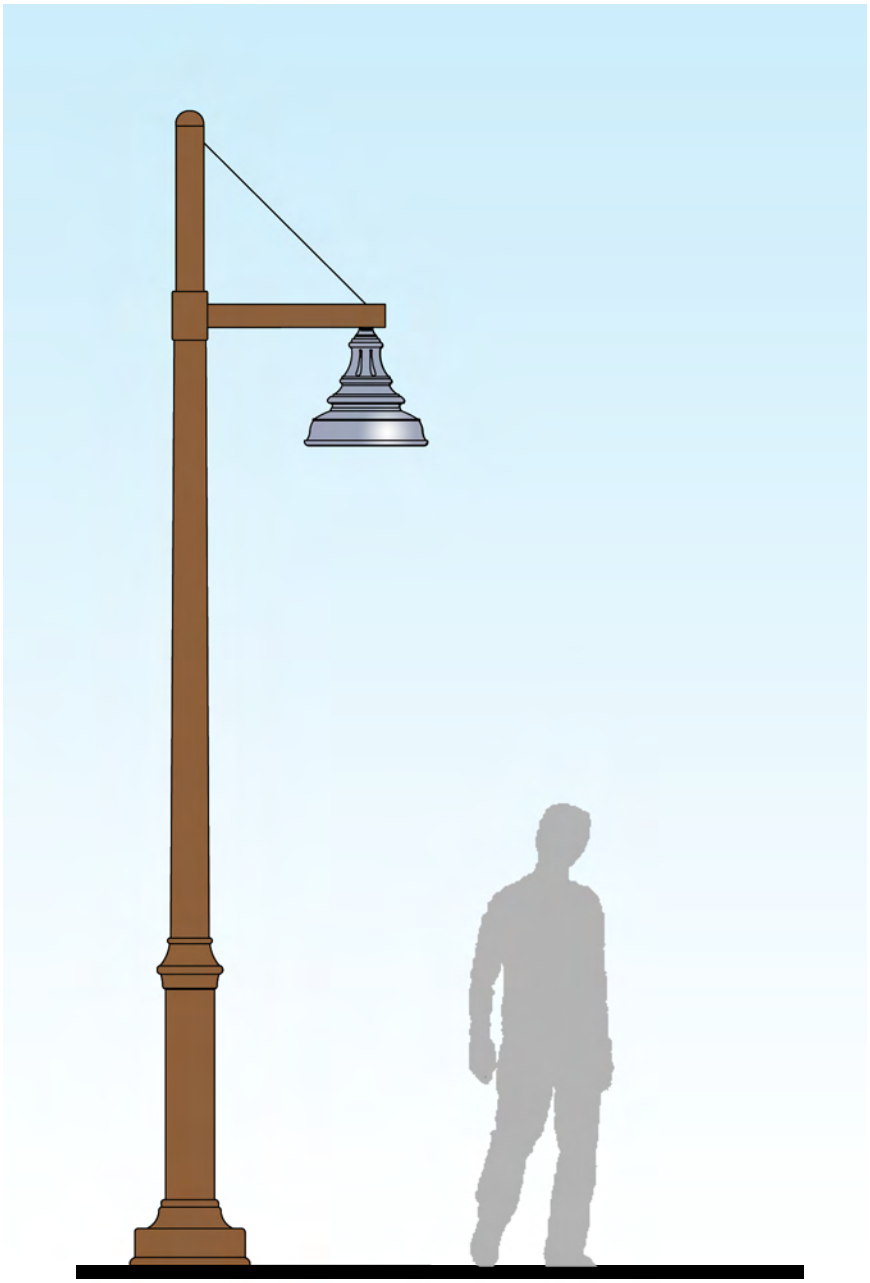
4.1.R DOG PARK FURNISHINGS



4.1.S EXAMPLE LIGHTING FIXTURES

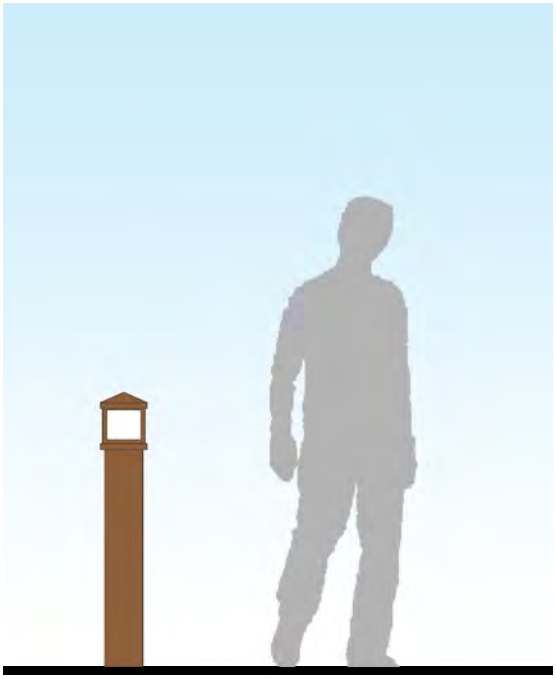
PARK LIGHTING

The park lighting fixtures follow the eclectic style of Viñedo combining traditional, contemporary, and industrial agriculture design components. The park light exhibits a pedestrian scale and compliments the architecture vernacular of the park structures



STREET LIGHTING

PG&E approved "Epic" light fixture with wood grain concrete pole.



4.1 Landscape Design Guidelines

4.1.T TYPICAL FRONT YARD CRITERIA

(Note: See Part 2: Design Submittal Package for Typical Front Yard Planting Plans)

FRONT YARD LANDSCAPING CRITERIA:

- Front yard landscaping will be installed by the Home Builder and maintained by the private homeowner.
- Trees will be installed a minimum of five feet away from any utility.
- Trees will be installed a minimum of ten feet away from any street light unless directed otherwise by the City.
- Linear root barriers should be installed at each tree planted six feet or closer from a curb or walk. Root barriers on the curb side should be 24" deep minimum. Root barriers installed on the walkway side should be 18" deep. In all cases, the root barriers should extend six feet to each side of tree trunk.
- Each lot should have at least one 24" box tree from the Community Plant Palette. This tree should have a minimum planting size of nine feet tall and three to four feet wide.
- Deciduous trees should be planted on the west facing side of homes to provide shade in the summer and allow maximum solar gain in the winter.
- All turf installations shall comply with the City of Paso Robles Water Efficient Landscape Ordinance (WELO) standards.
- Due to the wide variety of soil conditions found throughout Paso Robles, extra care should be given to prepare and apply soil amendments prior to planting.
- 'Structural Soil' should be considered for tree planting in areas that might be subject to compaction, such as street edges, narrow medians and parking lots.
- All irrigation should comply with applicable City (Paso Robles) standards and details.
- Irrigation systems should utilize water conserving methods and incorporate water efficient technologies such as drip emitters, sub-grade capillary action, irrigation for turf areas, evapotranspiration controllers and moisture sensors.
- Landscaping that is installed by the Home Builder should include hardscape coverage such as decorative paving, decking, and stones for non-irrigated areas.
- Each tree should be watered by two deep watering bubbler type irrigation heads on a separate system.
- Landscape character should reflect the form and or the community and its surrounding natural landscape.
- Shrubs shall be a minimum of 40% 1 gallon and 60% 5 gallon.
- Plants to be selected from the Master Plant Palette. Any variations from the Master Palette must be approved by the Master Developer and be compatible with Sunset Book's climate zone 18.

4.1.T NATIVE OAK REPLANTING PROGRAM

Native oaks that are removed shall be replaced according to the City's Oak Tree Preservation Ordinance in Chapter 10.01.050 of the Code of Ordinances.

4.1.U STREET TREE PLAN

Street trees will be installed by either the Master Developer or the Home Builder and maintained by the City as part of the public Right of Way.

LEGEND

- Koelreuteria paniculata- Chinese Flame Tree
- Olea Europe Wilsonii- Wilson Olive
- Pistache chinensis- Chinese Pistache
- Platanus racemosa- Western Sycamore
- Zelkova serrata- Zelkova
- Niblick Road - Platanus acerfolia (parkways), Quercus virginiana (median island)
- Airport Boulevard- Koelreuteria paniculate (parkway), Quercus agrifolia (median island)

4.1 | Landscape Design Guidelines

4.1.V COMMUNITY PLANT PALETTE

TREE PALETTE

SYM	COMMON NAME	BOTANICAL NAME	WUCOLS	DECIDUOUS/ EVERGREEN
T-1	STRAWBERRY TREE	ARBUTUS UNEDO	L	E
T-2	CHINESE FRINGE TREE	CHIONANTHUS RETUSUS	M	D
T-3	LEMON, ORANGE, ETC	CITRUS SPP.	M	E
T-4	AUSTRALIAN WILLOW	GEIJERA PARVIFLORA	M	E
T-5	GOLDENRAIN TREE	KOELREUTERIA PANICULATA	M	D
T-6	CRAPE MYRTLE (RED)	LAGERSTROEMIA INDICA 'DYNAMITE'	L	D
T-7	CRAPE MYRTLE (WHITE)	LAGERSTROEMIA INDICA 'NATCHEZ'	L	D
T-8	CRAPE MYRTLE (PINK)	LAGERSTROEMIA INDICA 'MUSKOGEE'	L	D
T-9	BAY LAUREL	LAURUS NOBILIS	L	E
T-10	SARATOGA BAY	LAURUS NOBILIS 'SARATOGA'	L	E
T-11	MAGNOLIA	MAGNOLIA GRANDIFLORA 'SAMUEL SOMMER'	M	E
T-12	OLIVE	OLEA EUROPAEA	VL	E
T-13	FRUITLESS OLIVE	OLEA EUROPAEA 'SWAN HILL'	VL	E
T-14	CHINESE PISTACHE	PISTACIA CHINENSIS 'KEITH DAVIES'	L	D
T-15	LONDON PLANE	PLATANUS X ACERIFOLIA AND CVS.	M	D
T-16	WESTERN SYCAMORE-NATIVE	PLATANUS RACEMOSA	M	D
T-17	HOLLY OAK	QUERCUS ILEX	L	E
T-18	VALLEY OAK - NATIVE	QUERCUS LOBATA	L	D
T-19	COAST LIVE OAK - NATIVE	QUERCUS AGRIFOLIA	L	E
T-20	BLUE OAK - NATIVE	QUERCUS DOUGLASII	VL	D
T-21	SOUTHERN LIVE OAK	QUERCUS VIRGINIANA	M	E
T-22	BRISBANE BOX	LOPHOSTEMON CONFERTUS	M	E
T-23	SAW LEAF ZELKOVA	ZELKOVA SERRATA	M	D

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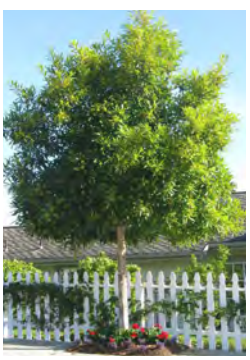
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4.1 Landscape Design Guidelines

4.1.V COMMUNITY PLANT PALETTE

SHRUB PALETTE

SYM	COMMON NAME	BOTANICAL NAME	WUCOLS
S-1	CENTURY PLANT	AGAVE AMERICANA	VL
S-2	WHALES TONGUE AGAVE	AGAVE OVATIFOLIA	VL
S-3	WEBER AGAVE	AGAVE WEBERI	VL
S-4	STALKED BULBINE	BULBINE FRUTESCENS	L
S-5	FORTNIGHT LILY	DIETES BICOLOR	L
S-6	DWARF BOTTLE BRUSH	CALLISTEMON CITRINUS 'LITTLE JOHN'	L
S-7	EVERGREEN EUONYMUS	EUONYMUS JAPONICUS	L
S-8	PINEAPPLE GUAVA	FEIJOA SELLOWIANA	L
S-9	RED YUCCA	HESPERALOE PARVIFOLIA	L
S-10	RED HOT POKER	KNIPHOFIA UVARIA	L
S-11	NEW GOLD LANTANA	LANTANA X. 'NEW GOLD'	M
S-12	WHITE LIGHTNIN' LANTANA	LANTANA SELLOWIANA 'MONMA'	L
S-13	BAY LAUREL	LAURUS NOBILIS	L
S-14	WALKER'S LOW CATMINT	NEPETA X FAASSENII 'WALKER'S LOW'	L
S-15	LITTLE OLLIE DWARF OLIVE	OLEA EUROPAEA 'MONTRA'	VL
S-16	RUSSIAN SAGE	PEROVSKIA ATRIPLICIFOLIA	L
S-17	DWARF YEDDO HAWTHORNE	RHAPHIOLEPIS UMBELLATA 'MINOR'	L
S-18	CARPET ROSE	ROSA	M
S-19	FLORIBUNDA ROSE	ROSA FLORIBUNDA	M
S-20	ROSEMARY	ROSMARINUS OFFICINALIS 'TUSCAN BLUE'	L
S-21	TRAILING ROSEMARY	ROSMARINUS 'PROSTRATUS'	L
S-22	MEXICAN BUSH SAGE	SALVIA LEUCANTHA "SANTA BARBARA'	L
S-23	GERMANDER	TEUCRIUM CHAMAEDRYS	L
S-24	SOCIETY GARLIC	TULBAGHIA VIOLACEA	L
S-25	YUCCA	YUCCA FILAMENTOSA	L

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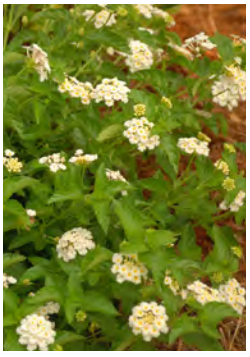
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4.1 Landscape Design Guidelines

4.1.V COMMUNITY PLANT PALETTE

GRASS, GROUNDCOVER & VINE PALETTE

SYM	COMMON NAME	BOTANICAL NAME	WUCOLS
	GRASSES		
G-1	BLUE GRAMMA GRASS	BOUTELOUA GRACILIS	L
G-2	WESTERN MEADOW SEDGE	CAREX PRAEGRACILIS	M
G-3	ATLAS FESCUE	FESTUCA MAIREI 'CANYON PRINCE'	L
G-4	MAIDEN GRASS	MISCANTHUS SINENSIS 'MORNING LIGHT'	M
G-5	WHITE MUHLY GRASS	MUHLENBERGIA CAPILLARIS 'WHITE CLOUD'	L
G-6	PINK MUHLY GRASS	MUHLENBERGIA CAPILLARIS 'REGAL MIST'	L
G-7	PINE MUHLY	MUHLENBERGIA DUBIA	L
G-8	LINDHEIMER'S MUHLY	MUHLENBERGIA LINDHEIMERI	L
G-9	MEXICAN FEATHER GRASS	NASSELLA TENUISSIMA	L
G-10	EVERGREEN FOUNTAIN GRASS	PENNISETUM 'FAIRY TAILS'	M
G-11	SLENDER VELDT GRASS	PENNISETUM SPATHIOLATUM	L
G-12	AUTUMN MOOR GRASS	SESLERIA AUTUMNALIS	M
G-13	FEATHER REED GRASS	CALAMAGROSTIS X ACUTIFLORA 'KARL FOERSTER'	L
	GROUNDCOVER		
GC-1	MYOPORUM	MYOPORUM PARVIFOLIUM & CVS.	L
GC-2	GROUNDCOVER ROSES	ROSA 'DRIFT SERIES'	M
	VINES		
V-1	CREEPING FIG	FICUS PUMILA	M
V-2	CAT'S CLAW VINE	MACFADYENA UNGUIS-CATI	L
V-3	BOSTON IVY	PARTHENOCISSUS TRICUSPIDATA	M

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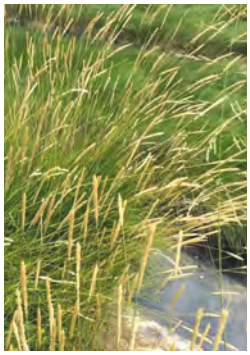
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GC-1

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4.2 Architectural Design Guidelines

4.2 ARCHITECTURAL DESIGN GUIDELINES

The purpose of this section is to provide guidance on the architectural design and massing of the various homes and structures within Viñedo.

4.2.A VISION STATEMENT

The community of Viñedo is designed to reflect the rich agrarian and architectural histories of the region. The design intent is to create a community that touches upon this history while adapting to meet the needs of today's active lifestyles and market expectations. To accomplish this, a palette of architectural styles was derived from these indigenous historical influences of the region.

Viñedo will offer a wide variety of new housing options and amenities, appropriately, in four architectural styles.

Three styles were identified for the residential buildings in Viñedo: Progressive Spanish, Modern Farmhouse and Wine Country Chic. Influenced by the numerous rural and agricultural buildings in the region; a fourth style, Commercial Agrarian, was chosen for the amenity and commercial structures located throughout the community.

The following architectural guidelines work in conjunction with the extensive network of open space and amenities to create an immersive environment that is an extension of the history of the site. This consistent architectural language creates a unique and strong a sense of place. The extensive landscape design found throughout the community also seeks to marry the built and natural environments, further reinforcing this theme.

4.2.B ARCHITECTURAL STYLES

As a tribute to the City and its history, the styles chosen for Viñedo were inspired by the rich architectural history of Paso Robles. While incorporating modern adaptations and contemporary features expected in today's housing market, the architectural styles chosen were derived from indigenous historical influences of the region.

Spanish architectural influences first migrated north from Mexico in the early 1800's. A combination of the westward movement, fertile farmland and natural hot springs initially drew pioneers to the region.

Agriculture became the catalyst for the growth of Paso Robles, incorporating in 1889. Wine grapes were first planted as early as 1797 by the Spanish conquistadors and Franciscan missionaries.

Today Paso Robles is one of the most desired wine growing regions in the country.

The Progressive Spanish, Modern Farmhouse and Wine Country Chic styles complement one another while using simple yet elegant details to differentiate themselves. These styles support a myriad of housing typologies and plans that cater to a wide range of lifestyles. Another common theme amongst all housing typologies is their emphasis on indoor/outdoor living opportunities.

4.2.C DESIGN PRINCIPLES

The following principles will help guide the development of the architecture to ensure a high level of quality and design consistency throughout the community:

- Choose appropriate massing and roof forms based on each architectural style;
- Design architectural elements and details to reinforce style languages;
- Create diverse and visually interesting streetscenes by varying styles, colors and materials along streetscapes;
- Architecture-forward: designs should emphasize architecture and deemphasize garages; and
- Utilize porches and patios to soften streetscapes and promote social interaction.

4.2.D ARCHITECTURAL PLAN MIX

- Homes and multi-family buildings shall be plotted in a manner that provides a variety of plans and elevation styles along all streetscapes.
- No two plans may be plotted next to or directly across from one another.
- Plotting the same elevation style for more than two buildings in a row is discouraged to promote streetscape diversity.
- Where multi-family buildings of the same type must plotted next to or across from each other, different elevation styles and color palettes shall be used.

Each neighborhood shall have a minimum of the following floor, unit and building plans and elevation styles:

SINGLE FAMILY NEIGHBORHOODS

SFD Conventional Lots (70x110s)

- 3 floor plans
- 3 elevation styles each

SFD Conventional Lots (60x110s)

- 3 floor plans
- 3 elevation styles each

SFD Conventional Lots (50x110s)

- 3 floor plans
- 3 elevation styles each

SFD Greencourts (40x80 Alley-Loaded):

- 3 floor plans
- 3 elevation styles each

SFD Motorcourts

- 3 floor plans
- 3 elevation styles each

MULTI-FAMILY NEIGHBORHOODS

Townhomes

- 5 unit plans
- 3 building plans
- 2 elevation styles each

Multi-Family

- 4 unit plans
- 1 building plan
- 2 elevation styles

4.2.E MULTI-FAMILY SITE PLANNING

BUILDING PLACEMENT

Buildings should be placed along the perimeter of blocks and edges of open space to better define the streetscape and reinforce purposeful spaces.

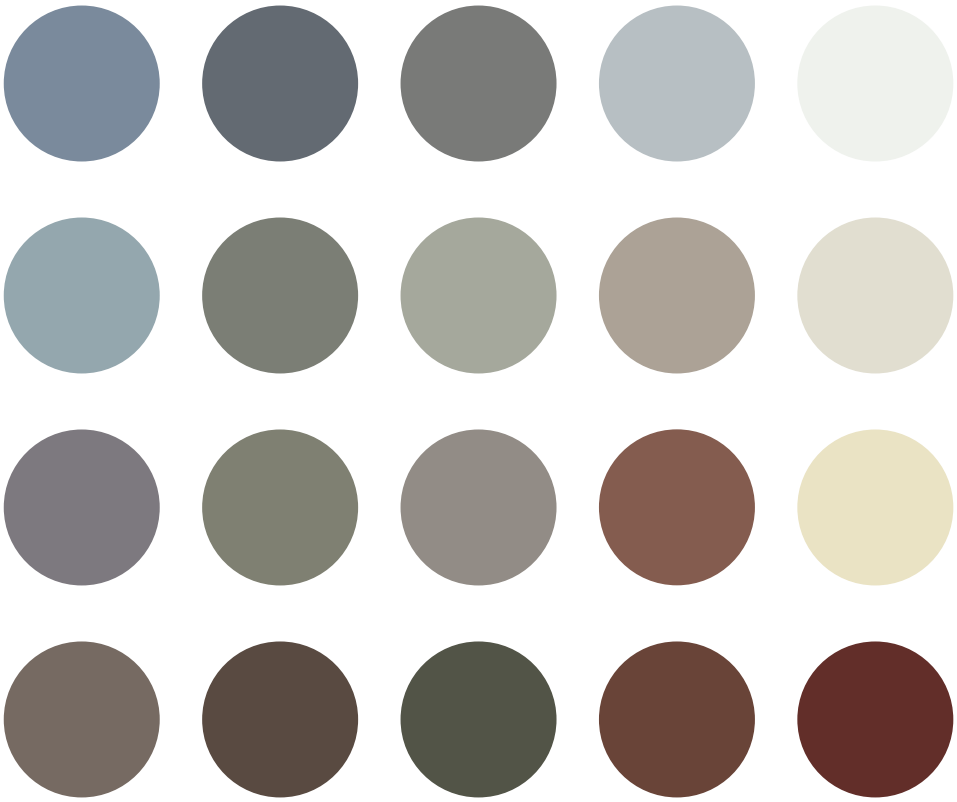
PARKING

Surface parking shall be located mid-block whenever possible to minimize its visual impact from surrounding public frontages.

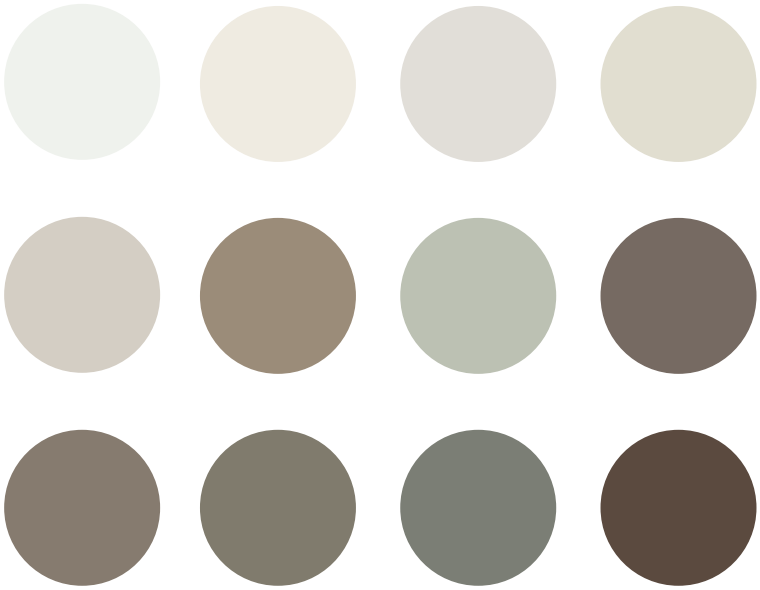
4.2 Architectural Design Guidelines

4.2.F COLORS & MATERIALS

BODY COLORS-SIDING



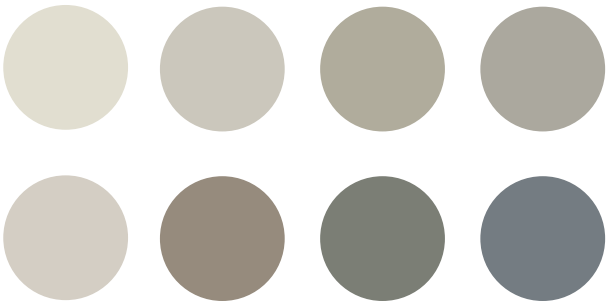
BODY COLORS-STUCCO



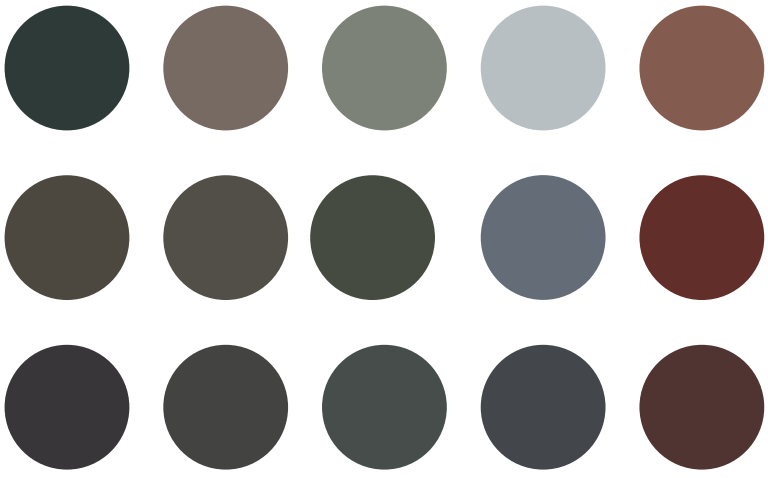
4.2 | Architectural Design Guidelines

4.2.F COLORS & MATERIALS

TRIM COLORS



ACCENT COLORS



4.2 Architectural Design Guidelines

4.2.F COLORS & MATERIALS

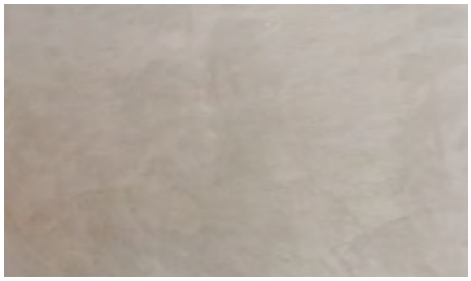
STONE

BOARD-FORMED NATURAL CONCRETE

BRICK

4.2.F COLORS & MATERIALS

SMOOTH STUCCO



SAND FINISH STUCCO

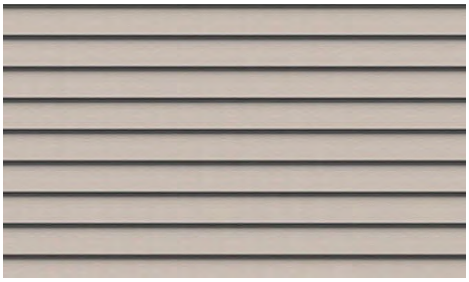
BOARD AND BATTEN SIDING

CEMENTITIOUS SHAKE

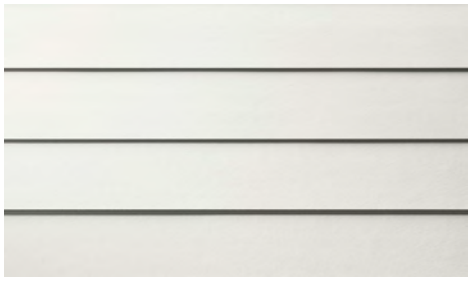
4.2 Architectural Design Guidelines

4.2.F COLORS & MATERIALS

LAP SIDING (HORIZONTAL, NARROW)



LAP SIDING (HORIZONTAL, WIDE)



LAP SIDING (HORIZONTAL, ALTERNATING EXPOSURES)

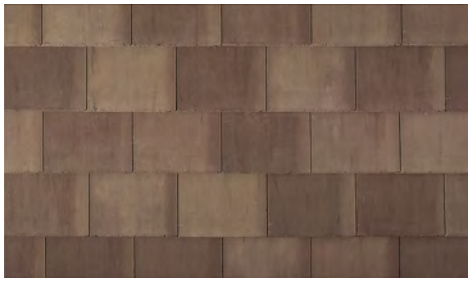
VERTICAL SIDING

4.2.F COLORS & MATERIALS

CONCRETE SHAKE ROOFING

SPANISH TILE

FLAT CONCRETE TILE

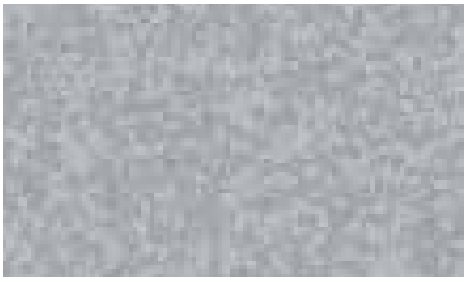


COMPOSITION SHINGLE ROOFING (8:12 PITCH OR GREATER)

4.2 Architectural Design Guidelines

4.2.F COLORS & MATERIALS

STANDING SEAM METAL ROOFING



CORRUGATED STEEL ROOFING

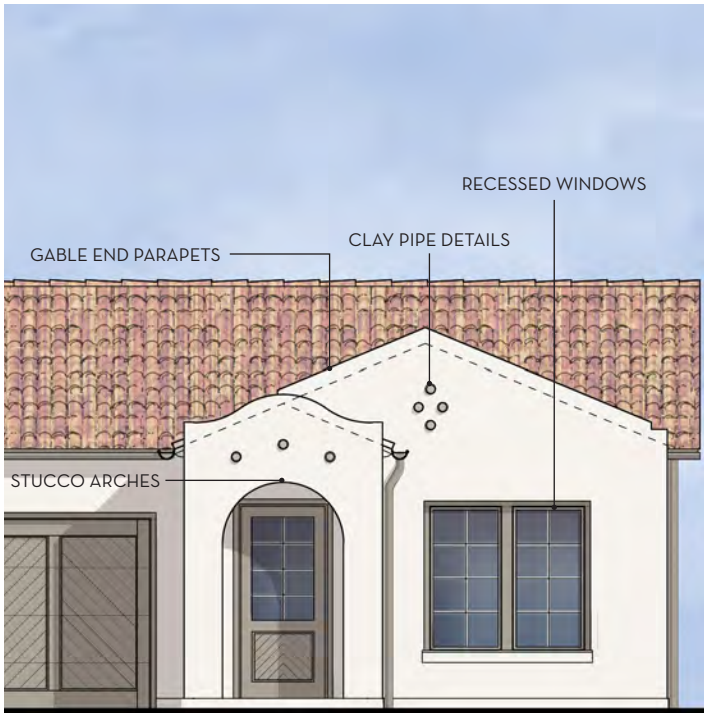
4.2 Architectural Design Guidelines

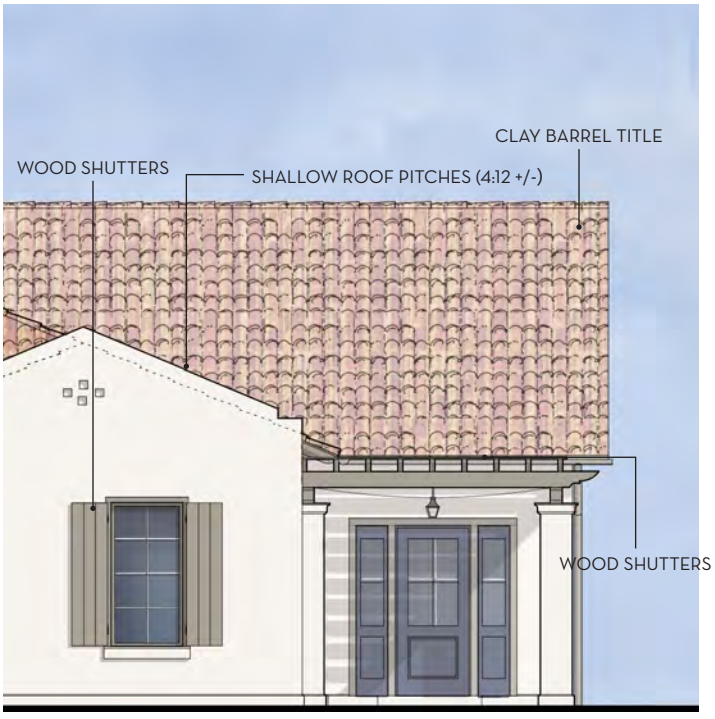
4.2.G PROGRESSIVE SPANISH

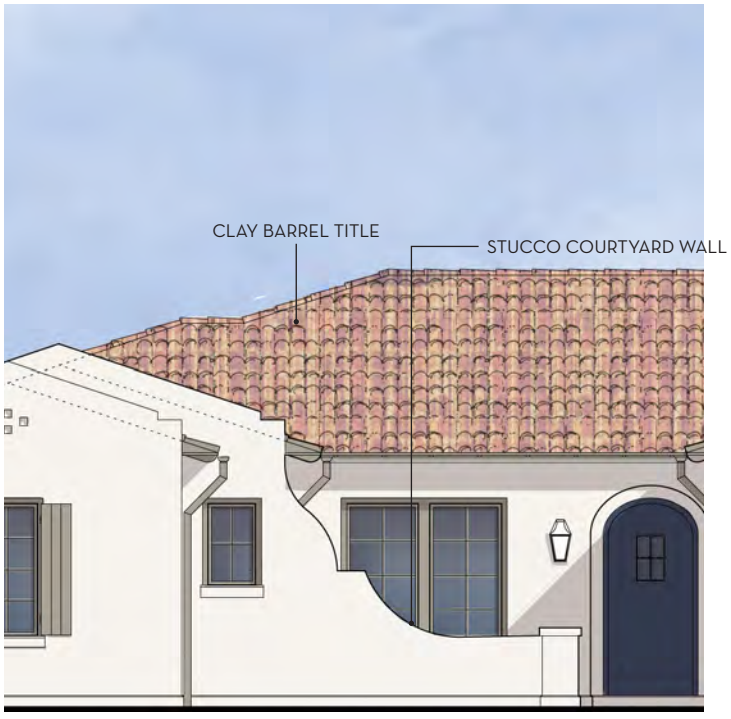
The Progressive Spanish style is a direct evolution of the longstanding Mission style found in the region. With its use of simple massings and clean facades and punched openings, the style easily lends itself to more contemporary and playful adaptations.

Some of the most notable characteristics of the Progressive Spanish style include "S" tile roofs, stucco walls, recessed entry doors and porticos, highlighted ornamental iron work and carefully proportioned windows appropriate to the building massing.

4.2.G.I ELEMENTS OF THE PROGRESSIVE SPANISH STYLE







4.2 Architectural Design Guidelines

4.2.G.I ELEMENTS OF THE PROGRESSIVE SPANISH STYLE

PROGRESSIVE SPANISH DESIGN ELEMENTS		
Elements	Standard Elevations	Enhanced Elevations*
Architectural Components	• Simple massings • Arched accents	• Balconies/verandas • Sun shades/shutters • Decorative metal accents and canopies
Roof Components	• Clean roof forms • Mixture of shallow-roof pitches, parapets and flat roofs • Roof pitch range: flat to 4:12	
Roof Materials	• Concrete barrel tile	• Wood trellis accents
Roof Colors	• Hues of terra cotta	
Wall Materials	• Medium sand float stucco finish (16/20 minimum)	• Stone or tile accents
Wall Colors	• Toned whites & light to medium light value warm colors	
Trim & Details	• Proportional entry light fixtures • Trim as appropriate	
Trim/Accent Colors	• Deep, saturated tones that contrast with the austerity of the clean stucco walls	
Windows	• Recessed • Square or vertical pane proportions	• Deep Recess • Header or Sill details • Shutters
Doors	• Solid or glazed front entry doors	• Arched entry
Garage Doors	• Raised panel or horizontal	• Windows

*Enhanced Elevation elements are required on all front and side-facing facades directly adjacent to a Public Right of Way including streets, parks, paseos, and mid-block pedestrian paths. Such elevations shall have a minimum of (2) two enhanced elements per facade.

4.2.G.II VARIOUS REPRESENTATIONS OF THE PROGRESSIVE SPANISH STYLE

4.2 Architectural Design Guidelines

4.2.H MODERN FARMHOUSE

The Modern Farmhouse style is defined by clean lines and simple geometric forms that are paired with traditional material applications. The style is an evolution of rural Americana and agriculturally influenced designs adapted for today's modern lifestyle.

Conceptual Modern Farmhouse Front Elevation: 50' x 100'

4.2.H.I ELEMENTS OF THE MODERN FARMHOUSE STYLE

4.2 Architectural Design Guidelines

4.2.H.II ELEMENTS OF THE MODERN FARMHOUSE STYLE

MODERN FARMHOUSE DESIGN ELEMENTS		
Elements	Standard Elevations	Enhanced Elevations*
Architectural Components	• Clean lines • Simple geometric forms	• Porches • Patios
Roof Components	• Clean, uncomplicated roof forms • Predominately gable ends • Roof pitch range: 4:12 to 12:12	• Rafter tails
Roof Materials	• Standing Seam, Concrete tile, Corrugated Metal and Composition Shingle (8:12 and greater)	• Standing Seam Roof • Corrugated Metal accents
Roof Colors	• Natural metal, greys and darker tonal values	
Wall Materials	• Board and Batten, siding, shake, Medium sand float stucco finish (16/20 minimum)	• Stone or concrete veneer accents
Wall Colors	• Toned whites & light to medium light value warm colors	
Trim & Details	• Well-placed & proportional entry light fixtures • Trim as appropriate	
Trim Colors	• Stark white or subtly contrasting color	
Windows	• Recessed • Vertically proportioned panes	• Trimmed openings • Shutters
Doors	• Solid or glazed front entry doors	• Stoop or covering
Garage Doors	• Horizontal or raised panel	• Windows

*Enhanced Elevation elements are required on all front and side-facing facades directly adjacent to a Public Right of Way including streets, parks, paseos, and mid-block pedestrian paths. Such elevations shall have a minimum of (2) two enhanced elements per facade.

4.2.H.III VARIOUS REPRESENTATIONS OF THE MODERN FARMHOUSE STYLE

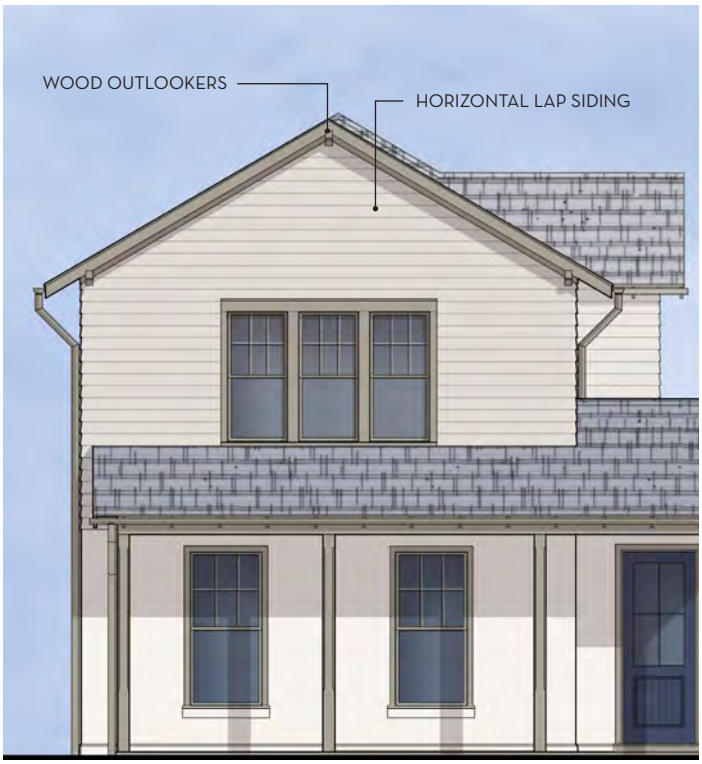
4.2 Architectural Design Guidelines

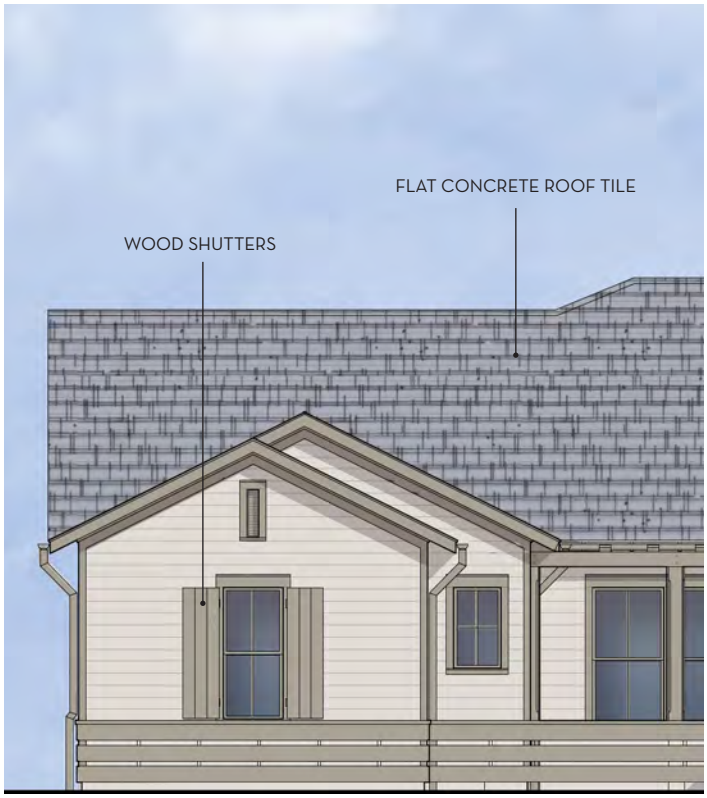
4.2.1 WINE COUNTRY CHIC

Wine Country Chic is a more refined style with rustic roots. The style is characterized by the use of subtle textures and details for a more sophisticated visual palette. Roof forms typically use lower pitches and are either gabled or hipped.

Conceptual Wine Country Chic Front Elevation: 50' x 100'

4.2.1.1 ELEMENTS OF THE WINE COUNTRY CHIC STYLE





4.2 Architectural Design Guidelines

4.2.I.II ELEMENTS OF THE WINE COUNTRY CHIC STYLE

WINE COUNTRY CHIC DESIGN ELEMENTS		
Elements	Standard Elevations	Enhanced Elevations*
Architectural Components	• Simple geometric forms • Horizontal lines	• Porches • Patios
Roof Components	• Simple roof forms • Hip and gable forms • Roof pitch range: 3:12 to 8:12	• Rafter tails
Roof Materials	• Standing Seam, Concrete tile, Corrugated Metal and Composition Shingle (8:12 and greater)	• Standing Seam Roof • Corrugated Metal accents
Roof Colors	• Natural metal, greys and darker tonal values	
Wall Materials	• Siding, shake, Medium sand float stucco finish (16/20 minimum)	• Stone or concrete veneer accents
Wall Colors	• Whites or saturated earth tones	
Trim & Details	• Well-placed & proportional entry light fixtures • Delicate trim details as appropriate	• Enhanced trim accents
Trim Colors	• Stark white or subtly contrasting color	
Windows	• Recessed • Vertically proportioned panes	• Bay windows • Shutters
Doors	• Solid or glazed front entry doors	• Stoop or covering
Garage Doors	• Horizontal or raised panel	• Windows

*Enhanced Elevation elements are required on all front and side-facing facades directly adjacent to a Public Right of Way including streets, parks, paseos, and mid-block pedestrian paths. Such elevations shall have a minimum of (2) two enhanced elements per facade.

4.2.I.III VARIOUS REPRESENTATIONS OF THE WINE COUNTRY CHIC STYLE

4.2 Architectural Design Guidelines

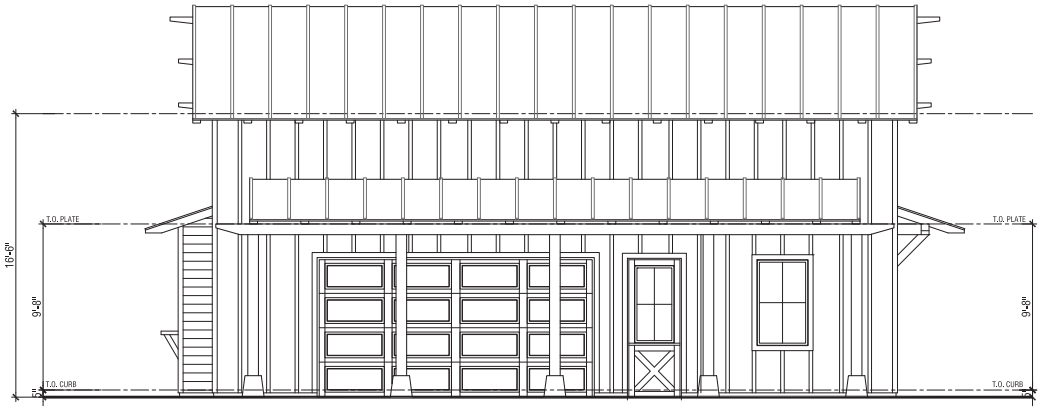
4.2.J COMMERCIAL AGRARIAN

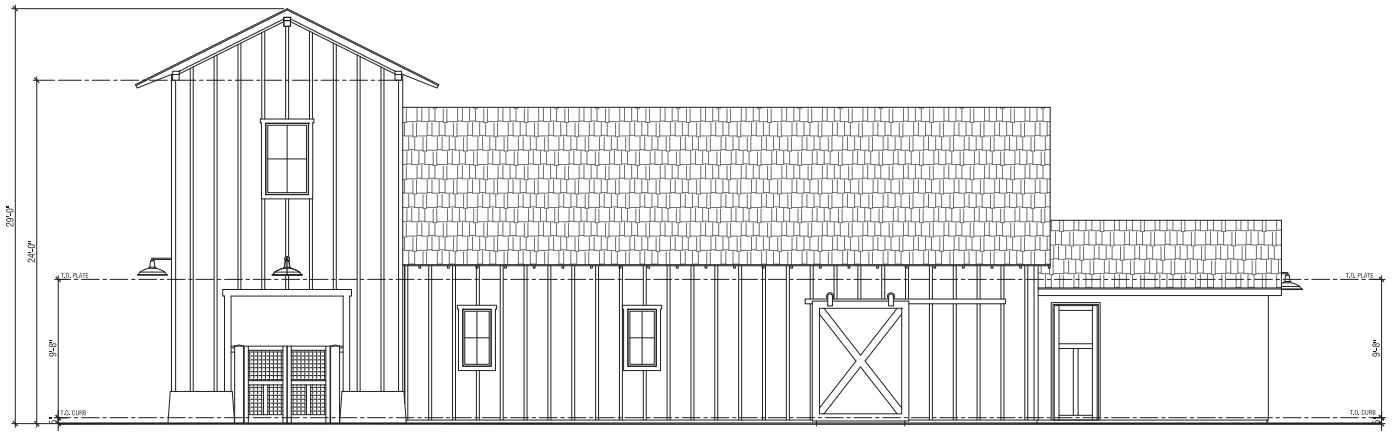
The Commercial Agrarian Style is a contemporary take on vernacular architecture. The style takes inspiration from the indigenous agrarian structures of the region. The large, simple forms of the agri-dustrial facilities are well-suited for commercial applications such as The Overlook (main recreation center). Furthermore, these farms and industrial facilities are typically arranged in campus configurations. This is an effective way to simultaneously break down the scale of the program while creating many "outdoor rooms" and interesting spatial relationships between buildings.

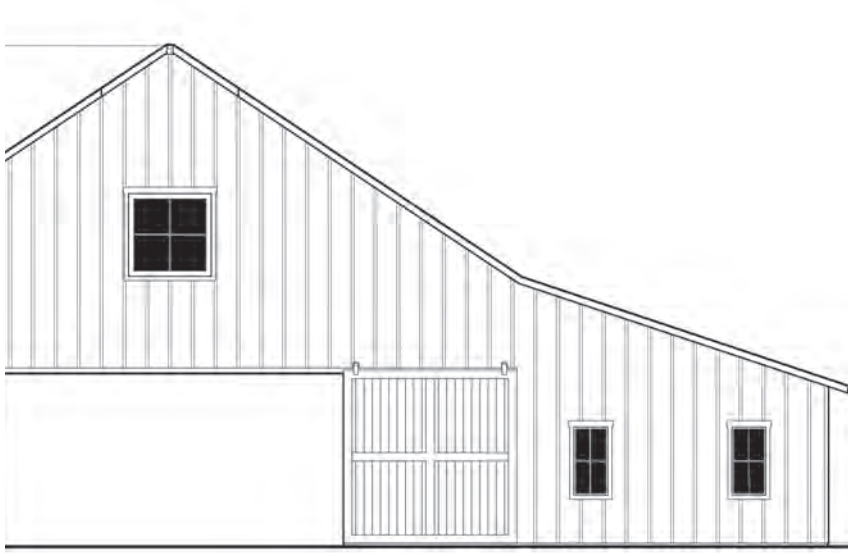
Conceptual Wine Country Chic Front Elevation: 50' x 100'

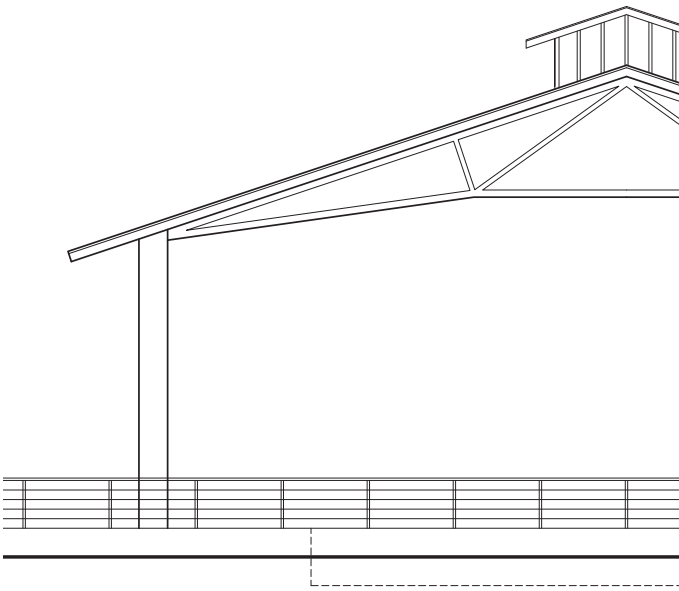
4.2.J.1 COMMERCIAL AGRARIAN

The Wine Country Chic style.... .









4.2 Architectural Design Guidelines

4.2.J.II ELEMENTS OF THE COMMERCIAL AGRARIAN STYLE

COMMERCIAL AGRARIAN DESIGN ELEMENTS		
Elements	Standard Elevations	Enhanced Elevations*
Architectural Components	• Simple, pure geometric forms • 'Commercial scale' compositions • Indoor/Outdoor program relationships	• Patios/ verandas • Decorative accents and canopies
Roof Components	• Clean, uncomplicated roof solutions • Mixture of shallow-roof pitches • Roof pitch range: 2:12 to 8:12	• Exposed rafter tails
Roof Materials	• Standing Seam, Corrugated Metal and Composition Shingle	• Accent metal roof
Roof Colors	• Natural metal hues	
Wall Materials	• Board and batten, siding, stone veneer, board-formed concrete	• Stone or concrete veneer accents
Wall Colors	• White and saturated earth tones	
Trim & Details	• Trim as appropriate	
Trim Colors	• Match the body color, or stark white to contrast against it	
Windows	• Recessed • Square or vertically proportioned panes • Large scale openings	• Bay windows • Enhanced Shutters
Doors	• Celebration of main entrances	• 10' doors
Garage Doors	• Roll up aluminum and glass	

*Enhanced Elevations are defined as all front or side architectural facades directly adjacent to a Public Right of Way including streets, parks, paseos, and mid-block pedestrian paths. Such elevations shall have a minimum of (2) two enhanced elements per facade.

4.2.J.III VARIOUS REPRESENTATIONS OF THE COMMERCIAL AGRARIAN STYLE

4.3 Design Review Process

4.3.A DESIGN REVIEW & APPROVAL PROCESS

Following adoption of this Specific Plan, separate Development Plan applications shall be submitted for each Planning Area (PA) consistent with this plan and all other applicable City regulations. These applications shall include all required final engineering plans and elements for subdivisions including infrastructure, utilities, landscaping and site improvements. These Development Plans shall be reviewed for consistency with this Specific Plan and all other applicable City requirements.

The process by which each Planning Area will be reviewed is outlined below.

Prior to any City submittal, each Builder shall first submit all plans to the Master Developer for substantial conformance review. Once approved by the Master Developer, the plans may be submitted to the City for final site plan review and approval.

PRE-APPLICATION MEETING

A pre-application meeting with the Community Development Director shall be held prior to the submittal of a proposed project.

SUBDIVISION MAPS

Each Planning Area will require a Tentative Tract and Final Tract Map for subdivision. Land plans and lotting may be refined during this process so long as they are consistent with the parameters outlined herein.

DEVELOPMENT PLAN

In addition to the TTM process, builders are required to simultaneously submit a detailed Development Plan package that includes:

- a detailed site plan,
- landscape plan,
- grading and drainage plan,
- fencing/wall plan, and
- a schematic architectural package for all structures located within the Planning Area.

PLANNING COMMISSION REVIEW

Once a project is deemed to be complete, it will be reviewed by the Planning Commission for consistency with the objectives outlined in this Specific Plan. Once approved, a builder may proceed with construction documents and obtaining building permits.

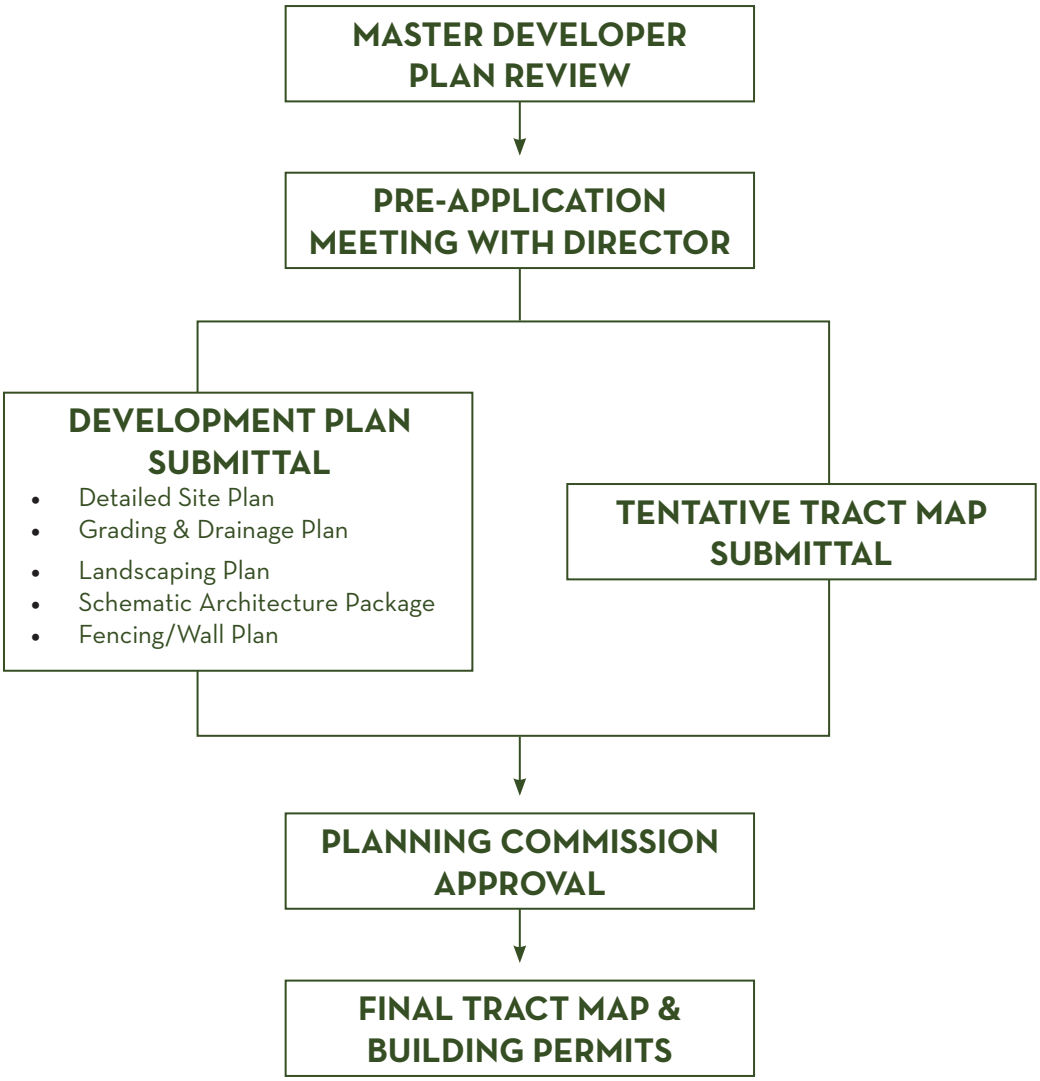
DESIGN SUBMITTAL PACKAGE

As Part 2 of this Specific Plan, the Design Submittal Package is a comprehensive collection of approved schematic architecture for all structures located within Viñedo and represents one possible outcome of such standards and guidelines. Such structures were designed to comply with the Development Standards and Architectural Guidelines contained herein.

Following adoption of this Specific Plan, a Builder could elect to advance these approved designs and pursue final Building Permits with an approved Site Plan. Alternatively, a Builder could elect to propose alternative designs or some combination thereof.

4.3 Design Review Process

4.3.1 DEVELOPMENT PLAN PROCESS REQUIRED FOR EACH PLANNING AREA:



4.3 Development Plan & Amendment Process

4.3.B SUBSTANTIAL CONFORMANCE DETERMINATION

For minor revisions that do not change the meaning or intent of the Viñedo Specific Plan, these shall be processed administratively. Such requested revisions must also be found to be in conformance with the General Plan and all applicable City standards.

The following list is designed to illustrate examples of those items that would allow for an administrative level of approval:

- Minor alterations in internal right of way alignments that do not substantially alter the land plan or circulation patterns;
- Minor revisions in grading and resulting drainage that do not effect the overall Water Quality Master Plan;
- Modifications to design elements such as materials and finishes so long as they are found to be consistent and compatible with the other approved elements;
- Modifications to the phasing plan if infrastructure is available and associated mitigation measures will be implemented;
- Transfer of density between Planning Areas so long as it does not exceed the total allowable number of dwelling units in the Specific Plan; and
- Minor alterations to the design or orientation of landscape areas or recreational amenities so long as the character and intent is maintained.

4.3.C AMENDMENTS TO THE SPECIFIC PLAN

The Viñedo Specific Plan includes a detailed site plan for each Planning Area in addition to a comprehensive collection of schematic architecture approved for all structures located within Viñedo. It is understood however, that modifications may be necessary in any project due to changes in the economy or changes in builder/consumer preferences over the life of a project. Therefore, flexibility is necessary to construct a successful community.

Any modifications to this Specific Plan shall be made in accordance to the process outlined below.

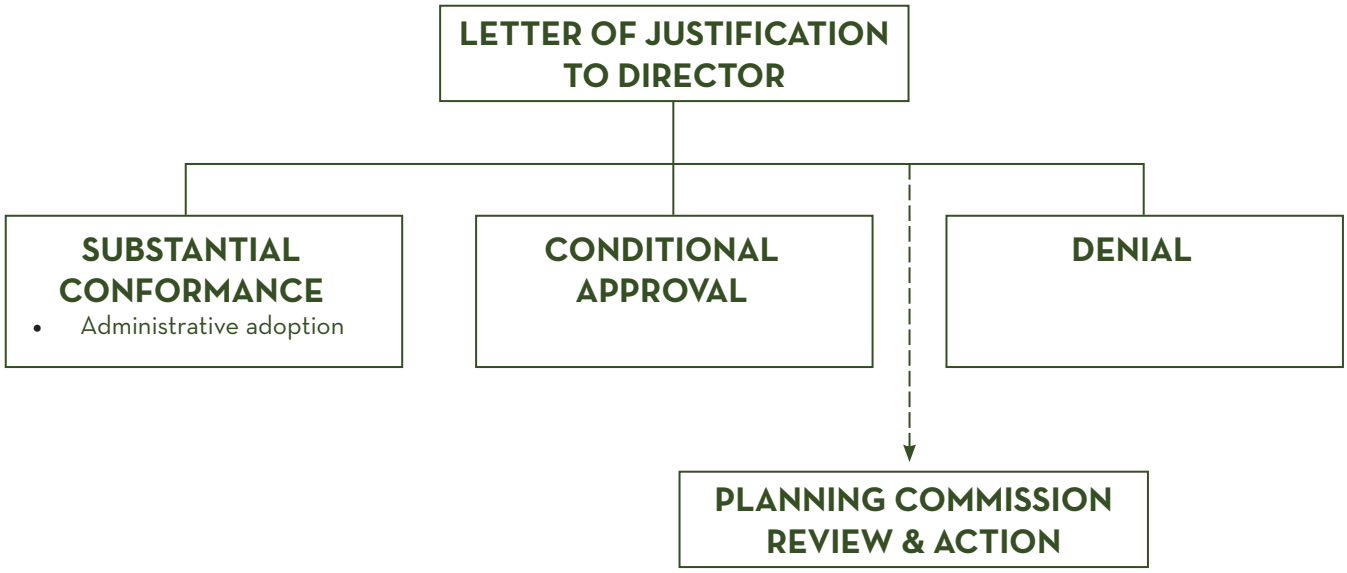
The Master Developer or builder shall first submit a letter of justification to the Community Development Director explaining why a modification is warranted.

If the modification is determined to be in substantial conformance with this Specific Plan, it may administratively be adopted. Alternatively, a project may also be conditionally approved or denied. The Community Development Director shall also have the authority to refer any such request to the Planning Commission.

An amendment shall be required for any proposed item that would result in a change to the character or intent of the standards and guidelines contained herein or that would trigger a supplemental EIR for this Specific Plan.

4.3 Design Review Process

4.3.2 SPECIFIC PLAN AMENDMENT PROCESS:



CHAPTER 5

IMPLEMENTATION & PHASING

5.0 Implementation & Phasing

This chapter outlines the anticipated phasing and implementation steps necessary to execute the Specific Plan including financial, construction and maintenance responsibilities.

The Implementation and Phasing Plan will help to ensure the expedient completion of public facilities, utilities and other necessary improvements as well as the ongoing proper maintenance of these facilities. Table 5.4: Financing, Construction and Maintenance Plan Summary outlines the parties responsible for each of these steps in the development of improvements proposed by the Specific Plan.

5.1 SEVERABILITY

If any section or clause of this Specific Plan is found to be invalid, such decision shall not affect the validity and enforceability of the remaining portions of this Plan.

5.2 DEVELOPMENT AGREEMENT

In addition to the requirements and provisions contained herein, the development of the Specific Plan shall be subject to the conditions outlined in the associated Development Agreement. All required off-site improvments shall also be outlined in this document.

5.3 CEQA MITIGATION MEASURES

All CEQA mitigation measures shall be determined and outlined in the associated Environmenal Impact Report for this Specific Plan.

5.4 FINANCING

Numerous mechanisms are available for financing the required improvements of this Specific Plan. All financing plans prepared for the implementation of this Specific Plan shall analyze a series of options to determine the best suited alternatives.

The following is a summary of potential mechanisms that could be used to finance improvements of this Specific Plan. Other sources may be available such as bonds or grants that are not listed below.

- Developer Funding
- Special Assessment Districts
- Community Facilities Districts

5.5 CONSTRUCTION

The installation and construction of necessary improvements will be conducted by the Master Developer, by Builders or a combination thereof.

5.6 MAINTENANCE

The proper long-term maintenance of common areas, recreation facilities and neighborhood parks are of paramount importance to both the appearance and functionality of Viñedo. A detailed Maintenance Plan will be developed by the that establishes standards and protocols to ensure the upkeep of such facilities.

A perminant maintenance organization/Home Owners Association shall be established for the Specific Plan area to maintain all common areas as outined in the Development Agreement.

5.7 Financing, Construction & Maintenance Plan Summary (Table)

TABLE 5.1: FINANCING, CONSTRUCTION & MAINTENANCE PLAN SUMMARY

SERVICE/ FACILITY	FINANCING	CONSTRUCTION	MAINTENANCE
ROADWAY ELEMENTS			
Public Street ROWs	Master Developer or City CFD	Master Developer	City CFD
Private Street ROWs	Master Developer	Master Developer	Master HOA or Sub-HOA
PUBLIC FACILITIES			
Storm Drainage Facilities	Master Developer or City CFD	Master Developer	City CFD
Detention/Water Quality Basins	Master Developer or City CFD	Master Developer	Master HOA & City of PR
Sewer Facilities	Master Developer or City CFD	Master Developer	City of PR
Water Facilities	Master Developer or City CFD	Master Developer	City of PR
Community Parks	TBD	TBD	City CFD
SHARED FACILITIES			
Common Area Landscape & Improvements	Master Developer	Master Developer	City CFD and/or HOA
Neighborhood Parks	Master Developer or Builder	Master Developer or Builder	City CFD and/or HOA
Private Recreation Centers	Master Developer	Master Developer	HOA
Community Walls/Fences/ Entry Gates/ Monumentation	Master Developer	Master Developer	City CFD and/or HOA
Community Signage (Wayfinding)	Master Developer	Master Developer	City CFD and/or HOA
PRIVATE FACILITIES			
Front Yard Landscape	Builder	Builder	Property Owner
Rear & Side Yard Landscape	Property Owner	Property Owner	Property Owner
Privacy Fences	Builder	Builder	Property Owner
Commercial Signs/Landscape	Property Owner	Property Owner	Property Owner

CFD Communities Facilities District
HOA Home Owner's Association

5.8 Development Phasing Plan

The development phasing plan for any large master plan community should provide flexibility but present the most cost-effective solution to developing property in terms of capital outlay for off-site public infrastructure improvements. The development of the Olsen-Chandler Ranch Specific Plan should follow a phasing plan that presents the opportunity to develop individual parcels of land without excessive off-site infrastructure improvements.

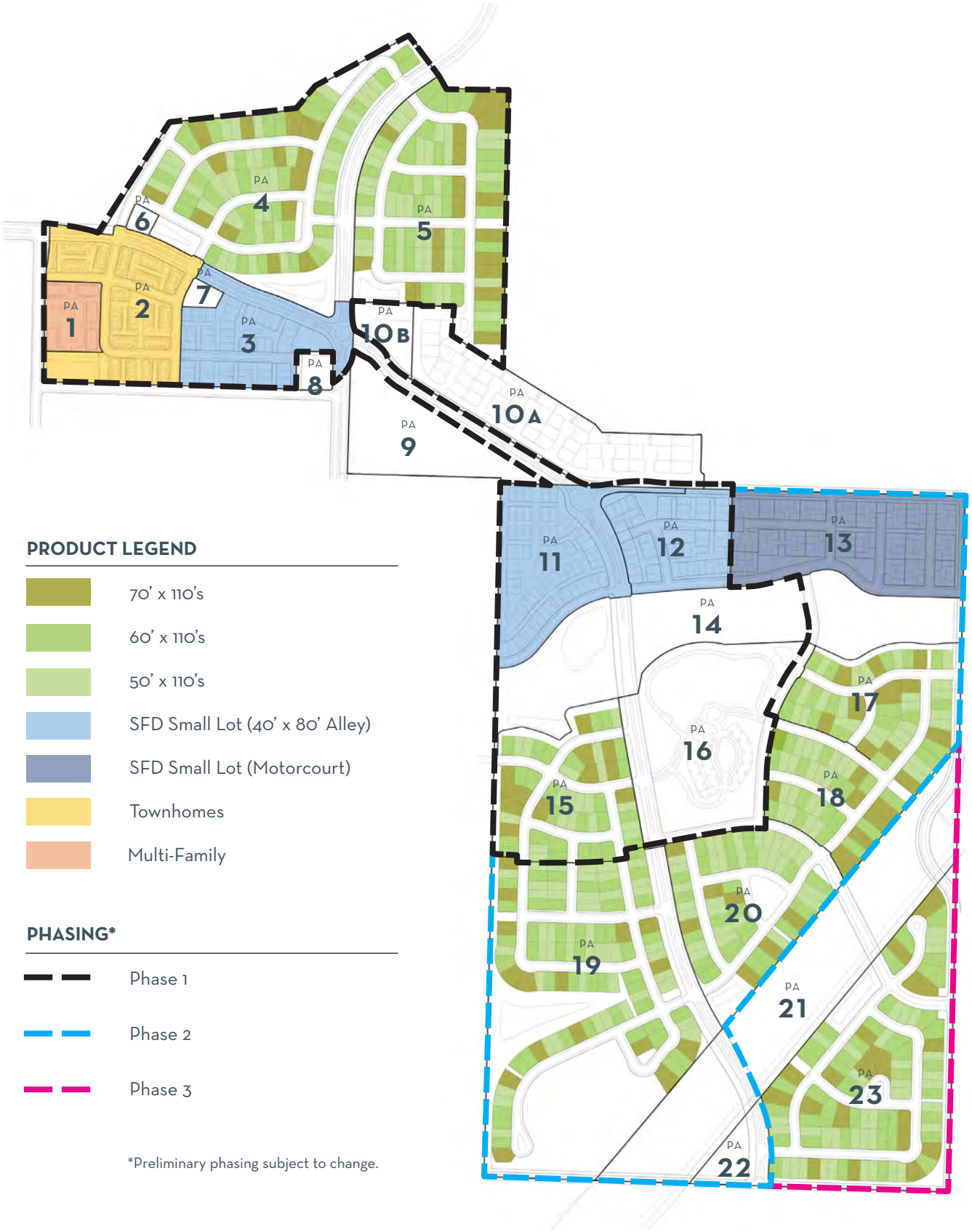
Major roadway infrastructure required for this project will be the construction of approximately 1.4 miles of NIBLICK Road from Fontana Road to Meadowlark Road at the southerly boundary of Olsen Ranch; construction of approximately 1,700 feet of Airport Road from the northerly boundary of Chandler Ranch to the proposed round-a-bout at NIBLICK Road and approximately 800 feet of roadway widening of Airport Road from the NIBLICK Road round-a-bout to Linne Road; the construction of approximately 2,800 feet of Parkview Lane from the westerly boundary of Olsen Ranch to Hanson Road; approximately 2,200 feet of improvements to Linne Road; approximately 4,000 feet of improvements to Hanson Road from Linne Road to Meadowlark Road; and approximately 2,250 feet of improvements along Meadowlark Road from the western boundary of Olsen Ranch to Hanson Road.

In addition to the roadway backbone infrastructure required to serve each parcel, utilities such as water, sanitary sewer and drainage facilities will be extended from the City of Paso Robles existing system within the proposed roadway infrastructure to serve each parcel.

This phasing plan outlines one option for the development approach. The actual phasing of the Specific Plan development will be based on market conditions and the land use that is in demand at the time of development. In the case of the Olsen-Chandler Specific Plan, the parcels with higher density are located adjacent to existing roadways and utility connection points, while the large single family lots are located more internally into the Specific Plan. The development of the parcels with larger single-family lots will require more off-site infrastructure in the earlier construction stages of the Specific Plan. The Phasing Plan relates to multiple planning areas of the total Specific Plan Area, excluding Planning Areas 8, 9 and 10. T

The following matrix outlines the phasing of major infrastructure elements through the build-out of the community.

5.8 Development Phasing Plan



PRODUCT LEGEND

- 70' x 110's
- 60' x 110's
- 50' x 110's
- SFD Small Lot (40' x 80' Alley)
- SFD Small Lot (Motorcourt)
- Townhomes
- Multi-Family

PHASING*

- Phase 1
- Phase 2
- Phase 3

*Preliminary phasing subject to change.

5.8 Development Phasing Plan

MAJOR INFRASTRUCTURE DEVELOPMENT MATRIX

PLANNING AREA (PA)	MAJOR ROADWAYS	ROADWAY FRONTAGE IMPROVEMENTS	WATER FACILITIES	RECYCLED WATER FACILITIES
PHASE 01				
Prior to 1st CO within Specific Plan Area				
Prior to 1st CO within Specific Plan Area				
PA-1		Approximately 800' of curb, gutter, sidewalk improvements with grind and overlay on Fontana Road from Niblick Road to Linne Road		
PA-2	Extension of Niblick Road from intersection of Niblick Road and Fontana Road to PA2 entry	Approximately 800' of curb, gutter, sidewalk improvements with grind and overlay on Linne Road from Fontana Road to PA 2 entry	Extend 12" water main from Niblick Road and Fontana Road intersection to PA 2 entry	
PA-3	Extension of Niblick Road from PA2 entry to Airport Road roundabout	Approximately 900' of curb, gutter, sidewalk improvements with grind and overlay on Linne Road from PA 2 entry to Airport Road	Extend 12" water main from PA 2 entry to Airport Road	
PA-4	Extension of Niblick Road from intersection of Niblick Road and Fontana Road to Airport Road roundabout		Extend 12" water main from Niblick Road and Fontana Road intersection to Airport Road roundabout	
	Widening 800' of Airport Road from Linne Road to Niblick Road including the roundabout at Niblick Road.		Extension of 800' of 12" water line from Linne Road to the Niblick Road roundabout	

5.8 Development Phasing Plan

SANITARY SEWER FACILITIES	DRAINAGE SYSTEM	DRY UTILITIES	MULTI PURPOSE TRAILS
Capacity improvements to replace 2,200 lf of sanitary sewer within Scott Street. Upgrades include the replacement of the 12" VCP with an 18" PVC main			
Capacity improvements to replace 1,700 lf of sanitary sewer within Commerce Way. Upgrades include the replacement of the 10" VCP with a 15" PVC main			
Install approximately 200' Sanitary Sewer main from development to existing City infrastructure	Install approximately 800' of storm drain system from Niblick Road to intersection of Fontana Road and Linne Road	Install gas, electric, cable, communications and fiber optic facilities within major roadways and roadway frontage improvements	
		Install gas, electric, cable, communications and fiber optic facilities within major roadways and roadway frontage improvements	
		Install gas, electric, cable, communications and fiber optic facilities within major roadways and roadway frontage improvements	
	Storm drain facilities within the primary access roads as required to drain roadway and/or convey flows from one PA to a downstream PA to accommodate the proposed drainage plan.	Install gas, electric, cable, communications and fiber optic facilities within major roadways and roadway frontage improvements	
		Install gas, electric, cable, communications and fiber optic facilities within major roadways and roadway frontage improvements	

5.8 Development Phasing Plan

MAJOR INFRASTRUCTURE DEVELOPMENT MATRIX

PLANNING AREA (PA)	MAJOR ROADWAYS	ROADWAY FRONTAGE IMPROVEMENTS	WATER FACILITIES	RECYCLED WATER FACILITIES
PHASE 01				
PA-5	Extension of Airport Road from the northern boundary of South Chandler Ranch to the roundabout at Niblick Road		Extension of 1,700' of 12" water line from Northern Boundary of South Chandler Ranch to the Niblick Road roundabout	Extension of City 10" recycled waterline from the northerly boundary of South Chandler Ranch to the Niblick Road roundabout
	Widening 800' of Airport Road from Linne Road to Niblick Road including the roundabout at Niblick Road.		Extension of 800' of 12" water line from Linne Road to the Niblick Road roundabout	
PA-6				
PA-7				
PA-11	Construction of full roadway improvements for Niblick Road from Airport Road to Turtle Creek including roundabout at Linne Road		Extension of 12" water main within Niblick Road	Extension of 10" recycled water main within Niblick Road
	Extension of Parkview Lane easterly to Niblick Road			
PA-12	Construction of full roadway improvements for Niblick Road from Airport Road to Turtle Creek including roundabout at Linne Road		Extension of 12" water main within Niblick Road	Extension of 10" recycled water main within Niblick Road
	Extension of Parkview Lane from Niblick Road to PA 12 easterly boundary			

5.8 Development Phasing Plan

SANITARY SEWER FACILITIES	DRAINAGE SYSTEM	DRY UTILITIES	MULTI PURPOSE TRAILS
	Storm drain facilities within the primary access roads as required to drain roadway and/or convey flows from one PA to a downstream PA to accommodate the proposed drainage plan.	Install gas, electric, cable, communications and fiber optic facilities within major roadways and roadway frontage improvements	
		Install gas, electric, cable, communications and fiber optic facilities within major roadways and roadway frontage improvements	
Connection and extension of 8" sanitary sewer system within Parkview Lane.	Construction of required storm drain system as outlined in final drainage report for Niblick Road	Install gas, electric, cable, communications and fiber optic facilities within major roadways and roadway frontage improvements	
		Install gas, electric, cable, communications and fiber optic facilities within major roadways and roadway frontage improvements	
Extension of 8" sanitary sewer system within Parkview Lane from Niblick Road to easterly boundary of PA 12	Storm drain facilities within the primary access roads as required to drain roadway and/or convey flows from one PA to a downstream PA to accommodate the proposed drainage plan.	Install gas, electric, cable, communications and fiber optic facilities within major roadways and roadway frontage improvements	
		Install gas, electric, cable, communications and fiber optic facilities within major roadways and roadway frontage improvements	
			Construction of multi purpose trail within creek area

5.8 Development Phasing Plan

MAJOR INFRASTRUCTURE DEVELOPMENT MATRIX

PLANNING AREA (PA)	MAJOR ROADWAYS	ROADWAY FRONTAGE IMPROVEMENTS	WATER FACILITIES	RECYCLED WATER FACILITIES
PHASE 01				
PA-15	Extension of Niblick Road across Turtle Creek to southern boundary of PA 15		Extension of 12" water main within Niblick Road	Extension of 10" recycled water main within Niblick Road
	Extension of Scott Road easterly through PA 15 to Niblick Road		Extension of 8" water line within Scott Road through PA 15 to Niblick Road	
PA-16	Extension of Niblick Road across Turtle Creek to southern boundary of PA 15		Extension of 12" water main within Niblick Road	Extension of 10" recycled water main within Niblick Road

5.8 Development Phasing Plan

SANITARY SEWER FACILITIES	DRAINAGE SYSTEM	DRY UTILITIES	MULTI PURPOSE TRAILS
Extension of 8" sanitary sewer within Niblick Road to southern PA 15 boundary	Construction of Turtle Creek Crossing	Install gas, electric, cable, communications and fiber optic facilities within major roadways and roadway frontage improvements	
	Storm drain facilities within the primary access roads as required to drain roadway and/or convey flows from one PA to a downstream PA to accommodate the proposed drainage plan.		
Extension of 8" sanitary sewer within Niblick Road to southern PA 15 boundary	Construction of Turtle Creek Crossing	Install gas, electric, cable, communications and fiber optic facilities within major roadways and roadway frontage improvements	
	Storm drain facilities within the primary access roads as required to drain roadway and/or convey flows from one PA to a downstream PA to accommodate the proposed drainage plan.		

5.8 Development Phasing Plan

MAJOR INFRASTRUCTURE DEVELOPMENT MATRIX

PLANNING AREA (PA)	MAJOR ROADWAYS	ROADWAY FRONTAGE IMPROVEMENTS	WATER FACILITIES	RECYCLED WATER FACILITIES
PHASE 02				
PA-13	Extension of Parkview Lane easterly for 2,000' from PA12 easterly boundary to Hanson Road	Approximately 1,800' of curb, gutter, sidewalk improvements with grind and overlay on Linne Road from Niblick Road roundabout to Hanson Road	Extension of 2,000' of 8" water main within Parkview Lane	
	Construction of 2,000' of Hanson Road from Linne Road to southern boundary of Turtle Creek			
PA-17	Construction of 2,000' of Hanson Road from Linne Road to the southern boundary of PA 17		Extension of 8" water main within Parkview Lane and up to PA 17 boundary	
PA-18				
PA-19	Extension of Niblick Road from southern boundary of PA 15 to Meadowlark Road		Extension of 12" water main within Niblick Road	Extension of 10" recycled water main within Niblick Road and through southerly internal roadway to Meadowlark Road
	Extension of Meadowlark Road from southwest boundary to the southerly entry to Olsen Ranch		Extension of 12" water main within Meadowlark Road and connection to City system	
			Install Water Booster Pump Station northwest of Our Town	

5.8 Development Phasing Plan

SANITARY SEWER FACILITIES	DRAINAGE SYSTEM	DRY UTILITIES	MULTI PURPOSE TRAILS
Extension of 2,000' of 8" sanitary sewer main within Parkview Lane	Reconstruction of culvert crossing at Turtle Creek	Install gas, electric, cable, communications and fiber optic facilities within major roadways and roadway frontage improvements	
	Storm drain facilities within the primary access roads as required to drain roadway and/or convey flows from one PA to a downstream PA to accommodate the proposed drainage plan.		
Extension of 8" sanitary sewer main within Parkview Lane and up to PA 17 boundary	Reconstruction of culvert crossing at Turtle Creek		
	Turtle Creek Crossing for internal access to Parkview Lane		
Upgrade to existing pumps within the Crestone Road sanitary sewer lift station	Expansion of existing pond area to create detention pond for southern portion of Olsen Ranch.	Install gas, electric, cable, communications and fiber optic facilities within major roadways and roadway frontage improvements	
	Storm drain facilities within the primary access roads as required to drain roadway and/or convey flows from one PA to a downstream PA to accommodate the proposed drainage plan.		

5.8 Development Phasing Plan

MAJOR INFRASTRUCTURE DEVELOPMENT MATRIX

PLANNING AREA (PA)	MAJOR ROADWAYS	ROADWAY FRONTAGE IMPROVEMENTS	WATER FACILITIES	RECYCLED WATER FACILITIES
PHASE 02				
PA-20	Extension of Niblick Road from southern boundary of PA 15 to Meadowlark Road		Extension of 12" water main within Niblick Road	Extension of 10" recycled water main within Niblick Road and through southerly internal roadway to Meadowlark Road
	Extension of Meadowlark Road from southwest boundary to the southerly entry to Olsen Ranch		Extension of 12" water main within Meadowlark Road and connection to City system	
			Install Water Booster Pump Station northwest of Our Town	

5.8 Development Phasing Plan

SANITARY SEWER FACILITIES	DRAINAGE SYSTEM	DRY UTILITIES	MULTI PURPOSE TRAILS
Connect and extend 8-inch sanitary sewer from Running Stag way through PA 19 to Niblick Road	Expansion of existing pond area to create detention pond for southern portion of Olsen Ranch.	Install gas, electric, cable, communications and fiber optic facilities within major roadways and roadway frontage improvements	
Upgrade to existing pumps within the Crestone Road sanitary sewer lift station	Storm drain facilities within the primary access roads as required to drain roadway and/or convey flows from one PA to a downstream PA to accommodate the proposed drainage plan.		

5.8 Development Phasing Plan

MAJOR INFRASTRUCTURE DEVELOPMENT MATRIX

PLANNING AREA (PA)	MAJOR ROADWAYS	ROADWAY FRONTAGE IMPROVEMENTS	WATER FACILITIES	RECYCLED WATER FACILITIES
PHASE 03				
PA-21				
PA-23	Reconstruction of 2,000' of Hanson Road from the southern boundary of PA 17 to Meadowlark Road			
	Extension of Meadowlark Road for approximately 1,300' from southerly entry to the Viñedo Specific plan to Hanson Road.			

5.8 Development Phasing Plan

SANITARY SEWER FACILITIES	DRAINAGE SYSTEM	DRY UTILITIES	MULTI PURPOSE TRAILS
	Storm drain facilities within the primary access roads as required to drain roadway and/or convey flows from one PA to a downstream PA to accommodate the proposed drainage plan.		

VIÑEDO

PASO ROBLES

Appendix C.1

Air Quality & Greenhouse Gas Impact Assessment

AIR QUALITY & GREENHOUSE GAS IMPACT ASSESSMENT

FOR THE PROPOSED

OLSEN-CHANDLER SPECIFIC PLAN

PASO ROBLES, CA

AUGUST 2019

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APPENDICES

Appendix A: SLOAPCD Asbestos Demolition/Renovation Notification Form
Appendix B: Naturally Occurring Asbestos Zone
Appendix C: Emissions Modeling & Support Documentation

LIST OF COMMON TERMS & ACRONYMS

AAM	Annual Arithmetic Mean
ARB	California Air Resources Board
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
CCAA	California Clean Air Act
CCAR	California Climate Action Registry
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
DPM	Diesel-Exhaust Particulate Matter or Diesel-Exhaust PM
FCAA	Federal Clean Air Act
GHG	Greenhouse Gases
HAP	Hazardous Air Pollutant
LOS	Level of Service
N_2O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards or National AAQS
NESHAPs	National Emission Standards for HAPs
NO_x	Oxides of Nitrogen
OAP	Ozone Attainment Plan
O_3	Ozone
Pb	Lead
PM	Particulate Matter
PM_{10}	Particulate Matter (less than 10 µm)
$PM_{2.5}$	Particulate Matter (less than 2.5 µm)
ppb	Parts per Billion
ppm	Parts per Million
ROG	Reactive Organic Gases
RTP	Regional Transportation Plan
SCCAB	South Central Coast Air Basin
SIP	State Implementation Plan
SJVAPCD	San Joaquin Valley Air Pollution Control District
SLOAPCD	San Luis Obispo County Air Pollution Control District
SLOCOG	San Luis Obispo Council of Governments
SCS	Sustainable Communities Strategy
SO_2	Sulfur Dioxide
TAC	Toxic Air Contaminant
$\mu g/m^3$	Micrograms per cubic meter
U.S. EPA	United State Environmental Protection Agency

INTRODUCTION

This report provides an analysis of air quality and greenhouse gas impacts associated with the proposed Olsen-Chandler Specific Plan Project. This report also provides a summary of existing conditions in the project area and the applicable regulatory framework pertaining to air quality and climate change.

PROPOSED PROJECT SUMMARY

The proposed Olsen-Chandler Specific Plan will provide a combination of land uses that include residential, commercial, park/open space, private recreation, and school. The plan will include 1,293 residential dwelling units (comprised of 1,065 single-family units and 228 multi-family units), 10,659 square feet (sq.ft.) of a shopping center, 29,335 sq.ft. of private recreation, and 495-student elementary school. The project site is generally located to the north and south of Linne Road, between Fontana Road and Hanson Road. The proposed Olsen-Chandler Specific Plan is depicted in Figure 1.

AIR QUALITY

Existing Setting

The project is located in the City of Paso Robles, within the South Central Coast Air Basin (SCCAB) and within the jurisdiction of the San Luis Obispo County Air Pollution Control District (SLOAPCD). Air quality in the SCCAB is influenced by a variety of factors, including topography, local and regional meteorology.

Topography

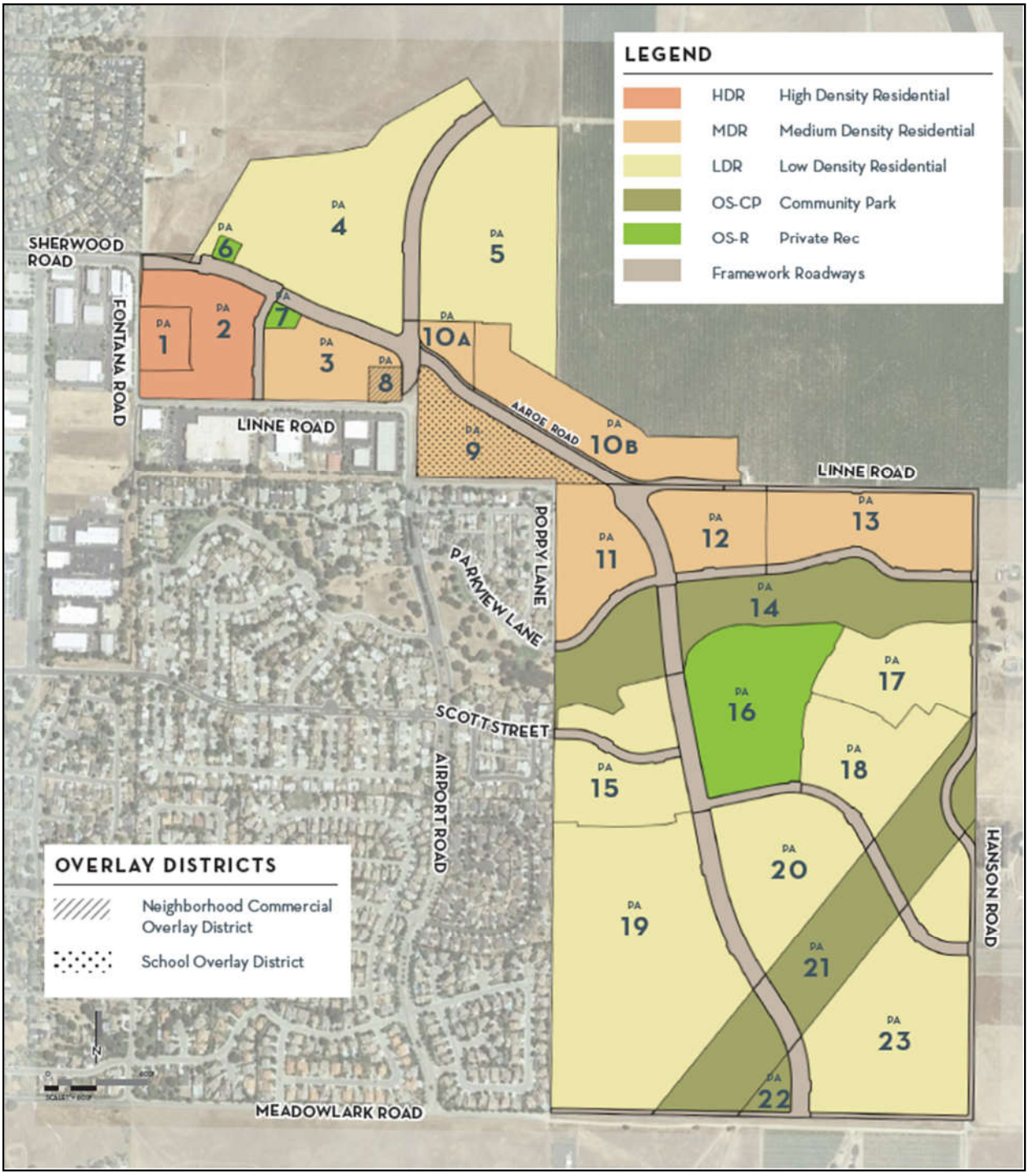
The City of Paso Robles is in the upper Salinas River Valley. The area is bordered on the south and west by the rugged mountainous ridges of the Santa Lucia Coastal Range, to the east by the low hills of the La Panza and Temblor ranges, and to the north by the low hills and flat-topped mesas of the Diablo Range. The highest elevations in the vicinity are in the Santa Lucia Coastal Range, where many peaks are 2,000 to 3,400 feet above mean sea level. Substantial ridgelines are distributed throughout the western, southern, and eastern portions of the City. The effects of the Pacific Ocean are diminished inland and by these major intervening terrain features.

Local and Regional Meteorology

The climate of the county can be generally characterized as Mediterranean, with warm, dry summers and cooler, relatively damp winters. Along the coast, mild temperatures are the rule throughout the year due to the moderating influence of the Pacific Ocean. This effect is diminished inland in proportion to the distance from the ocean or by major intervening terrain features, such as the coastal mountain ranges. As a result, inland areas are characterized by a considerably wider range of temperature conditions. Maximum summer temperatures average about 70 degrees Fahrenheit near the coast, while inland valleys are often in the high 90s. Minimum winter temperatures average from the low 30s along the coast to the low 20s inland (SLOAPCD 2001).

Regional meteorology is largely dominated by a persistent high-pressure area which commonly resides over the eastern Pacific Ocean. Seasonal variations in the strength and position of this pressure cell cause seasonal changes in the weather patterns of the area. The Pacific High remains generally fixed several hundred miles offshore from May through September, enhancing onshore winds and opposing offshore winds. During spring and early summer, as the onshore breezes pass over the cool water of the ocean, fog and low clouds often form in the marine air layer along the coast. Surface heating in the interior valleys dissipates the marine layer as it moves inland (SLOAPCD 2001).

Figure 1. Proposed Olsen-Chandler Specific Plan



Note: Low Density and Medium Density Residential consist of single-family units. High-Density Residential consists of multi-family units.
Source: Rincon Consultants 2019

From November through April the Pacific High tends to migrate southward, allowing northern storms to move across the county. About 90 percent of the total annual rainfall is received during this period. Winter conditions are usually mild, with intermittent periods of precipitation followed by mostly clear days. Rainfall amounts can vary considerably among different regions in the county. In the Coastal Plain, annual rainfall averages 16 to 28 inches, while the Upper Salinas River Valley generally receives about 12 to 20 inches of rain. The Carrizo Plain is the driest area of the county with less than 12 inches of rain in a typical year (SLOAPCD 2001).

Airflow around the county plays an important role in the movement and dispersion of pollutants. The speed and direction of local winds are controlled by the location and strength of the Pacific High-pressure system and other global patterns, by topographical factors, and by circulation patterns resulting from temperature differences between the land and sea. In spring and summer months, when the Pacific High attains its greatest strength, onshore winds from the northwest generally prevail during the day. At night, as the sea breeze dies, weak drainage winds flow down the coastal mountains and valleys to form a light, easterly land breeze (SLOAPCD 2001).

In the Fall, onshore surface winds decline and the marine layer grows shallow, allowing an occasional reversal to a weak offshore flow. This, along with the diurnal alternation of land-sea breeze circulation, can sometimes produce a "sloshing" effect. Under these conditions, pollutants may accumulate over the ocean for a period of one or more days and are subsequently carried back onshore with the return of the sea breeze. Strong inversions can form at this time, "trapping" pollutants near the surface (SLOAPCD 2001).

This effect is intensified when the Pacific High weakens or moves inland to the east. This may produce a "Santa Ana" condition in which air, often pollutant-laden, is transported into the county from the east and southeast. This can occur over a period of several days until the high-pressure system returns to its normal location, breaking the pattern. The breakup of a Santa Ana condition may result in relatively stagnant conditions and a buildup of pollutants offshore. The onset of the typical daytime sea breeze can bring these pollutants back onshore, where they combine with local emissions to cause high pollutant concentrations. Not all occurrences of the "post-Santa Ana" condition lead to high ambient pollutant levels, but it does play an important role in the air pollution meteorology of the county (SLOAPCD 2001).

Atmospheric Stability and Dispersion

Air pollutant concentrations are primarily determined by the amount of pollutant emissions in an area and the degree to which these pollutants are dispersed into the atmosphere. The stability of the atmosphere is one of the key factors affecting pollutant dispersion. Atmospheric stability regulates the amount of vertical and horizontal air exchange or mixing, that can occur within a given air basin. Restricted mixing and low wind speeds are generally associated with a high degree of stability in the atmosphere. These conditions are characteristic of temperature inversions (SLOAPCD 2001).

In the atmosphere, air temperatures normally decrease as altitude increases. At varying distances above the earth's surface, however, a reversal of this gradient can occur. This condition termed an inversion, is simply a warm layer of air above a layer of cooler air, and it has the effect of limiting the vertical dispersion of pollutants. The height of the inversion determines the size of the mixing volume trapped below. Inversion strength or intensity is measured by the thickness of the layer and the difference in temperature between the base and the top of the inversion. The strength of the inversion determines how easily it can be broken by winds or solar heating (SLOAPCD 2001).

Several types of inversions are common to this area. Weak, surface inversions are caused by radiational cooling of air in contact with the cold surface of the earth at night. In valleys and low lying areas, this condition is intensified by the addition of cold air flowing downslope from the hills and pooling on the valley floor. Surface inversions are a common occurrence throughout the county during the winter, particularly on cold mornings when the inversion is strongest. As the morning sun warms the earth and the air near the ground, the inversion lifts, gradually dissipating as the day progresses. During the late spring and early summer months, cool air over the ocean can intrude under the relatively warmer air over land, causing a marine inversion. These inversions can restrict dispersion along the coast, but they are typically shallow and will dissipate with surface heating (SLOAPCD 2001).

In contrast, in the summertime, the presence of the Pacific high-pressure cell can cause the air mass aloft to sink. As the air descends, compressional heating warms it to a temperature higher than the air below. This highly stable atmospheric condition, termed a subsidence inversion, is common to all of coastal California and can act as a nearly impenetrable lid to the vertical mixing of pollutants. The base of the inversion typically ranges from 1000 to 2500 feet above sea level; however, levels as low as 250 feet, among the lowest anywhere in the state, have been recorded on the coastal plateau in San Luis Obispo county. The strength of these inversions makes them difficult to disrupt. Consequently, they can persist for one or more days, causing air stagnation and the buildup of pollutants. Highest or worst-case ozone levels are often associated with the presence of this type of inversion (SLOAPCD 2001).

Criteria Air Pollutants

For the protection of public health and welfare, the Clean Air Act (CAA) required that the United States Environmental Protection Agency (U.S. EPA) establish National Ambient Air Quality Standards (NAAQS) for various pollutants. These pollutants are referred to as "criteria" pollutants because the US EPA publishes criteria documents to justify the choice of standards. These standards define the maximum amount of an air pollutant that can be present in ambient air without harm to the public's health. An ambient air quality standard is generally specified as a concentration averaged over a specific time period, such as one hour, eight hours, 24 hours, or one year. The different averaging times and concentrations are meant to protect against different exposure effects. The CAA allows states to adopt additional or more health-protective standards. The air quality regulatory framework and ambient air quality standards are discussed in greater detail later in this report.

Human Health & Welfare Effects

Common air pollutants and associated adverse health and welfare effects are summarized in Table 1. Within the SCCAB, the air pollutants of primary concern, with regard to human health, include ozone, particulate matter (PM) and carbon monoxide (CO). As depicted in Table 1, exposure to increased pollutant concentrations of ozone, PM and CO can result in various heart and lung ailments, cardiovascular and nervous system impairment, and death.

Table 1. Common Pollutants & Adverse Effects

Pollutant	Human Health & Welfare Effects
Particulate Matter (PM_{10} & $PM_{2.5}$)	Increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing; aggravated asthma; development of chronic bronchitis; irregular heartbeat; nonfatal heart attacks; and premature death in people with heart or lung disease. Impairs visibility (haze).
Ozone (O_3)	Irritates and causes inflammation of the mucous membranes and lung airways; causes wheezing, coughing and pain when inhaling deeply; decreases lung capacity; aggravates lung and heart problems. Damages plants; reduces crop yield. Damages rubber, some textiles, and dyes.
Sulfur Dioxide (SO_2)	Respiratory irritant. Aggravates lung and heart problems. In the presence of moisture and oxygen, sulfur dioxide converts to sulfuric acid which can damage marble, iron and steel; damage crops and natural vegetation. Impairs visibility. A precursor to acid rain.
Carbon Monoxide (CO)	Reduces the ability of blood to deliver oxygen to vital tissues, effecting the cardiovascular and nervous system. Impairs vision, causes dizziness, and can lead to unconsciousness or death.
Nitrogen Dioxide (NO_2)	Respiratory irritant; aggravates lung and heart problems. A precursor to ozone and acid rain. Contributes to global warming, and nutrient overloading which deteriorates water quality. Causes brown discoloration of the atmosphere.
Lead	Anemia, high blood pressure, brain and kidney damage, neurological disorders, cancer, lowered IQ. Affects animals, plants, and aquatic ecosystems.

Source: ARB 2018b

Odors

Typically, odors are generally regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from the psychological (i.e. irritation, anger, or anxiety) to the physiological, including circulatory and respiratory effects, nausea, vomiting, and headache.

Neither the state nor the federal governments have adopted rules or regulations for the control of odor sources. The SLOAPCD does not have an individual rule or regulation that specifically addresses odors; however, odors would be applicable to SLOAPCD's Rule ~~204~~ 402, Nuisance. Any actions related to odors would be based on citizen complaints to local governments and the SLOAPCD. The SLOAPCD recommends that odor impacts be addressed in a qualitative manner. Such analysis shall determine if the project results in excessive nuisance odors, as defined under the California Code of Regulations, Health & Safety Code Section 41700, air quality public nuisance.

Toxic Air Contaminants

Toxic air contaminants (TACs) are air pollutants that may cause or contribute to an increase in mortality or serious illness, or which may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air, but due to their high toxicity, they may pose a threat to public health even at very low concentrations. Because there is no threshold level below which adverse health impacts are not expected to occur, TACs differ from criteria pollutants for which acceptable levels of exposure can be determined and for which state and federal governments have set ambient air quality standards. TACs, therefore, are not considered "criteria pollutants" under either the Federal Clean Air Act (FCAA) or the California Clean Air Act (CCAA) and are thus not subject to National or State AAQS. TACs are not considered criteria pollutants in that the federal and California Clean Air Acts do not address them specifically through the setting of National or State AAQS. Instead, the U.S. EPA and ARB regulate Hazardous Air Pollutants (HAPs) and TACs, respectively, through statutes and regulations that generally require the use of the maximum or best available control technology to limit emissions. In conjunction with District rules, these federal and state statutes and regulations establish the regulatory framework for TACs. At the national levels, the U.S. EPA has established National Emission Standards for HAPs (NESHAPs), in accordance with the requirements of the FCAA and subsequent amendments. These are technology-based source-specific regulations that limit allowable emissions of HAPs.

Within California, TACs are regulated primarily through the Tanner Air Toxics Act (AB 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). The Tanner Act sets forth a formal procedure for ARB to designate substances as TACs. This includes research, public participation, and scientific peer review before ARB designates a substance as a TAC. Existing sources of TACs that are subject to the Air Toxics Hot Spots Information and Assessment Act are required to: (1) prepare a toxic emissions inventory; (2) prepare a risk assessment if emissions are significant; (3) notify the public of significant risk levels; and (4) prepare and implement risk reduction measures.

At the state level, the ARB has authority for the regulation of emissions from motor vehicles, fuels, and consumer products. Most recently, Diesel-exhaust particulate matter (DPM) was added to the ARB list of TACs. DPM is the primary TACs of concern for mobile sources. Of all controlled TACs, emissions of DPM are estimated to be responsible for about 70 percent of the total ambient TAC risk. The ARB has made the reduction of the public's exposure to DPM one of its highest priorities, with an aggressive plan to require cleaner diesel fuel and cleaner diesel engines and vehicles (ARB 2005).

At the local level, air districts have authority over stationary or industrial sources. All projects that require air quality permits from the SLOAPCD are evaluated for TAC emissions. The SLOAPCD limits emissions and public exposure to TACs through a number of programs. The SLOAPCD prioritizes TAC-emitting stationary sources, based on the quantity and toxicity of the TAC emissions and the proximity of the facilities to sensitive receptors. The SLOAPCD requires a comprehensive health risk assessment for facilities that are classified in the significant-risk category, pursuant to AB 2588. No major existing sources of TACs have been identified in the project area.

Asbestos

Asbestos is the common name for a group of naturally-occurring fibrous silicate minerals that can separate into thin but strong and durable fibers. Naturally-occurring asbestos, which was identified as a TAC in 1986 by ARB, is located in many parts of California and is commonly associated with ultramafic rock. The project site is not located within an area identified as having a potential for naturally-occurring ultramafic rock and serpentine soils.

Asbestos-containing material may be present in existing structures. The demolition of existing structures may be subject to regulatory requirements for the control of ACM. A summary of applicable regulatory requirements is included in Appendix A.

Ambient Air Quality

Air pollutant concentrations are measured at several monitoring stations in the SCCAB. The Paso Robles-Santa Fe Avenue and Atascadero-Lewis Avenue Monitoring Stations are the closest representative monitoring station with sufficient data to meet U.S. EPA and/or ARB criteria for quality assurance. The monitoring stations record ambient concentrations of ozone, nitrogen dioxide, $PM_{2.5}$, and PM_{10}. Ambient monitoring data was obtained for the last three years of available measurement data (i.e., 2015 through 2017) and is summarized in Table 2. As depicted, the state and federal 8-hour ozone standards were exceeded for two days and one day in 2017, respectively. Measured 1-hour ozone, NO_2, $PM_{2.5}$, and PM_{10} concentrations did not exceed the state and federal ambient air quality standards in the last three years of monitoring.

Table 2. Summary of Ambient Air Quality Monitoring Data

Pollutant	Monitoring Year		
	2015	2016	2017
Ozone (O_3)[1]			
Maximum concentration (1-hour/8-hour average; ppm)	0.073/0.068	0.091/0.067	0.083/0.075
Number of days state/national 1-hour standard exceeded	0/0	0/0	0/0
Number of days state/national 8-hour standard exceeded	0/0	0/0	2/1
Nitrogen Dioxide (NO_2)[2]			
Maximum concentration (1-hour average; ppb)	31	NA	NA
Annual average (ppb)	NA	NA	NA
Number of days state/national standard exceeded	0/0	0/0	0/0
Suspended Particulate Matter ($PM_{2.5}$)[2]			
Maximum 24-hour concentration (national/state; µg/m3)	29.1	NA	NA
Annual average national/state (µg/m3)	NA/NA	NA/NA	NA/NA
Number of days national standard exceeded (measured/calculated)[3]	0/NA	0/NA	0/NA
Suspended Particulate Matter (PM_{10})[1]			
Maximum concentration (national/state; µg/m3)	37.2	44.8	57.0
Number of days state standard exceeded (measured/calculated)[3]	0/0	0/NA	6/NA
Number of days national standard exceeded (measured/calculated)[3]	0/0	0/0	0/NA

ppm = parts per million by volume, µg/m^3 = micrograms per cubic meter, NA=Not Available

1. Based on ambient concentrations obtained from the Paso Robles-Santa Fe Avenue Monitoring Station.

2. Based on ambient concentrations obtained from the Atascadero-Lewis Avenue Monitoring Station.

3. Measured days are those days that an actual measurement was greater than the standard. Calculated days are estimated days that measurement would have exceeded the standard had measurements been collected every day.

Source: ARB 2019c

Regulatory Framework

Air quality within the SCCAB is regulated by several jurisdictions including the U.S. EPA, ARB, and the SLOAPCD. Each of these jurisdictions develops rules, regulations, and policies to attain the goals or directives imposed upon them through legislation.

Federal

U.S. ENVIRONMENTAL PROTECTION AGENCY

At the federal level, the U.S. EPA has been charged with implementing national air quality programs. The U.S. EPA's air quality mandates are drawn primarily from the FCAA, which was signed into law in 1970. Congress substantially amended the FCAA in 1977 and again in 1990.

FEDERAL CLEAN AIR ACT

The FCAA required the US EPA to establish National Ambient Air Quality Standards (NAAQS or National AAQS), and also set deadlines for their attainment. Two types of NAAQS have been established: primary standards, which protect public health, and secondary standards, which protect public welfare from non-health-related adverse effects, such as visibility restrictions. NAAQS are summarized in Table 3.

State

CALIFORNIA AIR RESOURCES BOARD

The California Air Resources Board (ARB) is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA) of 1988. Other ARB duties include monitoring air quality (in conjunction with air monitoring networks maintained by air pollution control districts and air quality management districts, establishing California Ambient Air Quality Standards (CAAQS), which in many cases are more stringent than the NAAQS, and setting emissions standards for new motor vehicles. The CAAQS are summarized in Table 3. The emission standards established for motor vehicles differ depending on various factors including the model year, and the type of vehicle, fuel, and engine used.

CALIFORNIA CLEAN AIR ACT

The CCAA requires that all air districts in the state endeavor to achieve and maintain CAAQS for Ozone, CO, SO_2, and NO_2 by the earliest practicable date. The CCAA specifies that districts focus particular attention on reducing the emissions from transportation and area-wide emission sources, and the act provides districts with authority to regulate indirect sources. Each district plan is required to either (1) achieve a five percent annual reduction, averaged over consecutive 3-year periods, in district-wide emissions of each non-attainment pollutant or its precursors, or (2) to provide for the implementation of all feasible measures to reduce emissions. Any planning effort for air quality attainment would thus need to consider both state and federal planning requirements.

ASSEMBLY BILLS 1807 & 2588 - TOXIC AIR CONTAMINANTS

Within California, TACs are regulated primarily through AB 1807 (Tanner Air Toxics Act) and AB 2588 (Air Toxics Hot Spots Information and Assessment Act of 1987). The Tanner Air Toxics Act sets forth a formal procedure for ARB to designate substances as TACs. This includes research, public participation, and scientific peer review before ARB designates a substance as a TAC. Existing sources of TACs that are subject to the Air Toxics Hot Spots Information and Assessment Act are required to: (1) prepare a toxic emissions inventory; (2) prepare a risk assessment if emissions are significant; (3) notify the public of significant risk levels; and (4) prepare and implement risk reduction measures.

Table 3. Summary of Ambient Air Quality Standards & Attainment Designations

Pollutant	Averaging Time	California Standards*		National Standards*	
		Concentration*	Attainment Status	Primary[a]	Attainment Status
Ozone (O_3)	1-hour	0.09 ppm	Non-Attainment	–	Attainment Western SLO County
	8-hour	0.070 ppm		0.070 ppm	
Particulate Matter (PM_{10})	AAM	20 µg/m3	Non-Attainment	–	/ Attainment
	24-hour	50 µg/m3		150 µg/m3	
Fine Particulate Matter ($PM_{2.5}$)	AAM	12 µg/m3	Attainment	12 µg/m3	/ Attainment
	24-hour	No Standard		35 µg/m3	
Carbon Monoxide (CO)	1-hour	20 ppm	Attainment	35 ppm	
	8-hour	9 ppm		9 ppm	
Nitrogen Dioxide (NO_2)	AAM	0.030 ppm	Attainment	0.053 ppm	Unclassified
	1-hour	0.18 ppm		100 ppm	
Sulfur Dioxide (SO_2)	AAM	–	Attainment	0.03 ppm	Unclassified
	24-hour	0.04 ppm		0.14 ppm	
	3-hour	–		0.5 ppm (1300 µg/m3)**	
	1-hour	0.25 ppm		75 ppb	
Lead	30-day Average	1.5 µg/m3	Attainment	–	No Attainment Information
	Calendar Quarter	–		1.5 µg/m3	
	Rolling 3-Month Average	–		0.15 µg/m3	
Sulfates	24-hour	25 µg/m3	Attainment	No Federal Standards	
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m3)	Attainment		
Vinyl Chloride	24-hour	0.01 ppm (26 µg/m3)	No Information Available		
Visibility-Reducing Particle Matter	8-hour	Extinction coefficient: 0.23/kilometer visibility of 10 miles or more (0.07-30 miles or more for Lake Tahoe) due to particles when the relative humidity is less than 70%.	Attainment		

** For more information on standards visit: http//ww.arb.ca.gov.research/aaqs/aaqs2.pdf*
*** Secondary Standard*
Source: SLOAPCD 2018; ARB 2019b

Reso A - Exhibit C2 (EIR Technical Appendix)

Pollutant	Averaging Time	California Standards****		Federal Standards****	
		Concentration	Attainment Status	Concentration	Attainment Status
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m³)	Non-Attainment	–	Non-Attainment Eastern SLO County - Attainment Western SLO County***
	8 Hour	0.070 ppm (137 µg/m³)		0.070 ppm (137 µg/m³)******	
Respirable Particulate Matter (PM10)	24 Hour	50 µg/m³	Non-Attainment	150 µg/m³	Unclassified*/ Attainment
	Annual Arithmetic Mean	20 µg/m³		–	
Fine Particulate Matter (PM2.5)	24 Hour	No State Standard	Attainment	35 µg/m³	Unclassified*/ Attainment
	Annual Arithmetic Mean	12 µg/m³		12.0 µg/m³ *****	
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10 mg/m³)	Attainment	9 ppm (10 mg/m³)	Unclassified*
	1 Hour	20 ppm (23 mg/m³)		35 ppm (40 mg/m³)	
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (57 µg/m³)	Attainment	0.053 ppm (100 µg/m³)	Unclassified*
	1 Hour	0.18 ppm (330 µg/m³)		100 ppb (196 mg/m³)	
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	–	Attainment	0.030 ppm (80 µg/m³)	Unclassified*
	24 Hour	0.04 ppm (105 µg/m³)		0.14 ppm (365 µg/m³)	
	3 Hour	–		0.5 ppm (1300 µg/m³)**	
	1 Hour	0.25 ppm (655 µg/m³)		75 ppb (196 mg/m³)	
Lead*	30 Day Average	1.5 µg/m³	Attainment	–	No Attainment Information
	Calendar Quarter	–		1.5 µg/m³	
	Rolling 3-Month Average*	–		0.15 µg/m³	
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per kilometer – visibility of ten miles or more (0.07-30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.	Attainment	No Federal Standards	
Sulfates	24 Hour	25 µg/m³	Attainment		
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m³)	Attainment		
Vinyl Chloride*	24 Hour	0.01 ppm (26 µg/m³)	No Attainment Information		

* Unclassified (EPA/Federal definition): Any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for that pollutant. ** Secondary Standard

*** San Luis Obispo County has been designated non-attainment east of the -120.4 deg Longitude line, in areas of SLO County that are south of latitude 35.45 degrees, and east of the -120.3 degree Longitude line, in areas of SLO County that are north of latitude 35.45 degrees. Map of non-attainment area is available upon request from the APCD. **** For more information on standards visit: http://ww.arb.ca.gov.research/aaqs/aaqs2.pdf

Attainment (EPA/Federal definition): Any area that meets the national primary or secondary ambient air quality standard for that pollutant. (CA definition): State standard was not exceeded during a three year period. ***** Federal PM2.5 Secondary Standard is 15µg/m³

Non-Attainment (EPA/Federal definition): Any area that does not meet, or contributes to an area that does not meet the national primary or secondary ambient air quality standard for that pollutant. (CA definition): State standard was exceeded at least once during a three year period. ******The 2008 NAAQS for 8hr ozone is 0.075 ppm. The 2015 NAAQS for 8hr ozone is 0.070 ppm. The attainment status shown in this table relates to the 2008 and 2015 NAAQS. SLO County has been designated non-attainment of the 2015 NAAQS. NAAQS is National Ambient Air Quality Standards I:\OUTREACH\Attainment Status Revised January 29, 2019

Source: SLOAPCD 2019

IN-USE OFF-ROAD DIESEL VEHICLE REGULATION

On July 26, 2007, the ARB adopted a regulation to reduce diesel particulate matter (PM) and oxides of nitrogen (NOx) emissions from in-use (existing) off-road heavy-duty diesel vehicles in California. The regulation applies to self-propelled diesel-fueled vehicles that cannot be registered and licensed to drive on-road, as well as two-engine vehicles that drive on road, with the limited exception of two-engine sweepers. Examples include loaders, crawler tractors, skid steers, backhoes, forklifts, airport ground support equipment, water well drilling rigs, and two-engine cranes. Such vehicles are used in construction, mining, and industrial operations. The regulation does not apply to stationary equipment or portable equipment such as generators. The off-road vehicle regulation establishes emissions performance requirements, reporting, disclosure, and labeling requirements for off-road vehicles, and limits unnecessary idling.

CALIFORNIA BUILDING CODE

The California Building Code (CBC) contains standards that regulate the method of use, properties, performance, or types of materials used in the construction, alteration, improvement, repair, or rehabilitation of a building or other improvement to real property. The California Building Code is adopted every three years by the Building Standards Commission (BSC). In the interim, the BSC also adopts annual updates to make necessary mid-term corrections. The CBC standards apply statewide; however, a local jurisdiction may amend a CBC standard if it makes a finding that the amendment is reasonably necessary due to local climatic, geological, or topographical conditions.

GREEN BUILDING STANDARDS

In essence, green buildings standards are indistinguishable from any other building standards. Both standards are contained in the California Building Code and regulate the construction of new buildings and improvements. The only practical distinction between the two is that whereas the focus of traditional building standards has been protecting public health and safety, the focus of green building standards is to improve environmental performance.

AB 32, which mandates the reduction of GHG emissions in California to 1990 levels by 2020, increased the urgency around the adoption of green building standards. In its scoping plan for the implementation of AB 32, ARB identified energy use as the second largest contributor to California's GHG emissions, constituting roughly 25 percent of all such emissions. In recommending a green building strategy as one element of the scoping plan, ARB estimated that green building standards would reduce GHG emissions by approximately 26 MMT of CO_2e by 2020.

The green buildings standards are updated every three years and were most recently updated on May 2018. Referred to as the 2019 Building Energy Efficiency Standards, these most recent updates focus on four key areas: smart residential photovoltaic systems, updated thermal envelope standards (preventing heat transfer from the interior to the exterior and vice versa), residential and nonresidential ventilation requirements, and nonresidential lighting requirements. The ventilation measures improve indoor air quality, protecting homeowners from air pollution originating from outdoor and indoor sources. Under the newly adopted standards, nonresidential buildings will use about 30 percent less energy due mainly to lighting upgrades (CEC 2018).

Local

COUNTY OF SAN LUIS OBISPO AIR POLLUTION CONTROL DISTRICT

The SLOAPCD is the agency primarily responsible for ensuring that NAAQS and CAAQS are not exceeded and that air quality conditions within the region are maintained. Responsibilities of the SLOAPCD include, but are not limited to, preparing plans for the attainment of ambient air quality standards, adopting and enforcing rules and regulations concerning sources of air pollution, issuing permits for stationary sources of air pollution, inspecting stationary sources of air pollution and responding to citizen complaints, monitoring ambient air quality and meteorological conditions, and implementing programs and regulations required by the FCAA and the CCAA.

Impact Analysis

Thresholds of Significance

In accordance with Appendix G of the *State CEQA Guidelines,* air quality impacts associated with the proposed project would be considered significant if it would:

a) Conflict with or obstruct implementation of the applicable air quality plan.

b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard.

c) Expose sensitive receptors to substantial pollutant concentrations.

d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

To assist in the evaluation of air quality impacts, the SLOAPCD has developed recommended significance thresholds, which are contained in the SLOAPCD's *CEQA Air Quality Handbook* (2012). For the purposes of this analysis, project emissions are considered potentially significant impacts if any of the following SLOAPCD thresholds are exceeded:

Construction Impacts

The threshold criteria established by the SLOAPCD to determine the significance and appropriate mitigation level for a project's short-term construction emissions are presented in Table 4 and discussed, as follows (SLOAPCD 2012):

Table 4. SLOAPCD Thresholds of Significance for Project-Level Construction Impacts

Pollutant	Threshold (1)		
	Daily (lbs/day)	Quarterly Tier 1 (tons)	Quarterly Tier 2 (tons)
Ozone Precursors (ROG + NO_X)	137	2.5	6.3
Diesel Particulate Matter (DPM)	7	0.13	0.32
Fugitive Particulate Matter (PM_{10}), Dust (2)	None	2.5	None

1. Daily and quarterly emissions thresholds are based on the California Health & Safety Code and the ARB Carl Moyer Guidelines.
2. Any project with a grading area greater than 4.0 acres of a worked area can exceed the 2.5 tons PM10 quarterly threshold.
Source: SLOAPCD 2012

ROG and NOx Emissions

Daily: For construction projects exceeding the 137 lbs/day threshold requires Standard Mitigation Measures;

Quarterly – Tier 1: For construction projects exceeding the 2.5 tons/quarter threshold, require Standard Mitigation Measures and Best Available Control Technology (BACT) for construction equipment. Off-site mitigation may be required if feasible mitigation measures are not implemented, or if no mitigation measures are feasible for the project.

Quarterly – Tier 2: For construction projects exceeding the 6.3 tons/quarter threshold, require Standard Mitigation Measures, BACT, implementation of a Construction Activity Management Plan (CAMP) and off-site mitigation are required.

Diesel Particulate Matter (DPM) Emissions

Daily: For construction projects exceeding the 7 lbs/day threshold, require Standard Mitigation Measures;

Quarterly - Tier 1: For construction projects exceeding the 0.13 tons/quarter threshold, require Standard Mitigation Measures, BACT for construction equipment; and,

Quarterly - Tier 2: For construction projects exceeding the 0.32 tons/quarter threshold, require Standard Mitigation Measures, BACT, implementation of a CAMP, and off-site mitigation.

Fugitive Particulate Matter (PM10), Dust Emissions

Quarterly- Tier 1: For construction projects exceeding the 2.5 tons/quarter threshold requires Fugitive PM_{10} Mitigation Measures and may require the implementation of a CAMP.

Operational Impacts

Criteria Air Pollutants

The threshold criteria established by the SLOAPCD to determine the significance and appropriate mitigation level for long-term operational emissions from a project are presented in Table 5. Projects exceeding the 25 ton/year threshold may be required to complete an Activity Management Plan (AMP), which would be constructed in a similar manner to the CAMP mitigation approach for construction-related emissions.

Table 5. SLOAPCD Thresholds of Significance for Project-Level Operational Impacts

Pollutant	Threshold [1]	
	Daily (lbs/day)	Annual (tons/year)
Ozone Precursors (ROG + NO_X)	25	25
Diesel Particulate Matter (DPM)[2]	1.25	None
Fugitive Particulate Matter (PM_{10}), Dust	25	25
CO	550	None

1. Daily and annual emissions thresholds are based on the California Health & Safety Code Division 26, Part 3, Chapter 10, Section 40918 and the ARB Carl Moyer Guidelines for DPM.

2. Applies to on-site emissions. DPM is seldom emitted from individual projects in quantities which lead to local or regional air quality attainment violations. Certain industrial and commercial projects may emit substantial quantities of on-site DPM through the use of stationary and mobile on-site diesel-fueled equipment.

Source: SLOAPCD 2012

Toxic Air Contaminants

If a project has the potential to emit toxic or hazardous air pollutants or is located in close proximity to sensitive receptors, impacts may be considered significant due to increased cancer risk for the affected population. The SLOAPCD has defined the excess cancer risk significance threshold at 10 in a million for projects.

Localized CO Concentrations

Localized CO concentrations associated with the proposed project would be considered a less-than-significant impact if: (1) Traffic generated by the proposed project would not result in deterioration of signalized intersection level of service (LOS) to LOS E or F; or (2) the project would not contribute additional traffic to a signalized intersection that already operates at LOS of E or F (Caltrans 1996).

Odors

Screening of potential odor impacts is typically recommended for the following two situations:

- Projects that would potentially generate odorous emissions proposed to locate near existing sensitive receptors or other land uses where people may congregate; and
- Residential or other sensitive receptor projects or other projects that may attract people locating near existing odor sources.

If the proposed project would locate receptors and known odor sources within one mile of each other, a full analysis of odor impacts is recommended. Known odor sources of primary concern, as identified by the SLOAPCD include landfills, transfer stations, asphalt batch plants, rendering plants, petroleum refineries, and painting/coating operations, as well as, composting, food processing, wastewater treatment, chemical manufacturing, and feedlot/dairy facilities.

Methodology

Short-term emissions associated with construction activities are largely dependent on the type of development proposed, area of ground disturbance, amount of buildings to be demolished, equipment required, and construction schedules. Emissions associated with the construction of the proposed project were calculated using the California Emissions Estimator Model (CalEEMod), version 2016.3.2, computer program. Project construction is anticipated to occur over an approximately 45-month period beginning in

2020. According to project engineers, no material would be imported or exported. Approximately 3,400 sq.ft. of existing structures would be demolished. Additional construction information, such as equipment use, worker vehicle trips, and equipment load factors were not available and were based on default parameters contained in the model. Project construction information is preliminary and is subject to change. Modeling assumptions and output files are included in Appendix C of this report.

Long-term operational increases in emissions of criteria air pollutants were calculated using the CalEEMod, version 2016.3.2. Emissions modeling included quantification of emissions associated with area sources, energy use, and mobile sources. Area sources included the use of architectural coatings and landscape maintenance activities. Energy use included emissions associated with natural gas and electricity use. Reductions in electricity use associated with the installation of solar PV systems for residential uses was calculated based on the estimated total electricity use for proposed single-family and multi-family residential land uses and assuming an average energy reduction of 50 percent (CEC 2019). Mitigated emissions associated with energy use assumes natural-gas fired appliances and building mechanical equipment (e.g., fireplaces, water heaters, space heaters) would not be installed.

Trip-generation rates for proposed residential land uses and the elementary school were derived from the City's *Travel Demand Forecasting Model* (2009), which are specific to the Paso Robles area, rather than relying on trip-generation rates based on nation-wide survey data developed by the Institute of Transportation Engineers (ITE). Although use of the ITE trip-generation rates are often used for traffic analysis purposes, the ITE rates may not be reflective of local conditions. As a result, for emissions calculation purposes, use of locally-specific trip-generation rates is preferred, when available, and approved for use by the SLOAPCD. Mobile-source emissions for land uses not identified in the City's *Travel Demand Forecasting Model*, which included the proposed commercial uses and health club, were quantified based on the trip-generation rates derived from the traffic analysis prepared for this project. Other proposed land uses (i.e., Community Supported Agriculture (CSA) maintenance shed, pool house, pool service building, event barn, community parks, neighborhood open space, and other asphalt surfaces) would not generate vehicle trips. With the exception of proposed residential land uses, the vehicle fleet mix used in the analysis was based on default assumptions contained in CalEEMod for San Luis Obispo County. It is important to note that the default fleet mix contained in CalEEMod is based largely on County-wide data and, therefore, may not be reflective of vehicle fleet mixes specific to some land uses, such as residential uses. For the proposed residential land uses, the fleet mix was adjusted based on the recommended fleet mix for residential land uses obtained from the San Joaquin Valley Air Pollution Control District (SJVAPCD) and approved for use by the SLOAPCD. The residential fleet mix was calculated by applying the SJVAPCD-recommended vehicle fleet-mix adjustments to the default fleet mix identified in CalEEMod for San Luis Obispo County. Land-use specific fleet-mix data for other land uses was not available and, therefore, were based on the default fleet mix identified in CalEEMod. Proposed land uses are summarized in Table 6. Exposure to localized pollutant concentrations was qualitatively assessed. Emission modeling files are provided in Appendix C.

Table 6. Planned Land Uses

Land Uses	Estimated Size (Acre)
Single-Family Residential Housing	147.45
Multifamily Housing (Low-Rise)	14.25
Shopping Center	0.24
Elementary School	0.95
Community Parks	45.3
Neighborhood Open Space	33.8
Private Recreational Uses (Event Barn, Pool, Health/Fitness Club)	17.1
CSA Maintenance Shed	0.01
Other Asphalt Surfaces	97.6
Total	356.7
Source: Rincon Consultants 2019	

Project Impacts and Mitigation Measures

Impact AQ-A. Conflict with or obstruct implementation of the applicable air quality plan.

SLOAPCD Clean Air Plan

As part of the CCAA, the SLOAPCD is required to develop a plan to achieve and maintain the state ozone standard by the earliest practicable date. The SLOAPCD's 2001 Clean Air Plan (CAP) addresses the attainment and maintenance of state and federal ambient air quality standards. The CAP was adopted by SLOAPCD's on March 26, 2002.

The SLOAPCD's CAP outlines the District's strategies to reduce ozone-precursor pollutants (i.e., ROG and NO_X) from a wide variety of sources. The SLOAPCD's CAP includes a stationary-source control program, which includes control measures for permitted stationary sources; as well as, transportation and land use management strategies to reduce motor vehicle emissions and use. The stationary-source control program is administered by SLOAPCD. Transportation and land use control measures are implemented at the local or regional level, by promoting and facilitating the use of alternative transportation options, increased pedestrian access and accessibility to community services and local destinations, reductions in vehicle miles traveled, and promotion of congestion management efforts. In addition, local jurisdictions also prepare population forecasts, which are used by SLOAPCD to forecast population-related emissions and air quality attainment, including those contained in the SLOAPCD's CAP. As a result, consistency with the SLOAPCD's CAP has been evaluated based on the proposed project's consistency with the land use management strategies and transportation control measures identified in the CAP. This analysis also provides an analysis of year 2050 population projections (medium growth scenario) contained in San Luis Obispo Council of Government's (SLOCOG) *2050 Regional Growth Forecast for San Luis Obispo County* (2017) and projected vehicle miles traveled (VMT), which are relied upon for regional air quality planning purposes. The population projects are included in SLOCOG's *2019 Regional Transportation Plan and Sustainable Communities Strategy* which identify the regional growth approach necessary to reach emission reduction targets set by the California Air Resources Board through SB 375 which is transportation legislation that supports the broader 2030 emission reduction targets required in SB 32.

Transportation and Land Use Control Measures

The SLOAPCD's CAP includes multiple transportation and land use control measures intended to reduce emissions through reductions in VMT and the promotion of alternative forms of transportation. The control measures applicable to the proposed project are summarized in Table 7. As noted in Table 7 and given the conceptual nature of the proposed project, some project features that would support reductions in VMT and the promotion of alternative forms of transportation have not yet been clearly defined. As a result, the proposed project would be considered inconsistent with the SLOAPCD's regional air quality planning efforts.

Projected Population, Employment & VMT Growth

The proposed project has been designed with a mix of land uses, including single-/multi-family residential, commercial, recreational, and public land uses. In total, the project is expected to result in an increase of approximately 3,517 residents and 78 employees. Based on U.S. Census data, the City's existing population is approximately 32,212 residents (USCB 2019). Under the medium growth scenario evaluated in the *2050 Regional Growth Forecast for San Luis Obispo County* (2017) the City's population is estimated to total approximately 32,755 residents in 2025 and 37,858 in 2050. In comparison to the existing estimated population, this equate to an increase of approximately 543 residents by year 2025 and 5,103 residents by year 2050. The proposed project would result in near-term increases in population that would exceed projected year 2025 population projections, but would not exceed future year 2050 projections.

SLOCOG is currently preparing the *2019 Regional Housing Needs Assessment (RHNA)*, which is mandated by state law as part of the periodic process of updating local General Plan Housing Elements. The RHNA allows communities to anticipate and plan for future growth in ways that enhance quality of life, improve access to jobs, promote transportation mobility, and address fair share housing needs. One of the objectives of RHNAs is to improve the intraregional jobs/housing balance, with the objective of achieving a one-to-one ratio. A one-to-one ratio is desirable for supporting and promoting transportation mobility and decreased

VMT. Based on the projections identified in the RHNA, the County would need to add 11,535 housing units by the end of 2028 to meet overall jobs/housing goals. This estimate is in line with SLOCOG's adopted 2050 Regional Growth Forecast (City of Paso Robles, 1018).

Table 7. Project Consistency with SLOAPCD's CAP Transportation and Land Use Control Measures

Control Measures	Project Consistency
Land Use Planning Strategies	
L-1 Planning Compact Communities. • Cities and unincorporated communities should be developed at densities that reduce trips and travel distances and encourage the use of alternative forms of transportation. • Urban growth should occur within the urban reserve lines of cities and unincorporated communities. • Local planning agencies should encourage walking and transit use by planning neighborhoods and commercial centers at densities to allow for convenient access to and use of local and regional transit systems.	**Consistent with Mitigation Incorporated**. The proposed project has been designed with a mix of land uses, including single-/multi-family residential, commercial, recreational, and public land uses. This mix of land uses would help to reduce vehicle trips. The project is located within the Urban Reserve Line of the City. Bicycle facilities in the area consist of a mix of Class I and Class II bikeways. Existing transit stops within the project area are located on Sherwood Road at Quail Run, Fontana Road at Linne Road, Airport Road near Parkview Lane, and Airport Road at Scott Street. Additional transit stops are located within one-quarter mile of the project area. The proposed project identifies pedestrian and bicycle facilities along some of the proposed on-site roadways, which would provide access to and promote the use of nearby existing bicycle and transit facilities. However, given the conceptual nature of the proposed project, detailed plans have not been developed for all roadways/locations. As a result, the proposed project would be inconsistent with this measure. **Mitigation Measures**: Traffic mitigation included for the proposed project would require the project to make a fair-share contribution to the City's impact fee program to fund necessary public transportation system improvements. Off-site improvements include the installation of traffic control devices and various other improvements that would reduce vehicle congestion and promote traffic calming. In addition, Mitigation Measure AQ-7 includes additional measures that would require the incorporation of features to promote alternative forms of transportation, including access to public transit. With mitigation, the proposed project would be consistent with this measure.
L-2 Providing for Mixed Land Use. • The mixing of compatible commercial and residential land uses should be encouraged when it will reduce dependence on the automobile or improve the balance between jobs and housing without creating incompatible land use relationships.	**Consistent**. As noted above, the proposed project has been designed with a mix of land uses, including single-/multi-family residential, commercial, recreational, and public land uses. This mix of land uses would help to reduce vehicle trips and provide increased balance between jobs and housing in the area. The proposed land uses are compatible with nearby existing land uses. In addition, refer to Control Measure L-1, above.
L-3 Balancing Jobs and Housing. • Within cities and unincorporated communities, the gap between the availability of jobs and housing should be narrowed and should not be allowed to expand.	
L-4 Circulation Management. • Jurisdictions should adopt the concept of improved accessibility as a planning goal and as a means to coordinate land use and transportation planning efforts. • Agencies should focus transportation funds on facilities and promotional programs that support transit, ridesharing, bicycling, and walking before focusing funds on capacity expansion for congestion relief.	**Consistent with Mitigation Incorporated**. The proposed project has been designed to provide efficient access to nearby major transportation systems through the development of a proposed on-site roadway network. However, given the conceptual nature of the project, detailed information is not available for all roadways. As a result, the proposed project would be considered inconsistent with this measure. **Mitigation Measures**: Traffic mitigation included for the proposed project would require the project to make a fair-share contribution to the City's impact fee program to fund necessary public transportation system improvements, including those that would reduce vehicle congestion and promote traffic calming. In addition, Mitigation Measure AQ-7 includes additional measures that would require the incorporation of features to promote alternative forms of transportation, including pedestrian, bicycle, ridesharing, and increased access to public transit. With mitigation, the proposed project would be consistent with this measure.

Table 7. Project Consistency with SLOAPCD's CAP Transportation and Land Use Control Measures

Control Measures	Project Consistency
Transportation Control Measures	
T-2B Regional Public Transit Improvements. • The goal of this measure is to improve transit service and facilities that will promote increased public transit use instead of a private automobile.	**Consistent with Mitigation Incorporated**. Existing transit stops in the project area are located on Sherwood Road at Quail Run, Fontana Road at Linne Road, Airport Road near Parkview Lane, and Airport Road at Scott Street. The proposed project identifies pedestrian and bicycle facilities along some of the proposed on-site roadways, which would provide access to and promote the use of nearby existing transit facilities. However, given the conceptual nature of the proposed project, detailed plans have not been developed for all roadways/locations. As a result, the proposed project would be inconsistent with this measure. **Mitigation Measures**: Traffic mitigation included for the proposed project would require the project to make a fair-share contribution to the City's impact fee program to fund necessary public transportation system improvement, including those that would reduce vehicle congestion and promote traffic calming. In addition, Mitigation Measure AQ-7 includes additional measures that would require the incorporation of features to promote alternative forms of transportation, including pedestrian, bicycle, ridesharing, and increased access to public transit. With mitigation, the project would be consistent with this measure.
T-3 Bicycling and Bikeway Enhancements. • The goal of this measure is to encourage a modal shift to bicycles through implementation of infrastructure improvements and administrative actions that provide inexpensive commute options and increased safety and convenience for commuters.	**Consistent with Mitigation Incorporated**. Refer to Control Measure L-1, above.
T-6 Traffic-Flow Improvements. • This measure focuses on implementation of measures that would promote traffic calming and decreased vehicle congestion.	
T-8 Teleworking, Teleconferencing, and Telelearning. • The objective of this measure is to reduce the number of trips and miles traveled by employees and students by promoting teleworking, tele-conferencing and telelearning.	**Consistent with Mitigation Incorporated**. As noted above, the proposed project has been designed with a mix of land uses, including single-/multi-family residential, commercial, recreational, and public land uses. This mix of land uses would help to reduce vehicle trips and provide increased balance between jobs and housing in the area. However, the proposed project does not include specific measures or design elements that would promote or encourage programs that would reduce VMT, such as ridesharing, alternative work schedules, or teleworking. **Mitigation Measures**: As noted above, various mitigation measures have been incorporated to promote the use of alternative forms of transportation, which would be anticipated to contribute to reductions in worker commute trips and VMT. In addition, Mitigation Measure AQ-7,t. would also encourage non-residential land uses to implement and promote programs to reduce employee vehicle miles traveled (e.g. incentives, SLO Regional Rideshare trip reduction program, vanpools, on-site employee housing, alternative schedules (e.g. 9–80s, 4–10s, telecommuting, satellite work sites, etc.). With mitigation, the project would be consistent with this measure.

According to the RHNA, Paso Robles has about 27 percent more jobs than housing units, indicative of a "jobs-rich" community. The City's jobs to housing ratio is estimated to improve from a year 2015 ratio of 1.27 to a ratio of 1.19 by year 2030 (refer to Table 8). To achieve this improvement in jobs/housing balance, the City will need to add approximately 946 jobs and 1,606 housing units, in comparison to 2015 estimates (City of Paso Robles 2018). The proposed project would contribute to this need by adding approximately 78 jobs and 1,293 housing units. When adding the project's contribution to baseline year 2015 jobs/housing ratio identified

in the RHNA, total jobs in the City would increase to 15,149 and total housing units would increase to 13,139. With implementation of the proposed project, the jobs/housing ratio for the City would improve from 1.27 to 1.15, which could help to support and promote local and regional improvements related to increased transportation mobility and potential reductions in VMT.

Table 8. Jobs and Housing Summary of the City of Paso Robles

Year	Jobs	Housing Units	Jobs/Housing Ratio
2015	15,071	11,846	1.27
2030	16,017	13,452	1.19
Year 2030 Compared to Year 2015:	+946	+1,606	-0.08
Source: City of Paso Robles. 2018.			

As noted above, the proposed project would not be inconsistent with projected 2030 population, employment, or VMT growth for the region. However, given the conceptual nature of the project, some features that would support reductions in VMT and the promotion of alternative forms of transportation have not yet been clearly defined or incorporated as part of the proposed project. In addition, as noted in Impact AQ-B, construction-generated emissions of ROG+NO_X and daily operational emissions of ROG+NO_X, as well as, fugitive PM_{10} would exceed SLOAPCD's recommended significance thresholds. For these reasons, the proposed project would be considered to potentially conflict with regional air quality planning efforts. This impact is considered ***potentially significant.***

Particulate Matter Report – Implementation of SB 656 Requirements

In July 2005, SLOAPCD adopted the *Particulate Matter Report* (PM Report). The PM Report identifies various measures and strategies to reduce public exposure to PM emitted from a wide variety of sources, including emissions from permitted stationary sources and fugitive sources, such as construction activities. As discussed in Impact AQ-B, uncontrolled fugitive dust generated during construction may result in localized pollutant concentrations that may result in increased nuisance concerns to nearby land uses. Therefore, construction-generated emissions of PM would be considered to have a ***potentially significant*** impact with regard to air quality planning efforts.

Mitigation Measures

Implement Mitigation Measures AQ-1 through AQ-7 (refer to Impact AQ-B).

Significance After Mitigation

Implementation of Mitigation Measures AQ-1, AQ-2, AQ-3, AQ-4, AQ-5, and AQ-6 would include measures to reduce construction-generated emissions of NOx, ROG, and PM. Mitigation Measures AQ-7 would include measures to reduce operational emissions of ROG, NO_x, and PM. Together these measures would help to provide consistency with the measures identified in the SLOAPCD's CAP. Construction emissions of ROG+NO_x would not exceed SLOAPCD's recommended significant thresholds after mitigation. However, daily operational emissions of ROG+NO_X and fugitive PM_{10} would exceed SLOAPCD's recommended significant thresholds after mitigation. As a result, the operational phase of the project would conflict with regional air quality planning efforts. With mitigation, this impact would be considered ***significant and unavoidable.***

Impact AQ-B. ***Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard. Construction Phase.***

Short-term Construction Emissions

Construction-generated emissions are of temporary duration, lasting only as long as construction activities occur, but have the potential to represent a significant air quality impact. Construction of the proposed project would result in the temporary generation of emissions associated with site grading and excavation, paving, motor vehicle exhaust associated with construction equipment and worker trips, as well as the movement of construction equipment on unpaved surfaces. Short-term construction emissions would result in increased emissions of ozone-precursor pollutants (i.e., ROG and NO_X) and emissions of PM. Emissions of

ozone-precursors would result from the operation of on- and off-road motorized vehicles and equipment. Emissions of airborne PM are largely dependent on the amount of ground disturbance associated with site preparation activities and can result in increased concentrations of PM that can adversely affect nearby sensitive land uses.

Estimated maximum daily and quarterly emissions associated with construction of the proposed project are presented in Table 9 and Table 10, respectively, and summarized in Table 11. Construction generated emissions were compared to SLOAPCD's recommended significant thresholds (Daily, Quarterly Tier 1, and Quarterly Tier 2). As depicted in Table 9, maximum daily emissions associated with the construction of the proposed project would total approximately 235.2 lbs/day of ROG+NO_X and 2.3 lbs/day of exhaust PM_{10}. As depicted in Table 10, the maximum quarterly construction-generated emissions would total approximately 7.4 tons/quarter of ROG+NO_X, 1.7 tons/quarter of fugitive PM_{10}, and 0.07 tons/quarter of exhaust PM_{10}.

Table 9. Daily Construction Emissions Without Mitigation

Construction Activity	Construction Year	Maximum Daily Emissions (lbs/day)[1]	
		ROG+NO_X	Exhaust PM_{10}
Demolition	2020	37.6	1.7
Site Preparation	2020	46.6	2.2
Grading/Excavation	2020	54.8	2.2
Building Construction	2020	204.1	2.1
Architectural Coatings	2020	31.1	0.2
Building Construction	2021	188.0	1.6
Architectural Coatings	2021	31.3	0.1
Building Construction	2022	175.9	1.4
Architectural Coatings	2022	30.6	0.1
Building Construction	2023	149.0	1.1
Architectural Coatings	2023	30.1	0.1
Paving	2023	17.0	0.5
SLOAPCD Daily Thresholds (pounds/day)		***137***	***7***
Maximum Daily Emissions-Year 2020		235.2	2.3
Exceed SLOAPCD Thresholds?		**Yes**	No
Maximum Daily Emissions-Year 2021		219.3	1.7
Exceed SLOAPCD Thresholds?		**Yes**	No
Maximum Daily Emissions-Year 2022		206.5	1.5
Exceed SLOAPCD Thresholds?		**Yes**	No
Maximum Daily Emissions-Year 2023		196.1	1.7
Exceed SLOAPCD Thresholds?		No	No

Maximum Daily Emissions: Assumes that facility construction, paving, and application of architectural coatings could potentially occur simultaneously on any given day. To be conservative, exhaust PM_{10} emissions were compared to SLOAPCD's DPM threshold. Totals may not sum due to rounding. Refer to Appendix C for modeling assumptions and results.
1 Maximum daily emissions include on-site and off-site emissions.

Maximum daily and quarterly construction emissions of ROG+NO_X would exceed SLOAPCD's daily, quarterly Tier 1, and quarterly Tier 2 significance thresholds. Emissions would be largely a result of mobile-source emissions associated with construction vehicle and equipment operations anticipated to occur during the building construction phase. Estimated emissions of fugitive PM and DPM would not exceed SLOAPCD's significance thresholds. However, if uncontrolled, fugitive dust generated during construction may result in localized pollutant concentrations that could exceed ambient air quality standards and result in increased nuisance concerns to nearby land uses. For these reasons, construction-generated emissions would be considered to have a ***potentially significant*** impact

Table 10. Quarterly Construction Emissions Without Mitigation

Quarter	Maximum Quarterly Emissions (tons)[1]			
	ROG+NO_X	PM_{10}[2]		
		Fugitive	Exhaust	Total
Year 2020 - Quarter 1	1.7	0.7	0.07	0.8
Year 2020 - Quarter 2	2.9	1.0	0.07	1.1
Year 2020 - Quarter 3	6.6	1.4	0.07	1.5
Year 2020 - Quarter 4	7.4	1.6	0.07	1.7
Year 2021 - Quarter 1	7.1	1.7	0.06	1.8
Year 2021 - Quarter 2	7.0	1.7	0.06	1.8
Year 2021 - Quarter 3	7.1	1.7	0.06	1.8
Year 2021 - Quarter 4	7.2	1.7	0.06	1.8
Year 2022 - Quarter 1	6.7	1.7	0.05	1.8
Year 2022 - Quarter 2	6.6	1.7	0.05	1.8
Year 2022 - Quarter 3	6.7	1.7	0.05	1.8
Year 2022 - Quarter 4	6.8	1.7	0.05	1.8
Year 2023 - Quarter 1	5.9	1.7	0.04	1.8
Year 2023 - Quarter 2	4.9	1.4	0.03	1.5
Year 2023 - Quarter 3	0.3	0.0	0.01	<0.1
SLOAPCD Quarterly Tier 1/Tier 2 Thresholds (tons/quarter)	**2.5/6.3**	**2.5/None**	**0.13/0.32**	**None**
Maximum Quarterly Emissions:	7.4	1.7	0.07	1.8
Exceed SLOAPCD Tier 1/Tier 2 Thresholds?	**Yes/Yes**	**No/NA**	**No/No**	**NA**

Maximum Quarterly Emissions: Assumes that facility construction, paving, and application of architectural coatings could potentially occur simultaneously on any given day. To be conservative, total exhaust PM_{10} emissions were compared to SLOAPCD's DPM threshold. Totals may not sum due to rounding. Refer to Appendix C for modeling assumptions and results. NA=Not Applicable

1. Maximum daily emissions include on-site and off-site emissions..

Table 11. Summary of Construction Emissions Without Mitigation

Criteria	Project Emissions	SLOAPCD Significance Threshold		Exceeds Significance Threshold?	
Maximum Daily Emissions of ROG+NO_X	235.2 lbs/day	137 lbs/day		**Yes**	
Maximum Daily Emissions of DPM	2.3 lbs/day	7 lbs/day		No	
		Tier 1	**Tier 2**	**Tier 1**	**Tier 2**
Maximum Quarterly Emissions of ROG+NO_X	7.4 tons/qtr	2.5 tons/qtr	6.3 tons/qtr	**Yes**	**Yes**
Maximum Quarterly Emissions of DPM	0.07 tons/qtr	0.13 tons/qtr	0.32 tons/qtr	No	No
Maximum Quarterly Emissions of Fugitive PM	1.49 tons/qtr	2.5 tons/qtr	None	No	No

Refer to Appendix C for modeling assumptions and results.

Mitigation Measures

AQ-1: A Construction Activity Management Plan (CAMP) shall be prepared to reduce construction generated emissions. At a minimum, the CAMP shall include SLOAPCD-recommended measures for the control of construction-generated emissions (refer to Mitigation Measures AQ-2 through AQ-6) and be submitted to SLOAPCD for review and approval at least three months prior to start of construction. If implementation of the SLOAPCD-recommended Standard and Best Available Control Technology (BACT) measures cannot reduce emissions below applicable thresholds, off-site mitigation may be required in coordination with SLOAPCD. The CAMP should include the following the following elements:

a. A Dust Control Management Plan that encompasses all, but is not limited to, dust control measures;
b. Tabulation of on and off-road construction equipment (age, horse-power and miles and/or hours of operation);
c. Schedule construction truck trips during non-peak hours to reduce peak-hour emissions;
d. Limit the length of the construction work-day period, if necessary; and,
e. Phase construction activities, if appropriate.

AQ-2: Standard Mitigation measures shall be implemented to reduce construction generated NO_x, ROG, and DPM.

a. Maintain all construction equipment in proper tune according to manufacturer's specifications;
b. Fuel all off-road and portable diesel-powered equipment with ARB certified motor vehicle diesel fuel (non-taxed version suitable for use off-road);
c. Diesel-fueled construction equipment shall meet, at a minimum, ARB's Tier 2 certified engines or cleaner off-road heavy-duty diesel engines, and comply with the State Off-Road Regulation;
d. Use on-road heavy-duty trucks that meet the ARB's 2007 or cleaner certification standard for on-road heavy-duty diesel engines, and comply with the State On-Road Regulation;
e. Construction or trucking companies with fleets that do not have engines in their fleet that meet the engine standards identified in the above two measures (e.g. captive or NOx exempt area fleets) may be eligible by proving alternative compliance;
f. All on and off-road diesel equipment shall not idle for more than 5 minutes. Signs shall be posted in the designated queuing areas and or job sites to remind drivers and operators of the 5-minute idling limit;
g. Diesel idling within 1,000 feet of sensitive receptors is not permitted;
h. Staging and queuing areas shall not be located within 1,000 feet of sensitive receptors;
i. Electrify equipment when feasible;
j. Substitute gasoline-powered in place of diesel-powered equipment, where feasible; and,
k. Use alternative-fueled construction equipment on-site where feasible, such as compressed natural gas (CNG), liquefied natural gas (LNG), propane or biodiesel.

AQ-3: The following BACT measures shall be implemented to reduce construction generated ozone-precursor emissions.

a. Further reducing emissions by expanding the Standard Mitigation requirements (MM AQ-2) to incorporate the use of Tier 3 and Tier 4 off-road equipment; repowered off-road equipment using cleaner engines; heavy-duty trucks meeting ARB's 2010, or cleaner, certification standard for on-road heavy-duty diesel engines; and installing California Verified Diesel Emission Control Strategies.

AQ-4: To the extent deemed necessary, based on the estimated emissions to be included in the CAMP, off-site mitigation shall be implemented to reduce construction generated emissions by stationary and mobile sources. It should include the following measures, but not be limited to, the following elements:

a. Fund a program to buy and scrap older heavy-duty diesel vehicles or equipment;
b. Replace/repower transit buses;
c. Replace/repower heavy-duty diesel school vehicles (i.e. bus, passenger or maintenance vehicles);
d. Retrofit or repower heavy-duty construction equipment, or on-road vehicles;
e. Repower or contribute to funding clean diesel locomotive main or auxiliary engines;
f. Purchase VDECs for local school buses, transit buses or construction fleets;
g. Install or contribute to funding alternative fueling infrastructure (i.e. fueling stations for CNG, LPG, conductive and inductive electric vehicle charging, etc.);
h. Fund expansion of existing transit services; and,
i. Replace/repower marine diesel engines.

AQ-5: The following measures shall be implemented to reduce construction generated fugitive dust. These measures shall be shown on grading and building plans.

a. Reduce the amount of disturbed area where possible.
b. Use water trucks, APCD approved dust suppressants (see Section 4.3 in the CEQA Air Quality Handbook), or sprinkler systems in sufficient quantities to prevent airborne dust from leaving the site and from exceeding the District's limit of 20% opacity for greater than 3 minutes in any 60-minute period. Increased watering frequency would be required whenever wind speeds exceed 15 mph. Reclaimed (non-potable) water should be used whenever possible. Please note that since water use is a concern due to drought conditions, the contractor or builder shall consider the use of an APCD-approved dust suppressant where feasible to reduce the amount of water used for dust control. For a list of suppressants, see Section 4.3 of the CEQA Air Quality Handbook.
c. All dirt stockpile areas should be sprayed daily as needed.
d. Permanent dust control measures identified in the approved project revegetation and landscape plans should be implemented as soon as possible following completion of any soil disturbing activities;
e. Exposed ground areas that are planned to be reworked at dates greater than one month after initial grading should be sown with a fast germinating, non-invasive grass seed and watered until vegetation is established.
f. All disturbed soil areas not subject to revegetation should be stabilized using approved chemical soil binders, jute netting, or other methods approved in advance by the SLOAPCD.
g. All roadways, driveways, sidewalks, etc. to be paved should be completed as soon as possible. In addition, building pads should be laid as soon as possible after grading unless seeding or soil binders are used.
h. Vehicle speed for all construction vehicles shall not exceed 15 mph on any unpaved surface at the construction site.
i. All trucks hauling dirt, sand, soil, or other loose materials are to be covered or should maintain at least two feet of freeboard (minimum vertical distance between the top of load and top of trailer) in accordance with CVC Section 23114.
j. Install wheel washers at the construction site entrance/exit, wash off the tires or tracks of all trucks and equipment leaving the site, or implement other SLOAPCD-approved track-out prevention devices sufficient to minimize the track-out of soil onto paved roadways.
k. Sweep streets at the end of each day if visible soil material is carried onto adjacent paved roads. Water sweepers with reclaimed water should be used where feasible.
l. The burning of vegetative material shall be prohibited. Effective February 25, 2000, the APCD prohibited developmental burning of vegetative material within San Luis Obispo County. If you have any questions regarding these requirements, contact the SLOAPCD Engineering & Compliance Division at (805) 781-5912.
m. The contractor or builder shall designate a person or persons to monitor the fugitive dust emissions and enhance the implementation of the measures as necessary to minimize dust complaints, reduce visible emissions below 20% opacity, and to prevent the transport of dust off-site. Their duties shall include holidays and weekend periods when work may not be in progress. The name and telephone number of such persons shall be provided to the SLOAPCD Compliance Division prior to the start of any grading, earthwork or demolition.
n. When applicable, portable equipment, 50 horsepower (hp) or greater, used during construction activities shall be registered with the California statewide portable equipment registration program (issued by the California Air Resources Board) or be permitted by the APCD. Such equipment may include power screens, conveyors, internal combustion engines, crushers, portable generators, tub grinders, trammel screens, and portable plants (e.g, aggregate plant, asphalt plant, concrete plant). For more information, contact the SLOAPCD Engineering & Compliance Division at (805) 781-5912.
o. Construction of the proposed project shall use low-VOC content paints not exceeding 50 grams per liter.
p. To the extent locally available, use prefinished building materials or materials that do not require the application of architectural coatings.

AQ-6: The following measures shall be implemented to reduce construction emissions from on and off-road construction equipment (NOx, ROG, and DPM) These measures shall be shown on grading and building plans:

a. Idling Restrictions Near Sensitive Receptors for Both On and off-Road Equipment
   1) Staging and queuing areas shall not be located within 1,000 feet of sensitive receptors;
   2) Diesel idling within 1,000 feet of sensitive receptors is not permitted;
   3) Use of alternative fueled equipment is recommended whenever possible; and,
   4) Signs that specify the no-idling requirements must be posted and enforced at the construction site.

b. Idling Restrictions for On-road Vehicles

   Section 2485 of Title 13, the California Code of Regulations limits diesel-fueled commercial motor vehicles that operate in the State of California with gross vehicular weight ratings of greater than 10,000 pounds and licensed for operation on highways. It applies to California and non-California based vehicles. In general, the regulation specifies that drivers of said vehicles:
   1) Shall not idle the vehicle's primary diesel engine for greater than 5 minutes at any location, except as noted in Subsection (d) of the regulation; and,
   2) Shall not operate a diesel-fueled auxiliary power system (APS) to power a heater, air conditioner, or any ancillary equipment on that vehicle during sleeping or resting in a sleeper berth for greater than 5.0 minutes at any location when within 100 feet of a restricted area, except as noted in Subsection (d) of the regulation.
   3) Signs must be posted in the designated queuing areas and job sites to remind drivers of the 5-minute idling limit. The specific requirements and exceptions in the regulation can be reviewed at the following web site: www.arb.ca.gov/msprog/truck-idling/2485.pdf.

c. Idling Restrictions for off-Road Equipment

   Off-road diesel equipment shall comply with the 5-minute idling restriction identified in Section 2449(d)(3) of the California Air Resources Board's In-Use Off-Road Diesel regulation: www.arb.ca.gov/regact/2007/ordiesl07/frooal.pdf.

   1) Signs shall be posted in the designated queuing areas and job sites to remind off-road equipment operators of the 5-minute idling limit.

Significance After Mitigation

Implementation of Mitigation Measures AQ-1, AQ-2, AQ-3, AQ-4, AQ-5, and AQ-6 would include measures to reduce construction-generated emissions of fugitive dust, as well as, mobile-source emissions associated with construction vehicles (e.g. Tier 3 and Tier 4 off-road engines) and equipment operations and evaporative emissions from architectural coasting (e.g. low VOC-emission paint). Together these measures would assist with the compliance of SLOAPCD's 20-percent opacity limit (APCD Rule 401), nuisance rule (APCD Rule 402), and minimize potential nuisance impacts to nearby receptors. To the extent necessary, off-site mitigation may also be required as part of the CAMP to be prepared (Mitigation Measure AQ-1) to ensure that construction-generated emissions would not exceed applicable SLOAPCD thresholds. As a result, daily and quarterly construction emissions of ROG + NO_x would not exceed SLOAPCD's construction emission thresholds. With mitigation, this impact would be considered ***less than significant.***

Long-term Operational Emissions

Long-term operational emissions associated with the proposed project would be predominantly associated with mobile sources. To a lesser extent, emissions associated with area sources, such as landscape maintenance activities, as well as, use of electricity and natural gas would also contribute to increased operational emissions.

Unmitigated operational emissions associated with the proposed project are summarized in Table 12. As shown, maximum daily operational emissions of ROG+NO_x would total approximately 133.2 lbs/day and 72.1 lbs/day of fugitive PM_{10}. Daily emissions of ROG+NO_x and fugitive PM_{10} would exceed SLOAPCD's corresponding significance thresholds. It is also important to note that the proposed project is not anticipated

to include the installation of stationary or mobile sources that would result in daily emissions in excess of SLOAPCD's DPM threshold. Annual emissions of ROG+NO_x would total approximately 22.3 tons/year and fugitive PM_{10} would total approximately 10.3 tons/year. Estimated annual operational emissions would not exceed SLOAPCD's recommended significance thresholds. The proposed project would result in increased emissions in excess of applicable significance thresholds for pollutants for which the region is designated non-attainment. As a result, this impact would be considered ***potentially significant***.

Table 12. Operational Emissions Without Mitigation

Operational Period/Source	Emissions[1]						
	ROG	NO_X	ROG+NO_X	CO	PM_{10}		
					Fugitive	Exhaust[2]	Total
Daily Emissions (lbs/day)							
Area Source	71.9	1.2	73.1	106.7	0	0.6	0.6
Energy Use	1.0	8.8	9.8	3.9	0	0.7	0.7
Mobile	16.4	33.9	50.3	202.4	72.1	0.6	72.7
Total Project Emissions	89.3	43.9	133.2	313.0	72.1	1.9	74.0
SLOAPCD Significance Thresholds	--	--	25	550	25	1.25[3]	--
Exceeds SLOAPCD Thresholds?	--	--	**Yes**	No	**Yes**	No[3]	--
Annual Emissions (tons/year)							
Total Project Emissions	15.6	6.7	22.3	15.0	10.3	0.3	10.6
SLOAPCD Significance Thresholds	--	--	25	--	25	--	--
Exceeds SLOAPCD Thresholds?	--	--	No	--	No	--	--

1. *Daily emissions are based on the highest emissions for summer or winter operational conditions for buildout year 2024 conditions. Totals may not sum due to rounding. Refer to Appendix C for modeling output files and assumptions.*
2. *Includes PM exhaust emissions for diesel- and gasoline-fueled vehicles. Based on the CalEEMod default fleet mix, diesel-fueled vehicles would represent less than 10 percent of the overall vehicle fleet mix/VMT and total exhaust PM_{10} emissions for the project. Estimated total diesel-exhaust PM_{10}, including on-site and off-site vehicular emissions, would be less than approximately 0.2 lbs/day. The proposed project is not anticipated to include the installation of on-site stationary or mobile sources of DPM emissions that would be anticipated to exceed the SLOAPCD's on-site significance threshold of 1.25 lbs/day.*
3. *The SLOAPCD-recommended DPM significance threshold applies to on-site emission sources.*

Mitigation Measures

AQ-7: The following mitigation measures shall be implemented, to the extent possible, to minimize long-term operational emissions of ROG, NO_x, CO, and PM_{10} to the extent locally available.

a. Install electric fireplaces in place of EPA certified Tier 2 residential wood-burning and natural gas appliances.
b. Provide a pedestrian-friendly and interconnected streetscape with good access to/from the development for pedestrians, bicyclists, and transit users to make alternative transportation more convenient, comfortable and safe. Features may include: appropriate signalization and signage; safe routes to school; linking cul-de-sacs and dead ends; orienting buildings toward streets with automobile parking in the rear, etc.
c. Provide shade over 50% of parking spaces to reduce evaporative emissions from parked vehicles, excluding areas where increased shade would affect the performance of solar PV systems.
d. Reduce fugitive dust from roads and parking areas with the use of paving or other materials.
e. Implement driveway design standards (e.g., speed bumps, curved driveway) for self-enforcement of reduced speed limits on unpaved driveways.
f. Use an SLOAPCD-approved suppressant on private unpaved roads leading to the site, unpaved driveways and parking areas applied at a rate and frequency that ensures compliance with SLOAPCD Rule 401: Visible Emissions, and ensures off-site nuisance impacts do not occur.
g. Incorporate traffic calming modifications to project roads to reduce vehicle speeds and increase pedestrian and bicycle usage and safety.

h. Work with SLOCOG to create, improve, or expand a nearby 'Park and Ride' lot with car parking and bike lockers in proportion to the size of the project.
i. Implement on-site circulation design elements in parking lots to reduce vehicle queuing and improve the pedestrian environment.
j. Encourage future non-residential land uses to provide employee lockers and showers to promote bicycle and pedestrian use. One shower and 5 lockers for every 25 employees is recommended.
k. Increase bicycle accessibility and safety in the vicinity of the project; for example: provide interconnected bicycle routes/lanes or construction of bikeways.
l. Exceed Cal Green standards by 25% for providing on-site bicycle parking: both short term racks and long term lockers, or a locked room with standard racks and access limited to bicyclists only.
m. If the project is located on an established transit route, provide improved public transit amenities (e.g.: covered transit turnouts, direct pedestrian access, bicycle racks, covered bench, smart signage, route information displays, lighting, etc.).
n. Encourage non-residential land uses to provide a bicycle-share program.
o. Encourage 15% of fleet vehicles owned by non-residential land uses to be zero-emission vehicles.
p. Encourage neighborhood electric vehicles/car-share program for the development.
q. Provide dedicated parking for carpools, vanpools, and/or high-efficiency vehicles to meet or exceed Cal Green Tier 2 for non-residential land uses.
r. Encourage non-residential land uses to provide vanpool, shuttle, minibus service (alternative fueled preferred), where appropriate.
s. Encourage non-residential land uses to provide childcare facility on site.
t. Encourage non-residential land uses to implement and promote programs to reduce employee vehicle miles traveled (e.g. incentives, SLO Regional Rideshare trip reduction program, vanpools, on-site employee housing, alternative schedules (e.g. 9–80s, 4–10s, telecommuting, satellite work sites, etc.).
u. Encourage non-residential land uses to provide a lunchtime shuttle to reduce single-occupant vehicle trips and/or coordinate regular food truck visits.
v. Meet or exceed applicable building standards at the time of development for providing electric vehicle charging infrastructure.
w. Meet or exceed applicable building standards at the time of development for building energy efficiency with a goal of achieving zero net energy (ZNE) buildings.
x. Meet or exceed applicable building standards at the time of development for utilizing recycled content materials.
y. Meet or exceed applicable building standards at the time of development for reducing cement use in the concrete mix as allowed by local ordinance and conditions.
z. Meet or exceed applicable building standards at the time of development for the use of greywater, rainwater or recycled water.
aa. Meet or exceed applicable building standards at the time of development for using shading, trees, plants, cool roofs, etc. to reduce the "heat island" effect.
bb. All built-in appliances shall comply with California Title 20, Appliance Efficiency Regulation.
cc. Utilize on-site renewable energy systems (e.g. solar, wind, geothermal, biomass and/or biogas) sufficient to meet or exceed applicable building standards at the time of development with a goal of achieving zero net energy (ZNE) buildings.
dd. Design roof trusses to handle dead weight loads of standard solar-heated water and photovoltaic panels.

Significance After Mitigation

Mitigated operational emissions associated with the proposed project are summarized in Table 13. With the implementation of Mitigation Measures AQ-7, operational daily and annual emissions would be reduced. However, operational emissions would still exceed SLOAPCD's recommended significant thresholds and result in a cumulatively considerable net increase of ozone and PM_{10} for which the area is designated non-attainment under CAAQS. With mitigation, this impact would be considered ***significant and unavoidable***.

Table 13. Operational Emissions With Mitigation

Operational Period/Source	Emissions						
	ROG	NO_X	ROG+NO_X	CO	PM_{10}		
					Fugitive	Exhaust	Total
Daily Emissions (lbs/day)							
Total Project Emissions	87.8	32.6	120.5	292.5	63.6	1.1	64.7
SLOAPCD Significance Thresholds	--	--	25	550	25	1.25	--
Exceeds SLOAPCD Thresholds?	--	--	**Yes**	No	**Yes**	No	--
Annual Emissions (tons/year)							
Total Project Emissions	15.4	4.8	20.2	44.4	9.1	0.2	9.3
SLOAPCD Significance Thresholds	--	--	25	--	25	--	--
Exceeds SLOAPCD Thresholds?	--	--	No	--	No	--	--

Note: Based on year 2024 operational conditions. Totals may not sum due to rounding. Refer to Appendix C for modeling output files and assumptions.

Impact AQ-D. Expose sensitive receptors to substantial pollutant concentrations.

The project site is bound by Fontana Road to the west and Hanson Road to the east. Nearby land uses consist predominantly of residential dwellings. The nearest Paso Express Bus Stop is located adjacent to the project site along Linne Road near Fontana Road. The nearest sensitive land uses include residential dwellings located across Poppy Lane, approximately 20 feet west of the project site.

Naturally-Occurring Asbestos

Naturally-occurring asbestos (NOA) has been identified as a toxic air contaminant by the ARB. In accordance with ARB Air Toxics Control Measure (ATCM), prior to any grading activities, a geologic evaluation should be conducted to determine if NOA is present within the area that will be disturbed. If NOA is not present, an exemption request form, along with a copy of the geologic report, must be filed with the SLOAPCD. If NOA is found at the site, the applicant must comply with all requirements outlined in the Asbestos ATCM.

Based on a review of the SLOAPCD's map depicting potential areas of NOA, the project site is not located in or near an area that has been identified as having a potential for NOA (refer to Appendix B). However, there is a potential for NOA could potentially be discovered during the grading process. As a result, this impact would be considered ***potentially significant***.

Localized CO Concentrations

Localized concentrations of CO are of primary concern in areas located near congested roadway intersections. Of particular concern are signalized intersections that are projected to operate at unacceptable levels of service (LOS) E or F (Caltrans 1996).

Based on the traffic analysis prepared for this project, the project would result in or contribute to unacceptable levels of service (i.e., LOS E or F) at three primarily affected signalized intersections (CCTC 2019). These affected signalized intersections include SR46E/Golden Hill Rd, 13th St/Riverside Ave, and Niblick Rd/South River Rd. Localized 1-hour and 8-hour CO concentrations at these intersections were modeled using the Caline4 computer program in accordance with Caltrans-recommended methodologies. Predicted CO concentrations at primarily affected signalized intersections are summarized in Table 14. As depicted in Table 14, the highest predicted 1-hour and 8-hour CO concentrations at these intersections would be 3.0 and 2.9 ppm, respectively. Predicted CO concentrations at these intersections would not exceed the 1-hour and 8-hour CAAQS of 20 and 9 parts per million (ppm), respectively. As a result, this impact is considered ***less than significant***.

Table 14. Localized Mobile-Source CO Concentrations

Roadway Intersection	Predicted CO Concentration (ppm)	
	1-Hour	8-Hour
SR 46 East/Golden Hill Road	3.0	1.7
13th Street/Riverside Avenue	2.9	1.7
Niblick Road/South River Road	3.0	1.7
California Ambient Air Quality Standards (CAAQS):	20	9
Exceeds CAAQS/Significant Impact?	No	No

Notes: Localized mobile-source CO concentrations were calculated using the Caline4 computer program based on peak-hour traffic volumes derived from the traffic analysis prepared for this project. Predicted 1-hour CO concentrations were converted to 8-hour concentrations assuming a persistence factor of 0.8. Modeled 1-hour and 8-hour receiver locations were placed at 3 and 7 meters from the roadway edge, respectively. Ambient background 1-hour and 8-hour CO concentrations (2.6 and 1.5, respectively) were based on the highest measured CO concentrations obtained from the nearest monitoring stations for the last three years of available data (2004-2006). Refer to Appendix C for emissions modeling assumptions and results.

Asbestos-Containing Materials

Demolition activities can have potential negative air quality impacts, including issues surrounding the proper handling, demolition, and disposal of asbestos-containing material (ACM). ACM could be encountered during the demolition of existing buildings, particularly older structures constructed prior to 1970. Asbestos can also be found in various building products, including (but not limited to) utility pipes/pipelines (transit pipes or insulation on pipes). If a project will involve the disturbance or potential disturbance of ACM, various regulatory requirements may apply, including the requirements stipulated in the National Emission Standard for Hazardous Air Pollutants (40CFR61, Subpart M-Asbestos NESHAP). These requirements include but are not limited to: 1) notification, within at least 10 business days of activities commencing, to the APCD, 2) an asbestos survey conducted by a Certified Asbestos Consultant, and, 3) applicable removal and disposal requirements of identified ACM.

The proposed project would include the demolition of approximately 2,400 sq.ft. of existing on-site structures. The demolition of existing structures may result in disturbance of ACM. This impact is considered ***potentially significant***.

Lead-Coated Materials

Demolition of structures coated with lead-based paint can have potential negative air quality impacts and may adversely affect the health of nearby individuals. Improper demolition can result in the release of lead-containing particles from the site. Sandblasting or removal of paint by heating with a heat gun can result in significant emissions of lead. In such instances, proper abatement of lead before demolition of these structures must be performed in order to prevent the release of lead from the site. Depending on the removal method, a SLOAPCD permit may be required. The demolition of existing structures may result in the disturbance of lead-containing materials. This impact is considered ***potentially significant***.

Localized PM Concentrations

Fugitive dust emissions would be primarily associated with building demolition, site preparation, grading, and vehicle travel on unpaved and paved surfaces. On-site off-road equipment and trucks would also result in short-term emissions of diesel-exhaust PM, which could contribute to elevated localized concentration at nearby receptors. Uncontrolled emissions of fugitive dust may also contribute to potential increases in nuisance impacts to nearby receptors. For these reasons, localized uncontrolled concentrations of construction-generated PM would be considered to have a ***potentially significant*** impact.

Mitigation Measures

Implement Mitigation Measure AQ-1 through AQ-6, AQ-7,d, AQ-7,f, and the following:

AQ-8: The following mitigation measures shall be implemented to reduce the disturbance of asbestos and lead. Strategies include but are not limited to the following:

a. Demolition of on-site structures shall comply with the National Emission Standards for Hazardous Air Emissions requirements (NESHAP, 40 CFR, Part 61, Subpart M) for the demolition of existing structures. The SLOAPCD is delegated authority by the Environmental Protection Agency (EPA) to implement the Federal Asbestos NESHAP. Prior to demolition of on-site structures, the SLOAPCD shall be notified, per NESHAP requirements. SLOAPCD notification form and reporting requirements are included in Appendix A. Additional information may be obtained at website URL: http://slocleanair.org/ business/asbestos.php.

b. If during the demolition of existing structures, paint is separated from the construction materials (e.g. chemically or physically), the paint waste will be evaluated independently from the building material by a qualified hazardous materials inspector to determine its proper management. All hazardous materials shall be handled and disposed of in accordance with local, state and federal regulations. According to the Department of Toxic Substances Control (DTSC), if the paint is not removed from the building material during demolition (and is not chipping or peeling), the material can be disposed of as construction debris (a non-hazardous waste). The landfill operator will be contacted prior to disposal of building material debris to determine any specific requirements the landfill may have regarding the disposal of lead-based paint materials. The disposal of demolition debris shall comply with any such requirements. Contact the SLOAPCD Enforcement Division at (805) 781-5912 for more information. Approval of a lead work plan and permit may be required. Lead work plans, if required, will need to be submitted to SLOAPCD ten days prior to the start of demolition.

c. Prior to any grading activities, a geologic evaluation shall be conducted to determine if naturally occurring asbestos (NOA) is present within the area that will be disturbed. If NOA is not present, an exemption request must be filed with the SLOAPCD. If NOA is found at the site, the applicant must comply with all requirements outlined in the Asbestos ATCM. These requirements may include but are not limited to:

   1) Development of an Asbestos Dust Mitigation Plan which must be approved by the SLOAPCD before operations begin, and,
   2) Development and approval of an Asbestos Health and Safety Program (required for some projects).

Significance After Mitigation

With the implementation of Mitigation Measure AQ-1 through AQ-6, AQ-7d, and AQ-7,f, fugitive dust emitted during project construction, as well as any fugitive dust generated during project operations, would be substantially reduced. Mitigation Measure AQ-8 would ensure compliance with applicable regulatory requirements pertaining to exposure to asbestos and lead-based paints. With mitigation, this impact would be considered ***less than significant.***

Impact AQ-D. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

The occurrence and severity of odor impacts depend on numerous factors, including the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of the receptors. While offensive odors rarely cause any physical harm, they still can be very unpleasant, leading to considerable distress among the public and often generating citizen complaints to local governments and regulatory agencies. Projects with the potential to frequently expose members of the public to objectionable odors would be deemed to have a significant impact.

The proposed project would not result in the installation of any equipment or processes that would be considered major odor-emission sources. In addition, no known odor sources are within one mile of the project site. However, construction of the proposed project would involve the use of a variety of gasoline or diesel-powered equipment that would emit exhaust fumes. Exhaust fumes, particularly diesel-exhaust, may be considered objectionable by some people. In addition, pavement coatings and architectural coatings used during project construction would also emit temporary odors. However, construction-generated emissions would occur intermittently throughout the workday and would dissipate rapidly with increasing distance from the source. As a result, short-term construction activities would not expose a substantial number of people to frequent odorous emissions. For these reasons, potential exposure of sensitive receptors to odorous emissions would be considered ***less than significant***.

GREENHOUSE GASES AND CLIMATE CHANGE

Existing Setting

To fully understand global climate change, it is important to recognize the naturally occurring "greenhouse effect" and to define the greenhouse gases (GHGs) that contribute to this phenomenon. Various gases in the earth's atmosphere, classified as atmospheric GHGs, play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space and a portion of the radiation is absorbed by the earth's surface. The earth emits this radiation back toward space, but the properties of the radiation change from high-frequency solar radiation to lower-frequency infrared radiation. Greenhouse gases, which are transparent to solar radiation, are effective in absorbing infrared radiation. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This phenomenon is known as the greenhouse effect. Among the prominent GHGs contributing to the greenhouse effect are carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Primary GHGs attributed to global climate change, are discussed, as follows:

- **Carbon Dioxide**. Carbon dioxide (CO_2) is a colorless, odorless gas. CO_2 is emitted in a number of ways, both naturally and through human activities. The largest source of CO_2 emissions globally is the combustion of fossil fuels such as coal, oil, and gas in power plants, automobiles, industrial facilities, and other sources. A number of specialized industrial production processes and product uses such as mineral production, metal production, and the use of petroleum-based products can also lead to CO_2 emissions. The atmospheric lifetime of CO_2 is variable because it is so readily exchanged in the atmosphere (U.S. EPA 2018).

- **Methane**. Methane (CH_4) is a colorless, odorless gas that is not flammable under most circumstances. CH_4 is the major component of natural gas, about 87 percent by volume. It is also formed and released to the atmosphere by biological processes occurring in anaerobic environments. Methane is emitted from a variety of both human-related and natural sources. Human-related sources include fossil fuel production, animal husbandry (enteric fermentation in livestock and manure management), rice cultivation, biomass burning, and waste management. These activities release significant quantities of methane to the atmosphere. Natural sources of methane include wetlands, gas hydrates, permafrost, termites, oceans, freshwater bodies, non-wetland soils, and other sources such as wildfires. Methane's atmospheric lifetime is about 12 years (U.S. EPA 2018).

- **Nitrous Oxide**. Nitrous oxide (N_2O) is a clear, colorless gas with a slightly sweet odor. N_2O is produced by both natural and human-related sources. Primary human-related sources of N_2O are agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuels, acid production, and nitric acid production. N_2O is also produced naturally from a wide variety of biological sources in soil and water, particularly microbial action in wet tropical forests. The atmospheric lifetime of N_2O is approximately 114 years (U.S. EPA 2018).

- **Hydrofluorocarbons.** Hydrofluorocarbons (HFCs) are man-made chemicals, many of which have been developed as alternatives to ozone-depleting substances for industrial, commercial, and consumer products. The only significant emissions of HFCs before 1990 were of the chemical HFC-23, which is generated as a byproduct of the production of HCFC-22 (or Freon 22, used in air conditioning applications). The atmospheric lifetime for HFCs varies from just over a year for HFC-152a to 270 years for HFC-23. Most of the commercially used HFCs have atmospheric lifetimes of less than 15 years (e.g., HFC-134a, which is used in automobile air conditioning and refrigeration, has an atmospheric life of 14 years) (U.S. EPA 2018).

- **Perfluorocarbons.** Perfluorocarbons (PFCs) are colorless, highly dense, chemically inert, and non-toxic. There are seven PFC gases: perfluoromethane (CF_4), perfluoroethane (C_2F_6), perfluoropropane (C_3F_8), perfluorobutane (C_4F_{10}), perfluorocyclobutane (C_4F_8), perfluoropentane (C_5F_{12}), and perfluorohexane (C_6F1_4). Natural geological emissions have been responsible for the PFCs that have accumulated in the atmosphere in the past; however, the largest current source is aluminum production, which releases CF_4 and C_2F_6 as byproducts. The estimated atmospheric lifetimes for PFCs ranges from 2,600 to 50,000 years (U.S. EPA 2018).

- **Nitrogen Trifluoride**. Nitrogen trifluoride (NF_3) is an inorganic, colorless, odorless, toxic, nonflammable gas used as an etchant in microelectronics. Nitrogen trifluoride is predominantly employed in the cleaning of the plasma-enhanced chemical vapor deposition chambers in the production of liquid crystal displays and silicon-based thin-film solar cells. It has a global warming potential of 16,100 carbon dioxide equivalents (CO_2e). While NF_3 may have a lower global warming potential than other chemical etchants, it is still a potent GHG. In 2009, NF_3 was listed by California as a high global warming potential GHG to be listed and regulated under Assembly Bill (AB) 32 (Section 38505 Health and Safety Code).
- **Sulfur Hexafluoride**. Sulfur hexafluoride (SF_6) is an inorganic compound that is colorless, odorless, non-toxic, and generally non-flammable. SF_6 is primarily used as an electrical insulator in high voltage equipment. The electric power industry uses roughly 80 percent of all SF_6 produced worldwide. Leaks of SF_6 occur from aging equipment and during equipment maintenance and servicing. SF_6 has an atmospheric life of 3,200 years (U.S. EPA 2018).
- **Black Carbon**. Black carbon is the strongest light-absorbing component of particulate matter (PM) emitted from burning fuels such as coal, diesel, and biomass. Black carbon contributes to climate change both directly by absorbing sunlight and indirectly by depositing on snow and by interacting with clouds and affecting cloud formation. Black carbon is considered a short-lived species, which can vary spatially and, consequently, it is very difficult to quantify associated global-warming potentials. The main sources of black carbon in California are wildfires, off-road vehicles (locomotives, marine vessels, tractors, excavators, dozers, etc.), on-road vehicles (cars, trucks, and buses), fireplaces, agricultural waste burning, and prescribed burning (planned burns of forest or wildlands) (CCAC 2018, U.S. EPA 2018).

Each GHG differs in its ability to absorb heat in the atmosphere based on the lifetime, or persistence, of the gas molecule in the atmosphere. Often, estimates of GHG emissions are presented in CO_2e, which weight each gas by its global warming potential (GWP). Expressing GHG emissions in CO_2e takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO_2 were being emitted. Table 15 provides a summary of the GWP for GHG emissions of typical concern with regard to community development projects, based on a 100-year time horizon. As indicated, Methane traps over 25 times more heat per molecule than CO_2, and N_2O absorbs roughly 298 times more heat per molecule than CO_2. Additional GHG with high GWP includes Nitrogen trifluoride, Sulfur hexafluoride, Perfluorocarbons, and black carbon.

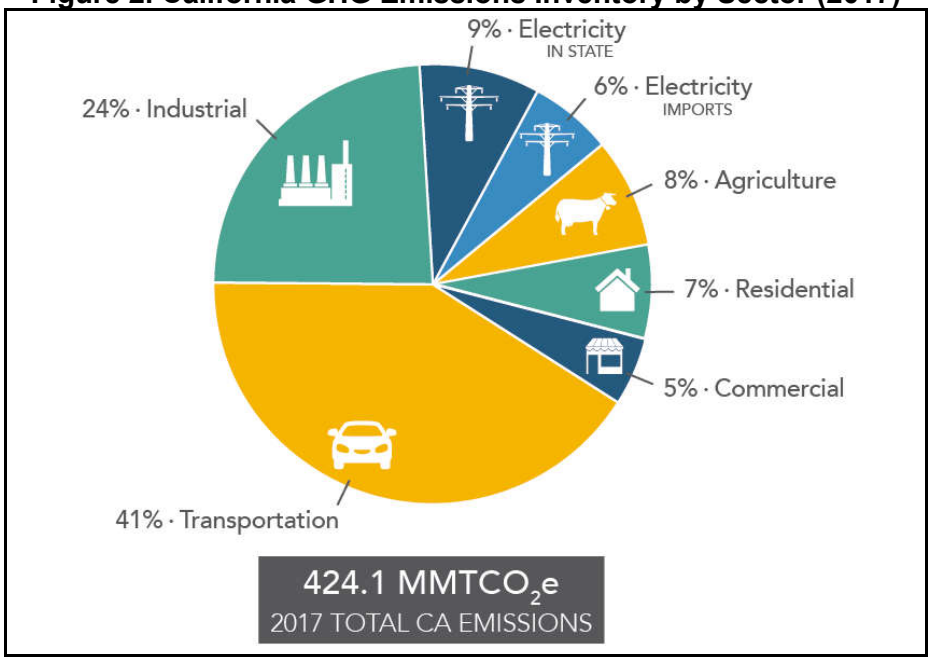
Table 15. Global Warming Potential for Greenhouse Gases

Greenhouse Gas	Global Warming Potential (100-year)
Carbon Dioxide (CO_2)	1
Methane (CH_4)	25
Nitrous Dioxide (N_2O)	298
Based on IPCC GWP values for 100-year time horizon. *Source: IPCC 2007*	

Statewide GHG Emissions

In 2017, GHG emissions within California totaled 424.1 million metric tons (MMT) of CO_2e. GHG emissions, by sector, are summarized in Figure 2. Within California, the transportation sector is the largest contributor, accounting for approximately 41 percent of the total state-wide GHG emissions. Emissions associated with industrial uses are the second-largest contributor, totaling roughly 24 percent. Electricity generation totaled roughly 15 percent. Other major emission sources included commercial uses, residential uses, agriculture, recycling and waste (ARB 2019a).

Figure 2. California GHG Emissions Inventory by Sector (2017)



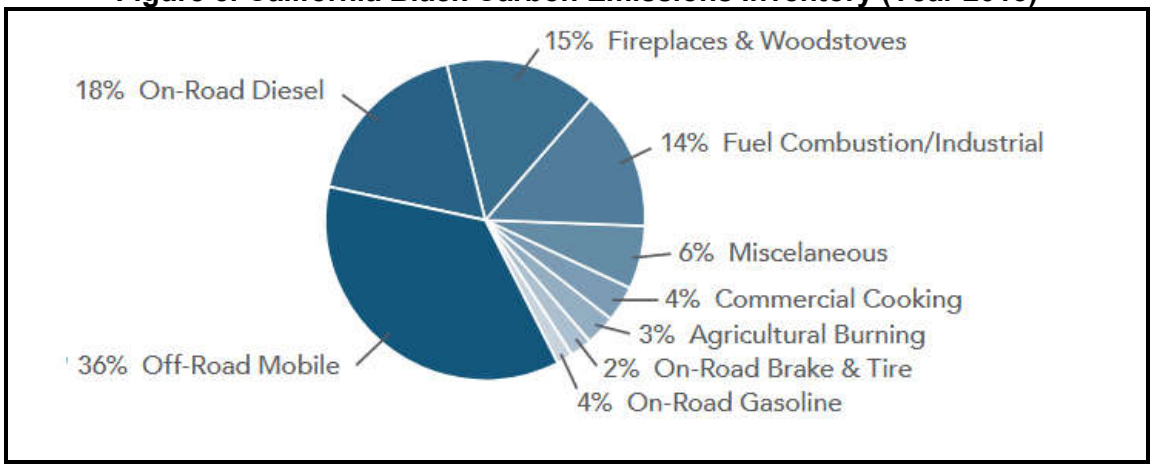
Source: ARB 2019a

Short-Lived Climate Pollutants

Short-lived climate pollutants (SLCPs), such as black carbon, fluorinated gases, and methane also have a dramatic effect on climate change. Though short-lived, these pollutants create a warming influence on the climate that is many times more potent than that of carbon dioxide.

As part of the ARB's efforts to address SLCPs, the ARB has developed a statewide emission inventory for black carbon. The black carbon inventory will help support the implementation of the SLCP Strategy, but it is not part of the State's GHG Inventory that tracks progress towards the State's climate targets. The most recent inventory for year 2013 conditions is depicted in Figure 3. As depicted, off-road mobile sources account for a majority of black carbon emissions totaling roughly 36 percent of the inventory. Other major anthropogenic sources of black carbon include on-road transportation, residential wood burning, fuel combustion, and industrial processes (ARB 2017).

Figure 3. California Black Carbon Emissions Inventory (Year 2013)



Source: ARB 2017

Effects of Global Climate Change

There are uncertainties as to exactly what the climate changes will be in various local areas of the earth. There are also uncertainties associated with the magnitude and timing of other consequences of a warmer planet: sea-level rise, spread of certain diseases out of their usual geographic range, the effect on agricultural production, water supply, sustainability of ecosystems, increased strength and frequency of storms, extreme heat events, increased air pollution episodes, and the consequence of these effects on the economy.

Within California, climate changes would likely alter the ecological characteristics of many ecosystems throughout the state. Such alterations would likely include increases in surface temperatures and changes in the form, timing, and intensity of the precipitation. For instance, historical records are depicting an increasing trend toward earlier snowmelt in the Sierra Nevada. This snowpack is a principal supply of water for the state, providing roughly 50 percent of the state's annual runoff. If this trend continues, some areas of the state may experience an increased danger of floods during the winter months and possible exhaustion of the snowpack during spring and summer months. Earlier snowmelt would also impact the State's energy resources. Currently, approximately 20 percent of California's electricity comes from hydropower. Early exhaustion of the Sierra snowpack, may force electricity producers to switch to more costly or non-renewable forms of electricity generation during spring and summer months. A changing climate may also impact agricultural crop yields, coastal structures, and biodiversity. As a result, resultant changes in climate will likely have detrimental effects on some of California's largest industries, including agriculture, wine, tourism, skiing, recreational and commercial fishing, and forestry (PCL 2018).

Regulatory Framework

Federal

EXECUTIVE ORDER 13514

Executive Order 13514 is focused on reducing GHGs internally in federal agency missions, programs, and operations. In addition, the executive order directs federal agencies to participate in the Interagency Climate Change Adaptation Task Force, which is engaged in developing a national strategy for adaptation to climate change.

On April 2, 2007, in Massachusetts v. U.S. EPA, 549 U.S. 497 (2007), the Supreme Court found that GHGs are air pollutants covered by the FCAA and that the U.S. EPA has the authority to regulate GHG. The Court held that the U.S. EPA Administrator must determine whether or not emissions of GHGs from new motor vehicles cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision.

On December 7, 2009, the U.S. EPA Administrator signed two distinct findings regarding GHGs under section 202(a) of the Clean Air Act:

- Endangerment Finding: The Administrator found that the current and projected concentrations of the six key well-mixed GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) in the atmosphere threaten the public health and welfare of current and future generations.
- Cause or Contribute Finding: The Administrator found that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution which threatens public health and welfare.

Although these findings did not themselves impose any requirements on industry or other entities, this action was a prerequisite to finalizing the U.S. EPA's Proposed Greenhouse Gas Emission Standards for Light-Duty Vehicles, which was published on September 15, 2009. On May 7, 2010, the final Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards was published in the Federal Register.

The U.S. EPA and the National Highway Traffic Safety Administration (NHTSA) are taking coordinated steps to enable the production of a new generation of clean vehicles with reduced GHG emissions and improved fuel efficiency from on-road vehicles and engines. These next steps include developing the first-ever GHG regulations for heavy-duty engines and vehicles, as well as additional light-duty vehicle GHG regulations. These steps were outlined by President Obama in a Presidential Memorandum on May 21, 2010.

The final combined U.S. EPA and NHTSA standards that make up the first phase of this national program apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. The standards require these vehicles to meet an estimated combined average emissions level of 250 grams of CO_2 per mile (the equivalent to 35.5 miles per gallon if the automobile industry were to meet this CO_2 level solely through fuel economy improvements). Together, these standards will cut GHG emissions by an estimated 960 MMT and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012-2016). On August 28, 2012, U.S. EPA and NHTSA issued their joint rule to extend this national program of coordinated GHG and fuel economy standards to model years 2017 through 2025 passenger vehicles.

State

ASSEMBLY BILL 1493

AB 1493 (Pavley) of 2002 (Health and Safety Code Sections 42823 and 43018.5) requires the ARB to develop and adopt the nation's first GHG emission standards for automobiles. These standards are also known as Pavley I. The California Legislature declared in AB 1493 that global warming is a matter of increasing concern for public health and the environment. It cites several risks that California faces from climate change, including a reduction in the state's water supply; an increase in air pollution caused by higher temperatures; harm to agriculture; an increase in wildfires; damage to the coastline; and economic losses caused by higher food, water, energy, and insurance prices. The bill also states that technological solutions to reduce GHG emissions would stimulate California's economy and provide jobs. In 2004, the State of California submitted a request for a waiver from federal clean air regulations, as the State is authorized to do under the FCAA, to allow the State to require reduced tailpipe emissions of CO_2. In late 2007, the U.S. EPA denied California's waiver request and declined to promulgate adequate federal regulations limiting GHG emissions. In early 2008, the State brought suit against the U.S. EPA related to this denial.

In January 2009, President Obama instructed the U.S. EPA to reconsider the Bush Administration's denial of California's and 13 other states' requests to implement global warming pollution standards for cars and trucks. In June 2009, the U.S. EPA granted California's waiver request, enabling the State to enforce its GHG emissions standards for new motor vehicles beginning with the current model year.

In 2009, President Obama announced a national policy aimed at both increasing fuel economy and reducing GHG pollution for all new cars and trucks sold in the US. The new standards would cover model years 2012 to 2016 and would raise passenger vehicle fuel economy to a fleet average of 35.5 miles per gallon by 2016. When the national program takes effect, California has committed to allowing automakers who show compliance with the national program to also be deemed in compliance with state requirements. California is committed to further strengthening these standards beginning in 2017 to obtain a 45 percent GHG reduction from the 2020 model year vehicles.

EXECUTIVE ORDER NO. S-3-05

Executive Order S-3-05 (State of California) proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra's snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the Executive Order established total GHG emission targets. Specifically, emissions are to be reduced to the 2000 level by 2010, to the 1990 level by 2020, and to 80 percent below the 1990 level by 2050.

The Executive Order directed the secretary of the California Environmental Protection Agency (CalEPA) to coordinate a multi-agency effort to reduce GHG emissions to the target levels. The secretary will also submit biannual reports to the governor and state legislature describing (1) progress made toward reaching the emission targets, (2) impacts of global warming on California's resources, and (3) mitigation and adaptation plans to combat these impacts. To comply with the Executive Order, the secretary of CalEPA created a

Climate Action Team made up of members from various state agencies and commissions. The Climate Action Team released its first report in March 2006 and continues to release periodic reports on progress. The report proposed to achieve the targets by building on voluntary actions of California businesses, local government, and community actions, as well as through state incentive and regulatory programs.

ASSEMBLY BILL 32 - CALIFORNIA GLOBAL WARMING SOLUTIONS ACT OF 2006

AB 32 (Health and Safety Code Sections 38500, 38501, 28510, 38530, 38550, 38560, 38561–38565, 38570, 38571, 38574, 38580, 38590, 38592–38599) requires that statewide GHG emissions be reduced to 1990 levels by the year 2020. The gases that are regulated by AB 32 include CO_2, CH_4, N_2O, HFCs, PFCs, NF_3, and SF_6. The reduction to 1990 levels will be accomplished through an enforceable statewide cap on GHG emissions that will be phased in starting in 2012. To effectively implement the cap, AB 32 directs ARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then ARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

AB 32 requires that ARB adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrives at the cap, institute a schedule to meet the emissions cap, and develop tracking, reporting, and enforcement mechanisms to ensure that the state achieves reductions in GHG emissions necessary to meet the cap. AB 32 also includes guidance to institute emissions reductions in an economically efficient manner and conditions to ensure that businesses and consumers are not unfairly affected by the reductions.

CLIMATE CHANGE SCOPING PLAN

In October 2008, ARB published its *Climate Change Proposed Scoping Plan*, which is the State's plan to achieve GHG reductions in California required by AB 32. This initial Scoping Plan contained the main strategies to be implemented in order to achieve the target emission levels identified in AB 32. The Scoping Plan included ARB-recommended GHG reductions for each emissions sector of the state's GHG inventory. The largest proposed GHG reduction recommendations were associated with improving emissions standards for light-duty vehicles, implementing the Low Carbon Fuel Standard program, implementation of energy efficiency measures in buildings and appliances, and the widespread development of combined heat and power systems, and developing a renewable portfolio standard for electricity production.

The Scoping Plan states that land use planning and urban growth decisions will play important roles in the state's GHG reductions because local governments have primary authority to plan, zone, approve, and permit how land is developed to accommodate population growth and the changing needs of their jurisdictions. ARB further acknowledges that decisions on how land is used will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emissions sectors. With regard to land use planning, the Scoping Plan expects approximately 5.0 MMT CO_2e will be achieved associated with the implementation of Senate Bill 375, which is discussed further below.

The initial Scoping Plan was first approved by ARB on December 11, 2008, and is updated every five years. The first update of the Scoping Plan was approved by the ARB on May 22, 2014, which looked past 2020 to set mid-term goals (2030-2035) on the road to reaching the 2050 goals., The most recent update released by ARB is the *2017 Climate Change Scoping Plan*, which was released on November 2017. The *2017 Climate Change Scoping Plan* incorporates strategies for achieving the 2030 GHG-reduction target established in SB 32 and EO B-30-15. Most notably, the *2017 Climate Change Scoping Plan* encourages zero net increases in GHG emissions. However, the *2017 Climate Change Scoping Plan* recognizes that achieving net zero increases in GHG emissions may not be feasible or appropriate for all projects and that the inability of a project to mitigate its GHG emissions to zero would not imply the project results in a substantial contribution to the cumulatively significant environmental impact of climate change under CEQA.

SENATE BILL 1078 AND GOVERNOR'S ORDER S-14-08

Senate Bill 1078 (Public Utilities Code Sections 387, 390.1, 399.25 and Article 16) addresses electricity supply and requires that retail sellers of electricity, including investor-owned utilities and community choice aggregators, provide a minimum 20 percent of their supply from renewable sources by 2017. This Senate Bill will affect statewide GHG emissions associated with electricity generation. In 2008, Governor Schwarzenegger signed Executive Order S-14-08, which set the Renewables Portfolio Standard target to 33 percent by 2020. It directed state government agencies and retail sellers of electricity to take all appropriate actions to implement this target. Executive Order S-14-08 was later superseded by Executive Order S-21-09 on September 15, 2009. Executive Order S-21-09 directed the ARB to adopt regulations requiring 33 percent of electricity sold in the State come from renewable energy by 2020. Statute SB X1-2 superseded this Executive Order in 2011, which obligated all California electricity providers, including investor-owned utilities and publicly owned utilities, to obtain at least 33 percent of their energy from renewable electrical generation facilities by 2020.

ARB is required by current law, AB 32 of 2006, to regulate sources of GHGs to meet a state goal of reducing GHG emissions to 1990 levels by 2020 and an 80 percent reduction of 1990 levels by 2050. The California Energy Commission and California Public Utilities Commission serve in advisory roles to help ARB develop the regulations to administer the 33 percent by 2020 requirement. ARB is also authorized to increase the target and accelerate and expand the time frame.

MANDATORY REPORTING OF GHG EMISSIONS

The California Global Warming Solutions Act (AB 32, 2006) requires the reporting of GHGs by major sources to the ARB. Major sources required to report GHG emissions include industrial facilities, suppliers of transportation fuels, natural gas, natural gas liquids, liquefied petroleum gas, and carbon dioxide, operators of petroleum and natural gas systems, and electricity retail providers and marketers.

CAP-AND-TRADE REGULATION

The cap-and-trade regulation is a key element in California's climate plan. It sets a statewide limit on sources responsible for 85 percent of California's GHG emissions and establishes a price signal needed to drive long-term investment in cleaner fuels and more efficient use of energy. The cap-and-trade rules came into effect on January 1, 2013, and apply to large electric power plants and large industrial plants. In 2015, fuel distributors, including distributors of heating and transportation fuels, also became subject to the cap-and-trade rules. At that stage, the program will encompass around 360 businesses throughout California and nearly 85 percent of the state's total GHG emissions.

Under the cap-and-trade regulation, companies must hold enough emission allowances to cover their emissions and are free to buy and sell allowances on the open market. California held its first auction of GHG allowances on November 14, 2012. California's GHG cap-and-trade system is projected to reduce GHG emissions to 1990 levels by the year 2020 and would achieve an approximate 80 percent reduction from 1990 levels by 2050.

SENATE BILL 32

SB 32 was signed by Governor Brown on September 8, 2016. SB 32 effectively extends California's GHG emission-reduction goals from year 2020 to year 2030. This new emission-reduction target of 40 percent below 1990 levels by 2030 is intended to promote further GHG-reductions in support of the State's ultimate goal of reducing GHG emissions by 80 percent below 1990 levels by 2050. SB 32 also directs the ARB to update the Climate Change Scoping Plan to address this interim 2030 emission-reduction target.

SENATE BILL 97

Senate Bill 97 (SB 97) was enacted in 2007. SB 97 required OPR to develop, and the Natural Resources Agency to adopt, amendments to the CEQA Guidelines addressing the analysis and mitigation of GHG emissions. Those CEQA Guidelines amendments clarified several points, including the following:

- Lead agencies must analyze the GHG emissions of proposed projects and must reach a conclusion regarding the significance of those emissions.
- When a project's GHG emissions may be significant, lead agencies must consider a range of potential mitigation measures to reduce those emissions.
- Lead agencies must analyze potentially significant impacts associated with placing projects in hazardous locations, including locations potentially affected by climate change.
- Lead agencies may significantly streamline the analysis of GHGs on a project level by using a programmatic GHG emissions reduction plan meeting certain criteria.
- CEQA mandates analysis of a proposed project's potential energy use (including transportation-related energy), sources of energy supply and ways to reduce energy demand, including through the use of efficient transportation alternatives.

As part of the administrative rulemaking process, the California Natural Resources Agency developed a Final Statement of Reasons explaining the legal and factual bases, intent, and purpose of the CEQA Guidelines amendments. The amendments to the CEQA Guidelines implementing SB 97 became effective on March 18, 2010.

SENATE BILL 100

Senate Bill 100 (SB 100) was signed by Governor Jerry Brown on September 10, 2018. SB 100 sets a goal of phasing out all fossil fuels from the state's electricity sector by 2045. SB 100 increases to 60 percent, from 50 percent, how much of California's electricity portfolio must come from renewables by 2030. It establishes a further goal to have an electric grid that is entirely powered by clean energy by 2045, which could include other carbon-free sources, like nuclear power, that are not renewable.

SENATE BILL 375

SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a sustainable communities strategy (SCS) or alternative planning strategy (APS) that will address land-use allocation in that MPOs regional transportation plan. ARB, in consultation with MPOs, establishes regional reduction targets for GHGs emitted by passenger cars and light trucks for the years 2020 and 2035. These reduction targets will be updated every eight years but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets. ARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG reduction targets, funding for transportation projects may be withheld. In 2018, ARB adopted updated SB 375 targets.

CALIFORNIA BUILDING CODE

The California Building Code (CBC) contains standards that regulate the method of use, properties, performance, or types of materials used in the construction, alteration, improvement, repair, or rehabilitation of a building or other improvement to real property. The California Building Code is adopted every three years by the Building Standards Commission (BSC). In the interim, the BSC also adopts annual updates to make necessary mid-term corrections. The CBC standards apply statewide; however, a local jurisdiction may amend a CBC standard if it makes a finding that the amendment is reasonably necessary due to local climatic, geological, or topographical conditions.

GREEN BUILDING STANDARDS

In essence, green buildings standards are indistinguishable from any other building standards. Both standards are contained in the California Building Code and regulate the construction of new buildings and improvements. The only practical distinction between the two is that whereas the focus of traditional building standards has been protecting public health and safety, the focus of green building standards is to improve environmental performance.

AB 32, which mandates the reduction of GHG emissions in California to 1990 levels by 2020, increased the urgency around the adoption of green building standards. In its scoping plan for the implementation of AB 32, ARB identified energy use as the second largest contributor to California's GHG emissions, constituting roughly 25 percent of all such emissions. In recommending a green building strategy as one element of the scoping plan, ARB estimated that green building standards would reduce GHG emissions by approximately 26 MMT of CO_2e by 2020.

The green buildings standards were most recently updated on May 2018. Referred to as the *2019 Building Energy Efficiency Standards*, this most recent update focus on four key areas: smart residential photovoltaic systems, updated thermal envelope standards (preventing heat transfer from the interior to the exterior and vice versa), residential and nonresidential ventilation requirements, and nonresidential lighting requirements. The ventilation measures improve indoor air quality, protecting homeowners from air pollution originating from outdoor and indoor sources. Under the newly adopted standards, nonresidential buildings will use about 30 percent less energy due mainly to lighting upgrades. The recently updated *2019 Building Energy Efficiency Standards* also require new homes built after January 1, 2020 to be equipped with solar photovoltaic (PV) systems. The solar PV systems are to be sized based on the buildings annual electricity demand, the building square footage, and the climate zone within which the home is located. However, under the *2019 Building Energy Efficiency Standards,* homes may still rely on other energy sources, such as natural gas. Compliance with the *2019 Building Energy Efficiency Standards,* including the solar PV system mandate, residential dwellings will use approximately 50 to 53 percent less energy than those under the 2016 standards. Actual reduction will vary depending on various factors (e.g., building orientation, sun exposure). Non-residential buildings will use about 30 percent less energy due mainly to lighting upgrades (CEC 2019).

SHORT-LIVED CLIMATE POLLUTANT REDUCTION STRATEGY

In March 2017, the ARB adopted the *Short-Lived Climate Pollutant Reduction Strategy* (*SLCP Strategy*) establishing a path to decrease GHG emissions and displace fossil-based natural gas use. Strategies include avoiding landfill methane emissions by reducing the disposal of organics through edible food recovery, composting, in-vessel digestion, and other processes; and recovering methane from wastewater treatment facilities, and manure methane at dairies, and using the methane as a renewable source of natural gas to fuel vehicles or generate electricity. The *SLCP Strategy* also identifies steps to reduce natural gas leaks from oil and gas wells, pipelines, valves, and pumps to improve safety, avoid energy losses, and reduce methane emissions associated with natural gas use. Lastly, the *SLCP Strategy* also identifies measures that can reduce hydrofluorocarbon (HFC) emissions at national and international levels, in addition to State-level action that includes an incentive program to encourage the use of low-GWP refrigerants, and limitations on the use of high-GWP refrigerants in new refrigeration and air-conditioning equipment (ARB 2017).

SAN LUIS OBISPO COUNTY AIR POLLUTION CONTROL DISTRICT

The SLOAPCD is a local public agency with the primary mission of realizing and preserving clean air for all county residents and businesses. Responsibilities of the SLOAPCD include, but are not limited to, preparing plans for the attainment of ambient air quality standards, adopting and enforcing rules and regulations concerning sources of air pollution, issuing permits for stationary sources of air pollution, inspecting stationary sources of air pollution and responding to citizen complaints, monitoring ambient air quality and meteorological conditions, and implementing programs and regulations required by federal and state regulatory requirements.

CITY OF PASO ROBLES CLIMATE ACTION PLAN

The City of Paso Robles Climate Action Plan (CAP) was adopted by the City Council on November 18th, 2013. The CAP is a long-range plan to reduce GHG emissions from City government operations and community activities within Paso Robles and prepare for the anticipated effects of climate change. The CAP will also help achieve multiple community goals such as lowering energy costs, reducing air pollution, supporting local economic development, and improving public health and quality of life (City of Paso Robles, 2013). It is important to note that the City's CAP was developed prior to adoption of SB 32. As a result, although the City's CAP is aligned with the emissions targets identified in AB 32, it is not necessarily reflective of the more stringent year 2030 emissions reduction target mandated by SB 32.

According to the GHG emissions inventory identified in the CAP, in 2005, the Paso Robles community emitted approximately 169,557 metric tons of carbon dioxide equivalent GHG emissions (MTCO2e), as a result of activities that took place within the transportation, residential energy use, commercial and industrial energy use, off-road vehicles and equipment, solid waste, aircraft and wastewater sectors. In 2005, the largest contributors to GHG emissions were transportation (40 percent), residential energy use (24 percent) and commercial/industrial energy use (20 percent) sectors. The remainder of emissions resulted from the solid waste (eight percent), off-road vehicles and equipment (8 percent), aircraft (less than one percent), and wastewater (less than one percent) sectors (City of Paso Robles, 2013).

Impact Analysis

In accordance with Appendix G of the *State CEQA Guidelines,* increased GHG emissions associated with the implementation of the Olsen-Chandler Specific Plan would be considered significant if may:

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

The SLOAPCD has adopted recommended GHG significance thresholds. These thresholds are based on AB 32 GHG emission reduction goals, which take into consideration the emission reduction strategies outlined in ARB's Scoping Plan. The GHG significance thresholds include one qualitative threshold and two quantitative thresholds options for the evaluation of operational GHG emissions. The qualitative threshold option is based on a consistency analysis in comparison to a Qualified Greenhouse Gas Reduction Strategy, or equitably similar adopted policies, ordinances, and programs. If a project complies with a Qualified Greenhouse Gas Reduction Strategy that is specifically applicable to the project, then the project would be considered to have a less-than-significant impact.

The two quantitative threshold options identified by the SLOAPCD include: 1) a bright-line threshold of 1,150 $MTCO_2e$/year; and 2) an efficiency threshold of 4.9 $MTCO_2e$/service population (SP; residents+employees) /year ($MTCO_2e$/SP/yr). An additional GHG significance threshold of 10,000 $MTCO_2e$/year is proposed for industrial stationary sources. The applicable GHG significance threshold to be used would depend on the type of project being proposed. Project-level analyses typically rely on the bright-line threshold, whereas, programmatic-level analyses, such as those prepared for larger community or general plans, typically rely on the efficiency metric threshold. Projects with GHG emissions that do not exceed the selected threshold would be considered to have a less-than-significant impact and would not conflict with applicable GHG-reduction plans, policies, or regulations. SLOAPCD's GHG emission thresholds are summarized in Table 16.

Table 16. SLOAPCD Greenhouse Gas Thresholds of Significance

Project	Threshold
Projects other than Stationary Sources	1. Compliance with Qualified GHG Reduction Strategy (i.e., Climate Action Plan); or 2. Bright Line Threshold: 1,150 MT CO_2e/year; or 3. Efficiency Threshold: 4.9 MT CO_2e/SP/year (residents+employees)
Stationary Sources (Industrial)	10,000 MT CO_2e/year
Construction	Amortized over the project life and added to operation GHG emissions
Source: SLOAPCD 2012	

Threshold of Significance

As noted above, the SLOAPCD recommends three approaches that can be applied for the evaluation of project-level GHG impacts. For large development projects, use of the SLOAPCD-recommended efficiency threshold or compliance with a qualified GHG-reduction strategy/CAP, such as the *City of Paso Robles Climate Action Plan*, is typically recommended. The City of Paso Robles CAP includes a "Consistency Worksheet", which identifies various mandatory and voluntary measures designed to reduce project-related

GHG emissions. The CAP Consistency Worksheet can be used to demonstrate project-level compliance with the CAP. However, it is important to note that the City's CAP, as well as, the SLOAPCD's recommended GHG significance thresholds were developed prior to adoption of SB 32. As a result, although the SLOAPCD's recommended GHG significance thresholds and the City's CAP are aligned with the emissions targets identified in AB 32, they are not reflective of the more stringent year 2030 emissions reduction target mandated by SB 32.

As noted earlier in this analysis, the buildout year for this project would be post year 2020, with an estimated buildout year of 2024. Because the SLOAPCD's-recommended GHG-efficiency threshold was based on AB 32 year 2020 GHG-reduction target, the GHG-efficiency threshold was adjusted to account for the more stringent year 2030 GHG-reduction target mandated by SB 32. The GHG-efficiency threshold was calculated by dividing the GHG emissions inventory goal (allowable emissions), by the estimated service population (SP). The efficiency threshold was calculated based on ARB's GHG emissions inventory identified in the *2017 Scoping Plan Update*. Emissions sectors that do not apply to the proposed project (i.e., industrial, agriculture) were excluded from the calculation. The GHG emissions inventory for the land use sectors applicable to the proposed project were then divided by the projected SP for both build-out year 2024 and future year 2030 operational conditions. The service population was calculated based on the most current population and employment projections derived from the California Department of Finance Demographic Research Unit and California Employment Development Department, respectively. The methodology used for quantification of the target efficiency threshold applied to the proposed project is summarized in Table 17. Project-generated GHG emissions that would exceed the efficiency threshold of 4.0 $MTCO_2e$/SP/year in year 2024 or 3.3 $MTCO_2e$/SP/year in 2030 would be considered to have a potentially significant impact on the environment that could conflict with GHG-reduction planning efforts. To be conservative, amortized construction-generated GHG emissions were included in annual operational GHG emissions estimates, consistent with SLOAPCD-recommended methodologies.

Table 17. Project-Level GHG Efficiency Threshold Calculation

	2024	2030
Land Use Sectors GHG Emissions Target[1]	249	213
Population[2]	41,994,283	43,939,250
Employment[3]	19,636,080	20,795,940
Service Population (SP)	61,630,363	64,735,190
GHG Efficiency Threshold ($MTCO_2e$/SP/yr)	4.0	3.3

Note: Employment data for interim years are estimated based on proportionality with population trends based on historical data. Based on AB 32 Scoping Plan's land use inventory sectors for years 2024 and 2030; Includes transportation sources.
1. Based on ARB 2017 Climate Scoping Plan Update/SB 32 Scoping Plan Emissions Sector targets.
2. California Department of Finance Demographic Research Unit. 2019. Report P-1 "State Population Projections (2010 - 2060)".
3. California Employment Development Department. Employment Projections Labor Market Information Resources and Data, "CA Long-Term. 2016-2026 Statewide Employment Projections". Projected year 2030 employment data was projected based on the average-annual increase for years 2016 through 2026.

Methodology

Short-term Construction Impacts

Short-term emissions were quantified using the CalEEMod, version 2016.3.2, based on estimated acreage and building square footage provided for the proposed project. Other modeling assumptions, including construction equipment requirements, hours of use, worker, and vendor vehicle trips, trip distances and fleet mix were based on model defaults for San Luis Obispo County. To be conservative, construction-generated emissions were amortized assuming a minimum project life of 30 years. In accordance with SLOAPCD-recommended methodologies for the analysis of GHG emissions, amortized construction emissions were included with operational emissions for comparison to applicable GHG significance thresholds. Refer to Appendix C for emissions modeling assumptions and results.

Long-term Operational Air Quality Impacts

Long-term operational GHG emissions were calculated using the CalEEMod, version 2016.3.2. Emissions modeling included quantification of emissions associated with area sources, energy use, and mobile sources. Reductions in electricity use associated with the installation of solar PV systems for residential uses was calculated based on the estimated total electricity use for proposed single-family and multi-family residential land uses and assuming an average energy reduction of 50 percent (CEC 2019). Mitigated emissions associated with energy use assumes natural-gas fired appliances and building mechanical equipment (e.g., fireplaces, water heaters, space heaters) for residential land uses would not be installed.

Trip-generation rates for the proposed residential land uses and elementary school were derived from the City's *Travel Demand Forecasting Model* (2009), which are specific to the Paso Robles area, rather than relying on trip-generation rates based on nation-wide survey data developed by the Institute of Transportation Engineers (ITE). Although use of the ITE trip-generation rates are often used for traffic analysis purposes, the ITE rates may not be reflective of local conditions. As a result, for emissions calculation purposes, use of locally-specific trip-generation rates is preferred, when available, and approved for use by the SLOAPCD. Mobile-source emissions for land uses not identified in the City's *Travel Demand Forecasting Model*, including the proposed commercial uses and health club, were quantified based on the trip-generation rates derived from the traffic analysis prepared for this project. Other proposed land uses (i.e., Community Supported Agriculture (CSA) maintenance shed, pool house, pool service building, event barn, community parks, neighborhood open space, and other asphalt surfaces) would not generate vehicle trips. With the exception of proposed residential land uses, the vehicle fleet mix used in the analysis was based on default assumptions contained in CalEEMod for San Luis Obispo County. It is important to note that the default fleet mix contained in CalEEMod is based largely on County-wide data and, therefore, may not be reflective of vehicle fleet mixes for some land uses, such as residential uses. The fleet mix for proposed residential land uses was adjusted based on the recommended fleet mix for residential land uses derived from the San Joaquin Valley Air Pollution Control District (SJVAPCD) and approved for use by the SLOAPCD. The fleet mix for proposed residential land uses was derived by applying the SJVAPCD-recommended vehicle fleet adjustments to the default fleet mix identified in CalEEMod. Fleet mix data for other land uses was not available and, therefore, were based on the default fleet mix identified in CalEEMod. Proposed land uses are summarized in Table 6. Exposure to localized pollutant concentrations was qualitatively assessed. Emission modeling files are provided in Appendix C.

The service population for the proposed project was calculated taking into account predicted employment and population for the project. For most development projects, service population is traditionally defined as the sum of the number of jobs and the number of residents provided by a project. However, this traditional definition of service population may not be applicable to all projects, depending on the end-use. For instance, with regard to schools, the student and employee population is the primary generator of GHG emissions with a majority of the school's emissions being associated with student vehicle trips. Therefore, the calculated GHG efficiency of the proposed project was expanded to include the student and employee population for the proposed school. GHG efficiency for the proposed project was calculated for build-out year 2024; as well as, future year 2030 to be in line with SB 32 GHG-reduction target year and reduction goal.

Project Impacts and Mitigation Measures

Impact GHG-A. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; and,

Estimated GHG emissions attributable to future development would be primarily associated with increases of CO_2 from mobile sources. To a lesser extent, other GHG pollutants, such as CH_4 and N_2O, would also be generated. Short-term and long-term GHG emissions associated with the development of the proposed project are discussed in greater detail, as follows:

Short-term Construction GHG Emissions

Estimated increases in GHG emissions associated with the construction of the proposed project are summarized in Table 18. Based on the modeling conducted, construction-related GHG emissions would total approximately 22,974 $MTCO_2e$. Amortized GHG emissions, when averaged over the assumed 50-year life of the project, would total approximately 459 $MTCO_2e$/year. There would also be a small amount of GHG emissions from waste generated during construction; however, this amount is speculative. Actual emissions may vary, depending on the final construction schedules, equipment required, and activities conducted. Amortized construction-generated GHG emissions are included in the operational GHG emissions impact discussion provided below.

Table 18. Construction-Generated GHG Emissions Without Mitigation

Construction Year	GHG Emissions ($MTCO_2e$/Year)
2020	4,848.9
2021	8,518.2
2022	8,295.9
2023	3,617.5
Construction Total:	22,974
Amortized Construction Emissions:	842.7

Amortized emissions are quantified based on a minimum 30-year project life. Refer to Appendix C for modeling assumptions and results.

Long-term Operational GHG Emissions

Estimated long-term increases in GHG emissions associated with the proposed project for buildout year 2024 and future year 2030 are summarized in Table 19. As depicted, operational GHG emissions for the proposed project, with the inclusion of amortized construction GHGs, would total approximately 16,107 $MTCO_2e$/year during the initial year of full operation (year 2024) and 13,733 $MTCO_2e$/year for operational year 2030. A majority of the operational GHG emissions would be associated with energy use and the operation of motor vehicles. To a lesser extent, GHG emissions would also be associated with solid waste generation and water use. Project-generated GHG emissions are projected to decrease in future years due largely to improvements in energy-efficiency and vehicle fleet emissions.

Based on the modeling conducted and assuming a total service population of 4,090 individuals (i.e., 3,517 residents, 495 students, and 78 employees), the calculated GHG efficiency for the proposed project, without mitigation, would be 3.0 $MTCO_2e$/SP/yr in 2024 and 2.6 $MTCO_2e$/SP/yr in 2030. The GHG efficiency for the proposed project would not exceed the thresholds of 3.9 $MTCO_2e$/SP/yr in 2024 and 3.2 $MTCO_2e$/SP/yr in 2030. It is important to note, however, that estimated GHG emissions conservatively calculated assuming that residential solar PV systems would provide a minimum estimated 50% of residential energy demand. According to the California Energy Commission, solar PV systems are estimated to provide an average of 50-53% of the residential energy demand, depending on various factors, including the buildings exposure/orientation to the sun and the number of sun exposure days, or climate zone, for the area within which the dwelling is located (CEC 2019). On average, Paso Robles has approximately 332 sunny days per year, and is one of the cities having the highest number of sunny days in the state (MeteoBlue 2019). As a result, actual emissions reductions associated with on-site solar PV systems would likely be higher than the

50% reduction assumed for this analysis. As noted in Impact GHG-B, project-generated increases in GHG emissions could conflict with GHG-reduction efforts, as a result this impact is considered ***potentially significant***. Refer to Impact GHG-B for additional discussion of GHG impacts and recommended mitigation measures.

Table 19. Operational GHG Emissions Without Mitigation

Operational Year/Source	GHG Emissions ($MTCO_2e$/Year)	
	Year 2024	Year 2030
Area Source[1]	29.5	29.5
Energy Use[2]	2,956.1	2,592.5
Motor Vehicles[3]	7,917.1	6,741.7
Waste Generation[4]	339.0	339.0
Water Use and Conveyance[5]	236.4	176.7
Total Operational Emissions:	11,478	9,879
Amortized Construction Emissions:	842.7	842.7
Total with Amortized Construction Emissions:	12,321	10,722
Service Population (SP)[6]:	4,090	4,090
MTCO2e/SP:	3.0	2.6
GHG Efficiency Significance Threshold:	4.0	3.3
Exceeds Threshold?	No	No

1. Area source includes emissions associated primarily with the use of landscape maintenance equipment.
2. Includes adjustment for California Renewable Portfolio Standards requirements and a 50% reduction in residential energy use with installation of on-site residential solar PV systems (CEC 2019).
3. Based on default fleet mix for non-residential land uses contained in CalEEMod for San Luis Obispo County. Fleet mix for residential land uses based on the vehicle distribution for residential land uses obtained from the SJVAPCD and applied to San Luis Obispo County default fleet mix, per SLOAPCD recommendations (SJVAPCD 2019; SLOAPCD 2019). Includes CH_4, N_20, and CO_2 mobile source emissions expressed in CO_2e.
4. Based on an average annual waste diversion/recycling rate of 50% based on statewide averages.
5. Incudes use of low-flow water fixtures and water-efficient irrigation systems, per current building code requirements.
6. Based on the estimated number of residents, employees, and students served by the proposed project (Rincon 2019).
Refer to Appendix C for modeling assumptions and results.

Impact GHG-B ***Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.***

As noted in Table 19, operational GHG emissions attributable to the proposed project would be primarily associated with energy use and mobile sources, which account for roughly 26% and 69% of the project's total operational GHG emissions, respectively. Applicable GHG-reduction plans related to reducing operational GHG emissions, include the City of Paso Robles CAP and SLOCOG's Sustainable Communities Strategies (SCS). The project's consistency with these plans is discussed in greater detail, as follows:

City of Paso Robles Climate Action Plan

The City's CAP is a long-range plan to reduce GHG emissions from City government operations and community activities within Paso Robles. The City's CAP includes a worksheet that identifies various "mandatory", as well as, "voluntary" GHG-reduction measures. All "mandatory" actions must be incorporated as binding and enforceable components of the project to be considered consistent with the CAP. If a project cannot meet one or more of the "mandatory" actions, substitutions may be allowed provided equivalent reductions can be achieved. In addition, to demonstrate consistency with the CAP, all required measures must be incorporated as binding and enforceable components of the project (City of Paso Robles, 2013).

The proposed project does not include all mandatory measures identified in the City's CAP and, therefore, would be considered inconsistent with the City's CAP. In addition, as noted earlier in this report, the City's CAP was developed prior to adoption of SB 32. As a result, although the City's GHG-reductions identified in the CAP are aligned with the emissions targets identified in AB 32, they are not reflective of the more stringent year 2030 emissions-reduction target mandated by SB 32.

SLOCOG's Sustainable Communities Strategies

As previously noted, ARB's updated *2017 Scoping Plan* reflects the new statewide GHG emissions reductions of 40 percent below 1990 emissions levels by 2030, as mandated by SB 32. A significant part of achieving the SB 32 goals are strategies to promote sustainable communities, such as the promotion of ZNE buildings, and improved transportation choices that result in reducing VMT. Other measures include the increased use of low-carbon fuels and cleaner vehicles.

To support achievement of the State's GHG emissions reduction goals, including the goals recently mandated by SB 32, California established the *Sustainable Communities and Climate Protection Act* (SB 375). SB 375 requires regional metropolitan planning organizations, such as SLOCOG, to develop Sustainable Communities Strategies (SCS) which align transportation, housing, and land use decisions toward achieving the State's GHG emissions-reduction targets. Under SB 375, the development and implementation of SCSs, which link transportation, land use, housing, and climate policy at the regional level, are designed to reduce per capita mobile-source GHG emissions, which is accomplished through implementation of measures that would result in reductions in per capita VMT.

In 2018, ARB adopted more aggressive SB 375 targets as one measure to support progress toward the *2017 Scoping Plan* goals. SB 375 aims to achieve, in aggregate, a 19% reduction in statewide per capita GHG emissions from passenger vehicles by year 2035 (relative to year 2005). To achieve this reduction, ARB sets target reductions for various regions throughout the state to be included in the Regional Transportation Plans/Sustainable Communities Strategies (RTP/SCS) prepared for these regions. For the San Luis Obispo Council of Governments (SLOCOG) region, the ARB set passenger vehicle GHG reduction targets at an 8%/capita decrease in 2020 and an 8%/capita decrease in 2035. This equates to a reduction from 22.7 daily VMT/capita in 2005 to 20.7 daily VMT/capita for 2035 (SLOCOG 2019). Assuming a linear reductions in VMT/capita, the target reduction for the project's buildout year 2024 would equate to a daily rate of approximately 21.4 VMT/capita.

Based on the emissions modeling conducted for this project, the project would generate an average of approximately 75,712 VMT on a daily basis. Based on this estimated average-daily VMT and a project population of 3,517 individuals, the daily VMT/capita for the project would be 21.5 without implementation of recommended air quality mitigation measures to reduce mobile-source emissions (refer to Mitigation Measure AQ-7). Although this rate would be below the 2035 daily rate of 20.7 VMT/capita for 2035, this rate would be slightly above the projected year 2024 daily rate of 2.4 VMT/capita. As a result, without mitigation, projected increases in VMT associated with the proposed project, and associated GHG emissions, would be inconsistent with SLOCOG's SCS.

Increased GHG emissions associated with the proposed project could result in significant increases in GHG emissions that could conflict with GHG-reduction planning efforts. As a result, this impact would be considered ***potentially significant***.

Mitigation Measures

Implement Mitigation Measures AQ-2, AQ-3, AQ-7 and the following:

GHG-1 the proposed project shall implement the following GHG-reduction measures:

a. The following measures shall be implemented consistent with the "mandatory" measures identified in the City's CAP. To the extent possible, "voluntary" measures identified in the City's CAP should also be incorporated
    1. The project shall install high-efficiency lights (i.e., sodium, light-emitting diode [LED]) in parking lots, streets, and other public areas. (CAP Measure E-5).

2. The project shall provide on-site bicycle parking and/or amenities beyond those required by California Green Building Standards Code and related facilities to support long-term use (lockers or a locked room with standard racks and access limited to bicyclists only). (CAP Measure TL-1)
3. The project shall incorporate a pedestrian access network that internally links all uses and connects all existing or planned external streets and pedestrian facilities contiguous with the project site. (CAP Measure TL-2)
4. The project shall be designed to minimize barriers to pedestrian access and interconnectivity. (CAP Measure TL-2)
5. The project shall incorporate traffic calming improvements as appropriate (e.g., marked crosswalks, count-down signal timers, curb extensions, speed tables, raised crosswalks, median islands, mini-circles, tight corner radii, etc.). (CAP Measure TL-2)
6. The project shall be designed to provide safe and convenient access to public transit within and/or contiguous to the project site. (CAP Measure TL-3)
7. The project shall comply with CALGreen Tier 1 or Tier 2 standards for water efficiency and conservation. (CAP Measure W-1)
8. The project shall divert a minimum of 65 percent of non-hazardous construction or demolition debris. (CAP Measure S-1)
9. Trees to be planted shall be native and drought tolerant, beyond those required as mitigation for tree removal. (CAP Measure T-1).

b. In addition to the above measures, the following additional measures shall be implemented:
    1. To the extent locally available and permissible to meet applicable building-code requirements at the time of development, all appliances and building mechanical equipment (e.g., water heaters, space heaters, pool heating systems) to be installed in residential structures shall be electric powered. Non-residential structures shall be designed to support the future conversion of building mechanical equipment to electric power. The installation of natural-gas fueled appliances and building mechanical equipment in non-residential structures shall be discouraged.
    2. Any water heaters installed for proposed swimming pool(s) shall be electric/solar powered. The use of natural-gas fueled pool heaters shall be prohibited.

Significance After Mitigation

Mitigated operational GHG emissions are summarized in Table 20. As noted in Table 20, implementation of the proposed mitigation measures would further reduce operational emissions for buildout year 2024 conditions to below the GHG efficiency threshold of 3.6 $MTCO_2e$/SP/year. Under predicted future year 2030 conditions, operational emissions would total approximately 2.1 $MTCO_2e$/SP/year, which would be below the corresponding efficiency threshold of 3.2 $MTCO_2e$/SP/year for ensuring consistency with SB 32 GHG-reduction requirements.

Mitigation Measure GHG-1 includes all "mandatory" GHG-reduction measures, as identified in the City's CAP, as well as, additional measures to promote ZNE use for on-site structures, such as the prohibited installation of natural-gas fires appliances for proposed residential development. Proposed non-residential land uses would also be designed and built to promote the use of electrically-powered building mechanical equipment, in support of future ZNE goals for non-residential structures. Mitigation Measures AQ-7 would require the implementation of additional mitigation measures that would help to further reduce operational emissions associated with energy and motor vehicle use. With implementation of these measures, the project's daily VMT/capita rate would be reduced to 19.0, or less, which would be below the projected SCS target daily rate of 20.7 VMT/capita for year 2035. It is also important to note that implementation of Mitigation Measures AQ-2 and AQ-3 would also help to reduce short-term GHG emissions associated with the operation of construction equipment and vehicles, including emissions of black carbon. With mitigation, the proposed project would be considered to have a less-than-significant impact on the environment and would not conflict with GHG-reduction planning efforts. With mitigation, this impact is considered ***less than significant***.

Table 20. Operational GHG Emissions With Mitigation

Operational Year/Source	GHG Emissions ($MTCO_2e$/Year)	
	Year 2024	Year 2030
Area Source[1]	29.5	29.5
Energy Use[2]	2,018.8	1,370.1
Motor Vehicles	7,020.3	5,979.3
Waste Generation[4]	339.0	339.0
Water Use and Conveyance[5]	236.4	176.7
Total Operational Emissions:	9644	7895
Amortized Construction Emissions:	842.7	842.7
Total with Amortized Construction Emissions:	1,0487	8,737
Service Population[6] (SP):	4,090	4,090
MTCO2e/SP:	2.6	2.1
GHG Efficiency Significance Threshold:	4.0	3.3
Exceeds Threshold?	No	No

1. Area source includes emissions associated primarily with the use of landscape maintenance equipment.
2. Includes adjustment for California Renewable Portfolio Standards requirements and a 50% reduction in residential energy use with installation of on-site residential solar PV systems (CEC 2019). Mitigated emissions includes additional reductions in residential natural gas use.
3. Based on default fleet mix for non-residential land uses contained in CalEEMod for San Luis Obispo County. Fleet mix for residential land uses based on the vehicle distribution for residential land uses recommended by the SJVAPCD applied to San Luis Obispo County default fleet mix, per SLOAPCD recommendations (SJVAPCD 2019, SLOAPCD 2019).
4. Based on an average annual waste diversion/recycling rate of 50% based on statewide averages.
5. Incudes use of low-flow water fixtures and water-efficient irrigation systems, per current building code requirements.
6. Based on the estimated number of residents, employees, and students served by the proposed project (Rincon 2019).
Refer to Appendix C for modeling assumptions and results.

REFERENCES

California Air Resources Board (ARB). 2000. *Diesel Risk Reduction Plan*. Available at url: http://www.arb.ca.gov/diesel/documents/rrpapp.htm.

California Air Resources Board (ARB). Accessed January 20, 2017(b). ARB Health-Related Fact Sheets. Website URL: http://www.arb.ca.gov/research/health/fs/fs.htm.

California Air Resources Board (ARB). Accessed January 20, 2017(d). California Green Building Strategy. Website URL: http://www.arb.ca.gov/cc/greenbuildings/greenbuildings.htm.

California Air Resources Board (ARB). Accessed January 20, 2019a. *California Greenhouse Gas Emissions Inventory*. Website URL: https://ww3.arb.ca.gov/cc/inventory/data/data.htm.

California Air Resources Board (ARB). Accessed January 20, 2019b. *Air Quality Standards and Area Designations*. Website URL: https://www.arb.ca.gov/desig/desig.htm.

California Air Resources Board (ARB). Accessed January 20, 2019c. *Air Quality and Emissions*. Website URL: https://www.arb.ca.gov/html/ds.htm.

California Air Resources Board (ARB). Accessed August 17, 2019d. *California's 2017 Climate Change Scoping Plan*. Website URL: https://ww3.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf.

California Air Resources Board (ARB). April 2005. *Air Quality and Land Use Handbook: A Community Health Perspective*.

California Department of Finance (DOF) Demographic Research Unit. 2019. Report P-1: State Population Projections (2010 - 2060), Available at website url: http://www.dof.ca.gov/Forecasting/Demographics/Projections/.

California Employment Development Department (EDD). 2019. Employment Projections Labor Market Information Resources and Data. CA Long-Term. 2016-2026 Statewide Employment Projections. Website url: https://projectionscentral.com/Projections/LongTerm.

California Energy Commission (CEC). 2019. *2019 Building Energy Efficiency Standards*. Website url: https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/2019-building-energy-efficiency.

Central Coast Transportation Consulting (CCTC). 2019. *Olsen-Chandler Specific Plan – Paso Robles Administrative Draft Transportation Impact Analysis.*

City of Paso Robles. 2013. *City of Paso Robles Climate Action Plan*.

City of Paso Robles. November 14, 2018. *Housing Constraints and Opportunities Committee Agenda*. Available at website url: https://www.prcity.com/AgendaCenter/ViewFile/Agenda/_11142018-142.

County of San Luis Obispo Air Pollution Control District (SLOAPCD). December 2001. *Clean Air Plan.*

County of San Luis Obispo Air Pollution Control District (SLOAPCD). July 2010. 2008-2009 Annual Air Quality Report.

County of San Luis Obispo Air Pollution Control District (SLOAPCD). April 2012. *CEQA Air Quality Handbook*. Available at website url: https://www.slocleanair.org/rules-regulations/land-use-ceqa.php.

County of San Luis Obispo Air Pollution Control District (SLOAPCD). Accessed: July 2018. *About Air Quality*. Website http://www.slocleanair.org/air-quality/about.php.

County of San Luis Obispo Air Pollution Control District (SLOAPCD). Accessed: December 28, 2019. San Luis Obispo County Attainment Status. https://storage.googleapis.com/slocleanair-org/images/cms/upload/files/AttainmentStatus29January2019.pdf.

San Luis Obispo County Air Pollution Control District (SLOAPCD). August 2019. Email correspondence between Andrew Mutziger, Supervising Air Quality Specialist, and Kurt Legleiter, Principal, AMBIENT Air Quality & Noise Consulting, LLC,

County of San Luis Obispo. Accessed July 6, 2017. *Permit View.* Website URL: http://www.sloplanning.org/PermitView/*MapSearch.*

Meteoblue Accessed: August 17, 2019. Weather archive Paso Robles. Website url: https://www.meteoblue.com/en/weather/historyclimate/weatherarchive/paso-robles_united-states-of-america_5381438 Rincon Consultants. 2019. *Project Site Plan.*

Rincon Consultants, Inc. August 2019. Email correspondence between Chris Bersbach, Senior Environmental Planner/Program Manager and Kurt Legleiter, Principal, AMBIENT Air Quality & Noise Consulting, LLC,

San Joaquin Valley Air Pollution Control District (SJVAPCD). 2019. *Residential Fleet Mix*. Available at website url: http://www.valleyair.org/ISR/ISRResources.htm#Models.

San Luis Obispo County Air Pollution Control District (SLOAPCD). April 2012. *2017 Clarification Memo related to the CEQA Air Quality Handbook*. Available at website url: https://www.slocleanair.org/rules-regulations/land-use-ceqa.php.

San Luis Obispo County Air Pollution Control District (SLOAPCD). 2018. APCD Naturally Occurring Asbestos Map. Available at website url: https://www.slocleanair.org/rules-regulations/land-use-ceqa.php.

San Luis Obispo Council of Governments (SLOCOG). 2019. *SLOCOG 2019 Regional Transportation Plan*. Available at website url: file:///C:/Users/Kurt/Downloads/__FINAL%202019%20RTP.pdf.

United States Census Bureau (USCB). Accessed: August 17, 2019. QuickFacts: El Paso de Robles (Paso Robles) city, California. Website url: https://www.census.gov/quickfacts/elpasoderoblespasoroblescitycalifornia.

United States Environmental Protection Agency (U.S. EPA). 2008a. *Climate Change – Greenhouse Gas Emissions: Carbon Dioxide*. Website URL: https://www.epa.gov/ghgemissions/overview-greenhouse-gases#carbon-dioxide.

United States Environmental Protection Agency (U.S. EPA). 2008b. *SF_6 Emission Reduction Partnership for Electric Power Systems: Basic Information*. Website URL: https://www.epa.gov/f-gas-partnership-programs/epas-sf6-emission-reduction-partnership-electric-power-systems.

United States Environmental Protection Agency (U.S. EPA). 2013. *EPA and NHTSA Adopt First-Ever Program to Reduce Greenhouse Gas Emissions and Improve Fuel Efficiency of Medium- and Heavy-Duty Vehicles*.

United States Environmental Protection Agency (U.S. EPA). Accessed: August 20, 2015. *Overview of Greenhouse Gases*. Website URL: *https://www.epa.gov/ghgemissions/overview-greenhouse-gases.*

Reso A - Exhibit C2 (EIR Technical Appendix)

APPENDIX A

SLOAPCD ASBESTOS NOTIFICATION FORMS

Reso A - Exhibit C2 (EIR Technical Appendix)

SLO COUNTY apcd | Air Pollution Control District San Luis Obispo County

3433 Roberto Court, San Luis Obispo, CA 93401
805-781-5912 – FAX: 805-781-1002

Naturally Occurring Asbestos Construction and Grading Project Form

Applicant Information/Property Owner		Project Name	
Address		Project Address	
City, State, Zip		City, State, Zip	
Email for Contact Person		Project Site Latitude, Longitude	Assessors Parcel Number
Phone Number	Date Submitted	Agent	Phone Number

Check Applicable	DESCRIPTION (attach applicable required information)	APCD REQUIREMENT 1	APCD REQUIREMENT 2
	Project is subject to ATCM regulation but exempt (See Website Map) http://www.slocleanair.org/business/pdf/serpentine-	Geological Evaluation	Exemption Request Form
	Project is subject to ATCM regulation and project is disturbing more than one acre	Geological Evaluation	Dust Control Measure Plan
	Project is subject to ATCM regulation and project is disturbing less than one acre	Geological Evaluation	Mini Dust Control Measure Plan

Please note that the applicant will be invoiced for any associated fees.

REQUIRED APPLICANT SIGNATURE:

Legal Declaration/Authorized Signature _____ Date _____

APCD OFFICE USE ONLY				
Geological Evaluation	Exemption Request Form	Dust Control Measure Plan		Monitoring, Health and Safety Plan
Approved: Yes ☐ No ☐	Approved: Yes ☐ No ☐	Approved: Yes ☐ No ☐		Approved: Yes ☐ No ☐
Comments:	Comments:	Comments:		
APCD Staff:	Date Received:	Date Reviewed	OIS Site #	OIS Project #
Invoice No.	Basic Fee	Additional Fees	Billable Hrs	Total Fees

SLO COUNTY apcd | Air Pollution Control District
San Luis Obispo County

3433 Roberto Court, San Luis Obispo, CA 93401
805-781-5912 – FAX: 805-781-1002

Naturally Occurring Asbestos
Construction & Grading Project Exemption Request Form

Applicant Information/ Property Owner		**Project Name**	
Address		**Project Address**	
City, State, Zip		**City, State, Zip**	
Email Address		**Project Site Latitude, Longitude**	**Assessors Parcel Number**
Phone Number	**Date Submitted**	**Agent**	**Phone Number**

The District may provide an exemption from Section 93105 of the California Code of Regulations - Asbestos Airborne Toxic Control Measu For Construction, Grading, Quarrying, And Surface Mining Operations for any property that has any portion of the area to be disturbed located in a geographic ultramafic rock unit; if a registered geologist has conducted a geologic evaluation of the property and determined that no serpentine or ultramafic rock is likely to be found in the area to be disturbed. Before an exemption can be granted, the owner/operator must provide a copy of a report detailing the geologic evaluation to the District for consideration. The District will approve or deny the exemption within 90 days. An outline of the required geological evaluation is provided in the District handout **"ASBESTOS AIRBORNE TOXIC CONTROL MEASURES FOR CONSTRUCTION, GRADING, QUARRYING, AND SURFACE MINING OPERATIONS – Geological Evaluation Requirements." See the APCD Website map: http://www.slocleanair.org/business/asbestos.php**

NOTE: A basic exemption evaluation fee of $172.00 will be charged.

APPLICANT MUST SIGN BELOW:

I request the San Luis Obispo County Air Pollution Control District grant this project exemption from the requirements of the ATCM based on the attached geological evaluation.

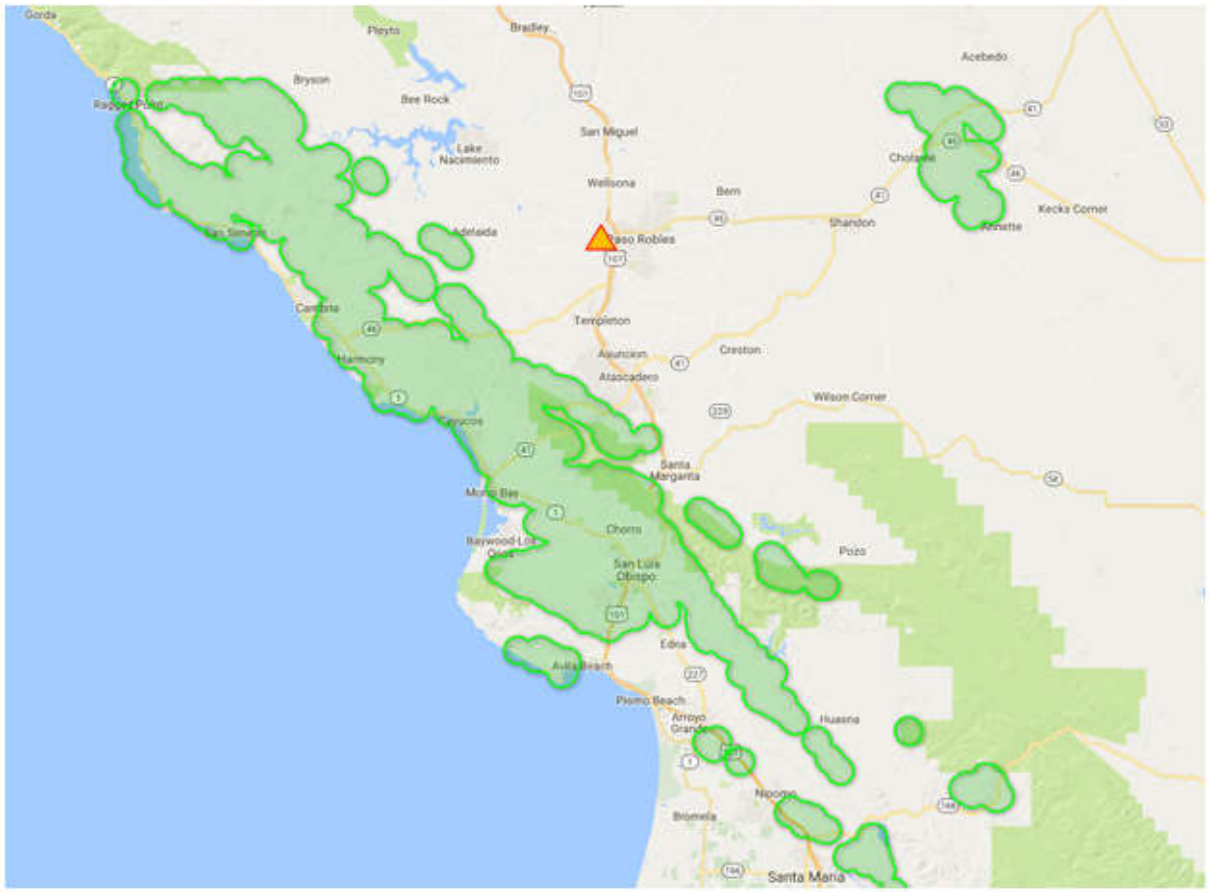
Legal Declaration/Authorized Signature _____ Date: _____

OFFICE USE ONLY - APCD Required Element – Geological Evaluation			
Date Received:	Date Reviewed:	OIS Site #:	OIS Project #:
	APCD Staff:	Approved	Not Approved
Comments:			

Reso A - Exhibit C2 (EIR Technical Appendix)

APPENDIX B

NATURALLY OCCURRING ASBESTOS ZONES



▲ **PROJECT SITE**

SLOAPCD. Naturally Occurring Asbestos Map. Available at: http://www.slocleanair.org/rules-regulations/land-use-ceqa.php

Reso A - Exhibit C2 (EIR Technical Appendix)

APPENDIX C

EMISSIONS MODELING & SUPPORT DOCUMENTATION

Reso A - Exhibit C2 (EIR Technical Appendix)

AMBIENT AIR QUALITY MONITORING DATA

Maximum 8-Hour Ozone Averages

Top 4 Summary: Highest 4 Daily Maximum 8-Hour Ozone Averages

at Paso Robles-Santa Fe Avenue

iADAM

	2015		2016		2017	
	Date	8-Hr Average	Date	8-Hr Average	Date	8-Hr Average
National 2015 Std (0.070 ppm):						
First High:	Jun 8	0.068	Sep 17	0.066	Sep 1	0.074
Second High:	Sep 19	0.066	Sep 27	0.064	Sep 2	0.070
Third High:	Apr 17	0.065	Jun 21	0.063	May 21	0.066
Fourth High:	Apr 18	0.065	Jun 24	0.063	Oct 16	0.065
California Std (0.070 ppm):						
First High:	Jun 8	0.068	Sep 17	0.067	Sep 1	0.075
Second High:	Sep 19	0.067	Sep 27	0.065	Sep 2	0.071
Third High:	Apr 17	0.066	Jun 21	0.064	May 21	0.066
Fourth High:	Apr 18	0.066	Jul 27	0.064	Mar 14	0.065
National 2015 Std (0.070 ppm):						
# Days Above the Standard:		0		0		1
Nat'l Standard Design Value:		0.061		0.062		0.064
National Year Coverage:		100		100		95
California Std (0.070 ppm):						
# Days Above the Standard:		0		0		2
California Designation Value:		0.068		0.068		0.071
Expected Peak Day Concentration:		0.068		0.071		0.072
California Year Coverage:		100		100		94

◄ Shift Backward 1 year ▼ Shift Forward ►

Notes:

Eight-hour ozone averages and related statistics are available at Paso Robles-Santa Fe Avenue between 1991 and 2017. Some years in this range may not be represented.

All averages expressed in parts per million.

orange exceeds a national ambient air quality standard.

yellow exceeds a California ambient air quality standard.

An exceedance of a standard is not necessarily related to a violation of the standard.

State and national statistics may differ for the following reasons:

National 8-hour averages are truncated to three decimal places; State 8-hour averages are rounded to three decimal places.

State criteria for ensuring that data are sufficiently complete for calculating 8-hour averages are more stringent than the national criteria.

Daily maximum 8-hour averages associated with the National 0.070 ppm standard exclude those 8-hour averages that have first hours between midnight and 6:00 am, Pacific Standard Time.

Daily maximum 8-hour averages associated with the National 0.070 ppm standard include only those 8-hour averages from days that have sufficient data for the day to be considered valid.

Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.

* means there was insufficient data available to determine the value.

Reso A - Exhibit C2 (EIR Technical Appendix)

Maximum Hourly Ozone Measurements

Top 4 Summary: Highest 4 Daily Maximum Hourly Ozone Measurements

at Paso Robles-Santa Fe Avenue

iADAM

	2015		2016		2017	
	Date	Measurement	Date	Measurement	Date	Measurement
First High:	Apr 18	0.073	Jul 28	0.091	Sep 1	0.083
Second High:	Sep 25	0.073	Aug 16	0.089	Mar 14	0.082
Third High:	Jun 8	0.072	Jul 27	0.081	Sep 2	0.078
Fourth High:	Sep 20	0.072	Jul 29	0.078	Oct 27	0.078
California:						
# Days Above the Standard:		0		0		0
California Designation Value:		0.07		0.08		0.08
Expected Peak Day Concentration:		0.073		0.078		0.079
National:						
# Days Above the Standard:		*0*		*0*		*0*
3-Year Estimated Expected Number of Exceedance Days:		*0.0*		*0.0*		*0.0*
1-Year Estimated Expected Number of Exceedance Days:		*0.0*		*0.0*		*0.0*
Nat'l Standard Design Value:		*0.072*		*0.078*		*0.082*
Year Coverage:		100		100		95

◄ Shift Backward 1 year ▼ Shift Forward ►

Notes:

Hourly ozone measurements and related statistics are available at Paso Robles-Santa Fe Avenue between 1991 and 2017. Some years in this range may not be represented.

All concentrations expressed in parts per million.

The national 1-hour ozone standard was revoked in June 2005. Statistics related to the national 1-hour ozone standard are shown in *italics* or *italics*.

yellow exceeds a California ambient air quality standard. *orange* exceeds the revoked 1-hour national ambient air quality standard.

An exceedance of a standard is not necessarily related to a violation of the standard.

Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.

* means there was insufficient data available to determine the value.

24-Hour PM2.5 Averages

Top 4 Summary: Highest 4 Daily 24-Hour PM2.5 Averages

at Atascadero-Lewis Avenue

iADAM

	2015		2016		2017	
	Date	24-Hr Average	Date	24-Hr Average	Date	24-Hr Average
National:						
First High:	Jan 13	29.1		*		*
Second High:	Jan 12	23.7		*		*
Third High:	Jan 1	23.5		*		*
Fourth High:	Jan 4	20.5		*		*
California:						
First High:	Jan 13	29.1		*		*
Second High:	Jan 12	23.7		*		*
Third High:	Jan 1	23.5		*		*
Fourth High:	Jan 4	20.5		*		*
National:						
Estimated # Days > 24-Hour Std:		*		*		*
Measured # Days > 24-Hour Std:		0		0		0
24-Hour Standard Design Value:		*		*		*
24-Hour Standard 98th Percentile:		*		*		*
2006 Annual Std Design Value:		*		*		*
2013 Annual Std Design Value:		*		*		*
Annual Average:		*		*		*
California:						
Annual Std Designation Value:		8		*		*
Annual Average:		*		*		*
Year Coverage:		36		*		*

◄ Shift Backward 1 year ▼ Shift Forward ►

Notes:

Daily PM2.5 averages and related statistics are available at Atascadero-Lewis Avenue between 1999 and 2015. Some years in this range may not be represented.

All averages expressed in micrograms per cubic meter.

yellow exceeds a California ambient air quality standard. orange exceeds a national ambient air quality standard.

An exceedance of a standard is not necessarily related to a violation of the standard.

State statistics are based on California approved samplers, whereas national statistics are based on samplers using federal reference or equivalent methods. State and national statistics may therefore be based on different samplers.

Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.

* means there was insufficient data available to determine the value.

Daily 24-Hour PM10 Averages

Top 4 Summary: Highest 4 Daily 24-Hour PM10 Averages

at Paso Robles-Santa Fe Avenue

iADAM

	2015		2016		2017	
	Date	24-Hr Average	Date	24-Hr Average	Date	24-Hr Average
National:						
First High:	Aug 17	37.2	Jul 28	44.8	Dec 16	56.2
Second High:	Sep 25	35.7	Jul 26	44.5	Oct 17	54.9
Third High:	Aug 16	35.7	Jul 27	44.4	Oct 18	53.8
Fourth High:	Oct 27	35.3	Sep 21	42.7	Dec 13	51.8
California:						
First High:	Oct 27	35.2	Jul 26	43.0	Dec 16	57.0
Second High:	Sep 25	34.6	Jul 28	42.8	Oct 17	54.3
Third High:	Sep 24	34.4	Jul 27	42.5	Dec 13	54.1
Fourth High:	Aug 16	34.2	Sep 21	42.1	Oct 18	53.1
National:						
Estimated # Days > 24-Hour Std:		0.0		0.0		*
Measured # Days > 24-Hour Std:		0		0		0
3-Yr Avg Est # Days > 24-Hr Std:		*		0.0		*
Annual Average:		*17.7*		*19.2*		*18.6*
3-Year Average:		*22*		*19*		*19*
California:						
Estimated # Days > 24-Hour Std:		0.0		*		*
Measured # Days > 24-Hour Std:		0		0		6
Annual Average:		17.2		*		*
3-Year Maximum Annual Average:		24		20		17
Year Coverage:		0		0		0

◄ Shift Backward 1 year ▼ Shift Forward ►

Notes:

Daily PM10 averages and related statistics are available at Paso Robles-Santa Fe Avenue between 1991 and 2017. Some years in this range may not be represented.

All averages expressed in micrograms per cubic meter.

The national annual average PM10 standard was revoked in December 2006 and is no longer in effect. Statistics related to the revoked standard are shown in *italics* or *italics*.

yellow exceeds a California ambient air quality standard. orange exceeds a national ambient air quality standard.

An exceedance of a standard is not necessarily related to a violation of the standard.

All values listed above represent midnight-to-midnight 24-hour averages and may be related to an exceptional event.

State and national statistics may differ for the following reasons:

State statistics are based on California approved samplers, whereas national statistics are based on samplers using federal reference or equivalent methods. State and national statistics may therefore be based on different samplers.

State statistics for 1998 and later are based on local conditions (except for sites in the South Coast Air Basin, where State statistics for 2002 and later are based on local conditions). National statistics are based on standard conditions.

State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.

Measurements are usually collected every six days. Measured days counts the days that a measurement was greater than the level of the standard; Estimated days mathematically estimates how many days concentrations would have been greater than the level of the standard had each day been monitored.

3-Year statistics represent the listed year and the 2 years before the listed year.

Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.

* means there was insufficient data available to determine the value.

Source: ARB. 2019. Air Quality & Emissions. Website url: https://www.arb.ca.gov/html/ds.htm.

Reso A - Exhibit C2 (EIR Technical Appendix)

Daily Construction Emissions Without Mitigation

Construction Activity	Construction Year	Daily Emissions (lbs/day)	
		ROG+NO_X	Exhaust PM_{10}
Demolition	2020	37.6	1.7
Site Preparation	2020	46.6	2.2
Grading/Excavation	2020	54.8	2.2
Building Construction	2020	204.1	2.1
Architectural Coatings	2020	31.1	0.2
Building Construction	2021	188.0	1.6
Architectural Coatings	2021	31.3	0.1
Building Construction	2022	175.9	1.4
Architectural Coatings	2022	30.6	0.1
Building Construction	2023	149.0	1.1
Architectural Coatings	2023	30.1	0.1
Paving	2023	17.0	0.5
SLOAPCD Significance Thresholds		*137*	*7*
Maximum Daily Emissions-Year 2020		235.2	2.3
Exceed SLOAPCD Thresholds?		Yes	No
Maximum Daily Emissions-Year 2021		219.3	1.7
Exceed SLOAPCD Thresholds?		Yes	No
Maximum Daily Emissions-Year 2022		206.5	1.5
Exceed SLOAPCD Thresholds?		Yes	No
Maximum Daily Emissions-Year 2023		196.1	1.7
Exceed SLOAPCD Thresholds?		No	No

Reso A - Exhibit C2 (EIR Technical Appendix)

CONSTRUCTION EMISSIONS SUMMARY

Construction Activity	Construction Year	Days	Site	Yearly Emissions (tons) ROG	Yearly Emissions (tons) NO_X	Yearly Emissions (tons) Exhaust PM_{10}	Yearly Emissions (tons) ROG+NO_X	Yearly Emissions (tons) Exhaust PM_{10}	Yearly Emissions (pounds) ROG+NO_X	Yearly Emissions (pounds) Exhaust PM_{10}	Daily Emissions (pounds) ROG+NO_X	Daily Emissions (pounds) Exhaust PM_{10}
Demolition	2020	5	On-Site	0.008280	0.083000	0.004150	0.09	0.00	188.14	8.32	37.63	1.66
			Off-Site	0.000230	0.002560	0.000010						
Site Preparation	2020	23	On-Site	0.046900	0.487800	0.025300	0.54	0.03	1072.86	50.62	46.65	2.20
			Off-Site	0.000910	0.000820	0.000010						
Grading/Excavation	2020	87	On-Site	0.193600	2.183600	0.094600	2.38	0.09	4768.92	189.32	54.82	2.18
			Off-Site	0.003800	0.003460	0.000060						
Building Construction	2020	148	On-Site	0.155800	1.410200	0.082100	15.10	0.16	30204.20	317.60	204.08	2.15
			Off-Site	1.611800	11.924300	0.076700						
Architectural Coatings	2020	39	On-Site	0.454000	0.032000	0.002110	0.61	0.00	1214.00	6.06	31.13	0.16
			Off-Site	0.063400	0.057600	0.000920						
Building Construction	2021	260	On-Site	0.248100	2.274900	0.125100	24.43	0.21	48867.20	411.40	187.95	1.58
			Off-Site	2.590200	19.320400	0.080600						
Architectural Coatings	2021	260	On-Site	3.115200	0.199300	0.012300	4.07	0.02	8148.20	36.80	31.34	0.14
			Off-Site	0.405800	0.353800	0.006100						
Building Construction	2022	260	On-Site	0.221800	2.030000	0.105200	22.86	0.18	45729.40	357.20	175.88	1.37
			Off-Site	2.414700	18.198200	0.073400						
Architectural Coatings	2022	260	On-Site	3.101400	0.183100	0.010600	3.98	0.02	7962.00	33.00	30.62	0.13
			Off-Site	0.379600	0.316900	0.005900						
Building Construction	2023	115	On-Site	0.090400	0.827100	0.040200	8.57	0.06	17139.00	123.80	149.03	1.08
			Off-Site	0.963200	6.688800	0.021700						
Architectural Coatings	2023	115	On-Site	1.371000	0.074900	0.004070	1.73	0.01	3459.20	13.22	30.08	0.11
			Off-Site	0.157700	0.126000	0.002540						
Paving	2023	45	On-Site	0.151100	0.229300	0.011500	0.38	0.01	765.16	23.04	17.00	0.51
			Off-Site	0.001210	0.000970	0.000020						

Reso A - Exhibit C2 (EIR Technical Appendix)

Operational Emissions Without Mitigation (Yr 2024)

Operational Period/Source	Emissions							MTCO2e
	ROG	NO_X	ROG+NO_X	CO	PM_{10}			
					Fug	Exh	Tot	
Daily Emissions (lbs/day)								
Area Source	71.9054	1.2292	73.1346	106.7015	0	0.5913	0.5913	
Energy Use - Total	1.0263	8.7937	9.82	3.9041	0	0.7091	0.7091	
Energy Use - Residential Solar PV Adjustment								
Energy Use with Residential Solar PV Adjustment								
Mobile - Total Uncorrected	19.994	78.3561	98.3501	226.559	72.6285	0.6467	73.2752	
Residential Fleet Mix Adjustment	-3.6089	-44.5021	-48.111	-24.1456	-0.5454	-0.1018	-0.6472	
Mobile - Total with Corrected Fleet Mix	16.3851	33.854	50.2391	202.4134	72.0831	0.5449	72.628	
Total Operational Emissions:	89.3168	43.8769	133.1937	313.019	72.0831	1.8453	73.9284	
SLOAPCD Significance Thresholds	--	--	25	550	25	1.25	--	
Exceeds SLOAPCD Thresholds?	--	--	Yes	No	Yes	Yes	--	
Annual Emissions (tons/year)								
Area Source	13.0665	0.2028	13.2693	17.6057	0	0.0976	0.0976	29.466
Energy Use - Total	0.1873	1.6049		0.7125	0	0.1294	0.1294	3934.807
Energy Use - Residential Solar PV Adjustment								-978.705
Energy Use with Residential Solar PV Adjustment								2956.102
Mobile - Total Uncorrected	2.8763	11.5051	14.3814	0.105	10.3694	0.0944	10.4638	9636.212
Residential Fleet Mix Adjustment	-0.5179	-6.6082	-7.1261	-3.3893	-0.0802	-0.0148	-0.095	-1770.895
Mobile - Total with Corrected Fleet Mix	2.3584	4.8969	7.2553	-3.2843	10.2892	0.0796	10.3688	7865.317
Waste								807.102
Water								276.617
Total Operational Emissions:	15.6122	6.7046	20.5246	15.0339	10.2892	0.3066	10.5958	12913.308
SLOAPCD Significance Thresholds	--	--	25	--	25	--	--	
Exceeds SLOAPCD Thresholds?	--	--	Yes	--	No	--	--	

Reso A - Exhibit C2 (EIR Technical Appendix)

Operational Emissions With Mitigation (Yr 2024)

Operational Period/Source	Emissions							MTCO2e
	ROG	NO_X	ROG+NO_X	CO	PM_{10}			
					Fug	Exh	Tot	
Daily Emissions (lbs/day)								
Area Source	71.9054	1.2292	73.1346	106.7015	0	0.5913	0.5913	
Energy Use - Total	0.9363	8.0229	8.9592	3.5622	0	0.6469	0.6469	
Energy Use - Residential Solar PV Adjustment								
Energy Use with Residential Solar PV Adjustment								
Energy Use - Res. Natural Gas Use Adjustment	-0.897	-7.6653	-8.5623	-3.2619	0	-0.6198	-0.6198	
Energy Use with Nat. Gas Adjustment	0.0393	0.3576	0.3969	0.3003	0	0.0271	0.0271	
Mobile - Total Uncorrected	19.2209	72.8092	92.0301	207.6006	64.0584	0.58	64.6384	
Residential Fleet Mix Adjustment	-3.2942	-41.8135	-45.1077	-22.0624	-0.481	-0.0904	-0.5714	
Mobile - Total with Corrected Fleet Mix	15.9267	30.9957	46.9224	185.5382	63.5774	0.4896	64.067	
Total Operational Emissions:	87.8714	32.5825	120.4539	292.54	63.5774	1.108	64.6854	
SLOAPCD Significance Thresholds	--	--	25	550	25	1.25	--	
Exceeds SLOAPCD Thresholds?	--	--	Yes	No	Yes	Yes	--	
Annual Emissions (tons/year)								
Area Source	13.0665	0.2028	13.2693	17.6057	0	0.0976	0.0976	29.466
Energy Use - Total	0.1709	1.4642	1.6351	0.6501	0	0.1181	0.1181	3648.575
Energy Use - Residential Solar PV Adjustment								-922.612
Energy Use with Residential Solar PV Adjustment								2725.963
Energy Use - Res. Natural Gas Use Adjustment	-0.1637	-1.3989	-1.5626	-0.5953	0	-0.1131		-1629.733
Energy Use with Nat. Gas Adjustment	0.0072	0.0653	0.0725	0.0548	0	0.005	0.1181	2018.842
Mobile - Total Uncorrected	2.7631	10.693	13.4561	29.8525	9.1458	0.0847	9.2305	8570.723
Residential Fleet Mix Adjustment	-0.4723	-6.21	-6.6823	-3.0942	-0.0708	-0.0131	-0.0839	-1596.155
Mobile - Total with Corrected Fleet Mix	2.2908	4.483	6.7738	26.7583	9.075	0.0716	9.1466	6974.568
Waste								338.983
Water								236.348
Total Operational Emissions:	15.3645	4.7511	20.1156	44.4188	9.075	0.1742	9.3623	9598.207
SLOAPCD Significance Thresholds	--	--	25	--	25	--	--	
Exceeds SLOAPCD Thresholds?	--	--	Yes	--	No	--	--	

Reso A - Exhibit C2 (EIR Technical Appendix)

RESIDENTIAL FLEET MIX ADJUSTMENT - YR 2024

Operational Period/Source	Emissions							MTCO2e
	ROG	NO_X	$ROG+NO_X$	CO	PM_{10}			
					Fug	Exh	Tot	
Daily Emissions (lbs/day)								
Default Fleet Mix	17.6081	69.7003	87.3084	202.3284	65.5519	0.581	66.1329	
Corrected Fleet Mix	13.9992	25.1982	39.1974	178.1828	65.0065	0.4792	65.4857	
Adjustment	-3.6089	-44.5021	-48.111	-24.1456	-0.5454	-0.1018	-0.6472	
Annual Emissions (tons/year)								
Default Fleet Mix	2.5401	10.2642	12.8043	29.2673	9.3932	0.0852	9.4784	8708.357
Corrected Fleet Mix	2.0222	3.656	5.6782	25.878	9.313	0.0704	9.3834	6937.462
Adjustment	-0.5179	-6.6082	-7.1261	-3.3893	-0.0802	-0.0148	-0.095	-1770.895

RESIDENTIAL SOLAR PV ADJUSTMENT - YR 2024

Operational Period/Source	Emissions							MTCO2e
	ROG	NO_X	$ROG+NO_X$	CO	PM_{10}			
					Fug	Exh	Tot	
Daily Emissions (lbs/day)								
Residential without Solar PV								
Residential with Solar PV								
Adjustment								
Annual Emissions (tons/year)								
Residential without Solar PV								1957.409
Residential with Solar PV								978.705
Adjustment								-978.705

Reso A - Exhibit C2 (EIR Technical Appendix)

RESIDENTIAL FLEET MIX ADJUSTMENT - YR 2024 WITH MITIGATION

Operational Period/Source	Emissions							MTCO2e
	ROG	NO_X	$ROG+NO_X$	CO	PM_{10}			
					Fug	Exh	Tot	
Daily Emissions (lbs/day)								
Default Fleet Mix	16.9103	64.6939	81.6042	185.2245	57.8168	0.5208	58.3376	
Corrected Fleet Mix	13.6161	22.8804	36.4965	163.1621	57.3358	0.4304	57.7662	
Adjustment	-3.2942	-41.8135	-45.1077	-22.0624	-0.481	-0.0904	-0.5714	
Annual Emissions (tons/year)								
Default Fleet Mix	2.4375	9.5285	11.966	26.736	8.2848	0.0763	8.3611	7743.172
Corrected Fleet Mix	1.9652	3.3185	5.2837	23.6418	8.214	0.0632	8.2772	6147.017
Adjustment	-0.4723	-6.21	-6.6823	-3.0942	-0.0708	-0.0131	-0.0839	-1596.155

RESIDENTIAL SOLAR PV ADJUSTMENT - YR 2024 WITH MTIGATION

Operational Period/Source	Emissions							MTCO2e
	ROG	NO_X	$ROG+NO_X$	CO	PM_{10}			
					Fug	Exh	Tot	
Daily Emissions (lbs/day)								
Residential without Solar PV								
Residential with Solar PV								
Adjustment								
Annual Emissions (tons/year)								
Residential without Solar PV								1845.224
Residential with Solar PV								922.612
Adjustment								-922.612

Reso A - Exhibit C2 (EIR Technical Appendix)

Operational Emissions Without Mitigation (Yr 2030)

Operational Period/Source	Emissions							MTCO2e
	ROG	NO_X	$ROG+NO_X$	CO	PM_{10}			
					Fugitive	Exhaust	Total	
Daily Emissions (lbs/day)								
Annual Emissions (tons/year)								
Area Source								29.461
Energy Use - Total								3245.175
Energy Use - Residential Solar PV Adjustment								-652.668
Energy Use with Residential Solar PV Adjustment								2592.507
Mobile - Total Uncorrected								8078.692
Residential Fleet Mix Adjustment								-1395.079
Mobile - Total with Corrected Fleet Mix								6683.612
Waste								807.102
Water								208.288
Total Operational Emissions:								10973.638

Reso A - Exhibit C2 (EIR Technical Appendix)

Operational Emissions With Mitigation (Yr 2030)

Operational Period/Source	Emissions							MTCO2e
	ROG	NO_X	$ROG+NO_X$	CO	PM_{10}			
					Fugitive	Exhaust	Total	
Daily Emissions (lbs/day)								
Annual Emissions (tons/year)								
Area Source								29.461
Energy Use - Total								2999.840
Energy Use - Residential Solar PV Adjustment								-615.262
Energy Use with Residential Solar PV Adjustment								2384.578
Energy Use - Res. Natural Gas Use Adjustment								-1629.733
Energy Use with Nat. Gas Adjustment								1370.107
Mobile - Total Uncorrected								7190.749
Residential Fleet Mix Adjustment								-1262.621
Mobile - Total with Corrected Fleet Mix								5928.128
Waste								338.983
Water								176.670
Total Operational Emissions:								7843.349

Reso A - Exhibit C2 (EIR Technical Appendix)

RESIDENTIAL FLEET MIX ADJUSTMENT - YR 2030

Operational Period/Source	Emissions							MTCO2e
	ROG	NO_X	$ROG+NO_X$	CO	PM_{10}			
					Fugitive	Exhaust	Total	
Daily Emissions (lbs/day)								
Annual Emissions (tons/year)								
Default Fleet Mix								7299.266
Corrected Fleet Mix								5904.186
Adjustment								-1395.079

RESIDENTIAL SOLAR PV ADJUSTMENT - YR 2030

Operational Period/Source	Emissions							MTCO2e
	ROG	NO_X	$ROG+NO_X$	CO	PM_{10}			
					Fugitive	Exhaust	Total	
Daily Emissions (lbs/day)								
Annual Emissions (tons/year)								
Residential without Solar PV								1305.336
Residential with Solar PV								652.668
Adjustment								-652.668

Reso A - Exhibit C2 (EIR Technical Appendix)

RESIDENTIAL FLEET MIX ADJUSTMENT - YR 2030 WITH MITIGATION

Operational Period/Source	Emissions							MTCO2e
	ROG	NO_X	ROG+NO_X	CO	PM_{10}			
					Fugitive	Exhaust	Total	
Daily Emissions (lbs/day)								
Annual Emissions (tons/year)								
Default Fleet Mix								6494.913
Corrected Fleet Mix								5232.292
Adjustment								-1262.621

RESIDENTIAL SOLAR PV ADJUSTMENT - YR 2030 WITH MTIGATION

Operational Period/Source	Emissions							MTCO2e
	ROG	NO_X	ROG+NO_X	CO	PM_{10}			
					Fugitive	Exhaust	Total	
Daily Emissions (lbs/day)								
Annual Emissions (tons/year)								
Residential without Solar PV								1230.524
Residential with Solar PV								615.262
Adjustment								-615.262

Reso A - Exhibit C2 (EIR Technical Appendix)

OPERATIONAL GHG SUMMARY (2024)

	Without Mitigation	With Mitigation
AREA SOURCE	29.5	29.5
ENERGY USE	2,956.1	2,018.8
MOTOR VEHICLES (CH4 & CO2 in CO2e)	7,865.3	6,974.6
MOTOR VEHICLES (N2O in CO2e)	51.8	45.7
MOTOR VEHICLES - TOTAL	7,917.1	7,020.3
WASTE GENERATION	339.0	339.0
WATER USE & CONVEYANCE	236.4	236.4
TOTAL	11,478.1	9,644.0
AMORTIZED CONSTRUCTION	842.7	842.7
TOTAL WITH CONST.	12,320.8	10,486.7
SERVICE POPULATION	4,090.0	4,090.0
MTCO2e/SP/Yr	3.0	2.6

OPERATIONAL GHG SUMMARY (2030)

	Without Mitigation	With Mitigation
AREA SOURCE	29.5	29.5
ENERGY USE	2,592.5	1,370.1
MOTOR VEHICLES (CH4 & CO2 in CO2e)	6,683.6	5,928.1
MOTOR VEHICLES (N2O in CO2e)	58.1	51.2
MOTOR VEHICLES - TOTAL	6,741.7	5,979.3
WASTE GENERATION	339.0	339.0
WATER USE & CONVEYANCE	176.7	176.7
TOTAL	9,879.4	7,894.6
AMORTIZED CONSTRUCTION	842.7	842.7
TOTAL WITH CONST.	10,722.0	8,737.3
SERVICE POPULATION	4,090.0	4,090.0
MTCO2e/SP/Yr	2.6	2.1

Reso A - Exhibit C2 (EIR Technical Appendix)

MOBILE SOURCE N20 - YEAR 2024 WITHOUT MITIGATION

SCENARIO: ALL LAND USES WITHOUT ADJUSTMENT

ANNUAL VMT: 27634856

VEHICLE FLEET MIX			N20 EMISSIONS	
VEHICLE TYPE	PERCENT	VMT	EMFAC (G/MI)	EMISSIONS
LDA	0.588806	16271569.02	0.002493845	0.04473048
LDT1	0.027737	766508.0009	0.002516246	0.00212605
LDT2	0.198305	5480130.119	0.002536081	0.01531999
MT	0.114471	3163389.601	0.044203714	0.15414025
LHD1	0.022249	614847.9111	0.059951623	0.04063247
LHD2	0.005748	158845.1523	0.068038748	0.01191338
MHD	0.012759	352593.1277	0.125358377	0.04872275
HHD	0.019721	544986.9952	0.183319618	0.11012849
BUS - OTHER	0.002316	64002.3265	0.132734565	0.0093645
BUS - URBAN	0.001163	32139.33753	0.151646082	0.00537245
MC	0.004776	131984.0723	0.06668364	0.00970165
BUS - SCHOOL	0.000758	20947.22085	0.130245666	0.00300742
MH	0.001192	32940.74835	0.134206333	0.00487316
			TOTAL:	0.46003306
			GWP:	298
			MT/TON:	0.9072
			CO2e:	124.367913

MOBILE SOURCE N20 - YEAR 2024 WITHOUT MITIGATION

SCENARIO: RESIDENTIAL LAND USES WITHOUT ADJUSTMENT

ANNUAL VMT: 25033354

VEHICLE FLEET MIX			N20 EMISSIONS	
VEHICLE TYPE	PERCENT	VMT	EMFAC (G/MI)	EMISSIONS
LDA	0.588806	14739789.04	0.002493845	0.04051962
LDT1	0.027737	694350.1399	0.002516246	0.00192591
LDT2	0.198305	4964239.265	0.002536081	0.01387779
MT	0.114471	2865593.066	0.044203714	0.13962973
LHD1	0.022249	556967.0931	0.059951623	0.0368074
LHD2	0.005748	143891.7188	0.068038748	0.01079187
MHD	0.012759	319400.5637	0.125358377	0.04413607
HHD	0.019721	493682.7742	0.183319618	0.09976117
BUS - OTHER	0.002316	57977.24786	0.132734565	0.00848294
BUS - URBAN	0.001163	29113.7907	0.151646082	0.0048667
MC	0.004776	119559.2987	0.06668364	0.00878835
BUS - SCHOOL	0.000758	18975.28233	0.130245666	0.00272431
MH	0.001192	29839.75797	0.134206333	0.00441441
			TOTAL:	0.41672627
			GWP:	298
			MT/TON:	0.9072
			CO2e:	112.660112

MOBILE SOURCE N20 - YEAR 2024 WITHOUT MITIGATION

SCENARIO: RESIDENTIAL LAND USES WITH ADJUSTMENT

ANNUAL VMT: 25033354

VEHICLE FLEET MIX			N20 EMISSIONS	
VEHICLE TYPE	PERCENT	VMT	EMFAC (G/MI)	EMISSIONS
LDA	0.611	15295379.29	0.002493845	0.04204693
LDT1	0.150	3755003.1	0.002516246	0.01041521
LDT2	0.190	4756337.26	0.002536081	0.01329659
MT	0.040	1001334.16	0.044203714	0.0487913
LHD1	0.000	2503.3354	0.059951623	0.00016543
LHD2	0.000	2503.3354	0.068038748	0.00018775
MHD	0.000	2503.3354	0.125358377	0.00034592
HHD	0.001	25033.354	0.183319618	0.00505863
BUS - OTHER	0.000	2503.3354	0.132734565	0.00036628
BUS - URBAN	0.003	72596.7266	0.151646082	0.01213537
MC	0.001	25033.354	0.06668364	0.00184011
BUS - SCHOOL	0.000	2503.3354	0.130245666	0.00035941
MH	0.004	90120.0744	0.134206333	0.01333212
			TOTAL:	0.14834104
			GWP:	298
			MT/TON:	0.9072
			CO2e:	40.1033486
		REDUCTION COMPARED TO NO ADJUSTMENT SCENARIO:		-72.556764

**Fleet mix adjusted based on SJVAPCD-recommended fleet mix for residential land uses, approved for use by SLOAPCD.*

YEAR 2024 WITHOUT MITGATION

TOTAL N20 IN CO2e ALL LAND USES - WITH RESIDENTIAL ADJUSTMENT: 51.8111489

Reso A - Exhibit C2 (EIR Technical Appendix)

MOBILE SOURCE N20 - YEAR 2030 WITHOUT MITIGATION

SCENARIO: ALL LAND USES WITHOUT ADJUSTMENT

ANNUAL VMT: 27634856

VEHICLE FLEET MIX			N20 EMISSIONS	
VEHICLE TYPE	PERCENT	VMT	EMFAC (G/MI)	EMISSIONS
LDA	0.610645	16875086.64	0.002413093	0.044887422
LDT1	0.025081	693109.8233	0.00244284	0.001866387
LDT2	0.199254	5506355.597	0.002523654	0.015317881
MT	0.104456	2886626.518	0.042281923	0.134539542
LHD1	0.014638	404519.0221	0.055574624	0.024781072
LHD2	0.00444	122698.7606	0.063071317	0.008530543
MHD	0.01255	346817.4428	0.120439538	0.046044168
HHD	0.019914	550320.5224	0.172523446	0.104657041
BUS - OTHER	0.002247	62095.52143	0.130307049	0.008919342
BUS - URBAN	0.001059	29265.3125	0.190240106	0.006137053
MC	0.00428	118277.1837	0.066650908	0.008689838
BUS - SCHOOL	0.000708	19565.47805	0.125554818	0.002707874
MH	0.000759	20974.8557	0.12937284	0.002991209
			TOTAL:	0.410069372
			GWP:	298
			MT/TON:	0.9072
			CO2e:	110.8604504

MOBILE SOURCE N20 - YEAR 2030 WITHOUT MITIGATION

SCENARIO: RESIDENTIAL LAND USES WITHOUT ADJUSTMENT

ANNUAL VMT: 25033354

VEHICLE FLEET MIX			N20 EMISSIONS	
VEHICLE TYPE	PERCENT	VMT	EMFAC (G/MI)	EMISSIONS
LDA	0.610645	15286492.45	0.002413093	0.04066179
LDT1	0.025081	627861.5517	0.00244284	0.001690689
LDT2	0.199254	4987995.918	0.002523654	0.01387588
MT	0.104456	2614884.025	0.042281923	0.121874201
LHD1	0.014638	366438.2359	0.055574624	0.022448221
LHD2	0.00444	111148.0918	0.063071317	0.007727491
MHD	0.01255	314168.5927	0.120439538	0.041709642
HHD	0.019914	498514.2116	0.172523446	0.094804791
BUS - OTHER	0.002247	56249.94644	0.130307049	0.008079689
BUS - URBAN	0.001059	26510.32189	0.190240106	0.00555932
MC	0.00428	107142.7551	0.066650908	0.00787179
BUS - SCHOOL	0.000708	17723.61463	0.125554818	0.002452959
MH	0.000759	19000.31569	0.12937284	0.002709621
			TOTAL:	0.371466085
			GWP:	298
			MT/TON:	0.9072
			CO2e:	100.4242215

MOBILE SOURCE N20 - YEAR 2030 WITHOUT MITIGATION

SCENARIO: RESIDENTIAL LAND USES WITH ADJUSTMENT

ANNUAL VMT: 25033354

VEHICLE FLEET MIX			N20 EMISSIONS	
VEHICLE TYPE	PERCENT	VMT	EMFAC (G/MI)	EMISSIONS
LDA	0.600	15020012.4	0.002413093	0.039952958
LDT1	0.150	3755003.1	0.00244284	0.01011137
LDT2	0.185	4631170.49	0.002523654	0.012883243
MT	0.050	1254171.035	0.042281923	0.058454253
LHD1	0.001	25033.354	0.055574624	0.001533558
LHD2	0.001	12516.677	0.063071317	0.000870213
MHD	0.002	50066.708	0.120439538	0.006646955
HHD	0.002	37550.031	0.172523446	0.007141066
BUS - OTHER	0.001	25033.354	0.130307049	0.003595767
BUS - URBAN	0.003	75100.062	0.190240106	0.015748783
MC	0.001	25033.354	0.066650908	0.001839203
BUS - SCHOOL	0.001	22530.0186	0.125554818	0.003118168
MH	0.004	100133.416	0.12937284	0.014279952
			TOTAL:	0.176175491
			GWP:	298
			MT/TON:	0.9072
			CO2e:	47.62826879
		REDUCTION COMPARED TO NO ADJUSTMENT SCENARIO:		-52.79595272

**Fleet mix adjusted based on SJVAPCD-recommended fleet mix for residential land uses, approved for use by SLOAPCD.*

YEAR 2030 WITHOUT MITIGATION

TOTAL N20 IN CO2e ALL LAND USES - WITH RESIDENTIAL ADJUSTMENT: 58.06449771

Reso A - Exhibit C2 (EIR Technical Appendix)

MOBILE SOURCE N20 - YEAR 2024 WITH MITIGATION

SCENARIO: ALL LAND USES WITHOUT ADJUSTMENT

ANNUAL VMT: 24373943

VEHICLE FLEET MIX			N20 EMISSIONS	
VEHICLE TYPE	PERCENT	VMT	EMFAC (G/MI)	EMISSIONS
LDA	0.588806	14351523.88	0.002493845	0.03945228
LDT1	0.027737	676060.057	0.002516246	0.00187518
LDT2	0.198305	4833474.767	0.002536081	0.01351223
MT	0.114471	2790109.629	0.044203714	0.1359517
LHD1	0.022249	542295.8578	0.059951623	0.03583784
LHD2	0.005748	140101.4244	0.068038748	0.0105076
MHD	0.012759	310987.1387	0.125358377	0.04297347
HHD	0.019721	480678.5299	0.183319618	0.09713333
BUS - OTHER	0.002316	56450.05199	0.132734565	0.00825949
BUS - URBAN	0.001163	28346.89571	0.151646082	0.0047385
MC	0.004776	116409.9518	0.06668364	0.00855685
BUS - SCHOOL	0.000758	18475.44879	0.130245666	0.00265255
MH	0.001192	29053.74006	0.134206333	0.00429813
			TOTAL:	0.40574916
			GWP:	298
			MT/TON:	0.9072
			CO2e:	109.692499

MOBILE SOURCE N20 - YEAR 2024 WITH MITIGATION

SCENARIO: RESIDENTIAL LAND USES WITHOUT ADJUSTMENT

ANNUAL VMT: 22079419

VEHICLE FLEET MIX			N20 EMISSIONS	
VEHICLE TYPE	PERCENT	VMT	EMFAC (G/MI)	EMISSIONS
LDA	0.588806	13000494.38	0.002493845	0.03573831
LDT1	0.027737	612416.8448	0.002516246	0.00169865
LDT2	0.198305	4378459.185	0.002536081	0.01224021
MT	0.114471	2527453.172	0.044203714	0.12315343
LHD1	0.022249	491244.9933	0.059951623	0.03246412
LHD2	0.005748	126912.5004	0.068038748	0.00951843
MHD	0.012759	281711.307	0.125358377	0.03892801
HHD	0.019721	435428.2221	0.183319618	0.08798936
BUS - OTHER	0.002316	51135.9344	0.132734565	0.00748195
BUS - URBAN	0.001163	25678.3643	0.151646082	0.00429243
MC	0.004776	105451.3051	0.06668364	0.00775132
BUS - SCHOOL	0.000758	16736.1996	0.130245666	0.00240284
MH	0.001192	26318.66745	0.134206333	0.00389351
			TOTAL:	0.36755258
			GWP:	298
			MT/TON:	0.9072
			CO2e:	99.3662226

MOBILE SOURCE N20 - YEAR 2024 WITH MITIGATION

SCENARIO: RESIDENTIAL LAND USES WITH ADJUSTMENT

ANNUAL VMT: 22079419

VEHICLE FLEET MIX			N20 EMISSIONS	
VEHICLE TYPE	PERCENT	VMT	EMFAC (G/MI)	EMISSIONS
LDA	0.611	13490525.01	0.002493845	0.0370854
LDT1	0.150	3311912.85	0.002516246	0.00918622
LDT2	0.190	4195089.61	0.002536081	0.0117276
MT	0.040	883176.76	0.044203714	0.04303393
LHD1	0.000	2207.9419	0.059951623	0.00014591
LHD2	0.000	2207.9419	0.068038748	0.0001656
MHD	0.000	2207.9419	0.125358377	0.0003051
HHD	0.001	22079.419	0.183319618	0.00446171
BUS - OTHER	0.000	2207.9419	0.132734565	0.00032305
BUS - URBAN	0.003	64030.3151	0.151646082	0.01070339
MC	0.001	22079.419	0.06668364	0.00162297
BUS - SCHOOL	0.000	2207.9419	0.130245666	0.000317
MH	0.004	79485.9084	0.134206333	0.01175893
			TOTAL:	0.13083681
			GWP:	298
			MT/TON:	0.9072
			CO2e:	35.3711547

**Fleet mix adjusted based on SJVAPCD-recommended fleet mix for residential land uses, approved for use by SLOAPCD.*

REDUCTION COMPARED TO NO ADJUSTMENT SCENARIO: -63.995068

YEAR 2024 WITH MITGATION

TOTAL N20 IN CO2e ALL LAND USES - WITH RESIDENTIAL ADJUSTMENT: 45.6974311

Reso A - Exhibit C2 (EIR Technical Appendix)

MOBILE SOURCE N20 - YEAR 2030 WITH MITIGATION

SCENARIO: ALL LAND USES WITHOUT ADJUSTMENT

ANNUAL VMT: 24373943

VEHICLE FLEET MIX			N20 EMISSIONS	
VEHICLE TYPE	PERCENT	VMT	EMFAC (G/MI)	EMISSIONS
LDA	0.610645	14883826.42	0.002413093	0.039590706
LDT1	0.025081	611322.8644	0.00244284	0.001646154
LDT2	0.199254	4856605.639	0.002523654	0.013510371
MT	0.104456	2546004.59	0.042281923	0.118663876
LHD1	0.014638	356785.7776	0.055574624	0.021856906
LHD2	0.00444	108220.3069	0.063071317	0.007523939
MHD	0.01255	305892.9847	0.120439538	0.040610956
HHD	0.019914	485382.7009	0.172523446	0.09230751
BUS - OTHER	0.002247	54768.24992	0.130307049	0.007866859
BUS - URBAN	0.001059	25812.00564	0.190240106	0.005412881
MC	0.00428	104320.476	0.066650908	0.007664437
BUS - SCHOOL	0.000708	17256.75164	0.125554818	0.002388345
MH	0.000759	18499.82274	0.12937284	0.002638246
			TOTAL:	0.361681186
			GWP:	298
			MT/TON:	0.9072
			CO2e:	97.77891731

MOBILE SOURCE N20 - YEAR 2030 WITH MITIGATION

SCENARIO: RESIDENTIAL LAND USES WITHOUT ADJUSTMENT

ANNUAL VMT: 22079419

VEHICLE FLEET MIX			N20 EMISSIONS	
VEHICLE TYPE	PERCENT	VMT	EMFAC (G/MI)	EMISSIONS
LDA	0.610645	13482686.82	0.002413093	0.0358637
LDT1	0.025081	553773.9079	0.00244284	0.001491187
LDT2	0.199254	4399412.553	0.002523654	0.012238526
MT	0.104456	2306327.791	0.042281923	0.107493049
LHD1	0.014638	323198.5353	0.055574624	0.019799332
LHD2	0.00444	98032.62036	0.063071317	0.006815648
MHD	0.01255	277096.7085	0.120439538	0.036787906
HHD	0.019914	439689.55	0.172523446	0.083617829
BUS - OTHER	0.002247	49612.45449	0.130307049	0.007126286
BUS - URBAN	0.001059	23382.10472	0.190240106	0.004903321
MC	0.00428	94499.91332	0.066650908	0.006942919
BUS - SCHOOL	0.000708	15632.22865	0.125554818	0.00216351
MH	0.000759	16758.27902	0.12937284	0.002389886
			TOTAL:	0.327633098
			GWP:	298
			MT/TON:	0.9072
			CO2e:	88.57416647

MOBILE SOURCE N20 - YEAR 2030 WITH MITIGATION

SCENARIO: RESIDENTIAL LAND USES WITH ADJUSTMENT

ANNUAL VMT: 22079419

VEHICLE FLEET MIX			N20 EMISSIONS	
VEHICLE TYPE	PERCENT	VMT	EMFAC (G/MI)	EMISSIONS
LDA	0.600	13247651.4	0.002413093	0.035238511
LDT1	0.150	3311912.85	0.00244284	0.008918229
LDT2	0.185	4084692.515	0.002523654	0.011363021
MT	0.050	1106178.892	0.042281923	0.051556653
LHD1	0.001	22079.419	0.055574624	0.001352598
LHD2	0.001	11039.7095	0.063071317	0.000767528
MHD	0.002	44158.838	0.120439538	0.005862614
HHD	0.002	33119.1285	0.172523446	0.00629842
BUS - OTHER	0.001	22079.419	0.130307049	0.003171467
BUS - URBAN	0.003	66238.257	0.190240106	0.013890427
MC	0.001	22079.419	0.066650908	0.001622177
BUS - SCHOOL	0.001	19871.4771	0.125554818	0.002750225
MH	0.004	88317.676	0.12937284	0.012594919
			TOTAL:	0.155386788
			GWP:	298
			MT/TON:	0.9072
			CO2e:	42.00813454
		REDUCTION COMPARED TO NO ADJUSTMENT SCENARIO:		-46.56603193

**Fleet mix adjusted based on SJVAPCD-recommended fleet mix for residential land uses, approved for use by SLOAPCD.*

YEAR 2030 WITH MITIGATION

TOTAL N20 IN CO2e ALL LAND USES - WITH RESIDENTIAL ADJUSTMENT: 51.21288538

Reso A - Exhibit C2 (EIR Technical Appendix)

VMT/Capita

	Without Mitigation	With Mitigation
Annual VMT:	27,634,856	24,373,043
Daily VMT:	75,712	66,775
Population:	3517	3517
VMT/Capita:	21.5	19.0

Annual VMT derived from CalEEMod modeling results.

Daily VMT assumes 365 days/year.

Population provided by the project applicant.

Reso A - Exhibit C2 (EIR Technical Appendix)

CONSTRUCTION EMISSIONS SUMMARY (TONS/QTR)

	EMISSIONS (TONS/QTR)						
		PM10			PM2.5		
CONSTRUCTION QUARTER	ROG+NOX	FUG	EXH	TOTAL	FUG	EXH	TOTAL
2020 Q1	1.64	0.68	0.07	0.75	0.22	0.06	0.28
TIER 1&2 THRESHOLDS	2.5 / 6.3	2.5 / None	0.13 / 0.32				
EXCEEDS?	No	No	No				
2020 Q2	2.89	0.96	0.07	1.03	0.22	0.07	0.29
TIER 1&2 THRESHOLDS	2.5 / 6.3	2.5 / None	0.13 / 0.32				
EXCEEDS?	Yes / No	No	No				
2020 Q3	6.57	1.44	0.07	1.51	0.39	0.07	0.45
TIER 1&2 THRESHOLDS	2.5 / 6.3	2.5 / None	0.13 / 0.32				
EXCEEDS?	Yes / Yes	No	No				
2020 Q4	7.31	1.58	0.07	1.66	0.42	0.07	0.49
TIER 1&2 THRESHOLDS	2.5 / 6.3	2.5 / None	0.13 / 0.32				
EXCEEDS?	Yes / Yes	No	No				
2021 Q1	7.13	1.68	0.06	1.74	0.45	0.05	0.50
TIER 1&2 THRESHOLDS	2.5 / 6.3	2.5 / None	0.13 / 0.32				
EXCEEDS?	Yes / Yes	No	No				
2021 Q2	7.00	1.68	0.06	1.74	0.45	0.05	0.50
TIER 1&2 THRESHOLDS	2.5 / 6.3	2.5 / None	0.13 / 0.32				
EXCEEDS?	Yes / Yes	No	No				
2021 Q3	7.00	1.68	0.06	1.74	0.45	0.05	0.50
TIER 1&2 THRESHOLDS	2.5 / 6.3	2.5 / None	0.13 / 0.32				
EXCEEDS?	Yes / Yes	No	No				
2021 Q4	7.13	1.68	0.06	1.74	0.45	0.05	0.50
TIER 1&2 THRESHOLDS	2.5 / 6.3	2.5 / None	0.13 / 0.32				
EXCEEDS?	Yes / Yes	No	No				
2022 Q1	6.74	1.68	0.05	1.73	0.45	0.05	0.50
TIER 1&2 THRESHOLDS	2.5 / 6.3	2.5 / None	0.13 / 0.32				
EXCEEDS?	Yes / Yes	No	No				
2022 Q2	6.62	1.68	0.05	1.73	0.45	0.05	0.50
TIER 1&2 THRESHOLDS	2.5 / 6.3	2.5 / None	0.13 / 0.32				
EXCEEDS?	Yes / Yes	No	No				
2022 Q3	6.62	1.68	0.05	1.73	0.45	0.05	0.50
TIER 1&2 THRESHOLDS	2.5 / 6.3	2.5 / None	0.13 / 0.32				

Reso A - Exhibit C2 (EIR Technical Appendix)

	EXCEEDS?	Yes / Yes	No	No				
2022	Q4	6.74	1.68	0.05	1.73	0.45	0.05	0.50
	TIER 1&2 THRESHOLDS	2.5 / 6.3	2.5 / None	0.13 / 0.32				
	EXCEEDS?	Yes / Yes	No	No				
2023	Q1	5.86	1.68	0.04	1.72	0.45	0.04	0.49
	TIER 1&2 THRESHOLDS	2.5 / 6.3	2.5 / None	0.13 / 0.32				
	EXCEEDS?	Yes / No	No	No				
2023	Q2	4.85	1.37	0.04	1.40	0.37	0.03	0.40
	TIER 1&2 THRESHOLDS	2.5 / 6.3	2.5 / None	0.13 / 0.32				
	EXCEEDS?	Yes / No	No	No				
2023	Q3	0.25	0.00	0.01	0.01	0.00	0.01	0.01
	TIER 1&2 THRESHOLDS	2.5 / 6.3	2.5 / None	0.13 / 0.32				
	EXCEEDS?	No	No	No				

Reso A - Exhibit C2 (EIR Technical Appendix)

CALEEMOD – YEAR 2024

Includes Construction and Operational Conditions.
Mobile-source adjustment for Residential Fleet Mix Calculated Separately.

Olsen-Chandler - San Luis Obispo County APCD Air District, Annual

NOTE: Does not include residential adjustment for fleet mix or solar PV, calculated separately.

Olsen-Chandler

San Luis Obispo County APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	0.58	1000sqft	0.01	576.00	0
Elementary School	495.00	Student	0.95	41,383.67	0
Other Asphalt Surfaces	97.60	Acre	97.60	4,251,456.00	0
City Park	45.30	Acre	45.30	1,973,268.00	0
City Park	33.80	Acre	33.80	1,472,328.00	0
Health Club	18.75	1000sqft	11.50	18,752.00	0
Racquet Club	6.21	1000sqft	3.80	6,205.00	0
Recreational Swimming Pool	0.00	1000sqft	1.10	1,789.00	0
Recreational Swimming Pool	0.00	1000sqft	0.70	1,154.00	0
Apartments Low Rise	228.00	Dwelling Unit	14.25	228,000.00	652
Single Family Housing	1,065.00	Dwelling Unit	147.45	1,917,000.00	3046
Regional Shopping Center	10.66	1000sqft	0.24	10,659.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.2	**Precipitation Freq (Days)**	44
Climate Zone	4			**Operational Year**	2024
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	447.45	**CH4 Intensity (lb/MWhr)**	0.02	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Includes RPS adjustment.

Land Use - Provided by the applicant team.

Construction Phase - Based on provided phase durations. Architectural Coating, starts five months after building construction and stops at the end of building construction.

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - Equipment use based on model defaults.

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Trips and VMT - Const trips based on model defaults.

On-road Fugitive Dust -

Demolition - Demolition of 3,400 building square footage.

Grading - Based on model defaults.

Architectural Coating - Residential low-VOC content: 50 g/L, per mitigation requirements. Non-Residential low-VOC content: 100 g/L.

Vehicle Trips - Trip-gen rates for residential and school based on City of Paso Robles' Travel Demand Forecast Model (Final), prepared by Fehr & Peers (August 5, 2009), Table 2. Other uses derived from the traffic analysis prepared for this project.

Vehicle Emission Factors - Emission factors based on model defaults.

Vehicle Emission Factors -

Vehicle Emission Factors -

Woodstoves - Assumes no hearths.

Consumer Products - Consumer products, arch coatings, and landscape equipment usage based on model defaults.

Energy Use -

Water And Wastewater - Adjusted for the removal of septic systems from the default assumptions.

Construction Off-road Equipment Mitigation - Includes 50%CE for watering travel ways, 61%CE for watering disturbed areas, 15 mph onsite speed limit. Use of T3 off-road equipment included.

Mobile Land Use Mitigation -

Olsen-Chandler - San Luis Obispo County APCD Air District, Annual

Area Mitigation -
Energy Mitigation -

Waste Mitigation - Assumes 58% waste reduction, per most current (2017) state-wide diversion rate (CalRecycle https://www.calrecycle.ca.gov/lgcentral/goalmeasure/disposalrate/graphs/estdiversion)

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	100.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	100.00
tblArchitecturalCoating	EF_Residential_Exterior	250.00	50.00
tblArchitecturalCoating	EF_Residential_Interior	250.00	50.00
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3

Olsen-Chandler - San Luis Obispo County APCD Air District, Annual

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	400.00	5.00
tblConstructionPhase	NumDays	240.00	23.00
tblConstructionPhase	NumDays	620.00	87.00
tblConstructionPhase	NumDays	6,200.00	783.00
tblConstructionPhase	NumDays	440.00	45.00
tblConstructionPhase	NumDays	440.00	674.00
tblConstructionPhase	PhaseEndDate	7/13/2021	1/7/2020
tblConstructionPhase	PhaseEndDate	6/14/2022	2/7/2020
tblConstructionPhase	PhaseEndDate	10/29/2024	6/9/2020
tblConstructionPhase	PhaseEndDate	8/4/2048	6/9/2023
tblConstructionPhase	PhaseEndDate	4/12/2050	8/11/2023
tblConstructionPhase	PhaseStartDate	7/14/2021	1/8/2020
tblConstructionPhase	PhaseStartDate	6/15/2022	2/8/2020
tblConstructionPhase	PhaseStartDate	10/30/2024	6/10/2020
tblConstructionPhase	PhaseStartDate	8/5/2048	6/10/2023
tblGrading	AcresOfGrading	217.50	1,550.00
tblLandUse	LandUseSquareFeet	580.00	576.00

Olsen-Chandler - San Luis Obispo County APCD Air District, Annual

tblLandUse	LandUseSquareFeet	18,750.00	18,752.00
tblLandUse	LandUseSquareFeet	6,210.00	6,205.00
tblLandUse	LandUseSquareFeet	0.00	1,789.00
tblLandUse	LandUseSquareFeet	0.00	1,154.00
tblLandUse	LandUseSquareFeet	10,660.00	10,659.00
tblLandUse	LotAcreage	0.43	11.50
tblLandUse	LotAcreage	0.14	3.80
tblLandUse	LotAcreage	0.00	1.10
tblLandUse	LotAcreage	0.00	0.70
tblLandUse	LotAcreage	345.78	147.45
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.02
tblProjectCharacteristics	CO2IntensityFactor	641.35	447.45
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblVehicleTrips	ST_TR	22.75	0.00
tblVehicleTrips	ST_TR	2.46	0.00
tblVehicleTrips	ST_TR	21.35	0.00
tblVehicleTrips	ST_TR	9.10	0.00
tblVehicleTrips	SU_TR	16.74	0.00
tblVehicleTrips	SU_TR	1.05	0.00
tblVehicleTrips	SU_TR	17.40	0.00
tblVehicleTrips	SU_TR	13.60	0.00
tblVehicleTrips	WD_TR	6.59	5.21
tblVehicleTrips	WD_TR	1.89	0.00
tblVehicleTrips	WD_TR	11.03	0.00
tblVehicleTrips	WD_TR	32.93	34.66
tblVehicleTrips	WD_TR	14.03	0.00
tblVehicleTrips	WD_TR	33.82	0.00

tblVehicleTrips	WD_TR	42.70	37.72
tblVehicleTrips	WD_TR	9.52	7.56
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
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tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	2.5387	16.1853	16.4177	0.0524	4.6136	0.2859	4.8994	1.2405	0.2671	1.5076						4,848.9110
2021	6.3593	22.1483	26.1606	0.0918	6.5868	0.2240	6.8108	1.7699	0.2115	1.9814						8,518.2350
2022	6.1174	20.7282	24.0813	0.0893	6.5617	0.1951	6.7568	1.7632	0.1842	1.9474						8,295.9189
2023	2.7347	7.9471	10.0747	0.0389	2.9056	0.0801	2.9857	0.7808	0.0752	0.8559						3,617.4591
Maximum	**6.3593**	**22.1483**	**26.1606**	**0.0918**	**6.5868**	**0.2859**	**6.8108**	**1.7699**	**0.2671**	**1.9814**						**8,518.2350**

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2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	2.2595	14.6292	16.7243	0.0524	3.8246	0.2155	4.0401	1.0287	0.2115	1.2402						4,848.9104
2021	6.1783	21.7077	26.3320	0.0918	6.5868	0.2170	6.8038	1.7699	0.2120	1.9819						8,518.2346
2022	5.9644	20.5409	24.2801	0.0893	6.5617	0.2091	6.7708	1.7632	0.2045	1.9676						8,295.9185
2023	2.6648	7.9659	10.2307	0.0389	2.9056	0.0954	3.0010	0.7808	0.0938	0.8746						3,617.4589
Maximum	**6.1783**	**21.7077**	**26.3320**	**0.0918**	**6.5868**	**0.2170**	**6.8038**	**1.7699**	**0.2120**	**1.9819**						**8,518.2346**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**3.85**	**3.23**	**-1.09**	**0.00**	**3.82**	**6.13**	**3.90**	**3.81**	**2.21**	**3.63**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-1-2020**	**3-31-2020**	1.6484	0.8737
2	**4-1-2020**	**6-30-2020**	2.8864	2.2597
3	**7-1-2020**	**9-30-2020**	6.6427	6.4322
4	**10-1-2020**	**12-31-2020**	7.3654	7.1455
5	**1-1-2021**	**3-31-2021**	7.0478	6.8947
6	**4-1-2021**	**6-30-2021**	6.9975	6.8427
7	**7-1-2021**	**9-30-2021**	7.0744	6.9179
8	**10-1-2021**	**12-31-2021**	7.2044	7.0479

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9	**1-1-2022**	**3-31-2022**	6.6624	6.5782
10	**4-1-2022**	**6-30-2022**	6.6203	6.5352
11	**7-1-2022**	**9-30-2022**	6.6931	6.6070
12	**10-1-2022**	**12-31-2022**	6.8104	6.7244
13	**1-1-2023**	**3-31-2023**	5.7908	5.7543
14	**4-1-2023**	**6-30-2023**	4.5476	4.5240
15	**7-1-2023**	**9-30-2023**	0.2550	0.2644
		Highest	7.3654	7.1455

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	13.0665	0.2028	17.6057	9.3000e-004		0.0976	0.0976		0.0976	0.0976						29.4657
Energy	0.1873	1.6049	0.7125	0.0102		0.1294	0.1294		0.1294	0.1294						3,934.8071
Mobile	2.8763	11.5051	32.6468	0.1050	10.3694	0.0944	10.4638	2.7747	0.0883	2.8630						9,636.2116
Waste						0.0000	0.0000		0.0000	0.0000						807.1016
Water						0.0000	0.0000		0.0000	0.0000						276.6166
Total	**16.1301**	**13.3128**	**50.9650**	**0.1162**	**10.3694**	**0.3214**	**10.6908**	**2.7747**	**0.3152**	**3.0899**						**14,684.2026**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	13.0665	0.2028	17.6057	9.3000e-004		0.0976	0.0976		0.0976	0.0976						29.4657
Energy	0.1709	1.4642	0.6501	9.3200e-003		0.1181	0.1181		0.1181	0.1181						3,648.5750
Mobile	2.7631	10.6930	29.8525	0.0934	9.1458	0.0847	9.2304	2.4473	0.0791	2.5264						8,570.7232
Waste						0.0000	0.0000		0.0000	0.0000						338.9827
Water						0.0000	0.0000		0.0000	0.0000						236.3480
Total	**16.0005**	**12.3600**	**48.1084**	**0.1037**	**9.1458**	**0.3003**	**9.4461**	**2.4473**	**0.2948**	**2.7420**						**12,824.0946**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.80**	**7.16**	**5.61**	**10.78**	**11.80**	**6.57**	**11.64**	**11.80**	**6.50**	**11.26**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**12.67**

3.0 Construction Detail

Construction Phase

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Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2020	1/7/2020	5	5	
2	Site Preparation	Site Preparation	1/8/2020	2/7/2020	5	23	
3	Grading	Grading	2/8/2020	6/9/2020	5	87	
4	Building Construction	Building Construction	6/10/2020	6/9/2023	5	783	
5	Paving	Paving	6/10/2023	8/11/2023	5	45	
6	Architectural Coating	Architectural Coating	11/10/2020	6/9/2023	5	674	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 1550

Acres of Paving: 97.6

Residential Indoor: 4,343,625; Residential Outdoor: 1,447,875; Non-Residential Indoor: 120,778; Non-Residential Outdoor: 40,259; Striped Parking Area: 255,087 (Architectural Coating – sqft)

OffRoad Equipment

Olsen-Chandler - San Luis Obispo County APCD Air District, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Olsen-Chandler - San Luis Obispo County APCD Air District, Annual

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	15.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	3,813.00	1,413.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	763.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.7300e-003	0.0000	1.7300e-003	2.6000e-004	0.0000	2.6000e-004						0.0000
Off-Road	8.2800e-003	0.0830	0.0544	1.0000e-004		4.1500e-003	4.1500e-003		3.8500e-003	3.8500e-003						8.5596
Total	**8.2800e-003**	**0.0830**	**0.0544**	**1.0000e-004**	**1.7300e-003**	**4.1500e-003**	**5.8800e-003**	**2.6000e-004**	**3.8500e-003**	**4.1100e-003**						**8.5596**

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3.2 Demolition - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	7.0000e-005	2.4100e-003	5.2000e-004	1.0000e-005	1.3000e-004	1.0000e-005	1.4000e-004	4.0000e-005	1.0000e-005	5.0000e-005						0.5778
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	1.6000e-004	1.5000e-004	1.2900e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	1.0000e-004	0.0000	1.0000e-004						0.3023
Total	**2.3000e-004**	**2.5600e-003**	**1.8100e-003**	**1.0000e-005**	**4.9000e-004**	**1.0000e-005**	**5.0000e-004**	**1.4000e-004**	**1.0000e-005**	**1.5000e-004**						**0.8800**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					6.7000e-004	0.0000	6.7000e-004	1.0000e-004	0.0000	1.0000e-004						0.0000
Off-Road	2.3100e-003	0.0458	0.0617	1.0000e-004		2.1600e-003	2.1600e-003		2.1600e-003	2.1600e-003						8.5596
Total	**2.3100e-003**	**0.0458**	**0.0617**	**1.0000e-004**	**6.7000e-004**	**2.1600e-003**	**2.8300e-003**	**1.0000e-004**	**2.1600e-003**	**2.2600e-003**						**8.5596**

3.2 Demolition - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	7.0000e-005	2.4100e-003	5.2000e-004	1.0000e-005	1.3000e-004	1.0000e-005	1.4000e-004	4.0000e-005	1.0000e-005	5.0000e-005						0.5778
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	1.6000e-004	1.5000e-004	1.2900e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	1.0000e-004	0.0000	1.0000e-004						0.3023
Total	**2.3000e-004**	**2.5600e-003**	**1.8100e-003**	**1.0000e-005**	**4.9000e-004**	**1.0000e-005**	**5.0000e-004**	**1.4000e-004**	**1.0000e-005**	**1.5000e-004**						**0.8800**

3.3 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2078	0.0000	0.2078	0.1142	0.0000	0.1142						0.0000
Off-Road	0.0469	0.4878	0.2474	4.4000e-004		0.0253	0.0253		0.0233	0.0233						38.7561
Total	**0.0469**	**0.4878**	**0.2474**	**4.4000e-004**	**0.2078**	**0.0253**	**0.2330**	**0.1142**	**0.0233**	**0.1375**						**38.7561**

3.3 Site Preparation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	9.1000e-004	8.2000e-004	7.1200e-003	2.0000e-005	1.9900e-003	1.0000e-005	2.0100e-003	5.3000e-004	1.0000e-005	5.4000e-004						1.6686
Total	**9.1000e-004**	**8.2000e-004**	**7.1200e-003**	**2.0000e-005**	**1.9900e-003**	**1.0000e-005**	**2.0100e-003**	**5.3000e-004**	**1.0000e-005**	**5.4000e-004**						**1.6686**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0810	0.0000	0.0810	0.0445	0.0000	0.0445						0.0000
Off-Road	0.0107	0.2193	0.2640	4.4000e-004		0.0109	0.0109		0.0109	0.0109						38.7561
Total	**0.0107**	**0.2193**	**0.2640**	**4.4000e-004**	**0.0810**	**0.0109**	**0.0919**	**0.0445**	**0.0109**	**0.0554**						**38.7561**

3.3 Site Preparation - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	9.1000e-004	8.2000e-004	7.1200e-003	2.0000e-005	1.9900e-003	1.0000e-005	2.0100e-003	5.3000e-004	1.0000e-005	5.4000e-004						1.6686
Total	**9.1000e-004**	**8.2000e-004**	**7.1200e-003**	**2.0000e-005**	**1.9900e-003**	**1.0000e-005**	**2.0100e-003**	**5.3000e-004**	**1.0000e-005**	**5.4000e-004**						**1.6686**

3.4 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0839	0.0000	1.0839	0.2327	0.0000	0.2327						0.0000
Off-Road	0.1936	2.1836	1.3902	2.7000e-003		0.0946	0.0946		0.0870	0.0870						238.9230
Total	**0.1936**	**2.1836**	**1.3902**	**2.7000e-003**	**1.0839**	**0.0946**	**1.1784**	**0.2327**	**0.0870**	**0.3197**						**238.9230**

3.4 Grading - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	3.8000e-003	3.4600e-003	0.0299	8.0000e-005	8.3800e-003	6.0000e-005	8.4300e-003	2.2300e-003	5.0000e-005	2.2800e-003						7.0128
Total	**3.8000e-003**	**3.4600e-003**	**0.0299**	**8.0000e-005**	**8.3800e-003**	**6.0000e-005**	**8.4300e-003**	**2.2300e-003**	**5.0000e-005**	**2.2800e-003**						**7.0128**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4227	0.0000	0.4227	0.0908	0.0000	0.0908						0.0000
Off-Road	0.0663	1.3041	1.5974	2.7000e-003		0.0565	0.0565		0.0565	0.0565						238.9227
Total	**0.0663**	**1.3041**	**1.5974**	**2.7000e-003**	**0.4227**	**0.0565**	**0.4792**	**0.0908**	**0.0565**	**0.1473**						**238.9227**

3.4 Grading - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	3.8000e-003	3.4600e-003	0.0299	8.0000e-005	8.3800e-003	6.0000e-005	8.4300e-003	2.2300e-003	5.0000e-005	2.2800e-003						7.0128
Total	**3.8000e-003**	**3.4600e-003**	**0.0299**	**8.0000e-005**	**8.3800e-003**	**6.0000e-005**	**8.4300e-003**	**2.2300e-003**	**5.0000e-005**	**2.2800e-003**						**7.0128**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1558	1.4102	1.2384	1.9800e-003		0.0821	0.0821		0.0772	0.0772						171.2716
Total	**0.1558**	**1.4102**	**1.2384**	**1.9800e-003**		**0.0821**	**0.0821**		**0.0772**	**0.0772**						**171.2716**

3.5 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.3862	10.8108	3.2753	0.0207	0.4717	0.0590	0.5307	0.1363	0.0564	0.1927						2,001.0644
Worker	1.2256	1.1135	9.6397	0.0250	2.6981	0.0177	2.7158	0.7170	0.0164	0.7334						2,259.0582
Total	**1.6118**	**11.9243**	**12.9151**	**0.0457**	**3.1698**	**0.0767**	**3.2465**	**0.8533**	**0.0728**	**0.9261**						**4,260.1225**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0495	1.0456	1.3137	1.9800e-003		0.0664	0.0664		0.0664	0.0664						171.2714
Total	**0.0495**	**1.0456**	**1.3137**	**1.9800e-003**		**0.0664**	**0.0664**		**0.0664**	**0.0664**						**171.2714**

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3.5 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.3862	10.8108	3.2753	0.0207	0.4717	0.0590	0.5307	0.1363	0.0564	0.1927						2,001.0644
Worker	1.2256	1.1135	9.6397	0.0250	2.6981	0.0177	2.7158	0.7170	0.0164	0.7334						2,259.0582
Total	**1.6118**	**11.9243**	**12.9151**	**0.0457**	**3.1698**	**0.0767**	**3.2465**	**0.8533**	**0.0728**	**0.9261**						**4,260.1225**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2481	2.2749	2.1631	3.5100e-003		0.1251	0.1251		0.1176	0.1176						304.1099
Total	**0.2481**	**2.2749**	**2.1631**	**3.5100e-003**		**0.1251**	**0.1251**		**0.1176**	**0.1176**						**304.1099**

3.5 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.5621	17.5526	5.1434	0.0365	0.8378	0.0501	0.8879	0.2421	0.0479	0.2900						3,531.5098
Worker	2.0280	1.7678	15.5128	0.0428	4.7904	0.0305	4.8209	1.2731	0.0281	1.3012						3,874.0265
Total	**2.5902**	**19.3204**	**20.6562**	**0.0793**	**5.6282**	**0.0806**	**5.7088**	**1.5151**	**0.0760**	**1.5912**						**7,405.5363**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0879	1.8565	2.3325	3.5100e-003		0.1179	0.1179		0.1179	0.1179						304.1095
Total	**0.0879**	**1.8565**	**2.3325**	**3.5100e-003**		**0.1179**	**0.1179**		**0.1179**	**0.1179**						**304.1095**

3.5 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.5621	17.5526	5.1434	0.0365	0.8378	0.0501	0.8879	0.2421	0.0479	0.2900						3,531.5098
Worker	2.0280	1.7678	15.5128	0.0428	4.7904	0.0305	4.8209	1.2731	0.0281	1.3012						3,874.0265
Total	**2.5902**	**19.3204**	**20.6562**	**0.0793**	**5.6282**	**0.0806**	**5.7088**	**1.5151**	**0.0760**	**1.5912**						**7,405.5363**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2218	2.0300	2.1272	3.5000e-003		0.1052	0.1052		0.0990	0.0990						303.0471
Total	**0.2218**	**2.0300**	**2.1272**	**3.5000e-003**		**0.1052**	**0.1052**		**0.0990**	**0.0990**						**303.0471**

Olsen-Chandler - San Luis Obispo County APCD Air District, Annual

3.5 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.5179	16.6147	4.7296	0.0361	0.8347	0.0439	0.8786	0.2412	0.0420	0.2832						3,493.9859
Worker	1.8968	1.5835	14.1560	0.0411	4.7721	0.0295	4.8016	1.2682	0.0272	1.2954						3,721.0411
Total	**2.4147**	**18.1982**	**18.8856**	**0.0772**	**5.6068**	**0.0734**	**5.6802**	**1.5094**	**0.0692**	**1.5786**						**7,215.0269**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0876	1.8494	2.3236	3.5000e-003		0.1175	0.1175		0.1175	0.1175						303.0467
Total	**0.0876**	**1.8494**	**2.3236**	**3.5000e-003**		**0.1175**	**0.1175**		**0.1175**	**0.1175**						**303.0467**

3.5 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.5179	16.6147	4.7296	0.0361	0.8347	0.0439	0.8786	0.2412	0.0420	0.2832						3,493.9859
Worker	1.8968	1.5835	14.1560	0.0411	4.7721	0.0295	4.8016	1.2682	0.0272	1.2954						3,721.0411
Total	**2.4147**	**18.1982**	**18.8856**	**0.0772**	**5.6068**	**0.0734**	**5.6802**	**1.5094**	**0.0692**	**1.5786**						**7,215.0269**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0904	0.8271	0.9340	1.5500e-003		0.0402	0.0402		0.0379	0.0379						134.0804
Total	**0.0904**	**0.8271**	**0.9340**	**1.5500e-003**		**0.0402**	**0.0402**		**0.0379**	**0.0379**						**134.0804**

Olsen-Chandler - San Luis Obispo County APCD Air District, Annual

3.5 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.1749	6.0593	1.8378	0.0157	0.3693	8.9900e-003	0.3783	0.1067	8.6000e-003	0.1153						1,519.8021
Worker	0.7882	0.6296	5.7177	0.0175	2.1107	0.0127	2.1234	0.5609	0.0117	0.5726						1,584.0367
Total	**0.9632**	**6.6888**	**7.5555**	**0.0332**	**2.4800**	**0.0217**	**2.5017**	**0.6676**	**0.0203**	**0.6880**						**3,103.8388**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0388	0.8180	1.0277	1.5500e-003		0.0520	0.0520		0.0520	0.0520						134.0803
Total	**0.0388**	**0.8180**	**1.0277**	**1.5500e-003**		**0.0520**	**0.0520**		**0.0520**	**0.0520**						**134.0803**

3.5 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.1749	6.0593	1.8378	0.0157	0.3693	8.9900e-003	0.3783	0.1067	8.6000e-003	0.1153						1,519.8021
Worker	0.7882	0.6296	5.7177	0.0175	2.1107	0.0127	2.1234	0.5609	0.0117	0.5726						1,584.0367
Total	**0.9632**	**6.6888**	**7.5555**	**0.0332**	**2.4800**	**0.0217**	**2.5017**	**0.6676**	**0.0203**	**0.6880**						**3,103.8388**

3.6 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0232	0.2293	0.3281	5.1000e-004		0.0115	0.0115		0.0106	0.0106						45.4248
Paving	0.1279					0.0000	0.0000		0.0000	0.0000						0.0000
Total	**0.1511**	**0.2293**	**0.3281**	**5.1000e-004**		**0.0115**	**0.0115**		**0.0106**	**0.0106**						**45.4248**

3.6 Paving - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	1.2100e-003	9.7000e-004	8.8000e-003	3.0000e-005	3.2500e-003	2.0000e-005	3.2700e-003	8.6000e-004	2.0000e-005	8.8000e-004						2.4384
Total	**1.2100e-003**	**9.7000e-004**	**8.8000e-003**	**3.0000e-005**	**3.2500e-003**	**2.0000e-005**	**3.2700e-003**	**8.6000e-004**	**2.0000e-005**	**8.8000e-004**						**2.4384**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0126	0.2541	0.3892	5.1000e-004		0.0137	0.0137		0.0137	0.0137						45.4247
Paving	0.1279					0.0000	0.0000		0.0000	0.0000						0.0000
Total	**0.1405**	**0.2541**	**0.3892**	**5.1000e-004**		**0.0137**	**0.0137**		**0.0137**	**0.0137**						**45.4247**

3.6 Paving - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	1.2100e-003	9.7000e-004	8.8000e-003	3.0000e-005	3.2500e-003	2.0000e-005	3.2700e-003	8.6000e-004	2.0000e-005	8.8000e-004						2.4384
Total	**1.2100e-003**	**9.7000e-004**	**8.8000e-003**	**3.0000e-005**	**3.2500e-003**	**2.0000e-005**	**3.2700e-003**	**8.6000e-004**	**2.0000e-005**	**8.8000e-004**						**2.4384**

3.7 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.4494					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	4.6000e-003	0.0320	0.0348	6.0000e-005		2.1100e-003	2.1100e-003		2.1100e-003	2.1100e-003						4.8606
Total	**0.4540**	**0.0320**	**0.0348**	**6.0000e-005**		**2.1100e-003**	**2.1100e-003**		**2.1100e-003**	**2.1100e-003**						**4.8606**

3.7 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0634	0.0576	0.4986	1.2900e-003	0.1396	9.2000e-004	0.1405	0.0371	8.5000e-004	0.0379						116.8561
Total	**0.0634**	**0.0576**	**0.4986**	**1.2900e-003**	**0.1396**	**9.2000e-004**	**0.1405**	**0.0371**	**8.5000e-004**	**0.0379**						**116.8561**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.4494					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	1.1300e-003	0.0258	0.0348	6.0000e-005		1.8100e-003	1.8100e-003		1.8100e-003	1.8100e-003						4.8606
Total	**0.4505**	**0.0258**	**0.0348**	**6.0000e-005**		**1.8100e-003**	**1.8100e-003**		**1.8100e-003**	**1.8100e-003**						**4.8606**

3.7 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0634	0.0576	0.4986	1.2900e-003	0.1396	9.2000e-004	0.1405	0.0371	8.5000e-004	0.0379						116.8561
Total	**0.0634**	**0.0576**	**0.4986**	**1.2900e-003**	**0.1396**	**9.2000e-004**	**0.1405**	**0.0371**	**8.5000e-004**	**0.0379**						**116.8561**

3.7 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	3.0866					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.0286	0.1993	0.2372	3.9000e-004		0.0123	0.0123		0.0123	0.0123						33.3771
Total	**3.1152**	**0.1993**	**0.2372**	**3.9000e-004**		**0.0123**	**0.0123**		**0.0123**	**0.0123**						**33.3771**

3.7 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.4058	0.3538	3.1042	8.5700e-003	0.9586	6.1000e-003	0.9647	0.2548	5.6200e-003	0.2604						775.2117
Total	**0.4058**	**0.3538**	**3.1042**	**8.5700e-003**	**0.9586**	**6.1000e-003**	**0.9647**	**0.2548**	**5.6200e-003**	**0.2604**						**775.2117**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	3.0866					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	7.7600e-003	0.1771	0.2391	3.9000e-004		0.0124	0.0124		0.0124	0.0124						33.3771
Total	**3.0944**	**0.1771**	**0.2391**	**3.9000e-004**		**0.0124**	**0.0124**		**0.0124**	**0.0124**						**33.3771**

3.7 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.4058	0.3538	3.1042	8.5700e-003	0.9586	6.1000e-003	0.9647	0.2548	5.6200e-003	0.2604						775.2117
Total	**0.4058**	**0.3538**	**3.1042**	**8.5700e-003**	**0.9586**	**6.1000e-003**	**0.9647**	**0.2548**	**5.6200e-003**	**0.2604**						**775.2117**

3.7 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	3.0748					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.0266	0.1831	0.2358	3.9000e-004		0.0106	0.0106		0.0106	0.0106						33.2463
Total	**3.1014**	**0.1831**	**0.2358**	**3.9000e-004**		**0.0106**	**0.0106**		**0.0106**	**0.0106**						**33.2463**

3.7 Architectural Coating - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.3796	0.3169	2.8327	8.2300e-003	0.9549	5.9000e-003	0.9608	0.2538	5.4400e-003	0.2592						744.5986
Total	**0.3796**	**0.3169**	**2.8327**	**8.2300e-003**	**0.9549**	**5.9000e-003**	**0.9608**	**0.2538**	**5.4400e-003**	**0.2592**						**744.5986**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	3.0748					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	7.7300e-003	0.1764	0.2382	3.9000e-004		0.0124	0.0124		0.0124	0.0124						33.2463
Total	**3.0825**	**0.1764**	**0.2382**	**3.9000e-004**		**0.0124**	**0.0124**		**0.0124**	**0.0124**						**33.2463**

3.7 Architectural Coating - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.3796	0.3169	2.8327	8.2300e-003	0.9549	5.9000e-003	0.9608	0.2538	5.4400e-003	0.2592						744.5986
Total	**0.3796**	**0.3169**	**2.8327**	**8.2300e-003**	**0.9549**	**5.9000e-003**	**0.9608**	**0.2538**	**5.4400e-003**	**0.2592**						**744.5986**

3.7 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.3600					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.0110	0.0749	0.1041	1.7000e-004		4.0700e-003	4.0700e-003		4.0700e-003	4.0700e-003						14.7032
Total	**1.3710**	**0.0749**	**0.1041**	**1.7000e-004**		**4.0700e-003**	**4.0700e-003**		**4.0700e-003**	**4.0700e-003**						**14.7032**

3.7 Architectural Coating - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.1577	0.1260	1.1441	3.5000e-003	0.4224	2.5400e-003	0.4249	0.1122	2.3400e-003	0.1146						316.9735
Total	**0.1577**	**0.1260**	**1.1441**	**3.5000e-003**	**0.4224**	**2.5400e-003**	**0.4249**	**0.1122**	**2.3400e-003**	**0.1146**						**316.9735**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.3600					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	3.4200e-003	0.0780	0.1054	1.7000e-004		5.4700e-003	5.4700e-003		5.4700e-003	5.4700e-003						14.7032
Total	**1.3634**	**0.0780**	**0.1054**	**1.7000e-004**		**5.4700e-003**	**5.4700e-003**		**5.4700e-003**	**5.4700e-003**						**14.7032**

3.7 Architectural Coating - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.1577	0.1260	1.1441	3.5000e-003	0.4224	2.5400e-003	0.4249	0.1122	2.3400e-003	0.1146						316.9735
Total	**0.1577**	**0.1260**	**1.1441**	**3.5000e-003**	**0.4224**	**2.5400e-003**	**0.4249**	**0.1122**	**2.3400e-003**	**0.1146**						**316.9735**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Transit Accessibility

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	2.7631	10.6930	29.8525	0.0934	9.1458	0.0847	9.2304	2.4473	0.0791	2.5264						8,570.7232
Unmitigated	2.8763	11.5051	32.6468	0.1050	10.3694	0.0944	10.4638	2.7747	0.0883	2.8630						9,636.2116

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,187.88	1,632.48	1383.96	3,251,683	2,867,984
City Park	0.00	0.00	0.00		
City Park	0.00	0.00	0.00		
Elementary School	638.55	0.00	0.00	1,174,696	1,036,082
General Office Building	0.00	0.00	0.00		
Health Club	649.88	391.31	501.19	846,726	746,813
Other Asphalt Surfaces	0.00	0.00	0.00		
Racquet Club	0.00	0.00	0.00		
Recreational Swimming Pool	0.00	0.00	0.00		
Recreational Swimming Pool	0.00	0.00	0.00		
Regional Shopping Center	402.10	532.68	269.06	580,080	511,630
Single Family Housing	8,051.40	10,554.15	9180.30	21,781,672	19,211,434
Total	10,929.80	13,110.62	11,334.51	27,634,856	24,373,943

4.3 Trip Type Information

Olsen-Chandler - San Luis Obispo County APCD Air District, Annual

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
City Park	13.00	5.00	5.00	33.00	48.00	19.00	66	28	6
City Park	13.00	5.00	5.00	33.00	48.00	19.00	66	28	6
Elementary School	13.00	5.00	5.00	65.00	30.00	5.00	63	25	12
General Office Building	13.00	5.00	5.00	33.00	48.00	19.00	77	19	4
Health Club	13.00	5.00	5.00	16.90	64.10	19.00	52	39	9
Other Asphalt Surfaces	13.00	5.00	5.00	0.00	0.00	0.00	0	0	0
Racquet Club	13.00	5.00	5.00	11.50	69.50	19.00	52	39	9
Recreational Swimming Pool	13.00	5.00	5.00	33.00	48.00	19.00	52	39	9
Recreational Swimming Pool	13.00	5.00	5.00	33.00	48.00	19.00	52	39	9
Regional Shopping Center	13.00	5.00	5.00	16.30	64.70	19.00	54	35	11
Single Family Housing	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
City Park	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
Elementary School	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
General Office Building	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
Health Club	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
Other Asphalt Surfaces	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
Racquet Club	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
Recreational Swimming Pool	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
Regional Shopping Center	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
Single Family Housing	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000						1,947.3897
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000						2,070.1557
NaturalGas Mitigated	0.1709	1.4642	0.6501	9.3200e-003		0.1181	0.1181		0.1181	0.1181						1,701.1853
NaturalGas Unmitigated	0.1873	1.6049	0.7125	0.0102		0.1294	0.1294		0.1294	0.1294						1,864.6514

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	2.32534e+006	0.0125	0.1072	0.0456	6.8000e-004		8.6600e-003	8.6600e-003		8.6600e-003	8.6600e-003						124.8263
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Elementary School	763115	4.1100e-003	0.0374	0.0314	2.2000e-004		2.8400e-003	2.8400e-003		2.8400e-003	2.8400e-003						40.9647
General Office Building	9429.12	5.0000e-005	4.6000e-004	3.9000e-004	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005						0.5062
Health Club	494678	2.6700e-003	0.0243	0.0204	1.5000e-004		1.8400e-003	1.8400e-003		1.8400e-003	1.8400e-003						26.5548
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Racquet Club	163688	8.8000e-004	8.0200e-003	6.7400e-003	5.0000e-005		6.1000e-004	6.1000e-004		6.1000e-004	6.1000e-004						8.7869
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Regional Shopping Center	25261.8	1.4000e-004	1.2400e-003	1.0400e-003	1.0000e-005		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005						1.3561
Single Family Housing	3.09543e+007	0.1669	1.4263	0.6070	9.1000e-003		0.1153	0.1153		0.1153	0.1153						1,661.6565
Total		**0.1873**	**1.6049**	**0.7125**	**0.0102**		**0.1294**	**0.1294**		**0.1294**	**0.1294**						**1,864.6514**

Olsen-Chandler - San Luis Obispo County APCD Air District, Annual

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	2.16474e+006	0.0117	0.0998	0.0425	6.4000e-004		8.0600e-003	8.0600e-003		8.0600e-003	8.0600e-003						116.2051
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Elementary School	690652	3.7200e-003	0.0339	0.0284	2.0000e-004		2.5700e-003	2.5700e-003		2.5700e-003	2.5700e-003						37.0748
General Office Building	8489.66	5.0000e-005	4.2000e-004	3.5000e-004	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005						0.4557
Health Club	457718	2.4700e-003	0.0224	0.0189	1.3000e-004		1.7100e-003	1.7100e-003		1.7100e-003	1.7100e-003						24.5707
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Racquet Club	151458	8.2000e-004	7.4200e-003	6.2400e-003	4.0000e-005		5.6000e-004	5.6000e-004		5.6000e-004	5.6000e-004						8.1304
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Regional Shopping Center	22735.6	1.2000e-004	1.1100e-003	9.4000e-004	1.0000e-005		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005						1.2205
Single Family Housing	2.81949e+007	0.1520	1.2992	0.5528	8.2900e-003		0.1050	0.1050		0.1050	0.1050						1,513.5281
Total		**0.1709**	**1.4642**	**0.6501**	**9.3100e-003**		**0.1181**	**0.1181**		**0.1181**	**0.1181**						**1,701.1853**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	991526				202.0011
City Park	0				0.0000
Elementary School	223058				45.4430
General Office Building	10270.1				2.0923
Health Club	154892				31.5556
Other Asphalt Surfaces	0				0.0000
Racquet Club	51253.3				10.4417
Recreational Swimming Pool	0				0.0000
Regional Shopping Center	113945				23.2137
Single Family Housing	8.61646e+006				1,755.4083
Total					**2,070.1557**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	928743				189.2104
City Park	0				0.0000
Elementary School	199718				40.6879
General Office Building	9560.56				1.9478
Health Club	142875				29.1076
Other Asphalt Surfaces	0				0.0000
Racquet Club	47277.1				9.6317
Recreational Swimming Pool	0				0.0000
Regional Shopping Center	102049				20.7902
Single Family Housing	8.12858e+006				1,656.0142
Total					**1,947.3897**

6.0 Area Detail

6.1 Mitigation Measures Area

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	13.0665	0.2028	17.6057	9.3000e-004		0.0976	0.0976		0.0976	0.0976						29.4657
Unmitigated	13.0665	0.2028	17.6057	9.3000e-004		0.0976	0.0976		0.0976	0.0976						29.4657

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.5374					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	8.9990					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	0.5301	0.2028	17.6057	9.3000e-004		0.0976	0.0976		0.0976	0.0976						29.4657
Total	**13.0665**	**0.2028**	**17.6057**	**9.3000e-004**		**0.0976**	**0.0976**		**0.0976**	**0.0976**						**29.4657**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.5374					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	8.9990					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	0.5301	0.2028	17.6057	9.3000e-004		0.0976	0.0976		0.0976	0.0976						29.4657
Total	**13.0665**	**0.2028**	**17.6057**	**9.3000e-004**		**0.0976**	**0.0976**		**0.0976**	**0.0976**						**29.4657**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

Olsen-Chandler - San Luis Obispo County APCD Air District, Annual

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated				236.3480
Unmitigated				276.6166

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	14.8551 / 9.36518				35.1502
City Park	0 / 94.2462				67.2018
Elementary School	1.2 / 3.08571				4.5003
General Office Building	0.103086 / 0.0631815				0.2426
Health Club	1.10893 / 0.679669				2.6101
Other Asphalt Surfaces	0 / 0				0.0000
Racquet Club	0.367279 / 0.225106				0.8645
Recreational Swimming Pool	0 / 0				0.0000
Regional Shopping Center	0.789613 / 0.483956				1.8585
Single Family Housing	69.389 / 43.7453				164.1886
Total					**276.6166**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	11.8841 / 8.79391				29.0484
City Park	0 / 88.4972				63.1025
Elementary School	0.959999 / 2.89748				3.9060
General Office Building	0.0824685 / 0.0593274				0.2004
Health Club	0.887147 / 0.638209				2.1554
Other Asphalt Surfaces	0 / 0				0.0000
Racquet Club	0.293823 / 0.211375				0.7139
Recreational Swimming Pool	0 / 0				0.0000
Regional Shopping Center	0.63169 / 0.454435				1.5348
Single Family Housing	55.5112 / 41.0768				135.6866
Total					**236.3480**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Olsen-Chandler - San Luis Obispo County APCD Air District, Annual

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated				338.9827
Unmitigated				807.1016

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	104.88				52.7443
City Park	6.8				3.4197
Elementary School	90.34				45.4321
General Office Building	0.54				0.2716
Health Club	106.88				53.7501
Other Asphalt Surfaces	0				0.0000
Racquet Club	35.4				17.8027
Recreational Swimming Pool	0				0.0000
Regional Shopping Center	11.19				5.6275
Single Family Housing	1248.86				628.0536
Total					**807.1016**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	44.0496				22.1526
City Park	2.856				1.4363
Elementary School	37.9428				19.0815
General Office Building	0.2268				0.1141
Health Club	44.8896				22.5751
Other Asphalt Surfaces	0				0.0000
Racquet Club	14.868				7.4771
Recreational Swimming Pool	0				0.0000
Regional Shopping Center	4.6998				2.3635
Single Family Housing	524.521				263.7825
Total					**338.9827**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Olsen-Chandler - San Luis Obispo County APCD Air District, Summer

NOTE: Does not include residential adjustment for fleet mix or solar PV, calculated separately.

Olsen-Chandler

San Luis Obispo County APCD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	0.58	1000sqft	0.01	576.00	0
Elementary School	495.00	Student	0.95	41,383.67	0
Other Asphalt Surfaces	97.60	Acre	97.60	4,251,456.00	0
City Park	45.30	Acre	45.30	1,973,268.00	0
City Park	33.80	Acre	33.80	1,472,328.00	0
Health Club	18.75	1000sqft	11.50	18,752.00	0
Racquet Club	6.21	1000sqft	3.80	6,205.00	0
Recreational Swimming Pool	0.00	1000sqft	1.10	1,789.00	0
Recreational Swimming Pool	0.00	1000sqft	0.70	1,154.00	0
Apartments Low Rise	228.00	Dwelling Unit	14.25	228,000.00	652
Single Family Housing	1,065.00	Dwelling Unit	147.45	1,917,000.00	3046
Regional Shopping Center	10.66	1000sqft	0.24	10,659.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.2	**Precipitation Freq (Days)**	44
Climate Zone	4			**Operational Year**	2024
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	447.45	**CH4 Intensity (lb/MWhr)**	0.02	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Includes RPS adjustment.

Land Use - Provided by the applicant team.

Construction Phase - Based on provided phase durations. Architectural Coating, starts five months after building construction and stops at the end of building construction.

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - Equipment use based on model defaults.

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Trips and VMT - Const trips based on model defaults.

On-road Fugitive Dust -

Demolition - Demolition of 3,400 building square footage.

Grading - Based on model defaults.

Architectural Coating - Residential low-VOC content: 50 g/L, per mitigation requirements. Non-Residential low-VOC content: 100 g/L.

Vehicle Trips - Trip-gen rates for residential and school based on City of Paso Robles' Travel Demand Forecast Model (Final), prepared by Fehr & Peers (August 5, 2009), Table 2. Other uses derived from the traffic analysis prepared for this project.

Vehicle Emission Factors - Emission factors based on model defaults.

Vehicle Emission Factors -

Vehicle Emission Factors -

Woodstoves - Assumes no hearths.

Consumer Products - Consumer products, arch coatings, and landscape equipment usage based on model defaults.

Energy Use -

Water And Wastewater - Adjusted for the removal of septic systems from the default assumptions.

Construction Off-road Equipment Mitigation - Includes 50%CE for watering travel ways, 61%CE for watering disturbed areas, 15 mph onsite speed limit. Use of T3 off-road equipment included.

Mobile Land Use Mitigation -

Olsen-Chandler - San Luis Obispo County APCD Air District, Summer

Area Mitigation -
Energy Mitigation -

Waste Mitigation - Assumes 58% waste reduction, per most current (2017) state-wide diversion rate (CalRecycle https://www.calrecycle.ca.gov/lgcentral/goalmeasure/disposalrate/graphs/estdiversion)

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	100.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	100.00
tblArchitecturalCoating	EF_Residential_Exterior	250.00	50.00
tblArchitecturalCoating	EF_Residential_Interior	250.00	50.00
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3

Olsen-Chandler - San Luis Obispo County APCD Air District, Summer

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	NumDays	400.00	5.00
tblConstructionPhase	NumDays	240.00	23.00
tblConstructionPhase	NumDays	620.00	87.00
tblConstructionPhase	NumDays	6,200.00	783.00
tblConstructionPhase	NumDays	440.00	45.00
tblConstructionPhase	NumDays	440.00	674.00
tblConstructionPhase	PhaseEndDate	7/13/2021	1/7/2020
tblConstructionPhase	PhaseEndDate	6/14/2022	2/7/2020
tblConstructionPhase	PhaseEndDate	10/29/2024	6/9/2020
tblConstructionPhase	PhaseEndDate	8/4/2048	6/9/2023
tblConstructionPhase	PhaseEndDate	4/12/2050	8/11/2023
tblConstructionPhase	PhaseStartDate	7/14/2021	1/8/2020
tblConstructionPhase	PhaseStartDate	6/15/2022	2/8/2020
tblConstructionPhase	PhaseStartDate	10/30/2024	6/10/2020
tblConstructionPhase	PhaseStartDate	8/5/2048	6/10/2023
tblGrading	AcresOfGrading	217.50	1,550.00
tblLandUse	LandUseSquareFeet	580.00	576.00

Olsen-Chandler - San Luis Obispo County APCD Air District, Summer

tblLandUse	LandUseSquareFeet	18,750.00	18,752.00
tblLandUse	LandUseSquareFeet	6,210.00	6,205.00
tblLandUse	LandUseSquareFeet	0.00	1,789.00
tblLandUse	LandUseSquareFeet	0.00	1,154.00
tblLandUse	LandUseSquareFeet	10,660.00	10,659.00
tblLandUse	LotAcreage	0.43	11.50
tblLandUse	LotAcreage	0.14	3.80
tblLandUse	LotAcreage	0.00	1.10
tblLandUse	LotAcreage	0.00	0.70
tblLandUse	LotAcreage	345.78	147.45
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.02
tblProjectCharacteristics	CO2IntensityFactor	641.35	447.45
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblVehicleTrips	ST_TR	22.75	0.00
tblVehicleTrips	ST_TR	2.46	0.00
tblVehicleTrips	ST_TR	21.35	0.00
tblVehicleTrips	ST_TR	9.10	0.00
tblVehicleTrips	SU_TR	16.74	0.00
tblVehicleTrips	SU_TR	1.05	0.00
tblVehicleTrips	SU_TR	17.40	0.00
tblVehicleTrips	SU_TR	13.60	0.00
tblVehicleTrips	WD_TR	6.59	5.21
tblVehicleTrips	WD_TR	1.89	0.00
tblVehicleTrips	WD_TR	11.03	0.00
tblVehicleTrips	WD_TR	32.93	34.66
tblVehicleTrips	WD_TR	14.03	0.00
tblVehicleTrips	WD_TR	33.82	0.00

tblVehicleTrips	WD_TR	42.70	37.72
tblVehicleTrips	WD_TR	9.52	7.56
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

Olsen-Chandler - San Luis Obispo County APCD Air District, Summer

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	50.7106	183.0230	222.9023	0.7397	51.7979	2.3090	54.1069	13.8873	2.1856	16.0729						75,557.2673
2021	48.1886	167.1197	202.7517	0.7231	51.7992	1.7076	53.5068	13.8878	1.6122	15.4999						73,935.7083
2022	46.5352	157.1664	187.5205	0.7061	51.8004	1.4920	53.2925	13.8882	1.4086	15.2968						72,273.2099
2023	44.4205	132.3845	171.9118	0.6862	51.8017	1.1889	52.9905	13.8887	1.1201	15.0087						70,303.8708
Maximum	**50.7106**	**183.0230**	**222.9023**	**0.7397**	**51.8017**	**2.3090**	**54.1069**	**13.8887**	**2.1856**	**16.0729**						**75,557.2673**

Olsen-Chandler - San Luis Obispo County APCD Air District, Summer

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	49.0819	177.7361	223.9286	0.7397	51.7979	2.0797	53.8775	13.8873	2.0229	15.9102						75,557.2673
2021	46.8022	163.7438	204.0651	0.7231	51.7992	1.6535	53.4527	13.8878	1.6154	15.5032						73,935.7083
2022	45.3578	155.7253	189.0497	0.7061	51.8004	1.5999	53.4004	13.8882	1.5644	15.4526						72,273.2099
2023	43.3894	132.2797	173.5628	0.6862	51.8017	1.4169	53.2186	13.8887	1.3895	15.2781						70,303.8707
Maximum	**49.0819**	**177.7361**	**223.9286**	**0.7397**	**51.8017**	**2.0797**	**53.8775**	**13.8887**	**2.0229**	**15.9102**						**75,557.2673**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**2.75**	**1.60**	**-0.70**	**0.00**	**0.00**	**-0.78**	**-0.02**	**0.00**	**-4.20**	**-0.43**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	71.9054	1.2292	106.7015	5.6400e-003		0.5913	0.5913		0.5913	0.5913						196.8506
Energy	1.0263	8.7937	3.9041	0.0560		0.7091	0.7091		0.7091	0.7091						11,262.6101
Mobile	20.8065	75.6457	222.9760	0.7405	72.6285	0.6439	73.2724	19.3928	0.6017	19.9945						74,871.7841
Total	**93.7382**	**85.6686**	**333.5816**	**0.8021**	**72.6285**	**1.9442**	**74.5727**	**19.3928**	**1.9020**	**21.2948**						**86,331.2448**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	71.9054	1.2292	106.7015	5.6400e-003		0.5913	0.5913		0.5913	0.5913						196.8506
Energy	0.9363	8.0229	3.5622	0.0511		0.6469	0.6469		0.6469	0.6469						10,275.2648
Mobile	20.0262	70.4213	202.7596	0.6585	64.0584	0.5771	64.6355	17.1045	0.5393	17.6437						66,592.9443
Total	**92.8679**	**79.6734**	**313.0232**	**0.7152**	**64.0584**	**1.8153**	**65.8737**	**17.1045**	**1.7774**	**18.8819**						**77,065.0596**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.93**	**7.00**	**6.16**	**10.83**	**11.80**	**6.63**	**11.67**	**11.80**	**6.55**	**11.33**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**10.73**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2020	1/7/2020	5	5	
2	Site Preparation	Site Preparation	1/8/2020	2/7/2020	5	23	
3	Grading	Grading	2/8/2020	6/9/2020	5	87	
4	Building Construction	Building Construction	6/10/2020	6/9/2023	5	783	
5	Paving	Paving	6/10/2023	8/11/2023	5	45	
6	Architectural Coating	Architectural Coating	11/10/2020	6/9/2023	5	674	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 1550

Acres of Paving: 97.6

Residential Indoor: 4,343,625; Residential Outdoor: 1,447,875; Non-Residential Indoor: 120,778; Non-Residential Outdoor: 40,259; Striped Parking Area: 255,087 (Architectural Coating – sqft)

OffRoad Equipment

Olsen-Chandler - San Luis Obispo County APCD Air District, Summer

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Olsen-Chandler - San Luis Obispo County APCD Air District, Summer

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	15.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	3,813.00	1,413.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	763.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.6909	0.0000	0.6909	0.1046	0.0000	0.1046						0.0000
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419						3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**0.6909**	**1.6587**	**2.3496**	**0.1046**	**1.5419**	**1.6465**						**3,774.1536**

3.2 Demolition - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0257	0.9464	0.2039	2.3700e-003	0.0524	4.1700e-003	0.0565	0.0143	3.9900e-003	0.0183						256.3163
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0642	0.0535	0.5325	1.3900e-003	0.1483	9.5000e-004	0.1492	0.0393	8.8000e-004	0.0402						138.6960
Total	**0.0899**	**1.0000**	**0.7364**	**3.7600e-003**	**0.2006**	**5.1200e-003**	**0.2058**	**0.0537**	**4.8700e-003**	**0.0585**						**395.0124**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.2695	0.0000	0.2695	0.0408	0.0000	0.0408						0.0000
Off-Road	0.9246	18.3130	24.6739	0.0388		0.8627	0.8627		0.8627	0.8627						3,774.1536
Total	**0.9246**	**18.3130**	**24.6739**	**0.0388**	**0.2695**	**0.8627**	**1.1322**	**0.0408**	**0.8627**	**0.9035**						**3,774.1536**

3.2 Demolition - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0257	0.9464	0.2039	2.3700e-003	0.0524	4.1700e-003	0.0565	0.0143	3.9900e-003	0.0183						256.3163
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0642	0.0535	0.5325	1.3900e-003	0.1483	9.5000e-004	0.1492	0.0393	8.8000e-004	0.0402						138.6960
Total	**0.0899**	**1.0000**	**0.7364**	**3.7600e-003**	**0.2006**	**5.1200e-003**	**0.2058**	**0.0537**	**4.8700e-003**	**0.0585**						**395.0124**

3.3 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307						0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216						3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0663**	**2.1974**	**20.2637**	**9.9307**	**2.0216**	**11.9523**						**3,714.8975**

3.3 Site Preparation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0770	0.0642	0.6389	1.6700e-003	0.1780	1.1400e-003	0.1791	0.0472	1.0500e-003	0.0483						166.4352
Total	**0.0770**	**0.0642**	**0.6389**	**1.6700e-003**	**0.1780**	**1.1400e-003**	**0.1791**	**0.0472**	**1.0500e-003**	**0.0483**						**166.4352**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.0458	0.0000	7.0458	3.8730	0.0000	3.8730						0.0000
Off-Road	0.9312	19.0656	22.9600	0.0380		0.9462	0.9462		0.9462	0.9462						3,714.8975
Total	**0.9312**	**19.0656**	**22.9600**	**0.0380**	**7.0458**	**0.9462**	**7.9920**	**3.8730**	**0.9462**	**4.8191**						**3,714.8975**

3.3 Site Preparation - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0770	0.0642	0.6389	1.6700e-003	0.1780	1.1400e-003	0.1791	0.0472	1.0500e-003	0.0483						166.4352
Total	**0.0770**	**0.0642**	**0.6389**	**1.6700e-003**	**0.1780**	**1.1400e-003**	**0.1791**	**0.0472**	**1.0500e-003**	**0.0483**						**166.4352**

3.4 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.9161	0.0000	24.9161	5.3503	0.0000	5.3503						0.0000
Off-Road	4.4501	50.1975	31.9583	0.0620		2.1739	2.1739		2.0000	2.0000						6,054.4257
Total	**4.4501**	**50.1975**	**31.9583**	**0.0620**	**24.9161**	**2.1739**	**27.0900**	**5.3503**	**2.0000**	**7.3503**						**6,054.4257**

3.4 Grading - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0855	0.0714	0.7099	1.8600e-003	0.1977	1.2600e-003	0.1990	0.0524	1.1700e-003	0.0536						184.9280
Total	**0.0855**	**0.0714**	**0.7099**	**1.8600e-003**	**0.1977**	**1.2600e-003**	**0.1990**	**0.0524**	**1.1700e-003**	**0.0536**						**184.9280**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.7173	0.0000	9.7173	2.0866	0.0000	2.0866						0.0000
Off-Road	1.5231	29.9782	36.7226	0.0620		1.2994	1.2994		1.2994	1.2994						6,054.4257
Total	**1.5231**	**29.9782**	**36.7226**	**0.0620**	**9.7173**	**1.2994**	**11.0167**	**2.0866**	**1.2994**	**3.3861**						**6,054.4257**

3.4 Grading - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0855	0.0714	0.7099	1.8600e-003	0.1977	1.2600e-003	0.1990	0.0524	1.1700e-003	0.0536						184.9280
Total	**0.0855**	**0.0714**	**0.7099**	**1.8600e-003**	**0.1977**	**1.2600e-003**	**0.1990**	**0.0524**	**1.1700e-003**	**0.0536**						**184.9280**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503						2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**						**2,568.6345**

Olsen-Chandler - San Luis Obispo County APCD Air District, Summer

3.5 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	5.1241	145.8264	41.7896	0.2852	6.5589	0.7918	7.3507	1.8890	0.7574	2.6464						30,395.1059
Worker	16.3087	13.6044	135.3488	0.3538	37.6958	0.2411	37.9369	9.9977	0.2224	10.2201						35,256.5297
Total	**21.4328**	**159.4308**	**177.1385**	**0.6390**	**44.2548**	**1.0328**	**45.2876**	**11.8867**	**0.9798**	**12.8665**						**65,651.6355**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6739	14.2261	17.8738	0.0269		0.9036	0.9036		0.9036	0.9036						2,568.6345
Total	**0.6739**	**14.2261**	**17.8738**	**0.0269**		**0.9036**	**0.9036**		**0.9036**	**0.9036**						**2,568.6345**

3.5 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	5.1241	145.8264	41.7896	0.2852	6.5589	0.7918	7.3507	1.8890	0.7574	2.6464						30,395.1059
Worker	16.3087	13.6044	135.3488	0.3538	37.6958	0.2411	37.9369	9.9977	0.2224	10.2201						35,256.5297
Total	**21.4328**	**159.4308**	**177.1385**	**0.6390**	**44.2548**	**1.0328**	**45.2876**	**11.8867**	**0.9798**	**12.8665**						**65,651.6355**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013						2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**						**2,568.7643**

3.5 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	4.1877	133.5589	36.8532	0.2832	6.5603	0.3747	6.9349	1.8895	0.3584	2.2479						30,218.0284
Worker	15.1893	12.1671	122.9107	0.3416	37.6958	0.2334	37.9293	9.9977	0.2153	10.2130						34,052.8437
Total	**19.3770**	**145.7260**	**159.7639**	**0.6248**	**44.2561**	**0.6081**	**44.8642**	**11.8872**	**0.5737**	**12.4609**						**64,270.8721**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6739	14.2261	17.8738	0.0269		0.9036	0.9036		0.9036	0.9036						2,568.7643
Total	**0.6739**	**14.2261**	**17.8738**	**0.0269**		**0.9036**	**0.9036**		**0.9036**	**0.9036**						**2,568.7643**

3.5 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	4.1877	133.5589	36.8532	0.2832	6.5603	0.3747	6.9349	1.8895	0.3584	2.2479						30,218.0284
Worker	15.1893	12.1671	122.9107	0.3416	37.6958	0.2334	37.9293	9.9977	0.2153	10.2130						34,052.8437
Total	**19.3770**	**145.7260**	**159.7639**	**0.6248**	**44.2561**	**0.6081**	**44.8642**	**11.8872**	**0.5737**	**12.4609**						**64,270.8721**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612						2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**						**2,569.6322**

3.5 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	3.8721	127.0109	33.9877	0.2810	6.5615	0.3291	6.8906	1.8900	0.3147	2.2047						30,017.9840
Worker	14.2488	10.9418	112.7867	0.3293	37.6958	0.2268	37.9227	9.9977	0.2092	10.2069						32,833.5360
Total	**18.1208**	**137.9527**	**146.7743**	**0.6103**	**44.2573**	**0.5559**	**44.8132**	**11.8876**	**0.5239**	**12.4115**						**62,851.5200**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6739	14.2261	17.8738	0.0269		0.9036	0.9036		0.9036	0.9036						2,569.6322
Total	**0.6739**	**14.2261**	**17.8738**	**0.0269**		**0.9036**	**0.9036**		**0.9036**	**0.9036**						**2,569.6322**

3.5 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	3.8721	127.0109	33.9877	0.2810	6.5615	0.3291	6.8906	1.8900	0.3147	2.2047						30,017.9840
Worker	14.2488	10.9418	112.7867	0.3293	37.6958	0.2268	37.9227	9.9977	0.2092	10.2069						32,833.5360
Total	**18.1208**	**137.9527**	**146.7743**	**0.6103**	**44.2573**	**0.5559**	**44.8132**	**11.8876**	**0.5239**	**12.4115**						**62,851.5200**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584						2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**						**2,570.4061**

3.5 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	2.9543	104.8910	30.0007	0.2761	6.5627	0.1531	6.7158	1.8904	0.1464	2.0368						29,528.0951
Worker	13.3733	9.8372	103.2043	0.3169	37.6958	0.2210	37.9168	9.9977	0.2037	10.2014						31,600.1547
Total	**16.3276**	**114.7282**	**133.2050**	**0.5929**	**44.2585**	**0.3741**	**44.6326**	**11.8881**	**0.3501**	**12.2381**						**61,128.2498**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6739	14.2261	17.8738	0.0269		0.9036	0.9036		0.9036	0.9036						2,570.4061
Total	**0.6739**	**14.2261**	**17.8738**	**0.0269**		**0.9036**	**0.9036**		**0.9036**	**0.9036**						**2,570.4061**

3.5 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	2.9543	104.8910	30.0007	0.2761	6.5627	0.1531	6.7158	1.8904	0.1464	2.0368						29,528.0951
Worker	13.3733	9.8372	103.2043	0.3169	37.6958	0.2210	37.9168	9.9977	0.2037	10.2014						31,600.1547
Total	**16.3276**	**114.7282**	**133.2050**	**0.5929**	**44.2585**	**0.3741**	**44.6326**	**11.8881**	**0.3501**	**12.2381**						**61,128.2498**

3.6 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0327	10.1917	14.5842	0.0228		0.5102	0.5102		0.4694	0.4694						2,225.4336
Paving	5.6825					0.0000	0.0000		0.0000	0.0000						0.0000
Total	**6.7152**	**10.1917**	**14.5842**	**0.0228**		**0.5102**	**0.5102**		**0.4694**	**0.4694**						**2,225.4336**

3.6 Paving - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0526	0.0387	0.4060	1.2500e-003	0.1483	8.7000e-004	0.1492	0.0393	8.0000e-004	0.0401						124.3122
Total	**0.0526**	**0.0387**	**0.4060**	**1.2500e-003**	**0.1483**	**8.7000e-004**	**0.1492**	**0.0393**	**8.0000e-004**	**0.0401**						**124.3122**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5609	11.2952	17.2957	0.0228		0.6093	0.6093		0.6093	0.6093						2,225.4336
Paving	5.6825					0.0000	0.0000		0.0000	0.0000						0.0000
Total	**6.2434**	**11.2952**	**17.2957**	**0.0228**		**0.6093**	**0.6093**		**0.6093**	**0.6093**						**2,225.4336**

3.6 Paving - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0526	0.0387	0.4060	1.2500e-003	0.1483	8.7000e-004	0.1492	0.0393	8.0000e-004	0.0401						124.3122
Total	**0.0526**	**0.0387**	**0.4060**	**1.2500e-003**	**0.1483**	**8.7000e-004**	**0.1492**	**0.0393**	**8.0000e-004**	**0.0401**						**124.3122**

3.7 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	23.6524					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109						281.9928
Total	**23.8946**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**						**281.9928**

3.7 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	3.2635	2.7223	27.0840	0.0708	7.5431	0.0482	7.5914	2.0006	0.0445	2.0451						7,055.0045
Total	**3.2635**	**2.7223**	**27.0840**	**0.0708**	**7.5431**	**0.0482**	**7.5914**	**2.0006**	**0.0445**	**2.0451**						**7,055.0045**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	23.6524					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.0594	1.3570	1.8324	2.9700e-003		0.0951	0.0951		0.0951	0.0951						281.9928
Total	**23.7118**	**1.3570**	**1.8324**	**2.9700e-003**		**0.0951**	**0.0951**		**0.0951**	**0.0951**						**281.9928**

3.7 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	3.2635	2.7223	27.0840	0.0708	7.5431	0.0482	7.5914	2.0006	0.0445	2.0451						7,055.0045
Total	**3.2635**	**2.7223**	**27.0840**	**0.0708**	**7.5431**	**0.0482**	**7.5914**	**2.0006**	**0.0445**	**2.0451**						**7,055.0045**

3.7 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	23.6524					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941						281.9309
Total	**23.8713**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**						**281.9309**

3.7 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	3.0395	2.4347	24.5950	0.0684	7.5431	0.0467	7.5898	2.0006	0.0431	2.0437						6,814.1410
Total	**3.0395**	**2.4347**	**24.5950**	**0.0684**	**7.5431**	**0.0467**	**7.5898**	**2.0006**	**0.0431**	**2.0437**						**6,814.1410**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	23.6524					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.0594	1.3570	1.8324	2.9700e-003		0.0951	0.0951		0.0951	0.0951						281.9309
Total	**23.7118**	**1.3570**	**1.8324**	**2.9700e-003**		**0.0951**	**0.0951**		**0.0951**	**0.0951**						**281.9309**

3.7 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	3.0395	2.4347	24.5950	0.0684	7.5431	0.0467	7.5898	2.0006	0.0431	2.0437						6,814.1410
Total	**3.0395**	**2.4347**	**24.5950**	**0.0684**	**7.5431**	**0.0467**	**7.5898**	**2.0006**	**0.0431**	**2.0437**						**6,814.1410**

3.7 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	23.6524					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817						281.9062
Total	**23.8569**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**						**281.9062**

3.7 Architectural Coating - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	2.8513	2.1895	22.5692	0.0659	7.5431	0.0454	7.5885	2.0006	0.0419	2.0424						6,570.1516
Total	**2.8513**	**2.1895**	**22.5692**	**0.0659**	**7.5431**	**0.0454**	**7.5885**	**2.0006**	**0.0419**	**2.0424**						**6,570.1516**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	23.6524					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.0594	1.3570	1.8324	2.9700e-003		0.0951	0.0951		0.0951	0.0951						281.9062
Total	**23.7118**	**1.3570**	**1.8324**	**2.9700e-003**		**0.0951**	**0.0951**		**0.0951**	**0.0951**						**281.9062**

3.7 Architectural Coating - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	2.8513	2.1895	22.5692	0.0659	7.5431	0.0454	7.5885	2.0006	0.0419	2.0424						6,570.1516
Total	**2.8513**	**2.1895**	**22.5692**	**0.0659**	**7.5431**	**0.0454**	**7.5885**	**2.0006**	**0.0419**	**2.0424**						**6,570.1516**

3.7 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	23.6524					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708						281.8690
Total	**23.8440**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**						**281.8690**

3.7 Architectural Coating - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	2.6761	1.9685	20.6517	0.0634	7.5431	0.0442	7.5873	2.0006	0.0408	2.0414						6,323.3459
Total	**2.6761**	**1.9685**	**20.6517**	**0.0634**	**7.5431**	**0.0442**	**7.5873**	**2.0006**	**0.0408**	**2.0414**						**6,323.3459**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	23.6524					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.0594	1.3570	1.8324	2.9700e-003		0.0951	0.0951		0.0951	0.0951						281.8690
Total	**23.7118**	**1.3570**	**1.8324**	**2.9700e-003**		**0.0951**	**0.0951**		**0.0951**	**0.0951**						**281.8690**

3.7 Architectural Coating - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	2.6761	1.9685	20.6517	0.0634	7.5431	0.0442	7.5873	2.0006	0.0408	2.0414						6,323.3459
Total	**2.6761**	**1.9685**	**20.6517**	**0.0634**	**7.5431**	**0.0442**	**7.5873**	**2.0006**	**0.0408**	**2.0414**						**6,323.3459**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Transit Accessibility

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	20.0262	70.4213	202.7596	0.6585	64.0584	0.5771	64.6355	17.1045	0.5393	17.6437						66,592.9443
Unmitigated	20.8065	75.6457	222.9760	0.7405	72.6285	0.6439	73.2724	19.3928	0.6017	19.9945						74,871.7841

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,187.88	1,632.48	1383.96	3,251,683	2,867,984
City Park	0.00	0.00	0.00		
City Park	0.00	0.00	0.00		
Elementary School	638.55	0.00	0.00	1,174,696	1,036,082
General Office Building	0.00	0.00	0.00		
Health Club	649.88	391.31	501.19	846,726	746,813
Other Asphalt Surfaces	0.00	0.00	0.00		
Racquet Club	0.00	0.00	0.00		
Recreational Swimming Pool	0.00	0.00	0.00		
Recreational Swimming Pool	0.00	0.00	0.00		
Regional Shopping Center	402.10	532.68	269.06	580,080	511,630
Single Family Housing	8,051.40	10,554.15	9180.30	21,781,672	19,211,434
Total	10,929.80	13,110.62	11,334.51	27,634,856	24,373,943

4.3 Trip Type Information

Olsen-Chandler - San Luis Obispo County APCD Air District, Summer

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
City Park	13.00	5.00	5.00	33.00	48.00	19.00	66	28	6
City Park	13.00	5.00	5.00	33.00	48.00	19.00	66	28	6
Elementary School	13.00	5.00	5.00	65.00	30.00	5.00	63	25	12
General Office Building	13.00	5.00	5.00	33.00	48.00	19.00	77	19	4
Health Club	13.00	5.00	5.00	16.90	64.10	19.00	52	39	9
Other Asphalt Surfaces	13.00	5.00	5.00	0.00	0.00	0.00	0	0	0
Racquet Club	13.00	5.00	5.00	11.50	69.50	19.00	52	39	9
Recreational Swimming Pool	13.00	5.00	5.00	33.00	48.00	19.00	52	39	9
Recreational Swimming Pool	13.00	5.00	5.00	33.00	48.00	19.00	52	39	9
Regional Shopping Center	13.00	5.00	5.00	16.30	64.70	19.00	54	35	11
Single Family Housing	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
City Park	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
Elementary School	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
General Office Building	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
Health Club	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
Other Asphalt Surfaces	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
Racquet Club	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
Recreational Swimming Pool	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
Regional Shopping Center	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
Single Family Housing	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.9363	8.0229	3.5622	0.0511		0.6469	0.6469		0.6469	0.6469						10,275.2648
NaturalGas Unmitigated	1.0263	8.7937	3.9041	0.0560		0.7091	0.7091		0.7091	0.7091						11,262.6101

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	6370.79	0.0687	0.5871	0.2498	3.7500e-003		0.0475	0.0475		0.0475	0.0475						753.9585
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Elementary School	2090.73	0.0226	0.2050	0.1722	1.2300e-003		0.0156	0.0156		0.0156	0.0156						247.4294
General Office Building	25.8332	2.8000e-004	2.5300e-003	2.1300e-003	2.0000e-005		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004						3.0573
Health Club	1355.28	0.0146	0.1329	0.1116	8.0000e-004		0.0101	0.0101		0.0101	0.0101						160.3924
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Racquet Club	448.46	4.8400e-003	0.0440	0.0369	2.6000e-004		3.3400e-003	3.3400e-003		3.3400e-003	3.3400e-003						53.0735
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Regional Shopping Center	69.2105	7.5000e-004	6.7900e-003	5.7000e-003	4.0000e-005		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004						8.1908
Single Family Housing	84806.4	0.9146	7.8155	3.3257	0.0499		0.6319	0.6319		0.6319	0.6319						10,036.5083
Total		**1.0263**	**8.7937**	**3.9041**	**0.0560**		**0.7091**	**0.7091**		**0.7091**	**0.7091**						**11,262.6101**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	5.93079	0.0640	0.5466	0.2326	3.4900e-003		0.0442	0.0442		0.0442	0.0442						701.8862
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Elementary School	1.8922	0.0204	0.1855	0.1558	1.1100e-003		0.0141	0.0141		0.0141	0.0141						223.9343
General Office Building	0.0232594	2.5000e-004	2.2800e-003	1.9200e-003	1.0000e-005		1.7000e-004	1.7000e-004		1.7000e-004	1.7000e-004						2.7527
Health Club	1.25402	0.0135	0.1229	0.1033	7.4000e-004		9.3400e-003	9.3400e-003		9.3400e-003	9.3400e-003						148.4086
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Racquet Club	0.414953	4.4700e-003	0.0407	0.0342	2.4000e-004		3.0900e-003	3.0900e-003		3.0900e-003	3.0900e-003						49.1081
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Regional Shopping Center	0.0622894	6.7000e-004	6.1100e-003	5.1300e-003	4.0000e-005		4.6000e-004	4.6000e-004		4.6000e-004	4.6000e-004						7.3717
Single Family Housing	77.2463	0.8331	7.1188	3.0293	0.0454		0.5756	0.5756		0.5756	0.5756						9,141.8032
Total		**0.9363**	**8.0229**	**3.5622**	**0.0511**		**0.6469**	**0.6469**		**0.6469**	**0.6469**						**10,275.2648**

6.0 Area Detail

6.1 Mitigation Measures Area

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	71.9054	1.2292	106.7015	5.6400e-003		0.5913	0.5913		0.5913	0.5913						196.8506
Unmitigated	71.9054	1.2292	106.7015	5.6400e-003		0.5913	0.5913		0.5913	0.5913						196.8506

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	19.3832					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	49.3095					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	3.2128	1.2292	106.7015	5.6400e-003		0.5913	0.5913		0.5913	0.5913						196.8506
Total	**71.9054**	**1.2292**	**106.7015**	**5.6400e-003**		**0.5913**	**0.5913**		**0.5913**	**0.5913**						**196.8506**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	19.3832					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	49.3095					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	3.2128	1.2292	106.7015	5.6400e-003		0.5913	0.5913		0.5913	0.5913						196.8506
Total	**71.9054**	**1.2292**	**106.7015**	**5.6400e-003**		**0.5913**	**0.5913**		**0.5913**	**0.5913**						**196.8506**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Olsen-Chandler - San Luis Obispo County APCD Air District, Winter

NOTE: Does not include residential adjustment for fleet mix or solar PV, calculated separately.

Olsen-Chandler

San Luis Obispo County APCD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	0.58	1000sqft	0.01	576.00	0
Elementary School	495.00	Student	0.95	41,383.67	0
Other Asphalt Surfaces	97.60	Acre	97.60	4,251,456.00	0
City Park	45.30	Acre	45.30	1,973,268.00	0
City Park	33.80	Acre	33.80	1,472,328.00	0
Health Club	18.75	1000sqft	11.50	18,752.00	0
Racquet Club	6.21	1000sqft	3.80	6,205.00	0
Recreational Swimming Pool	0.00	1000sqft	1.10	1,789.00	0
Recreational Swimming Pool	0.00	1000sqft	0.70	1,154.00	0
Apartments Low Rise	228.00	Dwelling Unit	14.25	228,000.00	652
Single Family Housing	1,065.00	Dwelling Unit	147.45	1,917,000.00	3046
Regional Shopping Center	10.66	1000sqft	0.24	10,659.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.2	**Precipitation Freq (Days)**	44
Climate Zone	4			**Operational Year**	2024
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	447.45	**CH4 Intensity (lb/MWhr)**	0.02	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Includes RPS adjustment.

Land Use - Provided by the applicant team.

Construction Phase - Based on provided phase durations. Architectural Coating, starts five months after building construction and stops at the end of building construction.

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - Equipment use based on model defaults.

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Trips and VMT - Const trips based on model defaults.

On-road Fugitive Dust -

Demolition - Demolition of 3,400 building square footage.

Grading - Based on model defaults.

Architectural Coating - Residential low-VOC content: 50 g/L, per mitigation requirements. Non-Residential low-VOC content: 100 g/L.

Vehicle Trips - Trip-gen rates for residential and school based on City of Paso Robles' Travel Demand Forecast Model (Final), prepared by Fehr & Peers (August 5, 2009), Table 2. Other uses derived from the traffic analysis prepared for this project.

Vehicle Emission Factors - Emission factors based on model defaults.

Vehicle Emission Factors -

Vehicle Emission Factors -

Woodstoves - Assumes no hearths.

Consumer Products - Consumer products, arch coatings, and landscape equipment usage based on model defaults.

Energy Use -

Water And Wastewater - Adjusted for the removal of septic systems from the default assumptions.

Construction Off-road Equipment Mitigation - Includes 50%CE for watering travel ways, 61%CE for watering disturbed areas, 15 mph onsite speed limit. Use of T3 off-road equipment included.

Mobile Land Use Mitigation -

Olsen-Chandler - San Luis Obispo County APCD Air District, Winter

Area Mitigation -
Energy Mitigation -

Waste Mitigation - Assumes 58% waste reduction, per most current (2017) state-wide diversion rate (CalRecycle https://www.calrecycle.ca.gov/lgcentral/goalmeasure/disposalrate/graphs/estdiversion)

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	100.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	100.00
tblArchitecturalCoating	EF_Residential_Exterior	250.00	50.00
tblArchitecturalCoating	EF_Residential_Interior	250.00	50.00
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
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tblConstructionPhase	NumDays	620.00	87.00
tblConstructionPhase	NumDays	6,200.00	783.00
tblConstructionPhase	NumDays	440.00	45.00
tblConstructionPhase	NumDays	440.00	674.00
tblConstructionPhase	PhaseEndDate	7/13/2021	1/7/2020
tblConstructionPhase	PhaseEndDate	6/14/2022	2/7/2020
tblConstructionPhase	PhaseEndDate	10/29/2024	6/9/2020
tblConstructionPhase	PhaseEndDate	8/4/2048	6/9/2023
tblConstructionPhase	PhaseEndDate	4/12/2050	8/11/2023
tblConstructionPhase	PhaseStartDate	7/14/2021	1/8/2020
tblConstructionPhase	PhaseStartDate	6/15/2022	2/8/2020
tblConstructionPhase	PhaseStartDate	10/30/2024	6/10/2020
tblConstructionPhase	PhaseStartDate	8/5/2048	6/10/2023
tblGrading	AcresOfGrading	217.50	1,550.00
tblLandUse	LandUseSquareFeet	580.00	576.00

tblLandUse	LandUseSquareFeet	18,750.00	18,752.00
tblLandUse	LandUseSquareFeet	6,210.00	6,205.00
tblLandUse	LandUseSquareFeet	0.00	1,789.00
tblLandUse	LandUseSquareFeet	0.00	1,154.00
tblLandUse	LandUseSquareFeet	10,660.00	10,659.00
tblLandUse	LotAcreage	0.43	11.50
tblLandUse	LotAcreage	0.14	3.80
tblLandUse	LotAcreage	0.00	1.10
tblLandUse	LotAcreage	0.00	0.70
tblLandUse	LotAcreage	345.78	147.45
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.02
tblProjectCharacteristics	CO2IntensityFactor	641.35	447.45
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblVehicleTrips	ST_TR	22.75	0.00
tblVehicleTrips	ST_TR	2.46	0.00
tblVehicleTrips	ST_TR	21.35	0.00
tblVehicleTrips	ST_TR	9.10	0.00
tblVehicleTrips	SU_TR	16.74	0.00
tblVehicleTrips	SU_TR	1.05	0.00
tblVehicleTrips	SU_TR	17.40	0.00
tblVehicleTrips	SU_TR	13.60	0.00
tblVehicleTrips	WD_TR	6.59	5.21
tblVehicleTrips	WD_TR	1.89	0.00
tblVehicleTrips	WD_TR	11.03	0.00
tblVehicleTrips	WD_TR	32.93	34.66
tblVehicleTrips	WD_TR	14.03	0.00
tblVehicleTrips	WD_TR	33.82	0.00

tblVehicleTrips	WD_TR	42.70	37.72
tblVehicleTrips	WD_TR	9.52	7.56
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
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tblWater	AerobicPercent	87.46	97.79
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tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

Olsen-Chandler - San Luis Obispo County APCD Air District, Winter

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	53.7437	184.5031	223.7649	0.7114	51.7979	2.3338	54.1317	13.8873	2.2093	16.0966						72,662.3857
2021	51.0514	168.2127	203.2421	0.6954	51.7992	1.7296	53.5288	13.8878	1.6332	15.5210						71,099.4826
2022	49.2665	158.0078	187.7679	0.6790	51.8004	1.5127	53.3131	13.8882	1.4284	15.3166						69,497.8760
2023	46.9974	133.1616	171.2454	0.6598	51.8017	1.1968	52.9984	13.8887	1.1276	15.0163						67,595.5298
Maximum	**53.7437**	**184.5031**	**223.7649**	**0.7114**	**51.8017**	**2.3338**	**54.1317**	**13.8887**	**2.2093**	**16.0966**						**72,662.3857**

Olsen-Chandler - San Luis Obispo County APCD Air District, Winter

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	52.1150	179.2163	224.7911	0.7114	51.7979	2.1045	53.9023	13.8873	2.0467	15.9340						72,662.3857
2021	49.6649	164.8368	204.5556	0.6954	51.7992	1.6755	53.4747	13.8878	1.6365	15.5243						71,099.4826
2022	48.0890	156.5668	189.2971	0.6790	51.8004	1.6206	53.4210	13.8882	1.5841	15.4724						69,497.8760
2023	45.9663	133.0567	172.8965	0.6598	51.8017	1.4248	53.2265	13.8887	1.3970	15.2857						67,595.5298
Maximum	**52.1150**	**179.2163**	**224.7911**	**0.7114**	**51.8017**	**2.1045**	**53.9023**	**13.8887**	**2.0467**	**15.9340**						**72,662.3857**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**2.60**	**1.59**	**-0.70**	**0.00**	**0.00**	**-0.78**	**-0.02**	**0.00**	**-4.15**	**-0.43**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	71.9054	1.2292	106.7015	5.6400e-003		0.5913	0.5913		0.5913	0.5913						196.8506
Energy	1.0263	8.7937	3.9041	0.0560		0.7091	0.7091		0.7091	0.7091						11,262.6101
Mobile	19.9940	78.3561	226.5509	0.7112	72.6285	0.6467	73.2752	19.3928	0.6044	19.9972						71,912.0651
Total	**92.9257**	**88.3790**	**337.1565**	**0.7728**	**72.6285**	**1.9470**	**74.5755**	**19.3928**	**1.9047**	**21.2975**						**83,371.5258**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	71.9054	1.2292	106.7015	5.6400e-003		0.5913	0.5913		0.5913	0.5913						196.8506
Energy	0.9363	8.0229	3.5622	0.0511		0.6469	0.6469		0.6469	0.6469						10,275.2648
Mobile	19.2209	72.8092	207.6006	0.6323	64.0584	0.5800	64.6383	17.1045	0.5420	17.6464						63,939.7792
Total	**92.0626**	**82.0613**	**317.8642**	**0.6890**	**64.0584**	**1.8181**	**65.8765**	**17.1045**	**1.7801**	**18.8846**						**74,411.8946**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.93**	**7.15**	**5.72**	**10.84**	**11.80**	**6.62**	**11.66**	**11.80**	**6.54**	**11.33**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**10.75**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2020	1/7/2020	5	5	
2	Site Preparation	Site Preparation	1/8/2020	2/7/2020	5	23	
3	Grading	Grading	2/8/2020	6/9/2020	5	87	
4	Building Construction	Building Construction	6/10/2020	6/9/2023	5	783	
5	Paving	Paving	6/10/2023	8/11/2023	5	45	
6	Architectural Coating	Architectural Coating	11/10/2020	6/9/2023	5	674	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 1550

Acres of Paving: 97.6

Residential Indoor: 4,343,625; Residential Outdoor: 1,447,875; Non-Residential Indoor: 120,778; Non-Residential Outdoor: 40,259; Striped Parking Area: 255,087 (Architectural Coating – sqft)

OffRoad Equipment

Olsen-Chandler - San Luis Obispo County APCD Air District, Winter

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Olsen-Chandler - San Luis Obispo County APCD Air District, Winter

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	15.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	3,813.00	1,413.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	763.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.6909	0.0000	0.6909	0.1046	0.0000	0.1046						0.0000
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419						3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**0.6909**	**1.6587**	**2.3496**	**0.1046**	**1.5419**	**1.6465**						**3,774.1536**

Olsen-Chandler - San Luis Obispo County APCD Air District, Winter

3.2 Demolition - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0265	0.9530	0.2166	2.3400e-003	0.0524	4.2600e-003	0.0566	0.0143	4.0700e-003	0.0184						252.5681
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0731	0.0607	0.5180	1.3300e-003	0.1483	9.5000e-004	0.1492	0.0393	8.8000e-004	0.0402						132.2033
Total	**0.0996**	**1.0138**	**0.7347**	**3.6700e-003**	**0.2006**	**5.2100e-003**	**0.2059**	**0.0537**	**4.9500e-003**	**0.0586**						**384.7714**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.2695	0.0000	0.2695	0.0408	0.0000	0.0408						0.0000
Off-Road	0.9246	18.3130	24.6739	0.0388		0.8627	0.8627		0.8627	0.8627						3,774.1536
Total	**0.9246**	**18.3130**	**24.6739**	**0.0388**	**0.2695**	**0.8627**	**1.1322**	**0.0408**	**0.8627**	**0.9035**						**3,774.1536**

3.2 Demolition - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0265	0.9530	0.2166	2.3400e-003	0.0524	4.2600e-003	0.0566	0.0143	4.0700e-003	0.0184						252.5681
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0731	0.0607	0.5180	1.3300e-003	0.1483	9.5000e-004	0.1492	0.0393	8.8000e-004	0.0402						132.2033
Total	**0.0996**	**1.0138**	**0.7347**	**3.6700e-003**	**0.2006**	**5.2100e-003**	**0.2059**	**0.0537**	**4.9500e-003**	**0.0586**						**384.7714**

3.3 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307						0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216						3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0663**	**2.1974**	**20.2637**	**9.9307**	**2.0216**	**11.9523**						**3,714.8975**

3.3 Site Preparation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0878	0.0729	0.6216	1.5900e-003	0.1780	1.1400e-003	0.1791	0.0472	1.0500e-003	0.0483						158.6439
Total	**0.0878**	**0.0729**	**0.6216**	**1.5900e-003**	**0.1780**	**1.1400e-003**	**0.1791**	**0.0472**	**1.0500e-003**	**0.0483**						**158.6439**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.0458	0.0000	7.0458	3.8730	0.0000	3.8730						0.0000
Off-Road	0.9312	19.0656	22.9600	0.0380		0.9462	0.9462		0.9462	0.9462						3,714.8975
Total	**0.9312**	**19.0656**	**22.9600**	**0.0380**	**7.0458**	**0.9462**	**7.9920**	**3.8730**	**0.9462**	**4.8191**						**3,714.8975**

3.3 Site Preparation - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0878	0.0729	0.6216	1.5900e-003	0.1780	1.1400e-003	0.1791	0.0472	1.0500e-003	0.0483						158.6439
Total	**0.0878**	**0.0729**	**0.6216**	**1.5900e-003**	**0.1780**	**1.1400e-003**	**0.1791**	**0.0472**	**1.0500e-003**	**0.0483**						**158.6439**

3.4 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					24.9161	0.0000	24.9161	5.3503	0.0000	5.3503						0.0000
Off-Road	4.4501	50.1975	31.9583	0.0620		2.1739	2.1739		2.0000	2.0000						6,054.4257
Total	**4.4501**	**50.1975**	**31.9583**	**0.0620**	**24.9161**	**2.1739**	**27.0900**	**5.3503**	**2.0000**	**7.3503**						**6,054.4257**

3.4 Grading - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0975	0.0810	0.6907	1.7700e-003	0.1977	1.2600e-003	0.1990	0.0524	1.1700e-003	0.0536						176.2710
Total	**0.0975**	**0.0810**	**0.6907**	**1.7700e-003**	**0.1977**	**1.2600e-003**	**0.1990**	**0.0524**	**1.1700e-003**	**0.0536**						**176.2710**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					9.7173	0.0000	9.7173	2.0866	0.0000	2.0866						0.0000
Off-Road	1.5231	29.9782	36.7226	0.0620		1.2994	1.2994		1.2994	1.2994						6,054.4257
Total	**1.5231**	**29.9782**	**36.7226**	**0.0620**	**9.7173**	**1.2994**	**11.0167**	**2.0866**	**1.2994**	**3.3861**						**6,054.4257**

3.4 Grading - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0975	0.0810	0.6907	1.7700e-003	0.1977	1.2600e-003	0.1990	0.0524	1.1700e-003	0.0536						176.2710
Total	**0.0975**	**0.0810**	**0.6907**	**1.7700e-003**	**0.1977**	**1.2600e-003**	**0.1990**	**0.0524**	**1.1700e-003**	**0.0536**						**176.2710**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503						2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**						**2,568.6345**

Olsen-Chandler - San Luis Obispo County APCD Air District, Winter

3.5 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	5.4189	145.1021	47.0554	0.2767	6.5589	0.8165	7.3755	1.8890	0.7811	2.6701						29,480.9464
Worker	18.5904	15.4413	131.6798	0.3373	37.6958	0.2411	37.9369	9.9977	0.2224	10.2201						33,606.0722
Total	**24.0092**	**160.5434**	**178.7352**	**0.6140**	**44.2548**	**1.0576**	**45.3123**	**11.8867**	**1.0035**	**12.8902**						**63,087.0186**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6739	14.2261	17.8738	0.0269		0.9036	0.9036		0.9036	0.9036						2,568.6345
Total	**0.6739**	**14.2261**	**17.8738**	**0.0269**		**0.9036**	**0.9036**		**0.9036**	**0.9036**						**2,568.6345**

Olsen-Chandler - San Luis Obispo County APCD Air District, Winter

3.5 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	5.4189	145.1021	47.0554	0.2767	6.5589	0.8165	7.3755	1.8890	0.7811	2.6701						29,480.9464
Worker	18.5904	15.4413	131.6798	0.3373	37.6958	0.2411	37.9369	9.9977	0.2224	10.2201						33,606.0722
Total	**24.0092**	**160.5434**	**178.7352**	**0.6140**	**44.2548**	**1.0576**	**45.3123**	**11.8867**	**1.0035**	**12.8902**						**63,087.0186**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013						2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**						**2,568.7643**

Olsen-Chandler - San Luis Obispo County APCD Air District, Winter

3.5 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	4.4592	132.6853	41.7274	0.2747	6.5603	0.3967	6.9570	1.8895	0.3795	2.2690						29,295.1205
Worker	17.3485	13.8059	119.2579	0.3257	37.6958	0.2334	37.9293	9.9977	0.2153	10.2130						32,458.5516
Total	**21.8077**	**146.4912**	**160.9853**	**0.6003**	**44.2561**	**0.6302**	**44.8863**	**11.8872**	**0.5948**	**12.4820**						**61,753.6721**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6739	14.2261	17.8738	0.0269		0.9036	0.9036		0.9036	0.9036						2,568.7643
Total	**0.6739**	**14.2261**	**17.8738**	**0.0269**		**0.9036**	**0.9036**		**0.9036**	**0.9036**						**2,568.7643**

3.5 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	4.4592	132.6853	41.7274	0.2747	6.5603	0.3967	6.9570	1.8895	0.3795	2.2690						29,295.1205
Worker	17.3485	13.8059	119.2579	0.3257	37.6958	0.2334	37.9293	9.9977	0.2153	10.2130						32,458.5516
Total	**21.8077**	**146.4912**	**160.9853**	**0.6003**	**44.2561**	**0.6302**	**44.8863**	**11.8872**	**0.5948**	**12.4820**						**61,753.6721**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612						2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**						**2,569.6322**

Olsen-Chandler - San Luis Obispo County APCD Air District, Winter

3.5 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	4.1255	126.0866	38.5744	0.2724	6.5615	0.3497	6.9112	1.8900	0.3345	2.2244						29,086.9758
Worker	16.3134	12.4132	109.1709	0.3139	37.6958	0.2268	37.9227	9.9977	0.2092	10.2069						31,296.7322
Total	**20.4389**	**138.4998**	**147.7453**	**0.5863**	**44.2573**	**0.5766**	**44.8339**	**11.8876**	**0.5437**	**12.4313**						**60,383.7080**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6739	14.2261	17.8738	0.0269		0.9036	0.9036		0.9036	0.9036						2,569.6322
Total	**0.6739**	**14.2261**	**17.8738**	**0.0269**		**0.9036**	**0.9036**		**0.9036**	**0.9036**						**2,569.6322**

Olsen-Chandler - San Luis Obispo County APCD Air District, Winter

3.5 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	4.1255	126.0866	38.5744	0.2724	6.5615	0.3497	6.9112	1.8900	0.3345	2.2244						29,086.9758
Worker	16.3134	12.4132	109.1709	0.3139	37.6958	0.2268	37.9227	9.9977	0.2092	10.2069						31,296.7322
Total	**20.4389**	**138.4998**	**147.7453**	**0.5863**	**44.2573**	**0.5766**	**44.8339**	**11.8876**	**0.5437**	**12.4313**						**60,383.7080**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584						2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**						**2,570.4061**

Olsen-Chandler - San Luis Obispo County APCD Air District, Winter

3.5 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	3.1524	104.0849	33.6497	0.2674	6.5627	0.1610	6.7237	1.8904	0.1539	2.0443						28,594.3384
Worker	15.3555	11.1564	99.6084	0.3021	37.6958	0.2210	37.9168	9.9977	0.2037	10.2014						30,121.4637
Total	**18.5079**	**115.2413**	**133.2582**	**0.5695**	**44.2585**	**0.3820**	**44.6405**	**11.8881**	**0.3576**	**12.2457**						**58,715.8021**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6739	14.2261	17.8738	0.0269		0.9036	0.9036		0.9036	0.9036						2,570.4061
Total	**0.6739**	**14.2261**	**17.8738**	**0.0269**		**0.9036**	**0.9036**		**0.9036**	**0.9036**						**2,570.4061**

3.5 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	3.1524	104.0849	33.6497	0.2674	6.5627	0.1610	6.7237	1.8904	0.1539	2.0443						28,594.3384
Worker	15.3555	11.1564	99.6084	0.3021	37.6958	0.2210	37.9168	9.9977	0.2037	10.2014						30,121.4637
Total	**18.5079**	**115.2413**	**133.2582**	**0.5695**	**44.2585**	**0.3820**	**44.6405**	**11.8881**	**0.3576**	**12.2457**						**58,715.8021**

3.6 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0327	10.1917	14.5842	0.0228		0.5102	0.5102		0.4694	0.4694						2,225.4336
Paving	5.6825					0.0000	0.0000		0.0000	0.0000						0.0000
Total	**6.7152**	**10.1917**	**14.5842**	**0.0228**		**0.5102**	**0.5102**		**0.4694**	**0.4694**						**2,225.4336**

3.6 Paving - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0604	0.0439	0.3919	1.1900e-003	0.1483	8.7000e-004	0.1492	0.0393	8.0000e-004	0.0401						118.4951
Total	**0.0604**	**0.0439**	**0.3919**	**1.1900e-003**	**0.1483**	**8.7000e-004**	**0.1492**	**0.0393**	**8.0000e-004**	**0.0401**						**118.4951**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5609	11.2952	17.2957	0.0228		0.6093	0.6093		0.6093	0.6093						2,225.4336
Paving	5.6825					0.0000	0.0000		0.0000	0.0000						0.0000
Total	**6.2434**	**11.2952**	**17.2957**	**0.0228**		**0.6093**	**0.6093**		**0.6093**	**0.6093**						**2,225.4336**

3.6 Paving - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0604	0.0439	0.3919	1.1900e-003	0.1483	8.7000e-004	0.1492	0.0393	8.0000e-004	0.0401						118.4951
Total	**0.0604**	**0.0439**	**0.3919**	**1.1900e-003**	**0.1483**	**8.7000e-004**	**0.1492**	**0.0393**	**8.0000e-004**	**0.0401**						**118.4951**

3.7 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	23.6524					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109						281.9928
Total	**23.8946**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**						**281.9928**

3.7 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	3.7200	3.0899	26.3498	0.0675	7.5431	0.0482	7.5914	2.0006	0.0445	2.0451						6,724.7399
Total	**3.7200**	**3.0899**	**26.3498**	**0.0675**	**7.5431**	**0.0482**	**7.5914**	**2.0006**	**0.0445**	**2.0451**						**6,724.7399**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	23.6524					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.0594	1.3570	1.8324	2.9700e-003		0.0951	0.0951		0.0951	0.0951						281.9928
Total	**23.7118**	**1.3570**	**1.8324**	**2.9700e-003**		**0.0951**	**0.0951**		**0.0951**	**0.0951**						**281.9928**

3.7 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	3.7200	3.0899	26.3498	0.0675	7.5431	0.0482	7.5914	2.0006	0.0445	2.0451						6,724.7399
Total	**3.7200**	**3.0899**	**26.3498**	**0.0675**	**7.5431**	**0.0482**	**7.5914**	**2.0006**	**0.0445**	**2.0451**						**6,724.7399**

3.7 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	23.6524					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941						281.9309
Total	**23.8713**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**						**281.9309**

3.7 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	3.4715	2.7626	23.8641	0.0652	7.5431	0.0467	7.5898	2.0006	0.0431	2.0437						6,495.1154
Total	**3.4715**	**2.7626**	**23.8641**	**0.0652**	**7.5431**	**0.0467**	**7.5898**	**2.0006**	**0.0431**	**2.0437**						**6,495.1154**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	23.6524					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.0594	1.3570	1.8324	2.9700e-003		0.0951	0.0951		0.0951	0.0951						281.9309
Total	**23.7118**	**1.3570**	**1.8324**	**2.9700e-003**		**0.0951**	**0.0951**		**0.0951**	**0.0951**						**281.9309**

3.7 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	3.4715	2.7626	23.8641	0.0652	7.5431	0.0467	7.5898	2.0006	0.0431	2.0437						6,495.1154
Total	**3.4715**	**2.7626**	**23.8641**	**0.0652**	**7.5431**	**0.0467**	**7.5898**	**2.0006**	**0.0431**	**2.0437**						**6,495.1154**

3.7 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	23.6524					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817						281.9062
Total	**23.8569**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**						**281.9062**

3.7 Architectural Coating - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	3.2644	2.4839	21.8456	0.0628	7.5431	0.0454	7.5885	2.0006	0.0419	2.0424						6,262.6296
Total	**3.2644**	**2.4839**	**21.8456**	**0.0628**	**7.5431**	**0.0454**	**7.5885**	**2.0006**	**0.0419**	**2.0424**						**6,262.6296**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	23.6524					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.0594	1.3570	1.8324	2.9700e-003		0.0951	0.0951		0.0951	0.0951						281.9062
Total	**23.7118**	**1.3570**	**1.8324**	**2.9700e-003**		**0.0951**	**0.0951**		**0.0951**	**0.0951**						**281.9062**

3.7 Architectural Coating - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	3.2644	2.4839	21.8456	0.0628	7.5431	0.0454	7.5885	2.0006	0.0419	2.0424						6,262.6296
Total	**3.2644**	**2.4839**	**21.8456**	**0.0628**	**7.5431**	**0.0454**	**7.5885**	**2.0006**	**0.0419**	**2.0424**						**6,262.6296**

3.7 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	23.6524					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708						281.8690
Total	**23.8440**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**						**281.8690**

3.7 Architectural Coating - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	3.0727	2.2324	19.9321	0.0604	7.5431	0.0442	7.5873	2.0006	0.0408	2.0414						6,027.4526
Total	**3.0727**	**2.2324**	**19.9321**	**0.0604**	**7.5431**	**0.0442**	**7.5873**	**2.0006**	**0.0408**	**2.0414**						**6,027.4526**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	23.6524					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.0594	1.3570	1.8324	2.9700e-003		0.0951	0.0951		0.0951	0.0951						281.8690
Total	**23.7118**	**1.3570**	**1.8324**	**2.9700e-003**		**0.0951**	**0.0951**		**0.0951**	**0.0951**						**281.8690**

3.7 Architectural Coating - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	3.0727	2.2324	19.9321	0.0604	7.5431	0.0442	7.5873	2.0006	0.0408	2.0414						6,027.4526
Total	**3.0727**	**2.2324**	**19.9321**	**0.0604**	**7.5431**	**0.0442**	**7.5873**	**2.0006**	**0.0408**	**2.0414**						**6,027.4526**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Transit Accessibility

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	19.2209	72.8092	207.6006	0.6323	64.0584	0.5800	64.6383	17.1045	0.5420	17.6464						63,939.7792
Unmitigated	19.9940	78.3561	226.5509	0.7112	72.6285	0.6467	73.2752	19.3928	0.6044	19.9972						71,912.0651

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,187.88	1,632.48	1383.96	3,251,683	2,867,984
City Park	0.00	0.00	0.00		
City Park	0.00	0.00	0.00		
Elementary School	638.55	0.00	0.00	1,174,696	1,036,082
General Office Building	0.00	0.00	0.00		
Health Club	649.88	391.31	501.19	846,726	746,813
Other Asphalt Surfaces	0.00	0.00	0.00		
Racquet Club	0.00	0.00	0.00		
Recreational Swimming Pool	0.00	0.00	0.00		
Recreational Swimming Pool	0.00	0.00	0.00		
Regional Shopping Center	402.10	532.68	269.06	580,080	511,630
Single Family Housing	8,051.40	10,554.15	9180.30	21,781,672	19,211,434
Total	10,929.80	13,110.62	11,334.51	27,634,856	24,373,943

4.3 Trip Type Information

Olsen-Chandler - San Luis Obispo County APCD Air District, Winter

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
City Park	13.00	5.00	5.00	33.00	48.00	19.00	66	28	6
City Park	13.00	5.00	5.00	33.00	48.00	19.00	66	28	6
Elementary School	13.00	5.00	5.00	65.00	30.00	5.00	63	25	12
General Office Building	13.00	5.00	5.00	33.00	48.00	19.00	77	19	4
Health Club	13.00	5.00	5.00	16.90	64.10	19.00	52	39	9
Other Asphalt Surfaces	13.00	5.00	5.00	0.00	0.00	0.00	0	0	0
Racquet Club	13.00	5.00	5.00	11.50	69.50	19.00	52	39	9
Recreational Swimming Pool	13.00	5.00	5.00	33.00	48.00	19.00	52	39	9
Recreational Swimming Pool	13.00	5.00	5.00	33.00	48.00	19.00	52	39	9
Regional Shopping Center	13.00	5.00	5.00	16.30	64.70	19.00	54	35	11
Single Family Housing	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
City Park	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
Elementary School	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
General Office Building	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
Health Club	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
Other Asphalt Surfaces	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
Racquet Club	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
Recreational Swimming Pool	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
Regional Shopping Center	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
Single Family Housing	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.9363	8.0229	3.5622	0.0511		0.6469	0.6469		0.6469	0.6469						10,275.2648
NaturalGas Unmitigated	1.0263	8.7937	3.9041	0.0560		0.7091	0.7091		0.7091	0.7091						11,262.6101

Olsen-Chandler - San Luis Obispo County APCD Air District, Winter

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	6370.79	0.0687	0.5871	0.2498	3.7500e-003		0.0475	0.0475		0.0475	0.0475						753.9585
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Elementary School	2090.73	0.0226	0.2050	0.1722	1.2300e-003		0.0156	0.0156		0.0156	0.0156						247.4294
General Office Building	25.8332	2.8000e-004	2.5300e-003	2.1300e-003	2.0000e-005		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004						3.0573
Health Club	1355.28	0.0146	0.1329	0.1116	8.0000e-004		0.0101	0.0101		0.0101	0.0101						160.3924
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Racquet Club	448.46	4.8400e-003	0.0440	0.0369	2.6000e-004		3.3400e-003	3.3400e-003		3.3400e-003	3.3400e-003						53.0735
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Regional Shopping Center	69.2105	7.5000e-004	6.7900e-003	5.7000e-003	4.0000e-005		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004						8.1908
Single Family Housing	84806.4	0.9146	7.8155	3.3257	0.0499		0.6319	0.6319		0.6319	0.6319						10,036.5083
Total		**1.0263**	**8.7937**	**3.9041**	**0.0560**		**0.7091**	**0.7091**		**0.7091**	**0.7091**						**11,262.6101**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	5.93079	0.0640	0.5466	0.2326	3.4900e-003		0.0442	0.0442		0.0442	0.0442						701.8862
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Elementary School	1.8922	0.0204	0.1855	0.1558	1.1100e-003		0.0141	0.0141		0.0141	0.0141						223.9343
General Office Building	0.0232594	2.5000e-004	2.2800e-003	1.9200e-003	1.0000e-005		1.7000e-004	1.7000e-004		1.7000e-004	1.7000e-004						2.7527
Health Club	1.25402	0.0135	0.1229	0.1033	7.4000e-004		9.3400e-003	9.3400e-003		9.3400e-003	9.3400e-003						148.4086
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Racquet Club	0.414953	4.4700e-003	0.0407	0.0342	2.4000e-004		3.0900e-003	3.0900e-003		3.0900e-003	3.0900e-003						49.1081
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Regional Shopping Center	0.0622894	6.7000e-004	6.1100e-003	5.1300e-003	4.0000e-005		4.6000e-004	4.6000e-004		4.6000e-004	4.6000e-004						7.3717
Single Family Housing	77.2463	0.8331	7.1188	3.0293	0.0454		0.5756	0.5756		0.5756	0.5756						9,141.8032
Total		**0.9363**	**8.0229**	**3.5622**	**0.0511**		**0.6469**	**0.6469**		**0.6469**	**0.6469**						**10,275.2648**

6.0 Area Detail

6.1 Mitigation Measures Area

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	71.9054	1.2292	106.7015	5.6400e-003		0.5913	0.5913		0.5913	0.5913						196.8506
Unmitigated	71.9054	1.2292	106.7015	5.6400e-003		0.5913	0.5913		0.5913	0.5913						196.8506

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	19.3832					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	49.3095					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	3.2128	1.2292	106.7015	5.6400e-003		0.5913	0.5913		0.5913	0.5913						196.8506
Total	**71.9054**	**1.2292**	**106.7015**	**5.6400e-003**		**0.5913**	**0.5913**		**0.5913**	**0.5913**						**196.8506**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	19.3832					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	49.3095					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	3.2128	1.2292	106.7015	5.6400e-003		0.5913	0.5913		0.5913	0.5913						196.8506
Total	**71.9054**	**1.2292**	**106.7015**	**5.6400e-003**		**0.5913**	**0.5913**		**0.5913**	**0.5913**						**196.8506**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Reso A - Exhibit C2 (EIR Technical Appendix)

CALEEMOD – YEAR 2030

Includes Operational GHG.
Mobile-source adjustment for Residential Fleet Mix Calculated Separately.

Olsen-Chandler - San Luis Obispo County APCD Air District, Annual

NOTE: Does not include residential adjustment for fleet mix or solar PV, calculated separately.

Olsen-Chandler

San Luis Obispo County APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	0.58	1000sqft	0.01	576.00	0
Elementary School	495.00	Student	0.95	41,383.67	0
Other Asphalt Surfaces	97.60	Acre	97.60	4,251,456.00	0
City Park	45.30	Acre	45.30	1,973,268.00	0
City Park	33.80	Acre	33.80	1,472,328.00	0
Health Club	18.75	1000sqft	11.50	18,752.00	0
Racquet Club	6.21	1000sqft	3.80	6,205.00	0
Recreational Swimming Pool	0.00	1000sqft	1.10	1,789.00	0
Recreational Swimming Pool	0.00	1000sqft	0.70	1,154.00	0
Apartments Low Rise	228.00	Dwelling Unit	14.25	228,000.00	652
Single Family Housing	1,065.00	Dwelling Unit	147.45	1,917,000.00	3046
Regional Shopping Center	10.66	1000sqft	0.24	10,659.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.2	**Precipitation Freq (Days)**	44
Climate Zone	4			**Operational Year**	2030
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	298.3	**CH4 Intensity (lb/MWhr)**	0.013	**N2O Intensity (lb/MWhr)**	0.003

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Includes RPS adjustment.

Land Use - Provided by the applicant team.

Construction Phase - Based on provided phase durations. Architectural Coating, starts five months after building construction and stops at the end of building construction.

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - Equipment use based on model defaults.

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Trips and VMT - Const trips based on model defaults.

On-road Fugitive Dust -

Demolition - Demolition of 3,400 building square footage.

Grading - Based on model defaults.

Architectural Coating - Residential low-VOC content: 50 g/L, per mitigation requirements. Non-Residential low-VOC content: 100 g/L.

Vehicle Trips - Trip-gen rates for residential and school based on City of Paso Robles' Travel Demand Forecast Model (Final), prepared by Fehr & Peers (August 5, 2009), Table 2. Other uses derived from the traffic analysis prepared for this project.

Vehicle Emission Factors - Emission factors based on model defaults.

Vehicle Emission Factors -

Vehicle Emission Factors -

Woodstoves - Assumes no hearths.

Consumer Products - Consumer products, arch coatings, and landscape equipment usage based on model defaults.

Energy Use -

Water And Wastewater - Adjusted for the removal of septic systems from the default assumptions.

Construction Off-road Equipment Mitigation - Includes 50%CE for watering travel ways, 61%CE for watering disturbed areas, 15 mph onsite speed limit. Use of T3 off-road equipment included.

Mobile Land Use Mitigation -

Olsen-Chandler - San Luis Obispo County APCD Air District, Annual

Area Mitigation -
Energy Mitigation -

Waste Mitigation - Assumes 58% waste reduction, per most current (2017) state-wide diversion rate (CalRecycle https://www.calrecycle.ca.gov/lgcentral/goalmeasure/disposalrate/graphs/estdiversion)

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	100.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	100.00
tblArchitecturalCoating	EF_Residential_Exterior	250.00	50.00
tblArchitecturalCoating	EF_Residential_Interior	250.00	50.00
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3

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tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	PhaseEndDate	7/13/2021	1/7/2020
tblConstructionPhase	PhaseEndDate	6/14/2022	2/7/2020
tblConstructionPhase	PhaseEndDate	10/29/2024	6/9/2020
tblConstructionPhase	PhaseEndDate	8/4/2048	6/9/2023
tblConstructionPhase	PhaseEndDate	4/12/2050	8/11/2023
tblConstructionPhase	PhaseStartDate	7/14/2021	1/8/2020
tblConstructionPhase	PhaseStartDate	6/15/2022	2/8/2020
tblConstructionPhase	PhaseStartDate	10/30/2024	6/10/2020
tblConstructionPhase	PhaseStartDate	8/5/2048	6/10/2023
tblLandUse	LandUseSquareFeet	580.00	576.00
tblLandUse	LandUseSquareFeet	18,750.00	18,752.00
tblLandUse	LandUseSquareFeet	6,210.00	6,205.00
tblLandUse	LandUseSquareFeet	0.00	1,789.00
tblLandUse	LandUseSquareFeet	0.00	1,154.00
tblLandUse	LandUseSquareFeet	10,660.00	10,659.00
tblLandUse	LotAcreage	0.43	11.50
tblLandUse	LotAcreage	0.14	3.80

Olsen-Chandler - San Luis Obispo County APCD Air District, Annual

tblLandUse	LotAcreage	0.00	1.10
tblLandUse	LotAcreage	0.00	0.70
tblLandUse	LotAcreage	345.78	147.45
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.013
tblProjectCharacteristics	CO2IntensityFactor	641.35	298.3
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.003
tblVehicleTrips	ST_TR	22.75	0.00
tblVehicleTrips	ST_TR	2.46	0.00
tblVehicleTrips	ST_TR	21.35	0.00
tblVehicleTrips	ST_TR	9.10	0.00
tblVehicleTrips	SU_TR	16.74	0.00
tblVehicleTrips	SU_TR	1.05	0.00
tblVehicleTrips	SU_TR	17.40	0.00
tblVehicleTrips	SU_TR	13.60	0.00
tblVehicleTrips	WD_TR	6.59	5.21
tblVehicleTrips	WD_TR	1.89	0.00
tblVehicleTrips	WD_TR	11.03	0.00
tblVehicleTrips	WD_TR	32.93	34.66
tblVehicleTrips	WD_TR	14.03	0.00
tblVehicleTrips	WD_TR	33.82	0.00
tblVehicleTrips	WD_TR	42.70	37.72
tblVehicleTrips	WD_TR	9.52	7.56
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79

tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
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tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	2.7776	16.1829	16.4172	0.0524	3.9053	0.2859	4.1911	1.1639	0.2671	1.4310						4,848.3405
2021	8.0008	22.1483	26.1606	0.0918	6.5868	0.2240	6.8108	1.7699	0.2115	1.9814						8,518.2350
2022	7.7527	20.7282	24.0813	0.0893	6.5617	0.1951	6.7568	1.7632	0.1842	1.9474						8,295.9189
2023	3.3432	7.9471	10.0747	0.0389	2.9056	0.0801	2.9857	0.7808	0.0752	0.8559						3,617.4591
Maximum	**8.0008**	**22.1483**	**26.1606**	**0.0918**	**6.5868**	**0.2859**	**6.8108**	**1.7699**	**0.2671**	**1.9814**						**8,518.2350**

2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	2.4984	14.6268	16.7237	0.0524	3.5484	0.2154	3.7638	0.9988	0.2114	1.2103						4,848.3399
2021	7.8199	21.7077	26.3320	0.0918	6.5868	0.2170	6.8038	1.7699	0.2120	1.9819						8,518.2346
2022	7.5996	20.5409	24.2801	0.0893	6.5617	0.2091	6.7708	1.7632	0.2045	1.9676						8,295.9185
2023	3.2733	7.9659	10.2307	0.0389	2.9056	0.0954	3.0010	0.7808	0.0938	0.8746						3,617.4589
Maximum	**7.8199**	**21.7077**	**26.3320**	**0.0918**	**6.5868**	**0.2170**	**6.8038**	**1.7699**	**0.2120**	**1.9819**						**8,518.2346**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**3.12**	**3.23**	**-1.09**	**0.00**	**1.79**	**6.13**	**1.95**	**3.01**	**2.21**	**2.92**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-1-2020**	**3-31-2020**	1.6460	0.8713
2	**4-1-2020**	**6-30-2020**	2.8864	2.2597
3	**7-1-2020**	**9-30-2020**	6.6427	6.4322
4	**10-1-2020**	**12-31-2020**	7.5990	7.3791
5	**1-1-2021**	**3-31-2021**	7.4521	7.2990
6	**4-1-2021**	**6-30-2021**	7.4063	7.2516
7	**7-1-2021**	**9-30-2021**	7.4877	7.3312
8	**10-1-2021**	**12-31-2021**	7.6177	7.4612

9	**1-1-2022**	**3-31-2022**	7.0667	6.9825
10	**4-1-2022**	**6-30-2022**	7.0291	6.9440
11	**7-1-2022**	**9-30-2022**	7.1064	7.0203
12	**10-1-2022**	**12-31-2022**	7.2237	7.1377
13	**1-1-2023**	**3-31-2023**	6.1951	6.1586
14	**4-1-2023**	**6-30-2023**	4.8238	4.8002
15	**7-1-2023**	**9-30-2023**	0.1785	0.1879
		Highest	7.6177	7.4612

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	13.0626	0.2025	17.5666	9.3000e-004		0.0977	0.0977		0.0977	0.0977						29.4608
Energy	0.1873	1.6049	0.7125	0.0102		0.1294	0.1294		0.1294	0.1294						3,245.1746
Mobile	1.9958	8.2759	22.2955	0.0877	10.3529	0.0637	10.4166	2.7677	0.0593	2.8270						8,078.6917
Waste						0.0000	0.0000		0.0000	0.0000						807.1016
Water						0.0000	0.0000		0.0000	0.0000						208.2882
Total	**15.2457**	**10.0833**	**40.5746**	**0.0989**	**10.3529**	**0.2907**	**10.6436**	**2.7677**	**0.2863**	**3.0541**						**12,368.7169**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	13.0626	0.2025	17.5666	9.3000e-004		0.0977	0.0977		0.0977	0.0977						29.4608
Energy	0.1709	1.4642	0.6501	9.3200e-003		0.1181	0.1181		0.1181	0.1181						2,999.8397
Mobile	1.9180	7.7884	20.3406	0.0781	9.1313	0.0572	9.1885	2.4411	0.0533	2.4944						7,190.7490
Waste						0.0000	0.0000		0.0000	0.0000						338.9827
Water						0.0000	0.0000		0.0000	0.0000						176.6701
Total	**15.1515**	**9.4550**	**38.5572**	**0.0883**	**9.1313**	**0.2730**	**9.4042**	**2.4411**	**0.2690**	**2.7101**						**10,735.7022**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.62**	**6.23**	**4.97**	**10.68**	**11.80**	**6.11**	**11.64**	**11.80**	**6.05**	**11.26**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**13.20**

3.0 Construction Detail

Construction Phase

Olsen-Chandler - San Luis Obispo County APCD Air District, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2020	1/7/2020	5	400	
2	Site Preparation	Site Preparation	1/8/2020	2/7/2020	5	240	
3	Grading	Grading	2/8/2020	6/9/2020	5	620	
4	Building Construction	Building Construction	6/10/2020	6/9/2023	5	6200	
5	Architectural Coating	Architectural Coating	11/10/2020	6/9/2023	5	440	
6	Paving	Paving	6/10/2023	8/11/2023	5	440	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 1550

Acres of Paving: 97.6

Residential Indoor: 4,343,625; Residential Outdoor: 1,447,875; Non-Residential Indoor: 120,778; Non-Residential Outdoor: 40,259; Striped Parking Area: 255,087 (Architectural Coating – sqft)

OffRoad Equipment

Olsen-Chandler - San Luis Obispo County APCD Air District, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Olsen-Chandler - San Luis Obispo County APCD Air District, Annual

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	15.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	3,813.00	1,413.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	763.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	0.0000						0.0000
Off-Road	8.2800e-003	0.0830	0.0544	1.0000e-004		4.1500e-003	4.1500e-003		3.8500e-003	3.8500e-003						8.5596
Total	**8.2800e-003**	**0.0830**	**0.0544**	**1.0000e-004**	**2.0000e-005**	**4.1500e-003**	**4.1700e-003**	**0.0000**	**3.8500e-003**	**3.8500e-003**						**8.5596**

3.2 Demolition - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-004	0.0000	1.0000e-004	2.0000e-005	0.0000	2.0000e-005						7.2200e-003
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	1.6000e-004	1.5000e-004	1.2900e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	1.0000e-004	0.0000	1.0000e-004						0.3023
Total	**1.6000e-004**	**1.8000e-004**	**1.3000e-003**	**0.0000**	**4.6000e-004**	**0.0000**	**4.6000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**						**0.3095**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000						0.0000
Off-Road	2.3100e-003	0.0458	0.0617	1.0000e-004		2.1600e-003	2.1600e-003		2.1600e-003	2.1600e-003						8.5596
Total	**2.3100e-003**	**0.0458**	**0.0617**	**1.0000e-004**	**1.0000e-005**	**2.1600e-003**	**2.1700e-003**	**0.0000**	**2.1600e-003**	**2.1600e-003**						**8.5596**

3.2 Demolition - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-004	0.0000	1.0000e-004	2.0000e-005	0.0000	2.0000e-005						7.2200e-003
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	1.6000e-004	1.5000e-004	1.2900e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	1.0000e-004	0.0000	1.0000e-004						0.3023
Total	**1.6000e-004**	**1.8000e-004**	**1.3000e-003**	**0.0000**	**4.6000e-004**	**0.0000**	**4.6000e-004**	**1.2000e-004**	**0.0000**	**1.2000e-004**						**0.3095**

3.3 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2078	0.0000	0.2078	0.1142	0.0000	0.1142						0.0000
Off-Road	0.0469	0.4878	0.2474	4.4000e-004		0.0253	0.0253		0.0233	0.0233						38.7561
Total	**0.0469**	**0.4878**	**0.2474**	**4.4000e-004**	**0.2078**	**0.0253**	**0.2330**	**0.1142**	**0.0233**	**0.1375**						**38.7561**

3.3 Site Preparation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	9.1000e-004	8.2000e-004	7.1200e-003	2.0000e-005	1.9900e-003	1.0000e-005	2.0100e-003	5.3000e-004	1.0000e-005	5.4000e-004						1.6686
Total	**9.1000e-004**	**8.2000e-004**	**7.1200e-003**	**2.0000e-005**	**1.9900e-003**	**1.0000e-005**	**2.0100e-003**	**5.3000e-004**	**1.0000e-005**	**5.4000e-004**						**1.6686**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0810	0.0000	0.0810	0.0445	0.0000	0.0445						0.0000
Off-Road	0.0107	0.2193	0.2640	4.4000e-004		0.0109	0.0109		0.0109	0.0109						38.7561
Total	**0.0107**	**0.2193**	**0.2640**	**4.4000e-004**	**0.0810**	**0.0109**	**0.0919**	**0.0445**	**0.0109**	**0.0554**						**38.7561**

3.3 Site Preparation - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	9.1000e-004	8.2000e-004	7.1200e-003	2.0000e-005	1.9900e-003	1.0000e-005	2.0100e-003	5.3000e-004	1.0000e-005	5.4000e-004						1.6686
Total	**9.1000e-004**	**8.2000e-004**	**7.1200e-003**	**2.0000e-005**	**1.9900e-003**	**1.0000e-005**	**2.0100e-003**	**5.3000e-004**	**1.0000e-005**	**5.4000e-004**						**1.6686**

3.4 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.3773	0.0000	0.3773	0.1565	0.0000	0.1565						0.0000
Off-Road	0.1936	2.1836	1.3902	2.7000e-003		0.0946	0.0946		0.0870	0.0870						238.9230
Total	**0.1936**	**2.1836**	**1.3902**	**2.7000e-003**	**0.3773**	**0.0946**	**0.4719**	**0.1565**	**0.0870**	**0.2435**						**238.9230**

3.4 Grading - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	3.8000e-003	3.4600e-003	0.0299	8.0000e-005	8.3800e-003	6.0000e-005	8.4300e-003	2.2300e-003	5.0000e-005	2.2800e-003						7.0128
Total	**3.8000e-003**	**3.4600e-003**	**0.0299**	**8.0000e-005**	**8.3800e-003**	**6.0000e-005**	**8.4300e-003**	**2.2300e-003**	**5.0000e-005**	**2.2800e-003**						**7.0128**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1471	0.0000	0.1471	0.0610	0.0000	0.0610						0.0000
Off-Road	0.0663	1.3041	1.5974	2.7000e-003		0.0565	0.0565		0.0565	0.0565						238.9227
Total	**0.0663**	**1.3041**	**1.5974**	**2.7000e-003**	**0.1471**	**0.0565**	**0.2037**	**0.0610**	**0.0565**	**0.1175**						**238.9227**

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3.4 Grading - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	3.8000e-003	3.4600e-003	0.0299	8.0000e-005	8.3800e-003	6.0000e-005	8.4300e-003	2.2300e-003	5.0000e-005	2.2800e-003						7.0128
Total	**3.8000e-003**	**3.4600e-003**	**0.0299**	**8.0000e-005**	**8.3800e-003**	**6.0000e-005**	**8.4300e-003**	**2.2300e-003**	**5.0000e-005**	**2.2800e-003**						**7.0128**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1558	1.4102	1.2384	1.9800e-003		0.0821	0.0821		0.0772	0.0772						171.2716
Total	**0.1558**	**1.4102**	**1.2384**	**1.9800e-003**		**0.0821**	**0.0821**		**0.0772**	**0.0772**						**171.2716**

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3.5 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.3862	10.8108	3.2753	0.0207	0.4717	0.0590	0.5307	0.1363	0.0564	0.1927						2,001.0644
Worker	1.2256	1.1135	9.6397	0.0250	2.6981	0.0177	2.7158	0.7170	0.0164	0.7334						2,259.0582
Total	**1.6118**	**11.9243**	**12.9151**	**0.0457**	**3.1698**	**0.0767**	**3.2465**	**0.8533**	**0.0728**	**0.9261**						**4,260.1225**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0495	1.0456	1.3137	1.9800e-003		0.0664	0.0664		0.0664	0.0664						171.2714
Total	**0.0495**	**1.0456**	**1.3137**	**1.9800e-003**		**0.0664**	**0.0664**		**0.0664**	**0.0664**						**171.2714**

3.5 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.3862	10.8108	3.2753	0.0207	0.4717	0.0590	0.5307	0.1363	0.0564	0.1927						2,001.0644
Worker	1.2256	1.1135	9.6397	0.0250	2.6981	0.0177	2.7158	0.7170	0.0164	0.7334						2,259.0582
Total	**1.6118**	**11.9243**	**12.9151**	**0.0457**	**3.1698**	**0.0767**	**3.2465**	**0.8533**	**0.0728**	**0.9261**						**4,260.1225**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2481	2.2749	2.1631	3.5100e-003		0.1251	0.1251		0.1176	0.1176						304.1099
Total	**0.2481**	**2.2749**	**2.1631**	**3.5100e-003**		**0.1251**	**0.1251**		**0.1176**	**0.1176**						**304.1099**

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3.5 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.5621	17.5526	5.1434	0.0365	0.8378	0.0501	0.8879	0.2421	0.0479	0.2900						3,531.5098
Worker	2.0280	1.7678	15.5128	0.0428	4.7904	0.0305	4.8209	1.2731	0.0281	1.3012						3,874.0265
Total	**2.5902**	**19.3204**	**20.6562**	**0.0793**	**5.6282**	**0.0806**	**5.7088**	**1.5151**	**0.0760**	**1.5912**						**7,405.5363**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0879	1.8565	2.3325	3.5100e-003		0.1179	0.1179		0.1179	0.1179						304.1095
Total	**0.0879**	**1.8565**	**2.3325**	**3.5100e-003**		**0.1179**	**0.1179**		**0.1179**	**0.1179**						**304.1095**

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3.5 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.5621	17.5526	5.1434	0.0365	0.8378	0.0501	0.8879	0.2421	0.0479	0.2900						3,531.5098
Worker	2.0280	1.7678	15.5128	0.0428	4.7904	0.0305	4.8209	1.2731	0.0281	1.3012						3,874.0265
Total	**2.5902**	**19.3204**	**20.6562**	**0.0793**	**5.6282**	**0.0806**	**5.7088**	**1.5151**	**0.0760**	**1.5912**						**7,405.5363**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2218	2.0300	2.1272	3.5000e-003		0.1052	0.1052		0.0990	0.0990						303.0471
Total	**0.2218**	**2.0300**	**2.1272**	**3.5000e-003**		**0.1052**	**0.1052**		**0.0990**	**0.0990**						**303.0471**

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3.5 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.5179	16.6147	4.7296	0.0361	0.8347	0.0439	0.8786	0.2412	0.0420	0.2832						3,493.9859
Worker	1.8968	1.5835	14.1560	0.0411	4.7721	0.0295	4.8016	1.2682	0.0272	1.2954						3,721.0411
Total	**2.4147**	**18.1982**	**18.8856**	**0.0772**	**5.6068**	**0.0734**	**5.6802**	**1.5094**	**0.0692**	**1.5786**						**7,215.0269**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0876	1.8494	2.3236	3.5000e-003		0.1175	0.1175		0.1175	0.1175						303.0467
Total	**0.0876**	**1.8494**	**2.3236**	**3.5000e-003**		**0.1175**	**0.1175**		**0.1175**	**0.1175**						**303.0467**

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3.5 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.5179	16.6147	4.7296	0.0361	0.8347	0.0439	0.8786	0.2412	0.0420	0.2832						3,493.9859
Worker	1.8968	1.5835	14.1560	0.0411	4.7721	0.0295	4.8016	1.2682	0.0272	1.2954						3,721.0411
Total	**2.4147**	**18.1982**	**18.8856**	**0.0772**	**5.6068**	**0.0734**	**5.6802**	**1.5094**	**0.0692**	**1.5786**						**7,215.0269**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0904	0.8271	0.9340	1.5500e-003		0.0402	0.0402		0.0379	0.0379						134.0804
Total	**0.0904**	**0.8271**	**0.9340**	**1.5500e-003**		**0.0402**	**0.0402**		**0.0379**	**0.0379**						**134.0804**

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3.5 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.1749	6.0593	1.8378	0.0157	0.3693	8.9900e-003	0.3783	0.1067	8.6000e-003	0.1153						1,519.8021
Worker	0.7882	0.6296	5.7177	0.0175	2.1107	0.0127	2.1234	0.5609	0.0117	0.5726						1,584.0367
Total	**0.9632**	**6.6888**	**7.5555**	**0.0332**	**2.4800**	**0.0217**	**2.5017**	**0.6676**	**0.0203**	**0.6880**						**3,103.8388**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0388	0.8180	1.0277	1.5500e-003		0.0520	0.0520		0.0520	0.0520						134.0803
Total	**0.0388**	**0.8180**	**1.0277**	**1.5500e-003**		**0.0520**	**0.0520**		**0.0520**	**0.0520**						**134.0803**

3.5 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.1749	6.0593	1.8378	0.0157	0.3693	8.9900e-003	0.3783	0.1067	8.6000e-003	0.1153						1,519.8021
Worker	0.7882	0.6296	5.7177	0.0175	2.1107	0.0127	2.1234	0.5609	0.0117	0.5726						1,584.0367
Total	**0.9632**	**6.6888**	**7.5555**	**0.0332**	**2.4800**	**0.0217**	**2.5017**	**0.6676**	**0.0203**	**0.6880**						**3,103.8388**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.6884					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	4.6000e-003	0.0320	0.0348	6.0000e-005		2.1100e-003	2.1100e-003		2.1100e-003	2.1100e-003						4.8606
Total	**0.6930**	**0.0320**	**0.0348**	**6.0000e-005**		**2.1100e-003**	**2.1100e-003**		**2.1100e-003**	**2.1100e-003**						**4.8606**

3.6 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0634	0.0576	0.4986	1.2900e-003	0.1396	9.2000e-004	0.1405	0.0371	8.5000e-004	0.0379						116.8561
Total	**0.0634**	**0.0576**	**0.4986**	**1.2900e-003**	**0.1396**	**9.2000e-004**	**0.1405**	**0.0371**	**8.5000e-004**	**0.0379**						**116.8561**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.6884					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	1.1300e-003	0.0258	0.0348	6.0000e-005		1.8100e-003	1.8100e-003		1.8100e-003	1.8100e-003						4.8606
Total	**0.6895**	**0.0258**	**0.0348**	**6.0000e-005**		**1.8100e-003**	**1.8100e-003**		**1.8100e-003**	**1.8100e-003**						**4.8606**

3.6 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0634	0.0576	0.4986	1.2900e-003	0.1396	9.2000e-004	0.1405	0.0371	8.5000e-004	0.0379						116.8561
Total	**0.0634**	**0.0576**	**0.4986**	**1.2900e-003**	**0.1396**	**9.2000e-004**	**0.1405**	**0.0371**	**8.5000e-004**	**0.0379**						**116.8561**

3.6 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	4.7282					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.0286	0.1993	0.2372	3.9000e-004		0.0123	0.0123		0.0123	0.0123						33.3771
Total	**4.7567**	**0.1993**	**0.2372**	**3.9000e-004**		**0.0123**	**0.0123**		**0.0123**	**0.0123**						**33.3771**

3.6 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.4058	0.3538	3.1042	8.5700e-003	0.9586	6.1000e-003	0.9647	0.2548	5.6200e-003	0.2604						775.2117
Total	**0.4058**	**0.3538**	**3.1042**	**8.5700e-003**	**0.9586**	**6.1000e-003**	**0.9647**	**0.2548**	**5.6200e-003**	**0.2604**						**775.2117**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	4.7282					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	7.7600e-003	0.1771	0.2391	3.9000e-004		0.0124	0.0124		0.0124	0.0124						33.3771
Total	**4.7359**	**0.1771**	**0.2391**	**3.9000e-004**		**0.0124**	**0.0124**		**0.0124**	**0.0124**						**33.3771**

3.6 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.4058	0.3538	3.1042	8.5700e-003	0.9586	6.1000e-003	0.9647	0.2548	5.6200e-003	0.2604						775.2117
Total	**0.4058**	**0.3538**	**3.1042**	**8.5700e-003**	**0.9586**	**6.1000e-003**	**0.9647**	**0.2548**	**5.6200e-003**	**0.2604**						**775.2117**

3.6 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	4.7101					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.0266	0.1831	0.2358	3.9000e-004		0.0106	0.0106		0.0106	0.0106						33.2463
Total	**4.7366**	**0.1831**	**0.2358**	**3.9000e-004**		**0.0106**	**0.0106**		**0.0106**	**0.0106**						**33.2463**

3.6 Architectural Coating - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.3796	0.3169	2.8327	8.2300e-003	0.9549	5.9000e-003	0.9608	0.2538	5.4400e-003	0.2592						744.5986
Total	**0.3796**	**0.3169**	**2.8327**	**8.2300e-003**	**0.9549**	**5.9000e-003**	**0.9608**	**0.2538**	**5.4400e-003**	**0.2592**						**744.5986**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	4.7101					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	7.7300e-003	0.1764	0.2382	3.9000e-004		0.0124	0.0124		0.0124	0.0124						33.2463
Total	**4.7178**	**0.1764**	**0.2382**	**3.9000e-004**		**0.0124**	**0.0124**		**0.0124**	**0.0124**						**33.2463**

3.6 Architectural Coating - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.3796	0.3169	2.8327	8.2300e-003	0.9549	5.9000e-003	0.9608	0.2538	5.4400e-003	0.2592						744.5986
Total	**0.3796**	**0.3169**	**2.8327**	**8.2300e-003**	**0.9549**	**5.9000e-003**	**0.9608**	**0.2538**	**5.4400e-003**	**0.2592**						**744.5986**

3.6 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	2.0833					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.0110	0.0749	0.1041	1.7000e-004		4.0700e-003	4.0700e-003		4.0700e-003	4.0700e-003						14.7032
Total	**2.0943**	**0.0749**	**0.1041**	**1.7000e-004**		**4.0700e-003**	**4.0700e-003**		**4.0700e-003**	**4.0700e-003**						**14.7032**

3.6 Architectural Coating - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.1577	0.1260	1.1441	3.5000e-003	0.4224	2.5400e-003	0.4249	0.1122	2.3400e-003	0.1146						316.9735
Total	**0.1577**	**0.1260**	**1.1441**	**3.5000e-003**	**0.4224**	**2.5400e-003**	**0.4249**	**0.1122**	**2.3400e-003**	**0.1146**						**316.9735**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	2.0833					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	3.4200e-003	0.0780	0.1054	1.7000e-004		5.4700e-003	5.4700e-003		5.4700e-003	5.4700e-003						14.7032
Total	**2.0867**	**0.0780**	**0.1054**	**1.7000e-004**		**5.4700e-003**	**5.4700e-003**		**5.4700e-003**	**5.4700e-003**						**14.7032**

3.6 Architectural Coating - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.1577	0.1260	1.1441	3.5000e-003	0.4224	2.5400e-003	0.4249	0.1122	2.3400e-003	0.1146						316.9735
Total	**0.1577**	**0.1260**	**1.1441**	**3.5000e-003**	**0.4224**	**2.5400e-003**	**0.4249**	**0.1122**	**2.3400e-003**	**0.1146**						**316.9735**

3.7 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0232	0.2293	0.3281	5.1000e-004		0.0115	0.0115		0.0106	0.0106						45.4248
Paving	0.0131					0.0000	0.0000		0.0000	0.0000						0.0000
Total	**0.0363**	**0.2293**	**0.3281**	**5.1000e-004**		**0.0115**	**0.0115**		**0.0106**	**0.0106**						**45.4248**

3.7 Paving - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	1.2100e-003	9.7000e-004	8.8000e-003	3.0000e-005	3.2500e-003	2.0000e-005	3.2700e-003	8.6000e-004	2.0000e-005	8.8000e-004						2.4384
Total	**1.2100e-003**	**9.7000e-004**	**8.8000e-003**	**3.0000e-005**	**3.2500e-003**	**2.0000e-005**	**3.2700e-003**	**8.6000e-004**	**2.0000e-005**	**8.8000e-004**						**2.4384**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0126	0.2541	0.3892	5.1000e-004		0.0137	0.0137		0.0137	0.0137						45.4247
Paving	0.0131					0.0000	0.0000		0.0000	0.0000						0.0000
Total	**0.0257**	**0.2541**	**0.3892**	**5.1000e-004**		**0.0137**	**0.0137**		**0.0137**	**0.0137**						**45.4247**

3.7 Paving - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	1.2100e-003	9.7000e-004	8.8000e-003	3.0000e-005	3.2500e-003	2.0000e-005	3.2700e-003	8.6000e-004	2.0000e-005	8.8000e-004						2.4384
Total	**1.2100e-003**	**9.7000e-004**	**8.8000e-003**	**3.0000e-005**	**3.2500e-003**	**2.0000e-005**	**3.2700e-003**	**8.6000e-004**	**2.0000e-005**	**8.8000e-004**						**2.4384**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Transit Accessibility

Improve Pedestrian Network

Olsen-Chandler - San Luis Obispo County APCD Air District, Annual

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.9180	7.7884	20.3406	0.0781	9.1313	0.0572	9.1885	2.4411	0.0533	2.4944						7,190.7490
Unmitigated	1.9958	8.2759	22.2955	0.0877	10.3529	0.0637	10.4166	2.7677	0.0593	2.8270						8,078.6917

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,187.88	1,632.48	1383.96	3,251,683	2,867,984
City Park	0.00	0.00	0.00		
City Park	0.00	0.00	0.00		
Elementary School	638.55	0.00	0.00	1,174,696	1,036,082
General Office Building	0.00	0.00	0.00		
Health Club	649.88	391.31	501.19	846,726	746,813
Other Asphalt Surfaces	0.00	0.00	0.00		
Racquet Club	0.00	0.00	0.00		
Recreational Swimming Pool	0.00	0.00	0.00		
Recreational Swimming Pool	0.00	0.00	0.00		
Regional Shopping Center	402.10	532.68	269.06	580,080	511,630
Single Family Housing	8,051.40	10,554.15	9180.30	21,781,672	19,211,434
Total	10,929.80	13,110.62	11,334.51	27,634,856	24,373,943

4.3 Trip Type Information

Olsen-Chandler - San Luis Obispo County APCD Air District, Annual

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
City Park	13.00	5.00	5.00	33.00	48.00	19.00	66	28	6
City Park	13.00	5.00	5.00	33.00	48.00	19.00	66	28	6
Elementary School	13.00	5.00	5.00	65.00	30.00	5.00	63	25	12
General Office Building	13.00	5.00	5.00	33.00	48.00	19.00	77	19	4
Health Club	13.00	5.00	5.00	16.90	64.10	19.00	52	39	9
Other Asphalt Surfaces	13.00	5.00	5.00	0.00	0.00	0.00	0	0	0
Racquet Club	13.00	5.00	5.00	11.50	69.50	19.00	52	39	9
Recreational Swimming Pool	13.00	5.00	5.00	33.00	48.00	19.00	52	39	9
Recreational Swimming Pool	13.00	5.00	5.00	33.00	48.00	19.00	52	39	9
Regional Shopping Center	13.00	5.00	5.00	16.30	64.70	19.00	54	35	11
Single Family Housing	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759
City Park	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759
Elementary School	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759
General Office Building	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759
Health Club	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759
Other Asphalt Surfaces	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759
Racquet Club	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759
Recreational Swimming Pool	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759
Regional Shopping Center	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759
Single Family Housing	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000						1,298.6544
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000						1,380.5232
NaturalGas Mitigated	0.1709	1.4642	0.6501	9.3200e-003		0.1181	0.1181		0.1181	0.1181						1,701.1853
NaturalGas Unmitigated	0.1873	1.6049	0.7125	0.0102		0.1294	0.1294		0.1294	0.1294						1,864.6514

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	2.32534e+006	0.0125	0.1072	0.0456	6.8000e-004		8.6600e-003	8.6600e-003		8.6600e-003	8.6600e-003						124.8263
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Elementary School	763115	4.1100e-003	0.0374	0.0314	2.2000e-004		2.8400e-003	2.8400e-003		2.8400e-003	2.8400e-003						40.9647
General Office Building	9429.12	5.0000e-005	4.6000e-004	3.9000e-004	0.0000		4.0000e-005	4.0000e-005		4.0000e-005	4.0000e-005						0.5062
Health Club	494678	2.6700e-003	0.0243	0.0204	1.5000e-004		1.8400e-003	1.8400e-003		1.8400e-003	1.8400e-003						26.5548
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Racquet Club	163688	8.8000e-004	8.0200e-003	6.7400e-003	5.0000e-005		6.1000e-004	6.1000e-004		6.1000e-004	6.1000e-004						8.7869
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Regional Shopping Center	25261.8	1.4000e-004	1.2400e-003	1.0400e-003	1.0000e-005		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005						1.3561
Single Family Housing	3.09543e+007	0.1669	1.4263	0.6070	9.1000e-003		0.1153	0.1153		0.1153	0.1153						1,661.6565
Total		**0.1873**	**1.6049**	**0.7125**	**0.0102**		**0.1294**	**0.1294**		**0.1294**	**0.1294**						**1,864.6514**

Olsen-Chandler - San Luis Obispo County APCD Air District, Annual

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	2.16474e+006	0.0117	0.0998	0.0425	6.4000e-004		8.0600e-003	8.0600e-003		8.0600e-003	8.0600e-003						116.2051
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Elementary School	690652	3.7200e-003	0.0339	0.0284	2.0000e-004		2.5700e-003	2.5700e-003		2.5700e-003	2.5700e-003						37.0748
General Office Building	8489.66	5.0000e-005	4.2000e-004	3.5000e-004	0.0000		3.0000e-005	3.0000e-005		3.0000e-005	3.0000e-005						0.4557
Health Club	457718	2.4700e-003	0.0224	0.0189	1.3000e-004		1.7100e-003	1.7100e-003		1.7100e-003	1.7100e-003						24.5707
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Racquet Club	151458	8.2000e-004	7.4200e-003	6.2400e-003	4.0000e-005		5.6000e-004	5.6000e-004		5.6000e-004	5.6000e-004						8.1304
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Regional Shopping Center	22735.6	1.2000e-004	1.1100e-003	9.4000e-004	1.0000e-005		8.0000e-005	8.0000e-005		8.0000e-005	8.0000e-005						1.2205
Single Family Housing	2.81949e+007	0.1520	1.2992	0.5528	8.2900e-003		0.1050	0.1050		0.1050	0.1050						1,513.5281
Total		**0.1709**	**1.4642**	**0.6501**	**9.3100e-003**		**0.1181**	**0.1181**		**0.1181**	**0.1181**						**1,701.1853**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	991526				134.7083
City Park	0				0.0000
Elementary School	223058				30.3046
General Office Building	10270.1				1.3953
Health Club	154892				21.0435
Other Asphalt Surfaces	0				0.0000
Racquet Club	51253.3				6.9633
Recreational Swimming Pool	0				0.0000
Regional Shopping Center	113945				15.4805
Single Family Housing	8.61646e+006				1,170.6278
Total					**1,380.5232**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	928743				126.1786
City Park	0				0.0000
Elementary School	199718				27.1335
General Office Building	9560.56				1.2989
Health Club	142875				19.4110
Other Asphalt Surfaces	0				0.0000
Racquet Club	47277.1				6.4231
Recreational Swimming Pool	0				0.0000
Regional Shopping Center	102049				13.8644
Single Family Housing	8.12858e+006				1,104.3450
Total					**1,298.6544**

6.0 Area Detail

6.1 Mitigation Measures Area

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	13.0626	0.2025	17.5666	9.3000e-004		0.0977	0.0977		0.0977	0.0977						29.4608
Unmitigated	13.0626	0.2025	17.5666	9.3000e-004		0.0977	0.0977		0.0977	0.0977						29.4608

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.5374					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	8.9990					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	0.5262	0.2025	17.5666	9.3000e-004		0.0977	0.0977		0.0977	0.0977						29.4608
Total	**13.0626**	**0.2025**	**17.5666**	**9.3000e-004**		**0.0977**	**0.0977**		**0.0977**	**0.0977**						**29.4608**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.5374					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	8.9990					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	0.5262	0.2025	17.5666	9.3000e-004		0.0977	0.0977		0.0977	0.0977						29.4608
Total	**13.0626**	**0.2025**	**17.5666**	**9.3000e-004**		**0.0977**	**0.0977**		**0.0977**	**0.0977**						**29.4608**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

Olsen-Chandler - San Luis Obispo County APCD Air District, Annual

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated				176.6701
Unmitigated				208.2882

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	14.8551 / 9.36518				27.4704
City Park	0 / 94.2462				44.8148
Elementary School	1.2 / 3.08571				3.3266
General Office Building	0.103086 / 0.0631815				0.1898
Health Club	1.10893 / 0.679669				2.0414
Other Asphalt Surfaces	0 / 0				0.0000
Racquet Club	0.367279 / 0.225106				0.6761
Recreational Swimming Pool	0 / 0				0.0000
Regional Shopping Center	0.789613 / 0.483956				1.4536
Single Family Housing	69.389 / 43.7453				128.3155
Total					**208.2882**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	11.8841 / 8.79391				22.5953
City Park	0 / 88.4972				42.0811
Elementary School	0.959999 / 2.89748				2.8652
General Office Building	0.0824685 / 0.0593274				0.1560
Health Club	0.887147 / 0.638209				1.6781
Other Asphalt Surfaces	0 / 0				0.0000
Racquet Club	0.293823 / 0.211375				0.5558
Recreational Swimming Pool	0 / 0				0.0000
Regional Shopping Center	0.63169 / 0.454435				1.1949
Single Family Housing	55.5112 / 41.0768				105.5438
Total					**176.6701**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Olsen-Chandler - San Luis Obispo County APCD Air District, Annual

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated				338.9827
Unmitigated				807.1016

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	104.88				52.7443
City Park	6.8				3.4197
Elementary School	90.34				45.4321
General Office Building	0.54				0.2716
Health Club	106.88				53.7501
Other Asphalt Surfaces	0				0.0000
Racquet Club	35.4				17.8027
Recreational Swimming Pool	0				0.0000
Regional Shopping Center	11.19				5.6275
Single Family Housing	1248.86				628.0536
Total					**807.1016**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	44.0496				22.1526
City Park	2.856				1.4363
Elementary School	37.9428				19.0815
General Office Building	0.2268				0.1141
Health Club	44.8896				22.5751
Other Asphalt Surfaces	0				0.0000
Racquet Club	14.868				7.4771
Recreational Swimming Pool	0				0.0000
Regional Shopping Center	4.6998				2.3635
Single Family Housing	524.521				263.7825
Total					**338.9827**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Olsen-Chandler - San Luis Obispo County APCD Air District, Summer

NOTE: Does not include residential adjustment for fleet mix or solar PV, calculated separately.

Olsen-Chandler

San Luis Obispo County APCD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	0.58	1000sqft	0.01	576.00	0
Elementary School	495.00	Student	0.95	41,383.67	0
Other Asphalt Surfaces	97.60	Acre	97.60	4,251,456.00	0
City Park	45.30	Acre	45.30	1,973,268.00	0
City Park	33.80	Acre	33.80	1,472,328.00	0
Health Club	18.75	1000sqft	11.50	18,752.00	0
Racquet Club	6.21	1000sqft	3.80	6,205.00	0
Recreational Swimming Pool	0.00	1000sqft	1.10	1,789.00	0
Recreational Swimming Pool	0.00	1000sqft	0.70	1,154.00	0
Apartments Low Rise	228.00	Dwelling Unit	14.25	228,000.00	652
Single Family Housing	1,065.00	Dwelling Unit	147.45	1,917,000.00	3046
Regional Shopping Center	10.66	1000sqft	0.24	10,659.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.2	**Precipitation Freq (Days)**	44
Climate Zone	4			**Operational Year**	2030
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	298.3	**CH4 Intensity (lb/MWhr)**	0.013	**N2O Intensity (lb/MWhr)**	0.003

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Includes RPS adjustment.

Land Use - Provided by the applicant team.

Construction Phase - Based on provided phase durations. Architectural Coating, starts five months after building construction and stops at the end of building construction.

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - Equipment use based on model defaults.

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Trips and VMT - Const trips based on model defaults.

On-road Fugitive Dust -

Demolition - Demolition of 3,400 building square footage.

Grading - Based on model defaults.

Architectural Coating - Residential low-VOC content: 50 g/L, per mitigation requirements. Non-Residential low-VOC content: 100 g/L.

Vehicle Trips - Trip-gen rates for residential and school based on City of Paso Robles' Travel Demand Forecast Model (Final), prepared by Fehr & Peers (August 5, 2009), Table 2. Other uses derived from the traffic analysis prepared for this project.

Vehicle Emission Factors - Emission factors based on model defaults.

Vehicle Emission Factors -

Vehicle Emission Factors -

Woodstoves - Assumes no hearths.

Consumer Products - Consumer products, arch coatings, and landscape equipment usage based on model defaults.

Energy Use -

Water And Wastewater - Adjusted for the removal of septic systems from the default assumptions.

Construction Off-road Equipment Mitigation - Includes 50%CE for watering travel ways, 61%CE for watering disturbed areas, 15 mph onsite speed limit. Use of T3 off-road equipment included.

Mobile Land Use Mitigation -

Olsen-Chandler - San Luis Obispo County APCD Air District, Summer

Area Mitigation -
Energy Mitigation -

Waste Mitigation - Assumes 58% waste reduction, per most current (2017) state-wide diversion rate (CalRecycle https://www.calrecycle.ca.gov/lgcentral/goalmeasure/disposalrate/graphs/estdiversion)

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	100.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	100.00
tblArchitecturalCoating	EF_Residential_Exterior	250.00	50.00
tblArchitecturalCoating	EF_Residential_Interior	250.00	50.00
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3

Olsen-Chandler - San Luis Obispo County APCD Air District, Summer

tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	PhaseEndDate	7/13/2021	1/7/2020
tblConstructionPhase	PhaseEndDate	6/14/2022	2/7/2020
tblConstructionPhase	PhaseEndDate	10/29/2024	6/9/2020
tblConstructionPhase	PhaseEndDate	8/4/2048	6/9/2023
tblConstructionPhase	PhaseEndDate	4/12/2050	8/11/2023
tblConstructionPhase	PhaseStartDate	7/14/2021	1/8/2020
tblConstructionPhase	PhaseStartDate	6/15/2022	2/8/2020
tblConstructionPhase	PhaseStartDate	10/30/2024	6/10/2020
tblConstructionPhase	PhaseStartDate	8/5/2048	6/10/2023
tblLandUse	LandUseSquareFeet	580.00	576.00
tblLandUse	LandUseSquareFeet	18,750.00	18,752.00
tblLandUse	LandUseSquareFeet	6,210.00	6,205.00
tblLandUse	LandUseSquareFeet	0.00	1,789.00
tblLandUse	LandUseSquareFeet	0.00	1,154.00
tblLandUse	LandUseSquareFeet	10,660.00	10,659.00
tblLandUse	LotAcreage	0.43	11.50
tblLandUse	LotAcreage	0.14	3.80

Olsen-Chandler - San Luis Obispo County APCD Air District, Summer

tblLandUse	LotAcreage	0.00	1.10
tblLandUse	LotAcreage	0.00	0.70
tblLandUse	LotAcreage	345.78	147.45
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.013
tblProjectCharacteristics	CO2IntensityFactor	641.35	298.3
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.003
tblVehicleTrips	ST_TR	22.75	0.00
tblVehicleTrips	ST_TR	2.46	0.00
tblVehicleTrips	ST_TR	21.35	0.00
tblVehicleTrips	ST_TR	9.10	0.00
tblVehicleTrips	SU_TR	16.74	0.00
tblVehicleTrips	SU_TR	1.05	0.00
tblVehicleTrips	SU_TR	17.40	0.00
tblVehicleTrips	SU_TR	13.60	0.00
tblVehicleTrips	WD_TR	6.59	5.21
tblVehicleTrips	WD_TR	1.89	0.00
tblVehicleTrips	WD_TR	11.03	0.00
tblVehicleTrips	WD_TR	32.93	34.66
tblVehicleTrips	WD_TR	14.03	0.00
tblVehicleTrips	WD_TR	33.82	0.00
tblVehicleTrips	WD_TR	42.70	37.72
tblVehicleTrips	WD_TR	9.52	7.56
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79

tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

Olsen-Chandler - San Luis Obispo County APCD Air District, Summer

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	63.2894	183.0230	222.9023	0.7397	51.7979	2.3090	54.1069	13.8873	2.1856	16.0729						75,557.2673
2021	60.7674	167.1197	202.7517	0.7231	51.7992	1.7076	53.5068	13.8878	1.6122	15.4999						73,935.7083
2022	59.1140	157.1664	187.5205	0.7061	51.8004	1.4920	53.2925	13.8882	1.4086	15.2968						72,273.2099
2023	56.9992	132.3845	171.9118	0.6862	51.8017	1.1889	52.9905	13.8887	1.1201	15.0087						70,303.8708
Maximum	**63.2894**	**183.0230**	**222.9023**	**0.7397**	**51.8017**	**2.3090**	**54.1069**	**13.8887**	**2.1856**	**16.0729**						**75,557.2673**

Olsen-Chandler - San Luis Obispo County APCD Air District, Summer

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	61.6607	177.7361	223.9286	0.7397	51.7979	2.0797	53.8775	13.8873	2.0229	15.9102						75,557.2673
2021	59.3809	163.7438	204.0651	0.7231	51.7992	1.6535	53.4527	13.8878	1.6154	15.5032						73,935.7083
2022	57.9365	155.7253	189.0497	0.7061	51.8004	1.5999	53.4004	13.8882	1.5644	15.4526						72,273.2099
2023	55.9681	132.2797	173.5628	0.6862	51.8017	1.4169	53.2186	13.8887	1.3895	15.2781						70,303.8707
Maximum	**61.6607**	**177.7361**	**223.9286**	**0.7397**	**51.8017**	**2.0797**	**53.8775**	**13.8887**	**2.0229**	**15.9102**						**75,557.2673**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**2.18**	**1.60**	**-0.70**	**0.00**	**0.00**	**-0.78**	**-0.02**	**0.00**	**-4.20**	**-0.43**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Olsen-Chandler - San Luis Obispo County APCD Air District, Summer

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	71.8815	1.2272	106.4642	5.6400e-003		0.5918	0.5918		0.5918	0.5918						196.8181
Energy	1.0263	8.7937	3.9041	0.0560		0.7091	0.7091		0.7091	0.7091						11,262.6101
Mobile	14.5805	54.8418	152.9935	0.6185	72.5165	0.4342	72.9507	19.3453	0.4043	19.7496						62,752.0966
Total	**87.4883**	**64.8627**	**263.3618**	**0.6801**	**72.5165**	**1.7351**	**74.2516**	**19.3453**	**1.7052**	**21.0505**						**74,211.5248**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	71.8815	1.2272	106.4642	5.6400e-003		0.5918	0.5918		0.5918	0.5918						196.8181
Energy	0.9363	8.0229	3.5622	0.0511		0.6469	0.6469		0.6469	0.6469						10,275.2648
Mobile	14.0464	51.7066	138.8515	0.5504	63.9596	0.3904	64.3499	17.0626	0.3634	17.4260						55,856.2582
Total	**86.8643**	**60.9566**	**248.8778**	**0.6071**	**63.9596**	**1.6291**	**65.5887**	**17.0626**	**1.6022**	**18.6647**						**66,328.3410**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.71**	**6.02**	**5.50**	**10.73**	**11.80**	**6.11**	**11.67**	**11.80**	**6.04**	**11.33**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**10.62**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2020	1/7/2020	5	400	
2	Site Preparation	Site Preparation	1/8/2020	2/7/2020	5	240	
3	Grading	Grading	2/8/2020	6/9/2020	5	620	
4	Building Construction	Building Construction	6/10/2020	6/9/2023	5	6200	
5	Architectural Coating	Architectural Coating	11/10/2020	6/9/2023	5	440	
6	Paving	Paving	6/10/2023	8/11/2023	5	440	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 1550

Acres of Paving: 97.6

Residential Indoor: 4,343,625; Residential Outdoor: 1,447,875; Non-Residential Indoor: 120,778; Non-Residential Outdoor: 40,259; Striped Parking Area: 255,087 (Architectural Coating – sqft)

OffRoad Equipment

Olsen-Chandler - San Luis Obispo County APCD Air District, Summer

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Olsen-Chandler - San Luis Obispo County APCD Air District, Summer

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	15.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	3,813.00	1,413.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	763.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6400e-003	0.0000	8.6400e-003	1.3100e-003	0.0000	1.3100e-003						0.0000
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419						3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**8.6400e-003**	**1.6587**	**1.6673**	**1.3100e-003**	**1.5419**	**1.5432**						**3,774.1536**

3.2 Demolition - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.2000e-004	0.0118	2.5500e-003	3.0000e-005	0.0398	5.0000e-005	0.0399	9.7900e-003	5.0000e-005	9.8400e-003						3.2040
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0642	0.0535	0.5325	1.3900e-003	0.1483	9.5000e-004	0.1492	0.0393	8.8000e-004	0.0402						138.6960
Total	**0.0645**	**0.0654**	**0.5350**	**1.4200e-003**	**0.1881**	**1.0000e-003**	**0.1891**	**0.0491**	**9.3000e-004**	**0.0501**						**141.9000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.3700e-003	0.0000	3.3700e-003	5.1000e-004	0.0000	5.1000e-004						0.0000
Off-Road	0.9246	18.3130	24.6739	0.0388		0.8627	0.8627		0.8627	0.8627						3,774.1536
Total	**0.9246**	**18.3130**	**24.6739**	**0.0388**	**3.3700e-003**	**0.8627**	**0.8661**	**5.1000e-004**	**0.8627**	**0.8632**						**3,774.1536**

3.2 Demolition - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.2000e-004	0.0118	2.5500e-003	3.0000e-005	0.0398	5.0000e-005	0.0399	9.7900e-003	5.0000e-005	9.8400e-003						3.2040
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0642	0.0535	0.5325	1.3900e-003	0.1483	9.5000e-004	0.1492	0.0393	8.8000e-004	0.0402						138.6960
Total	**0.0645**	**0.0654**	**0.5350**	**1.4200e-003**	**0.1881**	**1.0000e-003**	**0.1891**	**0.0491**	**9.3000e-004**	**0.0501**						**141.9000**

3.3 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307						0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216						3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0663**	**2.1974**	**20.2637**	**9.9307**	**2.0216**	**11.9523**						**3,714.8975**

3.3 Site Preparation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0770	0.0642	0.6389	1.6700e-003	0.1780	1.1400e-003	0.1791	0.0472	1.0500e-003	0.0483						166.4352
Total	**0.0770**	**0.0642**	**0.6389**	**1.6700e-003**	**0.1780**	**1.1400e-003**	**0.1791**	**0.0472**	**1.0500e-003**	**0.0483**						**166.4352**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.0458	0.0000	7.0458	3.8730	0.0000	3.8730						0.0000
Off-Road	0.9312	19.0656	22.9600	0.0380		0.9462	0.9462		0.9462	0.9462						3,714.8975
Total	**0.9312**	**19.0656**	**22.9600**	**0.0380**	**7.0458**	**0.9462**	**7.9920**	**3.8730**	**0.9462**	**4.8191**						**3,714.8975**

Olsen-Chandler - San Luis Obispo County APCD Air District, Summer

3.3 Site Preparation - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0770	0.0642	0.6389	1.6700e-003	0.1780	1.1400e-003	0.1791	0.0472	1.0500e-003	0.0483						166.4352
Total	**0.0770**	**0.0642**	**0.6389**	**1.6700e-003**	**0.1780**	**1.1400e-003**	**0.1791**	**0.0472**	**1.0500e-003**	**0.0483**						**166.4352**

3.4 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965						0.0000
Off-Road	4.4501	50.1975	31.9583	0.0620		2.1739	2.1739		2.0000	2.0000						6,054.4257
Total	**4.4501**	**50.1975**	**31.9583**	**0.0620**	**8.6733**	**2.1739**	**10.8472**	**3.5965**	**2.0000**	**5.5965**						**6,054.4257**

3.4 Grading - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0855	0.0714	0.7099	1.8600e-003	0.1977	1.2600e-003	0.1990	0.0524	1.1700e-003	0.0536						184.9280
Total	**0.0855**	**0.0714**	**0.7099**	**1.8600e-003**	**0.1977**	**1.2600e-003**	**0.1990**	**0.0524**	**1.1700e-003**	**0.0536**						**184.9280**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.3826	0.0000	3.3826	1.4026	0.0000	1.4026						0.0000
Off-Road	1.5231	29.9782	36.7226	0.0620		1.2994	1.2994		1.2994	1.2994						6,054.4257
Total	**1.5231**	**29.9782**	**36.7226**	**0.0620**	**3.3826**	**1.2994**	**4.6820**	**1.4026**	**1.2994**	**2.7021**						**6,054.4257**

3.4 Grading - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0855	0.0714	0.7099	1.8600e-003	0.1977	1.2600e-003	0.1990	0.0524	1.1700e-003	0.0536						184.9280
Total	**0.0855**	**0.0714**	**0.7099**	**1.8600e-003**	**0.1977**	**1.2600e-003**	**0.1990**	**0.0524**	**1.1700e-003**	**0.0536**						**184.9280**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503						2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**						**2,568.6345**

Olsen-Chandler - San Luis Obispo County APCD Air District, Summer

3.5 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	5.1241	145.8264	41.7896	0.2852	6.5589	0.7918	7.3507	1.8890	0.7574	2.6464						30,395.1059
Worker	16.3087	13.6044	135.3488	0.3538	37.6958	0.2411	37.9369	9.9977	0.2224	10.2201						35,256.5297
Total	**21.4328**	**159.4308**	**177.1385**	**0.6390**	**44.2548**	**1.0328**	**45.2876**	**11.8867**	**0.9798**	**12.8665**						**65,651.6355**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6739	14.2261	17.8738	0.0269		0.9036	0.9036		0.9036	0.9036						2,568.6345
Total	**0.6739**	**14.2261**	**17.8738**	**0.0269**		**0.9036**	**0.9036**		**0.9036**	**0.9036**						**2,568.6345**

Olsen-Chandler - San Luis Obispo County APCD Air District, Summer

3.5 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	5.1241	145.8264	41.7896	0.2852	6.5589	0.7918	7.3507	1.8890	0.7574	2.6464						30,395.1059
Worker	16.3087	13.6044	135.3488	0.3538	37.6958	0.2411	37.9369	9.9977	0.2224	10.2201						35,256.5297
Total	**21.4328**	**159.4308**	**177.1385**	**0.6390**	**44.2548**	**1.0328**	**45.2876**	**11.8867**	**0.9798**	**12.8665**						**65,651.6355**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013						2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**						**2,568.7643**

Olsen-Chandler - San Luis Obispo County APCD Air District, Summer

3.5 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	4.1877	133.5589	36.8532	0.2832	6.5603	0.3747	6.9349	1.8895	0.3584	2.2479						30,218.0284
Worker	15.1893	12.1671	122.9107	0.3416	37.6958	0.2334	37.9293	9.9977	0.2153	10.2130						34,052.8437
Total	**19.3770**	**145.7260**	**159.7639**	**0.6248**	**44.2561**	**0.6081**	**44.8642**	**11.8872**	**0.5737**	**12.4609**						**64,270.8721**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6739	14.2261	17.8738	0.0269		0.9036	0.9036		0.9036	0.9036						2,568.7643
Total	**0.6739**	**14.2261**	**17.8738**	**0.0269**		**0.9036**	**0.9036**		**0.9036**	**0.9036**						**2,568.7643**

3.5 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	4.1877	133.5589	36.8532	0.2832	6.5603	0.3747	6.9349	1.8895	0.3584	2.2479						30,218.0284
Worker	15.1893	12.1671	122.9107	0.3416	37.6958	0.2334	37.9293	9.9977	0.2153	10.2130						34,052.8437
Total	**19.3770**	**145.7260**	**159.7639**	**0.6248**	**44.2561**	**0.6081**	**44.8642**	**11.8872**	**0.5737**	**12.4609**						**64,270.8721**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612						2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**						**2,569.6322**

Olsen-Chandler - San Luis Obispo County APCD Air District, Summer

3.5 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	3.8721	127.0109	33.9877	0.2810	6.5615	0.3291	6.8906	1.8900	0.3147	2.2047						30,017.9840
Worker	14.2488	10.9418	112.7867	0.3293	37.6958	0.2268	37.9227	9.9977	0.2092	10.2069						32,833.5360
Total	**18.1208**	**137.9527**	**146.7743**	**0.6103**	**44.2573**	**0.5559**	**44.8132**	**11.8876**	**0.5239**	**12.4115**						**62,851.5200**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6739	14.2261	17.8738	0.0269		0.9036	0.9036		0.9036	0.9036						2,569.6322
Total	**0.6739**	**14.2261**	**17.8738**	**0.0269**		**0.9036**	**0.9036**		**0.9036**	**0.9036**						**2,569.6322**

3.5 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	3.8721	127.0109	33.9877	0.2810	6.5615	0.3291	6.8906	1.8900	0.3147	2.2047						30,017.9840
Worker	14.2488	10.9418	112.7867	0.3293	37.6958	0.2268	37.9227	9.9977	0.2092	10.2069						32,833.5360
Total	**18.1208**	**137.9527**	**146.7743**	**0.6103**	**44.2573**	**0.5559**	**44.8132**	**11.8876**	**0.5239**	**12.4115**						**62,851.5200**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584						2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**						**2,570.4061**

Olsen-Chandler - San Luis Obispo County APCD Air District, Summer

3.5 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	2.9543	104.8910	30.0007	0.2761	6.5627	0.1531	6.7158	1.8904	0.1464	2.0368						29,528.0951
Worker	13.3733	9.8372	103.2043	0.3169	37.6958	0.2210	37.9168	9.9977	0.2037	10.2014						31,600.1547
Total	**16.3276**	**114.7282**	**133.2050**	**0.5929**	**44.2585**	**0.3741**	**44.6326**	**11.8881**	**0.3501**	**12.2381**						**61,128.2498**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6739	14.2261	17.8738	0.0269		0.9036	0.9036		0.9036	0.9036						2,570.4061
Total	**0.6739**	**14.2261**	**17.8738**	**0.0269**		**0.9036**	**0.9036**		**0.9036**	**0.9036**						**2,570.4061**

Olsen-Chandler - San Luis Obispo County APCD Air District, Summer

3.5 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	2.9543	104.8910	30.0007	0.2761	6.5627	0.1531	6.7158	1.8904	0.1464	2.0368						29,528.0951
Worker	13.3733	9.8372	103.2043	0.3169	37.6958	0.2210	37.9168	9.9977	0.2037	10.2014						31,600.1547
Total	**16.3276**	**114.7282**	**133.2050**	**0.5929**	**44.2585**	**0.3741**	**44.6326**	**11.8881**	**0.3501**	**12.2381**						**61,128.2498**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.2311					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109						281.9928
Total	**36.4733**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**						**281.9928**

3.6 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	3.2635	2.7223	27.0840	0.0708	7.5431	0.0482	7.5914	2.0006	0.0445	2.0451						7,055.0045
Total	**3.2635**	**2.7223**	**27.0840**	**0.0708**	**7.5431**	**0.0482**	**7.5914**	**2.0006**	**0.0445**	**2.0451**						**7,055.0045**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.2311					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.0594	1.3570	1.8324	2.9700e-003		0.0951	0.0951		0.0951	0.0951						281.9928
Total	**36.2906**	**1.3570**	**1.8324**	**2.9700e-003**		**0.0951**	**0.0951**		**0.0951**	**0.0951**						**281.9928**

3.6 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	3.2635	2.7223	27.0840	0.0708	7.5431	0.0482	7.5914	2.0006	0.0445	2.0451						7,055.0045
Total	**3.2635**	**2.7223**	**27.0840**	**0.0708**	**7.5431**	**0.0482**	**7.5914**	**2.0006**	**0.0445**	**2.0451**						**7,055.0045**

3.6 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.2311					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941						281.9309
Total	**36.4500**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**						**281.9309**

3.6 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	3.0395	2.4347	24.5950	0.0684	7.5431	0.0467	7.5898	2.0006	0.0431	2.0437						6,814.1410
Total	**3.0395**	**2.4347**	**24.5950**	**0.0684**	**7.5431**	**0.0467**	**7.5898**	**2.0006**	**0.0431**	**2.0437**						**6,814.1410**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.2311					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.0594	1.3570	1.8324	2.9700e-003		0.0951	0.0951		0.0951	0.0951						281.9309
Total	**36.2906**	**1.3570**	**1.8324**	**2.9700e-003**		**0.0951**	**0.0951**		**0.0951**	**0.0951**						**281.9309**

Olsen-Chandler - San Luis Obispo County APCD Air District, Summer

3.6 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	3.0395	2.4347	24.5950	0.0684	7.5431	0.0467	7.5898	2.0006	0.0431	2.0437						6,814.1410
Total	**3.0395**	**2.4347**	**24.5950**	**0.0684**	**7.5431**	**0.0467**	**7.5898**	**2.0006**	**0.0431**	**2.0437**						**6,814.1410**

3.6 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.2311					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817						281.9062
Total	**36.4357**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**						**281.9062**

3.6 Architectural Coating - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	2.8513	2.1895	22.5692	0.0659	7.5431	0.0454	7.5885	2.0006	0.0419	2.0424						6,570.1516
Total	**2.8513**	**2.1895**	**22.5692**	**0.0659**	**7.5431**	**0.0454**	**7.5885**	**2.0006**	**0.0419**	**2.0424**						**6,570.1516**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.2311					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.0594	1.3570	1.8324	2.9700e-003		0.0951	0.0951		0.0951	0.0951						281.9062
Total	**36.2906**	**1.3570**	**1.8324**	**2.9700e-003**		**0.0951**	**0.0951**		**0.0951**	**0.0951**						**281.9062**

3.6 Architectural Coating - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	2.8513	2.1895	22.5692	0.0659	7.5431	0.0454	7.5885	2.0006	0.0419	2.0424						6,570.1516
Total	**2.8513**	**2.1895**	**22.5692**	**0.0659**	**7.5431**	**0.0454**	**7.5885**	**2.0006**	**0.0419**	**2.0424**						**6,570.1516**

3.6 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.2311					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708						281.8690
Total	**36.4228**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**						**281.8690**

3.6 Architectural Coating - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	2.6761	1.9685	20.6517	0.0634	7.5431	0.0442	7.5873	2.0006	0.0408	2.0414						6,323.3459
Total	**2.6761**	**1.9685**	**20.6517**	**0.0634**	**7.5431**	**0.0442**	**7.5873**	**2.0006**	**0.0408**	**2.0414**						**6,323.3459**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.2311					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.0594	1.3570	1.8324	2.9700e-003		0.0951	0.0951		0.0951	0.0951						281.8690
Total	**36.2906**	**1.3570**	**1.8324**	**2.9700e-003**		**0.0951**	**0.0951**		**0.0951**	**0.0951**						**281.8690**

3.6 Architectural Coating - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	2.6761	1.9685	20.6517	0.0634	7.5431	0.0442	7.5873	2.0006	0.0408	2.0414						6,323.3459
Total	**2.6761**	**1.9685**	**20.6517**	**0.0634**	**7.5431**	**0.0442**	**7.5873**	**2.0006**	**0.0408**	**2.0414**						**6,323.3459**

3.7 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0327	10.1917	14.5842	0.0228		0.5102	0.5102		0.4694	0.4694						2,225.4336
Paving	0.5812					0.0000	0.0000		0.0000	0.0000						0.0000
Total	**1.6139**	**10.1917**	**14.5842**	**0.0228**		**0.5102**	**0.5102**		**0.4694**	**0.4694**						**2,225.4336**

3.7 Paving - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0526	0.0387	0.4060	1.2500e-003	0.1483	8.7000e-004	0.1492	0.0393	8.0000e-004	0.0401						124.3122
Total	**0.0526**	**0.0387**	**0.4060**	**1.2500e-003**	**0.1483**	**8.7000e-004**	**0.1492**	**0.0393**	**8.0000e-004**	**0.0401**						**124.3122**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5609	11.2952	17.2957	0.0228		0.6093	0.6093		0.6093	0.6093						2,225.4336
Paving	0.5812					0.0000	0.0000		0.0000	0.0000						0.0000
Total	**1.1421**	**11.2952**	**17.2957**	**0.0228**		**0.6093**	**0.6093**		**0.6093**	**0.6093**						**2,225.4336**

3.7 Paving - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0526	0.0387	0.4060	1.2500e-003	0.1483	8.7000e-004	0.1492	0.0393	8.0000e-004	0.0401						124.3122
Total	**0.0526**	**0.0387**	**0.4060**	**1.2500e-003**	**0.1483**	**8.7000e-004**	**0.1492**	**0.0393**	**8.0000e-004**	**0.0401**						**124.3122**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Transit Accessibility

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	14.0464	51.7066	138.8515	0.5504	63.9596	0.3904	64.3499	17.0626	0.3634	17.4260						55,856.2582
Unmitigated	14.5805	54.8418	152.9935	0.6185	72.5165	0.4342	72.9507	19.3453	0.4043	19.7496						62,752.0966

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,187.88	1,632.48	1383.96	3,251,683	2,867,984
City Park	0.00	0.00	0.00		
City Park	0.00	0.00	0.00		
Elementary School	638.55	0.00	0.00	1,174,696	1,036,082
General Office Building	0.00	0.00	0.00		
Health Club	649.88	391.31	501.19	846,726	746,813
Other Asphalt Surfaces	0.00	0.00	0.00		
Racquet Club	0.00	0.00	0.00		
Recreational Swimming Pool	0.00	0.00	0.00		
Recreational Swimming Pool	0.00	0.00	0.00		
Regional Shopping Center	402.10	532.68	269.06	580,080	511,630
Single Family Housing	8,051.40	10,554.15	9180.30	21,781,672	19,211,434
Total	10,929.80	13,110.62	11,334.51	27,634,856	24,373,943

4.3 Trip Type Information

Olsen-Chandler - San Luis Obispo County APCD Air District, Summer

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
City Park	13.00	5.00	5.00	33.00	48.00	19.00	66	28	6
City Park	13.00	5.00	5.00	33.00	48.00	19.00	66	28	6
Elementary School	13.00	5.00	5.00	65.00	30.00	5.00	63	25	12
General Office Building	13.00	5.00	5.00	33.00	48.00	19.00	77	19	4
Health Club	13.00	5.00	5.00	16.90	64.10	19.00	52	39	9
Other Asphalt Surfaces	13.00	5.00	5.00	0.00	0.00	0.00	0	0	0
Racquet Club	13.00	5.00	5.00	11.50	69.50	19.00	52	39	9
Recreational Swimming Pool	13.00	5.00	5.00	33.00	48.00	19.00	52	39	9
Recreational Swimming Pool	13.00	5.00	5.00	33.00	48.00	19.00	52	39	9
Regional Shopping Center	13.00	5.00	5.00	16.30	64.70	19.00	54	35	11
Single Family Housing	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759
City Park	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759
Elementary School	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759
General Office Building	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759
Health Club	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759
Other Asphalt Surfaces	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759
Racquet Club	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759
Recreational Swimming Pool	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759
Regional Shopping Center	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759
Single Family Housing	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.9363	8.0229	3.5622	0.0511		0.6469	0.6469		0.6469	0.6469						10,275.2648
NaturalGas Unmitigated	1.0263	8.7937	3.9041	0.0560		0.7091	0.7091		0.7091	0.7091						11,262.6101

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	6370.79	0.0687	0.5871	0.2498	3.7500e-003		0.0475	0.0475		0.0475	0.0475						753.9585
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Elementary School	2090.73	0.0226	0.2050	0.1722	1.2300e-003		0.0156	0.0156		0.0156	0.0156						247.4294
General Office Building	25.8332	2.8000e-004	2.5300e-003	2.1300e-003	2.0000e-005		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004						3.0573
Health Club	1355.28	0.0146	0.1329	0.1116	8.0000e-004		0.0101	0.0101		0.0101	0.0101						160.3924
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Racquet Club	448.46	4.8400e-003	0.0440	0.0369	2.6000e-004		3.3400e-003	3.3400e-003		3.3400e-003	3.3400e-003						53.0735
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Regional Shopping Center	69.2105	7.5000e-004	6.7900e-003	5.7000e-003	4.0000e-005		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004						8.1908
Single Family Housing	84806.4	0.9146	7.8155	3.3257	0.0499		0.6319	0.6319		0.6319	0.6319						10,036.5083
Total		**1.0263**	**8.7937**	**3.9041**	**0.0560**		**0.7091**	**0.7091**		**0.7091**	**0.7091**						**11,262.6101**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	5.93079	0.0640	0.5466	0.2326	3.4900e-003		0.0442	0.0442		0.0442	0.0442						701.8862
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Elementary School	1.8922	0.0204	0.1855	0.1558	1.1100e-003		0.0141	0.0141		0.0141	0.0141						223.9343
General Office Building	0.0232594	2.5000e-004	2.2800e-003	1.9200e-003	1.0000e-005		1.7000e-004	1.7000e-004		1.7000e-004	1.7000e-004						2.7527
Health Club	1.25402	0.0135	0.1229	0.1033	7.4000e-004		9.3400e-003	9.3400e-003		9.3400e-003	9.3400e-003						148.4086
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Racquet Club	0.414953	4.4700e-003	0.0407	0.0342	2.4000e-004		3.0900e-003	3.0900e-003		3.0900e-003	3.0900e-003						49.1081
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Regional Shopping Center	0.0622894	6.7000e-004	6.1100e-003	5.1300e-003	4.0000e-005		4.6000e-004	4.6000e-004		4.6000e-004	4.6000e-004						7.3717
Single Family Housing	77.2463	0.8331	7.1188	3.0293	0.0454		0.5756	0.5756		0.5756	0.5756						9,141.8032
Total		**0.9363**	**8.0229**	**3.5622**	**0.0511**		**0.6469**	**0.6469**		**0.6469**	**0.6469**						**10,275.2648**

6.0 Area Detail

6.1 Mitigation Measures Area

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	71.8815	1.2272	106.4642	5.6400e-003		0.5918	0.5918		0.5918	0.5918						196.8181
Unmitigated	71.8815	1.2272	106.4642	5.6400e-003		0.5918	0.5918		0.5918	0.5918						196.8181

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	19.3832					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	49.3095					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	3.1889	1.2272	106.4642	5.6400e-003		0.5918	0.5918		0.5918	0.5918						196.8181
Total	**71.8815**	**1.2272**	**106.4642**	**5.6400e-003**		**0.5918**	**0.5918**		**0.5918**	**0.5918**						**196.8181**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	19.3832					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	49.3095					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	3.1889	1.2272	106.4642	5.6400e-003		0.5918	0.5918		0.5918	0.5918						196.8181
Total	**71.8815**	**1.2272**	**106.4642**	**5.6400e-003**		**0.5918**	**0.5918**		**0.5918**	**0.5918**						**196.8181**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Olsen-Chandler - San Luis Obispo County APCD Air District, Winter

NOTE: Does not include residential adjustment for fleet mix or solar PV, calculated separately.

Olsen-Chandler

San Luis Obispo County APCD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	0.58	1000sqft	0.01	576.00	0
Elementary School	495.00	Student	0.95	41,383.67	0
Other Asphalt Surfaces	97.60	Acre	97.60	4,251,456.00	0
City Park	45.30	Acre	45.30	1,973,268.00	0
City Park	33.80	Acre	33.80	1,472,328.00	0
Health Club	18.75	1000sqft	11.50	18,752.00	0
Racquet Club	6.21	1000sqft	3.80	6,205.00	0
Recreational Swimming Pool	0.00	1000sqft	1.10	1,789.00	0
Recreational Swimming Pool	0.00	1000sqft	0.70	1,154.00	0
Apartments Low Rise	228.00	Dwelling Unit	14.25	228,000.00	652
Single Family Housing	1,065.00	Dwelling Unit	147.45	1,917,000.00	3046
Regional Shopping Center	10.66	1000sqft	0.24	10,659.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.2	**Precipitation Freq (Days)**	44
Climate Zone	4			**Operational Year**	2030
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	298.3	**CH4 Intensity (lb/MWhr)**	0.013	**N2O Intensity (lb/MWhr)**	0.003

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Includes RPS adjustment.

Land Use - Provided by the applicant team.

Construction Phase - Based on provided phase durations. Architectural Coating, starts five months after building construction and stops at the end of building construction.

Off-road Equipment -

Off-road Equipment -

Off-road Equipment - Equipment use based on model defaults.

Off-road Equipment -

Off-road Equipment -

Off-road Equipment -

Trips and VMT - Const trips based on model defaults.

On-road Fugitive Dust -

Demolition - Demolition of 3,400 building square footage.

Grading - Based on model defaults.

Architectural Coating - Residential low-VOC content: 50 g/L, per mitigation requirements. Non-Residential low-VOC content: 100 g/L.

Vehicle Trips - Trip-gen rates for residential and school based on City of Paso Robles' Travel Demand Forecast Model (Final), prepared by Fehr & Peers (August 5, 2009), Table 2. Other uses derived from the traffic analysis prepared for this project.

Vehicle Emission Factors - Emission factors based on model defaults.

Vehicle Emission Factors -

Vehicle Emission Factors -

Woodstoves - Assumes no hearths.

Consumer Products - Consumer products, arch coatings, and landscape equipment usage based on model defaults.

Energy Use -

Water And Wastewater - Adjusted for the removal of septic systems from the default assumptions.

Construction Off-road Equipment Mitigation - Includes 50%CE for watering travel ways, 61%CE for watering disturbed areas, 15 mph onsite speed limit. Use of T3 off-road equipment included.

Mobile Land Use Mitigation -

Olsen-Chandler - San Luis Obispo County APCD Air District, Winter

Area Mitigation -
Energy Mitigation -

Waste Mitigation - Assumes 58% waste reduction, per most current (2017) state-wide diversion rate (CalRecycle https://www.calrecycle.ca.gov/lgcentral/goalmeasure/disposalrate/graphs/estdiversion)

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	100.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	100.00
tblArchitecturalCoating	EF_Residential_Exterior	250.00	50.00
tblArchitecturalCoating	EF_Residential_Interior	250.00	50.00
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	5.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	6.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3

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tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstEquipMitigation	Tier	No Change	Tier 3
tblConstructionPhase	PhaseEndDate	7/13/2021	1/7/2020
tblConstructionPhase	PhaseEndDate	6/14/2022	2/7/2020
tblConstructionPhase	PhaseEndDate	10/29/2024	6/9/2020
tblConstructionPhase	PhaseEndDate	8/4/2048	6/9/2023
tblConstructionPhase	PhaseEndDate	4/12/2050	8/11/2023
tblConstructionPhase	PhaseStartDate	7/14/2021	1/8/2020
tblConstructionPhase	PhaseStartDate	6/15/2022	2/8/2020
tblConstructionPhase	PhaseStartDate	10/30/2024	6/10/2020
tblConstructionPhase	PhaseStartDate	8/5/2048	6/10/2023
tblLandUse	LandUseSquareFeet	580.00	576.00
tblLandUse	LandUseSquareFeet	18,750.00	18,752.00
tblLandUse	LandUseSquareFeet	6,210.00	6,205.00
tblLandUse	LandUseSquareFeet	0.00	1,789.00
tblLandUse	LandUseSquareFeet	0.00	1,154.00
tblLandUse	LandUseSquareFeet	10,660.00	10,659.00
tblLandUse	LotAcreage	0.43	11.50
tblLandUse	LotAcreage	0.14	3.80

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tblLandUse	LotAcreage	0.00	1.10
tblLandUse	LotAcreage	0.00	0.70
tblLandUse	LotAcreage	345.78	147.45
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.013
tblProjectCharacteristics	CO2IntensityFactor	641.35	298.3
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.003
tblVehicleTrips	ST_TR	22.75	0.00
tblVehicleTrips	ST_TR	2.46	0.00
tblVehicleTrips	ST_TR	21.35	0.00
tblVehicleTrips	ST_TR	9.10	0.00
tblVehicleTrips	SU_TR	16.74	0.00
tblVehicleTrips	SU_TR	1.05	0.00
tblVehicleTrips	SU_TR	17.40	0.00
tblVehicleTrips	SU_TR	13.60	0.00
tblVehicleTrips	WD_TR	6.59	5.21
tblVehicleTrips	WD_TR	1.89	0.00
tblVehicleTrips	WD_TR	11.03	0.00
tblVehicleTrips	WD_TR	32.93	34.66
tblVehicleTrips	WD_TR	14.03	0.00
tblVehicleTrips	WD_TR	33.82	0.00
tblVehicleTrips	WD_TR	42.70	37.72
tblVehicleTrips	WD_TR	9.52	7.56
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79

tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	66.3224	184.5031	223.7649	0.7114	51.7979	2.3338	54.1317	13.8873	2.2093	16.0966						72,662.3857
2021	63.6301	168.2127	203.2421	0.6954	51.7992	1.7296	53.5288	13.8878	1.6332	15.5210						71,099.4826
2022	61.8452	158.0078	187.7679	0.6790	51.8004	1.5127	53.3131	13.8882	1.4284	15.3166						69,497.8760
2023	59.5761	133.1616	171.2454	0.6598	51.8017	1.1968	52.9984	13.8887	1.1276	15.0163						67,595.5298
Maximum	**66.3224**	**184.5031**	**223.7649**	**0.7114**	**51.8017**	**2.3338**	**54.1317**	**13.8887**	**2.2093**	**16.0966**						**72,662.3857**

Olsen-Chandler - San Luis Obispo County APCD Air District, Winter

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	64.6937	179.2163	224.7911	0.7114	51.7979	2.1045	53.9023	13.8873	2.0467	15.9340						72,662.3857
2021	62.2436	164.8368	204.5556	0.6954	51.7992	1.6755	53.4747	13.8878	1.6365	15.5243						71,099.4826
2022	60.6678	156.5668	189.2971	0.6790	51.8004	1.6206	53.4210	13.8882	1.5841	15.4724						69,497.8760
2023	58.5450	133.0567	172.8965	0.6598	51.8017	1.4248	53.2265	13.8887	1.3970	15.2857						67,595.5298
Maximum	**64.6937**	**179.2163**	**224.7911**	**0.7114**	**51.8017**	**2.1045**	**53.9023**	**13.8887**	**2.0467**	**15.9340**						**72,662.3857**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**2.08**	**1.59**	**-0.70**	**0.00**	**0.00**	**-0.78**	**-0.02**	**0.00**	**-4.15**	**-0.43**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	71.8815	1.2272	106.4642	5.6400e-003		0.5918	0.5918		0.5918	0.5918						196.8181
Energy	1.0263	8.7937	3.9041	0.0560		0.7091	0.7091		0.7091	0.7091						11,262.6101
Mobile	13.8386	56.2516	154.5161	0.5938	72.5165	0.4354	72.9520	19.3453	0.4055	19.7508						60,265.0457
Total	**86.7464**	**66.2725**	**264.8844**	**0.6555**	**72.5165**	**1.7364**	**74.2529**	**19.3453**	**1.7064**	**21.0517**						**71,724.4739**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	71.8815	1.2272	106.4642	5.6400e-003		0.5918	0.5918		0.5918	0.5918						196.8181
Energy	0.9363	8.0229	3.5622	0.0511		0.6469	0.6469		0.6469	0.6469						10,275.2648
Mobile	13.3073	52.9211	141.2552	0.5283	63.9596	0.3916	64.3512	17.0626	0.3647	17.4272						53,620.5128
Total	**86.1251**	**62.1711**	**251.2815**	**0.5850**	**63.9596**	**1.6304**	**65.5900**	**17.0626**	**1.6034**	**18.6660**						**64,092.5956**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.72**	**6.19**	**5.14**	**10.75**	**11.80**	**6.10**	**11.67**	**11.80**	**6.04**	**11.33**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**10.64**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2020	1/7/2020	5	400	
2	Site Preparation	Site Preparation	1/8/2020	2/7/2020	5	240	
3	Grading	Grading	2/8/2020	6/9/2020	5	620	
4	Building Construction	Building Construction	6/10/2020	6/9/2023	5	6200	
5	Architectural Coating	Architectural Coating	11/10/2020	6/9/2023	5	440	
6	Paving	Paving	6/10/2023	8/11/2023	5	440	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 1550

Acres of Paving: 97.6

Residential Indoor: 4,343,625; Residential Outdoor: 1,447,875; Non-Residential Indoor: 120,778; Non-Residential Outdoor: 40,259; Striped Parking Area: 255,087 (Architectural Coating – sqft)

OffRoad Equipment

Olsen-Chandler - San Luis Obispo County APCD Air District, Winter

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Olsen-Chandler - San Luis Obispo County APCD Air District, Winter

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	15.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	3,813.00	1,413.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	763.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6400e-003	0.0000	8.6400e-003	1.3100e-003	0.0000	1.3100e-003						0.0000
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419						3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**8.6400e-003**	**1.6587**	**1.6673**	**1.3100e-003**	**1.5419**	**1.5432**						**3,774.1536**

Olsen-Chandler - San Luis Obispo County APCD Air District, Winter

3.2 Demolition - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.3000e-004	0.0119	2.7100e-003	3.0000e-005	0.0398	5.0000e-005	0.0399	9.7900e-003	5.0000e-005	9.8400e-003						3.1571
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0731	0.0607	0.5180	1.3300e-003	0.1483	9.5000e-004	0.1492	0.0393	8.8000e-004	0.0402						132.2033
Total	**0.0735**	**0.0727**	**0.5207**	**1.3600e-003**	**0.1881**	**1.0000e-003**	**0.1891**	**0.0491**	**9.3000e-004**	**0.0501**						**135.3604**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.3700e-003	0.0000	3.3700e-003	5.1000e-004	0.0000	5.1000e-004						0.0000
Off-Road	0.9246	18.3130	24.6739	0.0388		0.8627	0.8627		0.8627	0.8627						3,774.1536
Total	**0.9246**	**18.3130**	**24.6739**	**0.0388**	**3.3700e-003**	**0.8627**	**0.8661**	**5.1000e-004**	**0.8627**	**0.8632**						**3,774.1536**

3.2 Demolition - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	3.3000e-004	0.0119	2.7100e-003	3.0000e-005	0.0398	5.0000e-005	0.0399	9.7900e-003	5.0000e-005	9.8400e-003						3.1571
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0731	0.0607	0.5180	1.3300e-003	0.1483	9.5000e-004	0.1492	0.0393	8.8000e-004	0.0402						132.2033
Total	**0.0735**	**0.0727**	**0.5207**	**1.3600e-003**	**0.1881**	**1.0000e-003**	**0.1891**	**0.0491**	**9.3000e-004**	**0.0501**						**135.3604**

3.3 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307						0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216						3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0663**	**2.1974**	**20.2637**	**9.9307**	**2.0216**	**11.9523**						**3,714.8975**

3.3 Site Preparation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0878	0.0729	0.6216	1.5900e-003	0.1780	1.1400e-003	0.1791	0.0472	1.0500e-003	0.0483						158.6439
Total	**0.0878**	**0.0729**	**0.6216**	**1.5900e-003**	**0.1780**	**1.1400e-003**	**0.1791**	**0.0472**	**1.0500e-003**	**0.0483**						**158.6439**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					7.0458	0.0000	7.0458	3.8730	0.0000	3.8730						0.0000
Off-Road	0.9312	19.0656	22.9600	0.0380		0.9462	0.9462		0.9462	0.9462						3,714.8975
Total	**0.9312**	**19.0656**	**22.9600**	**0.0380**	**7.0458**	**0.9462**	**7.9920**	**3.8730**	**0.9462**	**4.8191**						**3,714.8975**

3.3 Site Preparation - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0878	0.0729	0.6216	1.5900e-003	0.1780	1.1400e-003	0.1791	0.0472	1.0500e-003	0.0483						158.6439
Total	**0.0878**	**0.0729**	**0.6216**	**1.5900e-003**	**0.1780**	**1.1400e-003**	**0.1791**	**0.0472**	**1.0500e-003**	**0.0483**						**158.6439**

3.4 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965						0.0000
Off-Road	4.4501	50.1975	31.9583	0.0620		2.1739	2.1739		2.0000	2.0000						6,054.4257
Total	**4.4501**	**50.1975**	**31.9583**	**0.0620**	**8.6733**	**2.1739**	**10.8472**	**3.5965**	**2.0000**	**5.5965**						**6,054.4257**

3.4 Grading - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0975	0.0810	0.6907	1.7700e-003	0.1977	1.2600e-003	0.1990	0.0524	1.1700e-003	0.0536						176.2710
Total	**0.0975**	**0.0810**	**0.6907**	**1.7700e-003**	**0.1977**	**1.2600e-003**	**0.1990**	**0.0524**	**1.1700e-003**	**0.0536**						**176.2710**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.3826	0.0000	3.3826	1.4026	0.0000	1.4026						0.0000
Off-Road	1.5231	29.9782	36.7226	0.0620		1.2994	1.2994		1.2994	1.2994						6,054.4257
Total	**1.5231**	**29.9782**	**36.7226**	**0.0620**	**3.3826**	**1.2994**	**4.6820**	**1.4026**	**1.2994**	**2.7021**						**6,054.4257**

3.4 Grading - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0975	0.0810	0.6907	1.7700e-003	0.1977	1.2600e-003	0.1990	0.0524	1.1700e-003	0.0536						176.2710
Total	**0.0975**	**0.0810**	**0.6907**	**1.7700e-003**	**0.1977**	**1.2600e-003**	**0.1990**	**0.0524**	**1.1700e-003**	**0.0536**						**176.2710**

3.5 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503						2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**						**2,568.6345**

Olsen-Chandler - San Luis Obispo County APCD Air District, Winter

3.5 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	5.4189	145.1021	47.0554	0.2767	6.5589	0.8165	7.3755	1.8890	0.7811	2.6701						29,480.9464
Worker	18.5904	15.4413	131.6798	0.3373	37.6958	0.2411	37.9369	9.9977	0.2224	10.2201						33,606.0722
Total	**24.0092**	**160.5434**	**178.7352**	**0.6140**	**44.2548**	**1.0576**	**45.3123**	**11.8867**	**1.0035**	**12.8902**						**63,087.0186**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6739	14.2261	17.8738	0.0269		0.9036	0.9036		0.9036	0.9036						2,568.6345
Total	**0.6739**	**14.2261**	**17.8738**	**0.0269**		**0.9036**	**0.9036**		**0.9036**	**0.9036**						**2,568.6345**

3.5 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	5.4189	145.1021	47.0554	0.2767	6.5589	0.8165	7.3755	1.8890	0.7811	2.6701						29,480.9464
Worker	18.5904	15.4413	131.6798	0.3373	37.6958	0.2411	37.9369	9.9977	0.2224	10.2201						33,606.0722
Total	**24.0092**	**160.5434**	**178.7352**	**0.6140**	**44.2548**	**1.0576**	**45.3123**	**11.8867**	**1.0035**	**12.8902**						**63,087.0186**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013						2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**						**2,568.7643**

Olsen-Chandler - San Luis Obispo County APCD Air District, Winter

3.5 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	4.4592	132.6853	41.7274	0.2747	6.5603	0.3967	6.9570	1.8895	0.3795	2.2690						29,295.1205
Worker	17.3485	13.8059	119.2579	0.3257	37.6958	0.2334	37.9293	9.9977	0.2153	10.2130						32,458.5516
Total	**21.8077**	**146.4912**	**160.9853**	**0.6003**	**44.2561**	**0.6302**	**44.8863**	**11.8872**	**0.5948**	**12.4820**						**61,753.6721**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6739	14.2261	17.8738	0.0269		0.9036	0.9036		0.9036	0.9036						2,568.7643
Total	**0.6739**	**14.2261**	**17.8738**	**0.0269**		**0.9036**	**0.9036**		**0.9036**	**0.9036**						**2,568.7643**

3.5 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	4.4592	132.6853	41.7274	0.2747	6.5603	0.3967	6.9570	1.8895	0.3795	2.2690						29,295.1205
Worker	17.3485	13.8059	119.2579	0.3257	37.6958	0.2334	37.9293	9.9977	0.2153	10.2130						32,458.5516
Total	**21.8077**	**146.4912**	**160.9853**	**0.6003**	**44.2561**	**0.6302**	**44.8863**	**11.8872**	**0.5948**	**12.4820**						**61,753.6721**

3.5 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612						2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**						**2,569.6322**

3.5 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	4.1255	126.0866	38.5744	0.2724	6.5615	0.3497	6.9112	1.8900	0.3345	2.2244						29,086.9758
Worker	16.3134	12.4132	109.1709	0.3139	37.6958	0.2268	37.9227	9.9977	0.2092	10.2069						31,296.7322
Total	**20.4389**	**138.4998**	**147.7453**	**0.5863**	**44.2573**	**0.5766**	**44.8339**	**11.8876**	**0.5437**	**12.4313**						**60,383.7080**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6739	14.2261	17.8738	0.0269		0.9036	0.9036		0.9036	0.9036						2,569.6322
Total	**0.6739**	**14.2261**	**17.8738**	**0.0269**		**0.9036**	**0.9036**		**0.9036**	**0.9036**						**2,569.6322**

Olsen-Chandler - San Luis Obispo County APCD Air District, Winter

3.5 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	4.1255	126.0866	38.5744	0.2724	6.5615	0.3497	6.9112	1.8900	0.3345	2.2244						29,086.9758
Worker	16.3134	12.4132	109.1709	0.3139	37.6958	0.2268	37.9227	9.9977	0.2092	10.2069						31,296.7322
Total	**20.4389**	**138.4998**	**147.7453**	**0.5863**	**44.2573**	**0.5766**	**44.8339**	**11.8876**	**0.5437**	**12.4313**						**60,383.7080**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584						2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**						**2,570.4061**

Olsen-Chandler - San Luis Obispo County APCD Air District, Winter

3.5 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	3.1524	104.0849	33.6497	0.2674	6.5627	0.1610	6.7237	1.8904	0.1539	2.0443						28,594.3384
Worker	15.3555	11.1564	99.6084	0.3021	37.6958	0.2210	37.9168	9.9977	0.2037	10.2014						30,121.4637
Total	**18.5079**	**115.2413**	**133.2582**	**0.5695**	**44.2585**	**0.3820**	**44.6405**	**11.8881**	**0.3576**	**12.2457**						**58,715.8021**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.6739	14.2261	17.8738	0.0269		0.9036	0.9036		0.9036	0.9036						2,570.4061
Total	**0.6739**	**14.2261**	**17.8738**	**0.0269**		**0.9036**	**0.9036**		**0.9036**	**0.9036**						**2,570.4061**

3.5 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	3.1524	104.0849	33.6497	0.2674	6.5627	0.1610	6.7237	1.8904	0.1539	2.0443						28,594.3384
Worker	15.3555	11.1564	99.6084	0.3021	37.6958	0.2210	37.9168	9.9977	0.2037	10.2014						30,121.4637
Total	**18.5079**	**115.2413**	**133.2582**	**0.5695**	**44.2585**	**0.3820**	**44.6405**	**11.8881**	**0.3576**	**12.2457**						**58,715.8021**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.2311					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.2422	1.6838	1.8314	2.9700e-003		0.1109	0.1109		0.1109	0.1109						281.9928
Total	**36.4733**	**1.6838**	**1.8314**	**2.9700e-003**		**0.1109**	**0.1109**		**0.1109**	**0.1109**						**281.9928**

Olsen-Chandler - San Luis Obispo County APCD Air District, Winter

3.6 Architectural Coating - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	3.7200	3.0899	26.3498	0.0675	7.5431	0.0482	7.5914	2.0006	0.0445	2.0451						6,724.7399
Total	**3.7200**	**3.0899**	**26.3498**	**0.0675**	**7.5431**	**0.0482**	**7.5914**	**2.0006**	**0.0445**	**2.0451**						**6,724.7399**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.2311					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.0594	1.3570	1.8324	2.9700e-003		0.0951	0.0951		0.0951	0.0951						281.9928
Total	**36.2906**	**1.3570**	**1.8324**	**2.9700e-003**		**0.0951**	**0.0951**		**0.0951**	**0.0951**						**281.9928**

3.6 Architectural Coating - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	3.7200	3.0899	26.3498	0.0675	7.5431	0.0482	7.5914	2.0006	0.0445	2.0451						6,724.7399
Total	**3.7200**	**3.0899**	**26.3498**	**0.0675**	**7.5431**	**0.0482**	**7.5914**	**2.0006**	**0.0445**	**2.0451**						**6,724.7399**

3.6 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.2311					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941						281.9309
Total	**36.4500**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**						**281.9309**

3.6 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	3.4715	2.7626	23.8641	0.0652	7.5431	0.0467	7.5898	2.0006	0.0431	2.0437						6,495.1154
Total	**3.4715**	**2.7626**	**23.8641**	**0.0652**	**7.5431**	**0.0467**	**7.5898**	**2.0006**	**0.0431**	**2.0437**						**6,495.1154**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.2311					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.0594	1.3570	1.8324	2.9700e-003		0.0951	0.0951		0.0951	0.0951						281.9309
Total	**36.2906**	**1.3570**	**1.8324**	**2.9700e-003**		**0.0951**	**0.0951**		**0.0951**	**0.0951**						**281.9309**

3.6 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	3.4715	2.7626	23.8641	0.0652	7.5431	0.0467	7.5898	2.0006	0.0431	2.0437						6,495.1154
Total	**3.4715**	**2.7626**	**23.8641**	**0.0652**	**7.5431**	**0.0467**	**7.5898**	**2.0006**	**0.0431**	**2.0437**						**6,495.1154**

3.6 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.2311					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817						281.9062
Total	**36.4357**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**						**281.9062**

3.6 Architectural Coating - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	3.2644	2.4839	21.8456	0.0628	7.5431	0.0454	7.5885	2.0006	0.0419	2.0424						6,262.6296
Total	**3.2644**	**2.4839**	**21.8456**	**0.0628**	**7.5431**	**0.0454**	**7.5885**	**2.0006**	**0.0419**	**2.0424**						**6,262.6296**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.2311					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.0594	1.3570	1.8324	2.9700e-003		0.0951	0.0951		0.0951	0.0951						281.9062
Total	**36.2906**	**1.3570**	**1.8324**	**2.9700e-003**		**0.0951**	**0.0951**		**0.0951**	**0.0951**						**281.9062**

3.6 Architectural Coating - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	3.2644	2.4839	21.8456	0.0628	7.5431	0.0454	7.5885	2.0006	0.0419	2.0424						6,262.6296
Total	**3.2644**	**2.4839**	**21.8456**	**0.0628**	**7.5431**	**0.0454**	**7.5885**	**2.0006**	**0.0419**	**2.0424**						**6,262.6296**

3.6 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.2311					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708						281.8690
Total	**36.4228**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**						**281.8690**

3.6 Architectural Coating - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	3.0727	2.2324	19.9321	0.0604	7.5431	0.0442	7.5873	2.0006	0.0408	2.0414						6,027.4526
Total	**3.0727**	**2.2324**	**19.9321**	**0.0604**	**7.5431**	**0.0442**	**7.5873**	**2.0006**	**0.0408**	**2.0414**						**6,027.4526**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	36.2311					0.0000	0.0000		0.0000	0.0000						0.0000
Off-Road	0.0594	1.3570	1.8324	2.9700e-003		0.0951	0.0951		0.0951	0.0951						281.8690
Total	**36.2906**	**1.3570**	**1.8324**	**2.9700e-003**		**0.0951**	**0.0951**		**0.0951**	**0.0951**						**281.8690**

3.6 Architectural Coating - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	3.0727	2.2324	19.9321	0.0604	7.5431	0.0442	7.5873	2.0006	0.0408	2.0414						6,027.4526
Total	**3.0727**	**2.2324**	**19.9321**	**0.0604**	**7.5431**	**0.0442**	**7.5873**	**2.0006**	**0.0408**	**2.0414**						**6,027.4526**

3.7 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0327	10.1917	14.5842	0.0228		0.5102	0.5102		0.4694	0.4694						2,225.4336
Paving	0.5812					0.0000	0.0000		0.0000	0.0000						0.0000
Total	**1.6139**	**10.1917**	**14.5842**	**0.0228**		**0.5102**	**0.5102**		**0.4694**	**0.4694**						**2,225.4336**

3.7 Paving - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0604	0.0439	0.3919	1.1900e-003	0.1483	8.7000e-004	0.1492	0.0393	8.0000e-004	0.0401						118.4951
Total	**0.0604**	**0.0439**	**0.3919**	**1.1900e-003**	**0.1483**	**8.7000e-004**	**0.1492**	**0.0393**	**8.0000e-004**	**0.0401**						**118.4951**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.5609	11.2952	17.2957	0.0228		0.6093	0.6093		0.6093	0.6093						2,225.4336
Paving	0.5812					0.0000	0.0000		0.0000	0.0000						0.0000
Total	**1.1421**	**11.2952**	**17.2957**	**0.0228**		**0.6093**	**0.6093**		**0.6093**	**0.6093**						**2,225.4336**

3.7 Paving - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0604	0.0439	0.3919	1.1900e-003	0.1483	8.7000e-004	0.1492	0.0393	8.0000e-004	0.0401						118.4951
Total	**0.0604**	**0.0439**	**0.3919**	**1.1900e-003**	**0.1483**	**8.7000e-004**	**0.1492**	**0.0393**	**8.0000e-004**	**0.0401**						**118.4951**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Transit Accessibility

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	13.3073	52.9211	141.2552	0.5283	63.9596	0.3916	64.3512	17.0626	0.3647	17.4272						53,620.5128
Unmitigated	13.8386	56.2516	154.5161	0.5938	72.5165	0.4354	72.9520	19.3453	0.4055	19.7508						60,265.0457

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,187.88	1,632.48	1383.96	3,251,683	2,867,984
City Park	0.00	0.00	0.00		
City Park	0.00	0.00	0.00		
Elementary School	638.55	0.00	0.00	1,174,696	1,036,082
General Office Building	0.00	0.00	0.00		
Health Club	649.88	391.31	501.19	846,726	746,813
Other Asphalt Surfaces	0.00	0.00	0.00		
Racquet Club	0.00	0.00	0.00		
Recreational Swimming Pool	0.00	0.00	0.00		
Recreational Swimming Pool	0.00	0.00	0.00		
Regional Shopping Center	402.10	532.68	269.06	580,080	511,630
Single Family Housing	8,051.40	10,554.15	9180.30	21,781,672	19,211,434
Total	10,929.80	13,110.62	11,334.51	27,634,856	24,373,943

4.3 Trip Type Information

Olsen-Chandler - San Luis Obispo County APCD Air District, Winter

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
City Park	13.00	5.00	5.00	33.00	48.00	19.00	66	28	6
City Park	13.00	5.00	5.00	33.00	48.00	19.00	66	28	6
Elementary School	13.00	5.00	5.00	65.00	30.00	5.00	63	25	12
General Office Building	13.00	5.00	5.00	33.00	48.00	19.00	77	19	4
Health Club	13.00	5.00	5.00	16.90	64.10	19.00	52	39	9
Other Asphalt Surfaces	13.00	5.00	5.00	0.00	0.00	0.00	0	0	0
Racquet Club	13.00	5.00	5.00	11.50	69.50	19.00	52	39	9
Recreational Swimming Pool	13.00	5.00	5.00	33.00	48.00	19.00	52	39	9
Recreational Swimming Pool	13.00	5.00	5.00	33.00	48.00	19.00	52	39	9
Regional Shopping Center	13.00	5.00	5.00	16.30	64.70	19.00	54	35	11
Single Family Housing	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759
City Park	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759
Elementary School	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759
General Office Building	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759
Health Club	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759
Other Asphalt Surfaces	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759
Racquet Club	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759
Recreational Swimming Pool	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759
Regional Shopping Center	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759
Single Family Housing	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.9363	8.0229	3.5622	0.0511		0.6469	0.6469		0.6469	0.6469						10,275.2648
NaturalGas Unmitigated	1.0263	8.7937	3.9041	0.0560		0.7091	0.7091		0.7091	0.7091						11,262.6101

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	6370.79	0.0687	0.5871	0.2498	3.7500e-003		0.0475	0.0475		0.0475	0.0475						753.9585
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Elementary School	2090.73	0.0226	0.2050	0.1722	1.2300e-003		0.0156	0.0156		0.0156	0.0156						247.4294
General Office Building	25.8332	2.8000e-004	2.5300e-003	2.1300e-003	2.0000e-005		1.9000e-004	1.9000e-004		1.9000e-004	1.9000e-004						3.0573
Health Club	1355.28	0.0146	0.1329	0.1116	8.0000e-004		0.0101	0.0101		0.0101	0.0101						160.3924
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Racquet Club	448.46	4.8400e-003	0.0440	0.0369	2.6000e-004		3.3400e-003	3.3400e-003		3.3400e-003	3.3400e-003						53.0735
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Regional Shopping Center	69.2105	7.5000e-004	6.7900e-003	5.7000e-003	4.0000e-005		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004						8.1908
Single Family Housing	84806.4	0.9146	7.8155	3.3257	0.0499		0.6319	0.6319		0.6319	0.6319						10,036.5083
Total		**1.0263**	**8.7937**	**3.9041**	**0.0560**		**0.7091**	**0.7091**		**0.7091**	**0.7091**						**11,262.6101**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	5.93079	0.0640	0.5466	0.2326	3.4900e-003		0.0442	0.0442		0.0442	0.0442						701.8862
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Elementary School	1.8922	0.0204	0.1855	0.1558	1.1100e-003		0.0141	0.0141		0.0141	0.0141						223.9343
General Office Building	0.0232594	2.5000e-004	2.2800e-003	1.9200e-003	1.0000e-005		1.7000e-004	1.7000e-004		1.7000e-004	1.7000e-004						2.7527
Health Club	1.25402	0.0135	0.1229	0.1033	7.4000e-004		9.3400e-003	9.3400e-003		9.3400e-003	9.3400e-003						148.4086
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Racquet Club	0.414953	4.4700e-003	0.0407	0.0342	2.4000e-004		3.0900e-003	3.0900e-003		3.0900e-003	3.0900e-003						49.1081
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Regional Shopping Center	0.0622894	6.7000e-004	6.1100e-003	5.1300e-003	4.0000e-005		4.6000e-004	4.6000e-004		4.6000e-004	4.6000e-004						7.3717
Single Family Housing	77.2463	0.8331	7.1188	3.0293	0.0454		0.5756	0.5756		0.5756	0.5756						9,141.8032
Total		**0.9363**	**8.0229**	**3.5622**	**0.0511**		**0.6469**	**0.6469**		**0.6469**	**0.6469**						**10,275.2648**

6.0 Area Detail

6.1 Mitigation Measures Area

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	71.8815	1.2272	106.4642	5.6400e-003		0.5918	0.5918		0.5918	0.5918						196.8181
Unmitigated	71.8815	1.2272	106.4642	5.6400e-003		0.5918	0.5918		0.5918	0.5918						196.8181

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	19.3832					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	49.3095					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	3.1889	1.2272	106.4642	5.6400e-003		0.5918	0.5918		0.5918	0.5918						196.8181
Total	**71.8815**	**1.2272**	**106.4642**	**5.6400e-003**		**0.5918**	**0.5918**		**0.5918**	**0.5918**						**196.8181**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	19.3832					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	49.3095					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	3.1889	1.2272	106.4642	5.6400e-003		0.5918	0.5918		0.5918	0.5918						196.8181
Total	**71.8815**	**1.2272**	**106.4642**	**5.6400e-003**		**0.5918**	**0.5918**		**0.5918**	**0.5918**						**196.8181**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Reso A - Exhibit C2 (EIR Technical Appendix)

CALEEMOD OUTPUT FILES FOR RESIDENTIAL FLEET MIX ADJUSTMENT

District Accepted Fleet Mix for Residential Projects

	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
2013	0.5322	0.1901	0.1671	0.0628	0.0020	0.0011	0.0097	0.0243	0.0000	0.0047	0.0032	0.0012	0.0016
2014	0.5352	0.1905	0.1673	0.0609	0.0019	0.0010	0.0095	0.0232	0.0000	0.0047	0.0030	0.0012	0.0016
2015	0.5376	0.1911	0.1676	0.0591	0.0018	0.0010	0.0096	0.0219	0.0000	0.0047	0.0029	0.0011	0.0016
2016	0.5398	0.1917	0.1674	0.0576	0.0018	0.0010	0.0094	0.0213	0.0000	0.0046	0.0028	0.0011	0.0015
2017	0.5410	0.1927	0.1671	0.0563	0.0017	0.0010	0.0093	0.0210	0.0000	0.0045	0.0028	0.0011	0.0015
2018	0.5412	0.1941	0.1669	0.0553	0.0017	0.0009	0.0092	0.0209	0.0000	0.0045	0.0027	0.0011	0.0015
2019	0.5411	0.1955	0.1669	0.0545	0.0016	0.0009	0.0091	0.0208	0.0000	0.0044	0.0026	0.0011	0.0015
2020	0.5402	0.1972	0.1668	0.0540	0.0016	0.0009	0.0091	0.0206	0.0000	0.0044	0.0026	0.0011	0.0015
2021	0.5373	0.2000	0.1671	0.0542	0.0014	0.0009	0.0090	0.0206	0.0000	0.0044	0.0026	0.0009	0.0016
2022	0.5343	0.2030	0.1673	0.0545	0.0013	0.0009	0.0086	0.0207	0.0000	0.0044	0.0025	0.0007	0.0018
2023	0.5305	0.2058	0.1673	0.0550	0.0011	0.0009	0.0085	0.0218	0.0000	0.0043	0.0025	0.0004	0.0019
2024	0.5277	0.2090	0.1675	0.0556	0.0009	0.0009	0.0080	0.0214	0.0000	0.0043	0.0025	0.0002	0.0020
2025	0.5244	0.2120	0.1677	0.0563	0.0008	0.0009	0.0076	0.0212	0.0000	0.0043	0.0025	0.0001	0.0022
2026	0.5215	0.2146	0.1681	0.0569	0.0008	0.0009	0.0075	0.0203	0.0000	0.0044	0.0025	0.0002	0.0023
2027	0.5185	0.2170	0.1684	0.0575	0.0008	0.0010	0.0074	0.0195	0.0000	0.0044	0.0025	0.0005	0.0025
2028	0.5159	0.2192	0.1686	0.0582	0.0008	0.0010	0.0074	0.0187	0.0000	0.0044	0.0025	0.0007	0.0026
2029	0.5134	0.2212	0.1688	0.0587	0.0008	0.0010	0.0074	0.0181	0.0000	0.0044	0.0025	0.0009	0.0028
2030	0.5110	0.2231	0.1690	0.0593	0.0008	0.0010	0.0074	0.0173	0.0000	0.0044	0.0025	0.0012	0.0030
2031	0.5076	0.2254	0.1693	0.0598	0.0008	0.0010	0.0074	0.0174	0.0000	0.0044	0.0026	0.0012	0.0031
2032	0.5044	0.2274	0.1696	0.0602	0.0008	0.0010	0.0075	0.0176	0.0000	0.0044	0.0026	0.0012	0.0033
2033	0.5014	0.2291	0.1700	0.0606	0.0008	0.0010	0.0075	0.0178	0.0000	0.0044	0.0027	0.0012	0.0035
2034	0.4987	0.2308	0.1703	0.0609	0.0008	0.0010	0.0076	0.0180	0.0000	0.0044	0.0027	0.0012	0.0036
2035	0.4960	0.2323	0.1707	0.0613	0.0008	0.0010	0.0076	0.0182	0.0000	0.0044	0.0027	0.0012	0.0038
2036	0.4933	0.2333	0.1709	0.0615	0.0008	0.0010	0.0077	0.0191	0.0000	0.0044	0.0029	0.0012	0.0039
2037	0.4907	0.2341	0.1710	0.0618	0.0009	0.0010	0.0078	0.0202	0.0000	0.0044	0.0030	0.0011	0.0040
2038	0.4883	0.2348	0.1712	0.0620	0.0009	0.0010	0.0078	0.0213	0.0000	0.0044	0.0031	0.0011	0.0041
2039	0.4857	0.2356	0.1714	0.0623	0.0009	0.0010	0.0079	0.0223	0.0000	0.0043	0.0032	0.0011	0.0043
2040	0.4834	0.2363	0.1716	0.0625	0.0009	0.0010	0.0079	0.0233	0.0000	0.0043	0.0033	0.0011	0.0044

NOTE: Obtained from the SJVAPCD. The recommended fleet mix was compared to SJVAPCD default fleet mixes contained in CalEEMod to derived adjustment factors, which were then applied to the default fleet mix for San Luis Obispo County. Adjusted fleet mixes were applied to proposed residential land uses only. All other land uses were based on CalEEMod default fleet mix assumptions.

Reso A - Exhibit C2 (EIR Technical Appendix)

RESIDENTIAL MOBILE-SOURCE EMISSIONS FLEET MIX ADJUSTMENT CALCULATION - WITHOUT MITIGATION

	DAILY MOBILE-SOURCE EMISSIONS - SUMMER WITHOUT MITIGATION										
						PM10			PM2.5		
SCENARIO/YEAR	ROG	NOX	ROG+NOX	CO	SO2	FUG	EXH	TOT	FUG	EXH	TOT
DEFAULT 2024	18.3169	76.8844	95.2013	309.7726	0.7261	65.5519	1.8489	67.4008	17.5032	1.8111	19.3143
ADJUSTED 2024	14.956	22.9351	37.8911	178.1067	0.5412	65.0065	0.479	65.4856	17.2899	0.4446	17.7345
DIFFERENCE	-3.3609	-53.9493	-57.3102	-131.666	-0.1849	-0.5454	-1.3699	-1.9152	-0.2133	-1.3665	-1.5798
DEFAULT 2030	12.8323	48.5773	61.4096	137.0068	0.5569	65.4508	0.3898	65.8406	17.4604	0.363	17.8234
ADJUSTED 2030	10.183	17.6917	27.8747	119.4822	0.4589	65.1834	0.3479	65.5313	17.3646	0.3225	17.687
DIFFERENCE	-2.6493	-30.8856	-33.5349	-17.5246	-0.098	-0.2674	-0.0419	-0.3093	-0.0958	-0.0405	-0.1364

	DAILY MOBILE-SOURCE EMISSIONS - WINTER WITHOUT MITIGATION										
						PM10			PM2.5		
SCENARIO/YEAR	ROG	NOX	ROG+NOX	CO	SO2	FUG	EXH	TOT	FUG	EXH	TOT
DEFAULT 2024	17.6081	69.7003	87.3084	312.5333	0.6998	65.5519	0.581	66.1329	17.5032	0.5431	18.0463
ADJUSTED 2024	13.9992	25.1982	39.1974	178.1828	0.5173	65.0065	0.4792	65.4857	17.2899	0.4447	17.7346
DIFFERENCE	-3.6089	-44.5021	-48.111	-134.351	-0.1825	-0.5454	-0.1018	-0.6472	-0.2133	-0.0984	-0.3117
DEFAULT 2030	12.1861	49.8578	62.0439	138.0882	0.5347	65.4508	0.3909	65.8417	17.4604	0.3641	17.8244
ADJUSTED 2030	9.4068	19.0495	28.4563	118.6142	0.4391	65.1834	0.348	65.5314	17.3646	0.3226	17.6871
DIFFERENCE	-2.7793	-30.8083	-33.5876	-19.474	-0.0956	-0.2674	-0.0429	-0.3103	-0.0958	-0.0415	-0.1373

	ANNUAL MOBILE-SOURCE EMISSIONS - WITHOUT MITIGATION											
						PM10			PM2.5			
SCENARIO/YEAR	ROG	NOX	ROG+NOX	CO	SO2	FUG	EXH	TOT	FUG	EXH	TOT	MTCO2e
DEFAULT 2024	2.5401	10.2642	12.8043	29.2673	0.0949	9.3932	0.0852	9.4784	2.5135	0.0796	2.5931	8708.357
ADJUSTED 2024	2.0222	3.656	5.6782	25.878	0.0766	9.313	0.0704	9.3834	2.4821	0.0653	2.5474	6937.462
DIFFERENCE	-0.5179	-6.6082	-7.1261	-3.3893	-0.0183	-0.0802	-0.0148	-0.095	-0.0314	-0.0143	-0.0457	-1770.9
DEFAULT 2030	1.7623	7.3553	9.1176	20.001	0.0793	9.3783	0.0573	9.4357	2.5072	0.0534	2.5606	7299.266
ADJUSTED 2030	1.3628	2.7769	4.1397	17.2622	0.065	9.339	0.0511	9.3901	2.4931	0.0474	2.5405	5904.186
DIFFERENCE	-0.3995	-4.5784	-4.9779	-2.7388	-0.0143	-0.0393	-0.0062	-0.0456	-0.0141	-0.006	-0.0201	-1395.08

Reso A - Exhibit C2 (EIR Technical Appendix)

RESIDENTIAL MOBILE-SOURCE EMISSIONS FLEET MIX ADJUSTMENT CALCULATION - WITH MITIGATION

	DAILY MOBILE-SOURCE EMISSIONS - SUMMER WITH MITIGATION										
						PM10			PM2.5		
SCENARIO/YEAR	ROG	NOX	ROG+NOX	CO	SO2	FUG	EXH	TOT	FUG	EXH	TOT
DEFAULT 2024	17.6126	62.5379	80.1505	291.2123	0.6474	57.8168	1.7291	59.5459	15.4379	1.6951	17.133
ADJUSTED 2024	14.5539	29.7265	44.2804	271.6176	0.5341	57.3358	1.641	58.9768	115.2497	1.61	16.8597
DIFFERENCE	-3.0587	-32.8114	-35.8701	-19.5947	-0.1133	-0.481	-0.0881	-0.5691	99.8118	-0.0851	-0.2733
DEFAULT 2030	12.3503	45.7477	58.098	124.2427	0.4954	57.7276	0.3503	58.0779	15.4	0.3261	15.7262
ADJUSTED 2030	9.929	16.2231	26.1521	108.3549	0.4067	57.4918	0.3132	57.805	15.3155	0.2903	15.6058
DIFFERENCE	-2.4213	-29.5246	-31.9459	-15.8878	-0.0887	-0.2358	-0.0371	-0.2729	-0.0845	-0.0358	-0.1204

	DAILY MOBILE-SOURCE EMISSIONS - WINTER WITH MITIGATION										
						PM10			PM2.5		
SCENARIO/YEAR	ROG	NOX	ROG+NOX	CO	SO2	FUG	EXH	TOT	FUG	EXH	TOT
DEFAULT 2024	16.9103	64.6939	81.6042	185.2245	0.5693	57.8168	0.5208	58.3376	15.4379	0.4867	15.9246
ADJUSTED 2024	13.6161	22.8804	36.4965	163.1621	0.4584	57.3358	0.4304	57.7661	15.2497	0.3994	15.6491
DIFFERENCE	-3.2942	-41.8135	-45.1077	-22.0624	-0.1109	-0.481	-0.0904	-0.5715	-0.1882	-0.0873	-0.2755
DEFAULT 2030	11.7066	46.8518	58.5584	126.1194	0.4756	57.7276	0.3514	58.079	15.4	0.3272	15.7272
ADJUSTED 2030	9.1635	17.4462	26.6097	108.4251	0.3892	57.4918	0.3133	57.8051	15.3155	0.2904	15.6059
DIFFERENCE	-2.5431	-29.4056	-31.9487	-17.6943	-0.0864	-0.2358	-0.0381	-0.2739	-0.0845	-0.0368	-0.1213

	ANNUAL MOBILE-SOURCE EMISSIONS - WITH MITIGATION											
						PM10			PM2.5			
SCENARIO/YEAR	ROG	NOX	ROG+NOX	CO	SO2	FUG	EXH	TOT	FUG	EXH	TOT	MTCO2e
DEFAULT 2024	2.4375	9.5285	11.966	26.736	0.0844	8.2848	0.0763	8.3611	2.2169	0.0713	2.2882	7743.172
ADJUSTED 2024	1.9652	3.3185	5.2837	23.6418	0.0679	8.214	0.0632	8.2773	2.1892	0.0587	2.2479	6147.017
DIFFERENCE	-0.4723	-6.21	-6.6823	-3.0942	-0.0165	-0.0708	-0.0131	-0.0838	-0.0277	-0.0126	-0.0403	-1596.15
DEFAULT 2030	1.6918	6.9137	8.6055	18.2301	0.0705	8.2717	0.0515	8.3232	2.2113	0.048	2.2593	6494.913
ADJUSTED 2030	1.3267	2.5429	3.8696	15.7449	0.0576	8.237	0.046	8.283	2.1989	0.0427	2.2416	5232.392
DIFFERENCE	-0.3651	-4.3708	-4.7359	-2.4852	-0.0129	-0.0347	-0.0055	-0.0402	-0.0124	-0.0053	-0.0177	-1262.52

Reso A - Exhibit C2 (EIR Technical Appendix)

ELECTRICITY ADJUSTMENT FOR RESIDENTIAL SOLAR PV

ANNUAL WITHOUT SOLAR MTCO2e		
	WITHOUT MITIGATION	**WITH MITIGATION**
DEFAULT 2024	1755.408	1656.014
DEFAULT 2030	1305.336	1230.523
ADJUSTED 2024	877.704	828.007
DIFFERENCE	-877.704	-828.007
ADJUSTED 2030	652.668	615.2615
DIFFERENCE	-652.668	-1845.7845

NOTE: Assumes a minimum 50% reduction in electricity use/emissions (CEC 2019).

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Annual

Olsen-Chandler (Residential Fleet Mix-Without Adjustment)

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1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Low Rise	228.00	Dwelling Unit	14.25	228,000.00	652
Single Family Housing	1,065.00	Dwelling Unit	147.45	1,917,000.00	3046

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.2	**Precipitation Freq (Days)**	44
Climate Zone	4			**Operational Year**	2024
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	447.45	**CH4 Intensity (lb/MWhr)**	0.02	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Annual

Project Characteristics - Model run is for calculation of mobile-source emission reductions associated with residential fleet mix adjustment only. Refer to other model runs for emissions associated with other sources/land uses.

Land Use - Provided by the applicant team.

Construction Phase - Const does not apply.

Off-road Equipment -

Off-road Equipment - .

Trips and VMT - .

On-road Fugitive Dust -

Demolition - .

Grading - .

Architectural Coating - .

Vehicle Trips - Trip-gen rates for residential based on City of Paso Robles' Travel Demand Forecast Model (Final), prepared by Fehr & Peers (August 5, 2009), Table 2. SF=7.56; MF=5.21

Vehicle Emission Factors - Emission factors based on model defaults.

Vehicle Emission Factors -

Vehicle Emission Factors -

Woodstoves - Assumes no hearths.

Consumer Products - Consumer products, arch coatings, and landscape equipment usage based on model defaults.

Energy Use -

Water And Wastewater - Adjusted for the removal of septic systems from the default assumptions (97.79 Aerobic)

Construction Off-road Equipment Mitigation - Includes 50%CE for watering travel ways, 61%CE for watering disturbed areas, 15 mph onsite speed limit. Use of T3 off-road equipment included.

Mobile Land Use Mitigation -

Area Mitigation -

Energy Mitigation -

Waste Mitigation - Assumes 58% waste reduction, per most current (2017) state-wide diversion rate (CalRecycle https://www.calrecycle.ca.gov/lgcentral/goalmeasure/disposalrate/graphs/estdiversion)

Fleet Mix - Fleet mix adjusted based on SLOAPCD-approved use of SJVAPCD-recommended residential fleet mix, adjusted based on SLO County default residential fleet mix, by year.

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Annual

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblLandUse	LotAcreage	345.78	147.45
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.02
tblProjectCharacteristics	CO2IntensityFactor	641.35	447.45
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblTripsAndVMT	WorkerTripNumber	15.00	0.00
tblVehicleTrips	WD_TR	6.59	5.21
tblVehicleTrips	WD_TR	9.52	7.56
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Annual

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	8.2800e-003	0.0830	0.0544	1.0000e-004	0.0000	4.1500e-003	4.1500e-003	0.0000	3.8500e-003	3.8500e-003						8.5596
Maximum	**8.2800e-003**	**0.0830**	**0.0544**	**1.0000e-004**	**0.0000**	**4.1500e-003**	**4.1500e-003**	**0.0000**	**3.8500e-003**	**3.8500e-003**						**8.5596**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	8.2800e-003	0.0830	0.0544	1.0000e-004	0.0000	4.1500e-003	4.1500e-003	0.0000	3.8500e-003	3.8500e-003						8.5596
Maximum	**8.2800e-003**	**0.0830**	**0.0544**	**1.0000e-004**	**0.0000**	**4.1500e-003**	**4.1500e-003**	**0.0000**	**3.8500e-003**	**3.8500e-003**						**8.5596**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

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Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-1-2020	3-31-2020	0.0913	0.0913
		Highest	0.0913	0.0913

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	12.2618	0.2027	17.5938	9.3000e-004		0.0975	0.0975		0.0975	0.0975						29.4410
Energy	0.1795	1.5335	0.6525	9.7900e-003		0.1240	0.1240		0.1240	0.1240						3,743.8921
Mobile	2.5401	10.2642	29.2673	0.0949	9.3932	0.0852	9.4784	2.5135	0.0796	2.5931						8,708.3569
Waste						0.0000	0.0000		0.0000	0.0000						680.7979
Water						0.0000	0.0000		0.0000	0.0000						199.3388
Total	**14.9813**	**12.0004**	**47.5136**	**0.1056**	**9.3932**	**0.3066**	**9.6998**	**2.5135**	**0.3011**	**2.8146**						**13,361.8267**

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Annual

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	12.2618	0.2027	17.5938	9.3000e-004		0.0975	0.0975		0.0975	0.0975						29.4410
Energy	0.1637	1.3989	0.5953	8.9300e-003		0.1131	0.1131		0.1131	0.1131						3,474.9577
Mobile	2.4375	9.5285	26.7360	0.0844	8.2848	0.0763	8.3611	2.2169	0.0713	2.2882						7,743.1719
Waste						0.0000	0.0000		0.0000	0.0000						285.9351
Water						0.0000	0.0000		0.0000	0.0000						164.7350
Total	**14.8630**	**11.1302**	**44.9252**	**0.0942**	**8.2848**	**0.2869**	**8.5717**	**2.2169**	**0.2819**	**2.4988**						**11,698.2406**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.79**	**7.25**	**5.45**	**10.78**	**11.80**	**6.43**	**11.63**	**11.80**	**6.36**	**11.22**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**12.45**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2020	1/7/2020	5	200	

Acres of Grading (Site Preparation Phase): 0

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Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	0.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

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3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Off-Road	8.2800e-003	0.0830	0.0544	1.0000e-004		4.1500e-003	4.1500e-003		3.8500e-003	3.8500e-003						8.5596
Total	**8.2800e-003**	**0.0830**	**0.0544**	**1.0000e-004**	**0.0000**	**4.1500e-003**	**4.1500e-003**	**0.0000**	**3.8500e-003**	**3.8500e-003**						**8.5596**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**						**0.0000**

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3.2 Demolition - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Off-Road	8.2800e-003	0.0830	0.0544	1.0000e-004		4.1500e-003	4.1500e-003		3.8500e-003	3.8500e-003						8.5596
Total	**8.2800e-003**	**0.0830**	**0.0544**	**1.0000e-004**	**0.0000**	**4.1500e-003**	**4.1500e-003**	**0.0000**	**3.8500e-003**	**3.8500e-003**						**8.5596**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**						**0.0000**

4.0 Operational Detail - Mobile

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4.1 Mitigation Measures Mobile

Increase Transit Accessibility

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	2.4375	9.5285	26.7360	0.0844	8.2848	0.0763	8.3611	2.2169	0.0713	2.2882						7,743.1719
Unmitigated	2.5401	10.2642	29.2673	0.0949	9.3932	0.0852	9.4784	2.5135	0.0796	2.5931						8,708.3569

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,187.88	1,632.48	1383.96	3,251,683	2,867,984
Single Family Housing	8,051.40	10,554.15	9180.30	21,781,672	19,211,434
Total	9,239.28	12,186.63	10,564.26	25,033,354	22,079,419

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
Single Family Housing	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3

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4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
Single Family Housing	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000						1,845.2245
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000						1,957.4093
NaturalGas Mitigated	0.1637	1.3989	0.5953	8.9300e-003		0.1131	0.1131		0.1131	0.1131						1,629.7332
NaturalGas Unmitigated	0.1795	1.5335	0.6525	9.7900e-003		0.1240	0.1240		0.1240	0.1240						1,786.4828

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5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	2.32534e+006	0.0125	0.1072	0.0456	6.8000e-004		8.6600e-003	8.6600e-003		8.6600e-003	8.6600e-003						124.8263
Single Family Housing	3.09543e+007	0.1669	1.4263	0.6070	9.1000e-003		0.1153	0.1153		0.1153	0.1153						1,661.6565
Total		**0.1795**	**1.5335**	**0.6525**	**9.7800e-003**		**0.1240**	**0.1240**		**0.1240**	**0.1240**						**1,786.4828**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	2.16474e+006	0.0117	0.0998	0.0425	6.4000e-004		8.0600e-003	8.0600e-003		8.0600e-003	8.0600e-003						116.2051
Single Family Housing	2.81949e+007	0.1520	1.2992	0.5528	8.2900e-003		0.1050	0.1050		0.1050	0.1050						1,513.5281
Total		**0.1637**	**1.3989**	**0.5953**	**8.9300e-003**		**0.1131**	**0.1131**		**0.1131**	**0.1131**						**1,629.7332**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	991526				202.0011
Single Family Housing	8.61646e +006				1,755.4083
Total					**1,957.4093**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	928743				189.2104
Single Family Housing	8.12858e +006				1,656.0142
Total					**1,845.2245**

6.0 Area Detail

6.1 Mitigation Measures Area

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Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	12.2618	0.2027	17.5938	9.3000e-004		0.0975	0.0975		0.0975	0.0975						29.4410
Unmitigated	12.2618	0.2027	17.5938	9.3000e-004		0.0975	0.0975		0.0975	0.0975						29.4410

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.3555					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	8.3773					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	0.5290	0.2027	17.5938	9.3000e-004		0.0975	0.0975		0.0975	0.0975						29.4410
Total	**12.2618**	**0.2027**	**17.5938**	**9.3000e-004**		**0.0975**	**0.0975**		**0.0975**	**0.0975**						**29.4410**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.3555					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	8.3773					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	0.5290	0.2027	17.5938	9.3000e-004		0.0975	0.0975		0.0975	0.0975						29.4410
Total	**12.2618**	**0.2027**	**17.5938**	**9.3000e-004**		**0.0975**	**0.0975**		**0.0975**	**0.0975**						**29.4410**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Annual

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated				164.7350
Unmitigated				199.3388

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	14.8551 / 9.36518				35.1502
Single Family Housing	69.389 / 43.7453				164.1886
Total					**199.3388**

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Annual

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	11.8841 / 8.79391				29.0484
Single Family Housing	55.5112 / 41.0768				135.6866
Total					**164.7350**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated				285.9351
Unmitigated				680.7979

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	104.88				52.7443
Single Family Housing	1248.86				628.0536
Total					**680.7979**

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Annual

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	44.0496				22.1526
Single Family Housing	524.521				263.7825
Total					**285.9351**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Annual

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Summer

Olsen-Chandler (Residential Fleet Mix-Without Adjustment)

San Luis Obispo County APCD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Low Rise	228.00	Dwelling Unit	14.25	228,000.00	652
Single Family Housing	1,065.00	Dwelling Unit	147.45	1,917,000.00	3046

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.2	**Precipitation Freq (Days)**	44
Climate Zone	4			**Operational Year**	2024
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	447.45	**CH4 Intensity (lb/MWhr)**	0.02	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Summer

Project Characteristics - Model run is for calculation of mobile-source emission reductions associated with residential fleet mix adjustment only. Refer to other model runs for emissions associated with other sources/land uses.

Land Use - Provided by the applicant team.

Construction Phase - Const does not apply.

Off-road Equipment -

Off-road Equipment - .

Trips and VMT - .

On-road Fugitive Dust -

Demolition - .

Grading - .

Architectural Coating - .

Vehicle Trips - Trip-gen rates for residential based on City of Paso Robles' Travel Demand Forecast Model (Final), prepared by Fehr & Peers (August 5, 2009), Table 2. SF=7.56; MF=5.21

Vehicle Emission Factors - Emission factors based on model defaults.

Vehicle Emission Factors -

Vehicle Emission Factors -

Woodstoves - Assumes no hearths.

Consumer Products - Consumer products, arch coatings, and landscape equipment usage based on model defaults.

Energy Use -

Water And Wastewater - Adjusted for the removal of septic systems from the default assumptions (97.79 Aerobic)

Construction Off-road Equipment Mitigation - Includes 50%CE for watering travel ways, 61%CE for watering disturbed areas, 15 mph onsite speed limit. Use of T3 off-road equipment included.

Mobile Land Use Mitigation -

Area Mitigation -

Energy Mitigation -

Waste Mitigation - Assumes 58% waste reduction, per most current (2017) state-wide diversion rate (CalRecycle https://www.calrecycle.ca.gov/lgcentral/goalmeasure/disposalrate/graphs/estdiversion)

Fleet Mix - Fleet mix adjusted based on SLOAPCD-approved use of SJVAPCD-recommended residential fleet mix, adjusted based on SLO County default residential fleet mix, by year.

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Summer

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblLandUse	LotAcreage	345.78	147.45
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.02
tblProjectCharacteristics	CO2IntensityFactor	641.35	447.45
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblTripsAndVMT	WorkerTripNumber	15.00	0.00
tblVehicleTrips	WD_TR	6.59	5.21
tblVehicleTrips	WD_TR	9.52	7.56
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Summer

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	3.3121	33.2010	21.7532	0.0388	0.0000	1.6587	1.6587	0.0000	1.5419	1.5419						3,774.1536
Maximum	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**0.0000**	**1.6587**	**1.6587**	**0.0000**	**1.5419**	**1.5419**						**3,774.1536**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	3.3121	33.2010	21.7532	0.0388	0.0000	1.6587	1.6587	0.0000	1.5419	1.5419						3,774.1536
Maximum	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**0.0000**	**1.6587**	**1.6587**	**0.0000**	**1.5419**	**1.5419**						**3,774.1536**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Summer

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	67.4951	1.2286	106.6293	5.6300e-003		0.5910	0.5910		0.5910	0.5910						196.6856
Energy	0.9833	8.4026	3.5756	0.0536		0.6794	0.6794		0.6794	0.6794						10,790.4667
Mobile	18.3169	67.2533	199.5678	0.6668	65.5519	0.5786	66.1304	17.5032	0.5407	18.0440						67,423.0787
Total	**86.7953**	**76.8844**	**309.7726**	**0.7261**	**65.5519**	**1.8489**	**67.4008**	**17.5032**	**1.8111**	**19.3143**						**78,410.2310**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	67.4951	1.2286	106.6293	5.6300e-003		0.5910	0.5910		0.5910	0.5910						196.6856
Energy	0.8970	7.6653	3.2619	0.0489		0.6198	0.6198		0.6198	0.6198						9,843.6894
Mobile	17.6126	62.5379	181.3212	0.5928	57.8168	0.5184	58.3351	15.4379	0.4844	15.9222						59,950.8982
Total	**86.0048**	**71.4318**	**291.2123**	**0.6474**	**57.8168**	**1.7291**	**59.5459**	**15.4379**	**1.6951**	**17.1330**						**69,991.2732**

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.91**	**7.09**	**5.99**	**10.84**	**11.80**	**6.48**	**11.65**	**11.80**	**6.40**	**11.29**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**10.74**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2020	1/7/2020	5	200	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	0.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Summer

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419						3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**0.0000**	**1.6587**	**1.6587**	**0.0000**	**1.5419**	**1.5419**						**3,774.1536**

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Summer

3.2 Demolition - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**						**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419						3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**0.0000**	**1.6587**	**1.6587**	**0.0000**	**1.5419**	**1.5419**						**3,774.1536**

3.2 Demolition - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**						**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Transit Accessibility

Improve Pedestrian Network

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	17.6126	62.5379	181.3212	0.5928	57.8168	0.5184	58.3351	15.4379	0.4844	15.9222						59,950.8982
Unmitigated	18.3169	67.2533	199.5678	0.6668	65.5519	0.5786	66.1304	17.5032	0.5407	18.0440						67,423.0787

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,187.88	1,632.48	1383.96	3,251,683	2,867,984
Single Family Housing	8,051.40	10,554.15	9180.30	21,781,672	19,211,434
Total	9,239.28	12,186.63	10,564.26	25,033,354	22,079,419

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
Single Family Housing	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
Single Family Housing	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Summer

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.8970	7.6653	3.2619	0.0489		0.6198	0.6198		0.6198	0.6198						9,843.6894
NaturalGas Unmitigated	0.9833	8.4026	3.5756	0.0536		0.6794	0.6794		0.6794	0.6794						10,790.4667

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	6370.79	0.0687	0.5871	0.2498	3.7500e-003		0.0475	0.0475		0.0475	0.0475						753.9585
Single Family Housing	84806.4	0.9146	7.8155	3.3257	0.0499		0.6319	0.6319		0.6319	0.6319						10,036.5083
Total		**0.9833**	**8.4026**	**3.5756**	**0.0536**		**0.6794**	**0.6794**		**0.6794**	**0.6794**						**10,790.4667**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	5.93079	0.0640	0.5466	0.2326	3.4900e-003		0.0442	0.0442		0.0442	0.0442						701.8862
Single Family Housing	77.2463	0.8331	7.1188	3.0293	0.0454		0.5756	0.5756		0.5756	0.5756						9,141.8032
Total		**0.8970**	**7.6653**	**3.2619**	**0.0489**		**0.6198**	**0.6198**		**0.6198**	**0.6198**						**9,843.6894**

6.0 Area Detail

6.1 Mitigation Measures Area

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Summer

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	67.4951	1.2286	106.6293	5.6300e-003		0.5910	0.5910		0.5910	0.5910						196.6856
Unmitigated	67.4951	1.2286	106.6293	5.6300e-003		0.5910	0.5910		0.5910	0.5910						196.6856

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	18.3860					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	45.9030					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	3.2061	1.2286	106.6293	5.6300e-003		0.5910	0.5910		0.5910	0.5910						196.6856
Total	**67.4951**	**1.2286**	**106.6293**	**5.6300e-003**		**0.5910**	**0.5910**		**0.5910**	**0.5910**						**196.6856**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	18.3860					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	45.9030					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	3.2061	1.2286	106.6293	5.6300e-003		0.5910	0.5910		0.5910	0.5910						196.6856
Total	**67.4951**	**1.2286**	**106.6293**	**5.6300e-003**		**0.5910**	**0.5910**		**0.5910**	**0.5910**						**196.6856**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Summer

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Winter

Olsen-Chandler (Residential Fleet Mix-Without Adjustment)

San Luis Obispo County APCD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Low Rise	228.00	Dwelling Unit	14.25	228,000.00	652
Single Family Housing	1,065.00	Dwelling Unit	147.45	1,917,000.00	3046

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.2	**Precipitation Freq (Days)**	44
Climate Zone	4			**Operational Year**	2024
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	447.45	**CH4 Intensity (lb/MWhr)**	0.02	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Winter

Project Characteristics - Model run is for calculation of mobile-source emission reductions associated with residential fleet mix adjustment only. Refer to other model runs for emissions associated with other sources/land uses.

Land Use - Provided by the applicant team.

Construction Phase - Const does not apply.

Off-road Equipment -

Off-road Equipment - .

Trips and VMT - .

On-road Fugitive Dust -

Demolition - .

Grading - .

Architectural Coating - .

Vehicle Trips - Trip-gen rates for residential based on City of Paso Robles' Travel Demand Forecast Model (Final), prepared by Fehr & Peers (August 5, 2009), Table 2. SF=7.56; MF=5.21

Vehicle Emission Factors - Emission factors based on model defaults.

Vehicle Emission Factors -

Vehicle Emission Factors -

Woodstoves - Assumes no hearths.

Consumer Products - Consumer products, arch coatings, and landscape equipment usage based on model defaults.

Energy Use -

Water And Wastewater - Adjusted for the removal of septic systems from the default assumptions (97.79 Aerobic)

Construction Off-road Equipment Mitigation - Includes 50%CE for watering travel ways, 61%CE for watering disturbed areas, 15 mph onsite speed limit. Use of T3 off-road equipment included.

Mobile Land Use Mitigation -

Area Mitigation -

Energy Mitigation -

Waste Mitigation - Assumes 58% waste reduction, per most current (2017) state-wide diversion rate (CalRecycle https://www.calrecycle.ca.gov/lgcentral/goalmeasure/disposalrate/graphs/estdiversion)

Fleet Mix - Fleet mix adjusted based on SLOAPCD-approved use of SJVAPCD-recommended residential fleet mix, adjusted based on SLO County default residential fleet mix, by year.

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Winter

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblLandUse	LotAcreage	345.78	147.45
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.02
tblProjectCharacteristics	CO2IntensityFactor	641.35	447.45
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblTripsAndVMT	WorkerTripNumber	15.00	0.00
tblVehicleTrips	WD_TR	6.59	5.21
tblVehicleTrips	WD_TR	9.52	7.56
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Winter

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	3.3121	33.2010	21.7532	0.0388	0.0000	1.6587	1.6587	0.0000	1.5419	1.5419						3,774.1536
Maximum	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**0.0000**	**1.6587**	**1.6587**	**0.0000**	**1.5419**	**1.5419**						**3,774.1536**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	3.3121	33.2010	21.7532	0.0388	0.0000	1.6587	1.6587	0.0000	1.5419	1.5419						3,774.1536
Maximum	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**0.0000**	**1.6587**	**1.6587**	**0.0000**	**1.5419**	**1.5419**						**3,774.1536**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Winter

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	67.4951	1.2286	106.6293	5.6300e-003		0.5910	0.5910		0.5910	0.5910						196.6856
Energy	0.9833	8.4026	3.5756	0.0536		0.6794	0.6794		0.6794	0.6794						10,790.4667
Mobile	17.6081	69.7003	202.3284	0.6405	65.5519	0.5810	66.1329	17.5032	0.5431	18.0463						64,763.5281
Total	**86.0865**	**79.3315**	**312.5333**	**0.6998**	**65.5519**	**1.8514**	**67.4033**	**17.5032**	**1.8134**	**19.3167**						**75,750.6803**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	67.4951	1.2286	106.6293	5.6300e-003		0.5910	0.5910		0.5910	0.5910						196.6856
Energy	0.8970	7.6653	3.2619	0.0489		0.6198	0.6198		0.6198	0.6198						9,843.6894
Mobile	16.9103	64.6939	185.2245	0.5693	57.8168	0.5208	58.3376	15.4379	0.4867	15.9246						57,568.0319
Total	**85.3024**	**73.5878**	**295.1157**	**0.6239**	**57.8168**	**1.7316**	**59.5483**	**15.4379**	**1.6975**	**17.1353**						**67,608.4069**

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.91**	**7.24**	**5.57**	**10.85**	**11.80**	**6.47**	**11.65**	**11.80**	**6.40**	**11.29**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**10.75**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2020	1/7/2020	5	200	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	0.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Winter

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419						3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**0.0000**	**1.6587**	**1.6587**	**0.0000**	**1.5419**	**1.5419**						**3,774.1536**

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Winter

3.2 Demolition - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**						**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419						3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**0.0000**	**1.6587**	**1.6587**	**0.0000**	**1.5419**	**1.5419**						**3,774.1536**

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Winter

3.2 Demolition - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**						**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Transit Accessibility

Improve Pedestrian Network

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	16.9103	64.6939	185.2245	0.5693	57.8168	0.5208	58.3376	15.4379	0.4867	15.9246						57,568.0319
Unmitigated	17.6081	69.7003	202.3284	0.6405	65.5519	0.5810	66.1329	17.5032	0.5431	18.0463						64,763.5281

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,187.88	1,632.48	1383.96	3,251,683	2,867,984
Single Family Housing	8,051.40	10,554.15	9180.30	21,781,672	19,211,434
Total	9,239.28	12,186.63	10,564.26	25,033,354	22,079,419

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
Single Family Housing	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
Single Family Housing	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Winter

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.8970	7.6653	3.2619	0.0489		0.6198	0.6198		0.6198	0.6198						9,843.6894
NaturalGas Unmitigated	0.9833	8.4026	3.5756	0.0536		0.6794	0.6794		0.6794	0.6794						10,790.4667

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	6370.79	0.0687	0.5871	0.2498	3.7500e-003		0.0475	0.0475		0.0475	0.0475						753.9585
Single Family Housing	84806.4	0.9146	7.8155	3.3257	0.0499		0.6319	0.6319		0.6319	0.6319						10,036.5083
Total		**0.9833**	**8.4026**	**3.5756**	**0.0536**		**0.6794**	**0.6794**		**0.6794**	**0.6794**						**10,790.4667**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	5.93079	0.0640	0.5466	0.2326	3.4900e-003		0.0442	0.0442		0.0442	0.0442						701.8862
Single Family Housing	77.2463	0.8331	7.1188	3.0293	0.0454		0.5756	0.5756		0.5756	0.5756						9,141.8032
Total		**0.8970**	**7.6653**	**3.2619**	**0.0489**		**0.6198**	**0.6198**		**0.6198**	**0.6198**						**9,843.6894**

6.0 Area Detail

6.1 Mitigation Measures Area

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Winter

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	67.4951	1.2286	106.6293	5.6300e-003		0.5910	0.5910		0.5910	0.5910						196.6856
Unmitigated	67.4951	1.2286	106.6293	5.6300e-003		0.5910	0.5910		0.5910	0.5910						196.6856

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	18.3860					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	45.9030					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	3.2061	1.2286	106.6293	5.6300e-003		0.5910	0.5910		0.5910	0.5910						196.6856
Total	**67.4951**	**1.2286**	**106.6293**	**5.6300e-003**		**0.5910**	**0.5910**		**0.5910**	**0.5910**						**196.6856**

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Winter

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	18.3860					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	45.9030					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	3.2061	1.2286	106.6293	5.6300e-003		0.5910	0.5910		0.5910	0.5910						196.6856
Total	**67.4951**	**1.2286**	**106.6293**	**5.6300e-003**		**0.5910**	**0.5910**		**0.5910**	**0.5910**						**196.6856**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Winter

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Annual

Olsen-Chandler (Residential Fleet Mix-Without Adjustment)

San Luis Obispo County APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Low Rise	228.00	Dwelling Unit	14.25	228,000.00	652
Single Family Housing	1,065.00	Dwelling Unit	147.45	1,917,000.00	3046

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.2	**Precipitation Freq (Days)**	44
Climate Zone	4			**Operational Year**	2030
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	298.3	**CH4 Intensity (lb/MWhr)**	0.013	**N2O Intensity (lb/MWhr)**	0.003

1.3 User Entered Comments & Non-Default Data

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Annual

Project Characteristics - Model run is for calculation of mobile-source emission reductions associated with residential fleet mix adjustment only. Refer to other model runs for emissions associated with other sources/land uses.

Land Use - Provided by the applicant team.

Construction Phase - Const does not apply.

Off-road Equipment -

Off-road Equipment - .

Trips and VMT - .

On-road Fugitive Dust -

Demolition - .

Grading - .

Architectural Coating - .

Vehicle Trips - Trip-gen rates for residential based on City of Paso Robles' Travel Demand Forecast Model (Final), prepared by Fehr & Peers (August 5, 2009), Table 2. SF=7.56; MF=5.21

Vehicle Emission Factors - Emission factors based on model defaults.

Vehicle Emission Factors -

Vehicle Emission Factors -

Woodstoves - Assumes no hearths.

Consumer Products - Consumer products, arch coatings, and landscape equipment usage based on model defaults.

Energy Use -

Water And Wastewater - Adjusted for the removal of septic systems from the default assumptions (97.79 Aerobic)

Construction Off-road Equipment Mitigation - Includes 50%CE for watering travel ways, 61%CE for watering disturbed areas, 15 mph onsite speed limit. Use of T3 off-road equipment included.

Mobile Land Use Mitigation -

Area Mitigation -

Energy Mitigation -

Waste Mitigation - Assumes 58% waste reduction, per most current (2017) state-wide diversion rate (CalRecycle https://www.calrecycle.ca.gov/lgcentral/goalmeasure/disposalrate/graphs/estdiversion)

Fleet Mix - Fleet mix adjusted based on SLOAPCD-approved use of SJVAPCD-recommended residential fleet mix, adjusted based on SLO County default residential fleet mix, by year.

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Annual

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblLandUse	LotAcreage	345.78	147.45
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.013
tblProjectCharacteristics	CO2IntensityFactor	641.35	298.3
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.003
tblVehicleTrips	WD_TR	6.59	5.21
tblVehicleTrips	WD_TR	9.52	7.56

2.0 Emissions Summary

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Annual

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	8.4400e-003	0.0832	0.0557	1.0000e-004	3.6000e-004	4.1500e-003	4.5100e-003	1.0000e-004	3.8600e-003	3.9500e-003						8.8619
Maximum	**8.4400e-003**	**0.0832**	**0.0557**	**1.0000e-004**	**3.6000e-004**	**4.1500e-003**	**4.5100e-003**	**1.0000e-004**	**3.8600e-003**	**3.9500e-003**						**8.8619**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	8.4400e-003	0.0832	0.0557	1.0000e-004	3.6000e-004	4.1500e-003	4.5100e-003	1.0000e-004	3.8600e-003	3.9500e-003						8.8619
Maximum	**8.4400e-003**	**0.0832**	**0.0557**	**1.0000e-004**	**3.6000e-004**	**4.1500e-003**	**4.5100e-003**	**1.0000e-004**	**3.8600e-003**	**3.9500e-003**						**8.8619**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Annual

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-1-2020	3-31-2020	0.0916	0.0916
		Highest	0.0916	0.0916

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	12.2578	0.2024	17.5547	9.3000e-004		0.0976	0.0976		0.0976	0.0976						29.4361
Energy	0.1795	1.5335	0.6525	9.7900e-003		0.1240	0.1240		0.1240	0.1240						3,091.8189
Mobile	1.7623	7.3553	20.0010	0.0793	9.3783	0.0573	9.4357	2.5072	0.0534	2.5606						7,299.2658
Waste						0.0000	0.0000		0.0000	0.0000						680.7979
Water						0.0000	0.0000		0.0000	0.0000						201.8553
Total	**14.1995**	**9.0912**	**38.2083**	**0.0900**	**9.3783**	**0.2789**	**9.6573**	**2.5072**	**0.2750**	**2.7822**						**11,303.1740**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	12.2578	0.2024	17.5547	9.3000e-004		0.0976	0.0976		0.0976	0.0976						29.4361
Energy	0.1637	1.3989	0.5953	8.9300e-003		0.1131	0.1131		0.1131	0.1131						2,860.2567
Mobile	1.6918	6.9137	18.2301	0.0705	8.2717	0.0515	8.3232	2.2113	0.0480	2.2593						6,494.9126
Waste						0.0000	0.0000		0.0000	0.0000						285.9351
Water						0.0000	0.0000		0.0000	0.0000						164.9946
Total	**14.1133**	**8.5149**	**36.3801**	**0.0804**	**8.2717**	**0.2622**	**8.5339**	**2.2113**	**0.2587**	**2.4700**						**9,835.5352**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.61**	**6.34**	**4.78**	**10.68**	**11.80**	**5.98**	**11.63**	**11.80**	**5.93**	**11.22**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**12.98**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2020	1/7/2020	5	200	

Acres of Grading (Site Preparation Phase): 0

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Annual

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Annual

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Off-Road	8.2800e-003	0.0830	0.0544	1.0000e-004		4.1500e-003	4.1500e-003		3.8500e-003	3.8500e-003						8.5596
Total	**8.2800e-003**	**0.0830**	**0.0544**	**1.0000e-004**	**0.0000**	**4.1500e-003**	**4.1500e-003**	**0.0000**	**3.8500e-003**	**3.8500e-003**						**8.5596**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	1.6000e-004	1.5000e-004	1.2900e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	1.0000e-004	0.0000	1.0000e-004						0.3023
Total	**1.6000e-004**	**1.5000e-004**	**1.2900e-003**	**0.0000**	**3.6000e-004**	**0.0000**	**3.6000e-004**	**1.0000e-004**	**0.0000**	**1.0000e-004**						**0.3023**

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Annual

3.2 Demolition - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Off-Road	8.2800e-003	0.0830	0.0544	1.0000e-004		4.1500e-003	4.1500e-003		3.8500e-003	3.8500e-003						8.5596
Total	**8.2800e-003**	**0.0830**	**0.0544**	**1.0000e-004**	**0.0000**	**4.1500e-003**	**4.1500e-003**	**0.0000**	**3.8500e-003**	**3.8500e-003**						**8.5596**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	1.6000e-004	1.5000e-004	1.2900e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	1.0000e-004	0.0000	1.0000e-004						0.3023
Total	**1.6000e-004**	**1.5000e-004**	**1.2900e-003**	**0.0000**	**3.6000e-004**	**0.0000**	**3.6000e-004**	**1.0000e-004**	**0.0000**	**1.0000e-004**						**0.3023**

4.0 Operational Detail - Mobile

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Annual

4.1 Mitigation Measures Mobile

Increase Transit Accessibility

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.6918	6.9137	18.2301	0.0705	8.2717	0.0515	8.3232	2.2113	0.0480	2.2593						6,494.9126
Unmitigated	1.7623	7.3553	20.0010	0.0793	9.3783	0.0573	9.4357	2.5072	0.0534	2.5606						7,299.2658

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,187.88	1,632.48	1383.96	3,251,683	2,867,984
Single Family Housing	8,051.40	10,554.15	9180.30	21,781,672	19,211,434
Total	9,239.28	12,186.63	10,564.26	25,033,354	22,079,419

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
Single Family Housing	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Annual

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759
Single Family Housing	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000						1,230.5236
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000						1,305.3362
NaturalGas Mitigated	0.1637	1.3989	0.5953	8.9300e-003		0.1131	0.1131		0.1131	0.1131						1,629.7332
NaturalGas Unmitigated	0.1795	1.5335	0.6525	9.7900e-003		0.1240	0.1240		0.1240	0.1240						1,786.4828

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Annual

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	2.32534e+006	0.0125	0.1072	0.0456	6.8000e-004		8.6600e-003	8.6600e-003		8.6600e-003	8.6600e-003						124.8263
Single Family Housing	3.09543e+007	0.1669	1.4263	0.6070	9.1000e-003		0.1153	0.1153		0.1153	0.1153						1,661.6565
Total		**0.1795**	**1.5335**	**0.6525**	**9.7800e-003**		**0.1240**	**0.1240**		**0.1240**	**0.1240**						**1,786.4828**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	2.16474e+006	0.0117	0.0998	0.0425	6.4000e-004		8.0600e-003	8.0600e-003		8.0600e-003	8.0600e-003						116.2051
Single Family Housing	2.81949e+007	0.1520	1.2992	0.5528	8.2900e-003		0.1050	0.1050		0.1050	0.1050						1,513.5281
Total		**0.1637**	**1.3989**	**0.5953**	**8.9300e-003**		**0.1131**	**0.1131**		**0.1131**	**0.1131**						**1,629.7332**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	991526				134.7083
Single Family Housing	8.61646e +006				1,170.6278
Total					**1,305.3361**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	928743				126.1786
Single Family Housing	8.12858e +006				1,104.3450
Total					**1,230.5236**

6.0 Area Detail

6.1 Mitigation Measures Area

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Annual

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	12.2578	0.2024	17.5547	9.3000e-004		0.0976	0.0976		0.0976	0.0976						29.4361
Unmitigated	12.2578	0.2024	17.5547	9.3000e-004		0.0976	0.0976		0.0976	0.0976						29.4361

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.3555					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	8.3773					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	0.5251	0.2024	17.5547	9.3000e-004		0.0976	0.0976		0.0976	0.0976						29.4361
Total	**12.2578**	**0.2024**	**17.5547**	**9.3000e-004**		**0.0976**	**0.0976**		**0.0976**	**0.0976**						**29.4361**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.3555					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	8.3773					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	0.5251	0.2024	17.5547	9.3000e-004		0.0976	0.0976		0.0976	0.0976						29.4361
Total	**12.2578**	**0.2024**	**17.5547**	**9.3000e-004**		**0.0976**	**0.0976**		**0.0976**	**0.0976**						**29.4361**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Annual

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated				164.9946
Unmitigated				201.8553

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	14.8551 / 9.36518				35.5940
Single Family Housing	69.389 / 43.7453				166.2613
Total					**201.8552**

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Annual

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	11.8841 / 8.79391				29.0942
Single Family Housing	55.5112 / 41.0768				135.9004
Total					**164.9946**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated				285.9351
Unmitigated				680.7979

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	104.88				52.7443
Single Family Housing	1248.86				628.0536
Total					**680.7979**

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Annual

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	44.0496				22.1526
Single Family Housing	524.521				263.7825
Total					**285.9351**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Annual

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Summer

Olsen-Chandler (Residential Fleet Mix-Without Adjustment)

San Luis Obispo County APCD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Low Rise	228.00	Dwelling Unit	14.25	228,000.00	652
Single Family Housing	1,065.00	Dwelling Unit	147.45	1,917,000.00	3046

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.2	**Precipitation Freq (Days)**	44
Climate Zone	4			**Operational Year**	2030
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	298.3	**CH4 Intensity (lb/MWhr)**	0.013	**N2O Intensity (lb/MWhr)**	0.003

1.3 User Entered Comments & Non-Default Data

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Summer

Project Characteristics - Model run is for calculation of mobile-source emission reductions associated with residential fleet mix adjustment only. Refer to other model runs for emissions associated with other sources/land uses.

Land Use - Provided by the applicant team.

Construction Phase - Const does not apply.

Off-road Equipment -

Off-road Equipment - .

Trips and VMT - .

On-road Fugitive Dust -

Demolition - .

Grading - .

Architectural Coating - .

Vehicle Trips - Trip-gen rates for residential based on City of Paso Robles' Travel Demand Forecast Model (Final), prepared by Fehr & Peers (August 5, 2009), Table 2. SF=7.56; MF=5.21

Vehicle Emission Factors - Emission factors based on model defaults.

Vehicle Emission Factors -

Vehicle Emission Factors -

Woodstoves - Assumes no hearths.

Consumer Products - Consumer products, arch coatings, and landscape equipment usage based on model defaults.

Energy Use -

Water And Wastewater - Adjusted for the removal of septic systems from the default assumptions (97.79 Aerobic)

Construction Off-road Equipment Mitigation - Includes 50%CE for watering travel ways, 61%CE for watering disturbed areas, 15 mph onsite speed limit. Use of T3 off-road equipment included.

Mobile Land Use Mitigation -

Area Mitigation -

Energy Mitigation -

Waste Mitigation - Assumes 58% waste reduction, per most current (2017) state-wide diversion rate (CalRecycle https://www.calrecycle.ca.gov/lgcentral/goalmeasure/disposalrate/graphs/estdiversion)

Fleet Mix - Fleet mix adjusted based on SLOAPCD-approved use of SJVAPCD-recommended residential fleet mix, adjusted based on SLO County default residential fleet mix, by year.

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Summer

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblLandUse	LotAcreage	345.78	147.45
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.013
tblProjectCharacteristics	CO2IntensityFactor	641.35	298.3
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.003
tblVehicleTrips	WD_TR	6.59	5.21
tblVehicleTrips	WD_TR	9.52	7.56

2.0 Emissions Summary

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Summer

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	3.3763	33.2545	22.2857	0.0402	0.1483	1.6597	1.8079	0.0393	1.5427	1.5821						3,912.8496
Maximum	**3.3763**	**33.2545**	**22.2857**	**0.0402**	**0.1483**	**1.6597**	**1.8079**	**0.0393**	**1.5427**	**1.5821**						**3,912.8496**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	3.3763	33.2545	22.2857	0.0402	0.1483	1.6597	1.8079	0.0393	1.5427	1.5821						3,912.8496
Maximum	**3.3763**	**33.2545**	**22.2857**	**0.0402**	**0.1483**	**1.6597**	**1.8079**	**0.0393**	**1.5427**	**1.5821**						**3,912.8496**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Summer

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	67.4713	1.2265	106.3922	5.6300e-003		0.5916	0.5916		0.5916	0.5916						196.6532
Energy	0.9833	8.4026	3.5756	0.0536		0.6794	0.6794		0.6794	0.6794						10,790.4667
Mobile	12.8323	48.5773	137.0068	0.5569	65.4508	0.3898	65.8406	17.4604	0.3630	17.8234						56,497.2952
Total	**81.2869**	**58.2064**	**246.9746**	**0.6161**	**65.4508**	**1.6607**	**67.1115**	**17.4604**	**1.6340**	**19.0943**						**67,484.4151**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	67.4713	1.2265	106.3922	5.6300e-003		0.5916	0.5916		0.5916	0.5916						196.6532
Energy	0.8970	7.6653	3.2619	0.0489		0.6198	0.6198		0.6198	0.6198						9,843.6894
Mobile	12.3503	45.7477	124.2427	0.4954	57.7276	0.3503	58.0779	15.4000	0.3261	15.7262						50,273.3615
Total	**80.7186**	**54.6395**	**233.8968**	**0.5500**	**57.7276**	**1.5616**	**59.2892**	**15.4000**	**1.5375**	**16.9375**						**60,313.7041**

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.70**	**6.13**	**5.30**	**10.74**	**11.80**	**5.97**	**11.66**	**11.80**	**5.91**	**11.30**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**10.63**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2020	1/7/2020	5	200	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Summer

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419						3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**0.0000**	**1.6587**	**1.6587**	**0.0000**	**1.5419**	**1.5419**						**3,774.1536**

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Summer

3.2 Demolition - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0642	0.0535	0.5325	1.3900e-003	0.1483	9.5000e-004	0.1492	0.0393	8.8000e-004	0.0402						138.6960
Total	**0.0642**	**0.0535**	**0.5325**	**1.3900e-003**	**0.1483**	**9.5000e-004**	**0.1492**	**0.0393**	**8.8000e-004**	**0.0402**						**138.6960**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419						3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**0.0000**	**1.6587**	**1.6587**	**0.0000**	**1.5419**	**1.5419**						**3,774.1536**

3.2 Demolition - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0642	0.0535	0.5325	1.3900e-003	0.1483	9.5000e-004	0.1492	0.0393	8.8000e-004	0.0402						138.6960
Total	**0.0642**	**0.0535**	**0.5325**	**1.3900e-003**	**0.1483**	**9.5000e-004**	**0.1492**	**0.0393**	**8.8000e-004**	**0.0402**						**138.6960**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Transit Accessibility

Improve Pedestrian Network

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	12.3503	45.7477	124.2427	0.4954	57.7276	0.3503	58.0779	15.4000	0.3261	15.7262						50,273.3615
Unmitigated	12.8323	48.5773	137.0068	0.5569	65.4508	0.3898	65.8406	17.4604	0.3630	17.8234						56,497.2952

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,187.88	1,632.48	1383.96	3,251,683	2,867,984
Single Family Housing	8,051.40	10,554.15	9180.30	21,781,672	19,211,434
Total	9,239.28	12,186.63	10,564.26	25,033,354	22,079,419

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
Single Family Housing	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759
Single Family Housing	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Summer

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.8970	7.6653	3.2619	0.0489		0.6198	0.6198		0.6198	0.6198						9,843.6894
NaturalGas Unmitigated	0.9833	8.4026	3.5756	0.0536		0.6794	0.6794		0.6794	0.6794						10,790.4667

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	6370.79	0.0687	0.5871	0.2498	3.7500e-003		0.0475	0.0475		0.0475	0.0475						753.9585
Single Family Housing	84806.4	0.9146	7.8155	3.3257	0.0499		0.6319	0.6319		0.6319	0.6319						10,036.5083
Total		**0.9833**	**8.4026**	**3.5756**	**0.0536**		**0.6794**	**0.6794**		**0.6794**	**0.6794**						**10,790.4667**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	5.93079	0.0640	0.5466	0.2326	3.4900e-003		0.0442	0.0442		0.0442	0.0442						701.8862
Single Family Housing	77.2463	0.8331	7.1188	3.0293	0.0454		0.5756	0.5756		0.5756	0.5756						9,141.8032
Total		**0.8970**	**7.6653**	**3.2619**	**0.0489**		**0.6198**	**0.6198**		**0.6198**	**0.6198**						**9,843.6894**

6.0 Area Detail

6.1 Mitigation Measures Area

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Summer

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	67.4713	1.2265	106.3922	5.6300e-003		0.5916	0.5916		0.5916	0.5916						196.6532
Unmitigated	67.4713	1.2265	106.3922	5.6300e-003		0.5916	0.5916		0.5916	0.5916						196.6532

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	18.3860					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	45.9030					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	3.1823	1.2265	106.3922	5.6300e-003		0.5916	0.5916		0.5916	0.5916						196.6532
Total	**67.4713**	**1.2265**	**106.3922**	**5.6300e-003**		**0.5916**	**0.5916**		**0.5916**	**0.5916**						**196.6532**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	18.3860					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	45.9030					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	3.1823	1.2265	106.3922	5.6300e-003		0.5916	0.5916		0.5916	0.5916						196.6532
Total	**67.4713**	**1.2265**	**106.3922**	**5.6300e-003**		**0.5916**	**0.5916**		**0.5916**	**0.5916**						**196.6532**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Summer

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Winter

Olsen-Chandler (Residential Fleet Mix-Without Adjustment)

San Luis Obispo County APCD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Low Rise	228.00	Dwelling Unit	14.25	228,000.00	652
Single Family Housing	1,065.00	Dwelling Unit	147.45	1,917,000.00	3046

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.2	**Precipitation Freq (Days)**	44
Climate Zone	4			**Operational Year**	2030
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	298.3	**CH4 Intensity (lb/MWhr)**	0.013	**N2O Intensity (lb/MWhr)**	0.003

1.3 User Entered Comments & Non-Default Data

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Winter

Project Characteristics - Model run is for calculation of mobile-source emission reductions associated with residential fleet mix adjustment only. Refer to other model runs for emissions associated with other sources/land uses.

Land Use - Provided by the applicant team.

Construction Phase - Const does not apply.

Off-road Equipment -

Off-road Equipment - .

Trips and VMT - .

On-road Fugitive Dust -

Demolition - .

Grading - .

Architectural Coating - .

Vehicle Trips - Trip-gen rates for residential based on City of Paso Robles' Travel Demand Forecast Model (Final), prepared by Fehr & Peers (August 5, 2009), Table 2. SF=7.56; MF=5.21

Vehicle Emission Factors - Emission factors based on model defaults.

Vehicle Emission Factors -

Vehicle Emission Factors -

Woodstoves - Assumes no hearths.

Consumer Products - Consumer products, arch coatings, and landscape equipment usage based on model defaults.

Energy Use -

Water And Wastewater - Adjusted for the removal of septic systems from the default assumptions (97.79 Aerobic)

Construction Off-road Equipment Mitigation - Includes 50%CE for watering travel ways, 61%CE for watering disturbed areas, 15 mph onsite speed limit. Use of T3 off-road equipment included.

Mobile Land Use Mitigation -

Area Mitigation -

Energy Mitigation -

Waste Mitigation - Assumes 58% waste reduction, per most current (2017) state-wide diversion rate (CalRecycle https://www.calrecycle.ca.gov/lgcentral/goalmeasure/disposalrate/graphs/estdiversion)

Fleet Mix - Fleet mix adjusted based on SLOAPCD-approved use of SJVAPCD-recommended residential fleet mix, adjusted based on SLO County default residential fleet mix, by year.

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Winter

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
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tblProjectCharacteristics	N2OIntensityFactor	0.006	0.003
tblVehicleTrips	WD_TR	6.59	5.21
tblVehicleTrips	WD_TR	9.52	7.56

2.0 Emissions Summary

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Winter

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	3.3853	33.2618	22.2712	0.0401	0.1483	1.6597	1.8079	0.0393	1.5427	1.5821						3,906.3569
Maximum	**3.3853**	**33.2618**	**22.2712**	**0.0401**	**0.1483**	**1.6597**	**1.8079**	**0.0393**	**1.5427**	**1.5821**						**3,906.3569**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	3.3853	33.2618	22.2712	0.0401	0.1483	1.6597	1.8079	0.0393	1.5427	1.5821						3,906.3569
Maximum	**3.3853**	**33.2618**	**22.2712**	**0.0401**	**0.1483**	**1.6597**	**1.8079**	**0.0393**	**1.5427**	**1.5821**						**3,906.3569**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Winter

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	67.4713	1.2265	106.3922	5.6300e-003		0.5916	0.5916		0.5916	0.5916						196.6532
Energy	0.9833	8.4026	3.5756	0.0536		0.6794	0.6794		0.6794	0.6794						10,790.4667
Mobile	12.1861	49.8578	138.0882	0.5347	65.4508	0.3909	65.8417	17.4604	0.3641	17.8244						54,264.2122
Total	**80.6407**	**59.4869**	**248.0560**	**0.5940**	**65.4508**	**1.6619**	**67.1126**	**17.4604**	**1.6350**	**19.0954**						**65,251.3321**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	67.4713	1.2265	106.3922	5.6300e-003		0.5916	0.5916		0.5916	0.5916						196.6532
Energy	0.8970	7.6653	3.2619	0.0489		0.6198	0.6198		0.6198	0.6198						9,843.6894
Mobile	11.7066	46.8518	126.1194	0.4756	57.7276	0.3514	58.0790	15.4000	0.3272	15.7272						48,267.0978
Total	**80.0749**	**55.7436**	**235.7735**	**0.5301**	**57.7276**	**1.5627**	**59.2903**	**15.4000**	**1.5385**	**16.9386**						**58,307.4404**

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.70**	**6.29**	**4.95**	**10.75**	**11.80**	**5.97**	**11.66**	**11.80**	**5.90**	**11.29**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**10.64**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2020	1/7/2020	5	200	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Winter

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419						3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**0.0000**	**1.6587**	**1.6587**	**0.0000**	**1.5419**	**1.5419**						**3,774.1536**

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Winter

3.2 Demolition - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0731	0.0607	0.5180	1.3300e-003	0.1483	9.5000e-004	0.1492	0.0393	8.8000e-004	0.0402						132.2033
Total	**0.0731**	**0.0607**	**0.5180**	**1.3300e-003**	**0.1483**	**9.5000e-004**	**0.1492**	**0.0393**	**8.8000e-004**	**0.0402**						**132.2033**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419						3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**0.0000**	**1.6587**	**1.6587**	**0.0000**	**1.5419**	**1.5419**						**3,774.1536**

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Winter

3.2 Demolition - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0731	0.0607	0.5180	1.3300e-003	0.1483	9.5000e-004	0.1492	0.0393	8.8000e-004	0.0402						132.2033
Total	**0.0731**	**0.0607**	**0.5180**	**1.3300e-003**	**0.1483**	**9.5000e-004**	**0.1492**	**0.0393**	**8.8000e-004**	**0.0402**						**132.2033**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Transit Accessibility

Improve Pedestrian Network

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	11.7066	46.8518	126.1194	0.4756	57.7276	0.3514	58.0790	15.4000	0.3272	15.7272						48,267.0978
Unmitigated	12.1861	49.8578	138.0882	0.5347	65.4508	0.3909	65.8417	17.4604	0.3641	17.8244						54,264.2122

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,187.88	1,632.48	1383.96	3,251,683	2,867,984
Single Family Housing	8,051.40	10,554.15	9180.30	21,781,672	19,211,434
Total	9,239.28	12,186.63	10,564.26	25,033,354	22,079,419

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
Single Family Housing	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759
Single Family Housing	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Winter

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.8970	7.6653	3.2619	0.0489		0.6198	0.6198		0.6198	0.6198						9,843.6894
NaturalGas Unmitigated	0.9833	8.4026	3.5756	0.0536		0.6794	0.6794		0.6794	0.6794						10,790.4667

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	6370.79	0.0687	0.5871	0.2498	3.7500e-003		0.0475	0.0475		0.0475	0.0475						753.9585
Single Family Housing	84806.4	0.9146	7.8155	3.3257	0.0499		0.6319	0.6319		0.6319	0.6319						10,036.5083
Total		**0.9833**	**8.4026**	**3.5756**	**0.0536**		**0.6794**	**0.6794**		**0.6794**	**0.6794**						**10,790.4667**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	5.93079	0.0640	0.5466	0.2326	3.4900e-003		0.0442	0.0442		0.0442	0.0442						701.8862
Single Family Housing	77.2463	0.8331	7.1188	3.0293	0.0454		0.5756	0.5756		0.5756	0.5756						9,141.8032
Total		**0.8970**	**7.6653**	**3.2619**	**0.0489**		**0.6198**	**0.6198**		**0.6198**	**0.6198**						**9,843.6894**

6.0 Area Detail

6.1 Mitigation Measures Area

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Winter

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	67.4713	1.2265	106.3922	5.6300e-003		0.5916	0.5916		0.5916	0.5916						196.6532
Unmitigated	67.4713	1.2265	106.3922	5.6300e-003		0.5916	0.5916		0.5916	0.5916						196.6532

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	18.3860					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	45.9030					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	3.1823	1.2265	106.3922	5.6300e-003		0.5916	0.5916		0.5916	0.5916						196.6532
Total	**67.4713**	**1.2265**	**106.3922**	**5.6300e-003**		**0.5916**	**0.5916**		**0.5916**	**0.5916**						**196.6532**

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Winter

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	18.3860					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	45.9030					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	3.1823	1.2265	106.3922	5.6300e-003		0.5916	0.5916		0.5916	0.5916						196.6532
Total	**67.4713**	**1.2265**	**106.3922**	**5.6300e-003**		**0.5916**	**0.5916**		**0.5916**	**0.5916**						**196.6532**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

Olsen-Chandler (Residential Fleet Mix-Without Adjustment) - San Luis Obispo County APCD Air District, Winter

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

Olsen-Chandler (Residential Fleet Mix-With Adjustment)

San Luis Obispo County APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Low Rise	228.00	Dwelling Unit	14.25	228,000.00	652
Single Family Housing	1,065.00	Dwelling Unit	147.45	1,917,000.00	3046

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.2	**Precipitation Freq (Days)**	44
Climate Zone	4			**Operational Year**	2024
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	447.45	**CH4 Intensity (lb/MWhr)**	0.02	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

Project Characteristics - Model run is for calculation of mobile-source emission reductions associated with residential fleet mix adjustment only. Refer to other model runs for emissions associated with other sources/land uses.

Land Use - Provided by the applicant team.

Construction Phase - Const does not apply.

Off-road Equipment -

Off-road Equipment - .

Trips and VMT - .

On-road Fugitive Dust -

Demolition - .

Grading - .

Architectural Coating - .

Vehicle Trips - Trip-gen rates for residential based on City of Paso Robles' Travel Demand Forecast Model (Final), prepared by Fehr & Peers (August 5, 2009), Table 2.

Vehicle Emission Factors - Emission factors based on model defaults.

Vehicle Emission Factors -

Vehicle Emission Factors -

Woodstoves - Assumes no hearths.

Consumer Products - Consumer products, arch coatings, and landscape equipment usage based on model defaults.

Energy Use -

Water And Wastewater - Adjusted for the removal of septic systems from the default assumptions.

Construction Off-road Equipment Mitigation - Includes 50%CE for watering travel ways, 61%CE for watering disturbed areas, 15 mph onsite speed limit. Use of T3 off-road equipment included.

Mobile Land Use Mitigation -

Area Mitigation -

Energy Mitigation -

Waste Mitigation - Assumes 58% waste reduction, per most current (2017) state-wide diversion rate (CalRecycle https://www.calrecycle.ca.gov/lgcentral/goalmeasure/disposalrate/graphs/estdiversion)

Fleet Mix - Fleet mix adjusted based on SLOAPCD-approved use of SJVAPCD-recommended residential fleet mix, adjusted based on SLO County default residential fleet mix, by year.

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblFleetMix	HHD	0.02	1.0000e-003
tblFleetMix	HHD	0.02	1.0000e-003
tblFleetMix	LDA	0.59	0.61
tblFleetMix	LDA	0.59	0.61
tblFleetMix	LDT1	0.03	0.15
tblFleetMix	LDT1	0.03	0.15
tblFleetMix	LDT2	0.20	0.19
tblFleetMix	LDT2	0.20	0.19
tblFleetMix	LHD1	0.02	1.0000e-004
tblFleetMix	LHD1	0.02	1.0000e-004
tblFleetMix	LHD2	5.7480e-003	1.0000e-004
tblFleetMix	LHD2	5.7480e-003	1.0000e-004
tblFleetMix	MCY	4.7760e-003	1.0000e-003
tblFleetMix	MCY	4.7760e-003	1.0000e-003
tblFleetMix	MDV	0.11	0.04
tblFleetMix	MDV	0.11	0.04
tblFleetMix	MH	1.1920e-003	3.6000e-003
tblFleetMix	MH	1.1920e-003	3.6000e-003
tblFleetMix	MHD	0.01	1.0000e-004
tblFleetMix	MHD	0.01	1.0000e-004
tblFleetMix	OBUS	2.3160e-003	1.0000e-004
tblFleetMix	OBUS	2.3160e-003	1.0000e-004
tblFleetMix	SBUS	7.5800e-004	1.0000e-004
tblFleetMix	SBUS	7.5800e-004	1.0000e-004
tblFleetMix	UBUS	1.1630e-003	2.9000e-003

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

tblFleetMix	UBUS	1.1630e-003	2.9000e-003
tblLandUse	LotAcreage	345.78	147.45
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.02
tblProjectCharacteristics	CO2IntensityFactor	641.35	447.45
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblTripsAndVMT	WorkerTripNumber	15.00	0.00
tblVehicleTrips	WD_TR	6.59	5.21
tblVehicleTrips	WD_TR	9.52	7.56
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	8.2800e-003	0.0830	0.0544	1.0000e-004	0.0000	4.1500e-003	4.1500e-003	0.0000	3.8500e-003	3.8500e-003						8.5596
Maximum	**8.2800e-003**	**0.0830**	**0.0544**	**1.0000e-004**	**0.0000**	**4.1500e-003**	**4.1500e-003**	**0.0000**	**3.8500e-003**	**3.8500e-003**						**8.5596**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	8.2800e-003	0.0830	0.0544	1.0000e-004	0.0000	4.1500e-003	4.1500e-003	0.0000	3.8500e-003	3.8500e-003						8.5596
Maximum	**8.2800e-003**	**0.0830**	**0.0544**	**1.0000e-004**	**0.0000**	**4.1500e-003**	**4.1500e-003**	**0.0000**	**3.8500e-003**	**3.8500e-003**						**8.5596**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-1-2020	3-31-2020	0.0913	0.0913
		Highest	0.0913	0.0913

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	12.2618	0.2027	17.5938	9.3000e-004		0.0975	0.0975		0.0975	0.0975						29.4410
Energy	0.1795	1.5335	0.6525	9.7900e-003		0.1240	0.1240		0.1240	0.1240						3,743.8921
Mobile	2.0222	3.6560	25.8780	0.0766	9.3130	0.0704	9.3834	2.4821	0.0653	2.5474						6,937.4618
Waste						0.0000	0.0000		0.0000	0.0000						680.7979
Water						0.0000	0.0000		0.0000	0.0000						199.3388
Total	**14.4634**	**5.3922**	**44.1244**	**0.0873**	**9.3130**	**0.2919**	**9.6049**	**2.4821**	**0.2868**	**2.7689**						**11,590.9316**

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	12.2618	0.2027	17.5938	9.3000e-004		0.0975	0.0975		0.0975	0.0975						29.4410
Energy	0.1637	1.3989	0.5953	8.9300e-003		0.1131	0.1131		0.1131	0.1131						3,474.9577
Mobile	1.9652	3.3185	23.6418	0.0679	8.2140	0.0632	8.2773	2.1892	0.0587	2.2479						6,147.0170
Waste						0.0000	0.0000		0.0000	0.0000						285.9351
Water						0.0000	0.0000		0.0000	0.0000						164.7350
Total	**14.3907**	**4.9201**	**41.8309**	**0.0777**	**8.2140**	**0.2738**	**8.4879**	**2.1892**	**0.2693**	**2.4585**						**10,102.0858**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.50**	**8.75**	**5.20**	**10.96**	**11.80**	**6.18**	**11.63**	**11.80**	**6.12**	**11.21**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**12.84**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2020	1/7/2020	5	200	

Acres of Grading (Site Preparation Phase): 0

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Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	0.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Off-Road	8.2800e-003	0.0830	0.0544	1.0000e-004		4.1500e-003	4.1500e-003		3.8500e-003	3.8500e-003						8.5596
Total	**8.2800e-003**	**0.0830**	**0.0544**	**1.0000e-004**	**0.0000**	**4.1500e-003**	**4.1500e-003**	**0.0000**	**3.8500e-003**	**3.8500e-003**						**8.5596**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**						**0.0000**

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

3.2 Demolition - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Off-Road	8.2800e-003	0.0830	0.0544	1.0000e-004		4.1500e-003	4.1500e-003		3.8500e-003	3.8500e-003						8.5596
Total	**8.2800e-003**	**0.0830**	**0.0544**	**1.0000e-004**	**0.0000**	**4.1500e-003**	**4.1500e-003**	**0.0000**	**3.8500e-003**	**3.8500e-003**						**8.5596**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**						**0.0000**

4.0 Operational Detail - Mobile

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

4.1 Mitigation Measures Mobile

Increase Transit Accessibility

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.9652	3.3185	23.6418	0.0679	8.2140	0.0632	8.2773	2.1892	0.0587	2.2479						6,147.0170
Unmitigated	2.0222	3.6560	25.8780	0.0766	9.3130	0.0704	9.3834	2.4821	0.0653	2.5474						6,937.4618

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,187.88	1,632.48	1383.96	3,251,683	2,867,984
Single Family Housing	8,051.40	10,554.15	9180.30	21,781,672	19,211,434
Total	9,239.28	12,186.63	10,564.26	25,033,354	22,079,419

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
Single Family Housing	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.611000	0.150000	0.190000	0.040000	0.000100	0.000100	0.000100	0.001000	0.000100	0.002900	0.001000	0.000100	0.003600
Single Family Housing	0.611000	0.150000	0.190000	0.040000	0.000100	0.000100	0.000100	0.001000	0.000100	0.002900	0.001000	0.000100	0.003600

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000						1,845.2245
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000						1,957.4093
NaturalGas Mitigated	0.1637	1.3989	0.5953	8.9300e-003		0.1131	0.1131		0.1131	0.1131						1,629.7332
NaturalGas Unmitigated	0.1795	1.5335	0.6525	9.7900e-003		0.1240	0.1240		0.1240	0.1240						1,786.4828

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	2.32534e+006	0.0125	0.1072	0.0456	6.8000e-004		8.6600e-003	8.6600e-003		8.6600e-003	8.6600e-003						124.8263
Single Family Housing	3.09543e+007	0.1669	1.4263	0.6070	9.1000e-003		0.1153	0.1153		0.1153	0.1153						1,661.6565
Total		**0.1795**	**1.5335**	**0.6525**	**9.7800e-003**		**0.1240**	**0.1240**		**0.1240**	**0.1240**						**1,786.4828**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	2.16474e+006	0.0117	0.0998	0.0425	6.4000e-004		8.0600e-003	8.0600e-003		8.0600e-003	8.0600e-003						116.2051
Single Family Housing	2.81949e+007	0.1520	1.2992	0.5528	8.2900e-003		0.1050	0.1050		0.1050	0.1050						1,513.5281
Total		**0.1637**	**1.3989**	**0.5953**	**8.9300e-003**		**0.1131**	**0.1131**		**0.1131**	**0.1131**						**1,629.7332**

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	991526				202.0011
Single Family Housing	8.61646e +006				1,755.4083
Total					**1,957.4093**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	928743				189.2104
Single Family Housing	8.12858e +006				1,656.0142
Total					**1,845.2245**

6.0 Area Detail

6.1 Mitigation Measures Area

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	12.2618	0.2027	17.5938	9.3000e-004		0.0975	0.0975		0.0975	0.0975						29.4410
Unmitigated	12.2618	0.2027	17.5938	9.3000e-004		0.0975	0.0975		0.0975	0.0975						29.4410

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.3555					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	8.3773					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	0.5290	0.2027	17.5938	9.3000e-004		0.0975	0.0975		0.0975	0.0975						29.4410
Total	**12.2618**	**0.2027**	**17.5938**	**9.3000e-004**		**0.0975**	**0.0975**		**0.0975**	**0.0975**						**29.4410**

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6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.3555					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	8.3773					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	0.5290	0.2027	17.5938	9.3000e-004		0.0975	0.0975		0.0975	0.0975						29.4410
Total	**12.2618**	**0.2027**	**17.5938**	**9.3000e-004**		**0.0975**	**0.0975**		**0.0975**	**0.0975**						**29.4410**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated				164.7350
Unmitigated				199.3388

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	14.8551 / 9.36518				35.1502
Single Family Housing	69.389 / 43.7453				164.1886
Total					**199.3388**

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7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	11.8841 / 8.79391				29.0484
Single Family Housing	55.5112 / 41.0768				135.6866
Total					**164.7350**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated				285.9351
Unmitigated				680.7979

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	104.88				52.7443
Single Family Housing	1248.86				628.0536
Total					**680.7979**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	44.0496				22.1526
Single Family Housing	524.521				263.7825
Total					**285.9351**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Summer

Olsen-Chandler (Residential Fleet Mix-With Adjustment)

San Luis Obispo County APCD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Low Rise	228.00	Dwelling Unit	14.25	228,000.00	652
Single Family Housing	1,065.00	Dwelling Unit	147.45	1,917,000.00	3046

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.2	**Precipitation Freq (Days)**	44
Climate Zone	4			**Operational Year**	2024
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	447.45	**CH4 Intensity (lb/MWhr)**	0.02	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Summer

Project Characteristics - Model run is for calculation of mobile-source emission reductions associated with residential fleet mix adjustment only. Refer to other model runs for emissions associated with other sources/land uses.

Land Use - Provided by the applicant team.

Construction Phase - Const does not apply.

Off-road Equipment -

Off-road Equipment - .

Trips and VMT - .

On-road Fugitive Dust -

Demolition - .

Grading - .

Architectural Coating - .

Vehicle Trips - Trip-gen rates for residential based on City of Paso Robles' Travel Demand Forecast Model (Final), prepared by Fehr & Peers (August 5, 2009), Table 2.

Vehicle Emission Factors - Emission factors based on model defaults.

Vehicle Emission Factors -

Vehicle Emission Factors -

Woodstoves - Assumes no hearths.

Consumer Products - Consumer products, arch coatings, and landscape equipment usage based on model defaults.

Energy Use -

Water And Wastewater - Adjusted for the removal of septic systems from the default assumptions.

Construction Off-road Equipment Mitigation - Includes 50%CE for watering travel ways, 61%CE for watering disturbed areas, 15 mph onsite speed limit. Use of T3 off-road equipment included.

Mobile Land Use Mitigation -

Area Mitigation -

Energy Mitigation -

Waste Mitigation - Assumes 58% waste reduction, per most current (2017) state-wide diversion rate (CalRecycle https://www.calrecycle.ca.gov/lgcentral/goalmeasure/disposalrate/graphs/estdiversion)

Fleet Mix - Fleet mix adjusted based on SLOAPCD-approved use of SJVAPCD-recommended residential fleet mix, adjusted based on SLO County default residential fleet mix, by year.

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Summer

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblFleetMix	HHD	0.02	1.0000e-003
tblFleetMix	HHD	0.02	1.0000e-003
tblFleetMix	LDA	0.59	0.61
tblFleetMix	LDA	0.59	0.61
tblFleetMix	LDT1	0.03	0.15
tblFleetMix	LDT1	0.03	0.15
tblFleetMix	LDT2	0.20	0.19
tblFleetMix	LDT2	0.20	0.19
tblFleetMix	LHD1	0.02	1.0000e-004
tblFleetMix	LHD1	0.02	1.0000e-004
tblFleetMix	LHD2	5.7480e-003	1.0000e-004
tblFleetMix	LHD2	5.7480e-003	1.0000e-004
tblFleetMix	MCY	4.7760e-003	1.0000e-003
tblFleetMix	MCY	4.7760e-003	1.0000e-003
tblFleetMix	MDV	0.11	0.04
tblFleetMix	MDV	0.11	0.04
tblFleetMix	MH	1.1920e-003	3.6000e-003
tblFleetMix	MH	1.1920e-003	3.6000e-003
tblFleetMix	MHD	0.01	1.0000e-004
tblFleetMix	MHD	0.01	1.0000e-004
tblFleetMix	OBUS	2.3160e-003	1.0000e-004
tblFleetMix	OBUS	2.3160e-003	1.0000e-004
tblFleetMix	SBUS	7.5800e-004	1.0000e-004
tblFleetMix	SBUS	7.5800e-004	1.0000e-004
tblFleetMix	UBUS	1.1630e-003	2.9000e-003

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Summer

tblFleetMix	UBUS	1.1630e-003	2.9000e-003
tblLandUse	LotAcreage	345.78	147.45
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.02
tblProjectCharacteristics	CO2IntensityFactor	641.35	447.45
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblTripsAndVMT	WorkerTripNumber	15.00	0.00
tblVehicleTrips	WD_TR	6.59	5.21
tblVehicleTrips	WD_TR	9.52	7.56
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Summer

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	3.3121	33.2010	21.7532	0.0388	0.0000	1.6587	1.6587	0.0000	1.5419	1.5419						3,774.1536
Maximum	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**0.0000**	**1.6587**	**1.6587**	**0.0000**	**1.5419**	**1.5419**						**3,774.1536**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	3.3121	33.2010	21.7532	0.0388	0.0000	1.6587	1.6587	0.0000	1.5419	1.5419						3,774.1536
Maximum	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**0.0000**	**1.6587**	**1.6587**	**0.0000**	**1.5419**	**1.5419**						**3,774.1536**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Summer

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	67.4951	1.2286	106.6293	5.6300e-003		0.5910	0.5910		0.5910	0.5910						196.6856
Energy	0.9833	8.4026	3.5756	0.0536		0.6794	0.6794		0.6794	0.6794						10,790.4667
Mobile	14.9560	22.9351	178.1067	0.5412	65.0065	0.4790	65.4856	17.2899	0.4446	17.7345						54,039.4668
Total	**83.4344**	**32.5663**	**288.3116**	**0.6004**	**65.0065**	**1.7494**	**66.7559**	**17.2899**	**1.7150**	**19.0048**						**65,026.6191**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	67.4951	1.2286	106.6293	5.6300e-003		0.5910	0.5910		0.5910	0.5910						196.6856
Energy	0.8970	7.6653	3.2619	0.0489		0.6198	0.6198		0.6198	0.6198						9,843.6894
Mobile	14.5539	20.8326	161.7264	0.4795	57.3358	0.4302	57.7660	15.2497	0.3993	15.6489						47,874.9023
Total	**82.9461**	**29.7265**	**271.6176**	**0.5341**	**57.3358**	**1.6410**	**58.9768**	**15.2497**	**1.6100**	**16.8597**						**57,915.2773**

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.59**	**8.72**	**5.79**	**11.05**	**11.80**	**6.20**	**11.65**	**11.80**	**6.12**	**11.29**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**10.94**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2020	1/7/2020	5	200	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	0.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Summer

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419						3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**0.0000**	**1.6587**	**1.6587**	**0.0000**	**1.5419**	**1.5419**						**3,774.1536**

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Summer

3.2 Demolition - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**						**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419						3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**0.0000**	**1.6587**	**1.6587**	**0.0000**	**1.5419**	**1.5419**						**3,774.1536**

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Summer

3.2 Demolition - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**						**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Transit Accessibility

Improve Pedestrian Network

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	14.5539	20.8326	161.7264	0.4795	57.3358	0.4302	57.7660	15.2497	0.3993	15.6489						47,874.9023
Unmitigated	14.9560	22.9351	178.1067	0.5412	65.0065	0.4790	65.4856	17.2899	0.4446	17.7345						54,039.4668

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,187.88	1,632.48	1383.96	3,251,683	2,867,984
Single Family Housing	8,051.40	10,554.15	9180.30	21,781,672	19,211,434
Total	9,239.28	12,186.63	10,564.26	25,033,354	22,079,419

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
Single Family Housing	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.611000	0.150000	0.190000	0.040000	0.000100	0.000100	0.000100	0.001000	0.000100	0.002900	0.001000	0.000100	0.003600
Single Family Housing	0.611000	0.150000	0.190000	0.040000	0.000100	0.000100	0.000100	0.001000	0.000100	0.002900	0.001000	0.000100	0.003600

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Summer

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.8970	7.6653	3.2619	0.0489		0.6198	0.6198		0.6198	0.6198						9,843.6894
NaturalGas Unmitigated	0.9833	8.4026	3.5756	0.0536		0.6794	0.6794		0.6794	0.6794						10,790.4667

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	6370.79	0.0687	0.5871	0.2498	3.7500e-003		0.0475	0.0475		0.0475	0.0475						753.9585
Single Family Housing	84806.4	0.9146	7.8155	3.3257	0.0499		0.6319	0.6319		0.6319	0.6319						10,036.5083
Total		**0.9833**	**8.4026**	**3.5756**	**0.0536**		**0.6794**	**0.6794**		**0.6794**	**0.6794**						**10,790.4667**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	5.93079	0.0640	0.5466	0.2326	3.4900e-003		0.0442	0.0442		0.0442	0.0442						701.8862
Single Family Housing	77.2463	0.8331	7.1188	3.0293	0.0454		0.5756	0.5756		0.5756	0.5756						9,141.8032
Total		**0.8970**	**7.6653**	**3.2619**	**0.0489**		**0.6198**	**0.6198**		**0.6198**	**0.6198**						**9,843.6894**

6.0 Area Detail

6.1 Mitigation Measures Area

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Summer

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	67.4951	1.2286	106.6293	5.6300e-003		0.5910	0.5910		0.5910	0.5910						196.6856
Unmitigated	67.4951	1.2286	106.6293	5.6300e-003		0.5910	0.5910		0.5910	0.5910						196.6856

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	18.3860					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	45.9030					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	3.2061	1.2286	106.6293	5.6300e-003		0.5910	0.5910		0.5910	0.5910						196.6856
Total	**67.4951**	**1.2286**	**106.6293**	**5.6300e-003**		**0.5910**	**0.5910**		**0.5910**	**0.5910**						**196.6856**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	18.3860					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	45.9030					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	3.2061	1.2286	106.6293	5.6300e-003		0.5910	0.5910		0.5910	0.5910						196.6856
Total	**67.4951**	**1.2286**	**106.6293**	**5.6300e-003**		**0.5910**	**0.5910**		**0.5910**	**0.5910**						**196.6856**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Summer

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Winter

Olsen-Chandler (Residential Fleet Mix-With Adjustment)

San Luis Obispo County APCD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Low Rise	228.00	Dwelling Unit	14.25	228,000.00	652
Single Family Housing	1,065.00	Dwelling Unit	147.45	1,917,000.00	3046

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.2	**Precipitation Freq (Days)**	44
Climate Zone	4			**Operational Year**	2024
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	447.45	**CH4 Intensity (lb/MWhr)**	0.02	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Winter

Project Characteristics - Model run is for calculation of mobile-source emission reductions associated with residential fleet mix adjustment only. Refer to other model runs for emissions associated with other sources/land uses.

Land Use - Provided by the applicant team.

Construction Phase - Const does not apply.

Off-road Equipment -

Off-road Equipment - .

Trips and VMT - .

On-road Fugitive Dust -

Demolition - .

Grading - .

Architectural Coating - .

Vehicle Trips - Trip-gen rates for residential based on City of Paso Robles' Travel Demand Forecast Model (Final), prepared by Fehr & Peers (August 5, 2009), Table 2.

Vehicle Emission Factors - Emission factors based on model defaults.

Vehicle Emission Factors -

Vehicle Emission Factors -

Woodstoves - Assumes no hearths.

Consumer Products - Consumer products, arch coatings, and landscape equipment usage based on model defaults.

Energy Use -

Water And Wastewater - Adjusted for the removal of septic systems from the default assumptions.

Construction Off-road Equipment Mitigation - Includes 50%CE for watering travel ways, 61%CE for watering disturbed areas, 15 mph onsite speed limit. Use of T3 off-road equipment included.

Mobile Land Use Mitigation -

Area Mitigation -

Energy Mitigation -

Waste Mitigation - Assumes 58% waste reduction, per most current (2017) state-wide diversion rate (CalRecycle https://www.calrecycle.ca.gov/lgcentral/goalmeasure/disposalrate/graphs/estdiversion)

Fleet Mix - Fleet mix adjusted based on SLOAPCD-approved use of SJVAPCD-recommended residential fleet mix, adjusted based on SLO County default residential fleet mix, by year.

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Winter

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblFleetMix	HHD	0.02	1.0000e-003
tblFleetMix	HHD	0.02	1.0000e-003
tblFleetMix	LDA	0.59	0.61
tblFleetMix	LDA	0.59	0.61
tblFleetMix	LDT1	0.03	0.15
tblFleetMix	LDT1	0.03	0.15
tblFleetMix	LDT2	0.20	0.19
tblFleetMix	LDT2	0.20	0.19
tblFleetMix	LHD1	0.02	1.0000e-004
tblFleetMix	LHD1	0.02	1.0000e-004
tblFleetMix	LHD2	5.7480e-003	1.0000e-004
tblFleetMix	LHD2	5.7480e-003	1.0000e-004
tblFleetMix	MCY	4.7760e-003	1.0000e-003
tblFleetMix	MCY	4.7760e-003	1.0000e-003
tblFleetMix	MDV	0.11	0.04
tblFleetMix	MDV	0.11	0.04
tblFleetMix	MH	1.1920e-003	3.6000e-003
tblFleetMix	MH	1.1920e-003	3.6000e-003
tblFleetMix	MHD	0.01	1.0000e-004
tblFleetMix	MHD	0.01	1.0000e-004
tblFleetMix	OBUS	2.3160e-003	1.0000e-004
tblFleetMix	OBUS	2.3160e-003	1.0000e-004
tblFleetMix	SBUS	7.5800e-004	1.0000e-004
tblFleetMix	SBUS	7.5800e-004	1.0000e-004
tblFleetMix	UBUS	1.1630e-003	2.9000e-003

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Winter

tblFleetMix	UBUS	1.1630e-003	2.9000e-003
tblLandUse	LotAcreage	345.78	147.45
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.02
tblProjectCharacteristics	CO2IntensityFactor	641.35	447.45
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblTripsAndVMT	WorkerTripNumber	15.00	0.00
tblVehicleTrips	WD_TR	6.59	5.21
tblVehicleTrips	WD_TR	9.52	7.56
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Winter

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	3.3121	33.2010	21.7532	0.0388	0.0000	1.6587	1.6587	0.0000	1.5419	1.5419						3,774.1536
Maximum	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**0.0000**	**1.6587**	**1.6587**	**0.0000**	**1.5419**	**1.5419**						**3,774.1536**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	3.3121	33.2010	21.7532	0.0388	0.0000	1.6587	1.6587	0.0000	1.5419	1.5419						3,774.1536
Maximum	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**0.0000**	**1.6587**	**1.6587**	**0.0000**	**1.5419**	**1.5419**						**3,774.1536**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Winter

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	67.4951	1.2286	106.6293	5.6300e-003		0.5910	0.5910		0.5910	0.5910						196.6856
Energy	0.9833	8.4026	3.5756	0.0536		0.6794	0.6794		0.6794	0.6794						10,790.4667
Mobile	13.9992	25.1982	178.1828	0.5173	65.0065	0.4792	65.4857	17.2899	0.4447	17.7346						51,645.2258
Total	**82.4776**	**34.8294**	**288.3876**	**0.5765**	**65.0065**	**1.7495**	**66.7561**	**17.2899**	**1.7151**	**19.0050**						**62,632.3781**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	67.4951	1.2286	106.6293	5.6300e-003		0.5910	0.5910		0.5910	0.5910						196.6856
Energy	0.8970	7.6653	3.2619	0.0489		0.6198	0.6198		0.6198	0.6198						9,843.6894
Mobile	13.6161	22.8804	163.1621	0.4584	57.3358	0.4304	57.7661	15.2497	0.3994	15.6491						45,761.4303
Total	**82.0082**	**31.7743**	**273.0533**	**0.5130**	**57.3358**	**1.6411**	**58.9769**	**15.2497**	**1.6101**	**16.8598**						**55,801.8052**

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.57**	**8.77**	**5.32**	**11.02**	**11.80**	**6.20**	**11.65**	**11.80**	**6.12**	**11.29**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**10.91**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2020	1/7/2020	5	200	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	0.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Winter

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419						3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**0.0000**	**1.6587**	**1.6587**	**0.0000**	**1.5419**	**1.5419**						**3,774.1536**

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Winter

3.2 Demolition - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**						**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419						3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**0.0000**	**1.6587**	**1.6587**	**0.0000**	**1.5419**	**1.5419**						**3,774.1536**

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Winter

3.2 Demolition - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**						**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Transit Accessibility

Improve Pedestrian Network

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	13.6161	22.8804	163.1621	0.4584	57.3358	0.4304	57.7661	15.2497	0.3994	15.6491						45,761.4303
Unmitigated	13.9992	25.1982	178.1828	0.5173	65.0065	0.4792	65.4857	17.2899	0.4447	17.7346						51,645.2258

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,187.88	1,632.48	1383.96	3,251,683	2,867,984
Single Family Housing	8,051.40	10,554.15	9180.30	21,781,672	19,211,434
Total	9,239.28	12,186.63	10,564.26	25,033,354	22,079,419

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
Single Family Housing	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.611000	0.150000	0.190000	0.040000	0.000100	0.000100	0.000100	0.001000	0.000100	0.002900	0.001000	0.000100	0.003600
Single Family Housing	0.611000	0.150000	0.190000	0.040000	0.000100	0.000100	0.000100	0.001000	0.000100	0.002900	0.001000	0.000100	0.003600

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Winter

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.8970	7.6653	3.2619	0.0489		0.6198	0.6198		0.6198	0.6198						9,843.6894
NaturalGas Unmitigated	0.9833	8.4026	3.5756	0.0536		0.6794	0.6794		0.6794	0.6794						10,790.4667

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	6370.79	0.0687	0.5871	0.2498	3.7500e-003		0.0475	0.0475		0.0475	0.0475						753.9585
Single Family Housing	84806.4	0.9146	7.8155	3.3257	0.0499		0.6319	0.6319		0.6319	0.6319						10,036.5083
Total		**0.9833**	**8.4026**	**3.5756**	**0.0536**		**0.6794**	**0.6794**		**0.6794**	**0.6794**						**10,790.4667**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	5.93079	0.0640	0.5466	0.2326	3.4900e-003		0.0442	0.0442		0.0442	0.0442						701.8862
Single Family Housing	77.2463	0.8331	7.1188	3.0293	0.0454		0.5756	0.5756		0.5756	0.5756						9,141.8032
Total		**0.8970**	**7.6653**	**3.2619**	**0.0489**		**0.6198**	**0.6198**		**0.6198**	**0.6198**						**9,843.6894**

6.0 Area Detail

6.1 Mitigation Measures Area

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Winter

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	67.4951	1.2286	106.6293	5.6300e-003		0.5910	0.5910		0.5910	0.5910						196.6856
Unmitigated	67.4951	1.2286	106.6293	5.6300e-003		0.5910	0.5910		0.5910	0.5910						196.6856

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	18.3860					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	45.9030					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	3.2061	1.2286	106.6293	5.6300e-003		0.5910	0.5910		0.5910	0.5910						196.6856
Total	**67.4951**	**1.2286**	**106.6293**	**5.6300e-003**		**0.5910**	**0.5910**		**0.5910**	**0.5910**						**196.6856**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	18.3860					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	45.9030					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	3.2061	1.2286	106.6293	5.6300e-003		0.5910	0.5910		0.5910	0.5910						196.6856
Total	**67.4951**	**1.2286**	**106.6293**	**5.6300e-003**		**0.5910**	**0.5910**		**0.5910**	**0.5910**						**196.6856**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Winter

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

Olsen-Chandler (Residential Fleet Mix-With Adjustment)

San Luis Obispo County APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Low Rise	228.00	Dwelling Unit	14.25	228,000.00	652
Single Family Housing	1,065.00	Dwelling Unit	147.45	1,917,000.00	3046

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.2	**Precipitation Freq (Days)**	44
Climate Zone	4			**Operational Year**	2030
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	298.3	**CH4 Intensity (lb/MWhr)**	0.013	**N2O Intensity (lb/MWhr)**	0.003

1.3 User Entered Comments & Non-Default Data

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

Project Characteristics - Model run is for calculation of mobile-source emission reductions associated with residential fleet mix adjustment only. Refer to other model runs for emissions associated with other sources/land uses.

Land Use - Provided by the applicant team.

Construction Phase - Const does not apply.

Off-road Equipment -

Off-road Equipment - .

Trips and VMT - .

On-road Fugitive Dust -

Demolition - .

Grading - .

Architectural Coating - .

Vehicle Trips - Trip-gen rates for residential based on City of Paso Robles' Travel Demand Forecast Model (Final), prepared by Fehr & Peers (August 5, 2009), Table 2. SF=7.56; MF=5.21

Vehicle Emission Factors - Emission factors based on model defaults.

Vehicle Emission Factors -

Vehicle Emission Factors -

Woodstoves - Assumes no hearths.

Consumer Products - Consumer products, arch coatings, and landscape equipment usage based on model defaults.

Energy Use -

Water And Wastewater - Adjusted for the removal of septic systems from the default assumptions (97.79 Aerobic)

Construction Off-road Equipment Mitigation - Includes 50%CE for watering travel ways, 61%CE for watering disturbed areas, 15 mph onsite speed limit. Use of T3 off-road equipment included.

Mobile Land Use Mitigation -

Area Mitigation -

Energy Mitigation -

Waste Mitigation - Assumes 58% waste reduction, per most current (2017) state-wide diversion rate (CalRecycle https://www.calrecycle.ca.gov/lgcentral/goalmeasure/disposalrate/graphs/estdiversion)

Fleet Mix - Fleet mix adjusted based on SLOAPCD-approved use of SJVAPCD-recommended residential fleet mix, adjusted based on SLO County default residential fleet mix, by year.

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblFleetMix	HHD	0.02	1.5000e-003
tblFleetMix	HHD	0.02	1.5000e-003
tblFleetMix	LDA	0.61	0.60
tblFleetMix	LDA	0.61	0.60
tblFleetMix	LDT1	0.03	0.15
tblFleetMix	LDT1	0.03	0.15
tblFleetMix	LDT2	0.20	0.19
tblFleetMix	LDT2	0.20	0.19
tblFleetMix	LHD1	0.01	1.0000e-003
tblFleetMix	LHD1	0.01	1.0000e-003
tblFleetMix	LHD2	4.4400e-003	5.0000e-004
tblFleetMix	LHD2	4.4400e-003	5.0000e-004
tblFleetMix	MCY	4.2480e-003	1.0000e-003
tblFleetMix	MCY	4.2480e-003	1.0000e-003
tblFleetMix	MDV	0.10	0.05
tblFleetMix	MDV	0.10	0.05
tblFleetMix	MH	7.5900e-004	4.0000e-003
tblFleetMix	MH	7.5900e-004	4.0000e-003
tblFleetMix	MHD	0.01	2.0000e-003
tblFleetMix	MHD	0.01	2.0000e-003
tblFleetMix	OBUS	2.2470e-003	1.0000e-003
tblFleetMix	OBUS	2.2470e-003	1.0000e-003
tblFleetMix	SBUS	7.0800e-004	9.0000e-004
tblFleetMix	SBUS	7.0800e-004	9.0000e-004
tblFleetMix	UBUS	1.0590e-003	3.0000e-003

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

tblFleetMix	UBUS	1.0590e-003	3.0000e-003
tblLandUse	LotAcreage	345.78	147.45
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.013
tblProjectCharacteristics	CO2IntensityFactor	641.35	298.3
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.003
tblVehicleTrips	WD_TR	6.59	5.21
tblVehicleTrips	WD_TR	9.52	7.56
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	8.4400e-003	0.0832	0.0557	1.0000e-004	3.6000e-004	4.1500e-003	4.5100e-003	1.0000e-004	3.8600e-003	3.9500e-003						8.8619
Maximum	**8.4400e-003**	**0.0832**	**0.0557**	**1.0000e-004**	**3.6000e-004**	**4.1500e-003**	**4.5100e-003**	**1.0000e-004**	**3.8600e-003**	**3.9500e-003**						**8.8619**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	8.4400e-003	0.0832	0.0557	1.0000e-004	3.6000e-004	4.1500e-003	4.5100e-003	1.0000e-004	3.8600e-003	3.9500e-003						8.8619
Maximum	**8.4400e-003**	**0.0832**	**0.0557**	**1.0000e-004**	**3.6000e-004**	**4.1500e-003**	**4.5100e-003**	**1.0000e-004**	**3.8600e-003**	**3.9500e-003**						**8.8619**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-1-2020	3-31-2020	0.0916	0.0916
		Highest	0.0916	0.0916

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	12.2578	0.2024	17.5547	9.3000e-004		0.0976	0.0976		0.0976	0.0976						29.4361
Energy	0.1795	1.5335	0.6525	9.7900e-003		0.1240	0.1240		0.1240	0.1240						3,091.8189
Mobile	1.3628	2.7769	17.2622	0.0650	9.3390	0.0511	9.3901	2.4931	0.0474	2.5405						5,904.1864
Waste						0.0000	0.0000		0.0000	0.0000						680.7979
Water						0.0000	0.0000		0.0000	0.0000						155.7858
Total	**13.8000**	**4.5128**	**35.4694**	**0.0757**	**9.3390**	**0.2727**	**9.6117**	**2.4931**	**0.2690**	**2.7621**						**9,862.0252**

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	12.2578	0.2024	17.5547	9.3000e-004		0.0976	0.0976		0.0976	0.0976						29.4361
Energy	0.1637	1.3989	0.5953	8.9300e-003		0.1131	0.1131		0.1131	0.1131						2,860.2567
Mobile	1.3267	2.5429	15.7449	0.0576	8.2370	0.0460	8.2830	2.1989	0.0427	2.2416						5,232.3920
Waste						0.0000	0.0000		0.0000	0.0000						285.9351
Water						0.0000	0.0000		0.0000	0.0000						128.1390
Total	**13.7482**	**4.1442**	**33.8949**	**0.0675**	**8.2370**	**0.2567**	**8.4937**	**2.1989**	**0.2534**	**2.4523**						**8,536.1590**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.38**	**8.17**	**4.44**	**10.91**	**11.80**	**5.86**	**11.63**	**11.80**	**5.80**	**11.22**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**13.44**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2020	1/7/2020	5	200	

Acres of Grading (Site Preparation Phase): 0

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Off-Road	8.2800e-003	0.0830	0.0544	1.0000e-004		4.1500e-003	4.1500e-003		3.8500e-003	3.8500e-003						8.5596
Total	**8.2800e-003**	**0.0830**	**0.0544**	**1.0000e-004**	**0.0000**	**4.1500e-003**	**4.1500e-003**	**0.0000**	**3.8500e-003**	**3.8500e-003**						**8.5596**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	1.6000e-004	1.5000e-004	1.2900e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	1.0000e-004	0.0000	1.0000e-004						0.3023
Total	**1.6000e-004**	**1.5000e-004**	**1.2900e-003**	**0.0000**	**3.6000e-004**	**0.0000**	**3.6000e-004**	**1.0000e-004**	**0.0000**	**1.0000e-004**						**0.3023**

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

3.2 Demolition - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Off-Road	8.2800e-003	0.0830	0.0544	1.0000e-004		4.1500e-003	4.1500e-003		3.8500e-003	3.8500e-003						8.5596
Total	**8.2800e-003**	**0.0830**	**0.0544**	**1.0000e-004**	**0.0000**	**4.1500e-003**	**4.1500e-003**	**0.0000**	**3.8500e-003**	**3.8500e-003**						**8.5596**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	1.6000e-004	1.5000e-004	1.2900e-003	0.0000	3.6000e-004	0.0000	3.6000e-004	1.0000e-004	0.0000	1.0000e-004						0.3023
Total	**1.6000e-004**	**1.5000e-004**	**1.2900e-003**	**0.0000**	**3.6000e-004**	**0.0000**	**3.6000e-004**	**1.0000e-004**	**0.0000**	**1.0000e-004**						**0.3023**

4.0 Operational Detail - Mobile

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

4.1 Mitigation Measures Mobile

Increase Transit Accessibility

Improve Pedestrian Network

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.3267	2.5429	15.7449	0.0576	8.2370	0.0460	8.2830	2.1989	0.0427	2.2416						5,232.3920
Unmitigated	1.3628	2.7769	17.2622	0.0650	9.3390	0.0511	9.3901	2.4931	0.0474	2.5405						5,904.1864

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,187.88	1,632.48	1383.96	3,251,683	2,867,984
Single Family Housing	8,051.40	10,554.15	9180.30	21,781,672	19,211,434
Total	9,239.28	12,186.63	10,564.26	25,033,354	22,079,419

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
Single Family Housing	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.600000	0.150000	0.185000	0.050100	0.001000	0.000500	0.002000	0.001500	0.001000	0.003000	0.001000	0.000900	0.004000
Single Family Housing	0.600000	0.150000	0.185000	0.050100	0.001000	0.000500	0.002000	0.001500	0.001000	0.003000	0.001000	0.000900	0.004000

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000						1,230.5236
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000						1,305.3362
NaturalGas Mitigated	0.1637	1.3989	0.5953	8.9300e-003		0.1131	0.1131		0.1131	0.1131						1,629.7332
NaturalGas Unmitigated	0.1795	1.5335	0.6525	9.7900e-003		0.1240	0.1240		0.1240	0.1240						1,786.4828

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	2.32534e+006	0.0125	0.1072	0.0456	6.8000e-004		8.6600e-003	8.6600e-003		8.6600e-003	8.6600e-003						124.8263
Single Family Housing	3.09543e+007	0.1669	1.4263	0.6070	9.1000e-003		0.1153	0.1153		0.1153	0.1153						1,661.6565
Total		**0.1795**	**1.5335**	**0.6525**	**9.7800e-003**		**0.1240**	**0.1240**		**0.1240**	**0.1240**						**1,786.4828**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	2.16474e+006	0.0117	0.0998	0.0425	6.4000e-004		8.0600e-003	8.0600e-003		8.0600e-003	8.0600e-003						116.2051
Single Family Housing	2.81949e+007	0.1520	1.2992	0.5528	8.2900e-003		0.1050	0.1050		0.1050	0.1050						1,513.5281
Total		**0.1637**	**1.3989**	**0.5953**	**8.9300e-003**		**0.1131**	**0.1131**		**0.1131**	**0.1131**						**1,629.7332**

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	991526				134.7083
Single Family Housing	8.61646e +006				1,170.6278
Total					**1,305.3361**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	928743				126.1786
Single Family Housing	8.12858e +006				1,104.3450
Total					**1,230.5236**

6.0 Area Detail

6.1 Mitigation Measures Area

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	12.2578	0.2024	17.5547	9.3000e-004		0.0976	0.0976		0.0976	0.0976						29.4361
Unmitigated	12.2578	0.2024	17.5547	9.3000e-004		0.0976	0.0976		0.0976	0.0976						29.4361

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.3555					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	8.3773					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	0.5251	0.2024	17.5547	9.3000e-004		0.0976	0.0976		0.0976	0.0976						29.4361
Total	**12.2578**	**0.2024**	**17.5547**	**9.3000e-004**		**0.0976**	**0.0976**		**0.0976**	**0.0976**						**29.4361**

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.3555					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	8.3773					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	0.5251	0.2024	17.5547	9.3000e-004		0.0976	0.0976		0.0976	0.0976						29.4361
Total	**12.2578**	**0.2024**	**17.5547**	**9.3000e-004**		**0.0976**	**0.0976**		**0.0976**	**0.0976**						**29.4361**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated				128.1390
Unmitigated				155.7858

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	14.8551 / 9.36518				27.4704
Single Family Housing	69.389 / 43.7453				128.3155
Total					**155.7858**

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	11.8841 / 8.79391				22.5953
Single Family Housing	55.5112 / 41.0768				105.5438
Total					**128.1390**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated				285.9351
Unmitigated				680.7979

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	104.88				52.7443
Single Family Housing	1248.86				628.0536
Total					**680.7979**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	44.0496				22.1526
Single Family Housing	524.521				263.7825
Total					**285.9351**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Annual

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Summer

Olsen-Chandler (Residential Fleet Mix-With Adjustment)

San Luis Obispo County APCD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Low Rise	228.00	Dwelling Unit	14.25	228,000.00	652
Single Family Housing	1,065.00	Dwelling Unit	147.45	1,917,000.00	3046

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.2	**Precipitation Freq (Days)**	44
Climate Zone	4			**Operational Year**	2030
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	298.3	**CH4 Intensity (lb/MWhr)**	0.013	**N2O Intensity (lb/MWhr)**	0.003

1.3 User Entered Comments & Non-Default Data

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Summer

Project Characteristics - Model run is for calculation of mobile-source emission reductions associated with residential fleet mix adjustment only. Refer to other model runs for emissions associated with other sources/land uses.

Land Use - Provided by the applicant team.

Construction Phase - Const does not apply.

Off-road Equipment -

Off-road Equipment - .

Trips and VMT - .

On-road Fugitive Dust -

Demolition - .

Grading - .

Architectural Coating - .

Vehicle Trips - Trip-gen rates for residential based on City of Paso Robles' Travel Demand Forecast Model (Final), prepared by Fehr & Peers (August 5, 2009), Table 2. SF=7.56; MF=5.21

Vehicle Emission Factors - Emission factors based on model defaults.

Vehicle Emission Factors -

Vehicle Emission Factors -

Woodstoves - Assumes no hearths.

Consumer Products - Consumer products, arch coatings, and landscape equipment usage based on model defaults.

Energy Use -

Water And Wastewater - Adjusted for the removal of septic systems from the default assumptions (97.79 Aerobic)

Construction Off-road Equipment Mitigation - Includes 50%CE for watering travel ways, 61%CE for watering disturbed areas, 15 mph onsite speed limit. Use of T3 off-road equipment included.

Mobile Land Use Mitigation -

Area Mitigation -

Energy Mitigation -

Waste Mitigation - Assumes 58% waste reduction, per most current (2017) state-wide diversion rate (CalRecycle https://www.calrecycle.ca.gov/lgcentral/goalmeasure/disposalrate/graphs/estdiversion)

Fleet Mix - Fleet mix adjusted based on SLOAPCD-approved use of SJVAPCD-recommended residential fleet mix, adjusted based on SLO County default residential fleet mix, by year.

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Summer

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblFleetMix	HHD	0.02	1.5000e-003
tblFleetMix	HHD	0.02	1.5000e-003
tblFleetMix	LDA	0.61	0.60
tblFleetMix	LDA	0.61	0.60
tblFleetMix	LDT1	0.03	0.15
tblFleetMix	LDT1	0.03	0.15
tblFleetMix	LDT2	0.20	0.19
tblFleetMix	LDT2	0.20	0.19
tblFleetMix	LHD1	0.01	1.0000e-003
tblFleetMix	LHD1	0.01	1.0000e-003
tblFleetMix	LHD2	4.4400e-003	5.0000e-004
tblFleetMix	LHD2	4.4400e-003	5.0000e-004
tblFleetMix	MCY	4.2480e-003	1.0000e-003
tblFleetMix	MCY	4.2480e-003	1.0000e-003
tblFleetMix	MDV	0.10	0.05
tblFleetMix	MDV	0.10	0.05
tblFleetMix	MH	7.5900e-004	4.0000e-003
tblFleetMix	MH	7.5900e-004	4.0000e-003
tblFleetMix	MHD	0.01	2.0000e-003
tblFleetMix	MHD	0.01	2.0000e-003
tblFleetMix	OBUS	2.2470e-003	1.0000e-003
tblFleetMix	OBUS	2.2470e-003	1.0000e-003
tblFleetMix	SBUS	7.0800e-004	9.0000e-004
tblFleetMix	SBUS	7.0800e-004	9.0000e-004
tblFleetMix	UBUS	1.0590e-003	3.0000e-003

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Summer

tblFleetMix	UBUS	1.0590e-003	3.0000e-003
tblLandUse	LotAcreage	345.78	147.45
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.013
tblProjectCharacteristics	CO2IntensityFactor	641.35	298.3
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.003
tblVehicleTrips	WD_TR	6.59	5.21
tblVehicleTrips	WD_TR	9.52	7.56
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Summer

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	3.3763	33.2545	22.2857	0.0402	0.1483	1.6597	1.8079	0.0393	1.5427	1.5821						3,912.8496
Maximum	**3.3763**	**33.2545**	**22.2857**	**0.0402**	**0.1483**	**1.6597**	**1.8079**	**0.0393**	**1.5427**	**1.5821**						**3,912.8496**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	3.3763	33.2545	22.2857	0.0402	0.1483	1.6597	1.8079	0.0393	1.5427	1.5821						3,912.8496
Maximum	**3.3763**	**33.2545**	**22.2857**	**0.0402**	**0.1483**	**1.6597**	**1.8079**	**0.0393**	**1.5427**	**1.5821**						**3,912.8496**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Summer

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	67.4713	1.2265	106.3922	5.6300e-003		0.5916	0.5916		0.5916	0.5916						196.6532
Energy	0.9833	8.4026	3.5756	0.0536		0.6794	0.6794		0.6794	0.6794						10,790.4667
Mobile	10.1830	17.6917	119.4822	0.4589	65.1834	0.3479	65.5313	17.3646	0.3225	17.6870						45,932.9623
Total	**78.6376**	**27.3208**	**229.4500**	**0.5182**	**65.1834**	**1.6188**	**66.8022**	**17.3646**	**1.5934**	**18.9580**						**56,920.0822**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	67.4713	1.2265	106.3922	5.6300e-003		0.5916	0.5916		0.5916	0.5916						196.6532
Energy	0.8970	7.6653	3.2619	0.0489		0.6198	0.6198		0.6198	0.6198						9,843.6894
Mobile	9.9290	16.2231	108.3549	0.4067	57.4918	0.3132	57.8050	15.3155	0.2903	15.6058						40,700.9970
Total	**78.2973**	**25.1149**	**218.0090**	**0.4612**	**57.4918**	**1.5245**	**59.0163**	**15.3155**	**1.5016**	**16.8171**						**50,741.3396**

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.43**	**8.07**	**4.99**	**10.99**	**11.80**	**5.83**	**11.66**	**11.80**	**5.76**	**11.29**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**10.86**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2020	1/7/2020	5	200	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Summer

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419						3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**0.0000**	**1.6587**	**1.6587**	**0.0000**	**1.5419**	**1.5419**						**3,774.1536**

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Summer

3.2 Demolition - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0642	0.0535	0.5325	1.3900e-003	0.1483	9.5000e-004	0.1492	0.0393	8.8000e-004	0.0402						138.6960
Total	**0.0642**	**0.0535**	**0.5325**	**1.3900e-003**	**0.1483**	**9.5000e-004**	**0.1492**	**0.0393**	**8.8000e-004**	**0.0402**						**138.6960**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419						3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**0.0000**	**1.6587**	**1.6587**	**0.0000**	**1.5419**	**1.5419**						**3,774.1536**

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Summer

3.2 Demolition - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0642	0.0535	0.5325	1.3900e-003	0.1483	9.5000e-004	0.1492	0.0393	8.8000e-004	0.0402						138.6960
Total	**0.0642**	**0.0535**	**0.5325**	**1.3900e-003**	**0.1483**	**9.5000e-004**	**0.1492**	**0.0393**	**8.8000e-004**	**0.0402**						**138.6960**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Transit Accessibility

Improve Pedestrian Network

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	9.9290	16.2231	108.3549	0.4067	57.4918	0.3132	57.8050	15.3155	0.2903	15.6058						40,700.9970
Unmitigated	10.1830	17.6917	119.4822	0.4589	65.1834	0.3479	65.5313	17.3646	0.3225	17.6870						45,932.9623

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,187.88	1,632.48	1383.96	3,251,683	2,867,984
Single Family Housing	8,051.40	10,554.15	9180.30	21,781,672	19,211,434
Total	9,239.28	12,186.63	10,564.26	25,033,354	22,079,419

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
Single Family Housing	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.600000	0.150000	0.185000	0.050100	0.001000	0.000500	0.002000	0.001500	0.001000	0.003000	0.001000	0.000900	0.004000
Single Family Housing	0.600000	0.150000	0.185000	0.050100	0.001000	0.000500	0.002000	0.001500	0.001000	0.003000	0.001000	0.000900	0.004000

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Summer

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.8970	7.6653	3.2619	0.0489		0.6198	0.6198		0.6198	0.6198						9,843.6894
NaturalGas Unmitigated	0.9833	8.4026	3.5756	0.0536		0.6794	0.6794		0.6794	0.6794						10,790.4667

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	6370.79	0.0687	0.5871	0.2498	3.7500e-003		0.0475	0.0475		0.0475	0.0475						753.9585
Single Family Housing	84806.4	0.9146	7.8155	3.3257	0.0499		0.6319	0.6319		0.6319	0.6319						10,036.5083
Total		**0.9833**	**8.4026**	**3.5756**	**0.0536**		**0.6794**	**0.6794**		**0.6794**	**0.6794**						**10,790.4667**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	5.93079	0.0640	0.5466	0.2326	3.4900e-003		0.0442	0.0442		0.0442	0.0442						701.8862
Single Family Housing	77.2463	0.8331	7.1188	3.0293	0.0454		0.5756	0.5756		0.5756	0.5756						9,141.8032
Total		**0.8970**	**7.6653**	**3.2619**	**0.0489**		**0.6198**	**0.6198**		**0.6198**	**0.6198**						**9,843.6894**

6.0 Area Detail

6.1 Mitigation Measures Area

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Summer

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	67.4713	1.2265	106.3922	5.6300e-003		0.5916	0.5916		0.5916	0.5916						196.6532
Unmitigated	67.4713	1.2265	106.3922	5.6300e-003		0.5916	0.5916		0.5916	0.5916						196.6532

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	18.3860					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	45.9030					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	3.1823	1.2265	106.3922	5.6300e-003		0.5916	0.5916		0.5916	0.5916						196.6532
Total	**67.4713**	**1.2265**	**106.3922**	**5.6300e-003**		**0.5916**	**0.5916**		**0.5916**	**0.5916**						**196.6532**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	18.3860					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	45.9030					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	3.1823	1.2265	106.3922	5.6300e-003		0.5916	0.5916		0.5916	0.5916						196.6532
Total	**67.4713**	**1.2265**	**106.3922**	**5.6300e-003**		**0.5916**	**0.5916**		**0.5916**	**0.5916**						**196.6532**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Summer

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Winter

Olsen-Chandler (Residential Fleet Mix-With Adjustment)

San Luis Obispo County APCD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Apartments Low Rise	228.00	Dwelling Unit	14.25	228,000.00	652
Single Family Housing	1,065.00	Dwelling Unit	147.45	1,917,000.00	3046

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.2	**Precipitation Freq (Days)**	44
Climate Zone	4			**Operational Year**	2030
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	298.3	**CH4 Intensity (lb/MWhr)**	0.013	**N2O Intensity (lb/MWhr)**	0.003

1.3 User Entered Comments & Non-Default Data

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Winter

Project Characteristics - Model run is for calculation of mobile-source emission reductions associated with residential fleet mix adjustment only. Refer to other model runs for emissions associated with other sources/land uses.

Land Use - Provided by the applicant team.

Construction Phase - Const does not apply.

Off-road Equipment -

Off-road Equipment - .

Trips and VMT - .

On-road Fugitive Dust -

Demolition - .

Grading - .

Architectural Coating - .

Vehicle Trips - Trip-gen rates for residential based on City of Paso Robles' Travel Demand Forecast Model (Final), prepared by Fehr & Peers (August 5, 2009), Table 2. SF=7.56; MF=5.21

Vehicle Emission Factors - Emission factors based on model defaults.

Vehicle Emission Factors -

Vehicle Emission Factors -

Woodstoves - Assumes no hearths.

Consumer Products - Consumer products, arch coatings, and landscape equipment usage based on model defaults.

Energy Use -

Water And Wastewater - Adjusted for the removal of septic systems from the default assumptions (97.79 Aerobic)

Construction Off-road Equipment Mitigation - Includes 50%CE for watering travel ways, 61%CE for watering disturbed areas, 15 mph onsite speed limit. Use of T3 off-road equipment included.

Mobile Land Use Mitigation -

Area Mitigation -

Energy Mitigation -

Waste Mitigation - Assumes 58% waste reduction, per most current (2017) state-wide diversion rate (CalRecycle https://www.calrecycle.ca.gov/lgcentral/goalmeasure/disposalrate/graphs/estdiversion)

Fleet Mix - Fleet mix adjusted based on SLOAPCD-approved use of SJVAPCD-recommended residential fleet mix, adjusted based on SLO County default residential fleet mix, by year.

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Winter

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblFleetMix	HHD	0.02	1.5000e-003
tblFleetMix	HHD	0.02	1.5000e-003
tblFleetMix	LDA	0.61	0.60
tblFleetMix	LDA	0.61	0.60
tblFleetMix	LDT1	0.03	0.15
tblFleetMix	LDT1	0.03	0.15
tblFleetMix	LDT2	0.20	0.19
tblFleetMix	LDT2	0.20	0.19
tblFleetMix	LHD1	0.01	1.0000e-003
tblFleetMix	LHD1	0.01	1.0000e-003
tblFleetMix	LHD2	4.4400e-003	5.0000e-004
tblFleetMix	LHD2	4.4400e-003	5.0000e-004
tblFleetMix	MCY	4.2480e-003	1.0000e-003
tblFleetMix	MCY	4.2480e-003	1.0000e-003
tblFleetMix	MDV	0.10	0.05
tblFleetMix	MDV	0.10	0.05
tblFleetMix	MH	7.5900e-004	4.0000e-003
tblFleetMix	MH	7.5900e-004	4.0000e-003
tblFleetMix	MHD	0.01	2.0000e-003
tblFleetMix	MHD	0.01	2.0000e-003
tblFleetMix	OBUS	2.2470e-003	1.0000e-003
tblFleetMix	OBUS	2.2470e-003	1.0000e-003
tblFleetMix	SBUS	7.0800e-004	9.0000e-004
tblFleetMix	SBUS	7.0800e-004	9.0000e-004
tblFleetMix	UBUS	1.0590e-003	3.0000e-003

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Winter

tblFleetMix	UBUS	1.0590e-003	3.0000e-003
tblLandUse	LotAcreage	345.78	147.45
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.013
tblProjectCharacteristics	CO2IntensityFactor	641.35	298.3
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.003
tblVehicleTrips	WD_TR	6.59	5.21
tblVehicleTrips	WD_TR	9.52	7.56
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Winter

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	3.3853	33.2618	22.2712	0.0401	0.1483	1.6597	1.8079	0.0393	1.5427	1.5821						3,906.3569
Maximum	**3.3853**	**33.2618**	**22.2712**	**0.0401**	**0.1483**	**1.6597**	**1.8079**	**0.0393**	**1.5427**	**1.5821**						**3,906.3569**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	3.3853	33.2618	22.2712	0.0401	0.1483	1.6597	1.8079	0.0393	1.5427	1.5821						3,906.3569
Maximum	**3.3853**	**33.2618**	**22.2712**	**0.0401**	**0.1483**	**1.6597**	**1.8079**	**0.0393**	**1.5427**	**1.5821**						**3,906.3569**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Winter

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	67.4713	1.2265	106.3922	5.6300e-003		0.5916	0.5916		0.5916	0.5916						196.6532
Energy	0.9833	8.4026	3.5756	0.0536		0.6794	0.6794		0.6794	0.6794						10,790.4667
Mobile	9.4068	19.0495	118.6142	0.4391	65.1834	0.3480	65.5314	17.3646	0.3226	17.6871						43,957.7354
Total	**77.8613**	**28.6786**	**228.5820**	**0.4984**	**65.1834**	**1.6189**	**66.8023**	**17.3646**	**1.5935**	**18.9581**						**54,944.8553**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	67.4713	1.2265	106.3922	5.6300e-003		0.5916	0.5916		0.5916	0.5916						196.6532
Energy	0.8970	7.6653	3.2619	0.0489		0.6198	0.6198		0.6198	0.6198						9,843.6894
Mobile	9.1635	17.4462	108.4251	0.3892	57.4918	0.3133	57.8051	15.3155	0.2904	15.6059						38,955.6828
Total	**77.5318**	**26.3380**	**218.0792**	**0.4438**	**57.4918**	**1.5246**	**59.0164**	**15.3155**	**1.5017**	**16.8172**						**48,996.0254**

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.42**	**8.16**	**4.59**	**10.96**	**11.80**	**5.82**	**11.66**	**11.80**	**5.76**	**11.29**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**10.83**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2020	1/7/2020	5	200	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Winter

3.1 Mitigation Measures Construction

Use Soil Stabilizer

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419						3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**0.0000**	**1.6587**	**1.6587**	**0.0000**	**1.5419**	**1.5419**						**3,774.1536**

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Winter

3.2 Demolition - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0731	0.0607	0.5180	1.3300e-003	0.1483	9.5000e-004	0.1492	0.0393	8.8000e-004	0.0402						132.2033
Total	**0.0731**	**0.0607**	**0.5180**	**1.3300e-003**	**0.1483**	**9.5000e-004**	**0.1492**	**0.0393**	**8.8000e-004**	**0.0402**						**132.2033**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419						3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**	**0.0000**	**1.6587**	**1.6587**	**0.0000**	**1.5419**	**1.5419**						**3,774.1536**

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Winter

3.2 Demolition - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.0000
Worker	0.0731	0.0607	0.5180	1.3300e-003	0.1483	9.5000e-004	0.1492	0.0393	8.8000e-004	0.0402						132.2033
Total	**0.0731**	**0.0607**	**0.5180**	**1.3300e-003**	**0.1483**	**9.5000e-004**	**0.1492**	**0.0393**	**8.8000e-004**	**0.0402**						**132.2033**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Transit Accessibility

Improve Pedestrian Network

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	9.1635	17.4462	108.4251	0.3892	57.4918	0.3133	57.8051	15.3155	0.2904	15.6059						38,955.6828
Unmitigated	9.4068	19.0495	118.6142	0.4391	65.1834	0.3480	65.5314	17.3646	0.3226	17.6871						43,957.7354

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,187.88	1,632.48	1383.96	3,251,683	2,867,984
Single Family Housing	8,051.40	10,554.15	9180.30	21,781,672	19,211,434
Total	9,239.28	12,186.63	10,564.26	25,033,354	22,079,419

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
Single Family Housing	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.600000	0.150000	0.185000	0.050100	0.001000	0.000500	0.002000	0.001500	0.001000	0.003000	0.001000	0.000900	0.004000
Single Family Housing	0.600000	0.150000	0.185000	0.050100	0.001000	0.000500	0.002000	0.001500	0.001000	0.003000	0.001000	0.000900	0.004000

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Winter

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.8970	7.6653	3.2619	0.0489		0.6198	0.6198		0.6198	0.6198						9,843.6894
NaturalGas Unmitigated	0.9833	8.4026	3.5756	0.0536		0.6794	0.6794		0.6794	0.6794						10,790.4667

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Winter

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	6370.79	0.0687	0.5871	0.2498	3.7500e-003		0.0475	0.0475		0.0475	0.0475						753.9585
Single Family Housing	84806.4	0.9146	7.8155	3.3257	0.0499		0.6319	0.6319		0.6319	0.6319						10,036.5083
Total		**0.9833**	**8.4026**	**3.5756**	**0.0536**		**0.6794**	**0.6794**		**0.6794**	**0.6794**						**10,790.4667**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	5.93079	0.0640	0.5466	0.2326	3.4900e-003		0.0442	0.0442		0.0442	0.0442						701.8862
Single Family Housing	77.2463	0.8331	7.1188	3.0293	0.0454		0.5756	0.5756		0.5756	0.5756						9,141.8032
Total		**0.8970**	**7.6653**	**3.2619**	**0.0489**		**0.6198**	**0.6198**		**0.6198**	**0.6198**						**9,843.6894**

6.0 Area Detail

6.1 Mitigation Measures Area

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Winter

Use only Natural Gas Hearths

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	67.4713	1.2265	106.3922	5.6300e-003		0.5916	0.5916		0.5916	0.5916						196.6532
Unmitigated	67.4713	1.2265	106.3922	5.6300e-003		0.5916	0.5916		0.5916	0.5916						196.6532

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	18.3860					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	45.9030					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	3.1823	1.2265	106.3922	5.6300e-003		0.5916	0.5916		0.5916	0.5916						196.6532
Total	**67.4713**	**1.2265**	**106.3922**	**5.6300e-003**		**0.5916**	**0.5916**		**0.5916**	**0.5916**						**196.6532**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	18.3860					0.0000	0.0000		0.0000	0.0000						0.0000
Consumer Products	45.9030					0.0000	0.0000		0.0000	0.0000						0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000						0.0000
Landscaping	3.1823	1.2265	106.3922	5.6300e-003		0.5916	0.5916		0.5916	0.5916						196.6532
Total	**67.4713**	**1.2265**	**106.3922**	**5.6300e-003**		**0.5916**	**0.5916**		**0.5916**	**0.5916**						**196.6532**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

Olsen-Chandler (Residential Fleet Mix-With Adjustment) - San Luis Obispo County APCD Air District, Winter

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Reso A - Exhibit C2 (EIR Technical Appendix)

LOCALIZED MOBILE-SOURCE CO MODELING

Reso A - Exhibit C2 (EIR Technical Appendix)

Localized Carbon Monoxide (CO)

Signalized Intersections	Exposure Duration	Carbon Monoxide Concentrations (PPM)					
		Predicted Traffic	Maximum Ambient Background	Persistent Factor	Caculated	California Ambient Air Quality Standard	Exceed Ambient Air Quality Standard?
SR46E/Golden Hill Rd	1 Hour	0.4	2.6	-	3.0	20	No
	8 Hour	0.3	1.5	0.8	1.7	9	No
13th St/Riverside Ave	1 Hour	0.3	2.6	-	2.9	20	No
	8 Hour	0.3	1.5	0.8	1.7	9	No
Niblick Rd/South River Rd	1 Hour	0.4	2.6	-	3.0	20	No
	8 Hour	0.3	1.5	0.8	1.7	9	No

NOTE: Predicted CO concentrations were based on screening criteria identified in the CO Protocol. 1-hour and 8-hour receptors placed at 3 and 7 meters from the roadway edge, respectively; worst-case wind angle/stability class; and highest background CO from the last three years of available data (2004-2006). 8-hour concentrations calculated based on predicted 1-hour concentrations and assuming a persistence factor of 0.8.

Reso A - Exhibit C2 (EIR Technical Appendix)

Pollutant: CO
Year: 2006
Exceptional Events: Included (if any)
About this report

EPA Air Quality Standards:
Carbon Monoxide: 35 ppm (1-hour), 9 ppm (8-hour)

The following data links are active for the next 10 minutes, after which you must resubmit your query.
Download PDF (printable page)
Download CSV (spreadsheet)

To sort a column in the table below, click on the column heading.

Obs	First Max 8hr	Second Max 8hr	Days 8hr Max >STD	First Max 1hr	Second Max 1hr	Days 1hr Max >STD	Exc Events	Monitor Number	Site ID	Address	City	County	State	EPA Region
3612	0.8	0.6	0	1.1	1.1	0	None	1	060792006	3220 South Higuera Street, San Luis Obispo	San Luis Obispo	San Luis Obispo	CA	09

Pollutant: CO
Year: 2005
Exceptional Events: Included (if any)
About this report

EPA Air Quality Standards:
Carbon Monoxide: 35 ppm (1-hour), 9 ppm (8-hour)

The following data links are active for the next 10 minutes, after which you must resubmit your query.
Download PDF (printable page)
Download CSV (spreadsheet)

To sort a column in the table below, click on the column heading.

Obs	First Max 8hr	Second Max 8hr	Days 8hr Max >STD	First Max 1hr	Second Max 1hr	Days 1hr Max >STD	Exc Events	Monitor Number	Site ID	Address	City	County	State	EPA Region
5979	1.3	1	0	2.6	1.7	0	None	1	060792002	1160 Marsh St., San Luis Obispo	San Luis Obispo	San Luis Obispo	CA	09
2312	0.7	0.7	0	1.3	1.2	0	None	1	060792006	3220 South Higuera Street, San Luis Obispo	San Luis Obispo	San Luis Obispo	CA	09

Pollutant: CO
Year: 2004
Exceptional Events: Included (if any)
About this report

EPA Air Quality Standards:
Carbon Monoxide: 35 ppm (1-hour), 9 ppm (8-hour)

The following data links are active for the next 10 minutes, after which you must resubmit your query.
Download PDF (printable page)
Download CSV (spreadsheet)

To sort a column in the table below, click on the column heading.

Obs	First Max 8hr	Second Max 8hr	Days 8hr Max >STD	First Max 1hr	Second Max 1hr	Days 1hr Max >STD	Exc Events	Monitor Number	Site ID	Address	City	County	State	EPA Region
8202	1.5	1.5	0	2.6	2.3	0	None	1	060792002	1160 Marsh St., San Luis Obispo	San Luis Obispo	San Luis Obispo	CA	09
3727	1.2	1.1	0	2.1	1.8	0	None	1	060798001	6005 Lewis Avenue, Atascadero, Ca 93422	Atascadero	San Luis Obispo	CA	09

Highest 1-Hour Concentration: 2.6
Highest 8-Hour Concentration: 1.5

Reso A - Exhibit C2 (EIR Technical Appendix)

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB:
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT:

I. SITE VARIABLES

U=	0.5 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	0.0 CM/S		
CLAS=	7 (G)	VS=	0.0 CM/S		
MIXH=	1000. M	AMB=	0.0 PPM		
SIGTH=	20. DEGREES	TEMP=	15.0 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EB SR APP EX	-750	-5	-150	-5	AG	1784	0.6	0.0	10.0
B. EB SR APP IN	-150	-5	0	-5	AG	1784	1.7	0.0	10.0
C. EB SR DEP IN	0	-5	150	-5	AG	1419	0.9	0.0	10.0
D. EB SR DEP EX	150	-5	750	-5	AG	1419	0.6	0.0	10.0
E. WB SR APP EX	750	5	150	5	AG	1703	0.6	0.0	10.0
F. WB SR APP IN	150	5	0	5	AG	1703	1.7	0.0	10.0
G. WB SR DEP IN	0	5	-150	5	AG	1777	0.9	0.0	10.0
H. WB SR DEP EX	-150	5	-750	5	AG	1777	0.6	0.0	10.0
I. NB GH APP EX	5	-750	5	-150	AG	858	0.7	0.0	10.0
J. NB GH APP IN	5	-150	5	0	AG	858	1.6	0.0	10.0
K. NB GH DEP IN	5	0	5	150	AG	966	0.9	0.0	10.0
L. NB GH DEP EX	5	150	5	750	AG	966	0.7	0.0	10.0
M. SB GH APP EX	-5	750	-5	150	AG	919	0.7	0.0	10.0
N. SB GH APP IN	-5	150	-5	0	AG	919	1.6	0.0	10.0
O. SB GH DEP IN	-5	0	-5	-150	AG	1102	0.9	0.0	10.0
P. SB GH DEP EX	-5	-150	-5	-750	AG	1102	0.7	0.0	10.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 2

JOB:
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT:

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. 1 HR SW	-18	-18	0.0
2. 8 HR SW	-22	-22	0.0
3. 1 HR SE	18	-18	0.0
4. 8 HR SE	22	-22	0.0
5. 1 HR NW	-18	18	0.0
6. 8 HR NW	-22	22	0.0
7. 1 HR NE	18	18	0.0
8. 8 HR NE	22	22	0.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. 1 HR SW	19.	0.4	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
2. 8 HR SW	21.	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
3. 1 HR SE	288.	0.4	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.0
4. 8 HR SE	290.	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0
5. 1 HR NW	109.	0.3	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0
6. 8 HR NW	110.	0.3	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
7. 1 HR NE	246.	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0
8. 8 HR NE	235.	0.3	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0

Reso A - Exhibit C2 (EIR Technical Appendix)

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB:
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT:

I. SITE VARIABLES

U= 0.5 M/S Z0= 100. CM ALT= 0. (M)
BRG= WORST CASE VD= 0.0 CM/S
CLAS= 7 (G) VS= 0.0 CM/S
MIXH= 1000. M AMB= 0.0 PPM
SIGTH= 20. DEGREES TEMP= 15.0 DEGREE (C)

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EB NI APP EX	-750	-5	-150	-5	AG	2047	0.7	0.0	10.0
B. EB NI APP IN	-150	-5	0	-5	AG	2047	1.6	0.0	10.0
C. EB NI DEP IN	0	-5	150	-5	AG	1421	0.9	0.0	10.0
D. EB NI DEP EX	150	-5	750	-5	AG	1421	0.7	0.0	10.0
E. WB NI APP EX	750	5	150	5	AG	1132	0.7	0.0	10.0
F. WB NI APP IN	150	5	0	5	AG	1132	1.6	0.0	10.0
G. WB NI DEP IN	0	5	-150	5	AG	1393	0.9	0.0	10.0
H. WB NI DEP EX	-150	5	-750	5	AG	1393	0.7	0.0	10.0
I. NB SR APP EX	5	-750	5	-150	AG	794	0.7	0.0	10.0
J. NB SR APP IN	5	-150	5	0	AG	794	1.6	0.0	10.0
K. NB SR DEP IN	5	0	5	150	AG	707	0.9	0.0	10.0
L. NB SR DEP EX	5	150	5	750	AG	707	0.7	0.0	10.0
M. SB SR APP EX	-5	750	-5	150	AG	744	0.7	0.0	10.0
N. SB SR APP IN	-5	150	-5	0	AG	744	1.6	0.0	10.0
O. SB SR DEP IN	-5	0	-5	-150	AG	1196	0.9	0.0	10.0
P. SB SR DEP EX	-5	-150	-5	-750	AG	1196	0.7	0.0	10.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 2

JOB:
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT:

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. 1 HR SW	-18	-18	0.0
2. 8 HR SW	-22	-22	0.0
3. 1 HR SE	18	-18	0.0
4. 8 HR SE	22	-22	0.0
5. 1 HR NW	-18	18	0.0
6. 8 HR NW	-22	22	0.0
7. 1 HR NE	18	18	0.0
8. 8 HR NE	22	22	0.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. 1 HR SW	19.	0.3	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
2. 8 HR SW	21.	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
3. 1 HR SE	285.	0.4	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
4. 8 HR SE	286.	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
5. 1 HR NW	161.	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0
6. 8 HR NW	160.	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0
7. 1 HR NE	250.	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0
8. 8 HR NE	249.	0.3	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0

Reso A - Exhibit C2 (EIR Technical Appendix)

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB:
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT:

I. SITE VARIABLES

U= 0.5 M/S Z0= 100. CM ALT= 0. (M)
BRG= WORST CASE VD= 0.0 CM/S
CLAS= 7 (G) VS= 0.0 CM/S
MIXH= 1000. M AMB= 0.0 PPM
SIGTH= 20. DEGREES TEMP= 15.0 DEGREE (C)

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. EB 13 APP EX	-750	-5	-150	-5	AG	537	0.9	0.0	10.0
B. EB 13 APP IN	-150	-5	0	-5	AG	537	1.6	0.0	10.0
C. EB 13 DEP IN	0	-5	150	-5	AG	1423	1.2	0.0	10.0
D. EB 13 DEP EX	150	-5	750	-5	AG	1423	0.9	0.0	10.0
E. WB 13 APP EX	750	5	150	5	AG	1486	0.9	0.0	10.0
F. WB 13 APP IN	150	5	0	5	AG	1486	1.6	0.0	10.0
G. WB 13 DEP IN	0	5	-150	5	AG	596	1.2	0.0	10.0
H. WB 13 DEP EX	-150	5	-750	5	AG	596	0.9	0.0	10.0
I. NB RS APP EX	5	-750	5	-150	AG	358	0.8	0.0	10.0
J. NB RS APP IN	5	-150	5	0	AG	358	1.6	0.0	10.0
K. NB RS DEP IN	5	0	5	150	AG	788	0.9	0.0	10.0
L. NB RS DEP EX	5	150	5	750	AG	788	0.8	0.0	10.0
M. SB RS APP EX	-5	750	-5	150	AG	846	0.8	0.0	10.0
N. SB RS APP IN	-5	150	-5	0	AG	846	1.6	0.0	10.0
O. SB RS DEP IN	-5	0	-5	-150	AG	420	0.9	0.0	10.0
P. SB RS DEP EX	-5	-150	-5	-750	AG	420	0.8	0.0	10.0

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 2

JOB:
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT:

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. 1 HR SW	-18	-18	0.0
2. 8 HR SW	-22	-22	0.0
3. 1 HR SE	18	-18	0.0
4. 8 HR SE	22	-22	0.0
5. 1 HR NW	-18	18	0.0
6. 8 HR NW	-22	22	0.0
7. 1 HR NE	18	18	0.0
8. 8 HR NE	22	22	0.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. 1 HR SW	75.	0.3	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0
2. 8 HR SW	74.	0.2	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0
3. 1 HR SE	345.	0.3	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0
4. 8 HR SE	345.	0.3	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0
5. 1 HR NW	104.	0.3	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0
6. 8 HR NW	105.	0.3	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0
7. 1 HR NE	196.	0.2	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0
8. 8 HR NE	200.	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0

Appendix C.2

Energy Calculations

Olsen Chandler Specific Plan

Last Updated: August 28, 2019

Compression-Ignition Engine Brake-Specific Fuel Consumption (BSFC) Factors **[1]**:

HP: 0 to 100	0.0588	HP: Greater than 100	0.0529

Values above are expressed in gallons per horsepower-hour/BSFC.

CONSTRUCTION EQUIPMENT

Construction Equipment	#	Hours per Day	Horsepower	Load Factor	Construction Phase	Fuel Used (gallons)
Concrete/Industrial Saw	1	8	81	0.73	Demolition	138.99
Excavators	3	8	158	0.38	Demolition	380.84
Dozers	2	8	247	0.40	Demolition	417.80
Dozers	3	8	247	0.40	Site Preparation	2,882.80
Tractors/Loaders/Backhoes	4	8	97	0.37	Site Preparation	1,552.26
Excavators	2	8	158	0.38	Grading	4,417.73
Graders	1	8	187	0.41	Grading	2,820.68
Dozers	1	8	247	0.40	Grading	3,634.84
Scrapers	2	8	367	0.48	Grading	12,961.80
Tractors/Loaders/Backhoes	2	8	97	0.37	Grading	2,935.79
Cranes	1	7	231	0.29	Building Construction	19,408.35
Forklifts	3	8	89	0.20	Building Construction	19,656.49
Generator Sets	1	8	84	0.74	Building Construction	22,881.04
Tractors/Loaders/Backhoes	3	7	97	0.37	Building Construction	34,679.08
Welders	1	8	46	0.45	Building Construction	7,619.65
Air Compressor	1	6	78	0.48	Arch Coating	8,897.34
Pavers	2	8	130	0.42	Paving	2,077.99
Paving Equipment	2	8	132	0.36	Paving	1,808.54
Rollers	2	8	80	0.38	Paving	1,286.23
					Total Fuel Used (Gallons)	**150,458.24**

Construction Phase	Days of Operation
Demolition	5
Site Preparation	23
Grading	87
Building Construction	783
Paving	45
Architectural Coating	674

WORKER TRIPS

Constuction Phase	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
Demolition	24.0	15	13.0	40.63
Site Preparation	24.0	18	13.0	224.25
Grading	24.0	20	13.0	942.50
Building Construction	24.0	3,813	13.0	1,617,188.63
Paving	24.0	15	13.0	365.63
Architectural Coating	24.0	763	13.0	278,558.58
			Total	**1,897,320.21**

VENDOR TRIPS

Constuction Phase	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
Demolition	7.4	-	5.0	-
Site Preparation	7.4	-	5.0	-
Grading	7.4	-	5.0	-
Building Construction	7.4	1,413	5.0	747,553.38
Paving	7.4	-	5.0	-
Architectural Coating	7.4	-	5.0	-
			Total	**747,553.38**

Reso A - Exhibit C2 (EIR Technical Appendix)

HAULING TRIPS

Trip Class	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
Demolition	7.4	15	20.00	40.54
			Total	**40.54**

Total Gasoline Consumption (gallons)	**1,897,320.21**
Total Diesel Consumption (gallons)	**898,052.16**

Sources:

[1] United States Environmental Protection Agency. 2018. *Exhaust and Crankcase Emission Factors for Nonroad Compression-Ignition Engines in MOVES2014b* . July 2018. Available at: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100UXEN.pdf.

[2] United States Department of Transportation, Bureau of Transportation Statistics. 2018. *National Transportation Statistics 2018* . Available at: https://www.bts.gov/sites/bts.dot.gov/files/docs/browse-statistical-products-and-data/national-transportation-statistics/223001/ntsentire2018q4.pdf.

Olsen Chandler Specific Plan

Last Updated: June 28, 2019

Populate one of the following tables (Leave the other blank):

Residential Annual VMT	OR	Daily Vehicle Trips
Residential Annual VMT: 25,033,354		Daily Vehicle Trips:
		Average Trip Distance:

Fleet Class	Fleet Mix
Light Duty Auto (LDA)	0.600000
Light Duty Truck 1 (LDT1)	0.150000
Light Duty Truck 2 (LDT2)	0.185000
Medium Duty Vehicle (MDV)	0.050000
Light Heavy Duty 1 (LHD1)	0.001000
Light Heavy Duty 2 (LHD2)	0.001000
Medium Heavy Duty (MHD)	0.002000
Heavy Heavy Duty (HHD)	0.002000
Other Bus (OBUS)	0.001000
Urban Bus (UBUS)	0.003000
School Bus (SBUS)	0.001000
Motorhome (MH)	0.004000
Motorcycle (MCY)	0.001000

Fuel Economy (MPG)	
Passenger Vehicles	24.0
Light-Med Duty Trucks	17.4
Heavy Trucks/Other	7.4
Motorcycles	43.9

Fleet Mix

Vehicle Type	Percent	Fuel Type	Annual VMT: VMT	Vehicle Trips: VMT	Fuel Consumption (Gallons)
Passenger Vehicles	*60.00%*	*Gasoline*	15,020,012	0.00	625,833.85
Light-Medium Duty Trucks	*38.50%*	*Gasoline*	9,637,841	0.00	553,898.92
Heavy Trucks/Other	*1.50%*	*Diesel*	375,500	0.00	50,743.29
Motorcycle	*0.10%*	*Gasoline*	25,033	0.00	570.24

Total Gasoline Consumption (gallons)	**1,180,303.01**
Total Diesel Consumption (gallons)	**50,743.29**

Olsen Chandler Specific Plan

Last Updated: June 28, 2019

Populate one of the following tables (Leave the other blank):

Nonresidential Annual VMT		OR	Daily Vehicle Trips	
Nonresidential Annual VMT:	2,601,506		Daily Vehicle Trips:	
			Average Trip Distance:	

Fleet Class	Fleet Mix
Light Duty Auto (LDA)	0.588806
Light Duty Truck 1 (LDT1)	0.027737
Light Duty Truck 2 (LDT2)	0.198305
Medium Duty Vehicle (MDV)	0.114471
Light Heavy Duty 1 (LHD1)	0.022249
Light Heavy Duty 2 (LHD2)	0.005748
Medium Heavy Duty (MHD)	0.012759
Heavy Heavy Duty (HHD)	0.019721
Other Bus (OBUS)	0.002316
Urban Bus (UBUS)	0.001163
School Bus (SBUS)	0.000758
Motorhome (MH)	0.001192
Motorcycle (MCY)	0.004776

Fuel Economy (MPG)	
Passenger Vehicles	24.0
Light-Med Duty Trucks	17.4
Heavy Trucks/Other	7.4
Motorcycles	43.9

Fleet Mix

Vehicle Type	Percent	Fuel Type	Annual VMT: VMT	Vehicle Trips: VMT	Fuel Consumption (Gallons)
Passenger Vehicles	*58.88%*	*Gasoline*	1,531,782	0.00	63,824.26
Light-Medium Duty Trucks	*34.05%*	*Gasoline*	885,847	0.00	50,910.72
Heavy Trucks/Other	*6.59%*	*Diesel*	171,455	0.00	23,169.57
Motorcycle	*0.48%*	*Gasoline*	12,425	0.00	283.02

Total Gasoline Consumption (gallons)	**115,018.01**
Total Diesel Consumption (gallons)	**23,169.57**

Appendix D.1

Biological Reports

Biological Report

for

South Chandler Ranch

City of Paso Robles
San Luis Obispo County

Prepared for

Ayres Group
355 Bristol Street, Suite A
Costa Mesa, CA 93626-7923

by

ALTHOUSE AND MEADE, INC.
BIOLOGICAL AND ENVIRONMENTAL SERVICES
1602 Spring Street
Paso Robles, CA 93446
(805) 237-9626

February 2018

982.02

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Cover Page: South Chandler Ranch. May 3, 2017.

Synopsis

- This biological report examines a 117.3-acre Study Area located in the City of Paso Robles, San Luis Obispo County, California.
- The proposed project is a residential development. Site plans were still in development at the time this report was prepared.
- Habitat types identified and mapped in the Study Area consist of California annual grassland, anthropogenic, ruderal, and wetland.
- Botanical surveys conducted in spring 2017 identified 84 species, subspecies, and varieties of vascular plants in the Study Area. Appropriate habitat and soil conditions are suitable for three special status plant species. No special status plant species were detected in the Study Area during appropriately timed botanical surveys.
- Wildlife species that could be present in the Study Area include three species of amphibians, seven reptiles, 36 birds, and 20 mammals. Appropriate habitat is present in the Study Area for eight special status animals. No special status animals were detected in the Study Area in 2017.

1.0 Introduction

This report provides information regarding biological resources associated with the 117.3-acre South Chandler Ranch (Study Area) in the City of Paso Robles in San Luis Obispo County, California (Figure 1). Results are reported for botanical and wildlife surveys of the Study Area conducted in spring 2017. A habitat inventory and results of database and literature searches of special status species reports within a nine 7.5-minute quadrangle search area of the Study Area are also included. Special status species that could occur in the Study Area or be affected by the proposed project are discussed, and lists of plant and animal species that were identified or are expected in the Study Area are provided.

This Biological Report provides information regarding biological resources in the Study Area, and assesses impacts to biological resources that could occur from the proposed project. An evaluation of the effect of the proposed project on biological resources is included, and mitigation measures are provided.

1.1 Project Location and Description

The Study Area is located in the City of Paso Robles, San Luis Obispo County, California, east of the intersection of Sherwood Road and Fontana Road (Figure 2). Fontana Road borders the Study Area to the west, Linne Road borders the Study Area to the south, agricultural land borders the Study Area to the east, and undeveloped Chandler Ranch property lies to the north. The Study Area is located within the Templeton United States Geological Survey (USGS) 7.5-minute quadrangle, and is composed of 62 parcels which are provided in Appendix A. Approximate coordinates for the center of the Study Area are 35.615471°N and 120.644812°W (WGS 84). Elevation varies from 815 feet above mean sea level (amsl) to 929 feet amsl.

The proposed project (Project) is a residential development. Final site plans were not available at the time this report was prepared.

1.3 Responsible Parties

TABLE 1. RESPONSIBLE PARTIES.

Applicant	Biological Consultant
Ayres Group 355 Bristol Street, Suite A, Costa Mesa, CA 93626-7923	**Althouse and Meade, Inc.** 1602 Spring Street Paso Robles, CA 93446 (805) 237-9626
Planner/Engineer	**Lead Agency**
North Coast Engineering 725 Creston Road, Suite B Paso Robles, CA 93446 (805) 239-3127	**City of El Paso de Robles** Planning Division 1000 Spring Street Paso Robles, CA 93446 (805) 237-3970

2.0 Methods

The Study Area was surveyed for biological resources on April 28, 2017 and May 3, 2017. Surveys were conducted by Principal Biologist Jason Dart and Botanists Kristen Andersen and Shannon Henke. Surveys were conducted on foot in order to compile species lists, search for special status plants and animals, map habitats, and to photograph the Study Area. The entire Study Area was surveyed.

Each habitat type occurring in the Study Area was inspected, described, and catalogued (Section 3.0). All plant and animal species observed in the Study Area were identified and recorded (Section 4.0). Reconnaissance transects were meandering with an emphasis on locating habitat appropriate for special status plants. Transects were utilized to map boundaries of different vegetation types, describe general conditions and dominant species, compile species lists, and evaluate potential habitat for special status species. Identification of botanical resources included field observations and laboratory analysis of collected material (Table 6). Botanical surveys were conducted on May 3, 2017 according to agency guidelines (USFWS 2000, CDFG [CDFW] 2009, and CNPS 2001). Botanical surveys were appropriately timed to identify all special status plant species known from the region (refer to Section 4.1, and Table 4) that have potential to occur in the Study Area. Botanical nomenclature used in this document follows the Jepson Manual, Second Edition (Baldwin et al. 2012). We also provide Jepson Manual First Edition names in brackets where nomenclature has recently changed.

Wildlife documentation included observations of animal presence and wildlife sign such as nests, tracks, and scat. Observations of wildlife were recorded during field surveys in all areas of the Study Area (Table 7). Birds were identified by sight, using 10-power binoculars, or by vocalizations. Reptiles and amphibians were identified by sight, often using binoculars; traps were not used. Mammals recorded in the Study Area were identified by sight and tracks. Small

mammal trapping studies were beyond the scope of this report, although several species are likely to occur.

Mapping efforts utilized hand notation on recent land survey and aerial photos. Maps were created using aerial photo interpretation, field notation, and GPS data imported to ArcGIS 10, a Geographic Information System (GIS) software program. Data were overlaid on a 2016 National Agriculture Imagery Program (NAIP) aerial of San Luis Obispo County (USDA 2016). Biological resource constraints were mapped in the field on site. Hand notation on field maps was incorporated into point and polygon layers and overlaid on high resolution aerial photographs.

We conducted a search of the California Natural Diversity Database (CNDDB February 15, 2018 data) and the California Native Plant Society (CNPS) On-line Inventory of Rare and Endangered Plants of California for special status species known to occur in eight USGS 7.5-minute quadrangles surrounding the Study Area: Adelaida, Atascadero,, Creston, Estrella, Paso Robles, Santa Margarita, Templeton, and York Mountain. The Morro Bay North quadrangle was omitted from the CNDDB and CNPS search results because the quad is separated from the site by the coastal mountains and contains results for coastal species which would not be present in the Study Area.

Special status species lists produced by database and literature searches were cross-referenced with the described habitat types in the Study Area to identify all potential special status species that could occur on or near the Study Area. Each special status species that could occur on or near the Study Area is individually discussed (refer to Sections 4.1.4 and 4.2.3).

TABLE 2. BIOLOGICAL SURVEYS.

Survey Date	Temp.	Wind	Weather Observations	Biologist(s)
April 28, 2017	75 °F	Windy 10- 20 mph	Sunny	Jason Dart
May 3, 2017	90 °F	Calm 0 – 5 mph	Sunny, hot	Jason Dart Kristen Andersen Shannon Henke

3.0 Existing Conditions

Situated in rural eastern Paso Robles, the majority of the Study Area is fallow cropland turned grassland. It has rolling hills and gently sloping plains with more than 100 feet in elevation change from the north to south. The Study Area was first farmed prior to 1949 and has lain fallow since around 2006. Land use in the vicinity of the Study Area includes residential development to the northwest, commercial development to the west and south, a vineyard to the east and undeveloped Chandler Ranch property to the north (Figure 2).

In the southeastern portion of the Study Area approximately 15 acres was subdivided into 54 lots in the 1960's to develop the subdivision Our Town. The project ceased after 13 lots were developed on one of the six cul-de-sacs originating from the constructed Aaroe Road. Currently, some of the homes are inhabited, some dilapidated, and the remaining cul-de-sacs are paved and unmaintained, surrounded by weedy grassland.

The southeastern portion of the Study Area is bisected by a drainage ditch created in the 1960's to direct water from the Our Town subdivision toward a culvert at the intersection of Linne Road and Airport Road. This ditch is predominantly dry and is characterized by intermittent shrubs. Two small wetland features are also found in the Study Area, one in a bowl on the east side and one in a swale feature on the west.

3.1 Soils

Four individual soil map units from the Natural Resource Conservation Service (NRCS) Soil Survey Geographic Database (SSURGO) overlap the Study Area: Arbuckle-Positas complex, Nacimiento-Los Osos complex, Rincon clay loam, and San Ysidro loam (Soil Survey Staff 2017).

3.2 Habitat Types

Table 3 lists four habitat types described and mapped in the Study Area. The Biological Resources Map (Figure 4) provided in Section 8.0 indicates the locations of each habitat type in the Study Area. Most of the Study Area is mapped as California annual grassland with anthropogenic, ruderal, and wetland elements comprising a small portion of the area.

TABLE 3. HABITAT TYPES. The approximate acreage and location are provided for all habitat types occurring in the Study Area.

Habitat Type	Approximate Acreage	Location
California Annual Grassland	108.7	Throughout the Study Area
Anthropogenic	7.1	Southeast portion of Study Area
Ruderal	1.4	Southeast portion of Study Area
Wetland	0.08	On east and west sides of Study Area

3.2.1 California annual grassland

Annual grassland is the predominant habitat in the Study Area, covering approximately 108.7 acres of the site. Most of the area in the Study Area was farmed and ranched prior to 2006. Since then, the fallow cropland has reverted to grassland. Because of previous disturbance, the grassland is comprised mainly of non-native grasses and forbs. Dominant species include wild oats (*Avena barbata* and *A. fatua*), annual bromes (*Bromus diandrus, B. hordeaceus,* and *B. madritensis* subsp. *rubens*), filaree (*Erodium* ssp.), and mustards (*Brassica nigra* and *Hirschfeldia incana*).

Both early and late season wildflowers occur regularly in low abundance. Early season wildflowers include fiddlenecks (*Amsinckia* ssp.), blow wives (*Achyrachaena mollis*), valley tassels (*Castilleja attenuata*), lupines (*Lupinus* ssp.), and valley popcornflower (*Plagiobothrys canescens* var. *canescens*). Late-season wildflowers include spikeweed (*Centromadia fitchii),* clarkias (*Clarkia* ssp.), annual fireweed (*Epilobium brachycarpum*), and navarretia (*Navarretia*

ssp.). Native annual grasses such as bluegrass (*Poa annua*) and native perennial herbs such as milkweeds (*Asclepias* ssp.) and dwarf brodiaea (*Brodiaea terrestris*) are also found in low abundance.

3.2.2 Anthropogenic

Anthropogenic habitat is present on approximately 7.1 acres of the Study Area, in the southeast portion of the property around the unfinished Our Town development. This area is comprised of residences, streets, and yards, as well as associated structures, planted trees, and other landscaping. In these areas, non-native thistles (*Centaurea* ssp. and *Salsola tragus*) and other non-native forbs and grasses are the dominant herbaceous vegetation. Native plant communities are absent.

3.2.3 Ruderal

Ruderal habitat is present on approximately 1.4 acres of the Study Area, in the southeastern portion of the Study Area along the north and west side of the entrance road to Our Town. These disturbed roadside areas consist of bare ground and non-native forbs and grasses, with minimal native herbaceous vegetation.

3.2.4 Wetland

Two potentially jurisdictional wetland patches comprising 0.08 acres of the Study Area were defined in a wetland delineation report (Althouse and Meade, Inc. November 2017). One wetland occurs in a bowl on the east side of the Study Area and one occurs in a swale feature on the west.

The eastern wetland is a low spot 250 feet north of Our Town. It was likely created during the construction of Our Town when a pile of asphalt was left in the field. Plowing around the asphalt may have left the area lower and undisturbed, collecting water and creating a 0.01 acre (602 square feet) isolated wetland. Water enters the wetland through precipitation and surface runoff, but does not drain out except through percolation. Dominant plant species within the wetland are seaside barley (*Hordeum marinum*) and curly dock (*Rumex crispus*). Other wetland species such as toad rush (*Juncus bufonius*) and slender woolly marbles (*Psilocarphus tenellus*) are also present.

The western wetland lies in a swale feature in the northwest portion of the property and is 0.07 acre (2999 square feet). Water originating from surface or subsurface runoff from hills onsite is concentrated in a small swale, and likely sheet or subsurface flows downslope to the street or a culvert at the corner of Fontana Road and Linne Road. Dominant vegetation includes Italian ryegrass (*Festuca perennis*) and seaside barley, with patches of toad rush and slender woolly marbles. Adjacent upland areas and downslope of the wetland feature was dominated by rattail sixweeks grass (*Festuca myuros*).

3.3 Potential Wetlands and Jurisdictional Waters

Technical findings of a delineation of potential jurisdictional wetlands and waters of the United States are reported separately (Althouse and Meade, Inc. 2017).

3.4 Habitat Connectivity and Wildlife Movement

The Study Area is surrounded to the east, west, and south by development and agriculture, and is bordered on the west and south by roads. There is undeveloped ranch land to the north. Wildlife is most likely to move into the Study Area from the north, but may also pass through agriculture from the east or south. Because the Study Area is surrounded on three sides by vineyards, farming, and urban development, it is not likely to be an important corridor for wildlife movement.

4.0 Results

The CNDDB and the CNPS On-line Inventory of Rare and Endangered Plants of California contain records for 75 special status species within the designated search area. The search area includes the following eight USGS 7.5-minute quadrangles surrounding the Study Area: Adelaida, Paso Robles, Estrella, York Mountain, Templeton, Creston, Atascadero, and Santa Margarita.

Appropriate habitat and soil conditions are present in the Study Area for 3 special status plants and 8 special status animals (Tables 4 and 5).

No special status plant or wildlife species were detected in the Study Area. Figure 3 in Section 8.0 depicts the current GIS data for special status species and critical habitat mapped in the vicinity of the Study Area by the CNDDB and the U.S. Fish and Wildlife Service (USFWS).

4.1 Special Status Plants

4.1.1 Introduction to California Rare Plant Ranks

Plant species are considered rare when their distribution is confined to localized areas, when there is a threat to their habitat, when they are declining in abundance, or are threatened in a portion of their range. The California Rare Plant Rank (CRPR) categories range from species with a low threat (CRPR 4) to species that are presumed extinct (CRPR 1A). The plants of CRPR 1B are rare throughout their range. All but a few species are endemic to California. All of them are judged to be vulnerable under present circumstances, or to have a high potential for becoming vulnerable.

4.1.2 Introduction to CNDDB definitions

"Special Plants" is a broad term used to refer to all the plant taxa inventoried by the CNDDB, regardless of their legal or protection status (CDFW January 2018). Special plants include vascular plants, bryophytes (mosses, liverworts, and hornworts), and lichens.

4.1.3 Potential special status plant list

Table 4 lists 54 special status plant species reported from the region. Federal and California State status, global and State rank, and CNPS rank status for each species are given. Typical blooming period, habitat preference, potential habitat on site, and whether or not the species was observed in the Study Area are also provided.

TABLE 4. SPECIAL STATUS PLANT LIST. The 54 special status plants reported from the region are listed below. Potentially suitable habitat is present in the Study Area for three special status plant species. No special status plant species were detected in the Study Area.

	Common and Scientific Names	Fed/State Status CRPR	Blooming Period	Habitat Preference	Potential to Occur	Detected within Study Area	Effect of Proposed Activity
1.	**Bristlecone Fir** *Abies bracteata*	None/None 1B.3	N/A	Lower montane coniferous forest. Rocky sites in Monterey and SLO Counties. 210-1600 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect
2.	**Hoover's Bent Grass** *Agrostis hooveri*	None/None 1B.2	April - July	Sandy soil in oak woodland habitat; <600 m. Endemic to SLO & SB Counties.	No. Suitable habitat is not present in the Study Area.	No	No Effect
3.	**Douglas' Fiddleneck** *Amsinckia douglasiana*	None/None 4.2	March – May	Cismontane woodland, Valley and foothill grassland; unstable shaly sedimentary slopes; (100)150-1600 m. SCoR, w WTR	No. Suitable substrate is not present in the Study Area.	No	No Effect
4.	**Oval-leaved Snapdragon** *Antirrhinum ovatum*	None/None 4.2	May - November	Heavy, adobe-clay soils on gentle, open slopes, also disturbed areas; 200-1000 m. s SnJV, s SCoRI	No. Suitable habitat is not present in the Study Area.	No	No Effect
5.	**Santa Lucia Manzanita** *Arctostaphylos luciana*	None/None 1B.2	December - March	Shale outcrops, slopes, chaparral, 500-700 m. Cuesta Pass, SLO County.	No. Suitable habitat is not present in the Study Area.	No	No Effect
6.	**Bishop Manzanita** *Arctostaphylos obispoensis*	None/None 4.3	February - June	Rocky, generally serpentine soils, chaparral, open closed-cone forest near coast; 60-950 m. SCoRO (c&s Santa Lucia Range).	No. Suitable habitat is not present in the Study Area.	No	No Effect
7.	**Santa Margarita Manzanita** *Arctostaphylos pilosula*	None/None/ 1B.2	December - May	Shale outcrops, slopes, chaparral; 300-1100 m. s SCoRO. Endemic to SLO County	No. Suitable habitat is not present in the Study Area.	No	No Effect

	Common and Scientific Names	Fed/State Status CRPR	Blooming Period	Habitat Preference	Potential to Occur	Detected within Study Area	Effect of Proposed Activity
8.	**Miles' Milk-vetch** *Astragalus didymocarpus* var. *milesianus*	None/None 1B.2	March - May	Grassy areas near coast; < 400 m. s CCo.	No. Suitable habitat is present in the Study Area but the Study Area is outside the known range of this subspecies.	No	No Effect
9.	**Salinas Milk-vetch** *Astragalus macrodon*	None/None 4.3	April - July	Eroded pale shales or sandstone, serpentine alluvium; 200-1550 m. c&s SCoR.	No. Suitable habitat is not present in the Study Area.	No	No Effect
10.	**San Luis Mariposa-lily** *Calochortus obispoensis*	None/None 1B.2	May - June	Dry serpentine, generally open chaparral; 100-500 m. c CCo (e of Morro Bay), s SCoRO (San Luis Obispo Co.).	No. Suitable serpentine soil is not present in the Study Area.	No	No Effect
11.	**La Panza Mariposa-lily** *Calochortus simulans*	None/None 1B.3	April - May	Grassland, oak woodland & pine forest, on sand, granite, or serpentine; <1100 m. Endemic to SLO County	No. Suitable soil is not present in the Study Area.	No	No Effect
12.	**Dwarf Calycadenia** *Calycadenia villosa*	None/None 1B.1	May - October	Dry, rocky hills, ridges, in chaparral, woodland, meadows and seeps; <1100 m. c&s SCoRO	No. Suitable habitat is not present in the Study Area.	No	No Effect
13.	**Cambria morning glory** *Calystegia subacaulis* ssp. *episcopalis*	None/None 4.2	(March)April - June(July)	Dry, open scrub, woodland, or grassland; usually clay <500 m. c SCoRO Endemic to SLO County	No. Suitable habitat is not present in the Study Area.	No	No Effect
14.	**Hardham's Evening-primrose** *Camissoniopsis hardhamiae*	None/None 1B.2	March - May	Decomposed carbonate soils, in chaparral, cismontane woodland. 240-600 m. Monterey, SLO Counties	No. Suitable habitat is not present in the Study Area.	No	No Effect

	Common and Scientific Names	Fed/State Status CRPR	Blooming Period	Habitat Preference	Potential to Occur	Detected within Study Area	Effect of Proposed Activity
15.	**Carex Obispoensis** *San Luis Obispo sedge*	None/None 1B.2	March - June	Springs, streamsides in chaparral, generally on serpentine; < 800 m. PR, SCoRO (Monterey, San Luis Obispo cos.).	No. Suitable habitat is not present in the Study Area.	No	No Effect
16.	**San Luis Obispo Owl's-clover** *Castilleja densiflora* var. *obispoensis*	None/None 1B.2	April	Coastal grassland, <100 m. Endemic to SLO County.	No. Suitable habitat is present in the Study Area, but the Study Area is outside of the known range of this subspecies.	No	No Effect
17.	**Lemmon's Jewelflower** *Caulanthus lemmonii*	None/None 1B.2	March – May	Dry, exposed slopes, grassland, chaparral, scrub; 80-1100 m. sw SnJv, se SnFrb, e SCoRO, SCoRI	No. Suitable grassland is not present in the Study Area.	No	No Effect
18.	**Lompoc Ceanothus** *Ceanothus cuneatus* var. *fascicularis*	None/None 4.2	February - May	Sandy substrates, coastal chaparral; < 275 m. s CCo (Santa Barbara, San Luis Obispo cos.).	No. Suitable habitat is not present in the Study Area.	No	No Effect
19.	**Brewer's Spineflower** *Chorizanthe breweri*	None/None 1B.3	March - July	Gravel or rocks; 60-800 m. SCoRO (sw San Luis Obispo Co.).	No. Suitable habitat is not present in the Study Area.	No	No Effect
20.	**Douglas' Spineflower** *Chorizanthe douglasii*	None/None 4.3	April - July	Sand or gravel; (200)300-1600 m. e SCoRO, SCoRI.	No. Suitable habitat is not present in the Study Area.	No	No Effect
21.	**Palmer's Spineflower** *Chorizanthe palmeri*	None/None 4.2	May - August	Serpentine; 60--700 m. SCoRO (w Monterey, w San Luis Obispo cos.).	No. Suitable serpentine soil is not present in the Study Area.	No	No Effect
22.	**Straight-awned Spineflower** *Chorizanthe rectispina*	None/None 1B.3	May - July	Chaparral, dry woodland in sandy soil; 200-600 m. SCoRO	No. Suitable habitat is not present in the Study Area.	No	No Effect

	Common and Scientific Names	Fed/State Status CRPR	Blooming Period	Habitat Preference	Potential to Occur	Detected within Study Area	Effect of Proposed Activity
23.	**San Luis Obispo Fountain Thistle** *Cirsium fontinale* var. *obispoense*	FE/CE 1B.2	April – October	Serpentine seeps and streams; < 350 m. c SCoRO (San Luis Obispo Co.).	No. Suitable habitat is not present in the Study Area.	No	No Effect
24.	**Cuesta Ridge Thistle** *Cirsium occidentale* var. *lucianum*	None/None 1B.2	April - July	Chaparral, woodland or forest openings, often on serpentine; 500-750 m. s SCoRO (s Santa Lucia Range, San Luis Obispo Co.).	No. Suitable habitat is not present in the Study Area.	No	No Effect
25.	**Slender Clarkia** *Clarkia exilis*	None/None 4.3	April - May	Cismontane woodland; <1000 m.; s SNF, Teh	No. Suitable habitat is not present in the Study Area.	No	No Effect
26.	**Small-flowered Morning-glory** *Convolvulus simulans*	None/None 4.2	April - June	Clay substrates, occasionally serpentine, annual grassland, coastal-sage scrub, chaparral; 30-875 m. s SNF, SnJV/SCoRI, SnFrB, s SCoRO, SCo, ChI, WTR, PR	Moderate. Suitable habitat is present in the Study Area.	No	No Effect
27.	**Paniculate tarplant** *Deinandra paniculata*	None/None 4.2	(March)April - November	Vernally mesic or sandy soils in coastal scrub and grassland habitats; <1320 m.	No. Suitable habitat may be present however Study Area is outside of species known range.	No	No Effect
28.	**Small-flowered Gypsum-loving larkspur** *Delphinium gypsophilum* subsp. *parviflorum*	None/None 3.2	February - June	Slopes in grassland, open oak woodland; 90-1200 m. s SNF, Teh, SnJV, SCoR.	No. As of 2012 this is no longer a valid taxon.	No	No Effect

	Common and Scientific Names	Fed/State Status CRPR	Blooming Period	Habitat Preference	Potential to Occur	Detected within Study Area	Effect of Proposed Activity
29.	**Dune Larkspur** *Delphinium parryi* ssp. *blochmaniae*	None/None 1B.2	April - June	Coastal chaparral, sand. 0-200 m. s CCo	No. Suitable habitat is not present in the Study Area.	No	No Effect
30.	**Eastwood's Larkspur** *Delphinium parryi* subsp. *eastwoodiae*	None/None 1B.2	March - May	Coastal chaparral, grassland, on serpentine; 100-500m sCCo, SCoRO (San Luis Obispo County)	No. Suitable serpentine soil is not present in the Study Area.	No	No Effect
31.	**Umbrella Larkspur** *Delphinium umbraculorum*	None/None 1B.3	April - June	Moist oak forest; 400-1600 m. SCoRO, WTR.	No. Suitable habitat is not present in the Study Area.	No	No Effect
32.	**Mouse-gray dudleya** *Dudleya abramsii* subsp. *murina*	None/None 1B.3	May - June	Serpentine outcrops; 120-300 m. s SCoRO (San Luis Obispo Co.).	No. Suitable habitat is not present in the Study Area.	No	No Effect
33.	**Small Spikerush** *Eleocharis parvula*	None/None 4.3	(April)June - August(September)	Brackish, wet soil, coastal; <50 m. NCo, SnFrB, SCo; to BC; KS to NL, FL, LA; Mex, C.Am, Eurasia	No. Suitable habitat is not present in the Study Area.	No	No Effect
34.	**Yellow-flowered Eriastrum** *Eriastrum luteum*	None/None 1B.2	May - June	Bare sandy decomposed granite slopes in cismontane woodland, chaparral, forest; 360-1000 m. SCoR (Monterey, SLO cos.).	No. Suitable habitat is not present in the Study Area.	No	No Effect
35.	**Ojai Fritillary** *Fritillaria ojaiensis*	None/None 1B.2	February - May	Rocky slopes, river basins; 300--500 m. s SCoRO (San Luis Obispo, Santa Barbara cos.), WTR (Ventura Co.).	No. Suitable habitat is not present in the Study Area.	No	No Effect

	Common and Scientific Names	Fed/State Status CRPR	Blooming Period	Habitat Preference	Potential to Occur	Detected within Study Area	Effect of Proposed Activity
36.	**Hogwallow Starfish** *Hesperevax caulescens*	None/None 4.2	March - June	Drying shrink-swell clay of vernal pools, flats, steep slopes (sometimes serpentine); < 300(500) m. NCoRI, CaRF, n&s SNF, GV, SCoRO, sw PR.	No. Suitable habitat is not present in the Study Area.	No	No Effect
37.	**Mesa Horkelia** *Horkelia cuneata* var. *puberula*	None/None 1B.1	February - September	Dry, sandy coastal chaparral; gen 70-700 m. SCoRO, SCo.	No. Suitable habitat is not present in the Study Area.	No	No Effect
38.	**Kellogg's Horkelia** *Horkelia cuneata* var. *sericea*	None/None 1B.1	April - September	Old dunes, coastal sand hills; <200 m. CCo	No. Suitable habitat is not present in the Study Area.	No	No Effect
39.	**Santa Lucia Dwarf Rush** *Juncus luciensis*	None/None 1B.2	April - July	Vernal pools, ephemeral drainages, wet meadow habitats, and streams; 300-1900 m. CaRH, n SNH, SCoRO, TR, PR, MP.	Low. Suitable but limited habitat is present in wetlands in the Study Area.	No	No Effect
40.	**Jared's Pepper-Grass** *Lepidium jaredii* subsp. *jaredii*	None/None 1B.2	March - May	Alkali bottoms, slopes, washes, <500 m. SCoRI, SnJV	No. Suitable habitat is not present in the Study Area.	No	No Effect
41.	**Jones' Bush-mallow** *Malacothamnus jonesii*	None/None 4.3	May - July	Open chaparral in foothill woodland; 250-830 m. NCoRI, SCoRO	No. Suitable habitat is not present in the Study Area.	No	No Effect
42.	**Carmel Valley Bush-mallow** *Malacothamnus palmeri* var. *involucratus*	None/None 1B.2	April - October	Chaparral, cismontane woodland, coastal scrub; 30-1100 m. s CCo, SCoRO	No. Suitable habitat is not present in the Study Area.	No	No Effect
43.	**Santa Lucia Bush-mallow** *Malacothamnus palmeri* var. *palmeri*	None/None 1B.2	May - July	Interior valleys foothills; 30-800 m. CCo, SCoRO.	No. Suitable habitat is not present in the Study Area.	No	No Effect

	Common and Scientific Names	Fed/State Status CRPR	Blooming Period	Habitat Preference	Potential to Occur	Detected within Study Area	Effect of Proposed Activity
44.	**Carmel Valley Malacothrix** *Malacothrix saxatilis* var. *arachnoidea*	None/None 1B.2	March - December	Rock outcrops, steep rocky road cuts in chaparral; 25-1215 m. Endemic to Monterey County	No. Suitable habitat is not present in the Study Area.	No	No Effect
45.	**Oregon Meconella** *Meconella oregana*	None/None 1B.1	March - May	Shaded canyons; <1000 m. CCo (Fort Ord), SnFrB	No. Suitable habitat is not present in the Study Area.	No	No Effect
46.	**Palmer's Monardella** *Monardella palmeri*	None/None 1B.2	June - August	Chaparral, forest, on serpentine; 200-800 m. n SCoRO (Santa Lucia Range).	No. Suitable serpentine soil is not present in the Study Area.	No	No Effect
47.	**Woodland Woollythreads** *Monolopia gracilens*	None/None 1B.2	March - July	Chaparral, serpentine grassland, cismontane woodland, sandy to rocky soils; SnFrB, SCoR	No. Suitable serpentine soil is not present in the Study Area.	No	No Effect
48.	**Spreading Navarretia** *Navarretia fossalis*	FT/None 1B.1	April - June	Chenopod scrub, marshes and swamps, playas, and vernal pools; 30-1300 m. SCoRO, SCo, to Baja Cal.	No. Suitable habitat is not present in the Study Area.	No	No Effect
49.	**Shining Navarretia** *Navarretia nigelliformis* subsp. *radians*	None/None 1B.2	May - July	Vernal pools, clay depressions, dry grasslands; 150-1000 m. SCoR	High. Suitable habitat is present in the Study Area and there are occurrences within 0.5 mile on other areas of Chandler Ranch.	No	No Effect
50.	**Large-flowered Nemacladus** *Nemacladus secundiflorus* var. *secundiflorus*	None/None 4.3	April - May	Chaparral, Valley and foothill grassland; dry, gravelly slopes; 200-2000 m. s SNH, SCoR.	No. Suitable habitat is not present in the Study Area.	No	No Effect

	Common and Scientific Names	Fed/State Status CRPR	Blooming Period	Habitat Preference	Potential to Occur	Detected within Study Area	Effect of Proposed Activity
51.	**Hooked Popcornflower** *Plagiobothrys uncinatus*	None/None 1B.2	April - May	Canyon sides, chaparral, rocky outcrops, ± fire follower; on sandstone; 300-600 m. n SCoR (Gabilan Range, Santa Lucia Mountains)	No. Suitable habitat is not present in the Study Area.	No	No Effect
52.	**San Gabriel Ragwort** *Senecio astephanus*	None/None 4.3	April - June	Steep rocky slopes in chaparral/coastal-sage scrub and oak woodland; 400-1500 m. SCoR, TR.	No. Suitable habitat is not present in the Study Area.	No	No Effect
53.	**Cuesta Pass Checkerbloom** *Sidalcea hickmanii* subsp. *anomala*	None/Rare 1B.2	May - June	Closed-cone-conifer forest, generally serpentine; 600-800 m. SCoRO (near Cuesta Pass, San Luis Obispo Co.).	No. Suitable habitat is not present in the Study Area.	No	No Effect
54.	**Most Beautiful Jewelflower** *Streptanthus albidus* subsp. *peramoenus*	None/None 1B.2	April - September	Chaparral, Valley grassland, foothill woodland; strong affinity to serpentine soil; e SnFrB, SCoRO	No. Suitable serpentine soil is not present in the Study Area.	No	No Effect

California Geographic Subregion Abbreviations:
CCo: Central Coast
SCo: South Coast
SCoR: South Coast Ranges
SCoRO: Outer South Coast Ranges
SnFrB: San Francisco Bay
TR: Transverse Ranges
WTR: Western Transverse Ranges
Teh: Tehachapi Mtn Area
SLO: San Luis Obispo
SCoRI: Inner South Coast Ranges
ScV: Sacramento Valley
CW: Central West
PR: Peninsular Range
SnJV: San Joaquin Valley

State/Rank Abbreviations:
FE: Federally Endangered
FT: Federally Threatened
CE: California Endangered

California Rare Plant Ranks:
CRPR 1A: Plants presumed extirpated in California and either rare or extinct elsewhere
CRPR 1B: Plants rare, threatened, or endangered in California and elsewhere
CRPR 2A: Plants presumed extirpated in California, but common elsewhere
CRPR 2B: Plants rare, threatened, or endangered in California, but more common elsewhere
CRPR 4: Plants of limited distribution - a watch list

CRPR Threat Ranks:
0.1 - Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
0.2 - Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)
0.3 - Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

4.1.4 Special status plants discussion

Three special status plant species could potentially occur in the Study Area based on an analysis of known ecological requirements of these species and the habitat conditions that were observed in the Study Area. We discuss each of the three species and describe habitat, range restrictions, known occurrences, and survey results for the Study Area. In order to be consistent with regulatory agency botanical survey guidelines (USFWS 2000, CDFG 2009), seasonally timed floristic surveys were conducted in spring 2017 to coincide with potential special status plant bloom times. No special status plant species were detected in the Study Area during botanical surveys in spring 2017.

A. **Small-flowered Morning-glory** (*Convolvulus simulans*) is a CRPR 4.2 species that is known from scattered localities from the eastern San Francisco Bay area south to San Diego. It is found in valley grassland and coastal scrub habitats, usually with serpentine soils. The closest known record is approximately 6.4 miles northeast of the Study Area near Estrella Road, where it was collected in 1895. Moderately appropriate habitat is present in the annual grassland habitat in the Study Area. Small-flowered morning-glory was not detected in the Study Area during appropriately timed botanical surveys in spring 2017.

B. **Santa Lucia Dwarf Rush** (*Juncus luciensis)* is a CRPR 1B.2 species known from specimens collected in coastal counties from San Diego north to Monterey, and from scattered localities in northern California. It is a very small annual plant that grows in wet sandy soils in a variety of seasonally moist environments. It grows in dense clumps, with small leaves and branches arising from the base, and rarely exceeds two inches in height. The closest reported occurrence to the Study Area is approximately 6 miles southeast, from damp grain fields six miles east of Paso Robles on Creston Road (CNDDB 8). Suitable wet habitats are located in the Study Area for Santa Lucia dwarf rush. Santa Lucia dwarf rush was not detected in the Study Area during appropriately timed botanical surveys in spring 2017.

C. **Shining Navarretia** (*Navarretia nigelliformis* subsp. *radians*) is a CRPR 1B.2 subspecies endemic to California, primarily occurring in central California. It is known to occur in vernal pools, grassland, and cismontane woodland habitats, often on clay and alkaline sites up to 1,000 meters elevation. It is an annual herb that typically blooms between May and July. Shining navarretia was found approximately 0.5 mile north of the Study Area and 2.5 miles south of the Study Area on the former Chandler Ranch during floristic surveys by Althouse and Meade, Inc. in 2005. Shining navarretia was not detected in the Study Area during appropriately timed botanical surveys in spring 2017.

4.2 Special Status Animals

4.2.1 Introduction to CNDDB definitions

"Special Animals" is a general term that refers to all of the animal taxa inventoried by the CNDDB, regardless of their legal or protection status (CDFW October 2017). The Special Animals list is also referred to by the California Department of Fish and Wildlife (CDFW) as the list of "species at risk" or "special status species". These taxa may be listed or proposed for listing under the California and/or Federal Endangered Species Acts, but they may also be species deemed biologically rare, restricted in range, declining in abundance, or otherwise vulnerable.

Animals listed as California Species of Special Concern (SSC) may or may not be listed under California or Federal Endangered Species Acts. They are considered rare or declining in abundance in California. The Special Concern designation is intended to provide the California Department of Fish and Wildlife, biologists, land planners and managers with lists of species that require special consideration during the planning process in order to avert continued population declines and potential costly listing under federal and state endangered species laws. For many species of birds, the primary emphasis is on the breeding population in California. For some species that do not breed in California but winter here, emphasis is on wintering range. The SSC designation thus may include a comment regarding the specific protection provided such as nesting or wintering.

Animals listed as Fully Protected are those species considered by CDFW as rare or faced with possible extinction. Most, but not all, have subsequently been listed under the California Endangered Species Act (CESA) or the Federal Endangered Species Act (FESA). Fully Protected species may not be taken or possessed at any time and no provision of the California Fish and Game code authorizes the issuance of permits or licenses to take any Fully Protected species.

4.2.2 Potential special status animals list

Table 5 lists 21 special status animal species reported from the region. Federal and California State status and CDFW listing status for each species are given. Typical nesting or breeding period, habitat preference, potential habitat on site, and whether or not the species was observed in the Study Area are also provided.

TABLE 5. SPECIAL STATUS ANIMAL LIST. The 21 special status animals known or reported from the region are listed below. There are eight special status animals that could potentially occur within the Study Area based on review of preferred habitat types. No special status animals were detected in the Study Area.

	Common and Scientific Names	Fed/State Status CDFW Rank	Nesting/ Breeding Period	Habitat Preference	Potential to Occur	Detected within Study Area	Effect of Proposed Activity
1.	**Tricolored Blackbird** *Agelaius tricolor*	None/CE SSC (Nesting)	March 15 - August 15	Requires open water, protected nesting substrate, & foraging area with insect prey near nesting colony.	No. Suitable nesting habitat is not present in the Study Area.	No	No Effect
2.	**Grasshopper Sparrow** *Ammodramus savannarum*	None/none SSC (Nesting)	March 15 - August 15	Nests in grassland habitats on mountain slopes, foothills, and valleys. May nest colonially.	Low. Appropriate nesting habitat is present. Nearest nesting occurrence is 15 miles south.	No	Potential Adverse Effect Can Be Mitigated
3.	**Northern California Legless Lizard** *Anniella pulchra*	None/None SSC	Early Spring – July (some populations observed to breed biennially)	Chaparral, Coastal dunes, Coastal scrub; sandy or loose loamy soils under sparse vegetation.	No. Appropriate habitat is not present in the Study Area.	No	No Effect
4.	**Pallid Bat** *Antrozous pallidus*	None/None SSC	Spring - Summer	Rock crevices, caves, tree hollows, mines, old buildings, and bridges.	Low. Low quality roosting habitat is present in the Study Area.	No	Potential Adverse Effect Can Be Mitigated
5.	**Golden Eagle** *Aquila chrysaetos*	None/None FP	March 15 - August 15	Nests in large, prominent trees in valley and foothill woodland. Requires adjacent food source.	No. Appropriate nesting habitat is not present in the Study Area.	No	No Effect

	Common and Scientific Names	Fed/State Status CDFW Rank	Nesting/ Breeding Period	Habitat Preference	Potential to Occur	Detected within Study Area	Effect of Proposed Activity
6.	***Burrowing Owl** *Athene cunicularia*	None/None SSC	March 15 - August 15	Burrows in squirrel holes in open habitats with low vegetation.	Low. Appropriate habitat is present in the Study Area but conditions are not optimal for species.	No	Potential Adverse Effect Can Be Mitigated
7.	**Lesser Slender Salamander** *Batrachoseps minor*	None/None SSC	Unknown; Terrestrial Reproducti on	Broadleaved upland forest; South Santa Lucia Mountains in tanbark oak, coast live oak, blue oak, sycamore & laurel.	No. Appropriate habitat is not present in the Study Area.	No	No Effect
8.	**Vernal Pool Fairy Shrimp** *Branchinecta lynchi*	FT/None None	Rainy Season	Clear water sandstone depression pools, grassed swale, earth slump, or basalt flow depression pools.	Low. Wetlands in the Study Area are not likely to hold water long enough for reproduction.	No	No Effect
9.	**Townsend's Big-eared Bat** *Corynorhinus townsendii*	None/None SSC	Spring - Summer	Caves, buildings, and mine tunnels. Cave like attics as day roosts. On coast roosts are normally within 100 m. of creeks.	Low. Potentially suitable abandoned structures are present for roosting.	No	Potential Adverse Effect Can Be Mitigated
10.	**Western Pond Turtle** *Emys marmorata*	None/None SSC	April - August	Permanent or semi-permanent streams, ponds, lakes.	No. Appropriate habitat is not present in the Study Area.	No	No Effect
11.	**Monterey Dusky-footed Woodrat** *Neotoma macrotis luciana*	None/None SSC	N/A	Variety of habitats with moderate to dense understory vegetation	No. Appropriate habitat is not present in the Study Area.	No	No Effect
12.	**Salinas Pocket Mouse** *Perognathus inornatus psammophilus*	None/None SSC	N/A	Annual grassland and desert shrub in Salinas Valley, with friable soils	No. Appropriate habitat is not present in the Study Area.	No	No Effect

Common and Scientific Names	Fed/State Status CDFW Rank	Nesting/ Breeding Period	Habitat Preference	Potential to Occur	Detected within Study Area	Effect of Proposed Activity
13. **Coast Horned Lizard** *Phrynosoma blainvillii*	None/None SSC	May - September	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes.	No. Appropriate habitat is not present in the Study Area.	No	No Effect
14. **Purple Martin** *Progne subis*	None/none SSC (Nesting)	March 15 - August 15	In San Luis Obispo County prefers nesting in Sycamore trees along riparian corridors.	No. Appropriate habitat is not present in the Study Area.	No	No Effect
15. **Foothill Yellow-legged Frog** *Rana boylii*	None/Cand. T SSC	March - September	Partly shaded, shallow streams and riffles with rocky substrate. Min. 15 weeks for larval development.	No. Appropriate habitat is not present in the Study Area	No	No Effect
16. **California Red-legged Frog** *Rana draytonii*	FT/CT SSC	January - September	Lowlands and foothills in or near sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks for larval development.	No. Appropriate deep water sources are not present in the Study Area.	No	No Effect
17. **Western Spadefoot** *Spea hammondii*	None/None SSC	January - August	Vernal pools in grassland and woodland habitats	Low. Wetlands in the Study Area are not likely to hold water long enough for breeding.	No	No Effect
18. **Coast Range Newt** *Taricha torosa*	None/None SSC	December - May	Slow moving streams, ponds, and lakes with surrounding evergreen/oak forests along coast.	No. Appropriate habitat is not present in the Study Area.	No	No Effect

Common and Scientific Names	Fed/State Status CDFW Rank	Nesting/ Breeding Period	Habitat Preference	Potential to Occur	Detected within Study Area	Effect of Proposed Activity
19. **American Badger** *Taxidea taxus*	None/None SSC	February - May	Needs friable soils in open ground with abundant food source such as California ground squirrels.	Moderate. Appropriate habitat is present in the Study Area.	No	Potential Adverse Effect Can Be Mitigated
20. **Least Bell's Vireo** *Vireo bellii pusillus*	FE/CE None	March 15 - August 15	Riparian habitat, near water or dry streambed, <2000 ft. Nests in willows, mesquite, Baccharis.	No. Appropriate habitat is not present in the Study Area.	No	No Effect
21. **San Joaquin Kit Fox** *Vulpes macrotis mutica*	FE/CT None	December - July	Annual grasslands or grassy open stages with scattered shrubby vegetation. Needs loose textured sandy soil and prey base.	Low. Appropriate habitat is present in the Study Area but with no occurrences of species.	No	Potential Adverse Effect Can Be Mitigated

Habitat characteristics are from the Jepson Manual and the CDNNB.

*Not listed in the CNDDB or CNPS for the search area, but possibly for the location.

Abbreviations:
FE: Federally Endangered CE: California Endangered SSC: CDFW Species of Special Concern
FT: Federally Threatened CT: California Threatened FP: CDFW Fully-Protected

4.2.3 Special status animals discussion

Eight special status animals have potential to occur in the Study Area based on an analysis of known ecological requirements and the habitat conditions that were observed in the Study Area. We discuss the species and describe habitat, range restrictions, known occurrences, and survey results.

A. **Grasshopper Sparrow** (*Ammodramus savannarum*) is a California Species of Special Concern (nesting occurrences only) that is distributed across California west of the Cascade-Sierra Nevada crest, primarily as a summer resident from March to September. It has been seen as far north as Del Norte County, with a single disjunct population in Siskiyou County, and more scattered populations as far south as San Diego County. The grasshopper sparrow has been known to winter in California but this is rare. The breeding season is generally April to July with the peak being in May and June (CDFW 2014). This bird prefers large dense, dry grasslands on rolling hills, lowland plains, lower mountain slopes and valleys with scattered sage shrubs for perching (CNDDB 2017; CDFW 2014). If the shrub cover is dominant in the area, the grasshopper sparrow has been found to be absent. The bird needs grassland with patches of bare ground which is important for its foraging behavior (Shuford and Gardali 2008; CDFW 2014). Nests are built in grasses and forbs near the ground (CDFW 2014). The grasshopper sparrow's main food source is grasshoppers but it also eats other insects and seeds of pigweed, knotweed, campion and oats (Shuford and Gardali 2008). No grasshopper sparrows were observed in the Study Area during the spring surveys conducted in 2017. The closest reported occurrence of grasshopper sparrow is approximately 15 miles southeast of the Study Area (CNDDB 11). This record describes one bird and it is not clear that this was nesting. The Study Area contains low suitability grassland habitat for nesting grasshopper sparrows; the species was not seen during spring surveys and there are no nearby records of nesting.

B. **Pallid Bat** (*Antrozous pallidus*) is a California Species of Special Concern. The pallid bat is a large long-eared bat that occurs throughout the state and occupies a wide variety of habitats. Although most common in open, dry areas ideal for foraging with rocky outcrops for roosting, pallid bats are also found regularly in oak and pine woodlands where they roost in caves, mines, rock crevices, hollow trees and buildings (Nowak 1994). Bridges are also frequently used by pallid bats, often as night roosts between foraging periods (Pierson et al. 1996). The closest reported occurrence of the pallid bat is approximately 9.6 miles north of the Study Area under a bridge on River Road in San Miguel (CNDDB 104). Due to the presence of residential structures for roosting and the presence of sparsely vegetated habitats suitable for foraging, there is potential for this species to occur in the Study Area.

C. **Burrowing Owl** (*Athene cunicularia*) is a California Species of Special Concern. It is a small, rare owl that occupies abandoned mammal holes in the ground, most notably those of the California ground squirrel (*Otospermophilus beecheyi*). The burrowing owl is also known to inhabit badger and fox dens and man-made holes, such as pipes and culverts. Rarely, it has been known to dig burrows in softer soil types (Coulombe 1971; Gervais et. al. 2008). In winter months, burrowing owl individuals from other western populations will augment the year-round Californian populations (Gervais et. al. 2008). The breeding season is generally from March through August. Suitable habitat types for the burrowing owl are

dry, open annual or perennial grasslands and deserts with an abundance of burrows (CNDBB 2017; CDFW 2014). More specifically, the owl is found in coastal prairie, coastal scrub, great basin, Mojavean and Sonoran desert scrub and great basin, valley and foothill grassland habitats (CNDBB 2017). Two wintering or migrating burrowing owls were observed on former Chandler Ranch property by Althouse and Meade, Inc. biologists in October 2006, approximately 1.1 miles north of the Study Area. The closest reported CNDDB occurrence of potentially breeding burrowing owls is approximately 11 miles northwest from the Study Area on Camp Roberts Military Reservation (CNDDB 725). There is potential for wintering or transitory individuals to occur, but it is unlikely that burrowing owls would breed in the Study Area. Burrowing owls were not observed in the Study Area during 2017 spring surveys.

D. **Vernal Pool Fairy Shrimp** (*Branchinecta lynchi*) is a small freshwater crustacean that is federally listed as threatened. The species is endemic to California and southern Oregon and has an ephemeral life cycle, existing only in vernal pools or vernal pool-like habitats. The vernal pool fairy shrimp occurs only in cool-water pools. Individuals hatch from cysts during cold-weather winter storms; they require water temperatures of 50 °F or lower to hatch (Helm 1998; Eriksen and Belk 1999). The time to maturity and reproduction is temperature dependent, varying between 18 days and 147 days, with a mean of 39.7 days and immature and adult shrimp are known to die off when water temperatures rise to approximately 75°F (Helm 1998). The species is typically associated with smaller and shallower vernal pools (typically about 6 inches deep) that have relatively short periods of inundation (Helm 1998) and relatively low to moderate total dissolved solids (TDS) and alkalinity (Eriksen and Belk 1999). The nearest reported occurrence of vernal pool fairy shrimp is approximately 2 miles northeast of the Study Area in a vernal pool complex south of Highway 46 (CNDDB 287). The next nearest occurrence is approximately 2.18 miles west of the Study Area, northeast of the intersection of Niblick Road and Spring Street, west of Highway 101 in Paso Robles (CNDDB 621). Protocol-level wet season surveys were conducted in 2011/2012 and in 2012/2013 at 14 locations on Chandler Ranch, including seven locations in the Study Area. However, rainfall levels in both years were below the required 70% of average rainfall required by USFWS. Therefore the surveys were inconclusive (Dallas 2012; Dallas 2013). Dry season sampling conducted at the same 14 locations in 2012 did not detect vernal pool fairy shrimp (Helm Biological Consulting 2012).

E. **Townsend's Big-eared Bat** (*Corynorhinus townsendii*) is a California Species of Special Concern. Townsend's big-eared bat is medium sized with large rabbit-like ears. The subspecies are not distinguishable in the field. Both these subspecies have been recorded in a number of different habitats in California. In our area they are both found consistently in the vicinity of creek beds where they use the riparian corridor for foraging. Typical roost sites are in caves or buildings with cave-like features. Townsend's big-eared bat is sedentary and is presumed to spend the winter within 25 miles of its summer roosts. The nearest reported occurrence of this species is at Camp Roberts, where multiple individuals were observed roosting in buildings on Michigan Avenue, approximately 12.3 miles northwest of the Study Area Townsend's big-eared bat could possibly occur in the structures on the Study Area, but would be unlikely. Townsend's big-eared bat was not observed on the Study Area during 2017 site surveys.

F. **Western Spadefoot Toad** (*Spea hammondii*) is a California Species of Special Concern known from ephemeral pools in open grassland habitats across the interior region of San Luis Obispo County. Spadefoot toads remain underground for most of the year, emerging to breed in seasonal wetland pools during the rainy season. Development of the larvae from egg to metamorphosis can be very quick, depending upon water temperature. Spadefoot toads are known to breed in seasonal pools in the vicinity Highway 46, east of Paso Robles. The nearest reported occurrence is approximately 0.9 miles south of the Study Area on the Olsen Ranch (CNDDB 333). Two wetlands in the Study Area provide low potential breeding habitat; ponded water may not hold long enough for successful breeding.

G. **American Badger** (*Taxidea taxus*) is a California Species of Special Concern that has a widespread range across California (Brehme et. al. 2015; CDFW 2014). It is a permanent but uncommon resident in all parts of California, except for forested region of the far northwestern corner, and is more abundant in dry, open areas of most shrub and forest habitats (CNDDB 2017). The American Badger requires friable soil in order to dig burrows for cover and breeding. The main food source for the American Badger is fossorial rodents, mainly ground squirrels and pocket gophers (CDFW 2014). In habitats with a high density of shrubs, it has been found that both ground squirrel holes and badger mounds increased (Eldridge 2004). The breeding season is in summer and early fall and females give birth to litters usually in March and April (CDFW 2014). The closest reported occurrence of the American Badger is located approximately 4 miles southwest of the Study Area (CNDDB 23). There is potential habitat for American badger in the Study Area, however is unlikely to occur due to the proximity to urban development and intensive agriculture. Sign of American badger was not observed in the Study Area during 2017 surveys.

H. **San Joaquin Kit Fox** (*Vulpes macrotis mutica)* is a federally listed endangered species and a state listed threatened species. They are known from the Carrizo Plains and Camp Roberts, with transient individuals known to move between the two populations. Huerhuero Creek, located just north of Chandler Ranch, is considered to be one of the known movement corridors for kit fox. The two nearest reported occurrences are less than a mile from the Study Area, both on former Chandler Ranch property. One record is from 1990 and is 0.25 miles north (CNDDB 945), and the other is from 1991 and is 0.9 miles north (CNDDB 941). There is potentially suitable grassland habitat for San Joaquin kit fox in the Study Area. A protocol- level survey was conducted for San Joaquin kit fox by Althouse and Meade, Inc. in 2006 which determined that kit fox were not present at that time. San Joaquin kit fox was not observed in the Study Area during 2017 surveys, and is very unlikely to occur onsite.

4.4 Botanical Survey Results

Botanical surveys conducted in spring 2017 identified 84 species, subspecies, and varieties of vascular plant taxa in the Study Area (Table 6). The list includes 35 species native to California and 49 introduced (naturalized or planted) species. Native plant species account for approximately 42 percent of the taxa within the Study Area; introduced species account for approximately 58 percent. The high percentage of introduced species is reflective of the land use history of the site.

TABLE 6. VASCULAR PLANT LIST. The 84 species of vascular plants identified at the Study Area consist of 35 native species and 49 introduced species. The vascular plant list is separated into general life form categories, within which the taxa are listed alphabetically by scientific name.

Scientific Name	Special Status	Origin	Common Name
Trees – 2 Species			
Quercus douglasii	None	Native	Blue oak
Quercus lobata	None	Native	Valley oak
Shrubs – 1 Species			
Baccharis pilularis	None	Native	Coyote brush
Forbs – 68 Species			
Achyrachaena mollis	None	Native	Soft blow wives
Acmispon americanus var. *americanus*	None	Native	Spanish lotus
Acmispon brachycarpus [=*Lotus humistratus*]	None	Native	Short podded lotus
Amaranthus albus	None	Introduced	Tumbleweed
Amaranthus blitoides	None	Native	Procumbent pigweed
Ambrosia psilostachya	None	Native	Western ragweed
Amsinckia intermedia	None	Native	Common fiddleneck
Amsinckia lycopsoides	None	Native	Bugloss fiddleneck
Anagallis arvensis	None	Introduced	Scarlet pimpernel
Asclepias eriocarpa	None	Native	Kotolo
Asclepias fascicularis	None	Native	Narrow-leaf milkweed
Brassica nigra	None	Introduced	Black mustard
Brodiaea terrestris	None	Native	Dwarf brodiaea
Carduus pycnocephalus subsp. *pycnocephalus*	None	Introduced	Italian thistle
Castilleja attenuata	None	Native	Valley tassels
Centaurea melitensis	None	Introduced	Tocalote
Centaurea solstitialis	None	Introduced	Yellow star-thistle

Scientific Name	Special Status	Origin	Common Name
Centromadia [=Hemizonia] fitchii	None	Native	Spikeweed
Chenopodium album	None	Introduced	Lamb's quarters
Clarkia affinis	None	Native	Chaparral clarkia
Clarkia purpurea subsp. *quadrivulnera*	None	Native	Four-spot
Convolvulus arvensis	None	Introduced	Bindweed
Crassula connata	None	Native	Pygmy-weed
Croton setigerus	None	Native	Dove weed
Carduus pycnocephalus subsp. *pycnocephalus*	None	Introduced	Italian thistle
Descurainia sophia	None	Introduced	Flix weed
Epilobium brachycarpum	None	Native	Autumn willoweed
Erigeron bonariensis	None	Introduced	Flax-leaved horseweed
Erodium botrys	None	Introduced	Long beaked filaree
Erodium brachycarpum	None	Introduced	White stemmed filaree
Erodium cicutarium	None	Introduced	Redstem filaree
Eschscholzia californica	None	Native	California poppy
Euphorbia maculata	None	Introduced	Spotted spurge
Hirschfeldia incana	None	Introduced	Short podded mustard
Hypochaeris glabra	None	Introduced	Smooth cat's-ear
Hypochaeris radicata	None	Introduced	Rough cat's-ear
Juncus bufonius	None	Native	Toad rush
Lactuca serriola	None	Introduced	Prickly lettuce
Lepidium latifolium	None	Introduced	Perennial pepperweed
Lepidium nitidum	None	Native	Shining pepperweed
Logfia gallica	None	Introduced	Daggerleaf cottonrose
Lotus corniculatus	None	Introduced	Bird's-foot trefoil
Lupinus microcarpus	None	Native	Chick lupine
Lupinus nanus	None	Native	Sky lupine
Lupinus succulentus	None	Native	Arroyo lupine
Malva nicaeensis	None	Introduced	Bull mallow
Malva parviflora	None	Introduced	Cheeseweed
Matricaria discoidea	None	Introduced	Pineapple weed
Medicago polymorpha	None	Introduced	Bur clover
Melilotus indicus	None	Introduced	Sourclover

Scientific Name	Special Status	Origin	Common Name
Micropus californicus	None	Native	Q-tips
Microseris douglasii	None	Native	Douglas' microseris
Plagiobothrys canescens var. *canescens*	None	Native	Valley popcornflower
Plantago lanceolata	None	Introduced	English plantain
Polygonum aviculare	None	Introduced	Knotweed
Pseudognaphalium microcephalum	None	Native	Wright's cudweed
Psilocarphus tenellus	None	Native	Slender woolly-marbles
Salsola tragus	None	Introduced	Russian thistle
Silybum marianum	None	Introduced	Milk thistle
Sonchus asper subsp. *asper*	None	Introduced	Prickly sow thistle
Sonchus oleraceus	None	Introduced	Common sow thistle
Spergularia rubra	None	Introduced	Red sand-spurrey
Tribulus terrestris	None	Introduced	Puncture vine
Trichostema lanceolatum	None	Native	Vinegar weed
Trifolium hirtum	None	Introduced	Rose clover
Veronica peregrina subsp. *xalapensis*	None	Native	Purslane speedwell
Vicia sativa	None	Introduced	Spring vetch
Vicia villosa	None	Introduced	Hairy vetch
Xanthium strumarium	None	Native	Cocklebur
Grasses – 13 Species			
Avena barbata	None	Introduced	Slender wild oat
Avena fatua	None	Introduced	Wild oat
Bromus diandrus	None	Introduced	Ripgut brome
Bromus hordeaceus	None	Introduced	Soft chess
Bromus madritensis subsp. *rubens*	None	Introduced	Red brome
Cynodon dactylon	None	Introduced	Bermuda grass
Distichlis spicata	None	Native	Salt grass
Elymus caput-medusae	None	Introduced	Medusa head
Festuca myuros	None	Introduced	Rattail sixweeks grass
Festuca perennis	None	Introduced	Italian rye grass
Hordeum murinum	None	Introduced	Foxtail barley
Phalaris paradoxa	None	Introduced	Hood canary grass
Poa annua	None	Introduced	Annual blue grass

4.5 Wildlife Survey Results

At least 66 animal species are listed that could potentially occur in the Study Area (Table 7). These include at least 3 crustaceans, 3 amphibians, 7 reptiles, 38 birds, and 21 mammals. We provide this list as a guide to the wildlife observed in the Study Area and to the species that could potentially be present at least seasonally. Other species could occur as transients, particularly avian fauna.

TABLE 7. WILDLIFE LIST. At least 66 animal species have the potential to occur within the Study Area. The Special Status column indicates listing status of the organism under the Federal Endangered Species Act, the California Endangered Species Act, or by CDFW. Species observed at the site during our surveys are designated by the check symbol (✓) in the fourth column.

Common Name	Scientific Name	Special Status	Found On-site?	Habitat Type
Amphibians – 3 Species				
California (Western) Toad	*Anaxyrus [=Bufo] boreas halophilus*	None		Grassland, woodland
Sierran Treefrog [=Pacific Chorus Frog]	*Pseudacris sierra* [formerly *P. regilla*]	None		Many habitats near water
Western Spadefoot Toad	*Spea hammondii*	SSC		Grassland habitat with seasonal pools
Reptiles –7 Species				
Western Yellow-bellied Racer	*Coluber constrictor mormon*	None		Grasslands, open areas
Monterey Ringneck Snake	*Diadophis punctatus vandenburgii*	None		Woodlands, grasslands, chaparral
California Alligator Lizard	*Elgaria multicarinata multicarinata*	None		Open grassland, woodland, chaparral
California Kingsnake	*Lampropeltis californiae [=getula californiae]*	None		Woodland, grassland, streams
Pacific Gopher Snake	*Pituophis catenifer catenifer*	None		Woodland, grassland, rural
Skilton's [=Western] Skink	*Plestiodon [=Eumeces] skiltonianus skiltonianus*	None		Woodland, grassland, chaparral, inland and coastal
Coast Range [=Western] Fence Lizard	*Sceloporus occidentalis bocourtii*	None		Wide range; variety of habitats
Birds – 36 Species				
Red-winged Blackbird	*Agelaius phoeniceus*	None	✓	Marshes, fields
California Scrub-Jay	*Aphelocoma californica*	None		Oak, riparian woodlands
Burrowing Owl	*Athene cunicularia*	SSC		Grasslands with ground squirrel burrows
Red-tailed Hawk	*Buteo jamaicensis*	None	✓	Open, semi-open country

Common Name	Scientific Name	Special Status	Found On-site?	Habitat Type
California Quail	*Callipepla californica*	None		Shrubby habitats
Anna's Hummingbird	*Calypte anna*	None		Many habitats
Turkey Vulture	*Cathartes aura*	None		Open country
Rock Pigeon	*Columba livia*	None		Urban areas
American Crow	*Corvus brachyrhynchos*	None		Many habitats, esp. urban
Brewer's Blackbird	*Euphagus cyanocephalus*	None		Open habitats
American Kestrel	*Falco sparverius*	None		Open, semi-open country
Greater Roadrunner	*Geococcyx californianus*	None		Open habitats
House Finch	*Haemorhous mexicanus*	None		Riparian, grasslands, chaparral, woodlands,
Barn Swallow	*Hirundo rustica*	None		Riparian, grasslands, lakes
California Towhee	*Melozone crissalis*	None	✓	Chaparral scrub, shrubby urban areas
Northern Mockingbird	*Mimus polyglottos*	None	✓	Riparian, chaparral, woodlands, urban
Brown-headed Cowbird	*Molothrus ater*	None		Grasslands, ranches
House Sparrow	*Passer domesticus*	None		Urban
Cliff Swallow	*Petrochelidon pyrrhonota*	None		Urban; open areas near water
Spotted Towhee	*Pipilo maculatus*	None		Dense brushy areas
Bushtit	*Psaltriparus minimus*	None		Woodlands, chaparral
Black Phoebe	*Sayornis nigricans*	None		Near water in natural and urban settings
Say's Phoebe	*Sayornis saya*	None		Open country, grassland
Yellow-rumped Warbler	*Setophaga coronata*	None		Coniferous and mixed woodland (breeding)
Western Bluebird	*Sialia mexicana*	None	✓	Woodland near open areas
American Goldfinch	*Spinus tristis*	None		Weedy fields, woodlands
Eurasian Collared-Dove	*Streptopelia decaocto*	None		Urban areas
Western Meadowlark	*Sturnella neglecta*	None		Open habitats, grasslands
European Starling	*Sturnus vulgaris*	None	✓	Agricultural, livestock areas
Bewick's Wren	*Thryomanes bewickii*	None		Riparian woodland, scrub
House Wren	*Troglodytes aedon*	None		Shrubby areas
American Robin	*Turdus migratorius*	None		Streamsides, woodlands, urban parks
Western Kingbird	*Tyrannus verticalis*	None		Grasslands, savannah

Common Name	Scientific Name	Special Status	Found On-site?	Habitat Type
Cassin's Kingbird	*Tyrannus vociferans*	None		Open and semi-open areas
Barn Owl	*Tyto alba*	None		Agricultural, woodlands
Mourning Dove	*Zenaida macroura*	None		Open and semi-open habitats
	Mammals – 20 Species			
Pallid Bat	*Antrozous pallidus*	SSC		Riparian, woodland, urban
Coyote	*Canis latrans*	None		Open woodlands, brushy areas, wide ranging.
Townsend's Big-eared Bat	*Corynorhinus townsendii*	SSC		Arid western desert scrub and pine forest regions
Feral Cat	*Felis catus*	None		Varied
Black-tailed Jackrabbit	*Lepus californicus*	None		Grasslands
Striped Skunk	*Mephitis mephitis*	None		Mixed woods, brush, semi-open country
California Vole	*Microtus californicus*	None		Grassland meadows
Long-tailed Weasel	*Mustela frenata*	None		Grasslands
California Myotis	*Myotis californicus*	None		Tunnels, hollow trees, buildings, bridges.
Mule [Black-tailed] Deer	*Odocoileus hemionus*	None		Many habitats
Deer Mouse	*Peromyscus maniculatus*	None		All dry land habitats
Western Harvest Mouse	*Reithrodontomys megalotis*	None		Grassland, dense vegetation near water
Broad-footed Mole	*Scapanus latimanus*	None		Grasslands, agricultural, in moist soils
California Ground Squirrel	*Spermophilus beecheyi*	None	✓	Grasslands
Western Spotted Skunk	*Spirogale gracilis*	None		Variety of habitats
Brush Rabbit	*Sylvilagus bachmani*	None		Brushy habitats
Mexican Free-tailed Bat	*Tadarida brasiliensis*	None		Variety of habitats; roosts in bridges, buildings, caves
American Badger	*Taxidea taxus*	SSC		Open country
Valley Pocket Gopher	*Thomomys bottae*	None	✓	Variety of habitats
San Joaquin Kit Fox	*Vulpes macrotis mutica*	FE, ST		Open grasslands, scrub

FT = Federally Threatened; FE = Federally Endangered; ST = State Threatened; SSC = Species of Special Concern

5.0 Potential Impacts to Biological Resources

5.1 Regulatory Framework

5.1.1 Federal regulations

Endangered Species Act – The federal Endangered Species Act (ESA) provides the legal framework for the listing and protection of species (and their habitats) identified as being endangered or threatened with extinction. Actions that jeopardize endangered or threatened species and the habitats upon which they rely are considered a 'take' under the Endangered Species Act. Take of a federally listed threatened or endangered species is prohibited without a special permit. The Endangered Species Act allows for take of a threatened or endangered species incidental to development activities once a habitat conservation plan has been prepared to the satisfaction of the USFWS and an incidental take permit has been issued. The Endangered Species Act also allows for the take of threatened or endangered species after consultation has deemed that development activities will not jeopardize the continued existence of the species. The federal Endangered Species Act also provides for a Section 7 Consultation when a federal permit is required, such as a Clean Water Act Section 404 permit.

"Critical Habitat" is a term within the federal Endangered Species Act designed to guide actions by federal agencies (as opposed to state, local, or other agency actions) and defined as "an area occupied by a species listed as threatened or endangered within which are found physical or geographical features essential to the conservation of the species, or an area not currently occupied by the species which is itself essential to the conservation of the species."

Section 404 Clean Water Act Regulations – The Clean Water Act provides wetland regulation at the federal level and is administered by the U. S. Army Corps of Engineers (USACE). The purpose of the Clean Water Act is to restore and maintain the chemical, physical, and biological integrity of all waters of the U.S. Permitting is required for filling waters of the U.S. (including wetlands). Permits may be issued on an individual basis, or may be covered under approved nationwide permits.

Migratory Bird Treaty Act – All migratory bird species that are native to the U.S. or its territories are protected under the federal Migratory Bird Treaty Act, as amended under the Migratory Bird Treaty Reform Act of 2004. The Migratory Bird Treaty Act is generally protective of migratory birds.

5.1.2 State regulations

California Environmental Quality Act (CEQA) – CEQA requires that biological resources be considered when assessing the environmental impacts that are the result of proposed actions. The lead agencies determine the scope of what is considered an impact and what constitutes an "adverse effect" on a biological resource.

California Fish and Game Code – The California Fish and Game Code regulate the taking or possession of birds, mammals, fish, amphibians, and reptiles, as well as natural resources such as wetlands and waters of the state. It includes the California Endangered Species Act, Streambed Alteration Agreement regulations, and California Native Plant Protection Act. Fish

and Game Code states that it is "unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto," and "unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird" unless authorized.

California Endangered Species Act – The California Endangered Species Act (CESA), similar to the federal Endangered Species Act, contains a process for listing of species and regulating potential impacts to listed species. State threatened and endangered species include both plants and wildlife, but do not include invertebrates. The designation "rare species" applies only to California native plants. State threatened and endangered plant species are regulated largely under the Native Plant Preservation Act in conjunction with the California Endangered Species Act. State threatened and endangered animal species are legally protected against "take." The CESA authorizes CDFW to enter into a memorandum of agreement for take of listed species to issue an incidental take permit for a state-listed threatened and endangered species only if specific criteria are met. Section 2080 of the CESA prohibits the take of species listed as threatened or endangered pursuant to the Act. Section 2081 allows CDFW to authorize take prohibited under Section 2080 provided that: 1) the taking is incidental to an otherwise lawful activity; 2) the taking will be minimized and fully mitigated; 3) the applicant ensures adequate funding for minimization and mitigation; and 4) the authorization will not jeopardize the continued existence of the listed species.

Streambed Alteration Agreement Regulations – Section 1602 of the Fish & Game Code requires any person, state, or local governmental agency to provide advance written notification to CDFW prior to initiating any activity that would: 1) divert or obstruct the natural flow of, or substantially change or remove material from the bed, channel, or bank of any river, stream, or lake; or 2) result in the disposal or deposition of debris, waste, or other material into any river, stream, or lake. The state definition of "lakes, rivers, and streams" includes all rivers or streams that flow at least periodically or permanently through a well-defined bed or channel with banks that support fish or other aquatic life, and watercourses with surface or subsurface flows that support or have supported riparian vegetation.

California Native Plant Protection Act – Section 1900-1913 of the California Fish and Game Code contains the regulations of the Native Plant Protection Act of 1977. The intent of this act is to help conserve and protect rare and endangered plants in the state.

Regional Water Quality Control Board – The RWQCB not only regulates impacts to water quality in federal waters of the U.S. under Section 401 of the Clean Water Act, but they also regulate any isolated waters that are impacted under the state Porter Cologne Act utilizing a Waste Discharge Requirement. Discharge of fill material into waters of the State not subject to the jurisdiction of the USACE pursuant to Section 401 of the Clean Water Act may require authorization pursuant to the Porter Cologne Act through application for waste discharge requirements or through waiver of waste discharge requirements.

5.3 Habitat Impacts

The proposed project is anticipated to affect all areas of the 117.3 acre Study Area. This impact analysis assumes all habitat areas of the site will be impacted. See Figure 4 in Section 8.0 for the locations of each habitat type in the Study Area.

TABLE 8. POTENTIAL HABITAT IMPACTS.

Habitat Type	Permanent Impact Acres
California Annual Grassland	108.7
Anthropogenic	7.1
Ruderal	1.4
Wetland	0.08

5.3.1 California annual grassland

Approximately 108.7 acres of annual grassland could be permanently impacted by the Project. The grassland is fairly disturbed habitat dominated by non-native species, but may provide foraging habitat for songbirds, raptors, and small mammals. This is not a sensitive habitat type and does not require mitigation except where it affects special status species (see Section 5.6.3 below).

5.3.2 Anthropogenic

Approximately 7.1 acres of anthropogenic habitat would be permanently impacted by the Project. The Our Town development and all associated structures and roads would be removed. The existing structures and ornamental plants may provide habitat for nesting birds, bats, and small mammals. Anthropogenic habitats are not sensitive habitat types and do not require mitigation. No special status species are expected to be affected by removal of anthropogenic areas of the site.

5.3.3 Ruderal

Approximately 1.4 acres of ruderal habitat would be permanently impacted by the Project. This habitat is highly disturbed and dominated by non-native species, but may provide foraging habitat for songbirds and small mammals. This is not a sensitive habitat type and does not require mitigation. No special status species are expected to be affected by removal of ruderal areas of the site.

5.4 Wetlands and Jurisdictional Waters

Up to 0.08 acres of wetland and up to 591 feet of potential Federal non-wetland waters could be permanently impacted by the Project. The jurisdictional status of wetlands and waters in the Study Area has not yet been determined. Mitigation recommendations are provided if impacts are proposed to potential wetlands and waters on the site (see Section 6.2).

5.5 Nesting Birds

Vegetation removal and construction activities associated with the proposed Project could result in adverse impacts to nesting birds if conducted during nesting season (March 15 through August 15). The potential for impacts to nesting birds can be reduced (refer to Sections 6.3 and 6.4).

5.6 Special Status Species

5.6.1 Special status plants

Special status plants were not detected in the Study Area during appropriately timed botanical surveys in spring 2017. The proposed Project would not affect special status plants.

5.6.2 Special status birds

The Study Area has a moderate potential for wintering burrowing owls, and a low potential for nesting burrowing owls and nesting grasshopper sparrows. Potential impacts to burrowing owls or nesting grasshopper sparrows can avoided by implementing pre-construction surveys (refer to Sections 6.3 and 6.4).

5.6.3 Special status mammals

The removal of old buildings and trees for the proposed Project could impact roosting habitat for pallid bat and Townsend's big-eared bat. Impacts to special status bat species can be avoided by implementing preconstruction surveys (refer to Section 6.4).

There is potential habitat for American badger and San Joaquin kit fox within the Study Area. The grassland habitat within the Study Area is of low quality for these species, but transient individuals may occur. Impacts to these species can be avoided (Section 6.4).

5.6.4 Spadefoot toad

Wetlands on site are not expected to support breeding spadefoot toads. Mitigations for spadefoot toad are not recommended.

5.6.5 Vernal pool fairy shrimp

Multiple wet and dry season surveys for listed branchiopods, including vernal pool fairy shrimp, have had negative survey results. Wetlands on the site are not expected to hold sufficient surface water to support fairy shrimp in 2017-2018. Further protocol level surveys to demonstrate absence of listed branchiopods may be required by the U.S. Fish and Wildlife Service.

6.0 Recommendations and Mitigations

6.1 Habitats

Mitigation is not required for impacts to non-native annual grassland, anthropogenic, or ruderal habitats. See Section 6.4.5 for mitigation requirements for San Joaquin kit fox.

6.2 Wetlands and Jurisdictional Waters

Project activities could result in fill of wetland areas. A wetland delineation report was prepared for the Study Area according to state and federal standards to determine the extent of Clean Water Act section 404 jurisdictional wetlands and waters of the United States (Althouse and Meade, Inc. 2017). A jurisdictional determination of wetlands onsite should be obtained from the U.S. Army Corps of Engineers.

BR-1. If permanent impacts to wetlands are proposed, a mitigation, monitoring, and reporting plan shall be prepared and approved by the City and other jurisdictional agencies, as appropriate (i.e., California Department of Fish and Game, U.S. Army Corps of Engineers, and the Regional Water Quality Control Board). Wetland mitigation should increase the aerial extent of wetland habitat on site at a three-to-one ratio (created wetland area to impacted wetland area). Mitigation implementation and success will be monitored for a minimum of three years, depending on the jurisdictional agencies' requirements.

6.3 Nesting Birds

Migratory non-game native bird species are protected by international treaty under the Federal Migratory Bird Treaty Act (MBTA) of 1918 (50 C.F.R. Section 10.13). Sections 3503, 3503.5 and 3513 of the California Fish and Game Code prohibit take (as defined therein) of all native birds and their active nests, including raptors and other migratory non-game birds (as listed under the Federal MBTA).

BR-2. Within one week of ground disturbance activities, if work occurs between March 15 and August 15, nesting bird surveys shall be conducted. If surveys do not locate nesting birds, construction activities may be conducted. If nesting birds are located, no construction activities shall occur within 100 feet of nests until chicks are fledged. A pre-construction survey report shall be submitted to the lead agency immediately upon completion of the survey. The report shall detail appropriate fencing or flagging of the buffer zone and make recommendations on additional monitoring requirements. A map of the Project site and nest locations shall be included with the report. The Project biologist conducting the nesting survey shall have the authority to reduce or increase the recommended buffer depending upon site conditions.

6.4 Avoidance, Minimization, and Mitigation for Special Status Species

6.4.1 Special status plants

Special status plants were not detected in the Study Area during seasonally timed floristic surveys in spring 2017. The proposed Project would not impact special status plants.

6.4.2 Burrowing owl

BR-3. Not more than 14 days prior to any work that affects habitat containing burrows, pre-construction surveys for burrowing owls shall be conducted. The pre-construction surveys shall be conducted in a manner sufficient to determine no burrowing owls are present in the work areas. Pre-construction surveys shall be conducted throughout the year, when work is proposed, to account for breeding, wintering, and transient owls.

BR-4. If burrowing owls are present in the work areas during the breeding season (February 1 through August 31), the burrows must be monitored to determine if a breeding pair is present. If a breeding pair is confirmed, the burrow must be avoided and protected from impacts via a 250 foot setback from the burrow. If a breeding pair is not present, passive relocation may be used. If burrowing owls are present during the non-breeding season, a passive relocation effort, such as a one-way door, may be implemented. Monitoring and mitigation must be conducted under guidance from a qualified wildlife biologist. Mitigation and protection procedures should incorporate recommendations outlined in current survey guidelines from CDFW.

6.4.3 Special status bats

BR-5. Upon project approval, a qualified biologist shall conduct a survey of existing trees and structures on the Study Area to determine if roosting bats are present. If possible, the survey shall be conducted during the non-breeding season (November through March). The biologist shall have access to all interior attics, as needed. If a colony of bats is found roosting in any tree or structure, further surveys shall be conducted sufficient to determine the species present and the type of roost (day, night, maternity, etc.) If the bats are not part of an active maternity colony, passive exclusion measures may be implemented with approval from CDFG. November is the best time of the year to exclude bats from a roost because it is after the breeding season and before winter hibernation (not all species hibernate).

BR-6. If bats are roosting in trees or structures on the Study Area during the daytime but are not part of an active maternity colony, then exclusion measures must include one-way valves that allow bats to get out but are designed so that the bats may not re-enter the structure.

BR-7. If a bat colony is excluded, appropriate alternate bat habitat shall be installed in the Study Area. For each occupied roost removed, one bat box shall be installed in similar habitat and should have similar cavity or crevices properties to those which are

removed, including access, ventilation, dimensions, height above ground, and thermal conditions. Maternal bat colonies may not be disturbed.

6.4.4 American badger

BR-8. Within 15 days of starting any grading, grubbing, or oak tree removal, a preconstruction survey shall be conducted in the Study Area to locate occupied American badger dens within 100 feet of project areas. Orange construction fencing shall be installed under the direction of a project biologist in a manner sufficient to protect the dens from construction equipment. A buffer of 50 feet shall be used for occupied non-maternal dens. A buffer of 150 feet shall be installed if the den is determined to be a maternal pupping den. Construction activities shall not commence within the exclusion area until the badger has moved of its own accord. A preconstruction survey letter report shall be submitted to the lead agency for review within one week after completion of the survey.

6.4.5 San Joaquin kit fox

The Study Area is located within the two to one mitigation ratio area as per the San Luis Obispo County Standard Kit Fox Mitigation Ratios map, which is found at: https://www.slocounty.ca.gov/Departments/Planning-Building/Current-and-Environmental-Planning/Services/Environmental-Review/San-Joaquin-Kit-Fox.aspx.

BR-9. Prior to issuance of grading and/or construction permits, the applicant shall submit evidence to the County of San Luis Obispo, Department of Planning and Building, Environmental and Resource Management Division (County) that states that one or a combination of the following three San Joaquin kit fox mitigation measures has been implemented:

a. Provide for the protection in perpetuity, through acquisition of fee or a conservation easement of **[Total number of mitigation acres required]** acres of suitable habitat in the kit fox corridor area (e.g. within the San Luis Obispo County kit fox habitat area, northwest of Highway 58), either on-site or off-site, and provide for a non-wasting endowment to provide for management and monitoring of the property in perpetuity. Lands to be conserved shall be subject to the review and approval of the California Department of Fish and Game (Department) and the County.

   This mitigation alternative (a.) requires that all aspects if this program must be in place before County permit issuance or initiation of any ground disturbing activities.

b. Deposit funds into an approved in-lieu fee program, which would provide for the protection in perpetuity of suitable habitat in the kit fox corridor area within San Luis Obispo County, and provide for a non-wasting endowment for management and monitoring of the property in perpetuity.

   Mitigation alternative (b) above can be completed by providing funds to The Nature Conservancy (TNC) pursuant to the Voluntary Fee-Based Compensatory Mitigation Program (Program). The Program was established in agreement between the

Department and TNC to preserve San Joaquin kit fox habitat, and to provide a voluntary mitigation alternative to project proponents who must mitigate the impacts of projects in accordance with the California Environmental Quality Act (CEQA). The fee, payable to "The Nature Conservancy", would total **$[Amount of fee based on $___ per acre]**. This fee is calculated based on the current cost-per-unit of $___ per acre of mitigation, which is scheduled to be adjusted to address the increasing cost of property in San Luis Obispo County; your actual cost may increase depending on the timing of payment. This fee must be paid after the Department provides written notification about your mitigation options but prior to County permit issuance and initiation of any ground disturbing activities.

c. Purchase **[Total number of mitigation acres required]** ___credits in a Department-approved conservation bank, which would provide for the protection in perpetuity of suitable habitat within the kit fox corridor area and provide for a non-wasting endowment for management and monitoring of the property in perpetuity.

Mitigation alternative (c) above can be completed by purchasing credits from the Palo Prieto Conservation Bank (see contact information below). The Palo Prieto Conservation Bank was established to preserve San Joaquin kit fox habitat, and to provide a voluntary mitigation alternative to project proponents who must mitigate the impacts of projects in accordance with the California Environmental Quality Act (CEQA). The cost for purchasing credits is payable to the owners of The Palo Prieto Conservation Bank, and would total **$[Amount of mitigation acres required (i.e. credits), currently priced at $___ per credit]**. This fee is calculated based on the current cost-per-credit of $___ per acre of mitigation. The fee is established by the conservation bank owner and may change at any time. Your actual cost may increase depending on the timing of payment. Purchase of credits must be completed prior to County permit issuance and initiation of any ground disturbing activities.

BR-10. Prior to issuance of grading and/or construction permits, the applicant shall provide evidence that they have retained a qualified biologist acceptable to the City. The retained biologist shall perform the following monitoring activities:

i. Prior to issuance of grading and/or construction permits and within 30 days prior to initiation of site disturbance and/or construction, the biologist shall conduct a pre-activity (i.e. pre-construction) survey for known or potential kit fox dens and submit a letter to the City reporting the date the survey was conducted, the survey protocol, survey results, and what measures were necessary (and completed), as applicable, to address any kit fox activity within the project limits.

ii. The qualified biologist shall conduct weekly site visits during site-disturbance activities (i.e. grading, disking, excavation, stock piling of dirt or gravel, etc.) that proceed longer than 14 days, for the purpose of monitoring compliance with required Mitigation Measures BR-11 through BR-19. Site disturbance activities lasting up to 14 days do not require weekly monitoring by the biologist unless observations of kit fox or their dens are made on-site or the qualified biologist recommends monitoring for some other reason (see BR-10.iii). When weekly

monitoring is required, the biologist shall submit weekly monitoring reports to the City.

iii. **Prior to or during project activities**, if any observations are made of San Joaquin Kit fox, or any known or potential San Joaquin kit fox dens are discovered within the project limits, the qualified biologist shall re-assess the probability of incidental take (e.g. harm or death) to kit fox. At the time a den is discovered, the qualified biologist shall contact USFWS and the CDFW for guidance on possible additional kit fox protection measures to implement and whether or not a Federal and/or State incidental take permit is needed. If a potential den is encountered during construction, work shall stop until such time the USFWS/CDFW determines it is appropriate to resume work.

If incidental take of kit fox during project activities is possible, before project activities commence, the applicant must consult with the USFWS. The results of this consultation may require the applicant to obtain a Federal and/or State permit for incidental take during project activities. The applicant should be aware that the presence of kit foxes or known or potential kit fox dens at the project site could result in further delays of project activities.

iv. In addition, the qualified biologist shall implement the following measures:

1. Within 30 days prior to initiation of site disturbance and/or construction, fenced exclusion zones shall be established around all known and potential kit fox dens. Exclusion zone fencing shall consist of either large flagged stakes connected by rope or cord, or survey laths or wooden stakes prominently flagged with survey ribbon. Each exclusion zone shall be roughly circular in configuration with a radius of the following distance measured outward from the den or burrow entrances:
   - Potential kit fox den: 50 feet
   - Known or active kit fox den: 100 feet
   - Kit fox pupping den: 150 feet
2. All foot and vehicle traffic, as well as all construction activities, including storage of supplies and equipment, shall remain outside of exclusion zones. Exclusion zones shall be maintained until all project-related disturbances have been terminated, and then shall be removed.
3. If kit foxes or known or potential kit fox dens are found on site, daily monitoring by a qualified biologist shall be required during ground disturbing activities.

BR-11. Prior to issuance of grading and/or construction permits, the applicant shall clearly delineate the following as a note on the project plans: "*Speed signs of 25 mph (or lower) shall be posted for all construction traffic to minimize the probability of road mortality of the San Joaquin kit fox*". Speed limit signs shall be installed on the project site within 30 days prior to initiation of site disturbance and/or construction.

BR-12. Prior to issuance of grading and/or construction permit and within 30 days prior to initiation of site disturbance and/or construction, all personnel associated with the project shall attend a worker education training program, conducted by a qualified biologist, to avoid or reduce impacts on sensitive biological resources (i.e. San Joaquin kit fox). At a minimum, as the program relates to the kit fox, the training shall include the kit fox's life history, all mitigation measures specified by the City, as well as any related biological report(s) prepared for the project. The applicant shall notify the City shortly prior to this meeting. A kit fox fact sheet shall also be developed prior to the training program, and distributed at the training program to all contractors, employers and other personnel involved with the construction of the project.

BR-13. Prior to, during and after the site disturbance and/or construction phase, use of pesticides or herbicides shall be in compliance with all local, State and Federal regulations. This is necessary to minimize the probability of primary or secondary poisoning of endangered species utilizing adjacent habitats, and the depletion of prey upon which San Joaquin kit foxes depend.

BR-14. During the site disturbance and/or construction phase, grading and construction activities after dusk shall be prohibited unless coordinated through the City, during which additional kit fox mitigation measures may be required.

BR-15. During the site disturbance and/or construction phase, to prevent entrapment of the San Joaquin kit fox, all excavations, steep-walled holes and trenches in excess of two feet in depth shall be covered at the close of each working day by plywood or similar materials, or provided with one or more escape ramps constructed of earth fill or wooden planks. Trenches shall also be inspected for entrapped kit fox each morning prior to onset of field activities and immediately prior to covering with plywood at the end of each working day. Before such holes or trenches are filled, they shall be thoroughly inspected for entrapped kit fox. Any kit fox so discovered shall be allowed to escape before field activities resume, or removed from the trench or hole by a qualified biologist and allowed to escape unimpeded.

BR-16. During the site disturbance and/or construction phase, any pipes, culverts, or similar structures with a diameter of four inches or greater, stored overnight at the project site shall be thoroughly inspected for trapped San Joaquin kit foxes before the subject pipe is subsequently buried, capped, or otherwise used or moved in any way. If during the construction phase a kit fox is discovered inside a pipe, that section of pipe will not be moved. If necessary, the pipe may be moved only once to remove it from the path of activity, until the kit fox has escaped.

BR-17. During the site disturbance and/or construction phase, all food-related trash items such as wrappers, cans, bottles, and food scraps shall be disposed of only in closed containers. These containers shall be regularly removed from the site. Food items may attract San Joaquin kit foxes onto the project site, consequently exposing such animals to increased risk of injury or mortality. No deliberate feeding of wildlife shall be allowed.

BR-18. During the site disturbance and/or construction phase, any contractor or employee that inadvertently kills or injures a San Joaquin kit fox or who finds any such animal either dead, injured, or entrapped shall be required to report the incident immediately to the

applicant and City. In the event that any observations are made of injured or dead kit fox, the applicant shall immediately notify the USFWS and CDFW by telephone. In addition, formal notification shall be provided in writing within three working days of the finding of any such animal(s). Notification shall include the date, time, location and circumstances of the incident. Any threatened or endangered species found dead or injured shall be turned over immediately to CDFW for care, analysis, or disposition.

BR-19. Prior to final inspection, or occupancy, whichever comes first, should any long internal or perimeter fencing be proposed or installed, the applicant shall do the following to provide for kit fox passage:

i. If a wire strand/pole design is used, the lowest strand shall be no closer to the ground than 12 inches.
ii. If a more solid wire mesh fence is used, 8" x 12" openings near the ground shall be provided every 100 yards
iii. Upon fence installation, the applicant shall notify the City to verify proper installation. Any fencing constructed after issuance of a final permit shall follow the above guidelines

7.0 References

Althouse and Meade, Inc. 2006. San Joaquin Kit Fox Survey using the Protocol for the Northern Range. Survey Results Report for the Chandler Ranch Area Specific Plan Properties, Paso Robles, San Luis Obispo County, California.

Althouse and Meade, Inc. 2011. Supplemental Biological Report for the Chandler Ranch Area Specific Plan, San Luis Obispo County, California.

Althouse and Meade, Inc. 2017. Delineation of Potentially Jurisdictional Wetlands and Waters for South Chandler Ranch, Paso Robles, San Luis Obispo County. November.

Baldwin, B. G., D. H. Goldman, D. J. Keil, R. Patterson, T. J. Rosatti, and D. H. Wilken, editors. 2012. The Jepson manual: vascular plants of California, second edition. University of California Press, Berkeley.

Brehme, C. S., Hathaway, S. A., Booth, R., Smith, B. H. and Fisher R. N. 2015. Research results of American Badgers in western San Diego County, 2014. Data Summary prepared for California.

California Department of Fish and Game (CDFG). 2000. Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Natural Communities. Revised May 8, 2000.

California Department of Fish and Game (CDFG). 2009. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities. November 24.

California Department of Fish and Wildlife (CDFW). 2014. California Interagency Wildlife Task Group. CWHR version 9.0 personal computer program. Sacramento, CA.

California Department of Fish and Wildlife, Natural Diversity Database (CDNNB). 2017. Special Animals List. Periodic publication. 51 pp. October.

California Department of Fish and Wildlife, Natural Diversity Database (CNDDB). 2018. Special Vascular Plants, Bryophytes, and Lichens List. Quarterly publication. 127 pp. January.

California Natural Diversity Database (CNDDB). RareFind 5 [Internet]. California Department of Fish and Wildlife. Commercial version. January 18, 2018.

California Native Plant Society (CNPS). 2001. CNPS Botanical Survey Guidelines. California Native Plant Society. December 9, 1983, revised June 2, 2001

California Native Plant Society (CNPS). 2017. Inventory of Rare and Endangered Plants (online edition, v8-01a). California Native Plant Society. Sacramento, CA. Accessed July, 2017.

Consortium of California Herbaria (CCH). 2011. Regents of the University of California. http://ucjeps.berkeley.edu/consortium/ Accessed July, 2017.

Coulombe, H. N. 1971. Behavior and population ecology of the Burrowing Owl, *Speotyto cunicularia*, in the Imperial Valley of California. The Condor. 73: 162-176.

County of San Luis Obispo, Planning and Building Department. 2015. 2016 Draft Guidelines for Biological Resources Assessments. October.

Dallas, Mitchell C. 2012. Vernal Pool Branchiopod Survey Report, 2011/2012 Wet Season, Chandler Ranch Area Specific Plan, Paso Robles, San Luis Obispo County, California. Prepared for Althouse and Meade, Inc. May 2012.

Dallas, Mitchell C. 2013. Vernal Pool Branchiopod Survey Report, 2012/2013 Wet Season, Chandler Ranch Area Specific Plan, Paso Robles, San Luis Obispo County, California. Prepared for Althouse and Meade, Inc. May 2013.

eBird. 2017. eBird: An online database of bird distribution and abundance [web application]. eBird, Ithaca, New York. Available: http://www.ebird.org. (Accessed: November 14, 2017).

Eldridge, D. J. 2004. Mounds of the American Badger (*Taxidea taxus*): Significant features of North American shrub-steppe ecosystems. Journal of Mammalogy. 85(6): 1060-1067. December.

Eriksen, C. H. and Belk, D. 1999. Fairy shrimps of California's puddles, pools, and playas. Mad River Press, Inc. Eureka, California.

Helm, B. P. 1998. Biogeography of eight large branchiopods endemic to California. Pp. 124–139 in C. W. Witham, E. T. Bauder, D. Belk, W. R. Ferrin, Jr., and R. Ornduff, eds. Ecology, Conservation, and Management of Vernal Pool Ecosystems—Proceedings from a 1996 Conference. California Native Plant Society, Sacramento, California.

Helm Biological Consulting. 2012. Dry-season sampling for federally-listed large branchiopods at the Chandler Ranch Specific Plan Area. Prepared for Althouse and Meade, Inc. September 2012.

Hickman, James C. 1993. The Jepson Manual. University of California Press, Berkeley and Los Angeles, California.

Hoover, Robert F. 1970. The Vascular Plants of San Luis Obispo County, California. University of California Press. Berkeley, Los Angeles, and London.

Shuford, W. David, and Thomas Gardali, eds. 2008. *California Bird Species of Special Concern 2006: A Ranked Assessment of Species, Subspecies, and Distinct Populations of Birds of Immediate Conservation Concern in California.* Camarillo and Sacramento, CA: Western Field Ornithologists and California Department of Fish and Game.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/. Accessed July, 2017.

Travsky, A. and Beauvais, G. P. 2005. Species assessment for the Ferruginous Hawk (*Butteo Regalis*) in Wyoming. Prepared for United States Department of the Interior Bureau of Land Management, Cheyenne, Wyoming. January.

United States Department of Agriculture (USDA). 2014. Aerial photomosaic of San Luis Obispo County. National Agriculture Imagery Program (NAIP).

U.S. Fish and Wildlife Service (USFWS). 2000. Guidelines for Conducting and Reporting Botanical Inventories for Federally, Proposed, and Candidate Species. January.

8.0 Figures

- Figure 1. USGS Topographic Map
- Figure 2. Aerial Photograph
- Figure 3. CNDDB Plants and Animals Map
- Figure 4. Biological Resource Map

Figure 1. United States Geological Survey Topographic Map

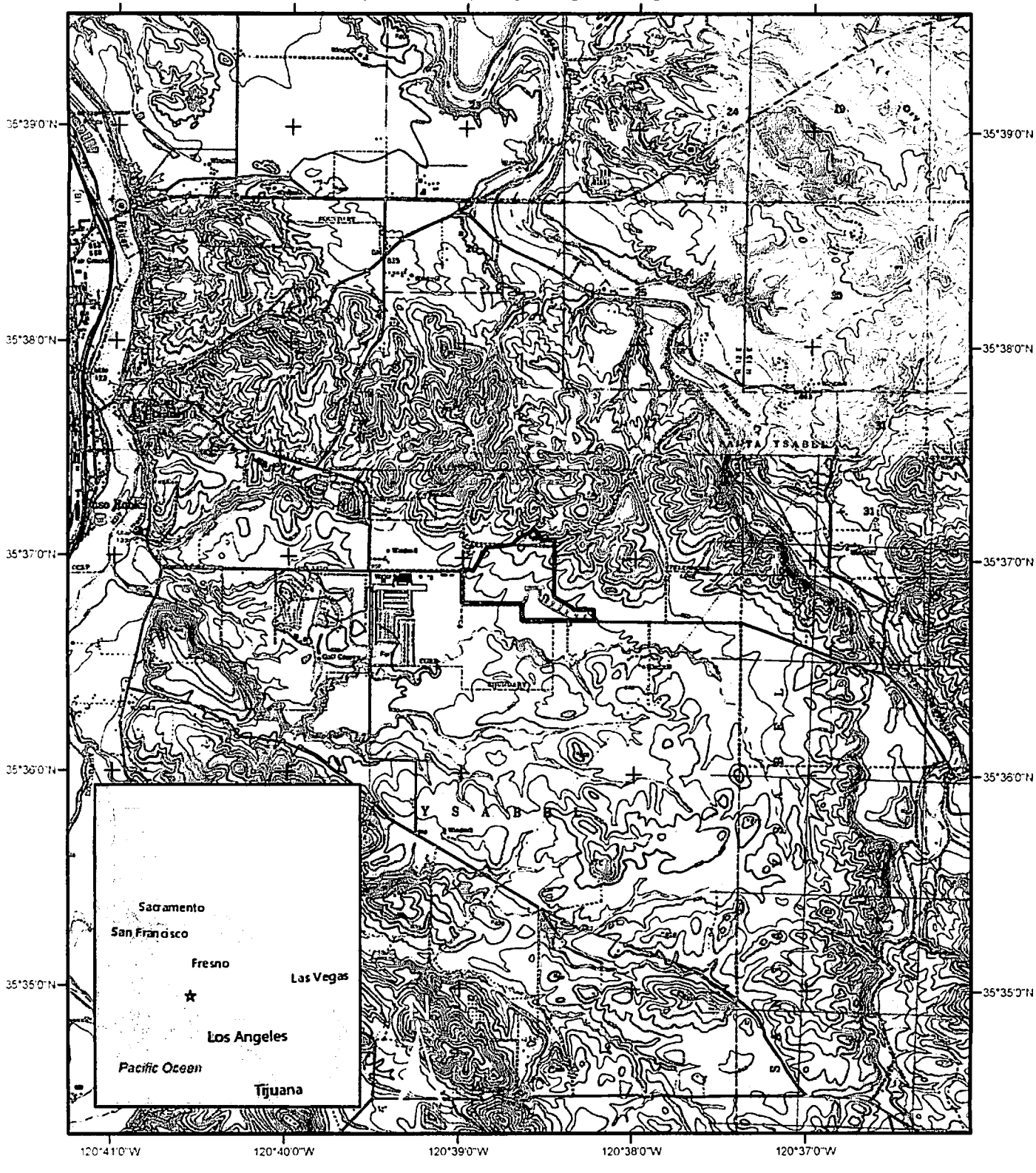
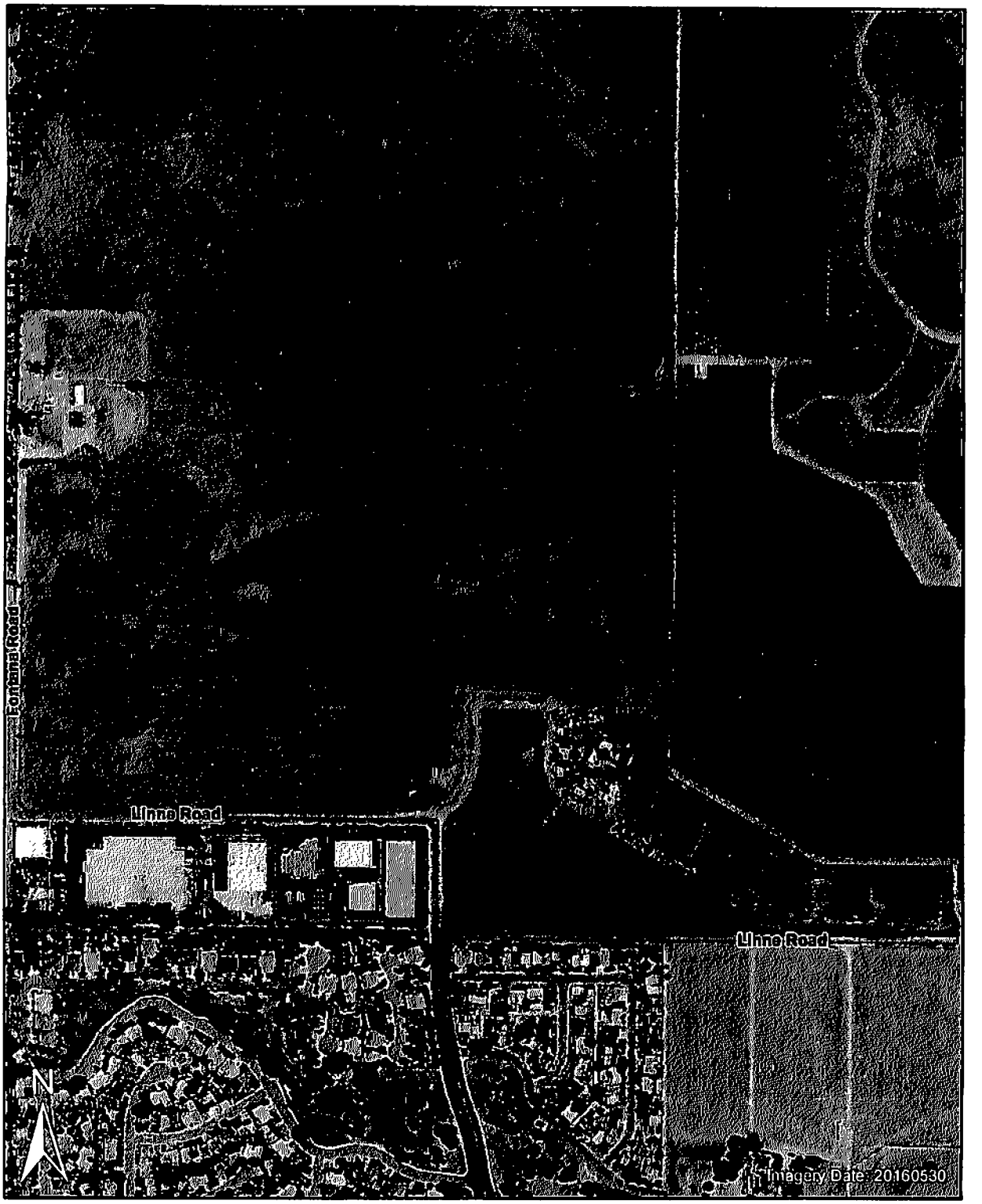


Figure 2. Aerial Photograph



Study Area (117.3 acres)

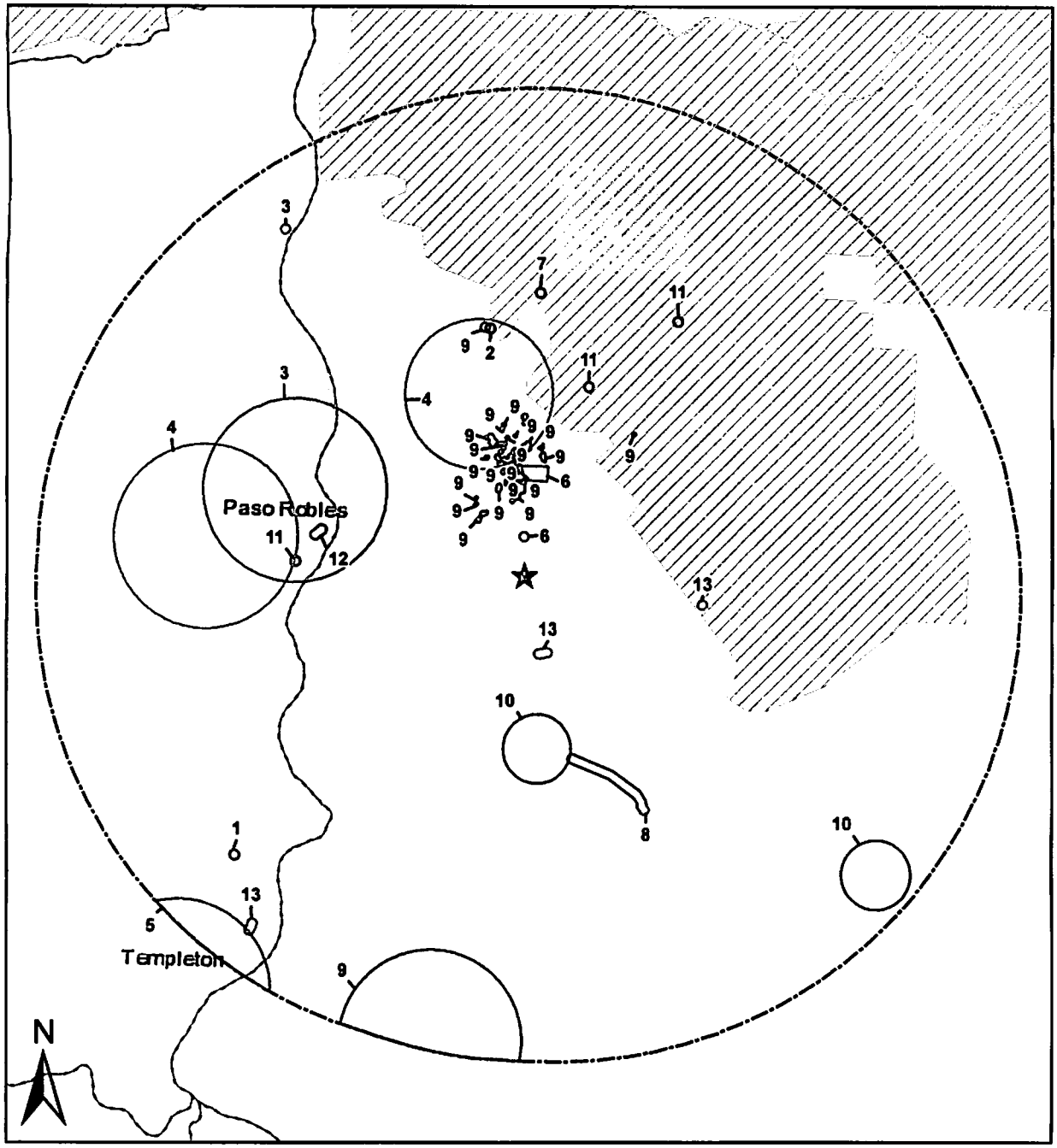
1 inch = 600 feet

0 200 400 800

Feet

Updated February 15, 2018 10:53 AM by JBB

Figure 3. California Natural Diversity Database Records and United States Fish and Wildlife Service Critical Habitat Map



Label	Common Name	Label	Common Name
1	American Badger	10	Tricolored Blackbird
2	Golden Eagle	11	Vernal Pool Fairy Shrimp
3	Least Bell's Vireo	12	Western Pond Turtle
4	Lemmon's Jewelflower	13	Western Spadefoot
5	Mesa Horkelia		
6	San Joaquin Kit Fox		
7	San Luis Obispo Owl's Clover		
8	Santa Lucia Dwarf Rush		
9	Shining Navarretia		

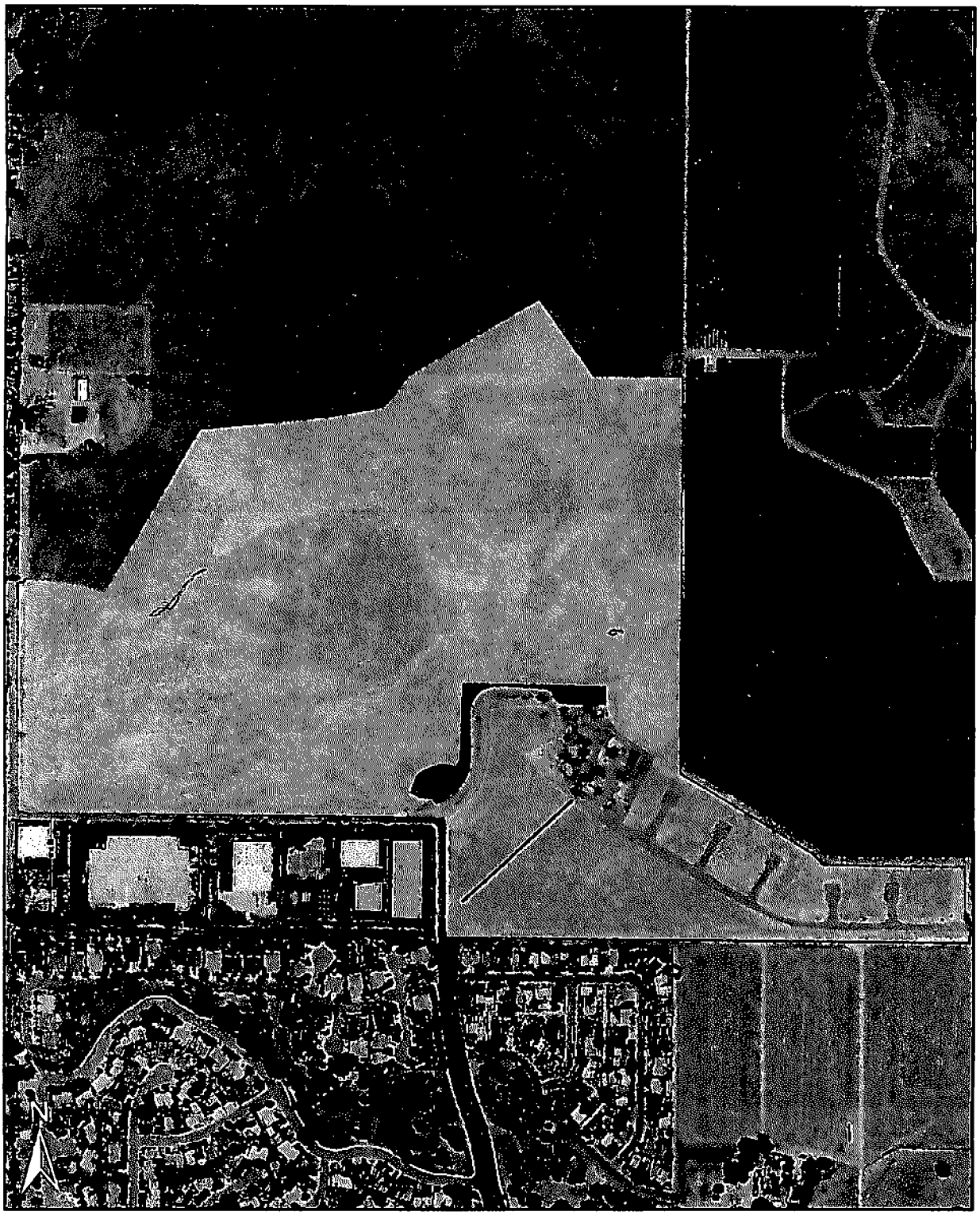
Project Location
5-Mile Radius
Critical Habitat
Vernal pool fairy shrimp
Steelhead

1 inch = 1.75 miles

0 0.5 1 2 3 Miles

Updated February 15, 2018 10:48 AM by: JBB

Figure 4. Biological Resources



9.0 Photographs

Photo 1. Annual grassland habitat. April 28, 2017.

Photo 2. Our Town abandoned road. April 28, 2017.

Photo 3. Potential wetland swale. May 3, 2017.

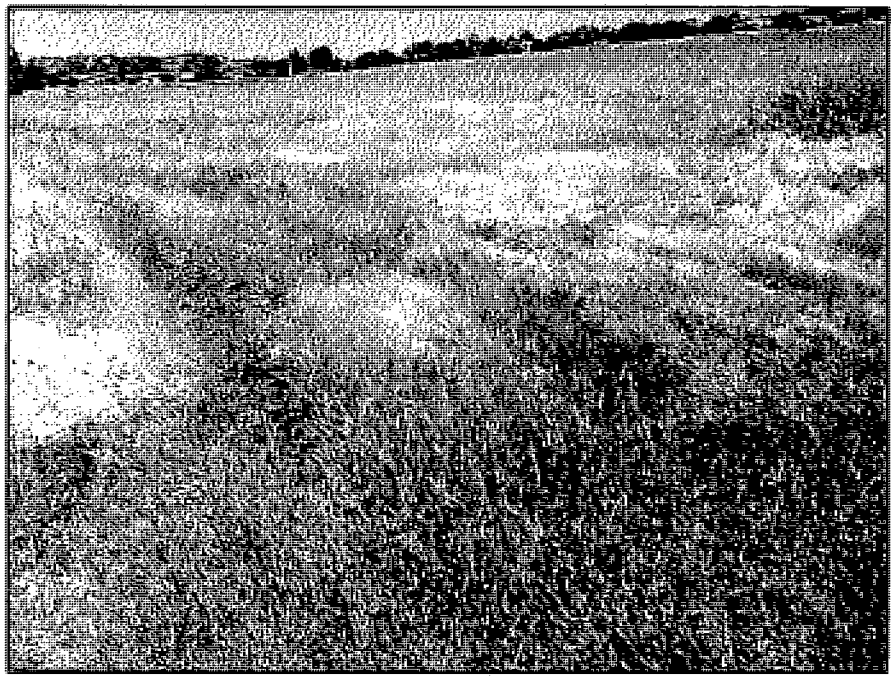


Photo 4. Potential wetland, center of Study Area. May 3, 2017.

Appendix A – Assessor Parcel Numbers within Study Area

APN	Acres
020-211-006	1.21
020-211-009	0.89
020-211-010	0.10
020-211-012	10.63
020-321-001	1.11
020-321-002	0.25
020-322-001	0.17
020-322-002	0.15
020-322-003	0.11
020-322-004	0.18
020-322-005	0.16
020-322-006	0.16
020-322-007	0.17
020-322-008	0.17
020-322-009	0.17
020-323-001	0.16
020-323-002	0.14
020-323-003	0.12
020-323-004	0.19
020-323-005	0.20
020-323-006	0.12
020-323-007	0.17
020-323-008	0.19
020-324-001	0.16
020-324-002	0.14
020-324-003	0.12
020-324-004	0.19
020-324-005	0.19
020-324-006	0.12
020-324-007	0.14
020-324-008	0.16

APN	Acres
020-331-001	0.16
020-331-002	0.14
020-331-003	0.12
020-331-004	0.19
020-331-005	0.19
020-331-006	0.12
020-331-007	0.14
020-331-008	0.16
020-332-001	0.20
020-332-002	0.17
020-332-003	0.16
020-332-004	0.19
020-332-005	0.19
020-332-006	0.12
020-332-007	0.15
020-332-008	0.16
020-333-001	0.17
020-333-002	0.16
020-333-003	0.15
020-333-004	0.15
020-333-005	0.16
020-333-006	0.17
020-334-001	0.18
020-334-002	0.24
020-334-003	0.19
020-334-004	0.15
020-334-005	0.16
020-334-006	0.17
025-362-037	0.76
025-381-001	4.45
025-381-005	83.46

Reso A - Exhibit C2 (EIR Technical Appendix)

Kit Fox Habitat Evaluation Form
Cover Sheet

Project Name **South Chandler Ranch** Date **7-12-2019**

Project Location **Paso Robles, CA**

Include project vicinity map and project boundary on copy of U.S.G.S. 7.5. minute map (size may be reduced)

U.S.G.S. Quad Map Name **Paso Robles**

Lat/Long or UTM coordinates (if available) **N 35.6157º**

W -120.64617º

Project Description **Residential Subdivision**

Project Size**:** ~95.5 Amount of Kit Fox Habitat Affected: **~95.5**

Quantity of WHR Habitat Types Impacted (i.e. – 2 acres annual grassland, 3 acres blue oak woodland)

WHR type California Annual Grassland **95.5 Acres**

Comments:

Acreage affected listed on this form is an estimate. Actual acreage affected will be determined by final grading plans.

Form Completed by: Daniel E. Meade

Revised 03/02

Reso A - Exhibit C2 (EIR Technical Appendix)

San Joaquin Kit Fox Habitat Evaluation Form

Is the project within 10 miles from a recorded San Joaquin kit fox observation or within contiguous suitable habitat as defined in Question 2(A-E)?

YES – Continue with evaluation form
NO – Evaluation form/surveys are not necessary

1. Importance of the project area relative to Recovery Plan for Upland Species of the San Joaquin Valley, California (Williams et al, 1998).
   - **A. Project would block or degrade an existing corridor linking core populations or isolate a subpopulation (20).**
   - B. Project is within a core population (15)
   - C. Project area is identified within satellite population (12)
   - D. Project area is within a corridor linking satellite populations (10)
   - E. Project area is not within any of the previously described areas but is within known kit fox range (5)

2. Habitat characteristics of the project area.
   - **A. Annual grassland or saltbush scrub present >50% of site (15)**
   - B. Grassland or saltbush scrub present but comprises <50% of project area (10)
   - C. Oak savannah present on >50% of site (8)
   - D. Fallow ag fields or grain/alfalfa crops (7)
   - E. Orchards/vineyards (5)
   - F. Intensively maintained row crops or suitable vegetation absent (0)

3. Isolation of project area
   - A. Project area surrounded by contiguous kit fox habitat as described in Question 2a-e (15)
   - **B. Project area adjacent to at least 40 acres of contiguous habitat or part of an existing corridor (10)**
   - C. Project area adjacent to <40 acres of habitat but linked by existing corridor (i.e.-river, canal, aqueduct) (7)
   - D. Project area surrounded by ag but less than 200 yards from habitat (5)
   - E. Project area completely isolated by row crops or development and is greater than 200 yards from potential habitat (0)

4. Potential for increased mortality as a result of the project implementation. Mortality may come from direct (e.g. – construction related) or indirect (e.g. – vehicle strikes due to increases in post development traffic) sources.
   - A. Increase in mortality likely (10)
   - **B. Unknown mortality effects (5)**
   - C. No long term effect on mortality (0)

5. Amount of potential kit fox habitat affected

A. > 320 acres (10)
B. 160-319 acres (7)
C. 80-159 acres (5)
D. 40-79 acres (3)
E. <40 acres (1)

6. Results of project implementation

A. Project site will be permanently converted and will no longer support foxes (10)
B. Project area will be temporarily impacted but will require periodic disturbance for ongoing maintenance (7)
C. Project area will be temporarily impacted and no maintenance necessary (5)
D. Project will result in changes to agricultural crops (2)
E. No habitat impacts (0)

7. Project shape

A. Large block (10)
B. Linear with >40 foot right-of way (5)
C. Linear with <40 foot right-of-way (3)

8. Have San Joaquin kit foxes been observed within 3 miles of the project area within the last 10 years?

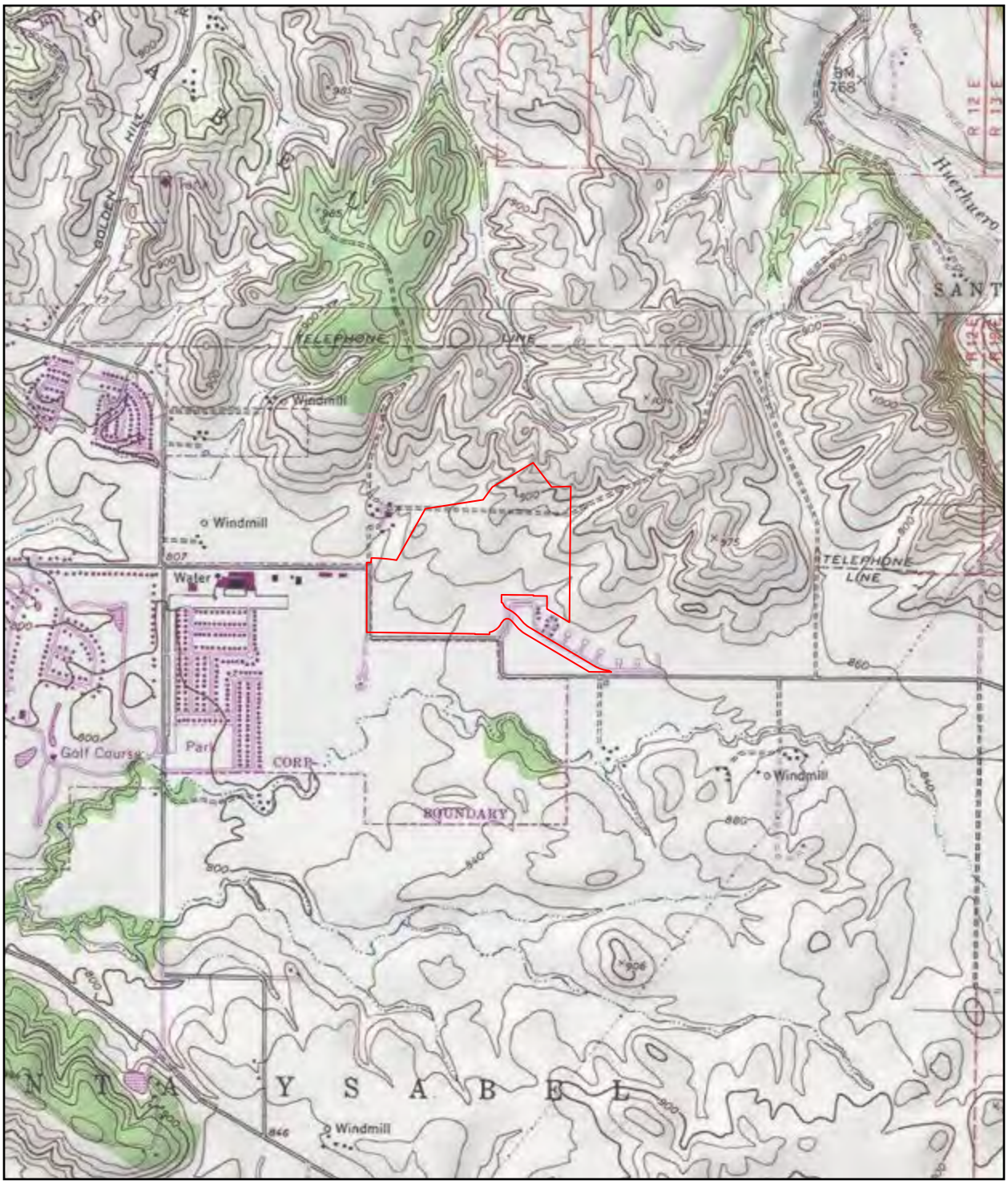
A. Yes (10)
B. No (0)

Scoring

1.	Recovery importance	20
2.	Habitat condition	15
3.	Isolation	10
4.	Mortality	5
5.	Quantity of habitat impacted	5
6.	Project results	10
7.	Project shape	10
8.	Recent observations	0
Total		75

Reso A - Exhibit C2 (EIR Technical Appendix)

Figure 1. United States Geological Survey Topographic Map



Legend

South Chandler Ranch

N

0 500 1,000 2,000 Feet

South Chandler Ranch
Map Center: 120.64403°W 35.61482°N
Paso Robles, San Luis Obispo County

USGS Quadrangle: Templeton

ALTHOUSE AND MEADE, INC.
BIOLOGICAL AND ENVIRONMENTAL SERVICES

Map Updated:
July 12, 2019 01:08 PM by JBB

Biological Report

for

Olsen Ranch

City of El Paso de Robles, California

Prepared for

Olsen Ranch 212, LLC
Mike Naggar & Associates
445 S. D St.
Perris, CA 92570

by

ALTHOUSE AND MEADE, INC.
BIOLOGICAL AND ENVIRONMENTAL SERVICES
1602 Spring Street
Paso Robles, CA 93446
(805) 237-9626

May 2019

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APPENDIX C. SPECIAL STATUS ANIMALS REPORTED FROM THE REGION
APPENDIX D. ARBORIST REPORT

Cover Page: View northeast of grassland and cropland habitats in the middle of the Olsen Ranch

SYNOPSIS

- This biological report describes biological resources at a 254.1-acre property located in the City of El Paso de Robles, San Luis Obispo County, California (Study Area). The Study Area includes Assessor's Parcel Number (APN) 009-795-001, 009-795-002, 009-795-003, 009-795-004, 009-795-005, and 009-795-006.
- The proposed project (Project) is a residential development on approximately 188 acres of the Study Area. A preliminary site plan was evaluated for this report. It is expected that a final site plan will be evaluated in a final Environmental Impact Report for the Project.
- Five habitat types were identified and mapped in the Study Area, including cropland, California annual grassland, riparian, wetlands and drainages, and anthropogenic.
- Botanical surveys conducted in the Study Area identified 134 species, subspecies, and varieties of vascular plants. Appropriate habitat and soil conditions are suitable for five special status plant species. No special status plant species were detected in the Study Area during appropriately timed botanical surveys.
- Wildlife species that could be present in the Study Area include three species of amphibians, nine reptiles, 50 birds, and 24 mammals. Appropriate habitat is present in the Study Area for seven special status animals. No special status animals were detected in the Study Area in 2018 and 2019. Western spadefoot toad, a California Species of Special Concern was observed onsite in 2004.
- Biological resources that could be impacted by the Project are evaluated based on preliminary site plans. Actual acreage of Project impacts would be based on approved final site plans. Mitigation recommendations are provided where applicable to reduce potential significant impacts to sensitive biological resources.

1 INTRODUCTION

This report provides results from the study of biological resources on the Olsen Ranch Property (Study Area), an approximately 254.1-acre property in the City of Paso Robles, San Luis Obispo County, California (Figure 1). This report also provides analysis of the potential impacts to identified biological resources from the proposed residential development project (Project). Results include a habitat assessment, botanical and wildlife inventories, special status species database search, and literature review. Discussion of special status species that have potential to occur within the Study Area, or be affected by the proposed Project, is also included. The effects of the proposed Project on biological resources are evaluated and mitigation recommendations are included.

1.1 Project Location and Description

Olsen Ranch is located just inside the eastern edge of the City of Paso Robles, where it is bounded by Linne Road to the north, Hanson Road to the east, Meadowlark Road to the south, and a subdivision to the west (Figure 2). The Project is located within the Templeton United States Geological Survey (USGS) 7.5-minute quadrangle and is comprised of six legal parcels (APNs 009-795-001, 009-795-002, 009-795-003, 009-795-004, 009-795-005, 009-795-006). Approximate coordinates for the center of the Study Area are 35.606 °N, 120.637°W (WGS 84). Elevation ranges from approximately 815 feet to 930 feet above mean sea level.

The proposed Project is a residential development in the Olsen-Chandler Ranch Specific Plan area. The Project includes 673 residential units, a community center, mixed-use consisting of light retail, a corner store and office, and community gardens and recreation areas.

Reso A - Exhibit C2 (EIR Technical Appendix)

Figure 1. United States Geological Survey Topographic Map

Legend

Olsen Ranch Boundary

N

0 0.25 0.5 1 Mile

Olsen Ranch
Map Center: 120.63666°W 35.60646°N
Paso Robles, San Luis Obispo County

USGS Quadrangle: Templeton

ALTHOUSE AND MEADE, INC.
BIOLOGICAL AND ENVIRONMENTAL SERVICES

Map Updated:
April 19, 2019 02:25 PM by MMP

1.2 Regulatory Framework

Standards for environmental protection and restoration, in the form of laws and regulations, are created within three different organizational levels of the government: Federal, State, and Local. Entities exist within each level to create and enforce regulations that help ensure protection of specific and pertinent regional issues threatening ecosystems and environments. The following regulations are applicable to the proposed Project.

1.2.1 Federal Regulations

Endangered Species Act. The federal Endangered Species Act (FESA) provides the legal framework for the listing and protection of species (and their habitats) identified as being endangered or threatened with extinction. "Critical Habitat" is a term within the FESA designed to guide actions by federal agencies and is defined as "an area occupied by a species listed as threatened or endangered within which are found physical or geographical features essential to the conservation of the species, or an area not currently occupied by the species which is itself essential to the conservation of the species." Actions that jeopardize endangered or threatened species and/or critical habitat are considered a 'take' under the FESA. "Take" under federal definition means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.

Projects that would result in "take" of any federally listed threatened or endangered species, or critical habitats, are required to obtain permits from the USFWS through either Section 7 (interagency consultation with a federal nexus) or Section 10 (Habitat Conservation Plan) of FESA, depending on the involvement by the federal government in permitting and/or funding of the project. Through Section 10, it is required to prepare a Habitat Conservation Plan (HCP) to be approved by the United States Fish and Wildlife Service (USFWS), which results in the issuance of an Incidental Take Permit (ITP). Through Section 7, which can only occur when a separate federal nexus in a project exists (prompting interagency consultation), a consultation by the various federal agencies involved can take place to determine appropriate actions to mitigate negative effects on endangered and threatened species and their habitat.

Migratory Bird Treaty Act. All migratory bird species that are native to the U.S. or its territories are protected under the federal Migratory Bird Treaty Act (MBTA) of 1918 (50 C.F.R. Section 10.13), as amended under the Migratory Bird Treaty Reform Act of 2004. The MBTA makes it illegal to purposefully take (pursue, hunt, shoot, wound, kill, trap, capture, or collect) any migratory bird, or the parts, nests, or eggs of such a bird, except under the terms of a valid Federal permit.

Section 404 Clean Water Act Regulations. The Clean Water Act provides wetland regulation at the federal level and is administered by the U. S. Army Corps of Engineers (USACE). The purpose of the Clean Water Act is to restore and maintain the chemical, physical, and biological integrity of all waters of the U.S. Permits are required for temporary or permanent fill within waters of the U.S. (WOTUS; including wetlands). Permits may be issued on an individual basis or may be covered under approved nationwide permits.

1.2.2 State Regulations

California Environmental Quality Act (CEQA). CEQA defines a "project" as any action undertaken from public or private entity that requires discretionary governmental review (a non-ministerial permittable action). All "projects" are required to undergo some level of environmental review pursuant to CEQA, unless an exemption applies. CEQA's environmental review process includes an assessment of existing resources, broken up by categories (i.e., air quality, aesthetics, etc.), a catalog of potential impacts to those resources caused by the proposed project, and a quantifiable result determining the level of significance an impact would generate. The goal of environmental review under CEQA is to avoid or mitigate impacts that would lead to a "significant effect" on a given resource; section 15382 of the CEQA Guidelines defines a "significant effect" as

> *a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance. An economic or social change by itself shall not be considered a significant effect on the environment, but may be considered in determining whether the physical change is significant.*

Public agencies are required to implement CEQA and execute jurisdiction to determine when applicable activities are or are not subject to CEQA. A public agency with the most prominent nexus and jurisdiction to a project is called the lead agency. The lead agencies determine the scope of what is considered an impact and what constitutes a "significant effect". "Biological resources" is one of the varying categories considered during environmental review through CEQA. A lead agency can require a biological assessment to be prepared to report on existing biological resources and recommend mitigation measures that will reduce or lessen potential negative impacts to those biological resources. The questions listed in CEQA's Appendix G: Biological Resources section, which are used to guide assessment of impacts to biological resources are as follows:

- *Does the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?*
- *Does the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?*
- *Does the project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?*
- *Does the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?*
- *Does the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?*
- *Does the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?*

The lead agency has the final determination over whether a project is or is not permissible, based upon the environmental review, completed requirements and environmental documentation, and their judgement that the project would not have a significant effect on the environment, or that all significant effects would be mitigated.

California Fish and Game Code. The California Fish and Game Code regulates the taking or possession of birds, mammals, fish, amphibians, and reptiles, as well as natural resources such as wetlands and waters of the state. It includes the California Endangered Species Act, Streambed Alteration Agreement regulations, and California Native Plant Protection Act. Fish and Game Code states that it is "unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto," and "unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird" unless authorized.

California Endangered Species Act. The California Endangered Species Act (CESA), like FESA, contains procedures for listing species and regulating potential impacts to listed species. State threatened or endangered species include both plants and wildlife, but do not include invertebrates. The designation "rare species" applies only to California native plants. State threatened and endangered plant species are regulated largely under the Native Plant Preservation Act in conjunction with the CESA. Section 2080 of CESA prohibits the take of species listed as threatened or endangered pursuant to the CESA. CESA authorizes the California Department of Fish and Wildlife (CDFW) to enter into a memorandum of agreement for take of listed species to issue an Incidental Take Permit (ITP) for a state-listed threatened or endangered species, only if specific criteria are met. Section 2081 allows CDFW to authorize take provided that: 1) the taking is incidental to an otherwise lawful activity; 2) the taking will be minimized and fully mitigated; 3) the applicant ensures adequate funding for minimization and mitigation; and 4) the authorization will not jeopardize the continued existence of the listed species.

CEQA requires that public agencies evaluate and disclose impacts to plant species protected under CESA and the NPPA. In addition, public agencies must also address plant species that may not be listed under CESA or the NPPA, but that may nevertheless meet the definition of rare or endangered provided in CEQA. CDFW works in collaboration with the California Native Plant Society and with botanical experts throughout the state to maintain an Inventory of Rare and Endangered Plants, and the similar Special Vascular Plants, Bryophytes, and Lichens List. Species on these lists may meet the CEQA definition of rare or endangered. As the trustee agency for the wildlife of California, which includes plants, ecological communities and the habitat upon which they depend, CDFW advises public agencies during the CEQA process to help ensure that the actions they approve do not significantly impact such resources. CDFW often advises that impacts to plant species with a California Rare Plant Rank in the Inventory be disclosed by the lead agency during project review to ensure compliance with CEQA.

California Native Plant Protection Act. Section 1900-1913 of the California Fish and Game Code contains the regulations of the Native Plant Protection Act of 1977. The intent of this act is to help conserve and protect rare and endangered plants in the state.

Streambed Alteration Agreement Regulations. Section 1602 of the Fish & Game Code requires any person, state, or local governmental agency to provide advance written notification to CDFW prior to initiating any activity that would: 1) divert or obstruct the natural flow of, or substantially change or remove material from the bed, channel, or bank of any river, stream, or lake; or 2) result in the disposal or deposition of debris, waste, or other material into any river, stream, or lake. The state definition of "lakes, rivers, and streams" includes all rivers or streams that flow at least periodically or permanently through a well-defined bed or channel with banks that support fish or

other aquatic life, and watercourses with surface or subsurface flows that support or have supported riparian vegetation.

Regional Water Quality Control Board. The RWQCB regulates impacts to water quality in federal waters of the U.S. under Section 401 of the Clean Water Act. RWQCB also regulates impacts to isolated waters, wetlands, riparian areas, and headwaters that may not be covered under the Clean Water Act. Statewide general waste discharge requirements for dredged or fill discharges to waters deemed by USACE to be outside of federal jurisdiction (General WDRs) are covered by Water Code section 13263(a) as implemented by the State Water Resources Control Board's Water Quality Order No. 2004-0004-DWQ. It is the intent of the General WDRs to regulate a subset of the discharges determined not to fall within federal jurisdiction, particularly those projects involving impacts to small acreage or linear feet and those involving a small volume or dredged material.

1.2.3 Local Regulations

California Oak Woodland Conservation Act – This act established the Oak Woodland Conservation Program in 2001, administered by the Wildlife Conservation Board, to help local jurisdictions protect and enhance their oak woodland resources. It offers landowners, conservation groups, and cities/counties and opportunity to obtain funding for projects designed to conserve and restore California's oak woodlands.

California Oak Woodlands Conservation: Environmental Quality -- Senate Bill 1334 requires a county to determine whether a project within its jurisdiction may result in a conversion of oak woodlands that will have a significant effect on the environment. If a county determines that there may be a significant effect to oak woodlands, the county shall require one or more of the following oak woodlands mitigation alternatives to mitigate the significant effect of the conversion of oak woodlands: (1) Conserve oak woodlands through the use of conservation easements; (2)(A) Plant an appropriate number of trees, including maintaining plantings and replacing dead or diseased trees; (B) The requirement to maintain trees pursuant to this paragraph terminates seven years after the trees are planted; (C) Mitigation pursuant to this paragraph shall not fulfill more than one-half of the mitigation requirement for the project; (D) The requirements imposed pursuant to this paragraph also may be used to restore former oak woodlands; (3) Contribute funds to the Oak Woodlands Conservation Fund, as established under subdivision (a) of Section 1363 of the Fish and Game Code, for the purpose of purchasing oak woodlands conservation easements, as specified under paragraph (1) of subdivision (d) of that section and the guidelines and criteria of the Wildlife Conservation Board. A project applicant that contributes funds under this paragraph shall not receive a grant from the Oak Woodlands Conservation Fund as part of the mitigation for the project; (4) Other mitigation measures developed by the county. Under this regulation, a lead agency that adopts, and a project that incorporates, one or more of the measures specified to mitigate the significant effects to oaks and oak woodlands shall be deemed to be in compliance.

City of Paso Robles Oak Tree Preservation Ordinance – The City of Paso Robles requires review of request to remove oak trees with trunk diameter of six inches (dbh) or greater. The Ordinance also requires approval for trimming branches 6 inches or greater on undeveloped or vacant sites, designation of critical root zones, and replacement requirements for tree removals.

2 METHODS

2.1 Literature Review

Relevant literature, including previous biological resource studies conducted in the vicinity and queries of special status species occurrence records were reviewed to determine what biological resources may occur near the Study Area. A previous Biological Report for the Olsen property (A&M 2004) was reviewed for this current study.

The California Natural Diversity Database (CDFW 2019a) and the California Native Plant Society (CNPS) On-line Inventory of Rare and Endangered Plants of California were reviewed for special status species known to occur in the eight USGS 7.5-minute quadrangles surrounding the Property: Adelaida, Atascadero, Creston, Estrella, Paso Robles, Santa Margarita, Templeton, and York Mountain. The Morro Bay North quadrangle was omitted from the CNDDB and CNPS search results because the quad is separated from the site by the coastal mountains and contains results for coastal species which would not be present in the Study Area. Additional special status species research consisted of reviewing previous biological reports for the area and searching online museum and herbarium specimen records for locality data within San Luis Obispo County. We reviewed online databases of specimen records maintained by the Museum of Vertebrate Zoology at the University of California, Berkeley, the California Academy of Sciences, and the Consortium of California Herbaria. Additional special status species with potential to occur on or near the Property were added to our special status species list (refer to Table 3 and Table 4).

Special status species lists produced by database and literature searches were cross-referenced with the described habitat types in the Study Area to identify all potential special status species that could occur on or near the Property. Each special status species that could occur on or near the Property is individually discussed (refer to Section 3.8 and 3.9).

After review of special status species data, the following criteria were used to determine the potential for special-status species to occur in the Study Area:

- ***Present:*** The species was observed in the Study Area during field surveys.
- ***High Potential:*** High habitat quality combined with CNDDB occurrences or other records indicate the species is likely to occur in the Study Area. Individuals may not have been observed in the Study Area during field surveys; however, the species likely occurs in the Project vicinity and could move into the Project site in the future.
- ***Moderate Potential:*** Suitable habitat is present in the Study Area and CNDDB occurrences or surveys have recorded the species within 10 miles of the Project. Individuals were not observed during surveys, but the species could be present, at least seasonally or as a transient.
- ***Low Potential:*** Marginally suitable habitat is present in the Study Area, but there are no occurrence records or only historical (i.e., 50 years or older) records within 10 miles of the Project area. Individuals were not observed during surveys and are not expected to be present.
- ***No Potential:*** Species, sign, or habitat were not observed in the Study Area during surveys and suitable habitat is not present.

2.2 Mapping

Mapping efforts utilized Samsung Galaxy Tab 4 tablets equipped with Garmin GLO GPS Receivers and a third-party mapping application. Biological resource constraints were mapped in the field on site. Hand notation of habitats on high resolution aerials were digitized into polygon layers. Maps were created using aerial photo interpretation, field notation, and spatial data imported to Esri ArcGIS, a Geographic Information System (GIS) software program. Data were overlaid on a 2016 National Agriculture Imagery Program (NAIP) aerial of San Luis Obispo County (NAIP and USDA 2016). Impacts were calculated using recent CAD site plans from Wallace Group Engineering.

Habitat types within the northern section of the property was digitized using airborne digital photographs of the Study Area that were acquired on March 18, 2019 using a commercially available sUAV by Part 107 certified pilot and visual spotter. A georeferenced RGB orthomosaic image of the Study Area was generated from the acquired aerial images for baseline review. All flight operations were conducted within visual line of sight and below a maximum altitude of 200 feet above-ground level. The study area occurs in class E2 airspace and ATC authorization was acquired through the FAA UAS Data Exchange (confirmation number: ARMZZ116XR) prior to flying. Permission from the property owner was granted before flight.

2.3 Soils

A custom soil report was created by importing the Study Area as an Area of Interest (AOI) into the Natural Resources Conservation Service (NRCS) Soil Survey Geographic Database (SSURGRO) via their online portal (USDA and NRCS 2019). The exported custom soil report, provided in Appendix A, includes a map showing an overlay of the seven soil map units within the AOI as well as a description of each.

2.4 Surveys

Olsen Ranch was surveyed for biological resources from September 2018 through May 2019 by Althouse and Meade, Inc. Surveys were conducted by Principal Biologists Jason Dart, LynneDee Althouse, and Daniel Meade, Biologists Jessica Griffiths, Diondra Jones, Will Knowlton and Darcee Gutilla, and Botanists Kristen Andersen, Shannon Henke, and Kyle Nessen (Table 1). Surveys were conducted on foot in order to compile species lists, search for special status plants and animals, to map habitats, and to photograph the Property.

Each habitat type occurring in the Study Area was inspected, described, and catalogued (Section 3.4, Table 2). All plant and animal species observed in the Study Area were identified and recorded (Section 3.10 and 3.11). Survey transects were meandering with an emphasis on locating habitat appropriate for special status plants while achieving full coverage of the Study Area. Transects were utilized to map boundaries of different vegetation types, describe general conditions and dominant species, compile species lists, and evaluate potential habitat for special status species. Identification of botanical resources included field observations and laboratory analysis of collected material. Botanical surveys were conducted according to agency guidelines (USFWS 2000; CNPS 2001; CDFW 2018). Botanical surveys were appropriately timed to identify all special status plant species known from the region (refer to Section 3.8, and Table 3) that have potential to occur in the Study Area. Botanical nomenclature used in this document follows the Jepson eFlora (Jepson Flora Project (eds.) 2019).

Wildlife documentation included observations of animal presence and wildlife sign such as nests, tracks, and scat. Observations of wildlife were recorded during field surveys in all areas of the Study Area (Table 6). Birds were identified by sight, using 10-power binoculars, or by vocalizations. Reptiles and amphibians were identified by sight, often using binoculars; traps were not used. Mammals recorded in the Study Area were identified by sight and tracks.

Special status species lists produced by database and literature searches were cross-referenced with the described habitat types in the Study Area to identify all potential special status species that could occur on or near the site. Each special status species that could occur on or near the Property is individually discussed (refer to Sections 3.8.4 and 3.9.3).

TABLE 1. BIOLOGICAL SURVEYS

Survey Date	Biologist(s)	Weather Observations	Activities
September 7, 2018	Shannon Henke Kyle Nessen	60 °F, clear and sunny	Vegetation Survey
October 16, 2018	Will Knowlton Diondra Jones	50 – 75 °F, clear, winds to 10 mph	Transect Den Survey
February 18, 2019	Shannon Henke	32 - 42 °F, winds 0 – 5 mph, 20 percent cloud cover	Botanical and Wildlife Surveys
March 12, 2019	Jason Dart Jacqueline Tilligkeit	65 °F, partly cloudy and breezy	Wetland and Botanical Surveys
March 14, 2019	Dan Meade	62 °F, partly cloudy 5- 10 mph.	Wetland and Vernal Pool Surveys
March 21, 2019	Dan Meade	60 °F, Cloudy, 5 mph	Wetland and Vernal Pool Surveys
March 26, 2019	Kristen Andersen Jacqueline Tilligkeit	70 °F, partly cloudy, calm	Wetland and Botanical Surveys
March 27, 2019	Dan Meade	56 °F, calm, cloudy with rain showers	Botanical and Wildlife Surveys
April 4, 2019	Jacqueline Tilligkeit	60 °F, overcast, calm	Habitat Mapping
April 8, 2019	Kyle Nessen	75 °F, clear, winds 0-5 mph	Drone Survey
April 16, 2019	LynneDee Althouse Jacqueline Tilligkeit	65 °F, partly cloudy, calm	Wetland Delineation
April 15, 2019	Kyle Nessen	67 °F, partly cloudy, winds 0-5 mph	Vernal Pool Botanical Survey
April 19, 2019	Kyle Nessen	70 °F, clear, winds 0-5 mph	Drone Survey
May 2, 2019	Jason Dart	66 °F, sunny, winds 0-5 mph	Botanical Survey
May 10, 2019	Darcee Guttilla	56 °F, cloudy, winds 5-10 mph	Nesting Bird Survey
May 13, 2019	Jessica Griffiths	56 °F, clear and sunny, calm	Nesting Bird Survey

3 RESULTS

3.1 Regional Context

The Olsen Ranch is an agricultural property situated on the eastern side of the Salinas River valley, east of Paso Robles, in an area of rolling hills and ephemeral waterways. The site is approximately 2.75 miles east of Highway 101, 2.25 miles south of State Route 46, and 1.5 miles west of Huerhuero Creek, on the south side of Linne Road. Waterways flow in a westerly direction to the Salinas River, which flows northward to Monterey Bay. The area is distinguished by expanses of rangeland, dry farmed croplands, scattered oak trees, and increasing residential, commercial and vineyard development.

3.2 Existing Conditions

Olsen Ranch topography is rolling hills, gently sloping alluvial terraces, and ephemeral waterways. Three residences are located on the site, fronting on Linne Road at the north end of the Study Area, with barns, irrigated and non-irrigated pastures, and other livestock and ranching infrastructure. A high voltage overhead power line passes through the southeastern portion of the Study Area. No other structures are in the southern two-thirds of the site.

Riparian habitat is associated with the northern drainage within the Study Area and is mapped to include portions of the waterway that have tree canopy directly associated with the waterway feature (refer to Figure 3). Riparian habitat consists of oak tree canopy with a few cottonwoods and willows that provide shade to an ephemeral waterway with a grass understory.

Mature oak trees, both valley oak and blue oak, are located in the riparian habitat and scattered in cropland and grassland fields. The number of mature oaks has been significantly reduced over decades and grazing and crop practices have eliminated recruitment of young trees. The trees that remain provide nesting habitat for a variety of birds.

The Study Area is sectioned off into fields that have been managed independently. Along Linne Road is an active cropland in the northwest corner of the Study Area that is further sectioned into several dry-farmed crop fields. Around the two residences in that area are several additional acres that are variously cropped or mowed annually. To the east, in the far northeast corner of the Study Area is an overgrown and weedy grassland that has not been cropped in the last 20 years, although it is periodically mowed. A few coyote brush shrubs have become established, but the only trees are associated with the ephemeral waterway and riparian habitat. One residence is located south of the waterway and is surrounded by grassland habitat that is seasonally mowed but not cropped. The southern two-thirds of the Study Area is divided unevenly from north to south by a ranch road, with all fields to the east actively cropped and the fields to the west have remained an untilled but heavily grazed grassland habitat. These fields are characterized by scattered mature oaks and rolling hills.

A man-made stockpond is situated along the western Study Area boundary where a wetland swale feature drainage saturated return flow westward off the property. The stockpond is decades old and supports mature willow trees and emergent wetland vegetation. The pond is seasonal, holding water into summer during most years, and it provides breeding habitat for several amphibian species and nesting habitat for a variety of birds.

Reso A - Exhibit C2 (EIR Technical Appendix)

Figure 2. Aerial Photograph

Legend

Olsen Ranch Boundary (254.1 acres)

N

0 500 1,000 Feet

Olsen Ranch
Map Center: 120.63666°W 35.60646°N
Paso Robles, San Luis Obispo County

Imagery Source and Date: USDA NAIP, 09/28/2016

3.3 Soils

Six individual soil map units from the NRCS Soil Survey Geographic Database (SSURGO) overlap the Study Area: Arbuckle-Positas complex, Arbuckle-San Ysidro complex, Cropley clay, Nacimiento-Los Osos complex, Rincon clay loam, and San Ysidro loam (USDA and NRCS 2019). These soil types are typically found on terraces and have alluvium parent material derived from calcareous or sedimentary rock. Slopes range from flat to 15 percent and the drainage class is well drained to moderately well drained. A custom USDA soils report is provided in Appendix A.

3.4 Habitat Types

Five general habitat types are described for the Olsen Ranch Study Area: cropland, California annual grassland, riparian, wetlands and waters, and anthropogenic. Habitats are characterized and acreages occurring in the Study Area are provided (Table 2; Figure 3). All habitats in the Study Area show signs of disturbance from long term rural residential practices on the site. Most of the Study Area is dry farmed in most years and is described as 147.3-acres of cropland habitat. California annual grassland is mapped in two areas comprising 82.1 acres where review of aerial photographs indicates farming has not occurred since at least 2003, and the vegetation is typical of non-native grasslands in the region. Approximately 4.0 acres of riparian habitat is associated with an ephemeral waterway that flows westward across the northern end of the Study Area. Wetlands are associated with riparian habitat, with a man-made stockpond in the central west portion of the site, and in a small low area in the southwest corner of the site, with a total of 0.2 acres mapped. Non-wetland waters comprise approximately 1.3 acres. Three residences and associated outbuildings, roads, and other agricultural infrastructure are mapped as 7.5 acres of anthropogenic habitat.

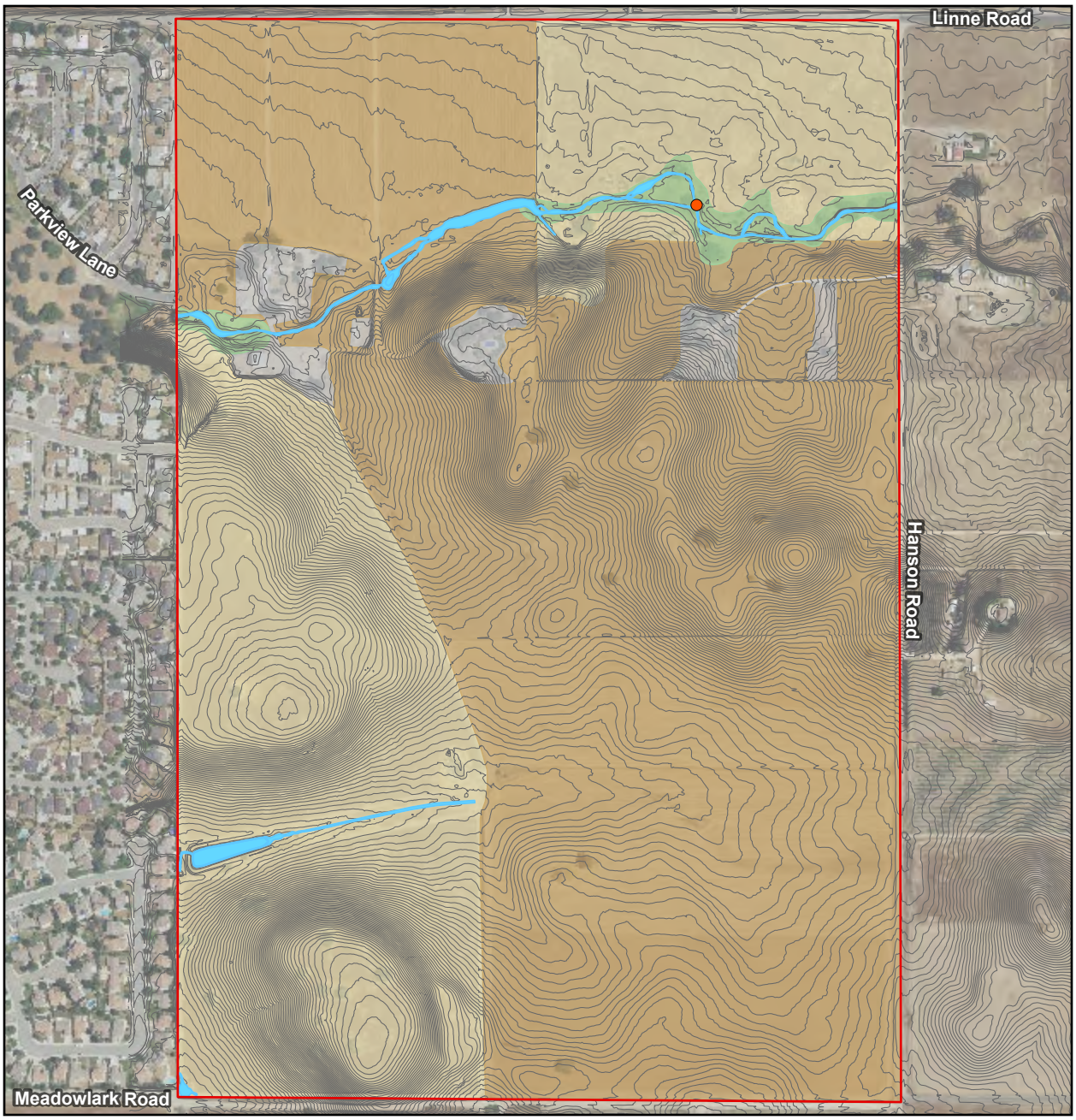
In its current condition, the Study Area habitats are relatively degraded and support an overall low diversity of native plant species. Grassland areas are overgrazed, and lack wildflower displays. The riparian habitat supports mature oak and cottonwood trees in an open canopy but is overgrown with weeds in the understory and lacks substantial shrub and tree recruitment. Croplands are very low in species diversity, and wetlands are also relatively low diversity compared to undisturbed wetland habitats and have poor functions and values due to past land use practices.

TABLE 2. HABITAT TYPES

Habitat Type	Location	Approximate Acreage
Cropland	NW field, W and SW fields	147.3
California Annual Grassland	NE field, SW fields	82.1
Riparian	Northern drainage	4.0
Wetlands and Waters	Northern drainage, central pond and drainage, southern corner wetland	1.5
Anthropogenic	Three residences and outbuildings in north	7.5

Reso A - Exhibit C2 (EIR Technical Appendix)

Figure 3. Biological Resources



Legend

- Inactive Raptor Nest
- 1-Foot Contours
- Olsen Ranch Boundary (254.1 acres)
- Wetlands and Drainages (1.5 acres)

Habitat Type*

- Anthropogenic (7.5 acres)
- California Annual Grassland (82.1 acres)
- Cropland (147.3 acres)
- Riparian (4.0 acres)

N

0 300 600 Feet

Olsen Ranch
Map Center: 120.63666°W 35.60646°N
Paso Robles, San Luis Obispo County

Biological Survey Date: 10/16/2018

*Reported areas are approximations and may not total to acreages reported in legal land description.

ALTHOUSE AND MEADE, INC.
BIOLOGICAL AND ENVIRONMENTAL SERVICES

Map Updated:
May 22, 2019 10:06 AM by JBB

3.4.1 Cropland

Olsen Ranch is an historical livestock and ranching operation with dry-farmed grain and hay crops to support their livestock. The 147.3-acres of cropland habitat is comprised of plant species adapted to frequent disturbances, consistent with routine tilling (Photo 1). Typical dry-farming practices require tilling the land one to three times a year to maintain soil moisture. Fallow cropland fields used for rangeland are dominated by wild oats (*Avena barbata* and *A. fatua*), annual bromes (*Bromus diandrus, B. hordeaceus,* and *B. madritensis* subsp. *rubens*), and mustards (*Brassica nigra* and *Hirschfeldia incana*) are prevalent. Significant patches of dense yellow star-thistle (*Centaurea solstitialis*), an invasive plant, occur in the northern fields and invasive annual grass, medusahead (*Elymus caput-medusae*) is common in the southern fields.

3.4.2 California Annual Grassland

Annual grassland habitat occupies approximately 82.1 acres of the Study Area, occurring in a field at the northeast property corner and on the southwest section of the property adjacent to residential neighborhoods (Photo 2). The habitat was likely farmed many decades ago but has been fallow for at least the last 25 years based on review of aerial imagery. In 2004 it was noted that the land was heavily grazed by sheep (Althouse and Meade, Inc. 2004), and the low species diversity and predominance of non-native Mediterranean annual grasses in 2019 are typical of heavily grazed and fallow grassland systems, even after decades of rest. The grassland species composition varies across the site but is primarily brome and oat dominated. It conforms best to the *Bromus* (*diandrus*, *hordeaceus*) – *Brachypodium distachyon* Alliance, also called Annual Brome Grasslands (Sawyer et al. 2009). Common grass species identified include wild oats, soft chess brome, and ripgut brome. Some native forbs are present, including Fitch's tarweed (*Centromadia fitchii*), red maids (*Calandrinia menziesii*), and clarkia (*Clarkia affinis, C. purpurea* subsp. *quadrivulnera*). No special status plants were identified in the grassland habitat, although potential habitat is present (refer to Section 3.8.3).

Wildlife in the grassland habitat is limited to a low abundance of small mammals such as California ground squirrel (*Otospermophilus beecheyi*), pocket gopher (*Thomomys bottae*), deer mice (*Peromyscus maniculatus*), voles (*Microtus californicus*), and harvest mice (*Reithrodontomys megalotis*). Coyote (*Canus latrans*) and red fox (*Vulpes vulpes*) likely pass through the property on occasion and American badger (*Taxidea taxus*) was not identified but has low potential to occur on site. The habitat is potentially suitable for San Joaquin kit fox (*Vulpes macrotis mutica*), however no sign was observed, and kit fox is currently not known to occur in the area. Striped skunk (*Mephitis mephitis*) was observed onsite, and California toad (*Bufo boreas halophilus*) occupies mammal burrows in the habitat.

3.4.3 Riparian

Riparian habitat is dominated by valley oak trees (*Quercus lobata*) in an intermittent oak woodland tree canopy layer along the waterway, and includes typical riparian trees such as Fremont cottonwood (*Populus fremontii*) and occasional red willow (*Salix laevigata*). Riparian habitat in the Study Area is limited to the northernmost drainage, approximately 700 feet south of Linne Road. It is associated with an ephemeral waterway that conveys water from east to west in a sinuous swale feature, paralleling Linne Road. The waterway captures runoff from a watershed originating about a mile to the east of the Study Area from a low rise on the west side of Huerhuero

Creek and flows through residential and commercial development in the southeast corner of the City toward the Salinas River.

Within the Study Area is an open riparian habitat with willows, oaks, and cottonwoods as the dominant canopy vegetation, and non-native grasses and forbs the dominant herbaceous vegetation in the understory. A more developed riparian zone occurs just west of Hanson Road (Photo 3) and then transitions to widely spaced trees and shrubs (Photo 4). Riparian understory is primarily ripgut brome with a few patches of creeping wild rye (*Elymus triticoides*), a native perennial grass species.

The eastern section of the stream meanders along the southern side of a weedy grassland field. A distinct channel has been formed from the outflow of the culvert under Hanson Road. The channel becomes shallower in the flat mid-section reach and forms a braided channel. An in-stream pond is present on the upstream side of the main access road into the ranch. During periods of stormflow water backs up and spreads out into the cropland fields (Photo 5). West of the main access road the waterway is within an irrigated sheep pasture where it lacks a defined bed and bank and associated riparian vegetation. A stand of valley and blue oaks occurs in the waterway at the west end of the Study Area.

Some wildlife may use the waterway as a movement corridor through the Study Area, however it appears to be overgrown with weeds and may not be conducive to animal movements for most of the year. A variety of bird species are expected to breed in the riparian habitat, including house finch, western kingbird, European starling, and oak titmouse.

3.4.4 Wetlands and Drainages

Wetlands in the Study Area are restricted to patches in the northern drainage, a man-made stock pond in the central drainage, and a weedy patch at the southwest corner of the Study Area. A wetland delineation for the property was produced by Althouse and Meade, Inc. in 2019.

Characteristic wetland indicators within the northern stream channel include dominance of spikerush (*Eleocharis macrostachya*) and Italian ryegrass (*Lolium perenne*). Where the stream is unvegetated and not a wetland, it is incised with a clear bed and bank and is covered in algal mats. Some portions of the northern drainage have multiple flow paths as it meanders through oak riparian habitat. The stream has also been bifurcated through fence installations and ranch activities. A small unvegetated pond within the northern drainage was likely created through the installation of an above-grade culvert under a ranch road. The pond serves as a stock pond for sheep.

The stock pond in the central drainage is larger and is vegetated at the mouth and along the edges with spikerush. It is fed by a small (approximately two feet wide and deep) ephemeral drainage flowing from east to west. For water to exit the stock pond, it reaches an overflow path on the west side of the pond and flows in a short swale feature (Photo 6). The overflow swale conveys water east towards a storm water ditch and then south to a storm water drain, on the west edge of the property.

At the southwest corner of the Study Area there is a poor-quality wetland supported by surface sheetflow and subsurface lateral return flow from the hills directly east. The elevation of the wetland is one to three feet lower than the adjacent Meadowlark Road and neighboring subdivision. Stormwater from surrounding, higher elevations flow to this corner where it is

trapped and pools in the Study Area. Biotic crust was present within the wetland area and hydrophytes such as toad rush (*Juncus bufonius*) and hyssop loosestrife (*Lythrum hyssopifolia*).

3.4.5 Anthropogenic

Anthropogenic habitat is present in the northern portion of Olsen Ranch. This area is comprised of residences and associated structures, yards with planted trees and other landscaping, and roads (Photo 7). Non-native, herbaceous forbs and grasses are the dominant vegetation including weedy species such as yellow star-thistle (*Centaurea solstitialis*) and Russian thistle (*Salsola tragus*).

3.5 Potential Wetlands and Jurisdictional Waters

Althouse and Meade, Inc. performed a wetland delineation for the Study Area in 2019 (A&M 2019). This work resulted in delineation of 0.24 acres of federal and state jurisdictional wetlands, and 4,594 linear feet covering 1.26 acres of non-wetland waters. Approximately 0.68 of the 1.26 acres has the potential to support non-persistent emergent wetlands. Approximately 0.02 acre of the 1.26 acres may be considered a wetland by RWQCB standards but not USACE. The project proposes to have minimal impacts to wetlands and waters and obtain necessary federal and state permits for any fill to jurisdictional aquatic features.

3.6 Oak Trees

Mature native oak trees occur in riparian, grassland and cropland habitats in the Study Area, and occur primarily as scattered canopy in a savannah-like habitat context. Woodland habitat is only present in the riparian habitat (see Section 3.4.3). A total of 172 oak trees were identified, including blue oak (*Quercus douglasii*) and valley oak species (refer to Arborist Report in Appendix D). All oak trees greater than four inches in diameter at breast height (dbh) in the Study Area were mapped, numbered, tagged, and assessed for health and habitat qualities.

In the grassland and cropland habitats of the southern two-thirds of the Study Area, mature oaks are scattered in low density. They are most notable in a hilltop grouping in the southwest corner of the Study Area. There is no recruitment of young oaks due to a long history of grazing. The trees are part of a relict oak savanna habitat that existed throughout the eastern Paso Robles region prior to modern agricultural practices. The current distribution of oak canopy outside the riparian habitat comprises an estimated 1.0 percent of the grassland and cropland habitats and is not considered oak savanna habitat, which is generally defined as an area of at least 10 percent cover of oaks.

Oak trees on site provide nesting habitat for a variety of birds, and natural trunk cavities may be suitable for roosting bats and mammals such as striped skunk and Virginia opossum.

3.7 Habitat Connectivity and Wildlife Movement

The Study Area provides moderate habitat connectivity to habitats north and south of the Study Area. Urban development of the City of Paso Robles is on the west side of the Study Area and vineyard occurs on portions of the north, east, and south boundaries. Rural residential parcels are to the east and south of the Study Area. Riparian and wetland habitats of the Study Area provide connectivity across the northern portion of the property and will remain in place. Although

common wildlife may use the Study Area habitats for local foraging and movement opportunities, it is not part of a significant wildlife movement corridor.

3.8 Botanical Resources

Review of special status plant occurrences within the designated search area determined 53 special status plant species are known to occur in the region (refer to Appendix B). Appropriate habitat and soil conditions are present in the Study Area for five special status plants (Table 3). Figure 4 in Section 3.8.4 depicts the current GIS data for special status plants and critical habitat mapped near the Study Area by the CNDDB and the United States Fish and Wildlife Service (USFWS).

3.8.1 CNDDB Definitions

"Special Plants" is a broad term used to refer to all the plant taxa inventoried by the CNDDB, regardless of their legal or protection status (CDFW and CNDDB 2019). Special plants include vascular plants, high priority bryophytes (mosses, liverworts, and hornworts), and lichens.

3.8.2 California Rare Plant Ranks

Plant species are considered rare when their distribution is confined to localized areas, when there is a threat to their habitat, when they are declining in abundance, or are threatened in a portion of their range. The California Rare Plant Rank (CRPR) categories range from species with a low threat (CRPR 4) to species that are presumed extinct (CRPR 1A). The plants of CRPR 1B are rare throughout their range. All but a few species are endemic to California. All of them are judged to be vulnerable under present circumstances, or to have a high potential for becoming vulnerable.

3.8.3 Potential Special Status Plant List

Error! Reference source not found. lists 5 special status plant species that could potentially occur in the Study Area. Federal and California State status, global and State rank, and CNPS rank status for each species are given. Also included are typical blooming periods, habitat preference, potential to occur on site, whether the species was detected in the Study Area, and effect of proposed activity. A comprehensive list of special status plant species reviewed is included as Appendix B.

TABLE 3. SPECIAL STATUS PLANT LIST

	Common Name *Scientific Name*	Fed/State Status Global/State Rank CRPR	Blooming Period	Habitat Preference	Potential to Occur	Detected in the Study Area?	Effect of Proposed Activity
1.	**Lemmon's Jewelflower** *Caulanthus lemmonii*	None/None G3/S3 1B.2	March – May	Dry, exposed slopes, grassland, chaparral, scrub; 80-1100 m.	Low. Suitable habitat may be present on dry slopes in the Study Area.	No	No Effect
2.	**Small-flowered Morning-glory** *Convolvulus simulans*	None/None G4/S4 4.2	April - June	Clay substrates, occasionally serpentine, annual grassland, coastal-sage scrub, chaparral; 30-875 m.	Low. Suitable clay substrates may be present in the Study Area, in Cropley clay and/or Rincon clay loam.	No	No Effect
3.	**Hogwallow Starfish** *Hesperevax caulescens*	None/None G3/S3 4.2	March - June	Drying shrink-swell clay of vernal pools, flats, steep slopes (sometimes serpentine); < 300(500) m.	Low. Suitable clay substrates may be present in the Study Area, in Cropley clay and/or Rincon clay loam.	No	No Effect
4.	**Santa Lucia Dwarf Rush** *Juncus luciensis*	None/None G3/S3 1B.2	April - July	Vernal pools, ephemeral drainages, wet meadow habitats, and streams; 300-1900 m.	Moderate. Suitable wetland habitat is present in the Study Area.	No	No Effect
5.	**Shining Navarretia** *Navarretia nigelliformis* subsp. *radians*	None/None G4T2/S2 1B.2	May - July	Vernal pools, clay depressions, dry grasslands; 150-1000 m.	High. Suitable habitat is present in grassland habitat in the Study Area. There are known occurrences within 0.5 mile of the Study Area.	No	No Effect

California Rare Plant Ranks:

CRPR 1A: Plants presumed extirpated in California and either rare or extinct elsewhere
CRPR 1B: Plants rare, threatened, or endangered in California and elsewhere
CRPR 2A: Plants presumed extirpated in California, but common elsewhere
CRPR 2B: Plants rare, threatened, or endangered in California, but more common elsewhere
CRPR 4: Plants of limited distribution - a watch list

CRPR Threat Ranks:

0.1 - Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
0.2 - Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)
0.3 - Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

3.8.4 Special Status Plants Discussion

Based on an analysis of known ecological requirements for the special status plant species reported from the region (**Error! Reference source not found.**), and the habitat conditions that were observed in the Study Area, it was determined that five special status plant species have some potential to occur in the Study Area. One special status plant species has a high potential to occur (shining navarretia), one species has a moderate potential to occur (Santa Lucia dwarf rush), and three species have a low potential to occur (Lemmon's Jewelflower, small-flowered morning glory, hogwallow starfish). There are no federal or state listed plant species with potential to occur in the Study Area. A total of five special status species are discussed below, including descriptions of habitat, range restrictions, known occurrences, and 2019 survey results for the Property.

A. **Lemmon's Jewel-flower** (*Caulanthus lemmonii*) is a CRPR 1B.2 species endemic to California. It is known to occur on dry, exposed slopes in grassland and pinyon and juniper woodland habitats between 80 to 1580 meters elevation. It is an annual herb that typically blooms between February and May (CNPS 2019). The closest specimen record is from 1960 from an unknown location approximately 2 miles west of Paso Robles (CNDDB 83). There are no recent records documented within 10 miles of the Property (CCH 2019). The annual grassland habitat on moderately sloping terrain in the Study Area is potentially suitable for this species, however due the lack of recent record in the vicinity, this species has low potential to occur in the Study Area. Lemmon's jewel-flower was not detected in the Study Area during appropriately timed botanical surveys conducted in 2019.

B. **Small-flowered Morning-glory** (*Convolvulus simulans*) is a CRPR 4.2 species that is known from scattered localities from the eastern San Francisco Bay area south to San Diego. It occurs in valley grassland, coastal scrub and chaparral habitats with clay substrates or serpentine seeps (CNPS 2019). The closest specimen record to the Property is a collection from 1895 near Estrella Road, approximately 6.5 miles northeast of the Property (CCH 2019). There are no other records of this species in the Paso Robles vicinity. Moderately suitable annual grassland habitat and the clay soils are present in the Study Area. Small-flowered morning-glory was not detected in the Study Area during appropriately timed botanical surveys conducted in 2019.

C. **Hogwallow Starfish** (*Hesperevax caulescens*) is a CRPR 4.2 species endemic to California. It is known to occur on clay soils and mesic sites in grassland and vernal pool habitats from 0 to 505 meters elevation. It is an annual herb that typically blooms between March and June (CNPS 2019). The closest known record is from approximately 13.5 miles northwest of the Property (CCH 2019). The clay soils in the mesic grassland and wetland habitats are suitable for this species however the lack of a nearby record makes this species unlikely to occur in the Study Area. Hogwallow starfish was not detected in the Study Area during appropriately timed botanical surveys conducted in 2019.

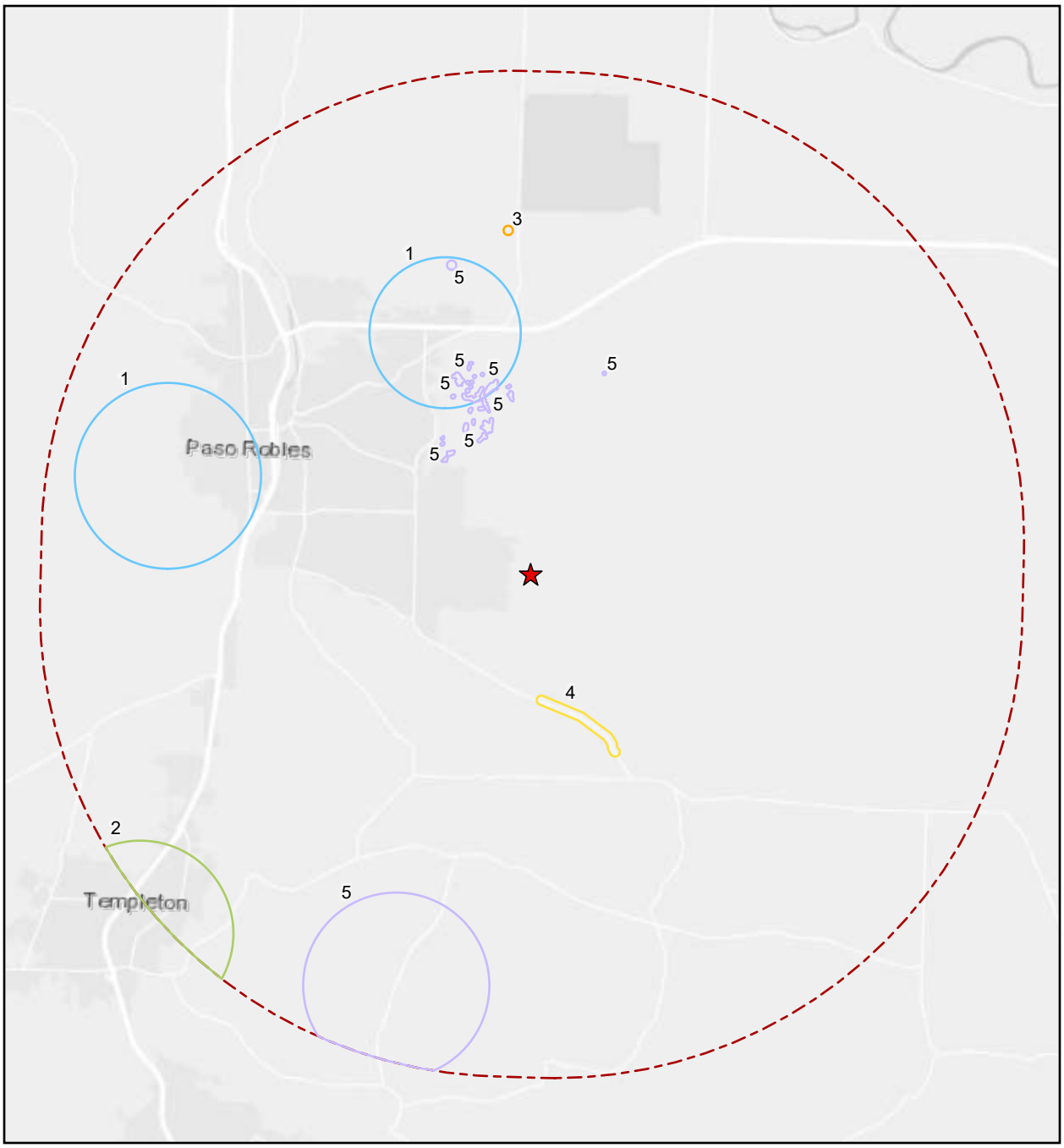
D. **Santa Lucia Dwarf Rush** (*Juncus luciensis)* is a CRPR 1B.2 species known from coastal counties extending from San Diego north to Monterey, and from scattered localities in northern California. It is a very small annual plant that grows in wet sandy soils in a variety of seasonally moist environments. It grows in dense clumps, with small leaves and branches arising from the base, and rarely exceeds two inches in height. The closest reported occurrence (CNDDB 8) was observed growing on damp grain fields approximately 0.9 miles south of the Property on Creston Road (CDFW 2019a). The suitable seasonal mesic habitats and the

proximity of a known occurrence of Santa Lucia dwarf rush indicates moderate potential for this species to occur in the Study Area. Santa Lucia dwarf rush was not detected in the Study Area during appropriately timed botanical surveys conducted in 2019.

E. **Shining Navarretia** (*Navarretia nigelliformis* subsp. *radians*) is a CRPR 1B.2 subspecies endemic to California, primarily occurring in central California. It is known to occur in vernal pools, grassland, and cismontane woodland habitats, often on clay and alkaline soils from 65 to 1,000 meters elevation (CNPS 2019; Jepson Flora Project (eds.) 2019). It is an annual herb that typically blooms between May and July. The closest reported occurrence is reported from approximately 0.8 mile northwest of the Property (CCH 2019) during floristic surveys conducted by Althouse and Meade, Inc. in 2005 on property that was formerly part of Chandler Ranch. Shining Navarretia has a high potential to occur in the Study Area. Shining navarretia was not detected in the Study Area during appropriately timed botanical surveys conducted in 2019.

Reso A - Exhibit C2 (EIR Technical Appendix)

Figure 4. CNDDB Plant Records and USFWS Critical Habitat



Label	CNDDB Record Common Name
1	Lemmon's jewelflower
2	Mesa horkelia
3	San Luis Obispo owl's-clover
4	Santa Lucia dwarf rush
5	Shining navarretia

Legend

Project Location

5 Mile Radius

No USFWS Critical Habitat for plants present within 5 mile radius.

N

0 0.5 1 2 Miles

Olsen Ranch
Map Center: 120.63666°W 35.60646°N
Paso Robles, San Luis Obispo County

CNDDB GIS Data Last Updated: April 2019

3.9 Wildlife Resources

Research on special status animal occurrences conducted within the designated search area (see Methods) determined 27 special status animal species are known to occur in the region (Appendix C). Appropriate habitat conditions are present in the Study Area for seven special status animals (Table 4). Figure 5 in Section 3.9.3 depicts the current GIS data for special status species and critical habitat mapped near the Property by the CNDDB and the United States Fish and Wildlife Service (USFWS).

3.9.1 CNDDB Definitions

"Special Animals" is a general term that refers to all of the animal taxa inventoried by the CNDDB, regardless of their legal or protection status (CDFW 2019b). The Special Animals list is also referred to by the California Department of Fish and Wildlife (CDFW) as the list of "species at risk" or "special status species." These taxa may be listed or proposed for listing under the California and/or Federal Endangered Species Acts, but they may also be species deemed biologically rare, restricted in range, declining in abundance, or otherwise vulnerable.

Animals listed as California Species of Special Concern (SSC) may or may not be listed under California or Federal Endangered Species Acts. They are considered rare or declining in abundance in California. The Special Concern designation is intended to provide the California Department of Fish and Wildlife, biologists, land planners and managers with lists of species that require special consideration during the planning process to avert continued population declines and potential costly listing under federal and state endangered species laws. For many species of birds, the primary emphasis is on the breeding population in California. For some species that do not breed in California but winter here, emphasis is on wintering range. The SSC designation thus may include a comment regarding the specific protection provided such as nesting or wintering.

Animals listed as Fully Protected are those species considered by CDFW as rare or faced with possible extinction. Most, but not all, have subsequently been listed under the California Endangered Species Act (CESA) or the Federal Endangered Species Act (FESA). Fully Protected species may not be taken or possessed at any time and no provision of the California Fish and Game code authorizes the issuance of permits or licenses to take any Fully Protected species.

3.9.2 Potential Special Status Animals List

Table 4 lists seven special status animal species that could potentially occur in the Study Area. Federal and California State status, global and State rank, and CDFW listing status for each species are given. Typical nesting or breeding period, habitat preference, potential habitat on site, whether the species was detected in the Study Area, and effect of proposed activity are also provided. A comprehensive list of special status animal species reviewed is included as Appendix C.

TABLE 4. SPECIAL STATUS ANIMAL LIST

	Common Name *Scientific Name*	Fed/State Status Global/State Rank CDFW Rank	Nesting-Breeding Period	Habitat Preference	Potential to Occur	Detected Within Study Area?	Effect of Proposed Activity
1.	**Pallid Bat** *Antrozous pallidus*	None/None G5/S3 SSC	Spring - Summer	Rock crevices, caves, tree hollows, mines, old buildings, and bridges.	Low. Low quality roosting habitat is present in the Study Area.	No	Potential Adverse Effect Can Be Mitigated
2.	**Vernal Pool Fairy Shrimp** *Branchinecta lynchi*	FT/None G3/S3 None	Rainy Season	Clear water sandstone depression pools, grassed swale, earth slump, or basalt flow depression pools.	Low. Appropriate habitat is not present in the Study Area.	No	To Be Determined by Dry Season Surveys in 2019
3.	**Townsend's Big-eared Bat** *Corynorhinus townsendii*	None/None G3G4/S2 SSC	Spring - Summer	Caves, buildings, and mine tunnels. Cave like attics as day roosts. On coast roosts are normally within 100 m. of creeks.	Low. Potentially suitable abandoned structures are present for roosting.	No	Potential Adverse Effect Can Be Mitigated
4.	**California Linderiella** *Linderiella occidentalis*	None/None G2G3/S2S3 SA	Rainy season	Seasonal pools in unplowed grasslands with old alluvial soils underlain by hardpan or in sandstone depressions.	Low. Appropriate habitat is not present in the Study Area.	No	No Effect
5.	**Western Spadefoot** *Spea hammondii*	None/None G3/S3 SSC	January - August	Vernal pools in grassland and woodland habitats	High. Appropriate habitat is present in the Study Area.	Yes	Potential Adverse Effect Can Be Mitigated

	Common Name *Scientific Name*	Fed/State Status Global/State Rank CDFW Rank	Nesting-Breeding Period	Habitat Preference	Potential to Occur	Detected Within Study Area?	Effect of Proposed Activity
6.	**American Badger** *Taxidea taxus*	None/None G5/S3 SSC	February -May	Needs friable soils in open ground with abundant food source such as California ground squirrels.	Moderate. Appropriate habitat is present in the Study Area.	No	Potential Adverse Effect Can Be Mitigated
7.	**San Joaquin Kit Fox** *Vulpes macrotis mutica*	FE/CT G4T2/S2 None	December - July	Annual grasslands or grassy open stages with scattered shrubby vegetation. Needs loose textured sandy soil and prey base.	Low. Appropriate habitat is present in the Study Area, but kit fox is not known to occur in the Paso Robles area at this time.	No	Potential Adverse Effect Can Be Mitigated

Habitat characteristics are from the Jepson Manual and the CDNNB.
*not listed in the CNDDB for the search area, but possibly for the location.

Abbreviations:

FE: Federally Endangered
FT: Federally Threatened
PE: Proposed Federally Endangered
PT: Proposed Federally Threatened
CE: California Endangered
CT: California Threatened
Cand. CE: Candidate for California Endangered
Cand. CT: Candidate for California Threatened
SSC: CDFW Species of Special Concern
FP: CDFW Fully Protected

3.9.3 Special Status Animals Discussion

Seven special status animals have potential to occur in the Study Area based on an analysis of known ecological requirements and the habitat conditions that were observed in the Study Area. We discuss the species and describe habitat, range restrictions, known occurrences, and survey results.

A. Pallid Bat (*Antrozous pallidus*) is a California Species of Special Concern. The pallid bat is a large long-eared bat that occurs throughout the state and occupies a wide variety of habitats. Although most common in open, dry areas ideal for foraging with rocky outcrops for roosting, pallid bats are also found regularly in oak and pine woodlands where they roost in caves, mines, rock crevices, hollow trees and buildings (Nowak et al. 1994). Bridges are also frequently used by pallid bats, often as night roosts between foraging periods (Pierson et al. 1996). The closest CNDDB occurrence of the pallid bat is a 2001 record approximately 10.6 miles north of the Property under River Road bridge in San Miguel (CNDDB 104). Due to the presence of residential structures for roosting and of sparsely vegetated habitats suitable for foraging, there is potential for this species to occur in the Study Area.

B. Vernal Pool Fairy Shrimp (*Branchinecta lynchi*) is a small freshwater crustacean that is federally listed as threatened. The species is endemic to California and southern Oregon and has an ephemeral life cycle, existing only in vernal pools or vernal pool-like habitats. The vernal pool fairy shrimp occurs only in cool-water pools. Individuals hatch from cysts during cold-weather winter storms; they require water temperatures of 50 °F or lower to hatch (Helm 1998; Eriksen and Belk 1999). The time to maturity and reproduction is temperature dependent, varying between 18 days and 147 days, with a mean of 39.7 days and immature and adult shrimp are known to die off when water temperatures rise to approximately 75°F (Helm 1998). The species is typically associated with smaller and shallower vernal pools (typically about 6 inches deep) that have relatively short periods of inundation (Helm 1998) and relatively low to moderate total dissolved solids (TDS) and alkalinity (Eriksen and Belk 1999). The nearest reported occurrence is a 1992 record approximately 2.7 miles northeast of the Study Area in a vernal pool complex south of Highway 46 (CNDDB 287). The next nearest occurrence is a 2005 record approximately 3 miles west of the Study Area, 1.3 miles northeast of the intersection of Niblick Road and Spring Street, west of Highway 101 in Paso Robles (CNDDB 621). Protocol surveys for rare branchiopods are in process for the Olsen property. Initial results have been negative for listed branchiopods, including *B. lynchii*. A complete report will be provided upon completion of the dry season survey portion of the protocol in summer 2019. Considering the above-average rainfall during the study period, it is unlikely that rare branchiopods occur in the Study Area as they were not detected in the wet season survey.

C. Townsend's Big-eared Bat (*Corynorhinus townsendii*) is a California Species of Special Concern. Townsend's big-eared bat is medium sized with large rabbit-like ears. In San Luis Obispo County Townsend's big-eared bat is consistently found in the vicinity of creek beds where they use the riparian corridors for foraging. Typical roost sites include caves or buildings with cave-like features. Townsend's big-eared bat is sedentary and presumed to spend the winter within 25 miles of its summer roosts. The nearest reported occurrence of this species is at Camp Roberts, where multiple individuals were observed roosting in buildings on

Michigan Avenue, approximately 12.3 miles northwest of the Property. Townsend's big-eared bat could possibly roost in structures in the Study Area, but the potential is expected to be low. Townsend's big-eared bat was not observed on the Study Area during site surveys.

D. California Linderiella (*Linderiella occidentalis*) is neither federally nor state listed but holds a Global Rank of G2G3 and a State Rank of S2S3 (NatureServe 2018). Both the global and state ranks for this species indicate that it is uncertain whether it should be considered either Imperiled (G2/S2) or Vulnerable (G3/S3) though NatureServe rounds its global status to G2. The reasoning for this ranking is that while it is not as restricted in range as some of the other California fairy shrimp, it is not considered abundant at any site, and its habitat continues to be threatened by urban and agricultural development (USFWS 1992). Its distribution ranges from Shasta County south to Fresno County, across the Central Valley, and the Coast and Transverse Ranges from Willits in Mendocino County south to near Sulfur Mountain in Ventura County. This species inhabits small, seasonal vernal pools in unplowed grasslands with old alluvial soils underlain by hardpan or in sandstone depressions, throughout central California. The closest reported occurrence of California linderiella is a 2003 record Santa Margarita Ranch approximately 12.8 miles south of the Property (CNDDB 218). Protocol surveys for rare branchiopods are in process for the Olsen property. Initial results have been negative for *L. occidentalis*, and any rare branchiopod. A complete report will be provided upon completion of the dry season survey portion of the protocol. Considering the above-average rainfall during the study period, it is unlikely that rare branchiopods occur in the Study Area and were not detected in the wet season survey.

E. Western Spadefoot Toad (*Spea hammondii*) is a California Species of Special Concern known from ephemeral pools in open grassland habitats across the interior region of San Luis Obispo County. Spadefoot toads remain underground for most of the year, emerging to breed in seasonal wetland pools during the rainy season. Development of the larvae from egg to metamorphosis can be very quick, depending upon water temperature. Spadefoot toad was documented breeding in the stock pond in the Study Area in 2004 (CNDDB 333). Spadefoot toads were not detected in 2019.

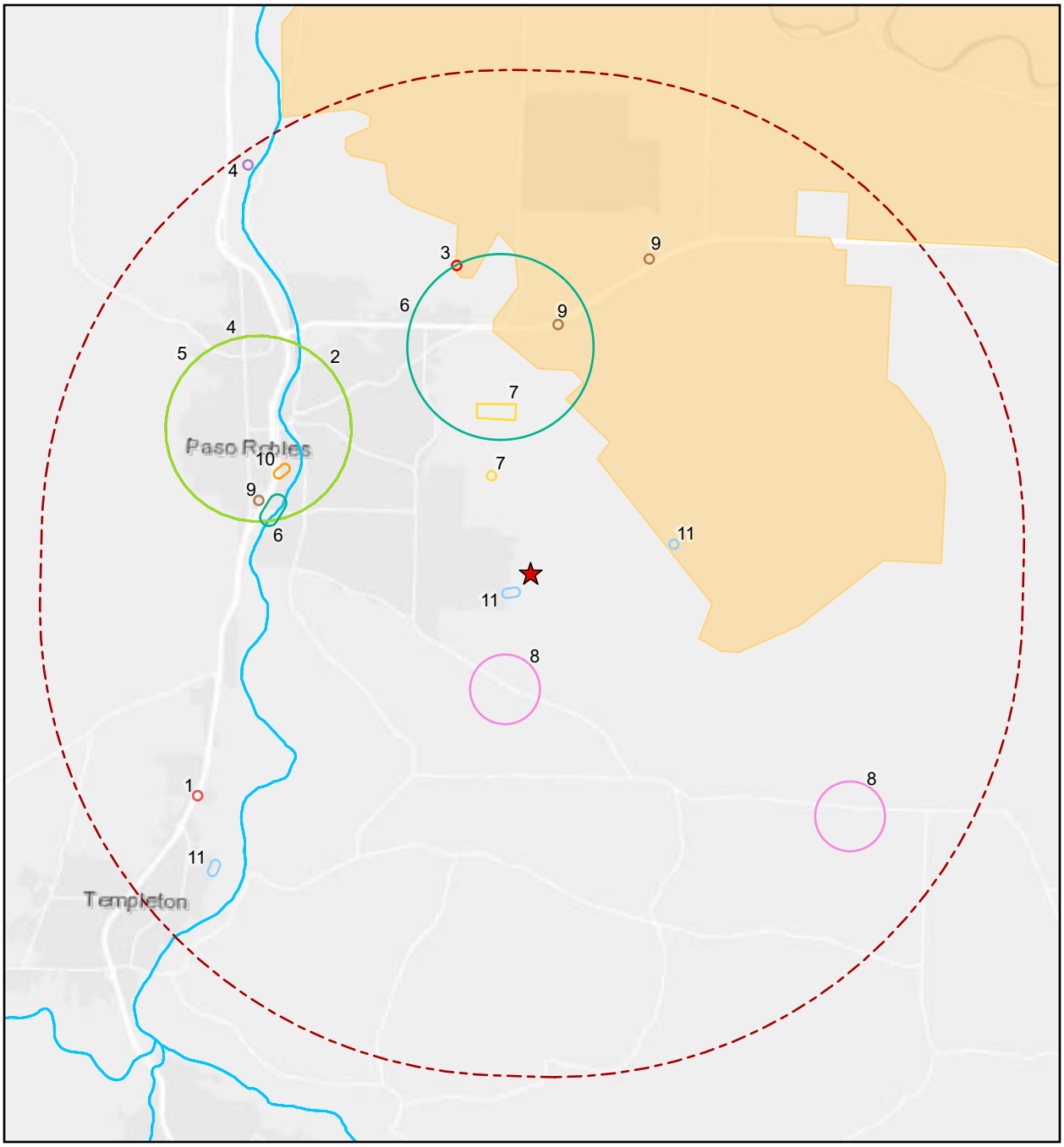
F. American Badger (*Taxidea taxus*) is a California Species of Special Concern that has a widespread range across California (CDFW 2014; Brehme et al. 2015). It is a permanent but uncommon resident in all parts of California, except for forested region of the far northwestern corner, and is more abundant in dry, open areas of most shrub and forest habitats (CDFW 2019). The American badger requires friable soil in order to dig burrows for cover and breeding. The main food source for the American badger is fossorial rodents, mainly ground squirrels and pocket gophers (CDFW 2014). The breeding season is in summer and early fall and females give birth to litters usually in March and April (CDFW 2014). The closest reported occurrence of the American badger is located approximately four miles southwest of the Study Area (CNDDB 23). There is potential habitat for American badger in the Study Area, however it is unlikely to occur due to the proximity to urban development and intensive agriculture. Transect den surveys of the entire Study Area did not detect badgers or their sign.

G. San Joaquin Kit Fox (*Vulpes macrotis mutica)* is a federally listed endangered species and a state listed threatened species. They are known from the Carrizo Plain and Camp Roberts, with transient individuals reported to move between the two populations. Huerhuero Creek, located approximately one mile east of Olsen Ranch, is one of the known movement corridors for kit fox. The two nearest reported occurrences are less than a mile north of the Property

near Barney Schwarz Park. One record is from 1990 and is 0.25 miles north (CNDDB 945), and the other is from 1991 and is 0.9 miles north (CNDDB 941). There is potentially suitable grassland habitat for San Joaquin kit fox in the Study Area, however kit foxes are not currently known to occupy lands in the Paso Robles region and are not expected to be onsite.

Reso A - Exhibit C2 (EIR Technical Appendix)

Figure 5. CNDDB Animal Records and USFWS Critical Habitat



Label	CNDDB Record Common Name
1	American badger
2	Atascadero June beetle
3	Golden eagle
4	Least Bell's vireo
5	Lompoc grasshopper
6	Northern California legless lizard
7	San Joaquin kit fox
8	Tricolored blackbird
9	Vernal pool fairy shrimp
10	Western pond turtle
11	Western spadefoot

Legend

- Project Location
- 5 Mile Radius

USFWS Critical Habitat for Animals

- Steelhead
- Vernal Pool Fairy Shrimp

N

0 0.5 1 2 Miles

Olsen Ranch
Map Center: 120.63666°W 35.60646°N
Paso Robles, San Luis Obispo County

CNDDB GIS Data Last Updated: April 2019

3.10 Botanical Survey Results

Botanical surveys conducted in the Study Area identified 134 species, subspecies, and varieties of vascular plant taxa in the Study Area (**Error! Reference source not found.**). The list includes 61 species native to California and 73 introduced (naturalized or planted) species. Native plant species account for approximately 46 percent of the Study Area flora; introduced species account for approximately 54 percent. No special status plant species were identified in the Study Area. One introduced species, *Trifolium tomentosum*, is a first record of this species in San Luis Obispo County (D. Keil, pers. comm).

TABLE 5. VASCULAR PLANT LIST

Common Name	Scientific Name	Special Status	Origin
Trees - 7 Species			
Tree tobacco	*Nicotiana glauca*	None	Introduced
Fremont cottonwood	*Populus fremontii* ssp. *fremontii*	None	Native
Almond	*Prunus dulcis*	None	Planted
Blue oak	*Quercus douglasii*	None	Native
Oak hybrid	*Quercus douglasii* x *lobata*	None	Native
Valley oak	*Quercus lobata*	None	Native
Red willow	*Salix laevigata*	None	Native
Shrubs – 2 Species			
Coyote brush	*Baccharis pilularis*	None	Native
Big leaf mistletoe	*Phoradendron leucarpum* ssp. *macrophyllum*	None	Native
Forbs – 111 Species			
Blow wives	*Achyrachaena mollis*	None	Native
Spanish clover	*Acmispon americanus* var. *americanus*	None	Native
Short podded lotus	*Acmispon brachycarpus*	None	Native
Tumbleweed amaranth	*Amaranthus albus*	None	Introduced
Mat amaranth	*Amaranthus blitoides*	None	Native
Western ragweed	*Ambrosia psilostachya*	None	Native
Common fiddleneck	*Amsinckia intermedia*	None	Native
Fiddleneck	*Amsinckia lycopsoides*	None	Native
Mayweed	*Anthemis cotula*	None	Introduced
Indian milkweed	*Asclepias eriocarpa*	None	Native
Narrow-leaved milk	*Asclepias fascicularis*	None	Native
Garden asparagus	*Asparagus officinalis*	None	Introduced
Australian saltbush	*Atriplex semibaccata*	None	Introduced
Black mustard	*Brassica nigra*	None	Introduced

Common Name	Scientific Name	Special Status	Origin
Dwarf brodiaea	*Brodiaea terrestris*	None	Native
Red maids	*Calandrinia menziesii*	None	Native
Bolander's water starwort	*Callitriche heterophylla* var. *bolanderi*	None	Native
Shepherd's purse	*Capsella bursa-pastoris*	None	Introduced
Italian thistle	*Carduus pycnocephalus*	None	Introduced
Slender owl's clover	*Castilleja attenuata*	None	Native
Purple owl's clover	*Castilleja exserta*	None	Native
Tocolote	*Centaurea melitensis*	None	Introduced
Yellow star thistle	*Centaurea solstitialis*	None	Introduced
Fitch's tarweed	*Centromadia fitchii*	None	Native
Lamb's-quarters	*Chenopodium album*	None	Introduced
Skeleton weed	*Chondrilla juncea*	None	Introduced
Fairy fan	*Clarkia affinis*	None	Native
Four spot	*Clarkia purpurea* subsp. *quadrivulnera*	None	Native
Clarkia	*Clarkia unguiculata*	None	Native
Miner's lettuce	*Claytonia perfoliata*	None	Native
Bindweed	*Convolvulus arvensis*	None	Introduced
Pygmyweed	*Crassula connata*	None	Native
Doveweed	*Croton setiger*	None	Native
Jimsonweed	*Datura wrightii*	None	Native
Salinas tarplant	*Deinandra pentactis*	None	Native
Tansy mustard	*Descurainia sophia*	None	Introduced
Annual willow-herb	*Epilobium brachycarpum*	None	Native
Asthma weed	*Erigeron bonariensis*	None	Introduced
Common horseweed	*Erigeron canadensis*	None	Native
Longbeak storksbill	*Erodium botrys*	None	Introduced
Foothill filaree	*Erodium brachycarpum*	None	Introduced
Redstem filaree	*Erodium cicutarium*	None	Introduced
California poppy	*Eschscholzia californica*	None	Native
Spotted spurge	*Euphorbia maculata*	None	Introduced
Common bedstraw	*Galium aparine*	None	Native
Wall bedstraw	*Galium parisiense*	None	Introduced
Lotus sweetjuice	*Glinus lotoides*	None	Introduced
Seaside heliotrope	*Heliotropium curassavicum* var. *oculatum*	None	Native
Bristly ox tongue	*Helminthotheca echioides*	None	Introduced

Common Name	Scientific Name	Special Status	Origin
Field mustard	*Hirschfeldia incana*	None	Introduced
Smooth cat's ear	*Hypochaeris glabra*	None	Introduced
Rough cat's-ear	*Hypochaeris radicata*	None	Introduced
Prickly lettuce	*Lactuca serriola*	None	Introduced
Slender hareleaf	*Lagophylla ramosissima*	None	Native
Henbit	*Lamium amplexicaule*	None	Introduced
Perennial pepperweed	*Lepidium latifolium*	None	Introduced
Pepperwort	*Lepidium nitidum*	None	Native
Narrowleaf cottonrose	*Logfia gallica*	None	Introduced
Birdfoot trefoil	*Lotus corniculatus*	None	Introduced
Miniature lupine	*Lupinus bicolor*	None	Native
Chick lupine	*Lupinus microcarpus*	None	Native
Sky blue lupine	*Lupinus nanus*	None	Native
Arroyo lupine	*Lupinus succulentus*	None	Native
Scarlet pimpernel	*Lysimachia arvensis*	None	Introduced
Hyssop loosestrife	*Lythrum hyssopifolia*	None	Introduced
Bull mallow	*Malva nicaeensis*	None	Introduced
Cheeseweed	*Malva parviflora*	None	Introduced
Horehound	*Marrubium vulgare*	None	Introduced
Pineapple weed	*Matricaria discoidea*	None	Introduced
California burclover	*Medicago polymorpha*	None	Introduced
Douglas' Microseris	*Microseris douglasii*	None	Native
Annual sweetclover	*Melilotus indicus*	None	Introduced
Slender cottonweed	*Micropus californicus*	None	Native
Douglas' microseris	*Microseris douglasii*	None	Native
Adobe popcornflower	*Plagiobothrys acanthocarpus*	None	Native
Valley popcornflower	*Plagiobothrys canescens* var. *canescens*	None	Native
English plantain	*Plantago lanceolata*	None	Introduced
Common knotweed	*Polygonum aviculare*	None	Introduced
Jersey cudweed	*Pseudognaphalium luteoalbum*	None	Introduced
Wright's cudweed	*Pseudognaphalium microcephalum*	None	Native
Woolly marbles	*Psilocarphus tenellus*	None	Native
Curly dock	*Rumex crispus*	None	Introduced
Russian thistle	*Salsola tragus*	None	Introduced
Common groundsel	*Senecio vulgaris*	None	Introduced

Common Name	Scientific Name	Special Status	Origin
Catchfly	*Silene gallica*	None	Introduced
Milk thistle	*Silybum marianum*	None	Introduced
Prickly sow-thistle	*Sonchus asper* subsp. *Asper*	None	Introduced
Common sow thistle	*Sonchus oleraceus*	None	Introduced
Stickwort	*Spergula arvensis*	None	Introduced
Red sand spurrey	*Spergularia rubra*	None	Introduced
Chickweed	*Stellaria media*	None	Introduced
White plume wirelettuce	*Stephanomeria exigua* subsp. *coronaria*	None	Native
Common fringe pod	*Thysanocarpus curvipes*	None	Native
Puncture vine	*Tribulus terrestris*	None	Introduced
Vinegar weed	*Trichostema lanceolatum*	None	Native
Rose clover	*Trifolium hirtum*	None	Introduced
Hairy clover	*Trifolium microcephalum*	None	Native
Woolly clover	*Trifolium tomentosum*	None	Introduced
Purslane speedwell	*Veronica peregrina* subsp. *xalapensis*	None	Native
Common vetch	*Vicia sativa*	None	Introduced
Winter vetch	*Vicia villosa*	None	Introduced
Cocklebur	*Xanthium strumarium*	None	Native
Graminoids - 23 Species			
Slender wild oat	*Avena barbata*	None	Introduced
Wild oat	*Avena fatua*	None	Introduced
Ripgut brome	*Bromus diandrus*	None	Introduced
Soft chess brome	*Bromus hordeaceus*	None	Introduced
Red top brome	*Bromus madritensis* subsp. *rubens*	None	Introduced
Bermuda grass	*Cynodon dactylon*	None	Introduced
Umbrella sedge	*Cyperus eragrostis*	None	Native
Saltgrass	*Distichlis spicata*	None	Native
Barnyard grass	*Echinochloa crus-galli*	None	Introduced
Pale spikerush	*Eleocharis macrostachya*	None	Native
Medusahead	*Elymus caput-medusae*	None	Introduced
Creeping wild rye	*Elymus triticoides*	None	Native
Rattail sixweeks grass	*Festuca myuros*	None	Introduced
Italian rye grass	*Festuca perennis*	None	Introduced
Seaside barley	*Hordeum marinum* subsp. *gussoneanum*	None	Introduced
Foxtail barley	*Hordeum murinum*	None	Introduced
Barley	*Hordeum vulgare*	None	Introduced

Common Name	Scientific Name	Special Status	Origin
Toadrush	*Juncus bufonius*	None	Native
Mexican rush	*Juncus mexicanus*	None	Native
Hood canarygrass	*Phalaris paradoxa*	None	Introduced
Annual bluegrass	*Poa annua*	None	Introduced
Annual beardgrass	*Polypogon monspeliensis*	None	Introduced
Needlegrass	*Stipa pulchra*	None	Native

3.11 Wildlife Survey Results

At least 86 animal species are listed that could potentially occur in the Study Area (Table 6). These include at least 3 amphibians, 9 reptiles, 50 birds, and 24 mammals. We provide this list as a guide to the wildlife observed in the Study Area and to the species that could potentially be present at least seasonally. Other species could occur as transients, particularly avian fauna. Species observed at the site during our surveys are designated by the check symbol (✓) in the fourth column.

TABLE 6. WILDLIFE LIST

Common Name	Scientific Name	Special Status	Found On-site?	Habitat Type
Amphibians – 3 Species				
California (Western) Toad	*Anaxyrus boreas halophilus*	None	✓	Grassland, woodland
Sierran Treefrog	*Pseudacris sierra*	None	✓	Many habitats near water
Western Spadefoot Toad	*Spea hammondii*	SSC	✓ 2004	Grassland habitat with seasonal pools
Reptiles – 9 Species				
Northern California Legless Lizard	*Anniella pulchra*	SSC		Sandy soils and leaf litter
Western Yellow-bellied Racer	*Coluber constrictor mormon*	None		Grasslands, open areas
Monterey Ringneck Snake	*Diadophis punctatus vandenburgii*	None		Woodlands, grasslands, chaparral
California Alligator Lizard	*Elgaria multicarinata webbii*	None		Open grassland, woodland, chaparral
California Kingsnake	*Lampropeltis californiae*	None	✓	Woodland, grassland, streams
Pacific Gopher Snake	*Pituophis catenifer catenifer*	None		Woodland, grassland, rural
Skilton's Skink	*Plestiodon skiltonianus skiltonianus*	None		Woodland, grassland, chaparral, inland and coastal
Coast Range Fence Lizard	*Sceloporus occidentalis bocourtii*	None	✓	Wide range; variety of habitats

Common Name	Scientific Name	Special Status	Found On-site?	Habitat Type
Western Side-blotched Lizard	*Uta stansburiana elegans*	None	✓	Wide range; variety of habitats
Birds – 50 Species				
Red-winged Blackbird	*Agelaius phoeniceus*	None	✓	Marshes, fields
American Pipit	*Anthus rubescens*		✓	Open habitat agricultural fields (in stubble or plowed)
California Scrub-jay	*Aphelocoma californica*	None	✓	Oak, riparian woodlands
Burrowing Owl	*Athene cunicularia*	SSC		Grasslands with ground squirrel burrows
Oak Titmouse	*Baeolophus inornatus*	Special Animal	✓	Open Woodlands
Red-tailed Hawk	*Buteo jamaicensis*	None	✓	Open, semi-open country
California Quail	*Callipepla californica*	None		Shrubby habitats
Anna's Hummingbird	*Calypte anna*	None	✓	Many habitats
Turkey Vulture	*Cathartes aura*	None	✓	Open country
Lark Sparrow	*Chondestes grammacus*	None	✓	Grasslands
Northern Flicker	*Colaptes auratus*	None	✓	Open Woodlands
Rock Pigeon	*Columba livia*	None	✓	Urban areas
American Crow	*Corvus brachyrhynchos*	None	✓	Many habitats, esp. urban
Common Raven	*Corvus corax*	None	✓	Many habitats, esp. urban
Brewer's Blackbird	*Euphagus cyanocephalus*	None	✓	Open habitats
American Kestrel	*Falco sparverius*	None	✓	Open, semi-open country
Greater Roadrunner	*Geococcyx californianus*	None		Open habitats
House Finch	*Haemorhous mexicanus*	None	✓	Many habitats, esp. urban
Barn Swallow	*Hirundo rustica*	None		Riparian, grasslands, lakes
Acorn woodpecker	*Melanerpes formicivorus*	None	✓	Open woodlands
California Towhee	*Melozone crissalis*	None	✓	Scrub habitats
Northern Mockingbird	*Mimus polyglottos*	None	✓	Mixed habitats, urban
Brown-headed Cowbird	*Molothrus ater*	None		Grasslands, ranches
House Sparrow	*Passer domesticus*	None	✓	Urban
Savannah Sparrow	*Passerculus sandwichensis*	None	✓	Grasslands
Cliff Swallow	*Petrochelidon pyrrhonota*	None		Urban; open areas near water
Nuttall's Woodpecker	*Picoides nuttallii*	None	✓	Open woodland
Spotted Towhee	*Pipilo maculatus*	None		Dense brushy areas
Bushtit	*Psaltriparus minimus*	None		Woodlands, chaparral
Ruby-crowned Kinglet	*Regulus calendula*	None	✓	Forests
Black Phoebe	*Sayornis nigricans*	None	✓	Near water in natural and urban settings

Common Name	Scientific Name	Special Status	Found On-site?	Habitat Type
Say's Phoebe	*Sayornis saya*	None	✓	Open country, grassland
Yellow-rumped Warbler	*Setophaga coronata*	None	✓	Coniferous and mixed woodland (breeding)
Yellow Warbler	*Setophaga petechia*	SSC	✓	Riparian woodland
Western Bluebird	*Sialia mexicana*	None	✓	Woodland near open areas
Lawrence's Goldfinch	*Spinus lawrencei*	None	✓	Open Woodland
Lesser Goldfinch	*Spinus psaltria*	None	✓	Open Woodland
American Goldfinch	*Spinus tristis*	None		Weedy fields, woodlands
Eurasian Collared-Dove	*Streptopelia decaocto*	None	✓	Urban areas
Western Meadowlark	*Sturnella neglecta*	None	✓	Open habitats, grasslands
European Starling	*Sturnus vulgaris*	None	✓	Agricultural, livestock areas
Bewick's Wren	*Thryomanes bewickii*	None		Riparian woodland, scrub
California Thrasher	*Toxostoma redivivum*	None	✓	Chaparral, suburban areas
House Wren	*Troglodytes aedon*	None		Shrubby areas
American Robin	*Turdus migratorius*	None		Streamsides, woodlands, urban parks
Western Kingbird	*Tyrannus verticalis*	None	✓	Grasslands, savannah
Cassin's Kingbird	*Tyrannus vociferans*	None	✓	Open and semi-open areas
Barn Owl	*Tyto alba*	None	✓	Agricultural, woodlands
Mourning Dove	*Zenaida macroura*	None	✓	Open and semi-open habitats
White-crowned sparrow	*Zonotrichia leucophrys*	None	✓	Open and shrubby habitats
Mammals – 24 Species				
Pallid Bat	*Antrozous pallidus*	SSC		Riparian, woodland, urban
Coyote	*Canis latrans*	None	✓	Open woodlands, brushy areas, wide ranging.
Townsend's Big-eared Bat	*Corynorhinus townsendii*	SSC		Arid western desert scrub and pine forest regions
Virginia Opossum	*Didelphis virginiana*	None		Woodlands, streams
Feral Cat	*Felis catus*	None	✓	Varied
Black-tailed Jackrabbit	*Lepus californicus*	None		Grasslands
Striped Skunk	*Mephitis mephitis*	None	✓	Mixed woods, brush, semi-open country
California Vole	*Microtus californicus*	None		Grassland meadows
Long-tailed Weasel	*Mustela frenata*	None		Grasslands
California Myotis	*Myotis californicus*	None		Tunnels, hollow trees, buildings, bridges.
Mule Deer	*Odocoileus hemionus*	None	✓	Many habitats
California Ground Squirrel	*Otospermophilus beecheyi*	None	✓	Grasslands

Common Name	Scientific Name	Special Status	Found On-site?	Habitat Type
Deer Mouse	*Peromyscus maniculatus*	None		All dry land habitats
Raccoon	*Procyon lotor*	None		Urban and wildlands
Western Harvest Mouse	*Reithrodontomys megalotis*	None		Grassland, dense vegetation near water
Desert Cottontail	*Sylvilagus audubonii*	None	✓	Brushy habitats
Brush Rabbit	*Sylvilagus bachmani*	None		Brushy habitats
Mexican Free-tailed Bat	*Tadarida brasiliensis*	None		Variety of habitats; roosts in bridges, buildings, caves
American Badger	*Taxidea taxus*	SSC		Open country
Valley Pocket Gopher	*Thomomys bottae*	None	✓	Variety of habitats
San Joaquin Kit Fox	*Vulpes macrotis mutica*	FE, ST		Open grasslands, scrub
Red Fox	*Vulpes vulpes*	None	✓	Variety of habitats

FT = Federally Threatened; FE = Federally Endangered; ST = State Threatened; SSC = Species of Special Concern

4 POTENTIAL IMPACTS TO BIOLOGICAL RESOURCES

The proposed Project is a residential development that would occupy approximately 188 acres of the 254-acre Olsen Ranch. The project is in the design phase at the time of this writing, but preliminary site plans were provided in digital format by Wallace Group for overlay on biological resources (refer to Figure 6). Primary development areas for the residential lots would occupy grassland and cropland habitats. All existing residences would be removed. Three access roads would cross the unnamed drainage at the north end of the site. Open space areas are proposed along the riparian corridor, and in grassland and cropland areas associated with the transmission line corridor.

4.1 Habitat Impacts

The proposed project is anticipated to affect approximately 188 acres of the 254-acre Study Area and would affect portions of all habitat types mapped on site. Table 7 shows the breakdown of habitat impacts based on the preliminary site plan layout.

TABLE 7. POTENTIAL HABITAT IMPACTS

Habitat Type	Permanent Impact Acres
Anthropogenic	5.55
California Annual Grassland	64.92
Cropland	116.73
Riparian	0.18
Wetlands	0.12
Non-Wetland Waters	0.44

4.1.1 California Annual Grassland

Approximately 64.9 acres of annual grassland could be permanently impacted by the Project. The grassland is a fairly disturbed habitat dominated by non-native species, but may provide foraging habitat for songbirds, raptors, and small to medium sized mammals. Development of this habitat would impact 10 oak trees, remove 12 oak trees, and remove three willows from near the stockpond. Twenty-six oaks would be avoided in this habitat type. This is not a sensitive habitat type and does not require mitigation except where it affects special status species such as San Joaquin kit fox, or oak trees (see Section 5.4).

TABLE 8. POTENTIAL OAK AND RIPARIAN TREE IMPACTS IN GRASSLAND

Tree Species	Remain	Impacted	Removed	Total
Blue Oak	14	5	7	**26**
Oak sp.	5	3	2	**10**
Red Willow	0	0	3	**3**
Valley Oak	7	2	3	**12**
Total	**26**	**10**	**15**	**51**

4.1.2 Anthropogenic

Three residences and their associated barns, outbuildings, ranch facilities, and ruderal surroundings would be removed. Anthropogenic habitats are not sensitive habitat types and do not require mitigation. No special status species are expected to be affected by removal of anthropogenic areas of the Olsen Ranch. The permanent impact of this habitat includes the impact of three oaks, removal of 17 oaks, and removal of one Fremont cottonwood. Two blue oaks would be avoided.

TABLE 9. POTENTIAL OAK AND RIPARIAN TREE IMPACTS IN ANTHROPOGENIC HABITAT

Tree Species	Remain	Impacted	Removed	Total
Blue Oak	2	1	14	**17**
Fremont Cottonwood	0	0	1	**1**
Valley Oak	0	2	3	**5**
Total	**2**	**3**	**18**	**23**

4.1.3 Riparian

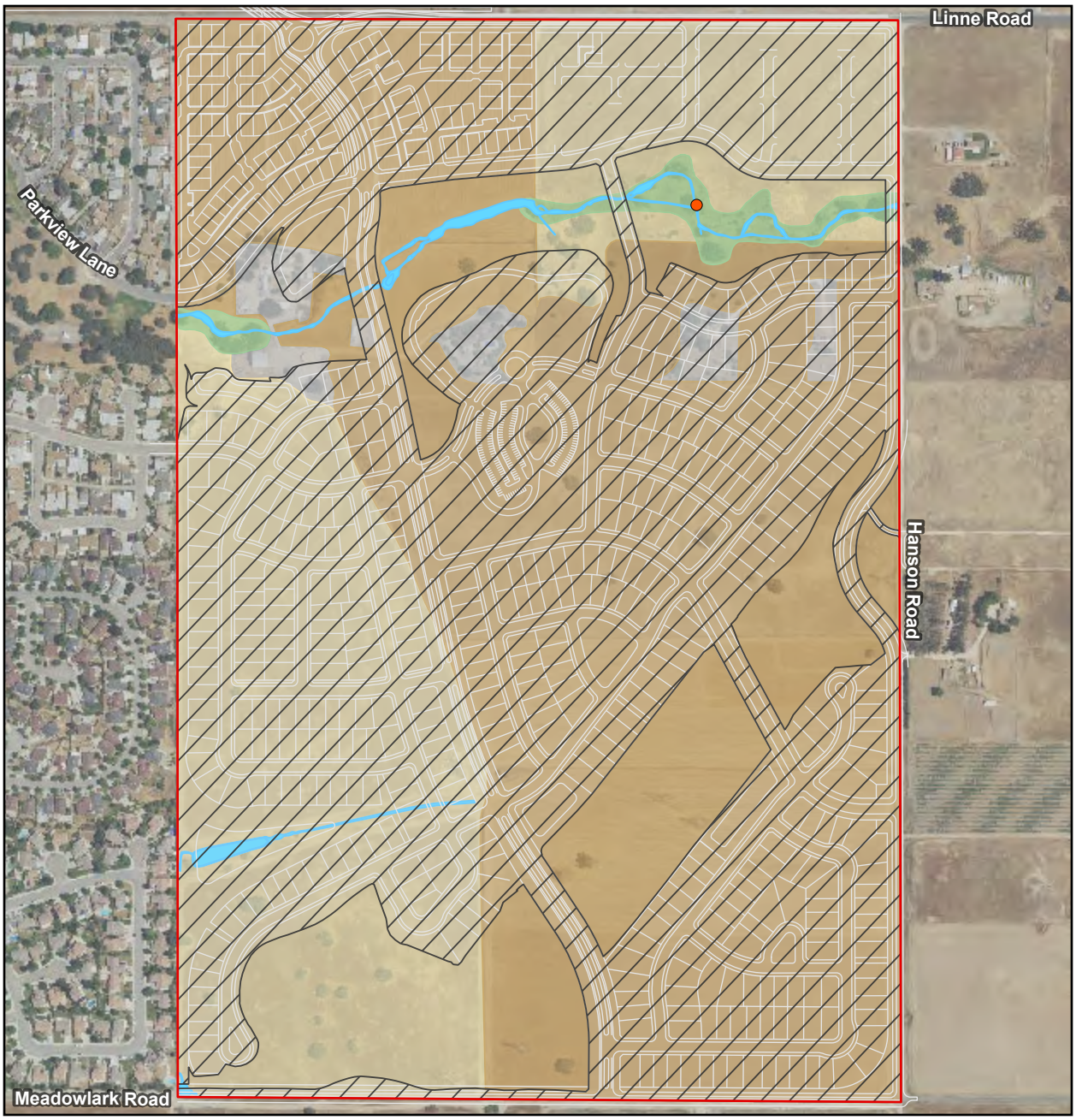
Approximately 0.18 acre of riparian habitat could be permanently impacted by the Project. The Project was designed to avoid and protect 95 percent of the riparian/oak woodland habitat. The only impacts to the riparian habitat will occur from two road crossings and the widening of Hansen Road on the eastern edge of the Property. Impacts to this habitat include the impact of seven oaks and removal of 11 oaks. Sixty-four oaks and five Fremont cottonwoods will be avoided within the riparian area.

TABLE 10. POTENTIAL OAK AND RIPARIAN TREE IMPACTS IN RIPARIAN HABITAT

Tree Species	Remain	Impacted	Removed	Total
Blue Oak	5	0	0	**5**
Fremont Cottonwood	5	0	0	**5**
Red Willow	1	0	0	**1**
Valley Oak	59	7	11	**77**
Total	**70**	**7**	**11**	**88**

Reso A - Exhibit C2 (EIR Technical Appendix)

Figure 6. Proposed Impacts to Biological Resources



Legend

Habitat Type*

- Anthropogenic (7.5 acres; 5.6 acres impacted)
- California Annual Grassland (82.1 acres; 64.9 acres impacted)
- Cropland (147.3 acres; 116.7 acres impacted)
- Riparian (4.0 acres; 0.2 acres impacted)

- Inactive Raptor Nest
- Site Plans
- Proposed Impact Area (188.0 acres)
- Wetlands and Waters (1.5 acres)
- Olsen Ranch Boundary (254.1 acres)

N

0 300 600 Feet

*Reported areas are approximations and may not total to acreages reported in legal land description.

Olsen Ranch
Map Center: 120.63666°W 35.60646°N
Paso Robles, San Luis Obispo County

Biological Survey Date: 10/16/2018

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BIOLOGICAL AND ENVIRONMENTAL SERVICES

Map Updated:
May 22, 2019 10:09 AM by JBB

4.2 Wetlands and Jurisdictional Waters

Up to 0.12 acre of wetland and up to 944 feet of potentially jurisdictional non-wetland waters could be permanently impacted by the Project. These impacts would occur in the northern drainage through two road crossings and Hanson Road widening, in the central drainage through housing development, and in the southwest corner wetland through housing development and Meadowlark Road widening. The jurisdictional status of wetlands and waters in the Study Area has not yet been formerly determined by agencies. Mitigation recommendations are provided if impacts are proposed to wetlands and waters on the site (see Section 5.2).

4.3 Oak Trees

The Project has the potential to remove 49 oak trees and impact an additional 24 oak trees while retaining 99 oaks (refer to Figure 7). Mitigation recommendations are provided for oak trees (refer to Section 5.4.7).

TABLE 11. OAK TREE IMPACTS

Tree Species	Remain	Impacted	Removed	Total
Blue Oak	22	8	28	**58**
Valley Oak	71	13	19	**103**
Oak sp.	6	3	2	**11**
Total	**99**	**24**	**49**	**172**

4.4 Nesting Birds

Vegetation removal and construction activities associated with the proposed Project could result in adverse impacts to nesting birds if conducted during nesting season (March 15 through August 15). The potential for impacts to nesting birds can be reduced (refer to Section 5.4).

4.5 Special Status Species

4.5.1 Special Status Plants

Special status plants were not detected in the Study Area during appropriately timed botanical surveys in spring 2019. The proposed Project would not affect special status plants, and no further surveys are recommended.

4.5.2 Special Status Birds

Special status birds were not detected in the Study Area. The proposed Project is not expected to affect special status birds.

4.5.3 Special Status Mammals

The removal of old buildings and trees for the proposed Project could impact roosting habitat for pallid bat and Townsend's big-eared bat. Impacts to special status bat species can be avoided by implementing preconstruction surveys (refer to Section 5.4.4).

There is potential habitat for American badger and San Joaquin kit fox within the Study Area. The grassland habitat within the Study Area is of low quality for these species, but transient individuals may occur. Impacts to these species can be mitigated (Sections 5.4.5 and 5.4.6).

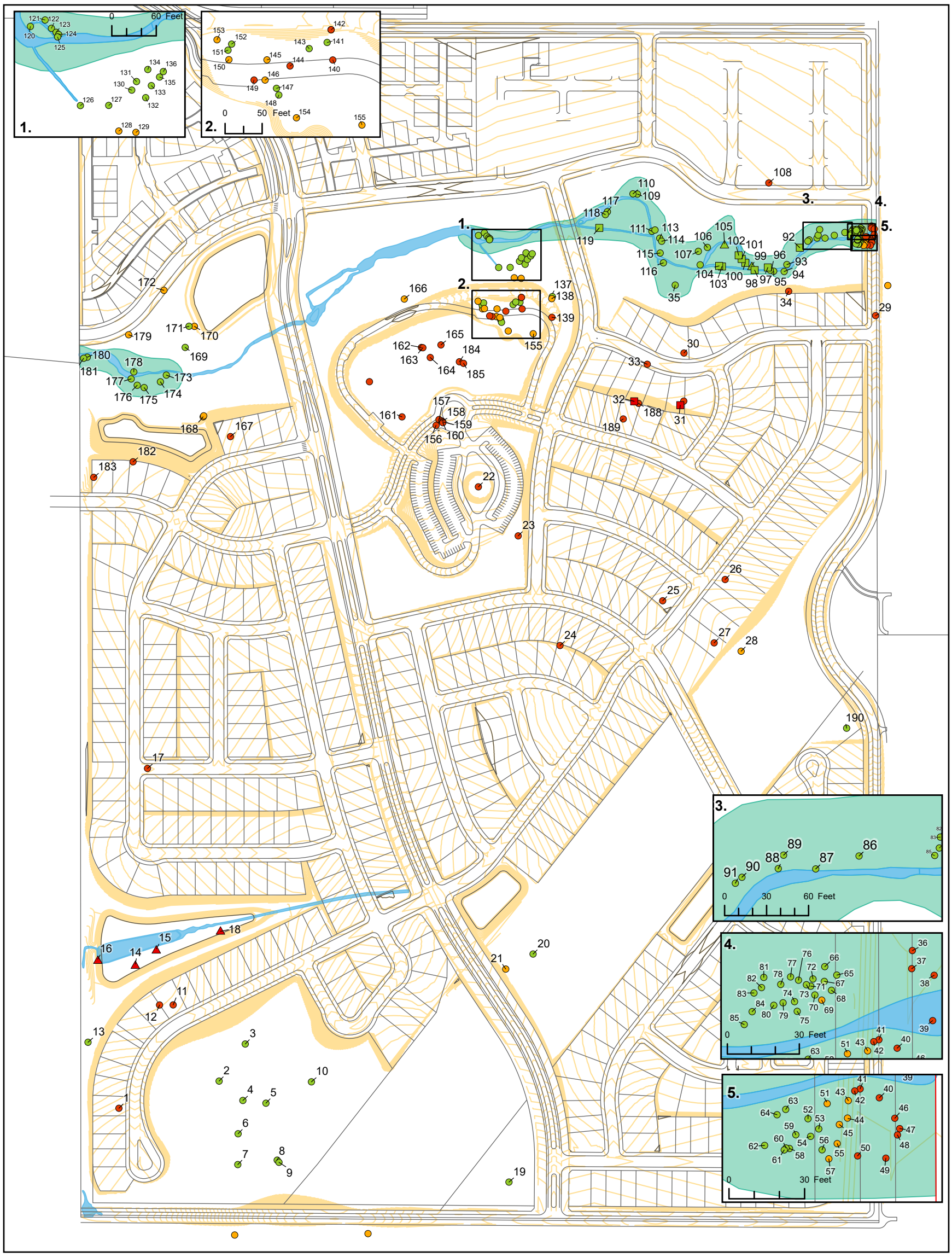
4.5.4 Spadefoot Toad

Spadefoot toad tadpoles were observed during surveys in the Study Area. Recommendations to avoid effects to this species are provided in Section 5.4.2.

4.5.5 Vernal Pool Fairy Shrimp

A protocol level survey for rare branchiopods is being conducted during the 2018-2019 season. Rainfall was above average for the rain season. No rare branchiopods were detected as of May 2019 during wet season surveys. A dry season survey of the stockpond was completed in fall 2018 that found no rare branchiopods present in that feature. A dry season survey will be accomplished for the remained of the Study Area in 2019 to complete the protocol.

Figure 7. Olsen Ranch Tree Impact Status



Legend

Tree Species
- Oak*
- Red Willow
- Fremont Cottonwood

Tree Impact Status
- Remain
- Impacted
- Remove

- Grading Limits
- Site Plans
- Wetlands and Waters
- Riparian Habitat

N

0 300 600 Feet

*Oaks with a DBH of 4 inches or less were not tagged.

Olsen Ranch
Map Center: 120.63668°W 35.60643°N
Paso Robles, San Luis Obispo County

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Map Updated:
May 21, 2019 08:44 AM by MMP

5 RECOMMENDATIONS AND MITIGATIONS

Mitigation is not required for impacts to cropland, non-native annual grassland, or anthropogenic habitats. Mitigation recommendations are provided for riparian habitat, wetlands and drainages, and wildlife.

5.1 Riparian Habitat

Approximately 0.18 acre of riparian habitat is predicted to be impacted by the Project. The Applicant may need to obtain permits from Army Corps of Engineers, California Department of Fish and Wildlife, and certification from the Regional Water Quality Control Board. As part of this process we recommend a restoration and enhancement plan for offsetting temporary impacts to these habitat types. Project design should consider crossing designs with minimal impact to streams, such as span bridges or rail car bridges.

BR-1. To minimize impacts on riparian habitat, prepare a restoration and enhancement plan. Temporary impacts typically require a minimum 1 to 1 ratio restoration (area of restored habitat to impacted habitat). Appropriate restoration and enhancement activities include planting appropriate native species, correcting bank stabilization issues, and providing habitat enhancements.

5.2 Wetlands and Drainages

Project activities could result in fill of wetlands and non-wetland drainages. A wetland delineation report was prepared for the Study Area according to state and federal standards to determine the extent of Clean Water Act section 404 jurisdictional wetlands and waters of the United States (Althouse and Meade, Inc. 2019). A jurisdictional determination of wetlands onsite should be obtained from the U.S. Army Corps of Engineers.

BR-2. If permanent impacts to wetlands are proposed, a mitigation, monitoring, and reporting plan shall be prepared and approved by the City and other jurisdictional agencies, as appropriate (i.e., California Department of Fish and Game, U.S. Army Corps of Engineers, and the Regional Water Quality Control Board). Wetland mitigation should increase the aerial extent of wetland habitat on site at a three-to-one ratio (created wetland area to impacted wetland area). Mitigation implementation and success will be monitored for a minimum of three years, depending on the jurisdictional agencies' requirements.

5.3 Nesting Birds

Migratory non-game native bird species are protected by international treaty under the Federal Migratory Bird Treaty Act (MBTA) of 1918 (50 C.F.R. Section 10.13). Sections 3503, 3503.5 and 3513 of the California Fish and Game Code prohibit take (as defined therein) of all native birds and their active nests, including raptors and other migratory non-game birds (as listed under the Federal MBTA).

BR-3. Within one week of ground disturbance activities, if work occurs between March 15 and August 15, nesting bird survey**s** shall be conducted**.** If surveys do not locate nesting birds, construction activities may be conducted. If nesting birds are located, no construction activities shall occur within 100 feet of nests until chicks are fledged. A pre-construction survey report shall be submitted to the lead agency immediately upon completion of the survey. The report shall detail appropriate fencing or flagging of the buffer zone and make recommendations on additional monitoring requirements. A map of the Project site and nest locations shall be included with the report. The Project biologist conducting the nesting survey shall have the authority to reduce or increase the recommended buffer depending upon site conditions.

5.4 Avoidance, Minimization, and Mitigation for Special Status Species

5.4.1 Special Status Plants

Special status plants were not detected in the Study Area during seasonally timed floristic surveys in spring 2019. The proposed Project would not impact special status plants.

5.4.2 Spadefoot Toad

To minimize impacts to western spadefoot toad the following measure is recommended (CDFW 2013):

BR-4. For work conducted during the western spadefoot toad migration and breeding season (November 1 to May 31), a qualified biologist will survey the active work areas (including access roads) in mornings following measurable precipitation events. Construction may commence once the biologist has confirmed that no spadefoot toads are in the work area.

When feasible, there will be a 50-foot no-disturbance buffer around burrows that provide suitable upland habitat for western spadefoot toad. Burrows considered suitable for spadefoot will be identified by a CDFW approved biologist. The biologist will delineate and mark the no-disturbance buffer.

If western spadefoot toad is found within the construction footprint, it will be allowed to move out of harm's way of its own volition, or a qualified biologist will relocate the organism to the nearest burrow that is outside of the construction impact area.

Prior to beginning work each day, a qualified biologist will inspect underneath equipment and stored pipes greater than 1.2 inches (3 cm) in diameter for western spadefoot toad. If any are found, they will be allowed to move out of the construction area under their own accord.

Trenches and holes will be covered and inspected daily for stranded animals. Trenches and holes deeper than one foot deep will contain escape ramps (maximum slope of 2:1) to allow trapped animals to escape uncovered holes or trenches. Holes and trenches will be inspected prior to filling.

5.4.3 Special Status Bats

BR-5. Upon project approval, a qualified biologist shall conduct a survey of existing trees and structures on the Study Area to determine if roosting bats are present. If possible, the survey shall be conducted during the non-breeding season (November through March). The biologist shall have access to all interior attics, as needed. If a colony of bats is found roosting in any tree or structure, further surveys shall be conducted sufficient to determine the species present and the type of roost (day, night, maternity, etc.) If the bats are not part of an active maternity colony, passive exclusion measures may be implemented with approval from CDFW. November is the best time of the year to exclude bats from a roost because it is after the breeding season and before winter hibernation (not all species hibernate).

BR-6. If bats are roosting in trees or structures on the Study Area during the daytime but are not part of an active maternity colony, then exclusion measures must include one-way valves that allow bats to get out but are designed so that the bats may not re-enter the structure.

BR-7. If a bat colony is excluded, appropriate alternate bat habitat shall be installed in the Study Area. For each occupied roost removed, one bat box shall be installed in similar habitat and should have similar cavity or crevices properties to those which are removed, including access, ventilation, dimensions, height above ground, and thermal conditions. Maternal bat colonies may not be disturbed.

5.4.4 American Badger

American badger could occur within the proposed Project areas. Project activities including grading and other excavation work could result in take of American badger adults or young, or disturbance of natal dens and abandonment by adult badgers. To reduce this potential impact the following measure is recommended:

BR-8. Within 15 days of starting any grading, grubbing, or tree removal, a preconstruction survey shall be conducted in the Study Area to locate occupied American badger dens within 100 feet of project areas. A preconstruction survey letter report shall be submitted to the lead agency for review within one week after completion of the survey. The survey shall cover the entire Study Area and shall examine both old and new dens. If potential badger dens are too long to completely inspect from the entrance, a fiber optic scope shall be used to examine the den to the end. A project biologist will install orange construction fencing in a manner sufficient to protect found dens from construction equipment. If badgers are found in dens in the Study Area from February 1 to July 1, nursing young may be present. Between February and July, to avoid disturbance and the possibility of direct take of adults and nursing young, and to prevent badgers from becoming trapped in burrows during construction activity, no grading shall occur within a 100-foot buffer of active badger dens. Between July 1 and February 1 all potential badger dens shall be inspected to determine if badgers are present. No grading will occur within a 50-foot buffer of active, non-maternal badger dens, from July to February. Construction activities shall not commence within the exclusion area until the badger has moved of its own accord. Inactive dens may be excavated by hand with a shovel to prevent re-use of dens during construction. During the winter badgers do not truly hibernate but are inactive

and asleep in their dens for several days at a time. Badgers can be torpid during the winter and they are vulnerable to disturbances that may collapse their dens before they rouse and emerge; surveys shall be conducted for badger dens throughout the entire year. If badger dens are found in the Study Area during the pre-construction survey, the CDFW wildlife biologist for the area shall be contacted to review current allowable management practices.

5.4.5 San Joaquin Kit Fox

San Joaquin kit fox could occur in the project area. The project would result in a net loss of kit fox habitat. Construction activities could directly impact (take) San Joaquin kit fox. Because the project is larger than 40 acres, a San Joaquin kit fox habitat evaluation form is required to determine the correct level of mitigation. A preliminary evaluation was completed by Daniel E. Meade and produced a score of 77 which translates to a 3 to 1 mitigation ratio, that is three acres required for mitigation for every acre removed as habitat. The exact acreage of habitat to be permanently removed has not been determined pending final project approval. The following mitigation recommendations are designed to reduce the potential for direct impacts to kit fox to a less than significant level.

BR-9. Prior to issuance of grading and/or construction permits, the applicant shall submit evidence to the City of Paso Robles that states that one or a combination of the following three San Joaquin kit fox mitigation measures has been implemented:

a. Provide for the protection in perpetuity, through acquisition of fee or a conservation easement of **[Total number of mitigation acres required]** acres of suitable habitat in the kit fox corridor area (e.g. within the San Luis Obispo County kit fox habitat area, northwest of Highway 58), either on-site or off-site, and provide for a non-wasting endowment to provide for management and monitoring of the property in perpetuity. Lands to be conserved shall be subject to the review and approval of the California Department of Fish and Game (Department) and the City.

   This mitigation alternative (a.) requires that all aspects if this program must be in place before City permit issuance or initiation of any ground disturbing activities.

b. Deposit funds into an approved in-lieu fee program, which would provide for the protection in perpetuity of suitable habitat in the kit fox corridor area within San Luis Obispo County, and provide for a non-wasting endowment for management and monitoring of the property in perpetuity.

   Mitigation alternative (b) above can be completed by providing funds to The Nature Conservancy (TNC) pursuant to the Voluntary Fee-Based Compensatory Mitigation Program (Program). The Program was established in agreement between the Department and TNC to preserve San Joaquin kit fox habitat, and to provide a voluntary mitigation alternative to project proponents who must mitigate the impacts of projects in accordance with the California Environmental Quality Act (CEQA). The fee, payable to "The Nature Conservancy", would total $**[Amount of fee based on $___ per acre]**. This fee is calculated based on the current cost-per-unit of $___ per acre of mitigation, which is scheduled to be adjusted to address the increasing cost of property in San Luis Obispo County; your actual cost may increase depending on the timing of payment. This fee must be paid after the Department provides written

notification about your mitigation options but prior to City permit issuance and initiation of any ground disturbing activities.

c. Purchase **[Total number of mitigation acres required]** ___credits in a Department-approved conservation bank, which would provide for the protection in perpetuity of suitable habitat within the kit fox corridor area and provide for a non-wasting endowment for management and monitoring of the property in perpetuity.

Mitigation alternative (c) above can be completed by purchasing credits from the Palo Prieto Conservation Bank (see contact information below). The Palo Prieto Conservation Bank was established to preserve San Joaquin kit fox habitat, and to provide a voluntary mitigation alternative to project proponents who must mitigate the impacts of projects in accordance with the California Environmental Quality Act (CEQA). The cost for purchasing credits is payable to the owners of The Palo Prieto Conservation Bank, and would total $**[Amount of mitigation acres required (i.e. credits), currently priced at $___ per credit]**. This fee is calculated based on the current cost-per-credit of $___ per acre of mitigation. The fee is established by the conservation bank owner and may change at any time. Your actual cost may increase depending on the timing of payment. Purchase of credits must be completed prior to City permit issuance and initiation of any ground disturbing activities.

BR-10. Prior to issuance of grading and/or construction permits, the applicant shall provide evidence that they have retained a qualified biologist acceptable to the City. The retained biologist shall perform the following monitoring activities:

a. Prior to issuance of grading and/or construction permits and within 30 days prior to initiation of site disturbance and/or construction, the biologist shall conduct a pre-activity (i.e. pre-construction) survey for known or potential kit fox dens and submit a letter to the City reporting the date the survey was conducted, the survey protocol, survey results, and what measures were necessary (and completed), as applicable, to address any kit fox activity within the project limits.

b. The qualified biologist shall conduct weekly site visits during site-disturbance activities (i.e. grading, disking, excavation, stock piling of dirt or gravel, etc.) that proceed longer than 14 days, for the purpose of monitoring compliance with required Mitigation Measures BR-11 through BR-19. Site disturbance activities lasting up to 14 days do not require weekly monitoring by the biologist unless observations of kit fox or their dens are made on-site or the qualified biologist recommends monitoring for some other reason. When weekly monitoring is required, the biologist shall submit weekly monitoring reports to the City.

c. **Prior to or during project activities**, if any observations are made of San Joaquin Kit fox, or any known or potential San Joaquin kit fox dens are discovered within the project limits, the qualified biologist shall re-assess the probability of incidental take (e.g. harm or death) to kit fox. At the time a den is discovered, the qualified biologist shall contact USFWS and the CDFW for guidance on possible additional kit fox protection measures to implement and whether or not a Federal and/or State incidental take permit is needed. If a potential den is encountered during construction, work shall stop until such time the USFWS/CDFW determines it is appropriate to resume work.

If incidental take of kit fox during project activities is possible, before project activities commence, the applicant must consult with the USFWS. The results of this consultation may require the applicant to obtain a Federal and/or State permit for incidental take during project activities. The applicant should be aware that the presence of kit foxes or known or potential kit fox dens at the project site could result in further delays of project activities.

d. In addition, the qualified biologist shall implement the following measures:

   1. Within 30 days prior to initiation of site disturbance and/or construction, fenced exclusion zones shall be established around all known and potential kit fox dens. Exclusion zone fencing shall consist of either large flagged stakes connected by rope or cord, or survey laths or wooden stakes prominently flagged with survey ribbon. Each exclusion zone shall be roughly circular in configuration with a radius of the following distance measured outward from the den or burrow entrances:

      - Potential kit fox den: 50 feet
      - Known or active kit fox den: 100 feet
      - Kit fox pupping den: 150 feet

   2. All foot and vehicle traffic, as well as all construction activities, including storage of supplies and equipment, shall remain outside of exclusion zones. Exclusion zones shall be maintained until all project-related disturbances have been terminated, and then shall be removed.

   3. If kit foxes or known or potential kit fox dens are found on site, daily monitoring by a qualified biologist shall be required during ground disturbing activities.

BR-11. **Prior to issuance of grading and/or construction permits**, the applicant shall clearly delineate the following as a note on the project plans: "*Speed signs of 25 mph (or lower) shall be posted for all construction traffic to minimize the probability of road mortality of the San Joaquin kit fox".* Speed limit signs shall be installed on the project site within 30 days prior to initiation of site disturbance and/or construction.

BR-12. Prior to issuance of grading and/or construction permit and within 30 days prior to initiation of site disturbance and/or construction, all personnel associated with the project shall attend a worker education training program, conducted by a qualified biologist, to avoid or reduce impacts on sensitive biological resources (i.e. San Joaquin kit fox). At a minimum, as the program relates to the kit fox, the training shall include the kit fox's life history, all mitigation measures specified by the City, as well as any related biological report(s) prepared for the project. The applicant shall notify the City shortly prior to this meeting. A kit fox fact sheet shall also be developed prior to the training program, and distributed at the training program to all contractors, employers and other personnel involved with the construction of the project.

BR-13. Prior to, during and after the site disturbance and/or construction phase, use of pesticides or herbicides shall be in compliance with all local, State and Federal regulations. This is necessary to minimize the probability of primary or secondary poisoning of endangered

species utilizing adjacent habitats, and the depletion of prey upon which San Joaquin kit foxes depend.

BR-14. During the site disturbance and/or construction phase, grading and construction activities after dusk shall be prohibited unless coordinated through the City, during which additional kit fox mitigation measures may be required.

BR-15. During the site disturbance and/or construction phase, to prevent entrapment of the San Joaquin kit fox, all excavations, steep-walled holes and trenches in excess of two feet in depth shall be covered at the close of each working day by plywood or similar materials, or provided with one or more escape ramps constructed of earth fill or wooden planks. Trenches shall also be inspected for entrapped kit fox each morning prior to onset of field activities and immediately prior to covering with plywood at the end of each working day. Before such holes or trenches are filled, they shall be thoroughly inspected for entrapped kit fox. Any kit fox so discovered shall be allowed to escape before field activities resume, or removed from the trench or hole by a qualified biologist and allowed to escape unimpeded.

BR-16. During the site disturbance and/or construction phase, any pipes, culverts, or similar structures with a diameter of four inches or greater, stored overnight at the project site shall be thoroughly inspected for trapped San Joaquin kit foxes before the subject pipe is subsequently buried, capped, or otherwise used or moved in any way. If during the construction phase a kit fox is discovered inside a pipe, that section of pipe will not be moved. If necessary, the pipe may be moved only once to remove it from the path of activity, until the kit fox has escaped.

BR-17. During the site disturbance and/or construction phase, all food-related trash items such as wrappers, cans, bottles, and food scraps shall be disposed of only in closed containers. These containers shall be regularly removed from the site. Food items may attract San Joaquin kit foxes onto the project site, consequently exposing such animals to increased risk of injury or mortality. No deliberate feeding of wildlife shall be allowed.

BR-18. During the site disturbance and/or construction phase, any contractor or employee that inadvertently kills or injures a San Joaquin kit fox or who finds any such animal either dead, injured, or entrapped shall be required to report the incident immediately to the applicant and City. In the event that any observations are made of injured or dead kit fox, the applicant shall immediately notify the USFWS and CDFW by telephone. In addition, formal notification shall be provided in writing within three working days of the finding of any such animal(s). Notification shall include the date, time, location and circumstances of the incident. Any threatened or endangered species found dead or injured shall be turned over immediately to CDFW for care, analysis, or disposition.

BR-19. Prior to final inspection, or occupancy, whichever comes first, should any long internal or perimeter fencing be proposed or installed, the applicant shall do the following to provide for kit fox passage:

a. If a wire strand/pole design is used, the lowest strand shall be no closer to the ground than 12 inches.
b. If a more solid wire mesh fence is used, 8" x 12" openings near the ground shall be provided every 100 yards

c. Upon fence installation, the applicant shall notify the City to verify proper installation. Any fencing constructed after issuance of a final permit shall follow the above guidelines

5.4.6 Oak Trees

Oak tree impacts and mitigation requirements shall be compiled by the project arborist or botanist upon completion of the final Project site plans. The following mitigation recommendations are modeled after guidelines set forth in the Paso Robles Tree Ordinance (City of El Paso De Robles 2002)

BR-20. Tree canopies and trunks within 50 feet of proposed disturbance zones should be mapped and numbered by a qualified biologist and a licensed land surveyor. Data for each tree should include date, species, number of stems, diameter at breast height (DBH) of each stem, critical root zone (CRZ) diameter, canopy diameter, tree height, health, habitat notes, and nests observed.

BR-21. An oak tree protection plan shall be prepared and approved by the City of Paso Robles.

BR-22. Impacts to the oak canopy or critical root zone (CRZ) should be avoided where practicable. Impacts include pruning, any ground disturbance within the dripline or CRZ of the tree (whichever distance is greater), and trunk damage.

BR-23. Impacted oaks shall be mitigated for by planting one 24-inch boxed tree for impacts up to 25 percent of the root zone or canopy. Two 24-inch boxed trees shall be planted for trees with impacts up to 50 percent of the tree, and so on. The mitigation trees shall be incorporated into the landscape plan.

BR-24. Replacement oaks for removed trees must be equivalent to 25 percent of the diameter of the removed tree(s). For example, the replacement requirement for removal of two trees of 15 inches DBH (30 total diameter inches), would be 7.5 inches (30 inches removed x 0.25 replacement factor). This requirement could be satisfied by planting five 1.5-inch trees, or three 2.5-inch trees, or any other combination totaling 7.5 inches. A minimum of two 24-inch box, 1.5-inch trees shall be required for each oak tree removed.

BR-25. Replacement trees should be seasonally maintained (browse protection, weed reduction and irrigation, as needed) and monitored annually for at least 7 years.

BR-26. It is the responsibility of the owner or project manager to provide a copy of the tree protection plan to any and all contractors and subcontractors that work within the critical root zone of any native tree and confirm they are trained in maintaining fencing, protecting root zones and conforming to all tree protection goals. It is highly recommended that each contractor sign and acknowledge this tree protection plan.

BR-27. Any future changes (within the critical root zone) in the project will need Project Arborist review and implementation of potential mitigation measures before any said changes can proceed.

BR-28. Fencing: The proposed fencing shall be shown on the grading plan. It must be a minimum of 4' high chain link, snow or safety fence staked (with t posts 8 feet on center) at the edge of the critical root zone or line of encroachment for each tree or group of trees. The fence

shall be up before any construction or earth moving begins. The owner shall be responsible for maintaining an erect fence throughout the construction period. The arborist(s), upon notification, will inspect the fence placement once it is erected. After this time, fencing shall not be moved without arborist inspection/approval. If the orange plastic fencing is used, a minimum of four zip ties shall be used on each stake to secure the fence. All efforts shall be made to maximize the distance from each saved tree. Weatherproof signs shall be permanently posted on the fences every 50 feet, with the following information: Tree Protection Zone: No personnel, equipment, materials, or vehicles allowed.

BR-29. Soil Aeration Methods: Soils within the critical root zone that have been compacted by heavy equipment and/or construction activities must be returned to their original state before all work is completed. Methods include water jetting, adding organic matter, and boring small holes with an auger (18" deep, 2-3' apart with a 2-4" auger) and the application of moderate amounts of nitrogen fertilizer. The arborist(s) shall advise.

BR-30. Chip Mulch: All areas within the critical root zone of the trees that can be fenced shall receive a 4-6" layer of chip mulch to retain moisture, soil structure and reduce the effects of soil compaction.

BR-31. Trenching Within Critical Root Zone: All trenching within the critical root zone of native trees shall be hand dug. All major roots shall be avoided whenever possible. All exposed roots larger than 1" in diameter shall be clean cut with sharp pruning tools and not left ragged. A Mandatory meeting between the arborists and grading contractor(s) must take place prior to work start.

BR-32. Grading Within the Critical Root Zone: Grading should not encroach within the critical root zone unless authorized. Grading should not disrupt the normal drainage pattern around the trees. Fills should not create a ponding condition and excavations should not leave the tree on a rapidly draining mound. Any exposed roots shall be covered the same day they were exposed if possible. If they cannot, they must be covered with burlap or another suitable material and wetted down 2 times per day until reburied.

BR-33. Equipment Operation: Vehicles and all heavy equipment shall not be driven under the trees, as this will contribute to soil compaction. Also, there is to be no parking of equipment or personal vehicles in these areas. All areas behind fencing are off limits unless pre-approved by the arborist.

BR-34. Existing Surfaces: The existing ground surface within the critical root zone of all oak trees shall not be cut, filled, compacted or pared, unless shown on the grading plans and approved by the arborist.

BR-35. Construction Materials and Waste: No liquid or solid construction waste shall be dumped on the ground within the critical root zone of any native tree. The critical root zone areas are not for storage of materials either.

BR-36. Arborist Monitoring: An arborist shall be present for soil disturbance work within the critical root zone of oak trees. Monitoring does not necessarily have to be continuous but

observational at times during these activities. All monitoring will be documented on the field report form which will be forwarded to the project manager and the City of Paso Robles Planning Department.

BR-37. Impacted Root Treatment: Roots impacted during construction (e.g., trenching or grading operations) shall be treated by the arborist on a case-by-case basis using best practices such as clean cuts accompanied by application of appropriate fungicides and insecticides by a licensed pest control applicator.

BR-38. Pre-Construction Meeting: An on-site pre-construction meeting with the Arborist(s), Owner(s), Planning Staff, and the earth moving team shall be required for this project. Prior to final occupancy, a letter from the arborist(s) shall be required verifying the health/condition of all impacted trees and providing any recommendations for any additional mitigation. The letter shall verify that the arborist(s) were on site for all grading and/or trenching activity that encroached into the critical root zone of the selected native trees, and that all work done in these areas was completed to the standards set forth above.

BR-39. Pruning: Class 1 pruning has emphasis on aesthetics, removal of dead, dying, decaying weak branches and selective thinning to lesson wind resistance. Class 2 pruning is recommended where aesthetic conditions are secondary to structural integrity and tree health concerns. It shall consist of removal of dead, dying, decaying, interfering, obstructing and weak branches as well as selective thinning to lesson wind resistance. Class 4 pruning, including crown reduction pruning, shall consist of reduction of tops, sides or individual limbs. A certified arborist shall direct all pruning. No pruning shall take more than 25% of the live crown of any native tree. Any trees that may need pruning for road/home clearance shall be pruned prior to any grading activities to avoid any branch tearing.

BR-40. Landscape: All landscape within the critical root zone shall consist of drought tolerant or native varieties. Lawns shall be avoided. All irrigation trenching shall be routed around critical root zones, otherwise above ground drip-irrigation shall be used. It is the owner's responsibility to notify the landscape contractor regarding this mitigation. For this site it is strongly recommended that drought tolerant native landscape is used with the approval of the arborist. This includes all city sidewalk/greenbelt areas.

BR-41. Utility Placement: All utilities, sewer and storm drains shall be placed down the roads and driveways and when possible outside of the critical root zones. The arborist shall supervise trenching within the critical root zone. All trenches in these areas shall be exposed by air spade or hand dug with utilities routed under/over roots larger than 3 inches in diameter.

BR-42. Fertilization and Cultural Practices: As the project moves toward completion, the arborist(s) may suggest either fertilization and/or mycorrhizal inoculation applications that will benefit tree health. Application of mycorrhizal inoculum offers several benefits to the host plant, including faster growth, improved nutrition, greater drought resistance, and protection from pathogens.

6 REFERENCES

Althouse and Meade, Inc. 2004. Preliminary biological assessment of the Olsen Ranch specific plan area. Paso Robles, CA.

Althouse and Meade, Inc. 2019. Delineation of potentially jurisdictional wetlands and waters for Olsen Ranch. Paso Robles, CA.

Brehme CS, Hathaway R, Booth BH, Fisher RN. 2015. Research of American badgers in western San Diego County, 2014. Data Summary prepared for California Department of Fish and Wildlife and the San Diego Association of Governments.

[CCH] Consortium of California Herbaria. 2019. Data provided by the participants of the Consortium of California Herbaria. [accessed 2019 Feb 14][accessed May 2019]. http://ucjeps.berkeley.edu/consortium/.

[CDFW] California Department of Fish and Wildlife. 2018. Protocols for surveying and evaluating impacts to special status native plant populations and natural communities.

[CDFW] California Department of Fish and Wildlife. 2013. San Joaquin River restoration program, Appendix I CDFW's conservation measures for biological resources that may be affected by program-level actions. Western spadefoot toad measure to avoid effects to species. Horizon Water and Environment, LLC. Oakland, CA

[CDFW] California Department of Fish and Wildlife. 2019a. California natural diversity database (CNDDB) - Commercial. [accessed May 2019]. https://map.dfg.ca.gov/rarefind/view/RareFind.aspx.

[CDFW] California Department of Fish and Wildlife. 2019b. Special animals list. Sacramento CA.

[CDFW] California Department of Fish and Wildlife, California Interagency Wildlife Task Group. 2014. CWHR version 9.0 personal computer program. Sacramento, CA.

[CDFW] California Department of Fish and Wildlife, [CNDDB] California Natural Diversity Database. 2019. Special vascular plants, bryophytes, and lichens list. Quarterly publication.

City of El Paso De Robles. 2002. Ordinance No. 835 N.S.

[CNPS] California Native Plant Society. 2001. CNPS botanical survey guidelines. California Native Plant Society.

[CNPS] California Native Plant Society. 2019. Inventory of rare and endangered plants of California (online edition, v8-03 0.39). [accessed May 2019]. http://www.rareplants.cnps.org.

Eriksen CH, Belk D. 1999. Fairy shrimps of California's puddles, pools, and playas. Mad River Press.

Helm BP. 1998. Biogeography of eight large branchiopods endemic to California. Sacramento, CA: Ecology, conservation, and management of vernal pool ecosystems. California Native Plant Society.

Jepson Flora Project (eds.). 2019. Jepson eFlora. [accessed May 2019]. http://ucjeps.berkeley.edu/eflora/.

[NAIP] National Agriculture Imagery Program, [USDA] United States Department of Agriculture. 2016. Aerial photomosiac of San Luis Obispo County.

NatureServe. 2018. Linderiella occidentalis. Arlington, VA: NatureServe. [accessed May 2019]. http://explorer.natureserve.org/servlet/NatureServe?searchName=Linderiella+occidentalis.

Nowak RM, Walker EP, Kunz TH, Pierson ED. 1994. Walker's bats of the world. Baltimore, MD: JHU Press.

Pierson ED, Rainey WE, Miller RM. 1996. Night roost sampling: a window on the forest bat community in northern California. In: Bats and forests symposium. Victoria, British Columbia: (Barclay R. M. R. Brigham R. M., eds.). Research Branch, Ministry of Forests, Victoria, British Columbia, Canada. p. 151–163.

Sawyer JO, Keeler-Wolf T, Evens J. 2009. A manual of California vegetation. Sacramento, Calif.: California Native Plant Society Press.

[USDA] United States Department of Agriculture, Soil Survey Staff, [NRCS] Natural Resource Conservation Service. 2019. Web soil survey. [accessed May 2019]. http://websoilsurvey.nrcs.usda.gov/.

[USFWS] US Fish and Wildlife Service. 1992. Endangered and threatened wildlife and plants; 90-day finding and commencement of status reviews for a petition to list the western pond turtle and California red-legged frog. Federal Register. 57:45761–45762.

[USFWS] US Fish and Wildlife Service. 2000. Guidelines for conducting and reporting botanical inventories for federally listed, proposed, and candidate plants. Sacramento, CA.

7 PHOTOGRAPHS

Photo 1. Cropland. View to the northwest from the northern drainage edge. September 7, 2018.

Photo 2. California Annual Grassland on the northeastern portion of the Study Area, View to the morthwest on September 7, 2018.

Photo 3. Riparian corridor of the northern drainage, View to the west from Hanson Road on February 18, 2019.

Photo 4. Riparian corridor near the middle of the Study area on the northern drainage. Trees are widely spaced in this section and the ground cover is weedy annual grasses. View to the west on September 7, 2018.

Photo 5. Water in cropland field following ten days of rainfall. View west on March 12, 2019.

Photo 6. Wetlands and Drainages. Stock pond on western Project boundary full and flowing following ten days of rainfall. View east on March 12, 2019.

Photo 7. Structures and fenced areas along the northern drainage feature. View is in the drainage looking to the east from near the western Study Area boundary on April 4, 2019.

8 APPENDICES

- **Appendix A. USDA Custom Soil Resource Report**
- **Appendix B. Special Status Plants Reported from the Region**
- **Appendix C. Special Status Animals Reported from the Region**
- **Appendix D. Arborist Report**

APPENDIX A. USDA CUSTOM SOIL RESOURCE REPORT

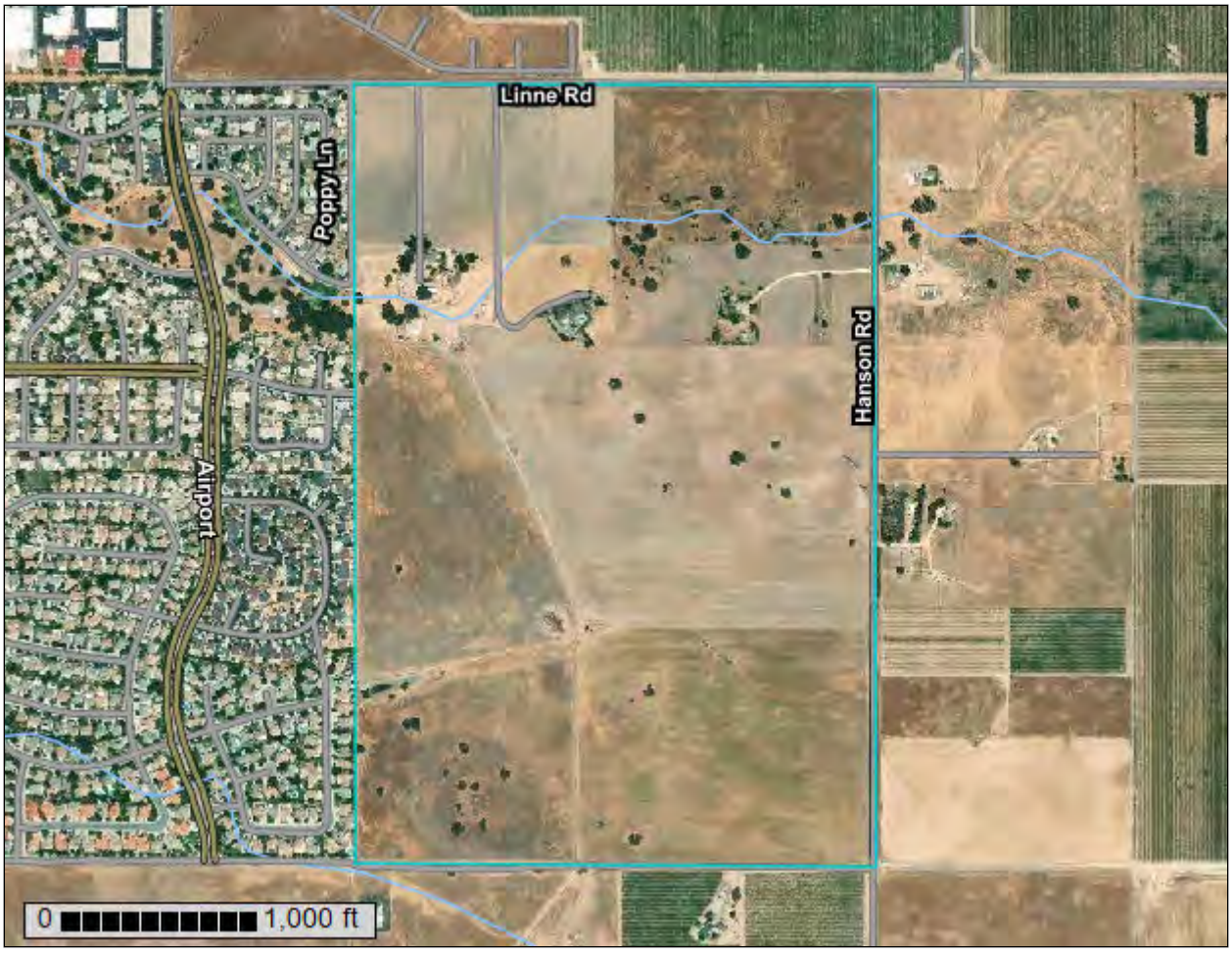
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for San Luis Obispo County, California, Paso Robles Area



April 5, 2019

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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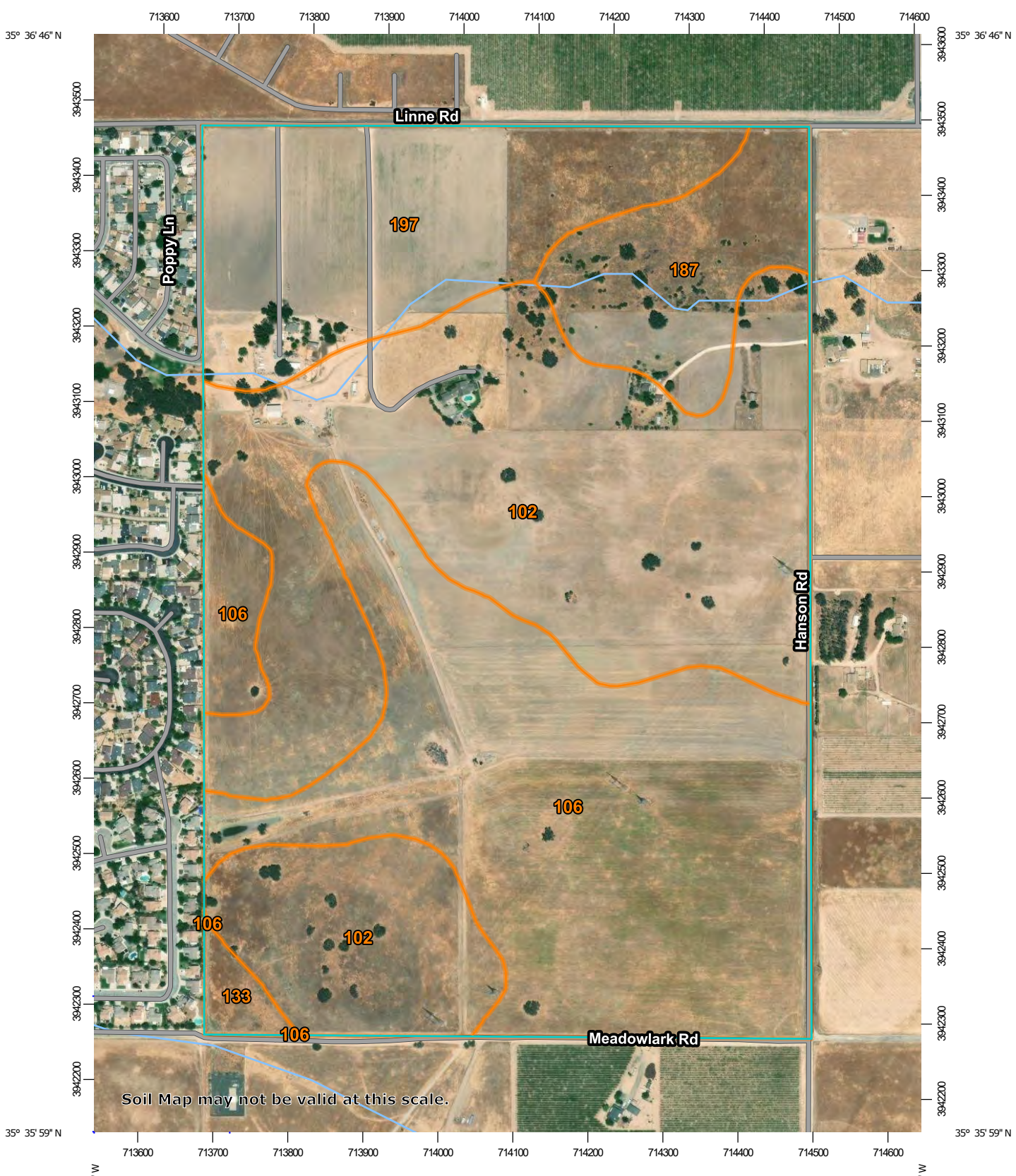
Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report

Soil Map



Map Scale: 1:7,110 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 100 200 400 600

Feet
0 300 600 1200 1800

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: San Luis Obispo County, California, Paso Robles Area
Survey Area Data: Version 12, Sep 14, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 17, 2016—Oct 1, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND	MAP INFORMATION
	imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
102	Arbuckle-Positas complex, 9 to 15 percent slopes	101.7	41.9%
106	Arbuckle-San Ysidro complex, 2 to 9 percent slopes	80.6	33.3%
133	Cropley clay, 2 to 9 percent slopes, MLRA 14	2.5	1.0%
187	Rincon clay loam, 0 to 2 percent slopes	18.7	7.7%
197	San Ysidro loam, 0 to 2 percent slopes, MLRA 14	38.9	16.1%
Totals for Area of Interest		**242.3**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

San Luis Obispo County, California, Paso Robles Area

102—Arbuckle-Positas complex, 9 to 15 percent slopes

Map Unit Setting

National map unit symbol: hbrk
Elevation: 600 to 1,500 feet
Mean annual precipitation: 12 to 20 inches
Mean annual air temperature: 60 to 61 degrees F
Frost-free period: 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Arbuckle and similar soils: 40 percent
Positas and similar soils: 30 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arbuckle

Setting

Landform: Terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium from mixed rock sources

Typical profile

H1 - 0 to 29 inches: fine sandy loam
H2 - 29 to 53 inches: sandy clay loam
H3 - 53 to 62 inches: stratified sandy loam to very gravelly sandy clay loam

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: COARSE LOAMY (R014XE003CA)
Hydric soil rating: No

Description of Positas

Setting

Landform: Terraces

Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium from mixed rock sources

Typical profile

H1 - 0 to 10 inches: coarse sandy loam
H2 - 10 to 28 inches: clay
H3 - 28 to 40 inches: sandy clay loam
H4 - 40 to 60 inches: stratified sandy loam to gravelly clay loam

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: 9 to 20 inches to abrupt textural change
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 1.2 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: COARSE LOAMY CLAYPAN (R014XE005CA)
Hydric soil rating: No

Minor Components

Greenfield, fine sandy loam

Percent of map unit: 10 percent
Hydric soil rating: No

Positas

Percent of map unit: 10 percent
Hydric soil rating: No

Cropley

Percent of map unit: 4 percent
Hydric soil rating: No

Hanford, fine sandy loam

Percent of map unit: 3 percent
Hydric soil rating: No

Unnamed, areas of 15 to 30 percent slope

Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, areas of 15 to 30 percent slope

Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, areas with cobbles on the surface

Percent of map unit: 1 percent
Hydric soil rating: No

106—Arbuckle-San Ysidro complex, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: hbrp
Elevation: 600 to 1,500 feet
Mean annual precipitation: 12 to 20 inches
Mean annual air temperature: 60 to 61 degrees F
Frost-free period: 200 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Arbuckle and similar soils: 40 percent
San ysidro and similar soils: 20 percent
Minor components: 39 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arbuckle

Setting

Landform: Terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium from mixed rock sources

Typical profile

H1 - 0 to 29 inches: fine sandy loam
H2 - 29 to 38 inches: sandy clay loam
H3 - 38 to 62 inches: stratified sandy loam to very gravelly sandy clay loam

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): 3e

Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: COARSE LOAMY (R014XE003CA)
Hydric soil rating: No

Description of San Ysidro

Setting

Landform: Terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from mixed rocks

Typical profile

H1 - 0 to 23 inches: loam
H2 - 23 to 38 inches: clay loam
H3 - 38 to 71 inches: sandy loam

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: 20 to 37 inches to abrupt textural change
Natural drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: LOAMY CLAYPAN (R014XE029CA)
Hydric soil rating: No

Minor Components

Greenfield, fine sandy loam

Percent of map unit: 14 percent
Hydric soil rating: No

Unnamed, similar to san ysidro soil

Percent of map unit: 10 percent
Hydric soil rating: No

Hanford, fine sandy loam

Percent of map unit: 5 percent
Hydric soil rating: No

Unnamed, simialr to arbuckle

Percent of map unit: 5 percent
Hydric soil rating: No

Cropley, clay

Percent of map unit: 2 percent

Hydric soil rating: No

Rincon, clay loam

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed

Percent of map unit: 1 percent
Landform: Drainageways
Hydric soil rating: Yes

133—Cropley clay, 2 to 9 percent slopes, MLRA 14

Map Unit Setting

National map unit symbol: 2tb9j
Elevation: 0 to 2,340 feet
Mean annual precipitation: 12 to 28 inches
Mean annual air temperature: 56 to 60 degrees F
Frost-free period: 270 to 365 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Cropley and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cropley

Setting

Landform: Alluvial fans, terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Base slope, tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from calcareous shale

Typical profile

A1 - 0 to 11 inches: clay
Bss1 - 11 to 51 inches: clay
BCk1 - 51 to 79 inches: sandy clay loam

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (1.0 to 3.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: CLAYEY (R014XD001CA)
Hydric soil rating: No

Minor Components

Salinas

Percent of map unit: 3 percent
Landform: Terraces, alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Base slope, tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Los osos

Percent of map unit: 3 percent
Landform: Hillslopes, ridges
Landform position (two-dimensional): Backslope, shoulder, footslope, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, concave
Across-slope shape: Convex, concave
Hydric soil rating: No

Clear lake

Percent of map unit: 2 percent
Landform: Basin floors
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Capay

Percent of map unit: 2 percent
Landform: Flood plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

187—Rincon clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hbv9
Elevation: 600 to 1,500 feet
Mean annual precipitation: 12 to 20 inches
Mean annual air temperature: 60 degrees F
Frost-free period: 200 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Rincon and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rincon

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock

Typical profile

H1 - 0 to 18 inches: clay loam
H2 - 18 to 64 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Ecological site: FINE LOAMY BOTTOM (R014XE025CA)
Hydric soil rating: No

Minor Components

Unnamed
Percent of map unit: 10 percent
Hydric soil rating: No

San ysidro, loam
Percent of map unit: 5 percent
Hydric soil rating: No

Cropley, clay
Percent of map unit: 3 percent
Hydric soil rating: No

Lockwood, shaly loam
Percent of map unit: 2 percent
Hydric soil rating: No

197—San Ysidro loam, 0 to 2 percent slopes, MLRA 14

Map Unit Setting
National map unit symbol: 2tyys
Elevation: 70 to 1,990 feet
Mean annual precipitation: 13 to 22 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 300 to 360 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
San ysidro and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of San Ysidro

Setting
Landform: Alluvial fans, valley floors, terraces
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock

Typical profile
A - 0 to 23 inches: loam
B1 - 23 to 38 inches: clay loam
Bt2 - 38 to 64 inches: loam

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: 16 to 24 inches to abrupt textural change

Natural drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: LOAMY CLAYPAN (R014XE029CA)
Hydric soil rating: No

Minor Components

Arbuckle

Percent of map unit: 6 percent
Hydric soil rating: No

Rincon

Percent of map unit: 2 percent
Hydric soil rating: No

Solano

Percent of map unit: 2 percent
Hydric soil rating: No

Pleasanton, loam

Percent of map unit: 2 percent
Hydric soil rating: No

Pescadero

Percent of map unit: 1 percent
Landform: Basin floors
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Cropley, clay

Percent of map unit: 1 percent
Hydric soil rating: No

Palexeralfs

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

APPENDIX B. SPECIAL STATUS PLANTS REPORTED FROM THE REGION

The 53 special status plants reported from the region are listed below. Potentially suitable habitat is present in the Study Area for five special status plant species. No special status plant species were detected in the Study Area.

	Common Name *Scientific Name*	Fed/State Status Global/State Rank Rare Plant Rank	Blooming Period	Habitat Preference	Potential to Occur	Detected in the Study Area?	Effect of Proposed Activity
1.	**Bristlecone Fir** *Abies bracteata*	None/None G2G3/S2S3 1B.3	N/A	Lower montane coniferous forest. Rocky sites in Monterey and SLO counties. 210-1600 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect
2.	**Hoover's Bent Grass** *Agrostis hooveri*	None/None G2/S2 1B.2	April - July	Sandy soil in oak woodland habitat; endemic to SLO & SB counties. <600 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect
3.	**Douglas' Fiddleneck** *Amsinckia douglasiana*	None/None G4/S4 4.2	March – May	Cismontane woodland, Valley and foothill grassland; unstable shaly sedimentary slopes; (100)150-1600 m.	No. Suitable substrate is not present in the Study Area.	No	No Effect
4.	**Oval-leaved Snapdragon** *Antirrhinum ovatum*	None/None G3/S3 4.2	May - November	Heavy, adobe-clay soils on gentle, open slopes, also disturbed areas; 200-1000 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect
5.	**Santa Lucia Manzanita** *Arctostaphylos luciana*	None/None G2/S2 1B.2	December - March	Shale outcrops, slopes, chaparral; Cuesta Pass, SLO County. 500-700 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect

	Common Name *Scientific Name*	Fed/State Status Global/State Rank Rare Plant Rank	Blooming Period	Habitat Preference	Potential to Occur	Detected in the Study Area?	Effect of Proposed Activity
6.	**Bishop Manzanita** *Arctostaphylos obispoensis*	None/None G3/S3 4.3	February - June	Rocky, generally serpentine soils, chaparral, open closed-cone forest near coast in Santa Lucia Range; 60-950 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect
7.	**Santa Margarita Manzanita** *Arctostaphylos pilosula*	None/None G2?/S2? 1B.2	December - May	Shale outcrops, slopes, chaparral;. endemic to SLO County. 300-1100 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect
8.	**Miles' Milk-vetch** *Astragalus didymocarpus* var. *milesianus*	None/None G5T2/S2 1B.2	March - May	Grassy areas near coast; < 400 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect
9.	**Salinas Milk-vetch** *Astragalus macrodon*	None/None G4/S4 4.3	April - July	Eroded pale shales or sandstone, serpentine alluvium; 200-1550 m.	No. Appropriate habitat is not present in the Study Area.	No	No Effect
10.	**San Luis Mariposa-lily** *Calochortus obispoensis*	None/None G2/S2 1B.2	May - June	Dry serpentine, generally open chaparral; east of Morro Bay, San Luis Obispo Co. 100-500 m.	No. Serpentine soil is not present in the Study Area.	No	No Effect
11.	**La Panza Mariposa-lily** *Calochortus simulans*	None/None G2/S2 1B.3	April - May	Grassland, oak woodland & pine forest, on sand, granite, or serpentine; endemic to SLO County. <1100 m.	No. Suitable soil type is not present in the Study Area.	No	No Effect

	Common Name *Scientific Name*	Fed/State Status Global/State Rank Rare Plant Rank	Blooming Period	Habitat Preference	Potential to Occur	Detected in the Study Area?	Effect of Proposed Activity
12.	**Dwarf Calycadenia** *Calycadenia villosa*	None/None G3/S3 1B.1	May - October	Dry, rocky hills, ridges, in chaparral, woodland, meadows and seeps. <1100 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect
13.	**Cambria morning glory** *Calystegia subacaulis* subsp. *episcopalis*	None/None G3T2/S2 4.2	(March)April - June(July)	Dry, open scrub, woodland, or grassland; usually clay; endemic to SLO County. <500 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect
14.	**Hardham's Evening-primrose** *Camissoniopsis hardhamiae*	None/None G2/S2 1B.2	March - May	Decomposed carbonate soils, in chaparral, cismontane woodland; Monterey, SLO counties. 240-600 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect
15.	**San Luis Obispo Sedge** *Carex obispoensis*	None/None G3?/S3? 1B.2	March - June	Springs, streamsides in chaparral, generally on serpentine; Monterey, SLO counties. < 800 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect
16.	**San Luis Obispo Owl's-clover** *Castilleja densiflora* var. *obispoensis*	None/None G5T2/S2 1B.2	April	Coastal grassland; endemic to SLO County. <100 m.	No. Suitable habitat is present however the Property is outside of the known range of this variety.	No	No Effect
17.	**Lemmon's Jewelflower** *Caulanthus lemmonii*	None/None G3/S3 1B.2	March – May	Dry, exposed slopes, grassland, chaparral, scrub. 80-1100 m.	Low. Suitable habitat may be present on dry slopes in the Study Area.	No	No Effect

	Common Name *Scientific Name*	Fed/State Status Global/State Rank Rare Plant Rank	Blooming Period	Habitat Preference	Potential to Occur	Detected in the Study Area?	Effect of Proposed Activity
18.	**Lompoc Ceanothus** *Ceanothus cuneatus* var. *fascicularis*	None/None G5T4/S4 4.2	February - May	Sandy substrates, coastal chaparral; Santa Barbara, SLO cos. < 275 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect
19.	**Brewer's Spineflower** *Chorizanthe breweri*	None/None G3/S3 1B.3	March - July	Gravel or rocks; endemic to SLO Co. 60-800 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect
20.	**Douglas' Spineflower** *Chorizanthe douglasii*	None/None G4/S4 4.3	April - July	Sand or gravel; (200)300-1600 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect
21.	**Palmer's Spineflower** *Chorizanthe palmeri*	None/None G4/S4 4.2	May - August	Serpentine; Monterey, SLO counties. 60--700 m.	No. Serpentine soil is not present in the Study Area.	No	No Effect
22.	**Straight-awned Spineflower** *Chorizanthe rectispina*	None/None G2/S2 1B.3	May - July	Chaparral, dry woodland in sandy soil. 200-600 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect
23.	**San Luis Obispo Fountain Thistle** *Cirsium fontinale* var. *obispoense*	Endangered/Endangered G2T2/S2 1B.2	April – October	Serpentine seeps and streams; endemic to SLO Co. < 350 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect
24.	**Cuesta Ridge Thistle** *Cirsium occidentale* var. *lucianum*	None/None G3G4T2/S2 1B.2	April - July	Chaparral, woodland or forest openings, often on serpentine; endemic to SLO Co. 500-750 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect
25.	**Slender Clarkia** *Clarkia exilis*	None/None G3/S3 4.3	April - May	Cismontane woodland; <1000 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect

	Common Name *Scientific Name*	Fed/State Status Global/State Rank Rare Plant Rank	Blooming Period	Habitat Preference	Potential to Occur	Detected in the Study Area?	Effect of Proposed Activity
26.	**Small-flowered Morning-glory** *Convolvulus simulans*	None/None G4/S4 4.2	April - June	Clay substrates, occasionally serpentine, annual grassland, coastal-sage scrub, chaparral; 30-875 m.	Low. Soils in the Study Area are poorly suited for this species.	No	No Effect
27.	**Paniculate tarplant** *Deinandra paniculata*	None/None G4/S4 4.2	(March)April - November	Vernally mesic or sandy soils in coastal scrub and grassland habitats; <1320 m.	No. Suitable habitat may be present however Property is outside of species known range.	No	No Effect
28.	**Small-flowered Gypsum-loving larkspur** *Delphinium gypsophilum* subsp. *parviflorum*	None/None G4T2T3Q/S2S3 3.2	February - June	Slopes in grassland, open oak woodland; 90-1200 m.	No. As of 2012 this is no longer a valid taxon.	No	No Effect
29.	**Dune Larkspur** *Delphinium parryi* ssp. *blochmaniae*	None/None G4T2/S2 1B.2	April - June	Coastal chaparral, sand. 0-200 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect
30.	**Eastwood's Larkspur** *Delphinium parryi* subsp. *eastwoodiae*	None/None G4T2/S2 1B.2	March - May	Coastal chaparral, grassland, on serpentine; SLO Co. 100-500 m.	No. Serpentine soil is not present in the Study Area.	No	No Effect
31.	**Umbrella Larkspur** *Delphinium umbraculorum*	None/None G3/S3 1B.3	April - June	Moist oak forest; 400-1600 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect
32.	**Mouse-gray dudleya** *Dudleya abramsii* subsp. *murina*	None/None G4T2/S2 1B.3	May - June	Serpentine outcrops; SLO Co. 120-300 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect

	Common Name *Scientific Name*	Fed/State Status Global/State Rank Rare Plant Rank	Blooming Period	Habitat Preference	Potential to Occur	Detected in the Study Area?	Effect of Proposed Activity
33.	**Small Spikerush** *Eleocharis parvula*	None/None G5/S3 4.3	(April) June – August (September)	Brackish, wet soil, coastal; <50 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect
34.	**Yellow-flowered Eriastrum** *Eriastrum luteum*	None/None G2/S2 1B.2	May - June	Bare sandy decomposed granite slopes in cismontane woodland, chaparral, forest; Monterey, SLO cos. 360-1000 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect
35.	**Ojai Fritillary** *Fritillaria ojaiensis*	None/None G3/S3 1B.2	February - May	Rocky slopes, river basins; 300-500 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect
36.	**Hogwallow Starfish** *Hesperevax caulescens*	None/None G3/S3 4.2	March - June	Drying shrink-swell clay of vernal pools, flats, steep slopes. <300 (500) m.	Low. Suitable clay substrates may be present in the Study Area, in Cropley clay and/or Rincon clay loam.	No	No Effect
37.	**Mesa Horkelia** *Horkelia cuneata* var. *puberula*	None/None G4T1/S1 1B.1	February - September	Dry, sandy coastal chaparral. 70-700 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect
38.	**Kellogg's Horkelia** *Horkelia cuneata* var. *sericea*	None/None G4T1?/S1? 1B.1	April - September	Old dunes, coastal sand hills; <200 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect
39.	**Santa Lucia Dwarf Rush** *Juncus luciensis*	None/None G3/S3 1B.2	April - July	Vernal pools, ephemeral drainages, wet meadow habitats, and streams. 300-1900 m.	Moderate. Suitable habitat is present in the Study Area.	No	No Effect

	Common Name *Scientific Name*	Fed/State Status Global/State Rank Rare Plant Rank	Blooming Period	Habitat Preference	Potential to Occur	Detected in the Study Area?	Effect of Proposed Activity
40.	**Jared's Pepper-Grass** *Lepidium jaredii* subsp. *jaredii*	None/None G2G3T1T2/S1S2 1B.2	March - May	Alkali bottoms, slopes, washes. <500 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect
41.	**Jones' Bush-mallow** *Malacothamnus jonesii*	None/None G4/S4 4.3	May - July	Open chaparral in foothill woodland. 250-830 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect
42.	**Carmel Valley Bush-mallow** *Malacothamnus palmeri* var. *involucratus*	None/None G3T2Q/S2 1B.2	April - October	Chaparral, cismontane woodland, coastal scrub. 30-1100 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect
43.	**Santa Lucia Bush-mallow** *Malacothamnus palmeri* var. *palmeri*	None/None G3T2Q/S2 1B.2	May - July	Interior valleys foothills; 30-800 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect
44.	**Oregon Meconella** *Meconella oregana*	None/None G2G3/S2 1B.1	March - May	Shaded canyons; <1000 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect
45.	**Palmer's Monardella** *Monardella palmeri*	None/None G2/S2 1B.2	June - August	Chaparral, forest, on serpentine. 200-800 m.	No. Serpentine soil is not present in the Study Area.	No	No Effect
46.	**Woodland Woollythreads** *Monolopia gracilens*	None/None G3/S3 1B.2	March - July	Chaparral, serpentine grassland, cismontane woodland, sandy to rocky soils. 100-1200 m.	No. Serpentine soil is not present in the Study Area.	No	No Effect
47.	**Spreading Navarretia** *Navarretia fossalis*	Threatened/None G2/S2 1B.1	April - June	Chenopod scrub, marshes and swamps, playas, and vernal pools; 30-1300 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect

	Common Name *Scientific Name*	Fed/State Status Global/State Rank Rare Plant Rank	Blooming Period	Habitat Preference	Potential to Occur	Detected in the Study Area?	Effect of Proposed Activity
48.	**Shining Navarretia** *Navarretia nigelliformis* subsp. *radians*	None/None G4T2/S2 1B.2	May - July	Vernal pools, clay depressions, dry grasslands. 150-1000 m.	High. Suitable habitat is present in grassland habitat in the Study Area. There are known occurrences within 0.5 mile of the Study Area.	No	No Effect
49.	**Large-flowered Nemacladus** *Nemacladus secundiflorus* var. *secundiflorus*	None/None G3T3?/S3? 4.3	April - May	Chaparral, Valley and foothill grassland; dry, gravelly slopes. 200-2000 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect
50.	**Hooked Popcornflower** *Plagiobothrys uncinatus*	None/None G2/S2 1B.2	April - May	Canyon sides, chaparral, rocky outcrops, ± fire follower; on sandstone. 300-600 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect
51.	**San Gabriel Ragwort** *Senecio astephanus*	None/None G3/S3 4.3	April - June	Steep rocky slopes in chaparral/coastal-sage scrub and oak woodland. 400-1500 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect
52.	**Cuesta Pass Checkerbloom** *Sidalcea hickmanii* subsp. *anomala*	None/Rare G3T1/S1 1B.2	May - June	Closed-cone-conifer forest, generally serpentine; SLO Co. 600-800 m.	No. Suitable habitat is not present in the Study Area.	No	No Effect

	Common Name *Scientific Name*	Fed/State Status Global/State Rank Rare Plant Rank	Blooming Period	Habitat Preference	Potential to Occur	Detected in the Study Area?	Effect of Proposed Activity
53.	**Most Beautiful Jewelflower** *Streptanthus albidus* subsp. *peramoenus*	None/None G2T2/S2 1B.2	April - September	Chaparral, Valley grassland, foothill woodland; strong affinity to serpentine soil. 150-800 m.	No. Suitable serpentine soil is not present in the Study Area.	No	No Effect

State/Rank Abbreviations:

FE: Federally Endangered
FT: Federally Threatened
PE: Proposed Federally Endangered
PT: Proposed Federally Threatened
CE: California Endangered
CR: California Rare
CT: California Threatened
Cand. CE: Candidate for California Endangered
Cand. CT: Candidate for California Threatened

California Rare Plant Ranks (CRPR):

CRPR 1A: Plants presumed extirpated in California and either rare or extinct elsewhere
CRPR 1B: Plants rare, threatened, or endangered in California and elsewhere
CRPR 2A: Plants presumed extirpated in California, but common elsewhere
CRPR 2B: Plants rare, threatened, or endangered in California, but more common elsewhere
CRPR 4: Plants of limited distribution - a watch list

CRPR Threat Ranks:

0.1 - Seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat)
0.2 - Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)
0.3 - Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

APPENDIX C. SPECIAL STATUS ANIMALS REPORTED FROM THE REGION

The 21 special status animals known or reported from the region are listed below. There are eight special status animals that could potentially occur within the Study Area based on review of preferred habitat types. No special status animals were detected in the Study Area.

	Common Name *Scientific Name*	Fed/State Status Global/State Rank CDFW Rank	Nesting-Breeding Period	Habitat Preference	Potential to Occur	Detected in the Study Area?	Effect of Proposed Activity
1.	**Tricolored Blackbird** *Agelaius tricolor*	None/Candidate Endangered G2G3/S1S2 SSC (Nesting)	March 15 - August 15	Requires open water, protected nesting substrate, & foraging area with insect prey near nesting colony.	No. Suitable nesting habitat is not present in the Study Area.	No	No Effect
2.	**Grasshopper Sparrow** *Ammodramus savannarum*	None/None G5/S3 SSC (Nesting)	March 15 - August 15	Nests in grassland habitats on mountain slopes, foothills, and valleys. May nest colonially.	No. Appropriate nesting habitat is not present in the Study Area.	No	No Effect
3.	**Northern California Legless Lizard** *Anniella pulchra*	None/None G3/S3 SSC	Early Spring – July	Chaparral, coastal dunes, coastal scrub; sandy or loose loamy soils under sparse vegetation.	Low. Potentially suitable habitat is present and there are known occurrences within 1.5 miles of the Study Area.	No	No Effect
4.	**Pallid Bat** *Antrozous pallidus*	None/None G5/S3 SSC	Spring - Summer	Rock crevices, caves, tree hollows, mines, old buildings, and bridges.	Low. Potentially suitable roosting habitat is present in buildings and large trees in the Study Area.	No	Potential Adverse Effect Can Be Mitigated
5.	**Golden Eagle** *Aquila chrysaetos*	None/None G5/S3 WL/FP	March 15 - August 15	Nests in large, prominent trees in valley and foothill woodland. Requires adjacent food source.	No. Seasonal foraging habitat is present in the Study Area. Nesting potential is not likely.	No	No Effect

	Common Name *Scientific Name*	Fed/State Status Global/State Rank CDFW Rank	Nesting-Breeding Period	Habitat Preference	Potential to Occur	Detected in the Study Area?	Effect of Proposed Activity
6.	**Great Blue Heron** *Ardea herodias*	None/None G5/S4 SA	March 15 through August 15	Colonial nester in tall trees, cliffsides, and sequestered spots on marshes.	No. Appropriate nesting habitat is not present in the Study Area.	No	No Effect
7.	**Lesser Slender Salamander** *Batrachoseps minor*	None/None G1/S1 SSC	Unknown; Terrestrial Reproduction	Broadleaved upland forest; South Santa Lucia Mountains in tanbark oak, coast live oak, blue oak, sycamore & laurel.	No. Appropriate habitat is not present in the Study Area.	No	No Effect
8.	**Obscure Bumble Bee** *Bombus caliginosus*	None/None G4?/S1S2 SA	Spring	Grasslands of the Central Valley, Central Coast mountains, and South Coast mountains, in astatic rain-filled pools. Open coastal grasslands and meadows.	Low. Marginal habitat is present in the Study Area.	No	Negligible Effect
9.	**Crotch Bumble Bee** *Bombus crotchii*	None/None G3G4/S1S2 SA	Spring	Coastal California east to the Sierra-Cascade crest and south into Mexico. Open grassland and scrub habitats. Nests underground.	Low. Appropriate habitat is present in the Study Area.	No	Negligible Effect
10.	**Vernal Pool Fairy Shrimp** *Branchinecta lynchi*	Threatened/None G3/S3 SA	Rainy Season	Clear water sandstone depression pools, grassed swale, earth slump, or basalt flow depression pools.	Moderate. Some marginal quality aquatic features are present in the Study Area.	No	No Effect

	Common Name *Scientific Name*	Fed/State Status Global/State Rank CDFW Rank	Nesting-Breeding Period	Habitat Preference	Potential to Occur	Detected in the Study Area?	Effect of Proposed Activity
11.	**Ferruginous Hawk** *Buteo regalis*	None/None G4/S3S4 WL (Wintering)	(Wintering) October - April	Open grasslands, sagebrush flats, desert scrub, low foothills and fringes of pinyon and juniper habitats. Winters locally in open grassland or savannah habitats. More common in interior SLO County than coast.	Low. Appropriate wintering habitat is present in the Study Area.	No	Potential Adverse Effect Can Be Mitigated
12.	**Townsend's Big-eared Bat** *Corynorhinus townsendii*	None/None G3G4/S2 SSC	Spring - Summer	Caves, buildings, and mine tunnels. Cave like attics as day roosts. On coast roosts are normally within 100 m. of creeks.	Low. Potentially suitable structures are present for roosting.	No	Potential Adverse Effect Can Be Mitigated
13.	**White-tailed Kite** *Elanus leucurus*	None/None G5/S3S4 FP	March 15 through August 15	Rolling foothills and valley margins with scattered oaks & river bottomlands or marshes next to deciduous woodland.	No. Appropriate nesting habitat is not present in the Study Area.	No	No Effect
14.	**Western Pond Turtle** *Emys marmorata*	None/None G3G4/S3 SSC	April - August	Permanent or semi-permanent streams, ponds, lakes.	No. Appropriate habitat is not present in the Study Area.	No	No Effect
15.	**California Linderiella** *Linderiella occidentalis*	None/None G2G3/S2S3 SA	Rainy season	Seasonal pools in unplowed grasslands with old alluvial soils underlain by hardpan or in sandstone depressions.	Low. One stockpond in the Study Area is potentially suitable for this species.	No	No Effect

	Common Name *Scientific Name*	Fed/State Status Global/State Rank CDFW Rank	Nesting-Breeding Period	Habitat Preference	Potential to Occur	Detected in the Study Area?	Effect of Proposed Activity
16.	**Monterey Dusky-footed Woodrat** *Neotoma macrotis luciana*	None/None G5T3/S3 SSC	N/A	Variety of habitats with moderate to dense understory vegetation	No. Appropriate habitat is not present in the Study Area.	No	No Effect
17.	**Salinas Pocket Mouse** *Perognathus inornatus psammophilus*	None/None G4T2?/S1 SSC	N/A	Annual grassland and desert shrub in Salinas Valley, with friable soils	No. Appropriate habitat is not present in the Study Area.	No	No Effect
18.	**Atascadero June beetle** *Polyphylla nubila*	None/None G1/S1 SA	Summer	Known only from inland sand dunes in San Luis Obispo County.	No. Appropriate habitat is not present in the Study Area.	No	No Effect
19.	**Purple Martin** *Progne subis*	None/None G5/S3 SSC (Nesting)	March 15 - August 15	In San Luis Obispo County prefers nesting in Sycamore trees along riparian corridors.	No. Appropriate habitat is not present in the Study Area.	No	No Effect
20.	**Foothill Yellow-legged Frog** *Rana boylii*	None/Candidate Threatened G3/S3 SSC	March - September	Partly shaded, shallow streams and riffles with rocky substrate. Min. 15 weeks for larval development.	No. Appropriate habitat is not present in the Study Area	No	No Effect
21.	**California Red-legged Frog** *Rana draytonii*	Threatened/None G2G3/S2S3 SSC	January - September	Lowlands and foothills in or near sources of deep water with dense, shrubby or emergent riparian vegetation. Requires 11-20 weeks for larval development.	No. Appropriate aquatic habitat is not present in the Study Area.	No	No Effect
22.	**Western Spadefoot** *Spea hammondii*	None/None G3/S3 SSC	January - August	Vernal pools in grassland and woodland habitats.	High. Appropriate habitat is present in the Study Area.	Detected in 2004 on site.	No Effect

	Common Name *Scientific Name*	Fed/State Status Global/State Rank CDFW Rank	Nesting-Breeding Period	Habitat Preference	Potential to Occur	Detected in the Study Area?	Effect of Proposed Activity
23.	**Coast Range Newt** *Taricha torosa*	None/None G4/S4 SSC	December - May	Slow moving streams, ponds, and lakes with surrounding evergreen/oak forests along coast.	No. Appropriate habitat is not present in the Study Area.	No	No Effect
24.	**American Badger** *Taxidea taxus*	None/None G5/S3 SSC	February -May	Needs friable soils in open ground with abundant food source such as California ground squirrels.	Moderate. Appropriate habitat is present in the Study Area.	No	Potential Adverse Effect Can Be Mitigated
25.	**Lompoc Grasshopper** *Trimerotropis occulens*	None/None G1G2/S1S2 SA	n/a	Unknown. Known only from Santa Barbara and San Luis Obispo Counties	Unlikely. Thought to be extirpated from the area. Only source of info is a 1909 collection.	No	No Effect
26.	**Least Bell's Vireo** *Vireo bellii pusillus*	Endangered/ Endangered G5T2/S2 None	March 15 - August 15	Riparian habitat, near water or dry streambed, <2000 ft. Nests in willows, mesquite, Baccharis.	No. Appropriate habitat is not present in the Study Area.	No	No Effect
27.	**San Joaquin Kit Fox** *Vulpes macrotis mutica*	Endangered/ Threatened G4T2/S2 None	December - July	Annual grasslands or grassy open stages with scattered shrubby vegetation. Needs loose textured sandy soil and prey base.	Low. Appropriate habitat is present in the Study Area but with no recent records of the species are known in the Paso region	No	Potential Adverse Effect Can Be Mitigated

Habitat characteristics are from the Jepson Manual and the CDNNB.

Abbreviations:

FE: Federally Endangered CE: California Endangered SSC: CDFW Species of Special Concern
FT: Federally Threatened CT: California Threatened FP: CDFW Fully-Protected

APPENDIX D. ARBORIST REPORT

Arborist Report

for

Olsen-Chandler Ranch

Paso Robles, California

Prepared for

Olsen Ranch 212, LLC
445 South D Street
Perris, CA 9530

by

ALTHOUSE AND MEADE, INC.
BIOLOGICAL AND ENVIRONMENTAL SERVICES
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APPENDIX B. TREE INFORMATION MATRIX

Certified Arborist Signature

Cory Meyer, ISA Certification No. WE7678-A
Althouse and Meade, Inc.
1602 Spring Street
Paso Robles, CA 93446
(805) 237-9626

As the certified arborist assigned to this project, I evaluated trees, reviewed, and approve the contents of this report.

Cory Meyer — 1/8/2019

Signature *Date*

Cover Page: View of a valley oak, the largest documented tree in the Arborist Report (Tree number 20), located in the southwestern portion of the Olsen property. This tree's health was rated 4. Taken October 3rd, 2018

1 INTRODUCTION

1.1 Summary

This report presents results of the tree assessment for the Olsen-Chandler Ranch, a 352.08-acre development located in Paso Robles, California, in advance of a residential development project (Project). All native trees were assessed, and a summary of tree health and management recommendations are presented. A total of 198 trees were assessed, including 193 trees on the property and five trees on adjacent properties where trees may be affected by proposed development.

1.2 City of Paso Robles Oak Tree Ordinance

This report provides relevant information for the planning and development process relative to the City of El Paso de Robles Oak Tree Ordinance (835 that amended municipal code amendment 2001-001-Oak Trees). The purpose of the oak tree ordinance is to preserve oak trees and maintain the heritage and character of "The Pass of the Oaks" as well as preserve the beauty and identity of the community. Preservation of existing oak trees in good health is the focus of this report.

1.3 Setting

1.3.1 Location

Olsen-Chandler Ranch is in Paso Robles, San Luis Obispo County, California. The Olsen Ranch, a 237.9-acre property, is bordered to the north by Linne Road, to the east by Hanson Road, to the west by residential development, and to the south by undeveloped agricultural land. The Chandler Ranch is a 105.7-acre property consisting of the southern Chandler Ranch parcel. The Project is located within the Templeton United States Geological Survey (USGS) 7.5-minute quadrangle and is comprised of six parcels (009-795-001, 009-795-002, 009-795-003, 009-795-004, 009-795-005, and 009-795-006). Approximate coordinates for the center of the property are 35.605891°N, -120.636460°W (WGS 84).

1.3.2 General Physical Characteristics

The Project area is comprised of rolling hills dominated by annual grassland. Some parcels are actively farmed or grazed while others lie fallow. Scattered oak trees occur in the southwest corner and in a band across the northern portion of the Olsen Ranch. Whereas most of the trees occur along an ephemeral stream in the northern part of Olsen Ranch where farmhouses and residences are located.

The Chandler Ranch parcel was historically farmed and is currently a regularly disked grassland habitat. Between a development known as "Our Town" and Linne Road, two young valley oak trees grow in a 3-foot deep stormwater ditch that conveys water diagonally toward the intersection of Airport Road and Linne Road. This ditch is primarily occupied with patches of coyote brush.

1.4 Responsible Parties

TABLE 1. RESPONSIBLE PARTIES

Applicant, certified arborist, engineer, and lead agency are provided.

Project Contact	ISA Certified Arborist and Biological Consultant
Olsen Ranch 212, LLC c/o Mike Naggar and Associates Inc. 445 S. D St. Perris, CA 92570 (915) 437-4329	**Cory Meyer, ISA Certification No. WE7678-A** **Jessica Griffiths, Senior Biologist** **Althouse and Meade, Inc.** 1602 Spring Street Paso Robles, CA 93446 (805) 237-9626 c/o Jessica Griffiths; JessicaG@alt-me.com
Project Engineer/Surveyors	**Lead Agency**
Byron Glenn, P.E. **Senior Civil Engineer** **Wallace Group** 612 Clarion Ct San Luis Obispo, CA 93401 (805) 544-4011 ByronG@wallacegroup.us	**Darren Nash** **City of Paso Robles** 1000 Spring Street Paso Robles, CA 93446 (805) 237-3970 DNash@prcity.com

2 METHODS

2.1 Field Tree Inventory and Evaluation

Surveys were conducted by certified arborist, Cory Meyer, and botanist, Kyle Nessen, on October 1, 3, 4, and 16, 2018 on the Olsen Ranch, and on December 13, 2018 on the Chandler Ranch parcel by LynneDee Althouse. Each tree was tagged in the field with a numbered aluminum tag and GPS points were taken. Tree height, canopy width, and diameter at breast height (dbh) were recorded and the overall condition of the tree was visually rated. The rating system defined in Table 2 consists of a scale from one to ten based on the structure and health of each tree. Any signs of pests, disease, or structural weakness were noted. Trees were inspected from the ground only; tree canopies were not accessed, and no below-ground inspection took place. Trees were also mapped by a licensed surveyor from the Wallace Group. Trees 4-inches dbh and under not recorded for this report were mapped up by the Wallace Group survey team.

TABLE 2. TREE HEALTH RATING SYSTEM

Rating	Condition
0	Deceased
1	Evidence of massive past failures, extreme disease and is in severe decline
2	May be saved with attention to pruning, insect/pest eradication and future monitoring
3	Some past failures, some pests or structural defects that may be mitigated with pruning
4	May have had minor past failures, excessive deadwood or minor structural defects that can be mitigated with pruning
5	Relatively healthy tree with little visual structural and or pest defects
6	Healthy tree that probably can be left in its natural state
7, 8, 9	Have had proper arboricultural pruning and attention or have no apparent structural defects
10	Specimen tree with perfect shape, structure and foliage in a natural or protected setting

3 RESULTS

3.1 Tree Quantities

A total of 198 trees were assessed, including 193 on the Project and another five trees immediately adjacent to the Project which could be impacted by Project development. Tree species tagged were valley oak (*Quercus lobata*), blue oak (*Quercus douglasii*), red willow (*Salix laevigata*), Fremont's cottonwood (*Populus fremontii*) and foothill pine (*Pinus sabiniana*). Several oaks were identified as "valley x blue oak" hybrids. See Table 3 for a summary of tree species and numbers. See Appendix A for a map showing tree locations. See Appendix B for a table showing individual tree data including dbh, height, width, and health rating.

TABLE 3. NUMBER AND SPECIES OF TREES ASSESSED

Species	Number
Valley oak	107
Blue oak	60
Valley x blue oak hybrid	10
Fremont's cottonwood	13
Red willow	6
Foothill pine	2
Total	**198**

3.2 Tree Health Discussion

Of the 193 trees assessed on the Project, five were dead, 19 were in poor condition (rated 1 or 2), 120 were in moderate condition (rated 3 or 4), and 49 were in good condition (rated 5, 6, or 7). No trees were recorded with a rating higher than 7 because of structure defects or damage observed during the inventory. Section 5 provides representative photographs that illustrate tree condition during the inventory. See Appendix B for a table of individual trees and their health ratings.

Many of the oak trees had an abundance of oak galls resulting from cynipid wasps. In general, most gall wasps on oak trees do not affect the trees' health. While leaves may drop prematurely or become distorted, gall wasps are usually only a cosmetic problem. A variety of galls, including urchin, red cone, potato, and hedgehog, were observed. These galls are caused by the wasp larvae affecting the leaf and twig tissue causing a reaction that develops the gall as a means of protection and a food source for the larvae as it metamorphosizes into a tiny wasp.

Valley oaks are often noted for the "oak apples", galls that look like tiny apples, formed by a gall wasp with the scientific name *Adricus californicus*. Another gall that looks like a "Hershey Kiss" is formed by the tiny gall wasp called *Adricus kingi* (Russo 2006).

Fungal conks, the fruiting part of a fungus that is typically underground or under the bark of trees, were observed on some trees, evidence that there is possible decay beneath the bark at these locations on the trees. Decay fungus was also noted on some of the dead trees standing. The presence of fungi responsible for decay such as heartrot, generally indicates elevated tree failure rate (Glaeser and Smith 2010).Trees with the presence of fungus or decay were given a relatively low health rating.

Pests noted included aphid infestations (resulting in sooty mold on some of the oak trees), whitefly, and current and old bark beetle (borer) activity.

Several willow and cottonwood trees appear to have been impacted by the prolonged drought, showing signs of water stress.

With the exception of the northeast portion of the property, oak regeneration was not observed due to farming and grazing.

4 MANAGEMENT RECOMMEDATIONS

The proposed Project may result in impacts to native trees. Avoidance and minimization measures to protect trees in place are listed below.

- **Arborist Monitoring.** An arborist shall be present for any activities that may result in impacts to trees. The monitoring does not have to be continuous but observational at times during these activities. It is the responsibility of the owner or their designee to inform the arborist prior to the work so he/she can be present.
- **Fencing**. All trees to remain within 50 feet of construction or grading activities shall be marked for protection (e.g., with flagging) and their root zone fenced prior to any grading. Grading, utility trenching, compaction of soil (including vehicle parking), or placement of fill shall be avoided within these fenced areas.
- **Trenching Within Drip Line.** Where trenching or digging within the dripline is specifically permitted, the work shall be conducted in a manner that minimizes root damage, as directed by the arborist. All roots larger than 1 inch in diameter that cannot be saved shall be cut clean with sharp pruning tools and not left ragged. Excavating or boring around roots is desirable if necessary, for utility installation of sewer, water, gas, or electric lines.
- **Grading Within the Drip Line.** Grading should not encroach within the drip line unless authorized.
- **Exposed Roots.** Any exposed roots shall be re-covered the same day they were exposed if possible. If they cannot, they must be covered with burlap or another suitable material and wetted down 2 times per day until reburied.
- **Existing Surfaces.** The existing ground surface within the drip line of all native trees shown on the plan shall not be cut, filled, or compacted unless shown on the grading plans and approved by the arborist.
- **Construction Materials and Waste.** No liquid or solid construction waste shall be dumped on the ground within the drip line of any native tree. The drip line areas are not for storage of materials.

5 PHOTOGRAPHS

Photo 1. **Health Rating 7:** Representative valley oak, tag number 169, looking north. October 4, 2018.

Photo 2. **Health Rating 6:** Representative blue oaks, tag numbers 11 and 12, looking east. October 3, 2018.

Photo 3. **Health Rating 5:** Representative blue oak, tag number 34, looking northeast. October 3, 2018.

Photo 4. **Health Rating 4:** Representative valley oak, tag number 87, looking northeast. October 4, 2018.

Photo 5. **Health Rating 3:** Representative blue oak, tag number 10, looking southwest. October 3, 2018.

Photo 6. **Health Rating 2:** Representative blue oak, tag number 24, looking southeast. October 3, 2018.

Photo 7. **Health Rating 1:** Representative blue oak, tag number 23, looking southeast. October 3, 2018.

Photo 8. **Health Rating 0:** Representative valley oak, tag number 167, looking east. October 4, 2018.

Photo 9. Red cone galls on valley oak leaves. September 7, 2018.

Photo 10. View of oak savanna with no regeneration, looking northeast. September 7, 2018.

6 REFERENCES

Glaeser, Jessi A, and Kevin T. Smith. 2010. Decay fungi of oaks and associated hardwoods for western arborists. Western Arborist, Winter, pp. 32-46. Available at: https://www.ncrs.fs.fed.us/pubs/jrnl/2010/nrs_2010_glaeser_003.pdf

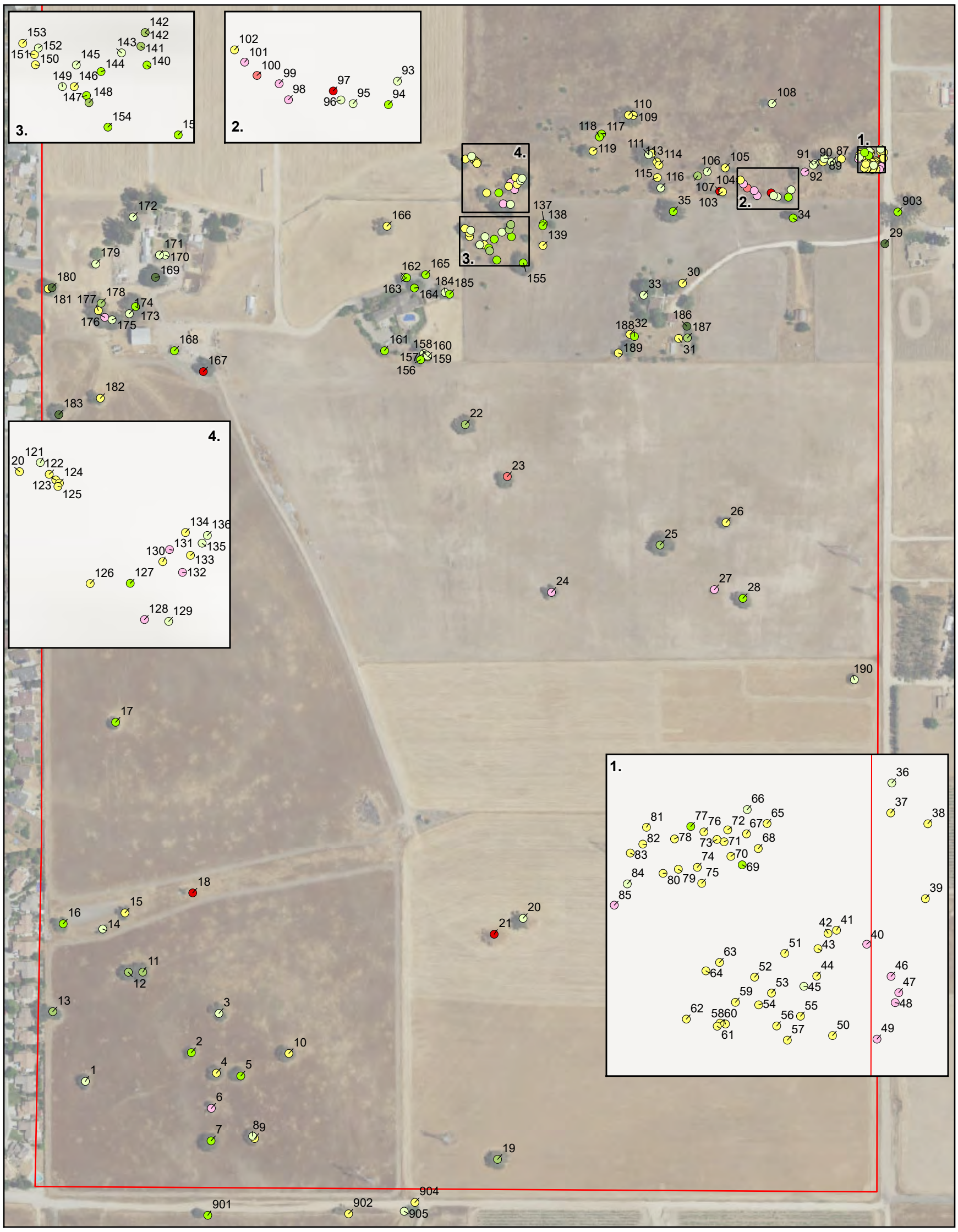
Miller, Renee. 2018. Oak trees and cynipid wasps & galls. Home Guides. SF Gate, http://homeguides.sfgate.com/oak-trees-cynipid-wasps-galls-75059.html. Accessed 18 December 2018.

Russo, Ron. 2007. Field guide to plant galls of California and other Western states. U.C. Press, Berkeley.

City of El Paso de Robles. 2002. Ordinance No. 8.35 N.S., an Ordinance of the City of El Paso de Robles Amending Section 10.01 et seq. and related Provision of the Municipal Code (Municipal Code Amendment 2001-001 – Oak Trees). Available at: https://www.prcity.com/DocumentCenter/View/11843/2002-City-Council-Ordinance---835-PDF

Wallace Group. 2018. Topographic survey of portion of lots 55-57, 65-66 in the city of Paso Robles, County of San Luis Obispo, CA. Review draft

Appendix A-1. Olsen Ranch Tree Inventory



Health Rating 0 - 2: Remove
Health Rating 3: Remove if Near Development
Health Rating 4 - 7: Preserve
Health Rating 8-10: No Trees Present

Olsen Chandler Ranch
Map Center: 120.63651°W 35.60607°N
Paso Robles, San Luis Obispo County

Imagery Date: 09/28/2016

Reso A - Exhibit C2 (EIR Technical Appendix)

Appendix A-2. Chandler Ranch Tree Inventory

Legend

Tree Health Rating

- 3
- 5
- 6

Chandler Ranch Boundary

Olsen Ranch Boundary

N

0 500 1,000 Feet

Health Rating 0 - 2: No Trees Present
Health Rating 3: Remove if Near Development
Health Rating 4 - 7: Preserve
Health Rating 8-10: No Trees Present

Olsen Chandler Ranch
Map Center: 120.64372°W 35.61566°N
Paso Robles, San Luis Obispo County

Imagery Date: 09/28/2016

ALTHOUSE AND MEADE, INC.
BIOLOGICAL AND ENVIRONMENTAL SERVICES

Map Updated:
January 04, 2019 09:54 AM by MMP

APPENDIX B. TREE INFORMATION MATRIX

Tag #	Species	# of Trunks	Total DBH (in)	Height (ft)	Width (ft)	Health Rating	Notes
1	Blue oak	2	36	30	48	4	Recommend pruning. Hollow large branch
2	Blue oak	1	25	33	42	5	
3	Blue oak	1	40	41	45	4	
4	Blue oak	1	35	39	51	3	Significant rot
5	Blue oak	1	31	36	51	5	Damaged trunk borers, active beehive
6	Blue oak	2	40	39	45	2	
7	Blue oak	1	43	56	72	5	
8	Blue oak	1	33	38	54	4	
9	Blue oak	1	19	26	21	3	Poor structure, heavy on right side
10	Blue oak	1	48	48	63	3	
11	Blue oak	1	38	43	72	6	
12	Blue oak	1	28	39	57	6	
13	Blue oak	1	32	46	36	6	
14	Red willow	2	35	18	39	4	
15	Red willow	3	57	26	51	3	
16	Red willow	6	72	33	63	5	
17	Blue oak	1	32	35	45	5	
18	Red willow	3	34	16	30	0	Dead
19	Oak hybrid	1	48	45	72	6	
20	Valley oak	1	56	50	69	4	
21	Valley oak	1	34	47	32	0	Dead
22	Blue oak	1	36	47	66	6	
23	Blue oak	1	33	32	66	1	Severe decline
24	Blue oak	1	38	27	33	2	1/2 tree failed
25	Blue oak	1	40	63	81	6	Large limb broken
26	Blue oak	1	30	29	45	3	

Tag #	Species	# of Trunks	Total DBH (in)	Height (ft)	Width (ft)	Health Rating	Notes
27	Blue oak	2	49	22	24	2	
28	Blue oak	1	38	44	75	5	
29	Valley oak	1	4	14	8	7	
30	Valley oak	1	14	36	33	3	Possible power lines
31	Fremont cottonwood	1	12	25	18	3	
32	Fremont cottonwood	1	10	23	30	3	
33	Valley oak	1	11	38	33	4	
34	Blue oak	1	48	45	60	5	Large branch failure
35	Valley oak	1	48	64	66	5	
36	Valley oak	1	8	20	16	4	Under power lines
37	Valley oak	1	9	21	15	3	Topped under power lines
38	Valley oak	5	19	23	21	3	Topped under power lines
39	Valley oak	1	14	25	24	3	Topped under power lines
40	Valley oak	1	8	15	6	2	Topped under power lines
41	Valley oak	1	5	18	10	3	Thinning benefits remaining trees
42	Valley oak	1	8	24	16	3	Thinning benefits remaining trees
43	Valley oak	1	6	25	5	3	Thinning benefits remaining trees
44	Valley oak	1	10	45	15	3	Thinning benefits remaining trees
45	Valley oak	1	12	47	24	4	
46	Valley oak	1	8	18	10	2	Topped under power lines
47	Valley oak	1	7	20	8	2	Topped under power lines
48	Valley oak	1	9	18	18	2	Topped under power lines
49	Valley oak	2	19	23	21	2	Topped under power lines
50	Valley oak	1	6	30	16	3	Thinning benefits remaining trees
51	Valley oak	1	7	33	15	3	Thinning benefits remaining trees
52	Valley oak	1	4	26	6	3	Thinning benefits remaining trees
53	Valley oak	1	8	40	16	3	Thinning benefits remaining trees

Tag #	Species	# of Trunks	Total DBH (in)	Height (ft)	Width (ft)	Health Rating	Notes
54	Valley oak	1	7	40	12	3	Thinning benefits remaining trees
55	Valley oak	1	8	44	20	3	Thinning benefits remaining trees
56	Valley oak	1	7	39	16	3	Thinning benefits remaining trees
57	Valley oak	1	10	42	24	3	Thinning benefits remaining trees
58	Valley oak	1	9	40	21	3	Thinning benefits remaining trees
59	Valley oak	1	4	26	18	3	Thinning benefits remaining trees
60	Valley oak	1	10	42	23	3	Thinning benefits remaining trees
61	Valley oak	1	6	32	16	3	Thinning benefits remaining trees
62	Valley oak	1	13	24	18	3	Thinning benefits remaining trees
63	Valley oak	1	10	40	8	3	Thinning benefits remaining trees
64	Valley oak	1	7	38	18	3	Thinning benefits remaining trees
65	Valley oak	1	5	32	18	3	Thinning benefits remaining trees
66	Valley oak	1	8	38	18	4	
67	Valley oak	1	5	35	12	3	Thinning benefits remaining trees
68	Valley oak	1	6	30	21	3	Thinning benefits remaining trees
69	Valley oak	2	14	42	21	5	
70	Valley oak	1	6	35	24	3	Thinning benefits remaining trees
71	Valley oak	1	5	34	9	3	Thinning benefits remaining trees
72	Valley oak	1	6	36	21	3	Thinning benefits remaining trees
73	Valley oak	1	5	30	9	3	Thinning benefits remaining trees
74	Valley oak	1	4	20	6	3	Thinning benefits remaining trees
75	Valley oak	1	4	28	12	3	Thinning benefits remaining trees
76	Valley oak	1	6	35	21	3	Thinning benefits remaining trees
77	Valley oak	4	27	50	21	5	
78	Valley oak	1	9	45	30	3	Thinning benefits remaining trees
79	Valley oak	1	4	25	12	3	Thinning benefits remaining trees
80	Valley oak	2	9	28	25	3	Thinning benefits remaining trees

Tag #	Species	# of Trunks	Total DBH (in)	Height (ft)	Width (ft)	Health Rating	Notes
81	Valley oak	1	5	25	9	3	Thinning benefits remaining trees
82	Valley oak	1	6	26	12	3	Thinning benefits remaining trees
83	Valley oak	1	5	20	9	3	Thinning benefits remaining trees
84	Valley oak	1	13	48	30	4	
85	Valley oak	1	42	42	45	2	
86	Valley oak	1	7	22	9	3	Thinning benefits remaining trees
87	Valley oak	2	47	63	72	4	
88	Valley oak	1	10	35	12	3	
89	Valley oak	3	36	53	45	4	
90	Valley oak	1	5	18	12	4	
91	Valley oak	1	6	18	15	4	
92	Fremont cottonwood	2	26	47	63	2	
93	Valley oak	1	9	40	21	4	
94	Valley oak	1	24	47	42	5	
95	Valley oak	1	10	32	24	4	
96	Valley oak	1	5	17	9	4	
97	Fremont cottonwood	1	16	54	30	0	Dead
98	Fremont cottonwood	4	28	39	42	2	
99	Red willow	4	37	15	27	2	
100	Fremont cottonwood	1	14	36	30	1	Sprouting at base. Mostly dead
101	Fremont cottonwood	1	14	28	21	2	
102	Fremont cottonwood	2	12	18	15	3	
103	Fremont cottonwood	1	6	15	12	3	Drought Impacts
104	Fremont cottonwood	1	10	18	12	0	Dead
105	Red willow	3	33	17	24	3	
106	Valley oak	1	7	25	12	4	

Tag #	Species	# of Trunks	Total DBH (in)	Height (ft)	Width (ft)	Health Rating	Notes
107	Valley oak	1	11	32	12	6	
108	Valley oak	1	11	28	21	4	
109	Valley oak	1	35	67	75	3	
110	Valley oak	1	26	59	23	3	
111	Valley oak	1	40	75	84	4	Mistletoe. Large Nest
112	Valley oak	1	14	32	18	3	Co-dominate, included bark
113	Valley oak	1	5	23	12	3	Poor branching, dead wood
114	Valley oak	1	7	24	9	3	Needs trimming
115	Valley oak	1	5	18	9	3	
116	Valley oak	2	32	58	55	4	Co-dominate
117	Valley oak	1	8	28	18	5	
118	Valley oak	1	7	25	15	5	
119	Fremont cottonwood	2	46	47	66	3	
120	Valley oak	2	50	35	45	3	Topped under power lines
121	Valley oak	1	9	33	18	4	Co-dominate, thinning
122	Valley oak	2	10	20	9	3	
123	Valley oak	2	12	30	18	3	Thinning
124	Valley oak	1	5	23	12	3	
125	Valley oak	1	6	27	9	3	
126	Oak hybrid	1	27	37	60	3	Poorly structured tree
127	Blue oak	1	6	22	18	5	
128	Valley oak	1	39	61	60	2	Large branch failures
129	Blue oak	3	26	27	30	4	
130	Valley oak	2	26	49	36	3	Co-dominant, dead wood in canopy
131	Oak hybrid	2	11	21	12	2	
132	Valley oak	1	20	56	54	2	
133	Oak hybrid	2	24	39	48	3	

Tag #	Species	# of Trunks	Total DBH (in)	Height (ft)	Width (ft)	Health Rating	Notes
134	Valley oak	1	19	60	45	3	Poorly structured
135	Valley oak	2	36	65	60	4	
136	Valley oak	5	67	32	58	4	
137	Oak hybrid	1	6	18	12	5	
138	Oak hybrid	1	6	18	9	5	
139	Valley oak	1	6	22	15	3	Poor structure
140	Oak hybrid	1	4	16	15	5	
141	Oak hybrid	1	7	27	15	6	
142	Oak hybrid	1	4	18	6	6	
143	Blue oak	2	8	14	15	4	
144	Blue oak	1	4	18	12	5	
145	Blue oak	7	20	21	27	4	Included bark in trunk, needs trimming
146	Valley oak	1	19	38	36	3	Co-dominate leaders, poor branch attachments
147	Blue oak	2	10	18	12	5	
148	Blue oak	1	6	14	9	6	
149	Blue oak	1	6	22	12	4	
150	Oak hybrid	1	15	25	18	3	Poor structure
151	Valley oak	2	10	25	12	3	Co-dominate trunk
152	Valley oak	1	7	24	15	4	
153	Blue oak	1	16	28	45	3	Under power lines
154	Blue oak	4	40	26	30	5	
155	Blue oak	1	49	44	72	5	
156	Blue oak	2	25	60	30	5	Sooty mold, wet wood
157	Blue oak	1	7	24	18	4	
158	Blue oak	1	8	30	18	4	
159	Blue oak	2	17	30	24	4	
160	Blue oak	2	19	29	24	3	

Tag #	Species	# of Trunks	Total DBH (in)	Height (ft)	Width (ft)	Health Rating	Notes
161	Blue oak	3	34	22	36	5	
162	Blue oak	3	27	38	27	4	
163	Blue oak	2	23	38	18	5	
164	Blue oak	1	17	32	39	5	
165	Blue oak	1	18	30	24	5	
166	Blue oak	1	38	42	60	3	Badly wounded trunk
167	Valley oak	1	63	40	15	0	Dead
168	Blue oak	3	26	25	30	5	
169	Blue oak	1	50	47	90	7	Fungal conks on trunk
170	Valley oak	1	7	35	18	4	
171	Blue oak	1	10	30	21	4	
172	Valley oak	1	26	53	60	4	
173	Blue oak	1	36	55	66	5	
174	Valley oak	1	29	52	57	4	
175	Blue oak	1	27	52	72	4	
176	Blue oak	1	41	52	66	2	Cavity into trunk, 1/3 dead. Cavity
177	Blue oak	1	28	58	72	3	In grove near barns
178	Valley oak	1	34	71	75	6	
179	Valley oak	3	19	38	30	4	
180	Valley oak	1	27	70	66	7	
181	Blue oak	1	8	16	24	3	Cavity in trunk
182	Valley oak	1	39	40	27	3	Broken branch hollow into trunk. Wood pecker cavities
183	Blue oak	1	48	43	69	7	
184	Blue oak	1	13	28	30	4	
185	Blue oak	1	12	26	33	5	
186	Foothill pine	1	8	28	18	7	
187	Foothill pine	1	6	24	15	6	

Tag #	Species	# of Trunks	Total DBH (in)	Height (ft)	Width (ft)	Health Rating	Notes
188	Blue oak	2	8	21	12	5	
189	Blue oak	1	17	25	24	3	Co-dominate, included bark
190	Blue oak	1	25	38	33	4	Post failures, east side of tree. Wood pecker cavities
191	Valley oak	1	8	20	12	7	In ditch
192	Valley oak	1	6	20	8	7	In ditch
193	Valley oak	5	34	35	20	3	West side of fence along Fontana Road; abundant galls
901	Blue oak	2	34	23	35	5	Outside Study Area
902	Blue oak	2	26	26	36	3	Outside Study Area. Some branch failures
903	Valley oak	1	38	55	60	5	Outside Study Area
904	Fremont cottonwood	2	16	20	18	3	Outside Study Area. Some borer activity and decay
905	Fremont cottonwood	1	17	24	20	4	Outside Study Area

Special Status Invertebrate Wet Season Survey

NINETY-DAY REPORT

USFWS TAKE PERMIT # TE-102310-3

SURVEY FOR THE OLSEN RANCH

IN PASO ROBLES, SAN LUIS OBISPO COUNTY, CALIFORNIA

Prepared By:

MITCHELL C. DALLAS

Branchiopod Surveyor
USFWS Take Permit #TE-102310-3
(805) 459-2907

7-1-19
DATE

I certify that the information in this survey report and attached exhibits fully and accurately represents my work.

Introduction

This report is required under United States Fish and Wildlife Service ESA §10(a)(1)(A) permit # TE-102310-3. The current permit expired on 9/7/18 and is currently in the renewal process following a successful renewal exam with the United States Fish and Wildlife Service Carlsbad Field Office. The current permit remains valid during the renewal process.

This report is submitted in fulfillment of conditions in the Permit, the Special Terms and Conditions for Mitchell C. Dallas and the U.S. Fish and Wildlife Service Interim Survey Guidance to Permittees of 11/7/2017 that is attached to that permit. A full WET SEASON protocol level survey was achieved. Wet season sampling was conducted to determine the presence or absence of federally listed Vernal Pool Branchiopods either within the project footprint or that may be affected by the project.

Permission to conduct the survey was granted by email from Chris Kofron and Juile Vanderwier of the U.S. Fish and Wildlife Service Ventura Office on 12/3/18. The following authorized surveyor conducted surveys during the wet season: Mitchell C. Dallas.

The wet season survey was conducted at the request of Althouse and Meade Inc. The action area was surveyed following rain events that occurred in order to determine if any features (pools) held water. In total, six features held water for sufficient time to be considered potential habitat requiring surveys. See attached photos and data sheets.

A reproduction of a U. S. Geological Survey topographic Templeton quadrangle map is attached showing the location surveyed. The coordinates for the pool are located in the Required Information Section of this report and on the attached survey field data sheets.

The information presented below is presented in the same order and with the same numbering system used in the guidance.

Project Description: The proposed project will build new homes in the Paso Robles area.

Required Information

1. The project site can be located on the attached U. S. Geological Survey Templeton, California, 7.5 minute topographic quadrangle map (Appendix 1). The location of the specific sites sampled is Township M27S Range 12E Section 11 35°36’11.79”N 120°38’26.53”W NAD 83

The action area is a combination of grazed and ungrazed fields and hay crops with an adjacent roads and infrastructure including track homes and large un or minimally developed parcels.

Olsen Habitat Feature Location		
USGS Templeton Quadrangle M27S 12E 11		
Feature #	Latitude	Longitude
1	35°36'11.79"N	120°38'26.53"W
2	35°36'13.55"N	120°38'19.93"W
3	35°36'33.37"N	120°38'18.48"W
4	35°36'34.31"N	120°38'17.52"W
5	35°36'36.30"N	120°38'12.80"W
6	35°36'04.00"N	120°38'27.50"W

2. A color aerial photo of the project location is included in the attached Appendix 2.
3. The estimated number of crustaceans observed in Pool #1 is listed in the attached data sheets. Estimates for the pool are as follows:

Species	Pool#1	#2	#3	#4	#5	#6
Branchinecta lynchi	N	N	N	N	N	N
Branchinecta conservatio	N	N	N	N	N	N
Branchinecta longiantenna	N	N	N	N	N	N
Lepidurus packardi	N	N	N	N	N	N
Streptocephalus Woottoni	N	N	N	N	N	N

Estimates are as per the guidance: none (N), few (F) (< 50) and many (M) (>50). Details are available in the attached data sheets.

4. Federally listed Vernal Pool Branchiopods were not found, none were preserved.
5. Qualitative description of the vernal pool community: The action area is located in San Luis Obispo County within the City of Paso Robles. The action area has a few homes and farm buildings within and it is bordered by roads, track homes and adjacent divided undeveloped parcels. There is rolling topography with swales and ponding water features. See attached data sheets for more details.

6. Data collected during the field visits can be found on the attached wet season data sheets in Appendix 3. Listed vernal pool branchiopods were not observed during the surveys.
7. Additional water quality data: none.
8. The survey methodology used was that described in guidance attached to Permit # TE-102310-3 to determine the presence or absence of federally listed Vernal Pool Branchiopods either within the project footprint or that may be affected by the project. During the survey effort there was a slight modification to the survey intervals with one survey occurring at a 13 day interval and another survey occurring at a 15 day interval. The variation in survey intervals was deemed negligible and approved by Juile Vanderwier of the U.S. Fish and Wildlife Service Ventura Office.

Conclusion

Federally listed Vernal Pool Branchiopods were not found in the potential habitat features within the project action area during this Wet Season protocol level survey. The survey did meet the criteria to establish a full wet season protocol level survey.

Contact: If you have any questions or require more information about this project or the invertebrate survey, please contact Mitchell Dallas, Authorized Surveyor, TE-102310-3 at (805) 459-2907 or email **mitchdallas@hotmail.com**.

Appendices

Appendix 1.

USGS original scale map showing the area surveyed.

Appendix 2.

Aerial photo of the feature locations.

Appendix 3.

Wet Season Data Sheets and Photos

Appendix 1

USGS Paso Robles Quadrangle

San Luis Obispo California

United States Geological Survey Topographic Map

Legend

Study Area

N

0 0.25 0.5 1 Mile

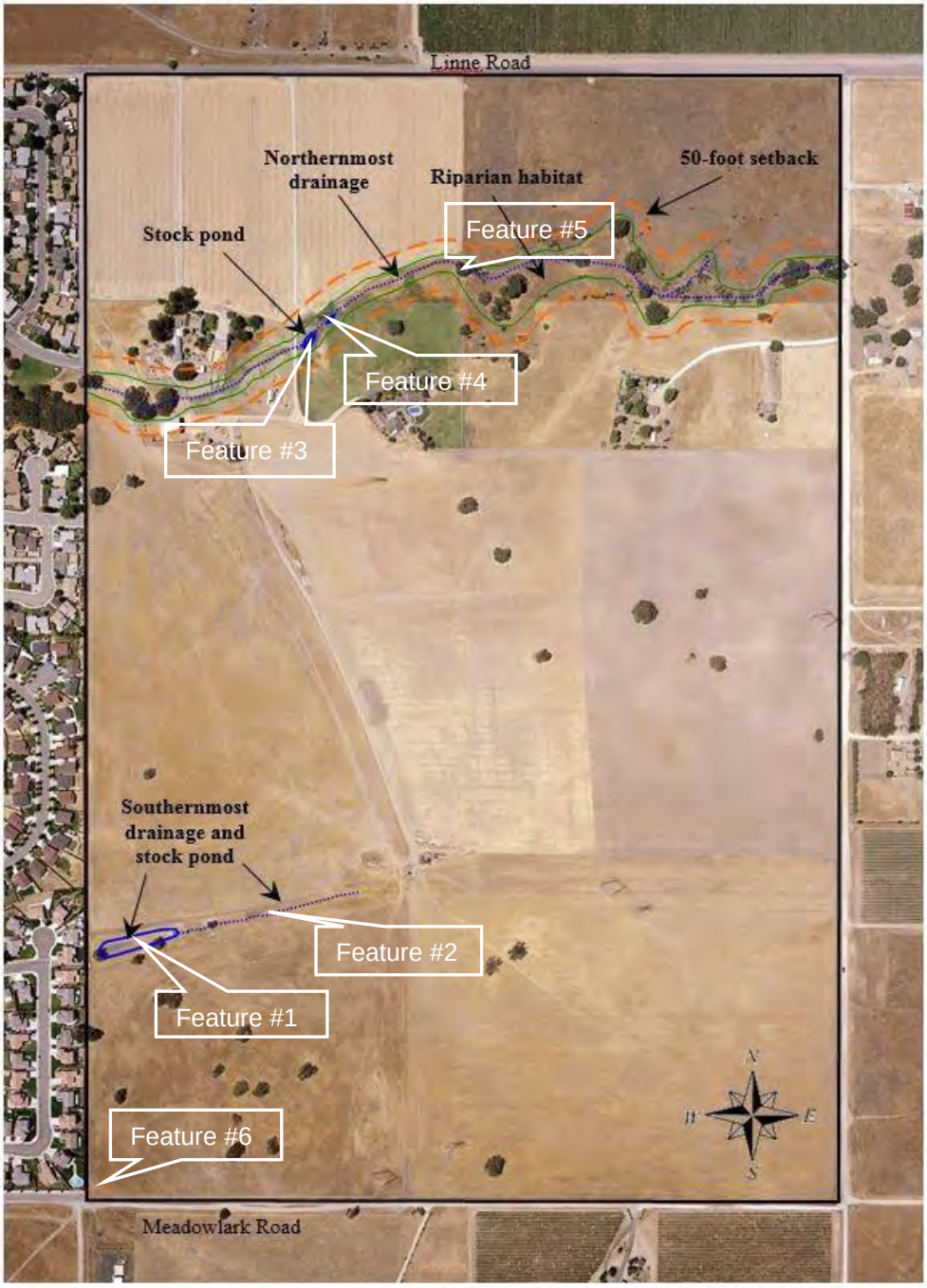
Olsen-Chandler Ranch
Map Center: 120.6435°W 35.60867°N
Paso Robles, San Luis Obispo County

USGS Quadrangle: Templeton

ALTHOUSE AND MEADE, INC.
BIOLOGICAL AND ENVIRONMENTAL SERVICES

Map Updated:
October 26, 2018 11:24 AM by JBB

Appendix 2


Linne Road
Northernmost drainage
Riparian habitat
50-foot setback
Stock pond
Feature #5
Feature #4
Feature #3
Southernmost drainage and stock pond
Feature #2
Feature #1
Feature #6
Meadowlark Road
N
W
E
S

Appendix 3

Wet Season Survey

Photos and Data Sheets

1/20/19 Feature #1 looking west

1/20/19 Feature #1 looking north

1/20/19 Feature #2 looking east

1/20/19 Feature #2 looking west

1/201/19 Feature #3 looking east

1/20/19 Feature #3 looking west

1/20/19 Feature #4 looking east

1/201/9 Feature #4 looking west

1/20/19 Feature #5 looking east

1/20/19 Feature #6 looking west

2/4/19 Feature #1 looking west

2/4/19 Feature #1 looking east

2/4/19 Feature #2 looking east

2/4/19 Feature #3 looking east

2/4/19 Feature #3 & 4 connected looking east

2/4/19 Feature #5 looking east

2/4/19 Feature #6 looking east

2/4/19 Feature #6 looking south

2/17/19 Feature #1 looking west

2/17/19 Feature #1 looking east

2/17/19 Feature #2 looking west

2/17/19 Feature #3 looking east

2/17/19 Feature #4 looking northeast

2/17/19 Feature #5 looking north

2/17/19 Feature #6 looking south

2/17/19 Feature #6 looking south

3/2/19 Feature #1 looking west

3/2/19 Feature #2 looking west

3/2/19 Feature #2 looking east

3/2/19 Feature #3 looking east

3/2/19 Feature #3 looking west

3/2/19 Feature #4 looking west

3/2/19 Feature #5 looking east

3/2/19 Feature #5 looking west

3/2/19 Feature #6 looking south

3/2/19 Feature #6 looking north

3/17/19 Feature #1 looking west

3/17/19 Feature #1 looking east

3/17/19 Feature #2 looking west

3/17/19 Feature #2 dry

3/17/19 Feature #3 looking west

3/17/19 Feature #4 looking east

3/17/19 Feature #4 looking west

3/17/19 Feature #5 looking east

3/17/19 Feature #5 looking west

3/31/19 Feature #1 looking west

3/31/19 Feature #1 looking east

3/31/19 Feature #3 looking east

3/31/19 Feature #3 looking west

3/31/19 Feature #4 looking east

3/31/19 Feature #5 looking east

3/31/19 Feature #5 looking west

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no X yes

Required color slides and/or photographs for the project site are included: ___ no X yes

Date: 1/20/19 Time: 12:30 County: SLO Quad: Templeton

Collector(s): M. Dallas Permit #: TE102310-3

Site/Project Name: Olsen Pool #: 1

Township: M27S Range: 12E Section: 11 35°36'11.79"N 120°38'26.53"W lat. long.

Temperature: Water: 54°F ~~°C~~ Air: 57°F ~~°C~~

Pool Depth:
at time of sampling: 36" ~~cm~~
estimated maximum: 48" cm

Surface Area:
at time of sampling: 1000 m^2 x ~~m~~
estimated maximum: 1299 m^2 x ~~m~~

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed: tire tracks garbage discing/plowing)
- ungrazed (grazed: cattle horses sheep other_____)
  (light moderate heavy)
- land use of habitat: Stock pond

(Optional) Water Chemistry Data None

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved NH_4:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Waterboatmen
Turbid water w/ lots of sticks
No VPBs Barking Dog

(USF&WS rev. 4/96)

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans: Ø
(note reproductive status)

Notostracans: Ø
(note reproductive status)

(Optional) Species Observations:

Cladocerans:	yes (no)	Insects: (adult or larvae)	
Conchostracans:	yes (no)	Anisoptera:	yes (no)
Copepods:	yes (no)	Zygoptera:	yes (no)
Ostracods	yes (no)	Hydrophilidae:	yes (no)
Fish	yes (no)	Dytiscidae:	yes (no)
Frogs	yes (no)	Corixidae:	(yes) no
Salamanders	yes (no)	Notonectidae:	yes (no)
Waterfowl	yes (no)	Belostomatidae:	yes (no)
Other (specify) _____		Other (specify) _____	

Voucher Specimens N/A

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no __X__ yes

Required color slides and/or photographs for the project site are included: ____ no __X__ yes

Date: 1/20/19 Time: 1:30 County: SLO Quad: Templeton

Collector(s): M. Dallas Permit #: TE102310-3

Site/Project Name: Olsen Pool #: 2

Township: M27S Range: 12E Section: 11 35°36'13.55"N 120°38'19.93"W lat. long.

Temperature: Water: 54°F °C Air: 57F °C

Pool Depth:
at time of sampling: 4" cm
estimated maximum: 12" cm

Surface Area:
at time of sampling: 8 m^2 x ____ m
estimated maximum: 12 m^2 x ____ m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: tire tracks garbage discing/plowing
- ungrazed — grazed: cattle horses sheep other____
  light moderate heavy
- land use of habitat: Pasture

(Optional) Water Chemistry Data

Alkalinity (total):____ppm or mg/l Conductivity:____uMHO

Dissolved NH_4:____ppt or ppm Dissolved Oxygen:____ppm or mg/l

pH:____ Turbidity: (secchi disc depth)____cm or: clear to bottom X

Salinity :____ppt or ppm Total Dissolved Solids (TDS):____ppm

Notes: clear water

No VPB's or any life

(USF&WS rev. 4/96)

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans: 0
(note reproductive status)

Notostracans: 0
(note reproductive status)

(Optional) Species Observations:

Cladocerans:	yes (no)	Insects: (adult or larvae)	
Conchostracans:	yes (no)	Anisoptera:	yes (no)
Copepods:	yes (no)	Zygoptera:	yes (no)
Ostracods	yes (no)	Hydrophilidae:	yes (no)
Fish	yes (no)	Dytiscidae:	yes (no)
Frogs	yes (no)	Corixidae:	yes (no)
Salamanders	yes (no)	Notonectidae:	yes (no)
Waterfowl	yes (no)	Belostomatidae:	yes (no)
Other (specify) _____		Other (specify) _____	

Voucher Specimens N/A

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #

Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no X yes

Required color slides and/or photographs for the project site are included: ___ no X yes

Date: 1/1/2019 Time: 9:45 County: SLO Quad: Templeton

Collector(s): M. Dallas Permit #: TE 102310-3

Site/Project Name: Olsen Pool #: 3

Township: 27S Range: 12E Section: 11 35°36'33.37"N 120°38'18.48"W lat. long.

Temperature: Water: 46°F ~~°C~~ Air: 52°F ~~°C~~

Pool Depth:
at time of sampling: 14" ~~cm~~
estimated maximum: 24" ~~cm~~

Surface Area:
at time of sampling: 300 m^2 x ___ ~~m~~
estimated maximum: 340 m^2 x ___ ~~m~~

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed:) tire tracks garbage (discing/plowing)
- ungrazed (grazed:) cattle horses (sheep) other ___
  light moderate (heavy)
- land use of habitat: Sheep Pasture

(Optional) Water Chemistry Data None

Alkalinity (total): ___ ppm or mg/l Conductivity: ___ uMHO

Dissolved NH_4: ___ ppt or ppm Dissolved Oxygen: ___ ppm or mg/l

pH: ___ Turbidity: (secchi disc depth) ___ cm or: clear to bottom X

Salinity : ___ ppt or ppm Total Dissolved Solids (TDS): ___ ppm

Notes: Clear water Lots of Veg
Waterboatmen
No VPB's

Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans: 0
(note reproductive status)

Notostracans: 0
(note reproductive status)

(Optional) Species Observations:

Cladocerans:	yes (no)	Insects: (adult or larvae)	
Conchostracans:	yes (no)	Anisoptera:	yes (no)
Copepods:	yes (no)	Zygoptera:	yes (no)
Ostracods	yes (no)	Hydrophilidae:	yes (no)
Fish	yes (no)	Dytiscidae:	yes (no)
Frogs	yes (no)	Corixidae:	(yes) no
Salamanders	yes (no)	Notonectidae:	yes (no)
Waterfowl	yes (no)	Belostomatidae:	yes (no)
Other (specify) _____		Other (specify) _____	

Voucher Specimens N/A

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no __X__ yes

Required color slides and/or photographs for the project site are included: ____ no __X__ yes

Date: 1/20/19 Time: 10:30 County: SLO Quad: Templeton

Collector(s): M. Dallas Permit #: TE-102310-3

Site/Project Name: Olsen Pool #: 4

Township: 27S Range: 12E Section: 11 35°36'34.31"N 120°38'12.52"W lat. long.

Temperature: Water: 46°F ~~°C~~ Air: 52°F ~~°C~~

Pool Depth:
at time of sampling: 12" ~~cm~~
estimated maximum: 16" ~~cm~~

Surface Area:
at time of sampling: 20 m^2 x ____ ~~m~~
estimated maximum: 25 m^2 x ____ m

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed:) tire tracks garbage (discing/plowing)
- ungrazed (grazed:) cattle horses (sheep) other____
  light moderate (heavy)
- land use of habitat: Sheep pasture

(Optional) Water Chemistry Data None

Alkalinity (total):____ppm or mg/l Conductivity:____uMHO

Dissolved NH_4:____ppt or ppm Dissolved Oxygen:____ppm or mg/l

pH:____ Turbidity: (secchi disc depth)____cm or: clear to bottom __X__

Salinity :____ppt or ppm Total Dissolved Solids (TDS):____ppm

Notes:
No VPB's Clear water No life
Broken concrete Rip Rap

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans: 0
(note reproductive status)

Notostracans: 0
(note reproductive status)

(Optional) Species Observations:

Cladocerans:	yes (no)	Insects: (adult or larvae)	
Conchostracans:	yes (no)	Anisoptera:	yes (no)
Copepods:	yes (no)	Zygoptera:	yes (no)
Ostracods	yes (no)	Hydrophilidae:	yes (no)
Fish	yes (no)	Dytiscidae:	yes (no)
Frogs	yes (no)	Corixidae:	yes (no)
Salamanders	yes (no)	Notonectidae:	yes (no)
Waterfowl	yes (no)	Belostomatidae:	yes (no)
Other (specify) _____		Other (specify) _____	

Voucher Specimens N/A

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no _X_ yes

Required color slides and/or photographs for the project site are included: ___ no _X_ yes

Date: 2/1/2019 Time: 11:30 County: SLO Quad: Templeton

Collector(s): M. Dallas Permit #: TE102310-3

Site/Project Name: Olsen Pool #: 5

Township: M27S Range: 12E Section: 11 35°36'36.30"N 120°38'12.80"W ____lat.____long.

Temperature: Water: 55°F ~~°C~~ Air: 57°F ~~°C~~

Pool Depth:
at time of sampling: 18" ~~cm~~
estimated maximum: 40" ~~cm~~

Surface Area:
at time of sampling: 900 m^2 x ____ m
estimated maximum: 1290 m^2 x ____ m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: tire tracks garbage discing/plowing
- ungrazed — grazed: cattle horses sheep other____ (light moderate heavy)
- land use of habitat: Hay crop

(Optional) Water Chemistry Data

Alkalinity (total):____ppm or mg/l Conductivity:____uMHO

Dissolved NH_4:____ppt or ppm Dissolved Oxygen:____ppm or mg/l

pH:____ Turbidity: (secchi disc depth)____cm or: clear to bottom NO

Salinity :____ppt or ppm Total Dissolved Solids (TDS):____ppm

Notes: Turbid water - New Feature -
few waterboatmen

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans: Ø
(note reproductive status)

Notostracans: Ø
(note reproductive status)

(Optional) Species Observations:

Cladocerans:	yes (no)	Insects: (adult or larvae)	
Conchostracans:	yes (no)	Anisoptera:	yes (no)
Copepods:	yes (no)	Zygoptera:	yes (no)
Ostracods	yes (no)	Hydrophilidae:	yes (no)
Fish	yes (no)	Dytiscidae:	yes (no)
Frogs	yes (no)	Corixidae:	(yes) no
Salamanders	yes (no)	Notonectidae:	yes (no)
Waterfowl	yes (no)	Belostomatidae:	yes (no)
Other (specify) _____		Other (specify) _____	

Voucher Specimens N/A

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no X yes

Required color slides and/or photographs for the project site are included: ___ no X yes

Date: 2/4/19 Time: 9:00 County: SLO Quad: Templeton

Collector(s): M. Dallas Permit #: TE102310-3

Site/Project Name: Olsen Pool #: 1

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: 53°F ~~°C~~ Air: 48°F ~~°C~~

Pool Depth:
at time of sampling: 48" cm
estimated maximum: 48" cm

Surface Area:
at time of sampling: 1300 m^2 x _____ ~~m~~
estimated maximum: 1300 m^2 x _____ m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: tire tracks garbage discing/plowing
- ungrazed — grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: Stock Pond

(Optional) Water Chemistry Data None

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved NH_4:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom NO

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Waterboatmen NO VPBs
Pond Full Tadpoles Beetles overflowing
Rainstorm during Survey

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans: 0
(note reproductive status)

Notostracans: 0
(note reproductive status)

(Optional) Species Observations:

Cladocerans:	yes (no)	Insects: (adult or larvae)	
Conchostracans:	yes (no)	Anisoptera:	yes (no)
Copepods:	yes (no)	Zygoptera:	yes (no)
Ostracods	yes (no)	Hydrophilidae:	yes (no)
Fish	yes (no)	Dytiscidae:	(yes) no
Frogs	(yes) no Tads	Corixidae:	(yes) no
Salamanders	yes (no)	Notonectidae:	yes (no)
Waterfowl	yes (no)	Belostomatidae:	yes (no)
Other (specify) _____		Other (specify) _____	

Voucher Specimens N/A

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no __X__ yes

Required color slides and/or photographs for the project site are included: ____ no __X__ yes

Date: 2/4/19 Time: 10:00 County: SLO Quad: Templeton

Collector(s): M. Dallas Permit #: TE102310-3

Site/Project Name: Olsen Pool #: 2

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: 53°F ~~°C~~ Air: 48°F ~~°C~~

Pool Depth:
at time of sampling: 12" ~~cm~~
estimated maximum: 12" ~~cm~~

Surface Area:
at time of sampling: 12 m² x _____ m
estimated maximum: 12 m² x _____ m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: tire tracks garbage discing/plowing

- ungrazed grazed: cattle horses sheep other_____
light moderate heavy

- land use of habitat: Pasture

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved NH_4:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Water flowing quick - Rain storm during Survey

No life

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans: 0
(note reproductive status)

Notostracans: 0
(note reproductive status)

(Optional) Species Observations:

Cladocerans:	yes no	Insects: (adult or larvae)	
Conchostracans:	yes no	Anisoptera:	yes no
Copepods:	yes no	Zygoptera:	yes no
Ostracods	yes no	Hydrophilidae:	yes no
Fish	yes no	Dytiscidae:	yes no
Frogs	yes no	Corixidae:	yes no
Salamanders	yes no	Notonectidae:	yes no
Waterfowl	yes no	Belostomatidae:	yes no
Other (specify) _____		Other (specify) _____	

Voucher Specimens N/A

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no X yes

Required color slides and/or photographs for the project site are included: ___ no X yes

Date: 2/4/19 Time: 10:45 County: SLO Quad: Templeton

Collector(s): M. Dallas Permit #: TE 02310-3

Site/Project Name: Olsen Pool #: 3

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: 53F °C Air: 48°F °C

Pool Depth:
at time of sampling: 24" ~~cm~~
estimated maximum: 24" ~~cm~~

Surface Area:
at time of sampling: 340 m^2 x _____ m
estimated maximum: 340 m^2 x _____ m

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed:) tire tracks garbage (discing/plowing)
- ungrazed (grazed:) cattle horses (sheep) other_____
  light moderate (heavy)
- land use of habitat: Sheep Pasture

(Optional) Water Chemistry Data None

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved NH_4:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Heavy Rain - water everywhere
Ducks Turbid water, Flowing No VPBS
Few waterboatmen

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans: 0
(note reproductive status)

Notostracans: 0
(note reproductive status)

(Optional) Species Observations:

Cladocerans:	yes no	Insects: (adult or larvae)	
Conchostracans:	yes no	Anisoptera:	yes no
Copepods:	yes no	Zygoptera:	yes no
Ostracods	yes no	Hydrophilidae:	yes no
Fish	yes no	Dytiscidae:	yes no
Frogs	yes no	Corixidae:	yes no
Salamanders	yes no	Notonectidae:	yes no
Waterfowl	yes no	Belostomatidae:	yes no
Other (specify) _____		Other (specify) _____	

Voucher Specimens N/A

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no __X__ yes

Required color slides and/or photographs for the project site are included: ____ no __X__ yes

Date: 2/4/19 Time: 11:15 County: SLO Quad: Templeton

Collector(s): M. Dallas Permit #: TE102310-3

Site/Project Name: Olsen Pool #: 4

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: 48°F °C Air: 51°F °C

Pool Depth:
at time of sampling: 16" cm
estimated maximum: 16" cm

Surface Area:
at time of sampling: 25 m^2 x _____ m
estimated maximum: 25 m^2 x _____ m

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed: tire tracks garbage discing/plowing)
- ungrazed (grazed: cattle horses sheep other_____ light moderate heavy)
- land use of habitat: Sheep Pasture

(Optional) Water Chemistry Data None

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved NH_4:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Heavy Rain No VPBS
Ducks Flowing water

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans: Ø
(note reproductive status)

Notostracans: Ø
(note reproductive status)

(Optional) Species Observations:

Cladocerans:	yes no	Insects: (adult or larvae)	
Conchostracans:	yes no	Anisoptera:	yes no
Copepods:	yes no	Zygoptera:	yes no
Ostracods	yes no	Hydrophilidae:	yes no
Fish	yes no	Dytiscidae:	yes no
Frogs	yes no	Corixidae:	yes no
Salamanders	yes no	Notonectidae:	yes no
Waterfowl	yes no	Belostomatidae:	yes no
Other (specify) _____		Other (specify) _____	

Voucher Specimens N/A

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no __X__ yes

Required color slides and/or photographs for the project site are included: ____ no __X__ yes

Date: 2/4/19 Time: 12:00 County: SLO Quad: Templeton

Collector(s): M. Dallas Permit #: TE102310-3

Site/Project Name: Olsen Pool #: 5

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: 53°F ~~°C~~ Air: 48°F ~~°C~~

Pool Depth:
at time of sampling: 40" ~~cm~~
estimated maximum: 40" ~~cm~~

Surface Area:
at time of sampling: 1290 m^2 x _____ m
estimated maximum: 1290 m^2 x _____ m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: tire tracks garbage discing/plowing
- ungrazed — grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: Hay Crop

(Optional) Water Chemistry Data None

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved NH_4:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes:
Flowing water - Swale like feature - No VPBS
Several recent rain events few waterboatmen

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans: 0
(note reproductive status)

Notostracans: 0
(note reproductive status)

(Optional) Species Observations:

Cladocerans:	yes (no)	Insects: (adult or larvae)	
Conchostracans:	yes (no)	Anisoptera:	yes (no)
Copepods:	yes (no)	Zygoptera:	yes (no)
Ostracods	yes (no)	Hydrophilidae:	yes (no)
Fish	yes (no)	Dytiscidae:	yes (no)
Frogs	yes (no)	Corixidae:	(yes) no
Salamanders	yes (no)	Notonectidae:	yes (no)
Waterfowl	yes (no)	Belostomatidae:	yes (no)
Other (specify) _____		Other (specify) _____	

Voucher Specimens N/A

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no X yes

Required color slides and/or photographs for the project site are included: ___ no X yes

Date: 2/17/19 Time: 10:30 County: SLO Quad: Templeton

Collector(s): M. Dallas Permit #: TE102310-3

Site/Project Name: Olsen Pool #: 1

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: 51°F ~~°C~~ Air: 52°F ~~°C~~

Pool Depth:
at time of sampling: 48" cm
estimated maximum: 48" cm

Surface Area:
at time of sampling: 1300 m^2 x _____ m
estimated maximum: 1300 m^2 x _____ m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: tire tracks (garbage) discing/plowing
- ungrazed — grazed: (cattle) horses sheep other_____
  (light) moderate heavy
- land use of habitat: Stock Pond

(Optional) Water Chemistry Data None

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved NH_4:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom No

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Millions of seedshrimp - NO VPBS
Tads - Duck
waterboatmen
- Showers/Rain last few days

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans: 0
(note reproductive status)

Notostracans: 0
(note reproductive status)

(Optional) Species Observations:

Cladocerans:	yes (no)	Insects: (adult or larvae)	
Conchostracans:	yes (no)	Anisoptera:	yes (no)
Copepods:	yes (no)	Zygoptera:	yes (no)
Ostracods	(yes) no	Hydrophilidae:	yes (no)
Fish	yes (no)	Dytiscidae:	yes (no)
Frogs	(yes) no	Corixidae:	(yes) no
Salamanders	yes (no)	Notonectidae:	yes (no)
Waterfowl	(yes) no	Belostomatidae:	yes (no)
Other (specify) _____		Other (specify) _____	

Voucher Specimens N/A

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no X yes

Required color slides and/or photographs for the project site are included: ____ no X yes

Date: 2/17/19 Time: 11:30 County: SLO Quad: Templeton

Collector(s): M. Dallas Permit #: TE102310-3

Site/Project Name: Olsen Pool #: 2

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: 51°F ~~°C~~ Air: 52°F ~~°C~~

Pool Depth:
at time of sampling: 14" ~~cm~~
estimated maximum: 14" ~~cm~~

Surface Area:
at time of sampling: 12 m^2 x _____ m
estimated maximum: 12 m^2 x _____ m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: tire tracks garbage discing/plowing
- ungrazed — grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: Pasture

(Optional) Water Chemistry Data None

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved NH_4:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Flowing water - questionable habitat

No VPBS - No seed shrimp No life

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans: Ø
(note reproductive status)

Notostracans: Ø
(note reproductive status)

(Optional) Species Observations:

Cladocerans:	yes no	Insects: (adult or larvae)	
Conchostracans:	yes no	Anisoptera:	yes no
Copepods:	yes no	Zygoptera:	yes no
Ostracods	yes no	Hydrophilidae:	yes no
Fish	yes no	Dytiscidae:	yes no
Frogs	yes no	Corixidae:	yes no
Salamanders	yes no	Notonectidae:	yes no
Waterfowl	yes no	Belostomatidae:	yes no
Other (specify) _____		Other (specify) _____	

Voucher Specimens N/A

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no X yes

Required color slides and/or photographs for the project site are included: ____ no X yes

Date: 2/17/19 Time: 12:15 County: SLO Quad: Templeton

Collector(s): M. Dallas Permit #: TE102310-3

Site/Project Name: Olsen Pool #: 3

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: 48°F ~~°C~~ Air: 51°F ~~°C~~

Pool Depth:
at time of sampling: 20" cm
estimated maximum: 24" cm

Surface Area:
at time of sampling: 340 m^2 x _____ m
estimated maximum: 340 m^2 x _____ m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: tire tracks garbage discing/plowing
- ungrazed — grazed: cattle horses sheep other_____ (light moderate heavy)
- land use of habitat: Sheep pasture

(Optional) Water Chemistry Data None

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved NH_4:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom X

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: clear water gental flow Showers/rain
Seed Shrimp
No VPBS

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans: 0
(note reproductive status)

Notostracans: 0
(note reproductive status)

(Optional) Species Observations:

Cladocerans:	yes no	Insects: (adult or larvae)	
Conchostracans:	yes no	Anisoptera:	yes no
Copepods:	yes no	Zygoptera:	yes no
Ostracods	yes no	Hydrophilidae:	yes no
Fish	yes no	Dytiscidae:	yes no
Frogs	yes no	Corixidae:	yes no
Salamanders	yes no	Notonectidae:	yes no
Waterfowl	yes no	Belostomatidae:	yes no
Other (specify) _____		Other (specify) _____	

Voucher Specimens N/A

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no X yes

Required color slides and/or photographs for the project site are included: ___ no X yes

Date: 2/17/19 Time: 12:45 County: SLO Quad: Templeton

Collector(s): M. Dallas Permit #: TE102310-3

Site/Project Name: Olsen Pool #: 4

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: 48°F ~~°C~~ Air: 51°F ~~°C~~

Pool Depth:
at time of sampling: 16" ~~cm~~
estimated maximum: 16" ~~cm~~

Surface Area:
at time of sampling: 25 m^2 x _____ m
estimated maximum: 25 m^2 x _____ m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: tire tracks garbage discing/plowing
- ungrazed — grazed: cattle horses sheep other_____ (light moderate heavy)
- land use of habitat: Pasture

(Optional) Water Chemistry Data None

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved NH_4:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom X

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: clearwater gental flow
Seed shrimp
No VPBs

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans: 0
(note reproductive status)

Notostracans: 0
(note reproductive status)

(Optional) Species Observations:

Cladocerans:	yes (no)	Insects: (adult or larvae)	
Conchostracans:	yes (no)	Anisoptera:	yes (no)
Copepods:	yes (no)	Zygoptera:	yes (no)
Ostracods	(yes) no	Hydrophilidae:	yes (no)
Fish	yes (no)	Dytiscidae:	yes (no)
Frogs	yes (no)	Corixidae:	yes (no)
Salamanders	yes (no)	Notonectidae:	yes (no)
Waterfowl	yes (no)	Belostomatidae:	yes (no)
Other (specify) _____		Other (specify) _____	

Voucher Specimens N/A

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no __X__ yes

Required color slides and/or photographs for the project site are included: ____ no __X__ yes

Date: 2/17/19 Time: 1:15 County: SLO Quad: Templeton

Collector(s): M. Dallas Permit #: TE102310-3

Site/Project Name: Olsen Pool #: 5

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: 51°F ~~°C~~ Air: 51°F ~~°C~~

Pool Depth:
at time of sampling: 40" ~~cm~~
estimated maximum: 40" ~~cm~~

Surface Area:
at time of sampling: 1290 m^2 x _____ m
estimated maximum: 1290 m^2 x _____ m

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed: tire tracks garbage discing/plowing)
- (ungrazed) grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: Hay crop

(Optional) Water Chemistry Data None

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved NH_4:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom No

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Darkwater NO VPBS Seasonal flow
Raining Seedshrimp Docks(8)

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans: (note reproductive status) 0

Notostracans: (note reproductive status) 0

(Optional) Species Observations:

Cladocerans:	yes (no)	Insects: (adult or larvae)	
Conchostracans:	yes (no)	Anisoptera:	yes (no)
Copepods:	yes (no)	Zygoptera:	yes (no)
Ostracods	(yes) no	Hydrophilidae:	yes (no)
Fish	yes (no)	Dytiscidae:	yes (no)
Frogs	yes (no)	Corixidae:	yes (no)
Salamanders	yes (no)	Notonectidae:	yes (no)
Waterfowl	(yes) no	Belostomatidae:	yes (no)
Other (specify) _____		Other (specify) _____	

Voucher Specimens N/A

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no X yes

Required color slides and/or photographs for the project site are included: ____ no X yes

Date: 2/17/19 Time: 2:00 County: SLO Quad: Templeton

Collector(s): M. Dallas Permit #: TE102360-3

Site/Project Name: Olsen Pool #: 6

Township: M27S Range: 12E Section: 11 35°36'04.00"N 120°38'27.50"W lat. long.

Temperature: Water: 53°F ~~°C~~ Air: 51°F ~~°C~~

Pool Depth:
at time of sampling: 7" ~~cm~~
estimated maximum: 10" ~~cm~~

Surface Area:
at time of sampling: 580 m^2 x ____ m
estimated maximum: 580 m^2 x ____ m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: tire tracks garbage discing/plowing
- ungrazed — grazed: cattle horses sheep other____ (light moderate heavy)
- land use of habitat: Pasture

(Optional) Water Chemistry Data

Alkalinity (total):____ppm or mg/l Conductivity:____uMHO

Dissolved NH_4:____ppt or ppm Dissolved Oxygen:____ppm or mg/l

pH:____ Turbidity: (secchi disc depth)____cm or: clear to bottom NO

Salinity :____ppt or ppm Total Dissolved Solids (TDS):____ppm

Notes: Dark/Black water - NO life
New feature - start survey

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans: 0
(note reproductive status)

Notostracans: 0
(note reproductive status)

(Optional) Species Observations:

Cladocerans:	yes (no)	Insects: (adult or larvae)	
Conchostracans:	yes (no)	Anisoptera:	yes (no)
Copepods:	yes (no)	Zygoptera:	yes (no)
Ostracods	yes (no)	Hydrophilidae:	yes (no)
Fish	yes (no)	Dytiscidae:	yes (no)
Frogs	yes (no)	Corixidae:	yes (no)
Salamanders	yes (no)	Notonectidae:	yes (no)
Waterfowl	yes (no)	Belostomatidae:	yes (no)
Other (specify) _____		Other (specify) _____	

Voucher Specimens N/A

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no _X_ yes

Required color slides and/or photographs for the project site are included: ___ no _X_ yes

Date: 3/2/19 Time: 10:00 County: SLO Quad: Templeton

Collector(s): M. Dallas Permit #: TE102360-3

Site/Project Name: Olsen Pool #: 1

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: 57°F °C Air: 58°F °C

Pool Depth:
at time of sampling: 33" ~~cm~~
estimated maximum: 48" ~~cm~~

Surface Area:
at time of sampling: 1100 m^2 x _____ ~~m~~
estimated maximum: 1300 m^2 x _____ ~~m~~

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: tire tracks garbage discing/plowing
- ungrazed — grazed: cattle horses sheep other_____ (light moderate heavy)
- land use of habitat: STOCK Pond

(Optional) Water Chemistry Data None

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved NH_4:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom NO

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Rain
Tads waterboatmen Seedshrimp

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans: 0
(note reproductive status)

Notostracans: 0
(note reproductive status)

(Optional) Species Observations:

Cladocerans:	yes (no)	Insects: (adult or larvae)	
Conchostracans:	yes (no)	Anisoptera:	yes (no)
Copepods:	yes (no)	Zygoptera:	yes (no)
Ostracods	(yes) no	Hydrophilidae:	yes (no)
Fish	yes (no)	Dytiscidae:	yes (no)
Frogs	(yes) no	Corixidae:	(yes) no
Salamanders	yes (no)	Notonectidae:	yes (no)
Waterfowl	yes (no)	Belostomatidae:	yes (no)
Other (specify) _____		Other (specify) _____	

Voucher Specimens N/A

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no X yes

Required color slides and/or photographs for the project site are included: ____ no X yes

Date: 3/2/19 Time: 10:55 County: SLO Quad: Templeton

Collector(s): M. Dallas Permit #: TE102310-3

Site/Project Name: Olsen Pool #: 2

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: 56°F ~~°C~~ Air: 58°F ~~°C~~

Pool Depth:
at time of sampling: 14" cm
estimated maximum: 14" cm

Surface Area:
at time of sampling: 12 m^2 x _____ m
estimated maximum: 12 m^2 x _____ m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: tire tracks garbage discing/plowing
- ungrazed — grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: Pasture-

(Optional) Water Chemistry Data None

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved NH_4:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Flowing water Rain
- No VFBS - No life

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans: Ø
(note reproductive status)

Notostracans: Ø
(note reproductive status)

(Optional) Species Observations:

Cladocerans:	yes (no)	Insects: (adult or larvae)	
Conchostracans:	yes (no)	Anisoptera:	yes (no)
Copepods:	yes (no)	Zygoptera:	yes (no)
Ostracods	yes (no)	Hydrophilidae:	yes (no)
Fish	yes (no)	Dytiscidae:	yes (no)
Frogs	yes (no)	Corixidae:	yes (no)
Salamanders	yes (no)	Notonectidae:	yes (no)
Waterfowl	yes (no)	Belostomatidae:	yes (no)
Other (specify) _____		Other (specify) _____	

Voucher Specimens N/A

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no _X_ yes

Required color slides and/or photographs for the project site are included: ____ no _X_ yes

Date: 3/2/19 Time: 11:30 County: SLO Quad: Templeton

Collector(s): M. Dallas Permit #: TE102310-3

Site/Project Name: Olsen Pool #: 3

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: 58°F °C Air: 58°F °C

Pool Depth:
at time of sampling: 18" cm
estimated maximum: 24" cm

Surface Area:
at time of sampling: 300 m x _____ m
estimated maximum: 340 m x _____ m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: tire tracks garbage discing/plowing
- ungrazed — grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: sheep pasture

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved NH_4:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _X_

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Ducks clear water waterboatmen
No VPBS Seedshrimp Train

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans: 0
(note reproductive status)

Notostracans: 0
(note reproductive status)

(Optional) Species Observations:

Cladocerans:	yes no	Insects: (adult or larvae)	
Conchostracans:	yes no	Anisoptera:	yes no
Copepods:	yes no	Zygoptera:	yes no
Ostracods	yes no	Hydrophilidae:	yes no
Fish	yes no	Dytiscidae:	yes no
Frogs	yes no	Corixidae:	yes no
Salamanders	yes no	Notonectidae:	yes no
Waterfowl	yes no	Belostomatidae:	yes no
Other (specify) _____		Other (specify) _____	

Voucher Specimens N/A

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no X yes

Required color slides and/or photographs for the project site are included: ___ no X yes

Date: 3/2/19 Time: 12:00 County: SLO Quad: Templeton

Collector(s): M. Dallas Permit #: TE 102310-3

Site/Project Name: Olsen Pool #: 4

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: 58° F ~~°C~~ Air: 58° F °C

Pool Depth:
at time of sampling: 10" ~~cm~~
estimated maximum: 16" ~~cm~~

Surface Area:
at time of sampling: 22 m^2 x _____ m
estimated maximum: 25 m^2 x _____ m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: tire tracks garbage discing/plowing
- ungrazed — grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: Pasture

(Optional) Water Chemistry Data None

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved NH_4:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom X

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Clear water Rain
Seed shrimp
No VPBS -

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans: 0
(note reproductive status)

Notostracans: 0
(note reproductive status)

(Optional) Species Observations:

Cladocerans:	yes (no)	Insects: (adult or larvae)	
Conchostracans:	yes (no)	Anisoptera:	yes (no)
Copepods:	yes (no)	Zygoptera:	yes (no)
Ostracods	(yes) no	Hydrophilidae:	yes (no)
Fish	yes (no)	Dytiscidae:	yes (no)
Frogs	yes (no)	Corixidae:	yes (no)
Salamanders	yes (no)	Notonectidae:	yes (no)
Waterfowl	yes (no)	Belostomatidae:	yes (no)
Other (specify) _____		Other (specify) _____	

Voucher Specimens N/A

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no __X__ yes

Required color slides and/or photographs for the project site are included: ____ no __X__ yes

Date: 3/2/19 Time: 12:45 County: SLO Quad: Templeton

Collector(s): M. Dallas Permit #: TE102360-3

Site/Project Name: Olsen Pool #: 5

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: 57°F ~~°C~~ Air: 58° ~~°C~~

Pool Depth:
at time of sampling: 28" ~~cm~~
estimated maximum: 40" cm

Surface Area:
at time of sampling: 1000 m^2 x _____ m
estimated maximum: 1290 m^2 x _____ m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: tire tracks garbage discing/plowing
- ungrazed — grazed: cattle horses sheep other_____ light moderate heavy

- land use of habitat: Hay Crop

(Optional) Water Chemistry Data None

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved NH_4:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom No

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Rain Turbid water No VPBs
Docks seed shrimp water boatmen

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans: Ø
(note reproductive status)

Notostracans: Ø
(note reproductive status)

(Optional) Species Observations:

Cladocerans:	yes (no)	Insects: (adult or larvae)	
Conchostracans:	yes (no)	Anisoptera:	yes (no)
Copepods:	yes (no)	Zygoptera:	yes (no)
Ostracods	(yes) no	Hydrophilidae:	yes (no)
Fish	yes (no)	Dytiscidae:	yes (no)
Frogs	yes (no)	Corixidae:	(yes) no
Salamanders	yes (no)	Notonectidae:	yes (no)
Waterfowl	(yes) no	Belostomatidae:	yes (no)
Other (specify) _____		Other (specify) _____	

Voucher Specimens N/A

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no __X__ yes

Required color slides and/or photographs for the project site are included: ____ no __X__ yes

Date: 3 / 2 / 19 Time: 2:00 County: SLO Quad: Templeton

Collector(s): M. Dallas Permit #: TE102310-3

Site/Project Name: Olsen Pool #: 6

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: 59°F ~~°C~~ Air: 58°F ~~°C~~

Pool Depth:
at time of sampling: 2" ~~cm~~
estimated maximum: 10" ~~cm~~

Surface Area:
at time of sampling: 150 m^2 x _____ m
estimated maximum: 580 m^2 x _____ m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: tire tracks garbage discing/plowing
- ungrazed — grazed: cattle horses sheep other_____ (light moderate heavy)
- land use of habitat: Pasture

(Optional) Water Chemistry Data None

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved NH_4:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom NO

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: almost Dry
No life - very dark/black water

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans: 0
(note reproductive status)

Notostracans: 0
(note reproductive status)

(Optional) Species Observations:

Cladocerans:	yes (no)	Insects: (adult or larvae)	
Conchostracans:	yes (no)	Anisoptera:	yes (no)
Copepods:	yes (no)	Zygoptera:	yes (no)
Ostracods	yes (no)	Hydrophilidae:	yes (no)
Fish	yes (no)	Dytiscidae:	yes (no)
Frogs	yes (no)	Corixidae:	yes (no)
Salamanders	yes (no)	Notonectidae:	yes (no)
Waterfowl	yes (no)	Belostomatidae:	yes (no)
Other (specify) _____		Other (specify) _____	

Voucher Specimens N/A

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no __X__ yes

Required color slides and/or photographs for the project site are included: ____ no __X__ yes

Date: 3 / 17 / 19 Time: 9:00 County: SLO Quad: Templeton

Collector(s): M. Dallas Permit #: TE-102360-3

Site/Project Name: Olsen Pool #: 1

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: 51°F ~~°C~~ Air: 46°F ~~°C~~

Pool Depth:
at time of sampling: 48" cm
estimated maximum: 48" cm

Surface Area:
at time of sampling: 1200 m^2 x _____ m
estimated maximum: 1300 m^2 x _____ m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: tire tracks garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: STOCK Pond

(Optional) Water Chemistry Data None

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved NH_4:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Clam Shrimp
Seed Shrimp
Tads Waterboatmen
No VPBs listed

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans: 0
(note reproductive status)

Notostracans: 0
(note reproductive status)

(Optional) Species Observations:

Cladocerans:	yes no	Insects: (adult or larvae)	
Conchostracans:	yes no	Anisoptera:	yes no
Copepods:	yes no	Zygoptera:	yes no
Ostracods	yes no	Hydrophilidae:	yes no
Fish	yes no	Dytiscidae:	yes no
Frogs	yes no	Corixidae:	yes no
Salamanders	yes no	Notonectidae:	yes no
Waterfowl	yes no	Belostomatidae:	yes no
Other (specify) _____		Other (specify) _____	

Voucher Specimens N/A

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no X yes

Required color slides and/or photographs for the project site are included: ____ no X yes

Date: 3/17/19 Time: 10:00 County: SLO Quad: Templeton

Collector(s): M. Dallas Permit #: TE102360-3

Site/Project Name: Olsen Pool #: 2

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: Dry °C Air: 46°F °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: _____cm

Surface Area:
at time of sampling: Ø m x _____m
estimated maximum: _____m x _____m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: tire tracks garbage discing/plowing
- ungrazed — grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: Pasture

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved NH_4:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry - Mainly swift flow

No life

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) Ø

Notostracans:
(note reproductive status) Ø

(Optional) Species Observations:

Cladocerans:	yes	no	Insects: (adult or larvae)		
Conchostracans:	yes	no	Anisoptera:	yes	no
Copepods:	yes	no	Zygoptera:	yes	no
Ostracods	yes	no	Hydrophilidae:	yes	no
Fish	yes	no	Dytiscidae:	yes	no
Frogs	yes	no	Corixidae:	yes	no
Salamanders	yes	no	Notonectidae:	yes	no
Waterfowl	yes	no	Belostomatidae:	yes	no
Other (specify) _____			Other (specify) _____		

Voucher Specimens N/A

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no X yes

Required color slides and/or photographs for the project site are included: ____ no X yes

Date: 3/17/19 Time: 10:30 County: SLO Quad: Templeton

Collector(s): M. Dallas Permit #: TE 102310-3

Site/Project Name: Olsen Pool #: 3

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: 56°F ~~°C~~ Air: 46°F ~~°C~~

Pool Depth:
at time of sampling: 18" cm
estimated maximum: 24" cm

Surface Area:
at time of sampling: 300 m^2 x _____ m
estimated maximum: 340 m^2 x _____ m

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed: tire tracks garbage discing/plowing)
- ungrazed (grazed: cattle horses sheep other_____ light moderate heavy)
- land use of habitat: Sheep pasture

(Optional) Water Chemistry Data None

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved NH_4:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom X

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Clearwater
Tads seedshrimp waterboatmen
No VPBS

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans: 0
(note reproductive status)

Notostracans: 0
(note reproductive status)

(Optional) Species Observations:

Cladocerans:	yes no	Insects: (adult or larvae)	
Conchostracans:	yes no	Anisoptera:	yes no
Copepods:	yes no	Zygoptera:	yes no
Ostracods	yes no	Hydrophilidae:	yes no
Fish	yes no	Dytiscidae:	yes no
Frogs	yes no	Corixidae:	yes no
Salamanders	yes no	Notonectidae:	yes no
Waterfowl	yes no	Belostomatidae:	yes no
Other (specify) _____		Other (specify) _____	

Voucher Specimens N/A

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no X yes

Required color slides and/or photographs for the project site are included: ____ no X yes

Date: 3/17/19 Time: 11:00 County: SLO Quad: Templeton

Collector(s): M. Dallas Permit #: TE 60230-3

Site/Project Name: Olsen Pool #: 4

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: 56°F ~~°C~~ Air: 46°F ~~°C~~

Pool Depth:
at time of sampling: 9" ~~cm~~
estimated maximum: 16" ~~cm~~

Surface Area:
at time of sampling: 16 m x _____ m
estimated maximum: 25 m x _____ m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: tire tracks garbage discing/plowing
- ungrazed — grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: Pasture

(Optional) Water Chemistry Data None

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved NH_4:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom X

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Clearwater
Few Tads Seed shrimp No VPBS

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) Ø

Notostracans:
(note reproductive status) Ø

(Optional) Species Observations:

Cladocerans:	yes (no)	Insects: (adult or larvae)	
Conchostracans:	yes (no)	Anisoptera:	yes (no)
Copepods:	yes (no)	Zygoptera:	yes (no)
Ostracods	(yes) no	Hydrophilidae:	yes (no)
Fish	yes (no)	Dytiscidae:	yes (no)
Frogs	(yes) no	Corixidae:	yes (no)
Salamanders	yes (no)	Notonectidae:	yes (no)
Waterfowl	yes (no)	Belostomatidae:	yes (no)
Other (specify) _____		Other (specify) _____	

Voucher Specimens N/A

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no X yes

Required color slides and/or photographs for the project site are included: ____ no X yes

Date: 3/12/19 Time: 1130 County: SLO Quad: TE102310-3

Collector(s): M. Dallas Permit #: TE102310-3

Site/Project Name: Olsen Pool #: 5

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: 56°F ~~°C~~ Air: 48°F ~~°C~~

Pool Depth:
at time of sampling: 26" ~~cm~~
estimated maximum: 40" cm

Surface Area:
at time of sampling: 800 m^2 x _____ m
estimated maximum: 1290 m^2 x _____ m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: tire tracks garbage discing/plowing
- ungrazed — grazed: cattle horses sheep other_____ (light moderate heavy)
- land use of habitat: Hay Crop

(Optional) Water Chemistry Data None

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved NH_4:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Toads seed shrimp Tads
egg mass waterboatmen
NO VPTS Pondsetting Swallow

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans: 0
(note reproductive status)

Notostracans: 0
(note reproductive status)

(Optional) Species Observations:

Cladocerans:	yes (no)	Insects: (adult or larvae)	
Conchostracans:	yes (no)	Anisoptera:	yes (no)
Copepods:	yes (no)	Zygoptera:	yes (no)
Ostracods	(yes) no	Hydrophilidae:	yes (no)
Fish	yes (no)	Dytiscidae:	yes (no)
Frogs	(yes) no	Corixidae:	(yes) no
Salamanders	yes (no)	Notonectidae:	yes (no)
Waterfowl	yes (no)	Belostomatidae:	yes (no)
Other (specify) _____		Other (specify) _____	

Voucher Specimens N/A

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no __X__ yes

Required color slides and/or photographs for the project site are included: ____ no __X__ yes

Date: 3 / 17 / 19 Time: 12:30 County: SLO Quad: Templeton

Collector(s): M. Dallas Permit #: TE 60230-3

Site/Project Name: Olsen Pool #: 6

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: DRY °C Air: 46°F °C

Pool Depth:
at time of sampling: 0 cm
estimated maximum: 10" cm

Surface Area:
at time of sampling: 0 m x _____ m
estimated maximum: 581 m x _____ m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: tire tracks garbage discing/plowing

- ungrazed grazed: cattle horses sheep other_____
light moderate heavy

- land use of habitat: Pasture

(Optional) Water Chemistry Data None

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved NH_4:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) N/A

Notostracans:
(note reproductive status) N/A

(Optional) Species Observations:

Cladocerans:	yes	no	Insects: (adult or larvae)		
Conchostracans:	yes	no	Anisoptera:	yes	no
Copepods:	yes	no	Zygoptera:	yes	no
Ostracods	yes	no	Hydrophilidae:	yes	no
Fish	yes	no	Dytiscidae:	yes	no
Frogs	yes	no	Corixidae:	yes	no
Salamanders	yes	no	Notonectidae:	yes	no
Waterfowl	yes	no	Belostomatidae:	yes	no
Other (specify) _____			Other (specify) _____		

Voucher Specimens N/A

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #

Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no X yes

Required color slides and/or photographs for the project site are included: ____ no X yes

Date: 3/13/19 Time: 11:30 County: SLO Quad: Templeton

Collector(s): M. Dallas Permit #: TE102340-3

Site/Project Name: Olsen Pool #: 1

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: 58°F ~~°C~~ Air: 66°F °C

Pool Depth:
at time of sampling: 45" ~~cm~~
estimated maximum: 48" ~~cm~~

Surface Area:
at time of sampling: 1200 m^2 x _____ m
estimated maximum: 1300 m^2 x _____ m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: tire tracks garbage discing/plowing
- ungrazed — grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: STOCK Pond

(Optional) Water Chemistry Data None

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved NH_4:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Semi clearwater Ducks
TADS clam shrimp seedshrimp
No listed VPBs

Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans: Ø
(note reproductive status)

Notostracans: Ø
(note reproductive status)

(Optional) Species Observations:

Cladocerans:	yes (no)	Insects: (adult or larvae)	
Conchostracans:	(yes) no	Anisoptera:	yes (no)
Copepods:	yes (no)	Zygoptera:	yes (no)
Ostracods	(yes) no	Hydrophilidae:	yes (no)
Fish	yes (no)	Dytiscidae:	yes (no)
Frogs	(yes) no	Corixidae:	(yes) no
Salamanders	yes (no)	Notonectidae:	yes (no)
Waterfowl	(yes) no	Belostomatidae:	yes (no)
Other (specify) _____		Other (specify) _____	

Voucher Specimens N/A

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no X yes

Required color slides and/or photographs for the project site are included: ____ no X yes

Date: 3/31/19 Time: 9:00 County: SLO Quad: Templeton

Collector(s): M. Dallas Permit #: TE102360-3

Site/Project Name: Olsen Pool #: 3

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: 61°F ~~°C~~ Air: 64°F ~~°C~~

Pool Depth:
at time of sampling: 14" ~~cm~~
estimated maximum: 24" ~~cm~~

Surface Area:
at time of sampling: 220 m^2 x _____ m
estimated maximum: 340 m^2 x _____ m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: tire tracks garbage discing/plowing
- ungrazed — grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: Sheep pasture

(Optional) Water Chemistry Data None

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved NH_4:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom X

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Clear water
Numerous seed shrimp & waterboatmen
Tads No VPBS

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans: Ø
(note reproductive status)

Notostracans: Ø
(note reproductive status)

(Optional) Species Observations:

Cladocerans:	yes (no)	Insects: (adult or larvae)	
Conchostracans:	yes (no)	Anisoptera:	yes (no)
Copepods:	yes (no)	Zygoptera:	yes (no)
Ostracods	(yes) no	Hydrophilidae:	yes (no)
Fish	yes (no)	Dytiscidae:	yes (no)
Frogs	(yes) no	Corixidae:	(yes) no
Salamanders	yes (no)	Notonectidae:	yes (no)
Waterfowl	yes (no)	Belostomatidae:	yes (no)
Other (specify) _____		Other (specify) _____	

Voucher Specimens N/A

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no X yes

Required color slides and/or photographs for the project site are included: ____ no X yes

Date: 3/31/19 Time: 9:45 County: SLO Quad: Templeton

Collector(s): M. Dallas Permit #: TE102310-3

Site/Project Name: Olsen Pool #: 4

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: 61° ~~°C~~ Air: 66°F ~~°C~~

Pool Depth:
at time of sampling: 6" cm
estimated maximum: 16" cm

Surface Area:
at time of sampling: 8 m^2 x _____ m
estimated maximum: 25 m^2 x _____ m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: tire tracks garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: Pasture

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved NH_4:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom X

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Clear water
waterboatmen seedshrimp TADS
No VPBS

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans: 0
(note reproductive status)

Notostracans: 0
(note reproductive status)

(Optional) Species Observations:

Cladocerans:	yes no	Insects: (adult or larvae)	
Conchostracans:	yes no	Anisoptera:	yes no
Copepods:	yes no	Zygoptera:	yes no
Ostracods	yes no	Hydrophilidae:	yes no
Fish	yes no	Dytiscidae:	yes no
Frogs	yes no	Corixidae:	yes no
Salamanders	yes no	Notonectidae:	yes no
Waterfowl	yes no	Belostomatidae:	yes no
Other (specify) _____		Other (specify) _____	

Voucher Specimens N/A

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no X yes

Required color slides and/or photographs for the project site are included: ___ no X yes

Date: 3/31/19 Time: 10:30 County: SLO Quad: Templeton

Collector(s): M. Dallas Permit #: TE10231O-3

Site/Project Name: Olsen Pool #: 5

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: 59°F °C Air: 64°F °C

Pool Depth:
at time of sampling: 16" ~~cm~~
estimated maximum: 40" ~~cm~~

Surface Area:
at time of sampling: 350 m^2 x _____m
estimated maximum: 1290 m^2 x _____m

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed:) tire tracks garbage (discing/plowing)

(- ungrazed) grazed: cattle horses sheep other_____
light moderate heavy

- land use of habitat: Hay crop

(Optional) Water Chemistry Data None

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved NH_4:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes:
Numerous Seed shrimp + Adult waterboatmen
No VPBs

Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observed: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans: Ø
(note reproductive status)

Notostracans: Ø
(note reproductive status)

(Optional) Species Observations:

Cladocerans:	yes (no)	Insects: (adult or larvae)	
Conchostracans:	yes (no)	Anisoptera:	yes (no)
Copepods:	yes (no)	Zygoptera:	yes (no)
Ostracods	(yes) no	Hydrophilidae:	yes (no)
Fish	yes (no)	Dytiscidae:	yes (no)
Frogs	(yes) no	Corixidae:	(yes) no
Salamanders	yes (no)	Notonectidae:	yes (no)
Waterfowl	yes (no)	Belostomatidae:	yes (no)
Other (specify) _____		Other (specify) _____	

Voucher Specimens N/A

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

Species	# Individuals	Accession/Catalog #	Pool #

Special Status Invertebrate Dry Season Survey

NINETY-DAY REPORT

USFWS TAKE PERMIT # TE-102310-4

SURVEY FOR THE OLSEN RANCH

IN PASO ROBLES, SAN LUIS OBISPO COUNTY, CALIFORNIA

Prepared By:

MITCHELL C. DALLAS

Branchiopod Surveyor
USFWS Take Permit #TE-102310-4
(805) 459-2907

8/28/19
DATE

I certify that the information in this survey report and attached exhibits fully and accurately represents my work.

Reso A - Exhibit C2 (EIR Technical Appendix)

Introduction

This report is required under United States Fish and Wildlife Service ESA §10(a)(1)(A) permit # TE-102310-4. The current permit expires on 7/23/24.

This report is submitted in fulfillment of conditions in the Permit, the Special Terms and Conditions for Mitchell C. Dallas and the U.S. Fish and Wildlife Service Interim Survey Guidance to Permittees of 11/7/2017 that is attached to that permit. A full DRY SEASON protocol level survey was achieved. Dry season soil sampling and analysis was conducted to determine the presence or absence of federally listed Vernal Pool Branchiopods either within the project footprint or that may be affected by the project.

Permission to conduct the survey was granted by email from Chris Kofron and Juile Vanderwier of the U.S. Fish and Wildlife Service Ventura Office on 7/2/19. The following authorized surveyor conducted surveys during the wet season: Mitchell C. Dallas. Protocol level wet season surveys of the potential habitat features were conducted during the 2018/2019 wet season with negative (absent) results. This dry season survey was conducted as a follow up to the 2018/2019 wet season survey.

The dry season survey was conducted at the request of Althouse and Meade Inc. Soil samples were collected on 6/22/19. In total, five features were surveyed (feature #'s 2-6). Feature #1 was dry season sampled in 2018 to make a determination in advance of this survey effort in order to help facilitate design elements of the proposed project. See attached data sheets.

A reproduction of a U. S. Geological Survey topographic Paso Robles quadrangle map is attached showing the location surveyed. The coordinates for the pool are located in the Required Information Section of this report and on the attached survey field data sheets.

The information presented below is presented in the same order and with the same numbering system used in the guidance.

Project Description: The proposed project will build new homes in the Paso Robles area.

Required Information

1. The project site can be located on the attached U. S. Geological Survey Templeton, California, 7.5 minute topographic quadrangle map (Appendix 1). The location of the specific sites sampled is Township M27S Range 12E Section 11 35°36'11.79"N 120°38'26.53"W NAD 83

The action area is both grazed and ungrazed, in crop production with areas of historic grazing that is somewhat undisturbed with an adjacent roads and infrastructure.

Olsen Habitat Feature Location USGS Templeton Quadrangle M27S 12E 11				
Feature #	Size Square Meters	# of Samples	Latitude	Longitude
2	7	10	35°36'13.55"N	120°38'19.93"W
3	342	50	35°36'33.37"N	120°38'18.48"W
4	24	10	35°36'34.31"N	120°38'17.52"W
5	1289	50	35°36'36.30"N	120°38'12.80"W
6	580	50	35°36'04.00"N	120°38'27.50"W

2. A color aerial photo of the project location is included in the attached Appendix 2.
3. The estimated number of crustaceans observed in Pool #1 is listed in the attached data sheets. Estimates for the pool are as follows:

Species	Pool#	#2	#3	#4	#5	#6
Branchinecta lynchi		N	N	N	N	N
Branchinecta conservatio		N	N	N	N	N
Branchinecta longiantenna		N	N	N	N	N
Lepidurus packardi		N	N	N	N	N
Streptocephalus Woottoni		N	N	N	N	N

Estimates are as per the guidance: none (N), few (F) (< 50) and many (M) (>50). Details are available in the attached data sheets.

4. Federally listed Vernal Pool Branchiopod resting eggs were not found, none were preserved.
5. Qualitative description of the vernal pool community: The action area is located in San Luis Obispo County within the City of Paso Robles. The action area has a few homes and farm buildings within and it is bordered by roads, track homes and adjacent

divided undeveloped parcels. There is rolling topography with stock ponds swales and ponding water features. See attached data sheets for more details.

6. Data collected during the field visits can be found on the attached dry season data sheets in Appendix 3. Listed vernal pool branchiopod resting eggs were not observed during the surveys.

7. Additional data: none.

8. The survey methodology used was that described in guidance attached to Permit # TE-102310-4 to determine the presence or absence of federally listed Vernal Pool Branchiopods either within the project footprint or that may be affected by the project.

Conclusion

Federally listed Vernal Pool Branchiopod resting eggs were not found in the potential habitat features within the project action area during this Dry Season protocol level survey. The survey did meet the criteria to establish a full dry season protocol level survey.

Contact: If you have any questions or require more information about this project or the invertebrate survey, please contact Mitchell Dallas, Authorized Surveyor, TE-102310-4 at (805) 459-2907 or email **mitchdallas@hotmail.com**.

Appendices

Appendix 1.

USGS original scale map showing the area surveyed.

Appendix 2.

Aerial photo of the potential habitat feature locations.

Appendix 3.

Dry Season Data Sheets

Appendix 1

USGS Paso Robles Quadrangle

San Luis Obispo California

United States Geological Survey Topographic Map

Legend

Study Area

N

0 0.25 0.5 1 Mile

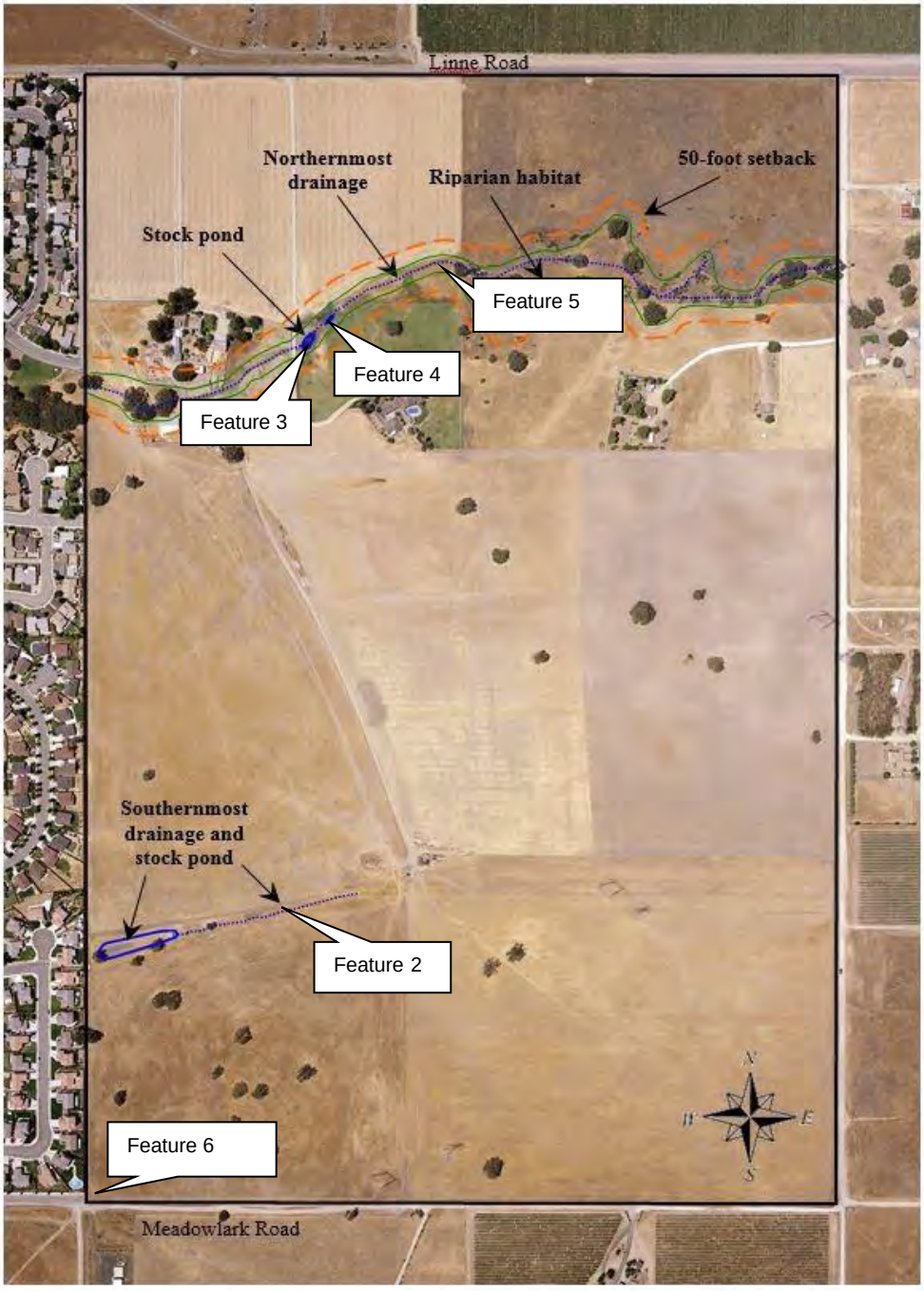
Olsen-Chandler Ranch
Map Center: 120.6435°W 35.60867°N
Paso Robles, San Luis Obispo County

USGS Quadrangle: Templeton

ALTHOUSE AND MEADE, INC.
BIOLOGICAL AND ENVIRONMENTAL SERVICES

Map Updated:
October 26, 2018 11:24 AM by JBB

Appendix 2


Linne Road
Northernmost drainage
Riparian habitat
50-foot setback
Stock pond
Feature 5
Feature 4
Feature 3
Southernmost drainage and stock pond
Feature 2
Feature 6
Meadowlark Road
N
W
E
S

Appendix 3

Dry Season Survey

Data Sheets

Appendix 2. U.S. Fish and Wildlife Service – Data Sheet for Dry Season Sample Analysis for Listed Large Branchiopods

Project Information

Project Name: Olsen
USFWS Project Number:
County: San Luis Obispo
Lat: 35°36'13.55"N
Long: 120°38'19.93"W
Quad: Templeton
Township: 27S
Range: 12E
Section: 11
Page 1 of 1

Biologist Information

Name of Person(2) Who Conducted the Following Tasks and Permit Number(s):

Soil Collection: Mitch Dallas
Soil Processing: Mitch Dallas
Soil Analysis/Cysts ID: Mitch Dallas
Soil Collection Date: 6/22/19

2 Pool/ Habitat/ Basin No.	Invertbrates Present (X)															LBC = Large Branchiopod Cysts Comments
	Insect Exo-Skeletons	Micro-Turbellaria Cysts	Cladocera Ephippia	Ostracods Live/Cysts/ Carapaces	Copepods Live/Cysts	Number of Large Branchiopod Cysts = LBC						Hydracarina Live	Nematoda	Collembola	Other Species	
						Branchinecta sp.	*Lepidurus packardi*	*Streptocephalus wootoni*	*Linderiella occidentalis*	*Lynceus brachyurus*	*Cyzicus californicus*					
2-1																No LBC
2-2																No LBC
2-3																No LBC
2-4																No LBC
2-5																No LBC
2-6																No LBC
2-7																No LBC
2-8																No LBC
2-9																No LBC
2-10																No LBC
																No LBC
																No LBC
																No LBC
																No LBC

Appendix 2. U.S. Fish and Wildlife Service – Data Sheet for Dry Season Sample Analysis for Listed Large Branchiopods

Project Information

Project Name: Olsen
USFWS Project Number:
County: SLO
Lat: 35°36'33.37"N
Long: 120°38'19.48"W
Quad: Templeton
Township: M27S
Range: 12E
Section: 11
Page 1 of 2

Biologist Information

Name of Person(2) Who Conducted the Following Tasks and Permit Number(s):
Soil Collection: Mitch Dallas TE 102310-3
Soil Processing: Mitch Dallas "
Soil Analysis/Cysts ID: Mitch Dallas "
Soil Collection Date: 6/22/19

3 Pool/ Habitat/ Basin No.	Invertebrates Present (X)															Other Species	Comments
	Insect Exo-Skeletons	Micro-Turbellaria Cysts	Cladocera Ephippia	Ostracods Live/Cysts/ Carapaces	Copepods Live/Cysts	Number of Large Branchiopod Cysts = LBC: *Branchinecta* sp.	*Lepidurus packardi*	*Streptocephalus wootoni*	*Linderiella occidentalis*	*Lynceus brachyurus*	*Cyzicus californicus*	Hydracarina Live	Nematoda	Collembola		
3-1	X			X													No LBC
3-2	X			X													1C
3-3	X			X													1C
3-4	X			X													1C
3-5	X			X													1C
3-6	X			X													1C
3-7	X			X													1C
3-8	X			X													1C
3-9	X			X													1C
3-10	X			X													1C
3-11	X			X													1C
3-12	X			X													1C
3-13	X			X													1C
3-14	X			X													1C
3-15	X			X													1C
3-16	X			X													1C
3-17	X			X													1C
3-18	X			X													1C
3-19	X			X													1C
3-20	X			X													1C
3-21	X			X													1C
3-22	X			X													1C
3-23	X			X													1C
3-24	X			X													1C
3-25	X			X													1C
3-26	X			X													1C
3-27	X			X													1C
3-28	X			X													1C
3-29	X			X													1C
3-30	X			X													1C
3-31	X			X													1C
3-32	X			X													1C
3-33	X			X													1C
3-34	X			X													1C
3-35	X			X													1C
3-36	X			X													1C
3-37	X			X													1C
3-38	X			X													1C
3-39	X			X													1C
3-40	X			X													1C
3-41	X			X													1C
3-42	X			X													1C

Appendix 2. U.S. Fish and Wildlife Service – Data Sheet for Dry Season Sample Analysis for Listed Large Branchiopods

Project Information

Project Name: Olsen
USFWS Project Number:
County: SLO
Lat: 35°36'33.37"N
Long: 120° 38' 18.48"W
Quad: Templeton
Township: 31S
Range: 12E
Section: 4
Page 2 of 2

Biologist Information

Name of Person(2) Who Conducted the Following Tasks and Permit Number(s):
Soil Collection: McDaniel TE 1023103
Soil Processing: "
Soil Analysis/Cysts ID: "
Soil Collection Date: 6/22/19

Pool/ Habitat/ Basin No.	Invertbrates Present (X)														Other Species	Comments
						Number of Large Branchiopod Cysts = LBC										
	Insect Exo-Skeletons	Micro-Turbellaria Cysts	Cladocera Ephippia	Ostracods Live/Cysts/ Carapaces	Copepods Live/Cysts	*Branchinecta* sp.	*Lepidurus packardi*	*Streptocephalus wootoni*	*Linderiella occidentalis*	*Lynceus brachyurus*	*Cyzicus californicus*	Hydracarina Live	Nematoda	Collembola		
3																
3-43																NO LBC
3-44																"
3-45																"
3-46																"
3-47																"
3-48																"
3-49																"
3-50																"

Appendix 2. U.S. Fish and Wildlife Service – Data Sheet for Dry Season Sample Analysis for Listed Large Branchiopods

Project Information

Project Name: Olsen
USFWS Project Number:
County: San Luis Obispo
Lat: 35°36'34.31"N
Long: 120°38'17.52"W
Quad: Templeton
Township: 27S
Range: 12E
Section: 11
Page 1-1

Biologist Information

Name of Person(2) Who Conducted the Following Tasks and Permit Number(s):

Soil Collection: Mitch Dallas TE 102310-3
Soil Processing: Mitch Dallas
Soil Analysis/Cysts ID: Mitch Dallas
Soil Collection Date: 6/22/19

Pool/ Habitat/ Basin No. (4)	Invertbrates Present (X)															Comments
	Insect Exo-Skeletons	Micro-Turbellaria Cysts	Cladocera Ephippia	Ostracods Live/Cysts/ Carapaces	Copepods Live/Cysts	Number of Large Branchiopod Cysts = LBC: *Branchinecta* sp.	*Lepidurus packardi*	*Streptocephalus wootoni*	*Linderiella occidentalis*	*Lynceus brachyurus*	*Cyzicus californicus*	Hydracarina Live	Nematoda	Collembola	Other Species	
4-1																No LBC
4-2																No LBC
4-3																NO LBC
4-4																No LBC
4-5																NO LBC
4-6																NO LBC
4-7																NO LBC
4-8																NO LBC
4-9																NO LBC
4-10																NO LBC

Appendix 2. U.S. Fish and Wildlife Service – Data Sheet for Dry Season Sample Analysis for Listed Large Branchiopods

Project Information

Project Name: Olsen
USFWS Project Number:
County: San Luis Obispo
Lat: 35°36'36.3"N
Long: 120°38'12.8"W
Quad: Templeton
Township: 27S
Range: 12E
Section: 11
Page 1 of 2

Biologist Information

Name of Person(2) Who Conducted the Following Tasks and Permit Number(s):

Soil Collection: Mitch Dallas TE-102310-3
Soil Processing: Mitch Dallas "
Soil Analysis/Cysts ID: Mitch Dallas "
Soil Collection Date: 6/22/19

5 Pool/ Habitat/ Basin No.	Invertbrates Present (X)															Other Species	Comments
						Number of Large Branchiopod Cysts = LBC											
	Insect Exo-Skeletons	Micro-Turbellaria Cysts	Cladocera Ephippia	Ostracods Live/Cysts/ Carapaces	Copepods Live/Cysts	*Branchinecta* sp.	*Lepidurus packardi*	*Streptocephalus wootoni*	*Linderiella occidentalis*	*Lynceus brachyurus*	*Cyzicus californicus*	Hydracarina Live	Nematoda	Collembola		
5-1																	NO LBC
5-2																	"
5-3																	"
5-4																	"
5-6>5-5																	" "
5-7																	"
5-8																	"
5-9																	"
5-10																	"
5-11																	"
5-12																	"
5-13																	"
5-14																	"
5-15																	"
5-16																	"
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5-36																	"
5-37																	"
5-38																	"
5-39																	"
5-40																	"
5-41																	"
5-42																	"
5-43																	"

Appendix 2. U.S. Fish and Wildlife Service – Data Sheet for Dry Season Sample Analysis for Listed Large Branchiopods

Project Information

Project Name: Olsen
USFWS Project Number:
County: San Luis Obispo
Lat: 35° 36' 36.3" N
Long: 120° 38' 12.8" W
Quad: Templeton
Township: 26S
Range: 12E
Section: "
Page 2 of 2

Biologist Information

Name of Person(2) Who Conducted the Following Tasks and Permit Number(s):
Soil Collection: Mitch Dallas TE 102310-3
Soil Processing: "
Soil Analysis/Cysts ID: "
Soil Collection Date: 6/22/19

Pool/ Habitat/ Basin No.	Invertebrates Present (X)															Other Species	Comments
						Number of Large Branchiopod Cysts = LBC											
	Insect Exo-Skeletons	Micro-Turbellaria Cysts	Cladocera Ephippia	Ostracods Live/Cysts/ Carapaces	Copepods Live/Cysts	*Branchinecta* sp.	*Lepidurus packardi*	*Streptocephalus wootoni*	*Linderiella occidentalis*	*Lynceus brachyurus*	*Cyzicus californicus*	Hydracarina Live	Nematoda	Collembola		
5																	
5.44																	No LBC
5.45																	"
5.46																	"
5.47																	"
5.48																	"
5.49																	"
5.50																	"

Appendix 2. U.S. Fish and Wildlife Service – Data Sheet for Dry Season Sample Analysis for Listed Large Branchiopods

Project Information

Project Name: Olsen
USFWS Project Number:
County: San Luis Obispo
Lat: 35° 36' 04.0" N
Long: 120° 38' 27.5" W
Quad: Templeton
Township: 27S
Range: 12E
Section: 11
Page 1 of 2

Biologist Information

Name of Person(2) Who Conducted the Following Tasks and Permit Number(s):
Soil Collection: Mitch Dallas TE 102350-3
Soil Processing: Mitch Dallas
Soil Analysis/Cysts ID: Mitch Dallas
Soil Collection Date: 6/22/19

6 Pool/ Habitat/ Basin No.	Invertebrates Present (X)															Comments
	Insect Exo-Skeletons	Micro-Turbellaria Cysts	Cladocera Ephippia	Ostracods Live/Cysts/ Carapaces	Copepods Live/Cysts	Number of Large Branchiopod Cysts = LBC: *Branchinecta* sp.	*Lepidurus packardi*	*Streptocephalus wootoni*	*Linderiella occidentalis*	*Lynceus brachyurus*	*Cyzicus californicus*	Hydracarina Live	Nematoda	Collembola	Other Species	
6-1																NO LBC
6-2																"
6 3																"
6 4																"
6 5																"
6 6																"
6 7																"
6 8																"
6 9																"
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6 38																"
6 39																"
6 40																"
6 41																"
6 42																"

Appendix 2. U.S. Fish and Wildlife Service – Data Sheet for Dry Season Sample Analysis for Listed Large Branchiopods

Project Information

Project Name: Olsen
USFWS Project Number:
County: SLO
Lat: 35° 36' 04.0" N
Long: 120° 38' 27.5" W
Quad: Templeton
Township: M27S
Range: 12E
Section: 11
Page 2 of 2

Biologist Information

Name of Person(2) Who Conducted the Following Tasks and Permit Number(s):
Soil Collection: Mitch Dallas TE102310-3
Soil Processing: "
Soil Analysis/Cysts ID: "
Soil Collection Date: 6/22/19

Pool/ Habitat/ Basin No.	Invertbrates Present (X)															Comments
						Number of Large Branchiopod Cysts = LBC									Other Species	
	Insect Exo-Skeletons	Micro-Turbellaria Cysts	Cladocera Ephippia	Ostracods Live/Cysts/ Carapaces	Copepods Live/Cysts	*Branchinecta* sp.	*Lepidurus packardi*	*Streptocephalus wootoni*	*Linderiella occidentalis*	*Lynceus brachyurus*	*Cyzicus californicus*	Hydracarina Live	Nematoda	Collembola		
6																
643																No LBC
644																"
645																"
646																"
647																"
648																"
649																"
650																"

Appendix D.2

Wetland Delineations

Delineation of Potentially Jurisdictional Wetlands and Waters

for

South Chandler Ranch

Paso Robles,
San Luis Obispo County

Prepared for

Ayres Group
355 Bristol Street, Suite A
Costa Mesa, CA 93626-7923

by

ALTHOUSE AND MEADE, INC.
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November 2017

982.03

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Cover Page: Potential wetland within Study Area. May 4, 2017

Synopsis

- This wetland delineation examines a 116.42-acre Study Area located in the City of Paso Robles, California (Section 1.2).

- Based on the results of the formal field delineation following regulatory protocol, we conclude that there are 0.08 acres of potentially jurisdictional isolated wetlands under jurisdiction of the Regional Water Quality Control Board and California Department of Fish and Wildlife (Section 4.1).

- An additional 591 linear feet of non-wetland waters within the Study Area are jurisdictional per standards set forth by the United States Army Corps of Engineers, Regional Water Quality Control Board, and California Department of Fish and Wildlife (Section 4.2).

List of Acronyms and Abbreviations

CDFW	California Department of Fish and Wildlife
CFR	Code of Federal Regulations
CWA	Clean Water Act
EPA	Environmental Protection Agency
FEMA-FIRM	Federal Emergency Management Agency Flood Insurance Rate Map
GPS	Global Positioning System
HUC	Hydrologic Unit Code
NAIP	National Agriculture Imagery Program
NRCS	Natural Resource Conservation Service
NTCHS	National Technical Committee for Hydric Soils
OHWM	Ordinary High Water Mark
RWQCB	Regional Water Quality Control Board
SSURGO	Soil Survey Geographic Database
SWRCB	State Water Resources Control Board
TNW	Traditional Navigable Water
TOB	Top of Bank
U.S.	United States
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WETS	Climate Analysis for Wetlands Tables

Definitions of Wetland Indicators

Wetland Plant Indicator Status Ratings In Order of Wetland Affinity		
OBL	Obligate	Hydrophyte, almost always occur in wetland. Estimated probability >99 percent to occur in wetlands under natural conditions.
FACW	Facultative Wetland	Hydrophyte, usually occur in wetland, but may occur in non-wetland. Estimated probability >67% to 99% to occur in wetlands under natural conditions.
FAC	Facultative	Equally likely to occur in wetland and non-wetland. Estimated probability 33% to 67% to occur in wetlands under natural conditions.
FACU	Facultative Upland	Non-hydrophyte, usually occurs in non-wetland, but may occur in wetland. Estimated probability 1% to <33% to occur in wetlands under natural conditions.
UPL	Upland	Almost never occur in wetland. Estimated probability <1% to occur in wetlands under natural conditions.
NL	No Listed	Species not included in the federal list of wetland indicator plants. Assumed upland for purposes of wetland analysis.

1.0 Introduction

1.1 Purpose

This report provides a delineation of potentially jurisdictional wetlands and non-wetland waters on the 116-acre South Chandler Ranch (Study Area), located in the City of Paso Robles in San Luis Obispo County, California. The purpose of this report is to describe potentially jurisdictional waters and wetlands according to the Clean Water Act (CWA) Section 404, the Porter-Cologne Water Quality Act (State Water Code), and Fish and Game Code Section 1600. This document presents a comprehensive inventory and mapping effort of wetland and non-wetland aquatic resources within the Study Area and provides information for owners, the United States Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), California Department of Fish and Wildlife (CDFW), and the Lead Agency in decisions regarding activities in the Study Area. Section 2.0 provides more detail on the regulatory framework and scope of this jurisdictional delineation.

TABLE 1. RESPONSIBLE PARTIES.

Owner/Applicant	Project Planner	Biological Consultant
Ayres Group 355 Bristol Street, Suite A, Costa Mesa, CA 93626-7923	**Larry Werner** Land Development Specialist 725 Creston Road, Suite B Paso Robles, CA 93446 (805) 239-3127 x207	**Althouse and Meade, Inc.** 1602 Spring Street Paso Robles, CA 93446 (805) 237-9626 Contact: Jacqueline Tilligkeit

1.2 Study Area Location and Extent

The Study Area is 116.42 acres located within the city limits at the eastern edge of Paso Robles. It is bounded by Fontana Road to the west, Linne Road to the south, a vineyard to the east, and additional Chandler Ranch property to the north (Figure 1). Along Fontana and Linne Roads are industrial and business properties as well as residential subdivisions. Approximate coordinates for the center of the Study Area are 35.616° N / 120.645° W (WGS84) in the Templeton United States Geological Survey (USGS) 7.5-minute topographic quadrangle (Figure 2). Elevation ranges from approximately 810 to 940 feet above mean sea level. The Study Area is composed of 62 parcels; the Assessor's Parcel Numbers are provided in Appendix A.

1.3 Current Conditions

The large majority of the Study Area is fallow cropland turned grassland. It has rolling hills and gently sloping plains with more than 100 feet in elevation change from the north to south. The Study Area was first farmed prior to 1949 and has laid fallow since around 2006 except for being occasionally grazed.

In the southeastern portion of the Study Area, 15 acres was subdivided into 54 lots in the 1960's to develop the subdivision Our Town (Dirkx 2017; Figure 3). The project ceased after 13 lots

were developed on one of the six cul-de-sacs originating from the constructed Aaroe Road. Currently, some of the homes are inhabited, some dilapidated, and the remaining cul-de-sacs are paved and unmaintained, surrounded by weedy grassland.

1.3.1 ***Hydrology***

The Study Area is only a few hundred feet from the highest point of the Mustard Creek – Salinas River (12-digit Hydrologic Unit Code) watershed within the larger Salinas watershed (8-digit HUC) which is formed by the Coastal Range (Figure 4). Less than 2 miles to the west is the Salinas River, a TNW. Highest elevations onsite occur in the northeast corner and the lowest occur in the southwest. Water onsite flows southwest to culverts at the corner of Fontana Road and Linne Road and at the intersection of Linne Road and Airport Road.

Water from adjacent vineyards enters the site at the eastern boundary and is diverted around rolling hills into shallow valleys across the Study Area. Otherwise, the main water source for the site is direct precipitation. Figure 5 shows the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (FIRM) and indicates that the Study Area is well within the minimal flood hazard zone (FEMA 2017). In addition, neither the National Hydrography Dataset nor the National Wetlands Inventory have indicated wetland features within the Study Area (Figure 6 and 7).

A drainage ditch that bisects the southeastern portion of the Study Area was created in the 1960's to divert water from Our Town (Figure 3). It begins at a culvert underneath Aaroe Road and continues to 120 feet northeast of the intersection of Linne Road and Airport Road. This ditch does not appear to be maintained.

1.3.2 ***Vegetation and Habitats***

Annual grassland is the predominant habitat within the Study Area, covering approximately 108 acres of the site. Most of the grassland has been disturbed by past farming and ranching operations, leaving much of the area to be comprised of non-native grasses and forbs. The landscape composition includes typical non-native grassland habitat, with dominant species including wild oats (*Avena barbata* and *Avena fatua*), annual bromes (*Bromus diandrus, Bromus hordeaceus,* and *Bromus madritensis* subsp. *rubens*), filaree (*Erodium* ssp.), and mustards (*Brassica nigra* and *Hirschfeldia incana*).

1.3.3 ***Soils***

Four individual soil map units from the Natural Resource Conservation Service (NRCS) Soil Survey Geographic Database (SSURGO) overlap the Study Area: Arbuckle-Positas complex, Nacimiento-Los Osos complex, Rincon clay loam, and San Ysidro loam (Soil Survey Staff 2017).

A custom soil report for the Study Area is provided as Appendix B.

1.3.4 ***Climate***

The Climate Analysis for Wetlands Tables (WETS) for Paso Robles Municipal Airport (Station ID 046742, 3.5 miles north of Project site) indicates that average 30-year rainfall is 13.08 inches

(Table 2). The 2016-2017[1] rainfall year was above average particularly in January with the annual precipitation totaling 16.14 inches (NOAA 2017). Rainfall was above the WETS range in the majority of the wet months (Chart 1). Soil pits were investigated in May 2017.

TABLE 2. PRECIPITATION (INCHES) BY MONTH.

Year	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1971-2000	0.01	0.06	0.36	0.51	1.12	1.73	2.83	2.87	2.65	0.68	0.23	0.02
2016-2017	0	0	0	1.39	1.26	1.03	6.91	3.89	0.53	0.95	0.18	0

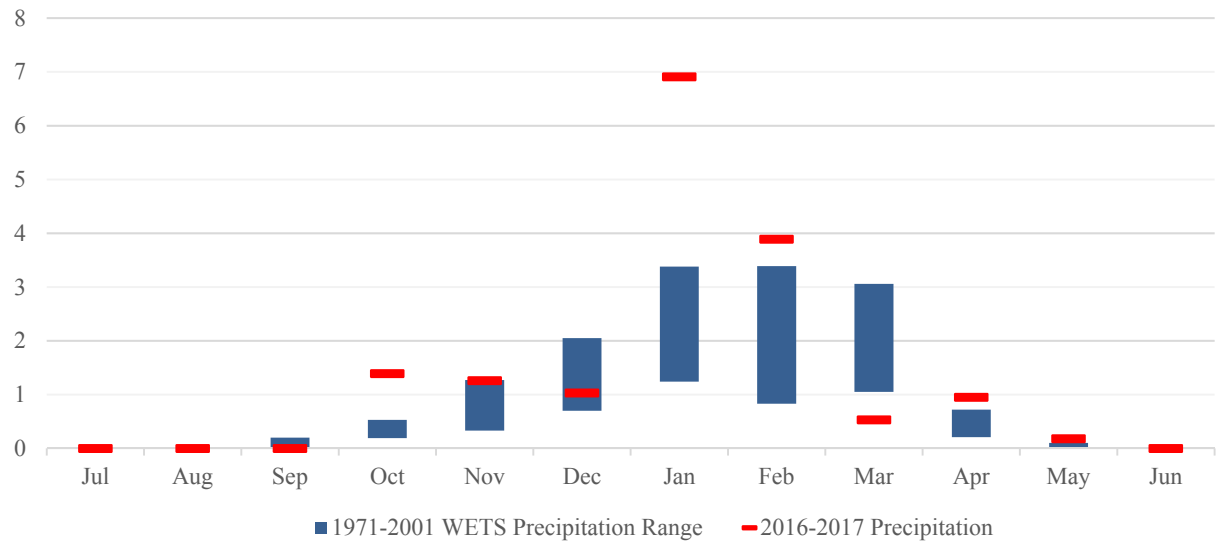


CHART 1. WETS[2] PRECIPITATION AND 2016-2017 RAINFALL YEAR (INCHES).

[1] Rainfall years range from July to June.

[2] WETS tables display the average range of precipitation by month by providing a probability analysis.

2.0 Regulatory Framework

2.1 United States Army Corps of Engineers

Section 404 of the CWA authorizes the USACE to regulate activities that discharge dredged or fill material to wetlands and other waters of the United States. The term "waters of the United States" encompasses resources described by the Environmental Protection Agency (EPA) and the Corps regulations, 40 CFR (Code of Federal Regulations) § 230.3(s) and 33 CFR § 328.3(a). The geographic limits of relevant federal jurisdiction for non-tidal waters of the U.S. are defined at 33 CFR § 328.4(c).

The *Corps of Engineers Wetlands Delineation Manual* (hereafter "1987 Manual"; Environmental Laboratory 1987) defines wetlands (Environmental Protection Agency regulations at 40 CFR § 230.3(t); USACE regulations at 33 CFR § 328.3(b)). Wetlands are considered "special aquatic sites" under the USACE definition. Special aquatic sites are afforded protection under the CWA (Sections 401 and 404). The 1987 Manual and various regional supplements describe the criteria that must be met to determine the presence of a wetland, the methods used to determine whether they are met, and the geographic extent of wetland areas identified in the field.

The USACE takes jurisdiction over wetlands that exhibit hydrology, hydric soil, and hydrophytic vegetation (three parameters) by the standard set forth in the Arid West Regional Supplement. For non-wetland water features, USACE jurisdiction is limited to the Ordinary High Water Mark (OHWM). Both wetlands and non-wetland waters (drainages) must exhibit a significant nexus to a Traditionally Navigable Water (TNW).

2.2 Regional Water Quality Control Board

Waters are defined in California Water Code section 13050(e) as "any surface water or groundwater, including saline waters, within the boundaries of the state." However, July 2017 guidance from the RWQCB indicates that they have adopted the USACE policy of a "three-parameter wetland" (SWRCB 2017). They will also take jurisdiction over a non-wetland water to the OHWM. In contrast to the USACE, however, the RWQCB will take jurisdiction over isolated wetland features that do not have significant nexus to a TNW. Therefore, all USACE features are RWQCB jurisdiction but not all RWQCB features are USACE jurisdiction.

2.3 California Department of Fish and Wildlife

CDFW found the U.S. Fish and Wildlife Service (USFWS) wetland definition and classification system based on the 1979 Cowardin definition to be the most biologically valid (Cowardin et al. 1979). In general, CDFW will take jurisdiction over drainage or lake features with a bed and bank and will limit their jurisdiction to the top of bank (TOB), and may include adjacent wetland or riparian areas on a case by case basis.

The RWQCB and CDFW (hence forward may be referred to as "state" or "state of California") receive regulatory authority over wetlands and waters within California as specified in Section 401 of the Clean Water Act (CWA), the Porter-Cologne Water Quality Act (California Water Code), the California Coastal Act of 1975 (CCA), and Fish and Game Code Section 1600.

3.0 Delineation Methods

3.1 Overview of Sampling Methodology

Jurisdictional wetlands and other waters were identified using methods and guidelines described in the 1987 Manual, the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (hereafter "2008 Supplement"; USACE 2008b), and *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (hereafter "OHWM Manual"; USACE 2008a). Site visits were made in May 2017 by Wetland Scientist Jacqueline Tilligkeit and Botanist Jason Dart (Table 3). Table 3 summarizes dates of field work and personnel attending each site visit.

TABLE 3. FIELD WORK LOG.

Survey Date	Activities	Personnel
May 3, 2017	Site survey and sample sites	Jacqueline Tilligkeit Jason Dart
May 4, 2017	Sample sites	Jacqueline Tilligkeit
November 10, 2017	Current conditions and observational soil pit	Jacqueline Tilligkeit Ken McCarron

3.1.1 ***Wetlands***

Soil pits were dug by hand at three sampling sites based on low relief and investigation of aerial photographs. Locations of sampling sites were recorded on the Delineation of Jurisdictional Areas Map (Exhibit A) and USACE Arid West Region Wetland Determination Data Forms (Exhibit B). Photos of each site are included in Section 8.0.

Wetland Hydrology

The presence or absence of wetland hydrology field indicators was assessed following methodology presented in the 1987 Manual and the 2008 Supplement. Wetland indicators used to determine if wetland hydrology features are present include, but are not limited to, high water table, site topography, drift lines, drainage patterns, sediment deposits, inundation, observation of wet conditions during the growing season, and saturation of soils.

Wetland Soils

Soils were examined according to methodology presented in the 2008 Supplement and 1987 Manual. The presence or absence of hydric soil indicators was determined by soil characteristics outlined within the USDA-NRCS publication, *Field Indicators of Hydric Soils in the United States* (version 7.0; USDA-NRCS 2010) and the National Technical Committee for Hydric Soils (NTCHS) definition of hydric soils.

Wetland Vegetation

To determine if wetland species were present, vegetation in each stratum was identified to the species level and confirmed using the *National Wetland Plant List* (Lichvar et al. 2016). If wetland

species were found, species dominance was recorded for each stratum using the "50/20 Rule," as per the 2008 Supplement. Dominance test was calculated for all samples and prevalence index was calculated if samples had a presence of hydric soil and hydrology but did not pass the dominance test.

3.1.2 Non-Wetland Waters

Potential non-wetland waters occur when drainages display evidence of hydrology but do not contain vegetation suggestive of wetlands. Evidence of OHWM is used to determine extent of Corps jurisdiction over non-wetland waters of the U.S. The OHWM Manual lists and describes indicators associated with areas that become flooded or ponded, but are not dominated by wetland vegetation and the duration of flooding, ponding, and/or near-surface soil saturation (less than or equal to 12 inches) is not sufficient to cause hydric soils to form or wetland hydrology conditions to occur. OHWM, if present, was identified and noted according to guidance provided in the OHWM Manual. Wetland Determination Data Forms (USACE 2010) were used to determine OHWM for non-wetland waters and are included under Exhibit C.

3.1.3 Waters Connectivity/Adjacency

Connectivity to Traditional Navigable Waters and their tributaries is established via field work where accessible, as well through analysis of aerial photographs, USGS topographic map, and the USGS National Hydrography Dataset. This connectivity determines whether the feature has "significant nexus" (i.e., it significantly affects the chemical, biological, or physical integrity of a Traditionally Navigable Water).

3.2 Mapping Methodology

Mapping efforts utilized Samsung Galaxy Tab A tablets equipped with Garmin GLO Global Positioning System (GPS) Receivers. Delineation boundaries were drawn using aerial photography and field notes. Existing datasets such as the National Hydrography Dataset and the USGS topographic maps were considered during mapping. Our results vary somewhat from these existing publications due to the finer scale and on-the-ground data collection techniques used in our work. GPS data, digitized notes, and photos were imported into Esri ArcGIS, a Geographic Information Systems software suite, and interpreted into maps. Maps were produced at a minimum scale of 1 map inch to 400 feet on the ground using field data, and presented over a 2016 National Agriculture Imagery Program (NAIP) Aerial Photograph.

4.0 Technical Findings

Wetland habitats in the Study Area meet state definitions and drainage features meet federal and state definitions. Our 2017 field work resulted in the delineation of 0.08 acre state jurisdictional wetlands and 591 linear feet of federal non-wetland waters within the Study Area.

4.1 State Wetlands

Two State wetland patches were mapped within the Study Area, one in a bowl on the east side and one in a swale feature on the west (Exhibit A). These wetland features are isolated palustrine persistent emergent (Cowardin et al. 1979) wetlands dominated by native and non-native herbs and grasses. Table 4 summarizes Determination Data Form findings.

4.1.1 ***Bowl Wetland***

The Bowl Wetland is a low spot 250 feet north of Our Town. It was likely created during the construction of Our Town when a pile of asphalt was left in the field. Plowing around the asphalt may have left the area lower and undisturbed, collecting water and creating a 0.01 acre (602 square feet) isolated wetland.

Hydrology

Water enters Bowl Wetland through precipitation and surface runoff. Water cannot exit the pool except through percolation into the soil therefore there is no connectivity to a TNW and this feature is considered isolated. Standing water was not present during an early May site visit but biotic crust and oxidized rhizospheres indicate hydrology.

Hydric Soils

Within the top eight inches of soil, the black silty clay (10YR 2/1) matrix contains dark grayish brown (10YR 4/2) depletions and dark yellowish brown (10YR 3/6) redoximorphic concentrations in the pore linings. The percentages and color distinction were sufficient to mark depleted matrix, redox dark surface, and redox depressions as hydric soil indicators.

Hydrophytic Vegetation

Dominant plant species within the wetland are seaside barley (*Hordeum marinum*, FAC) and curly dock (*Rumex crispus*, FAC) with a presence of other hydrophytes such as toad rush (*Juncus bufonius*, FACW) and slender woolly marbles (*Psilocarphus tenellus*, OBL). The wetland feature passes the dominance text and also contains two percent biotic crust.

4.1.2 ***Swale Wetland***

The Swale Wetland lays in a swale feature in the northwest portion of the property and is 0.07 acre (2999 square feet). Water is concentrated in a small drainage that supports hydrophytic vegetation. There is no clear flow path or connection from the wetland to a TNW. Downslope of the wetland, water likely sheet or subsurface flows to the street or a culvert at the corner of Fontana Road and Linne Road. It is unclear where the culvert would connect to a storm ditch or creek.

Hydrology

Water originating from surface or subsurface runoff from hills onsite is concentrated in a small swale in the Study Area. Biotic crust was present during the field investigations. The narrow swale continues for less than 300 feet before the topography flattens into a gentle southwest sloping hillside with no sign of hydrology.

Hydric Soils

Five percent dark yellowish brown redoximorphic features were present at three inches within the very dark brown (10YR 2/2) sandy clay loam matrix. The prominence, depth, and quantity of the redox features qualified as a redox dark surface and redox depressions indicator.

Hydrophytic Vegetation

Italian ryegrass (*Festuca perennis*, FAC) and seaside barley are dominant within the sample site with a presence of toad rush and slender woolly marbles. The sample site passes the dominance test and presented ten percent biotic crust. Adjacent upland areas and downslope of the wetland feature was dominated strongly (95 percent cover) by rattail sixweeks grass (*Festuca myuros*, FACU).

4.1.3 ***Additional Areas Investigated***

Two swale features on the eastern edge of the Study Area were investigated during site visits due to greener vegetation in aerial imagery and suggestive topography.

In the northern feature, Italian ryegrass (FAC) was the only dominant species in this location with the second highest percent absolute coverage from ripgut brome (UPL). A soil pit was dug to 16 inches. It displayed a very dark brown silty clay matrix with no sign of redoximorphic features nor a restrictive layer. Hydrology indicators were also absent within the feature. This location was not mapped as a wetland because it only displayed one parameter: the dominance of a plant species that is equally likely to occur in a wetland and upland.

The southern feature was hardly identifiable in the field. It did not have distinct vegetation communities compared to adjacent upland areas. Italian ryegrass (FAC), rattail sixweeks grass (FACU), and wild oats (NL) are dominants within the swale with no clear change in vegetation percent coverage nor species dominance to demarcate an OHWM. An observational soil pit revealed less than one percent redoximorphic features in a very dark brown matrix. Additionally, the topography undulates from historic plowing and burrowing mammal activity without a clear path for the water to flow and no bed and bank.

TABLE 4. WETLAND CHARACTERISTICS.

Feature	Sample Site	Dominant Species	Wetland Vegetation?	Soil Indicator	Wetland Soil?	Hydrology Indicator	Wetland Hydrology?	Connection	Jurisdiction	Wetland Type
n/a	1	FAC	Yes	None	No	None	No	No	None	n/a
Bowl Wetland	2	FAC, FAC	Yes	F3, F6, F8	Yes	B12, C3	Yes	No	State Only	Palustrine Persistent Emergent
Swale Wetland	4	FAC, FAC	Yes	F6, F8	Yes	B12	Yes	No	State Only	Palustrine Persistent Emergent

FAC: 34-66% in wetlands

F3: Depleted Matrix
F6: Redox Dark Surface
F8: Redox Depressions

B12: Biotic Crust
C3: Oxidized Rhizospheres along Living Roots

4.2 Federal Non-Wetland Waters

One potential federal non-wetland water was delineated within the Study Area (Our Town Drainage). The artificial unconsolidated bottom palustrine feature contains less than five percent vegetation at the bottom of the ditch. The general flow path begins in the property to the east in a vineyard where it is fed by runoff from precipitation and irrigation and ends northeast of the intersection of Linne Road and Airport Road. An aerial photograph from 1949 reveals a clear flow path in this corner of the property prior to the installation of the neighboring vineyard (Figure 3). In this photo, the drainage continues across Linne and flows for 1300 feet before converging with an unnamed creek. A 1962 aerial photo shows that the drainage downslope of Our Town within the Study Area was channelized during the construction of the partial development (Figure 3). Currently the channel ends just short of a culvert that carries the water across Linne and into a storm ditch. The storm ditch zigs and zags through developed land before meeting up with the same unnamed creek near the intersection of Commerce Way and Scott Street. The creek ends at the Salinas River, a TNW.

As discussed in paragraph three of Section 4.1.3, there is no evidence of an OHWM north of Our Town. The artificial channel and jurisdictional feature begins at the road and continues to approximately 60 feet from Linne Road where it sheet flows to the culverts. The end of the drainage has become more poorly defined since the 1962 aerial, likely due to transportation of sediment down the ditch and deposition during sheet flow when the water velocity slows.

The channel is lined with coyote bush (*Baccharis pilularis*), wild oat (*Avena fatua*), ripgut brome (*Bromus diandrus*), and soft brome. The bottom of the channel contains less than five percent vegetation and more than 50 percent biotic crust coverage in some locations. Hydrology indicators include biotic crust and drift deposit. The OHWM is approximately 2.5 feet wide and is demarcated by a change in vegetation percentage, break in bank slope, and presence/absence of hydrology. The TOB is 5 feet wide on average.

5.0 Jurisdictional Delineation

The Study Area does not contain habitat that meets the definition of wetland by the USACE. Approximately 0.08 acre (3601 square feet) of isolated wetland habitat was delineated as state jurisdiction (Table 5). Despite displaying hydrology, hydric soil, and hydrophytic vegetation, both wetland features are only considered state jurisdictional due to the lack of connectivity to a TNW.

TABLE 5. STATE JURISDICTIONAL WETLAND MEASUREMENTS.

Feature	Area (ac)	Area (sq ft)
Bowl Wetland	0.01	602
Swale Wetland	0.07	2999
Total	**0.08**	**3601**

Our Town Drainage (591 feet) meets the definition of an USACE non-wetland water within the Study Area. It is federally jurisdictional due to the presence of an OHWM as well as its proximity to a culvert that carries water along a clear path to the Salinas River. The state (RWQCB and CDFW) would also take jurisdiction over this potentially federal feature.

Jurisdictional area calculations are included in Table 6.

TABLE 6. FEDERAL JURISDICTIONAL NON-WETLAND WATER MEASUREMENTS.

Feature	OHWM Width (ft)	TOB Width (ft)	Length (ft)
Our Town Drainage	2.5	5	591

This report is subject to verification by the USACE, RWQCB, and CDFW.

6.0 Photographs

Bowl Wetland

Low lying area likely created by leaving a mound of asphalt during Our Town construction. View west.

May 3, 2017

Bowl Wetland

Dominated by seaside barley and curly dock.

May 3, 2017.

Swale Wetland

View looking downslope. Dominated by Italian rye grass and seaside barley. View west.

May 4, 2017

Upslope from Swale Wetland

Dominated by rattail sixweeks grass.

May 4, 2017.

Our Town Drainage

Coyote bush lines drainage to Our Town.

May 3, 2017

Our Town Drainage

The downstream end of the drainage dissipates and sheet flows.

May 3, 2017

Our Town Drainage

The substrate of the drainage presents hydrology indicators and minimal vegetation.

May 3, 2017

7.0 Figures

- Figure 1. Aerial Photograph
- Figure 2. United States Geological Survey Topographic Map
- Figure 3. Aerial Imagery History
- Figure 4. Hydrologic Unit Codes
- Figure 5. Federal Emergency Management Agency Flood Insurance Rate Map
- Figure 6. National Wetlands Inventory
- Figure 7. National Hydrography Dataset

Reso A - Exhibit C2 (EIR Technical Appendix)

Figure 1. Aerial Photograph

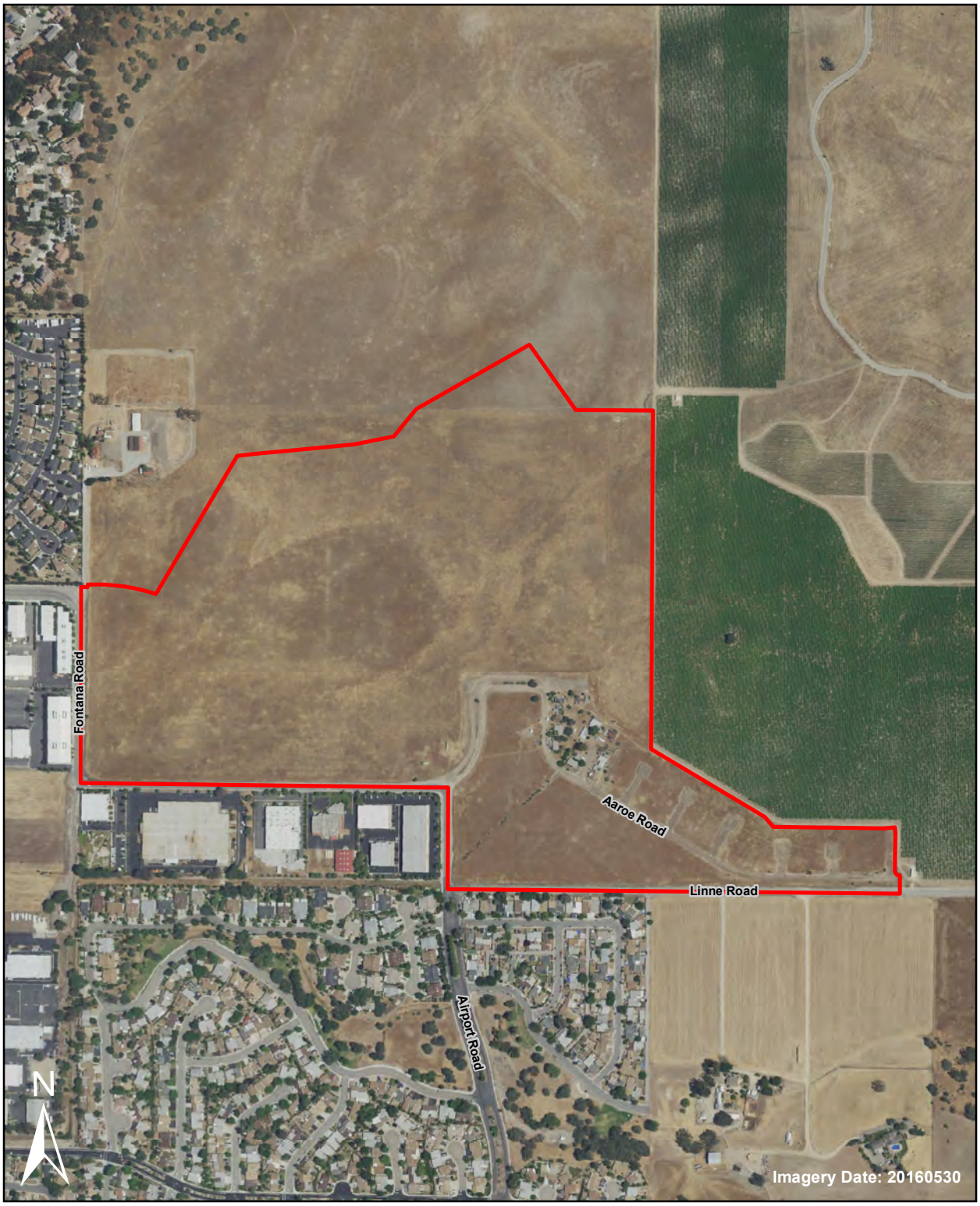
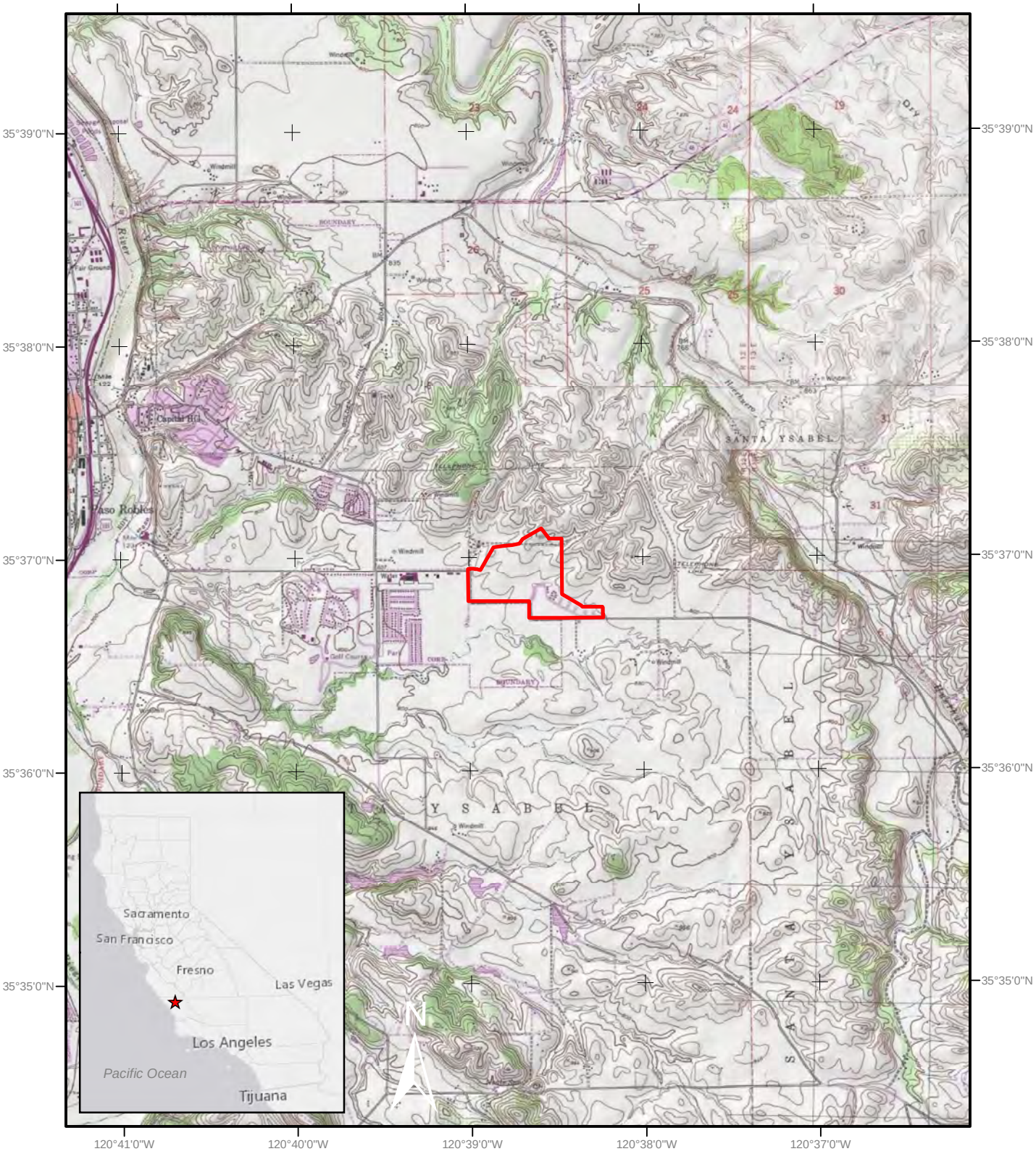


Figure 2. United States Geological Survey Topographic Map



Project Location (35.6155, -120.6450)

Study Area (117.3 acres)

1 inch = 0.75 mile

0 0.25 0.5 0.75 1 Mile

Templeton 7.5-minute USGS Quadrangle
Unsectioned T26S R12E

Updated November 09, 2017 03:00 PM by JBB

Figure 3. Aerial Imagery History

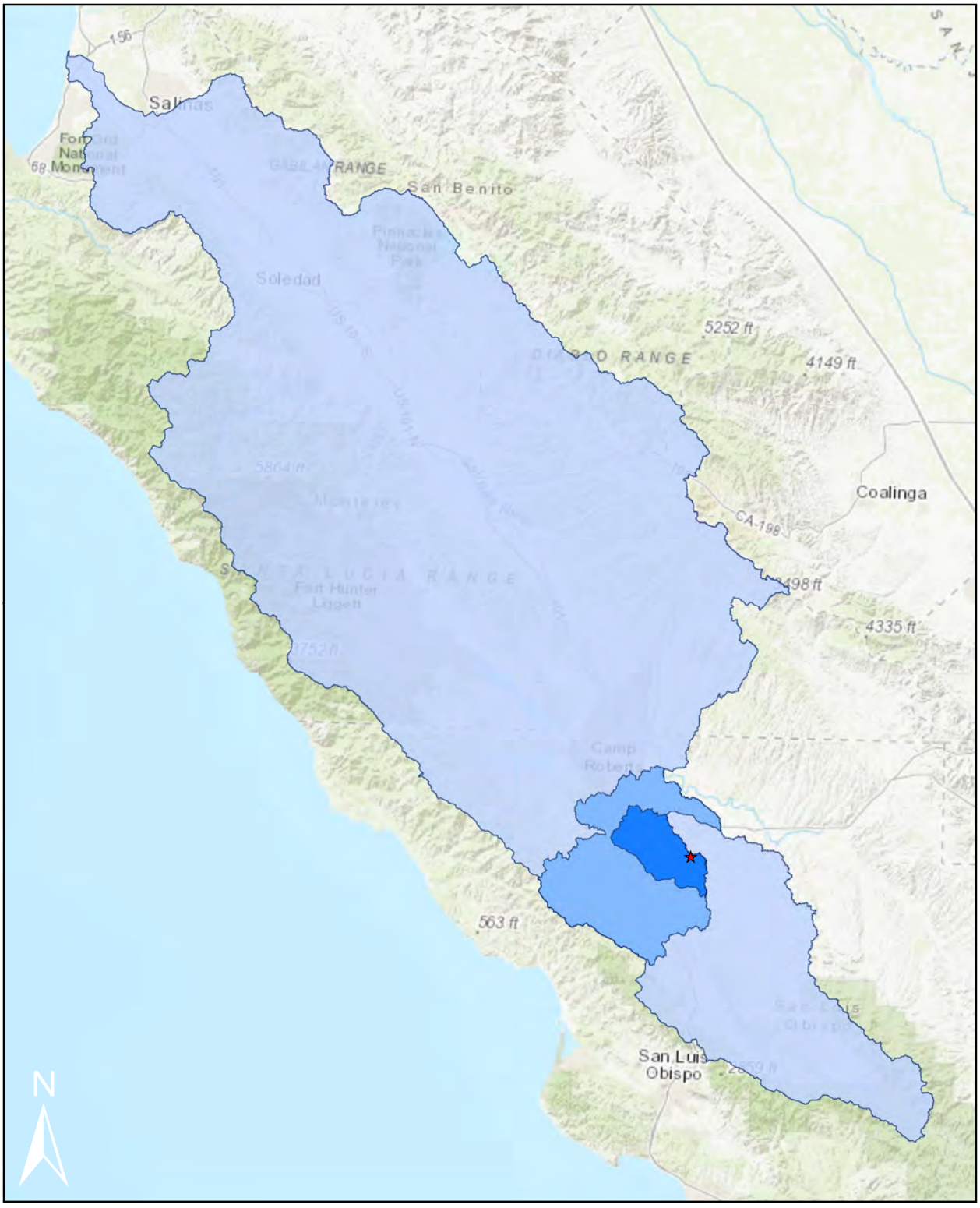
Study Area

1 inch = 1,250 feet

0 500 1,000 1,500 2,000 Feet

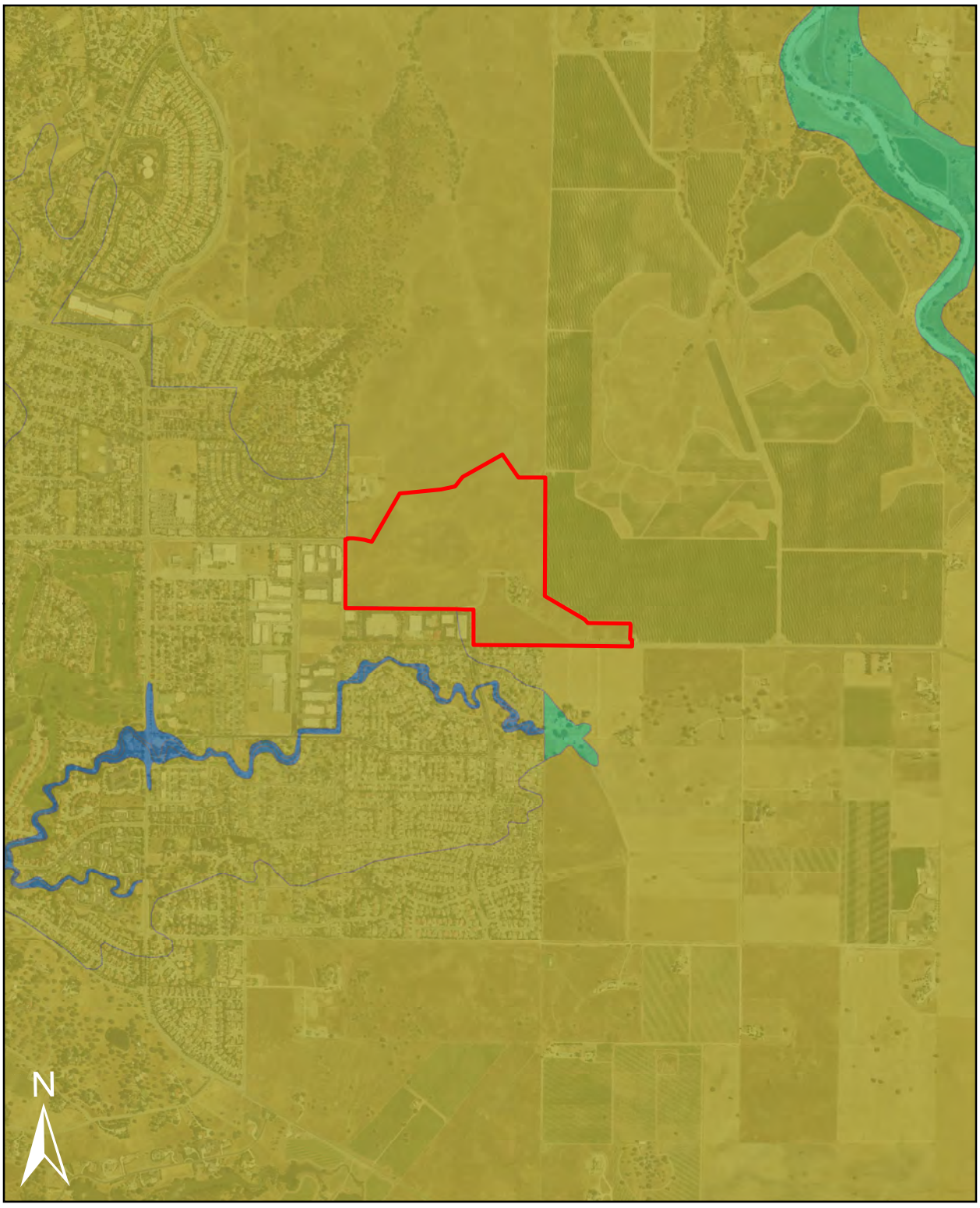
Updated November 09, 2017 03:01 PM by JBB

Figure 4. Hydrologic Unit Codes



Reso A - Exhibit C2 (EIR Technical Appendix)

Figure 5. Federal Emergency Management Agency Flood Insurance Rate Map



FEMA/FIRM Zone Classification

Moderate to Low Risk Areas

Zone	Description
B and X (shaded)	Area of moderate flood hazard, usually the area between the limits of the 100- year and 500-year floods. B Zones are also used to designate base floodplains of lesser hazards, such as areas protected by levees from 100-year flood, or shallow flooding areas with average depths of less than one foot or drainage areas less than 1 square mile.
C and X (unshaded)	Area of minimal flood hazard, usually depicted on FIRMs as above the 500-year flood level. Zone C may have ponding and local drainage problems that don't warrant a detailed study or designation as base floodplain. Zone X is the area determined to be outside the 500-year flood and protected by levee from 100- year flood.

High Risk Areas

Zone	Description
A	Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.
AE	The base floodplain where base flood elevations are provided. AE Zones are now used on new format FIRMs instead of A1-A30 Zones.
A1-A30	These are known as numbered A Zones (e.g., A7 or A14). This is the base floodplain where the FIRM shows a BFE (old format).
AH	Areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.
AO	River or stream flood hazard areas, and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.
AR	Areas with a temporarily increased flood risk due to the building or restoration of a flood control system (such as a levee or a dam). Mandatory flood insurance purchase requirements will apply, but rates will not exceed the rates for unnumbered A zones if the structure is built or restored in compliance with Zone AR floodplain management regulations.
A99	Areas with a 1% annual chance of flooding that will be protected by a Federal flood control system where construction has reached specified legal requirements. No depths or base flood elevations are shown within these zones.
V	Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26% chance of flooding over the life of a 30-year mortgage. No base flood elevations are shown within these zones.
VE, V1-30	Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.

Figure 6. National Wetlands Inventory

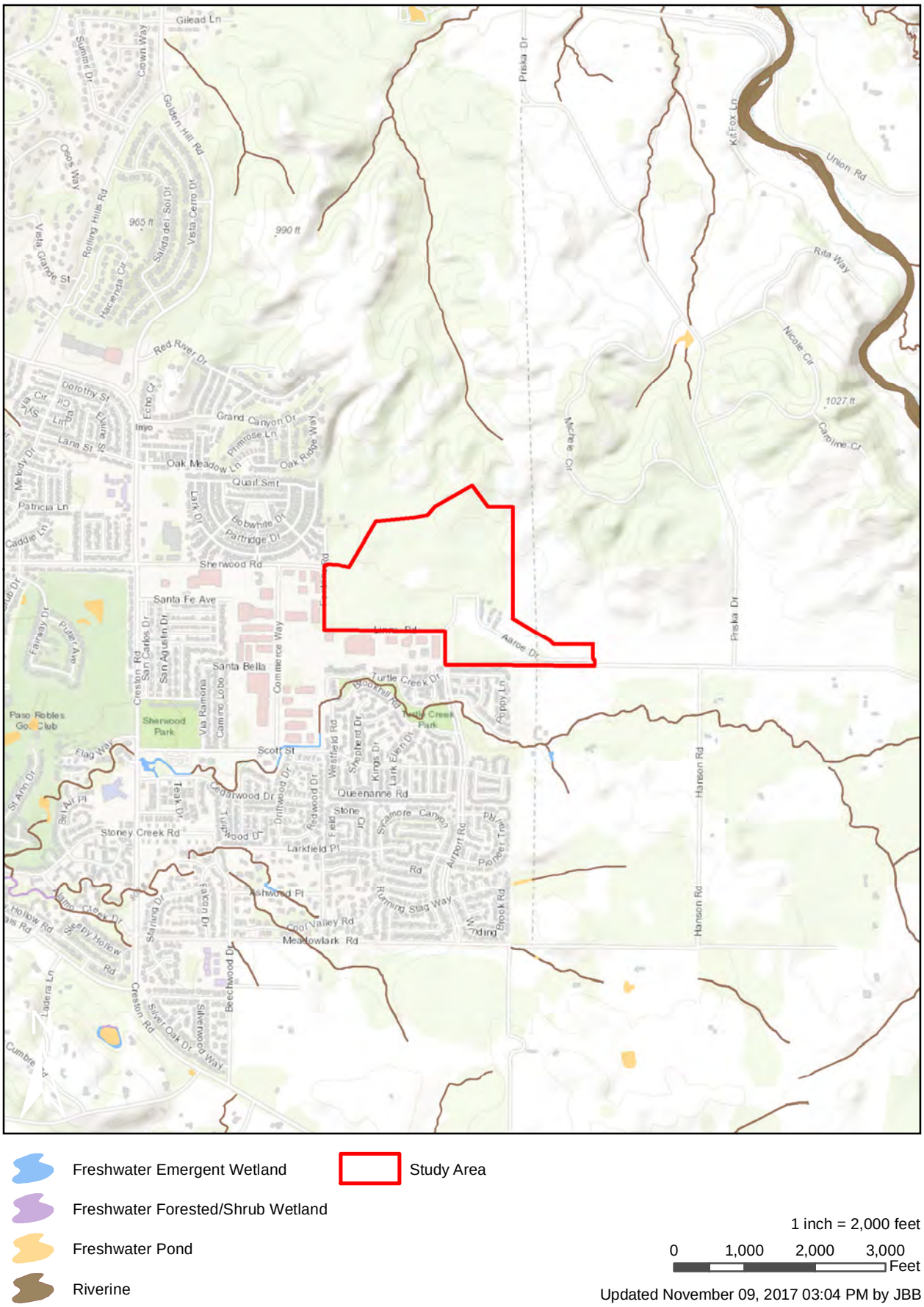
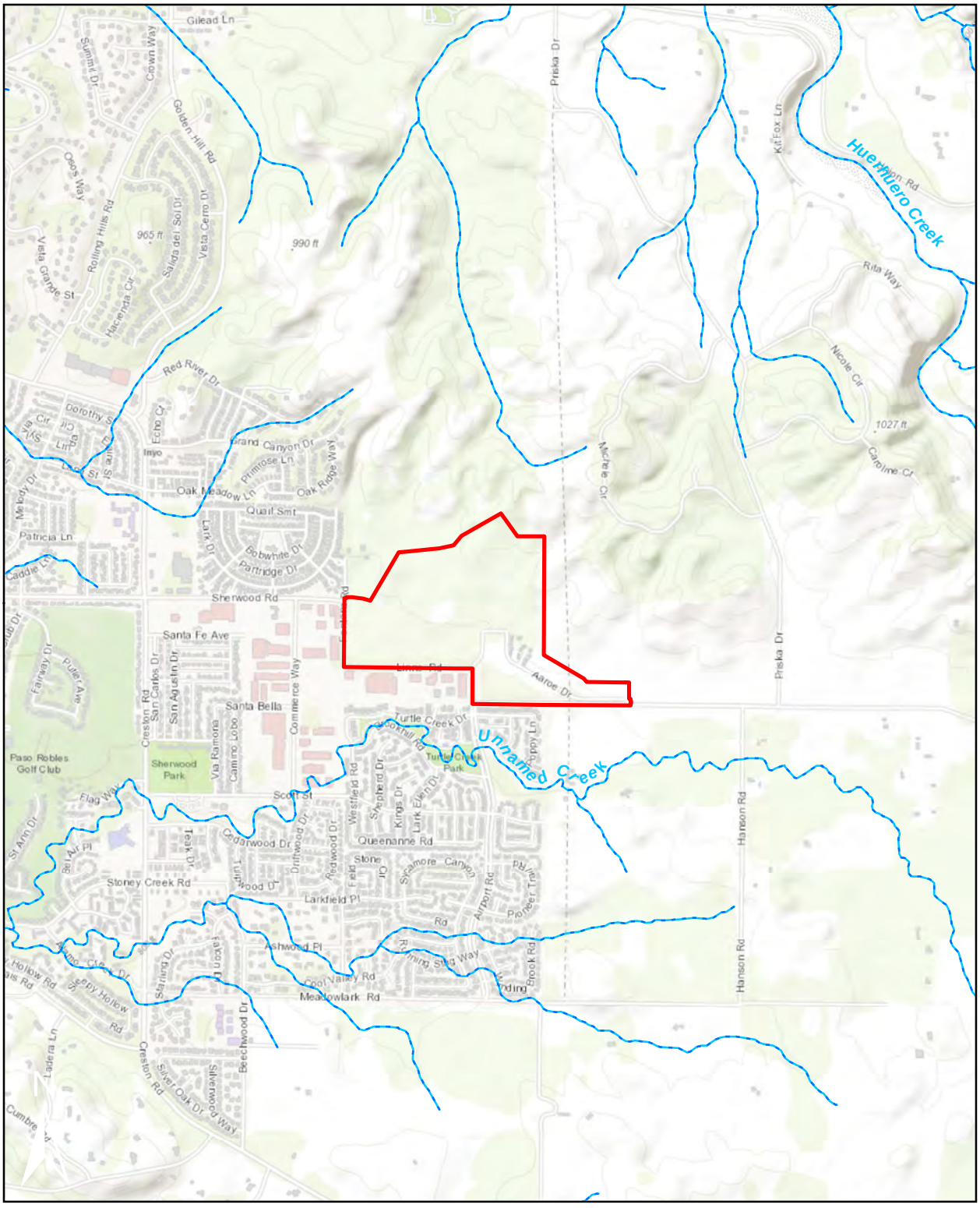


Figure 7. National Hydrography Dataset



8.0 References

33 CFR 320-332. Subsection of Regulations for Navigation and Navigable Waters. Text from Code of Federal Regulations. Available from: http://www.ecfr.gov. Accessed November 2017.

40 CFR 230. Section 404(b)(1) Guidelines for specification of disposal sites for dredged or fill material. Text from Code of Federal Regulations. Available at http://www.ecfr. gov. Accessed November 2017.

Cowardin, L. M., V. Carter, F. C. Golet, and E. T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C.

Dirkx, Phil. 2017. "Property planned for new Paso homes was once the site of a grand dream gone bankrupt." *The Tribune*, March 23, 2017. http://www.sanluisobispo.com/news/local/community/columns-blogs_/over-the-hill/article140442303.html

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Miss. Technical Report Y-87-1. 207

Federal Emergency Management Agency (FEMA). 2012. National Flood Hazard Layer. FIRM Panel 06079C0607G. Available from http://fema.maps.arcgis.com/.

National Oceanic and Atmospheric Administration (NOAA). 2017. USDA Field Office Climate Data. Paso Robles Municipal Airport (046742). Product generated by ACIS – NOAA Regional Climate Centers. Accessed November 2017.

Soil Survey Staff. 2017. Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/ Accessed September 2017.

State Water Resources Control Board (SWRCB). 2017. Preliminary Draft State Wetland Definition and Procedures for Discharges of Dredged or Fill Materials to Waters of the State. [Proposed for Inclusion in the Water Quality Control Plans for Inland Surface Waters and Enclosed Bays and Estuaries and Ocean Waters of California]. 21 July 2017

U.S. Army Corps of Engineers. 2008a. A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States. Ed. R.W. Lichvar and S.M. McColley. ERDC/CRREL TR-08-12. Hanover, NH: U.S. Army Engineer Research and Development Center.

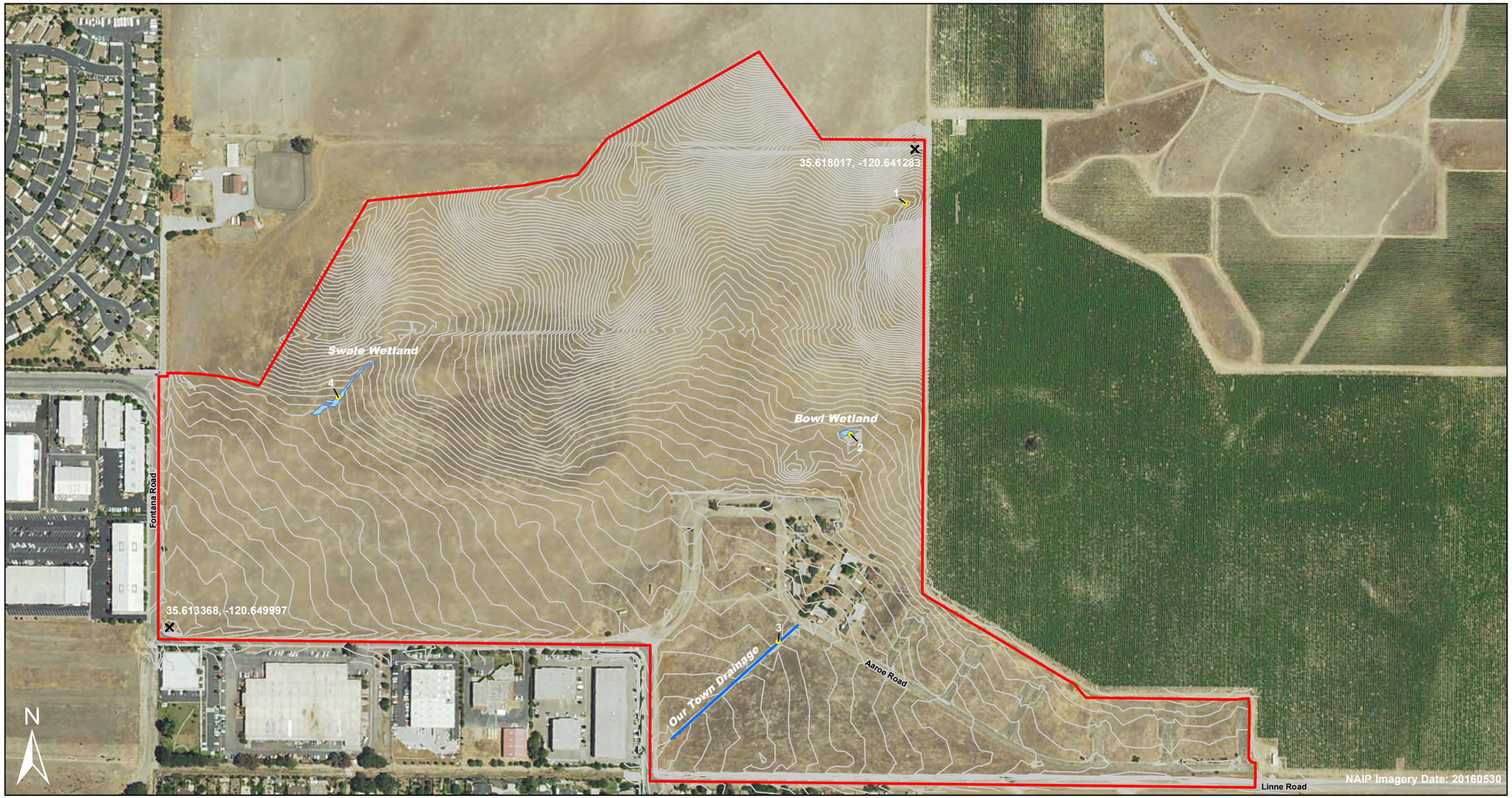
_____. 2008b. A Regional supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0). Ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-08-28. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

_____. 2010. Updated Datasheet for the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the United States. Ed. K.E. Curtis and R.W. Lichvar. ERDC/CRREL TN-10-1. Hanover, NH: U.S. Army Engineer Research and Development Center.

U.S. Department of Agriculture. Natural Resources Conservation District. 2010. Field Indicators of Hydric Soils in the United States. Version 7.0. G.W. Hurt and L.M. Vasilas (eds.). USDA, NRCS in cooperation with the National Technical Committee for Hydric Soils (NTCHS).

Exhibit A – Delineation of Jurisdictional Areas

Exhibit A. Delineation of Jurisdictional Areas



Sample Sites

Map Reference Point

State Wetlands (0.08 acre)

Study Area (117.3 acres)

Non-Wetland Waters of the U.S. (591 feet)

Site Topography (1-Foot Countour Interval)

Site Name: Chandler Ranch
Investigators: Jacqueline Tilligkeit, Jason Dart

1 inch = 350 Feet

0 100 200 300 400 500 600 Feet

Map Updated November 16, 2017 08:14 AM by JBB

Exhibit B – Wetland Determination Data Forms

A United States Army Corps of Engineers, Wetland Determination Data Form (2008 Arid West Supplement Version 2.0) was completed in the field for two sampling sites. The forms included here are copies of forms written in the field. The original forms are on file in the Althouse and Meade, Inc. office.

Reso A - Exhibit C2 (EIR Technical Appendix)

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Chandler Ranch City/County: Paso Robles Sampling Date: 5-3-17

Applicant/Owner: Ayres Group State: CA Sampling Point: 1

Investigator(s): J. Tilligkeit Section, Township, Range: T26S R12E

Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): concave Slope (%): 3

Subregion (LRR): LRRC Lat: 35.617524 Long: -120.641363 Datum: WGS84

Soil Map Unit Name: Nacimiento-Los Osos complex NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____ No ✓	
Wetland Hydrology Present?	Yes _____ No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: none)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: none)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 3'x3')			
1. Festuca perenne	85	Y	FAC
2. Bromus diandrus	10	N	UPL
3. Bromus hordeaceus	5	N	FACU
4. Hordeum murinum	5	N	FAC
5.			
6.			
7.			
8.			
	105 = Total Cover		
Woody Vine Stratum (Plot size: none)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Reso A - Exhibit C2 (EIR Technical Appendix)

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-16	10YR 2/2	100					SiC	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: None

Depth (inches): >16

Hydric Soil Present? Yes ____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): ____

Water Table Present? Yes ____ No ✓ Depth (inches): >16

Saturation Present? (includes capillary fringe) Yes ____ No ✓ Depth (inches): >16

Wetland Hydrology Present? Yes ____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Reso A - Exhibit C2 (EIR Technical Appendix)

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Chandler Ranch City/County: Paso Robles Sampling Date: 5-3-17

Applicant/Owner: Ayres Group State: CA Sampling Point: 2

Investigator(s): J. Tillgkeit & K. Anderson Section, Township, Range: T26S R12E

Landform (hillslope, terrace, etc.): artificial pool Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): LRR C Lat: 35.615282 Long: -120.642034 Datum:

Soil Map Unit Name: Arbuckle - Positas complex NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ✓

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓ No ____	
Wetland Hydrology Present?	Yes ✓ No ____	

Remarks:
Artificial pool with a mound of asphalt in the middle. Does not display any sign of connectivity - isolated!

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: none)			
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: none)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 5' x 10')			
1. Hordeum marinum	40	FAC	Y
2. Rumex crispus	15	FAC	Y
3. Juncus bufonius	10	FACW	N
4. Festuca perennis	3	FAC	N
5. Asclepia fascicularis	3	FAC	N
6. Bromus hordeaceus	1	FACU	N
7. Psilocarphus tenellus	1	OBL	N
8.	10		N
	83 = Total Cover		
Woody Vine Stratum (Plot size: none)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 7 % Cover of Biotic Crust 2

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals:	(A)	(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

Reso A - Exhibit C2 (EIR Technical Appendix)

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/1	95	10YR 4/2	60	D	M	S:C	
			10YR 3/6	5	C	PL		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: none

Depth (inches): >8

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- X Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): >8

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): >8

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Water ends at pool - isolated feature.

Reso A - Exhibit C2 (EIR Technical Appendix)

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Chandler Ranch City/County: Paso Robles Sampling Date: 5-4-17

Applicant/Owner: Ayres Group State: CA Sampling Point: 4

Investigator(s): J. Tillquist Section, Township, Range: T26S R12E

Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): concave Slope (%): 5

Subregion (LRR): LRRC Lat: 35.615593 Long: -120.648051 Datum: WGS84

Soil Map Unit Name: Arbuckle - Positas complex NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓ No ____	
Wetland Hydrology Present?	Yes ✓ No ____	

Remarks:
Wetland in swale feature with clear boundary. No clear flowpath to TNW

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: none)			
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: none)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: ____)			
1. Festuca perennis	30	Y	FAC
2. Hordeum marinum	30	Y	FAC
3. Bromus hordeaceus	5	N	FACU
4. Juncus bufonius	10	N	FACW
5. Festuca myuros	5	N	UPL
6. Psilocarphus tenellus	10	N	OBL
7.			
8.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: none)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 5 % Cover of Biotic Crust 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ____	x 1 =	____
FACW species ____	x 2 =	____
FAC species ____	x 3 =	____
FACU species ____	x 4 =	____
UPL species ____	x 5 =	____
Column Totals: ____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

Reso A - Exhibit C2 (EIR Technical Appendix)

SOIL

Sampling Point: 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 2/2	100					SCL	Very rocky
3-9+	10YR 2/2	95	10YR 3/6	5	C	PL	SCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: none

Depth (inches): >9

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- X Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): >9

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): >9

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Exhibit C – Wetland Determination Data Form to Determine OHWM

A United States Army Corps of Engineers, Wetland Determination Data Form was completed in the field for one drainage feature. The datasheet included here is a copy of the datasheet written in the field. The original is on file in the Althouse and Meade, Inc. office.

Reso A - Exhibit C2 (EIR Technical Appendix)

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Chandler Ranch City/County: Paso Robles Sampling Date: 5-3-17

Applicant/Owner: Ayers Group State: CA Sampling Point: 3

Investigator(s): Sotillight.t to Ko. Anders Section, Township, Range: T26S R12E

Landform (hillslope, terrace, etc.): ditch Local relief (concave, convex, none): concave Slope (%): 2

Subregion (LRR): LRRC Lat: 35.61341 Long: -120.69285 Datum: _____

Soil Map Unit Name: San Ysidro loam NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:
Sheet being used to determine OHWM of an other (non-wetland) water.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: site)			
1. Baccharis pilularis			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: site)			
1. Avena fatua			
2. Bromus diandrus			
3. Bromus hordeaceus			
4. Trifolium sp.			
5. Hirschfeldia sp.			
6.			
7.			
8.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species _____	x 2 =	_____
FAC species _____	x 3 =	_____
FACU species _____	x 4 =	_____
UPL species _____	x 5 =	_____
Column Totals: _____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:
Less than 5% coverage of bottom of drainage. Banks dominated by upland species listed above.

Reso A - Exhibit C2 (EIR Technical Appendix)

SOIL

Sampling Point: 3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

No pit

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- X Drift Deposits (B3) (**Nonriverine**)
- X Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- X Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Change in vegetation % to indicate OHWM. Width is approx 205 feet. Also break in bank and the above listed hydrology indicators w/in OHWM.

Appendix A – Assessor Parcel Numbers within Study Area

APN	Acres
020-211-006	1.21
020-211-009	0.89
020-211-010	0.10
020-211-012	10.63
020-321-001	1.11
020-321-002	0.25
020-322-001	0.17
020-322-002	0.15
020-322-003	0.11
020-322-004	0.18
020-322-005	0.16
020-322-006	0.16
020-322-007	0.17
020-322-008	0.17
020-322-009	0.17
020-323-001	0.16
020-323-002	0.14
020-323-003	0.12
020-323-004	0.19
020-323-005	0.20
020-323-006	0.12
020-323-007	0.17
020-323-008	0.19
020-324-001	0.16
020-324-002	0.14
020-324-003	0.12
020-324-004	0.19
020-324-005	0.19
020-324-006	0.12
020-324-007	0.14
020-324-008	0.16

APN	Acres
020-331-001	0.16
020-331-002	0.14
020-331-003	0.12
020-331-004	0.19
020-331-005	0.19
020-331-006	0.12
020-331-007	0.14
020-331-008	0.16
020-332-001	0.20
020-332-002	0.17
020-332-003	0.16
020-332-004	0.19
020-332-005	0.19
020-332-006	0.12
020-332-007	0.15
020-332-008	0.16
020-333-001	0.17
020-333-002	0.16
020-333-003	0.15
020-333-004	0.15
020-333-005	0.16
020-333-006	0.17
020-334-001	0.18
020-334-002	0.24
020-334-003	0.19
020-334-004	0.15
020-334-005	0.16
020-334-006	0.17
025-362-037	0.76
025-381-001	4.45
025-381-005	83.46

Appendix B – Custom USDA Soil Report

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for San Luis Obispo County, California, Paso Robles Area

Chandler Ranch Wetland Delineation

September 25, 2017

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report

Soil Map

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: San Luis Obispo County, California, Paso Robles Area
Survey Area Data: Version 10, Sep 28, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 16, 2016—Feb 23, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

San Luis Obispo County, California, Paso Robles Area (CA665)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
102	Arbuckle-Positas complex, 9 to 15 percent slopes	51.3	44.1%
179	Nacimiento-Los Osos complex, 9 to 30 percent slopes	10.1	8.7%
188	Rincon clay loam, 2 to 9 percent slopes, MLRA 14	0.0	0.0%
197	San Ysidro loam, 0 to 2 percent slopes, MLRA 14	54.9	47.2%
Totals for Area of Interest		**116.4**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

San Luis Obispo County, California, Paso Robles Area

102—Arbuckle-Positas complex, 9 to 15 percent slopes

Map Unit Setting

National map unit symbol: hbrk
Elevation: 600 to 1,500 feet
Mean annual precipitation: 12 to 20 inches
Mean annual air temperature: 60 to 61 degrees F
Frost-free period: 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Arbuckle and similar soils: 40 percent
Positas and similar soils: 30 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arbuckle

Setting

Landform: Terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium from mixed rock sources

Typical profile

H1 - 0 to 29 inches: fine sandy loam
H2 - 29 to 53 inches: sandy clay loam
H3 - 53 to 62 inches: stratified sandy loam to very gravelly sandy clay loam

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: COARSE LOAMY (R014XE003CA)
Hydric soil rating: No

Description of Positas

Setting

Landform: Terraces

Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium from mixed rock sources

Typical profile

H1 - 0 to 10 inches: coarse sandy loam
H2 - 10 to 28 inches: clay
H3 - 28 to 40 inches: sandy clay loam
H4 - 40 to 60 inches: stratified sandy loam to gravelly clay loam

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: 9 to 20 inches to abrupt textural change
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 1.2 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: COARSE LOAMY CLAYPAN (R014XE005CA)
Hydric soil rating: No

Minor Components

Greenfield, fine sandy loam

Percent of map unit: 10 percent
Hydric soil rating: No

Positas

Percent of map unit: 10 percent
Hydric soil rating: No

Cropley

Percent of map unit: 4 percent
Hydric soil rating: No

Hanford, fine sandy loam

Percent of map unit: 3 percent
Hydric soil rating: No

Unnamed, areas of 15 to 30 percent slope

Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, areas of 15 to 30 percent slope

Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, areas with cobbles on the surface

Percent of map unit: 1 percent
Hydric soil rating: No

179—Nacimiento-Los Osos complex, 9 to 30 percent slopes

Map Unit Setting

National map unit symbol: hbv1
Elevation: 600 to 1,500 feet
Mean annual precipitation: 12 to 20 inches
Mean annual air temperature: 60 degrees F
Frost-free period: 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Nacimiento and similar soils: 30 percent
Los osos and similar soils: 20 percent
Minor components: 50 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Nacimiento

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from calcareous shale and/or sandstone

Typical profile

H1 - 0 to 18 inches: silty clay loam
H2 - 18 to 28 inches: silty clay loam
H3 - 28 to 32 inches: weathered bedrock

Properties and qualities

Slope: 9 to 30 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: Fine Loamy 9-13 (R015XE020CA)
Hydric soil rating: No

Description of Los Osos

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Residuum weathered from shale and/or sandstone

Typical profile

H1 - 0 to 14 inches: clay loam
H2 - 14 to 24 inches: clay
H3 - 24 to 59 inches: weathered bedrock

Properties and qualities

Slope: 9 to 30 percent
Depth to restrictive feature: 20 to 40 inches to paralithic bedrock
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: Fine Loamy 9-13 (R015XE020CA)
Hydric soil rating: No

Minor Components

Balcom, loam

Percent of map unit: 10 percent
Hydric soil rating: No

Positas, coarse sandly loam

Percent of map unit: 10 percent
Hydric soil rating: No

Unnamed, similar to los osos soil

Percent of map unit: 10 percent
Hydric soil rating: No

Ayar, silty clay
Percent of map unit: 5 percent
Hydric soil rating: No

Diablo, clay
Percent of map unit: 5 percent
Hydric soil rating: No

Shimmon, loam
Percent of map unit: 5 percent
Hydric soil rating: No

Arbuckle, fine sandy loam
Percent of map unit: 1 percent
Hydric soil rating: No

Greenfield, fine sandy loam
Percent of map unit: 1 percent
Hydric soil rating: No

Rincon, clay loam
Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, gr/cb surfaces
Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, slopes of 30 to 50 percent
Percent of map unit: 1 percent
Hydric soil rating: No

188—Rincon clay loam, 2 to 9 percent slopes, MLRA 14

Map Unit Setting
National map unit symbol: 2tb8p
Elevation: 10 to 3,110 feet
Mean annual precipitation: 11 to 33 inches
Mean annual air temperature: 56 to 62 degrees F
Frost-free period: 250 to 320 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition
Rincon and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rincon

Setting
Landform: Alluvial fans, terraces

Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey alluvium derived from sedimentary rock

Typical profile

A - 0 to 6 inches: clay loam
Ap - 6 to 18 inches: clay loam
Bt - 18 to 52 inches: clay
Btk - 52 to 64 inches: clay loam

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Available water storage in profile: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: FINE LOAMY BOTTOM (R014XE025CA)

Minor Components

Arbuckle

Percent of map unit: 2 percent
Hydric soil rating: No

Cropley

Percent of map unit: 2 percent
Hydric soil rating: No

Lockwood

Percent of map unit: 2 percent
Hydric soil rating: No

Capay

Percent of map unit: 2 percent
Hydric soil rating: No

Brentwood

Percent of map unit: 1 percent
Hydric soil rating: No

Antioch

Percent of map unit: 1 percent
Hydric soil rating: No

197—San Ysidro loam, 0 to 2 percent slopes, MLRA 14

Map Unit Setting

National map unit symbol: 2tyys
Elevation: 70 to 1,990 feet
Mean annual precipitation: 13 to 22 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 300 to 360 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

San ysidro and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of San Ysidro

Setting

Landform: Alluvial fans, terraces, valley floors
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock

Typical profile

A - 0 to 23 inches: loam
B1 - 23 to 38 inches: clay loam
Bt2 - 38 to 64 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 16 to 24 inches to abrupt textural change
Natural drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: LOAMY CLAYPAN (R014XE029CA)
Hydric soil rating: No

Minor Components

Arbuckle
Percent of map unit: 6 percent
Hydric soil rating: No

Rincon
Percent of map unit: 2 percent
Hydric soil rating: No

Pleasanton, loam
Percent of map unit: 2 percent
Hydric soil rating: No

Solano
Percent of map unit: 2 percent
Hydric soil rating: No

Cropley, clay
Percent of map unit: 1 percent
Hydric soil rating: No

Pescadero
Percent of map unit: 1 percent
Landform: Basin floors
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Palexeralfs
Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

Delineation of Potentially Jurisdictional Wetlands and Waters

for

Olsen Ranch

Paso Robles, San Luis Obispo County

Prepared for

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Cover Page: Mouth of pond with common spikerush. March 26, 2019.

Definitions of Wetland Indicators

Wetland Plant Indicator Status Ratings in Order of Wetland Affinity

OBL	Obligate	Hydrophyte, almost always occur in wetland. Estimated probability >99 percent to occur in wetlands under natural conditions.
FACW	Facultative Wetland	Hydrophyte, usually occur in wetland, but may occur in non-wetland. Estimated probability >67% to 99% to occur in wetlands under natural conditions.
FAC	Facultative	Equally likely to occur in wetland and non-wetland. Estimated probability 33% to 67% to occur in wetlands under natural conditions.
FACU	Facultative Upland	Non-hydrophyte, usually occurs in non-wetland, but may occur in wetland. Estimated probability 1% to <33% to occur in wetlands under natural conditions.
UPL	Upland	Almost never occur in wetland. Estimated probability <1% to occur in wetlands under natural conditions.
NL	Not Listed	Species not included in federal list of wetland indicator plants. Assumed upland for purposes of wetland analysis.

1 INTRODUCTION

1.1 Purpose

This report provides a delineation of potential jurisdictional wetland and non-wetland waters according to federal standards on the Olsen Ranch Property (Study Area), located in the City of Paso Robles in San Luis Obispo County, California. Olsen Ranch 212, LLC requested this delineation from Althouse and Meade, Inc. Its purpose is to describe potentially jurisdictional waters and wetlands according to the Clean Water Act (CWA) Section 404, the Porter-Cologne Water Quality Act (State Water Code), and Fish and Game Code Section 1600. This document presents a comprehensive inventory and mapping effort of wetland and non-wetland aquatic resources within the Study Area and provides information for owners, the United States Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), California Department of Fish and Wildlife (CDFW), and the Lead Agency in decisions regarding activities in the Study Area. Section 2.0 provides more detail on the regulatory framework and scope of this jurisdictional delineation.

1.2 Study Area Location and Extent

Approximate coordinates for the center of the Study Area are 35.606° N / 120.637° W (WGS84) in the Templeton United States Geological Survey (USGS) 7.5-minute topographic quadrangle (Figure 1). Elevation ranges from approximately 815 to 1000 feet above mean sea level. The Study Area is 254.1 acres bounded by Linne Road to the north, Hanson Road to the east, Meadowlark Road to the south, and a subdivision to the west (Figure 2).

1.3 Current Conditions

The Study Area covers approximately 248 acres of rolling hills, seasonal drainages, and agricultural land. *Quercus douglasii* (blue oaks) dot the landscape in the grasslands, and *Populus fremontii* (Fremont cottonwoods), *Salix laevigata* (red willows), and *Quercus lobata* (valley oaks) are associated with wet areas in the northernmost seasonal drainage. An ephemeral pond, created by a man-made dam, occurs on the property in a natural drainageway near the center of the property discussed in Section 1.3.2.

Three residential lots are currently on the property, with barns, irrigated and non-irrigated pastures, and other facilities associated with a livestock operation on the ranch. Debris piles consisting of old irrigation pipes, fence posts, and assorted farm equipment are on the property. The entire property has been historically grazed, and most of it has been farmed, except the steepest slopes in the southwest and northeast corners. The most recent farming has occurred in the northwest and eastern-center of the Study Area. The long history of intensive grazing and dry farming has left the landscape dominated by non-native plants, with few trees or shrubs outside of the riparian area. Blue oaks are scattered throughout the Study Area but are concentrated in the riparian habitat in the northern portion.

1.3.1 Vegetation and Habitats

Habitats in the Study Area are generally moderately disturbed and modified through land management practices such as disking and livestock range but are otherwise undeveloped except

for a few rural houses and associated dirt roads which support non-native, herbaceous, forbs and grasses dominated by weedy species such as the invasive yellow star-thistle (*Centaurea solstitialis*) and Russian thistle (*Salsola tragus*).

The previously farmed and grazed land is dominated by wild oats (*Avena barbata* and *A. fatua*), barley (*Hordeum murinum*), annual bromes (*Bromus diandrus, B. hordeaceus,* and *B. madritensis* subsp. *rubens*), and mustards (*Brassica nigra* and *Hirschfeldia incana*) in high abundance with other occasional grasses and forbs. Large patches of dense yellow star-thistle occur in the northern pastures and the invasive annual grass medusahead (*Elymus caput-medusae*) is common in the southern portion.

The California annual grassland is composed primarily of non-native grasses and forbs. Dominant species include wild oats, annual bromes, filaree (*Erodium* ssp.), and mustards. Both early and late season wildflowers occur regularly in low abundance. Early season wildflowers include fiddlenecks (*Amsinckia* ssp.), blow wives (*Achyrachaena mollis*), valley tassels (*Castilleja attenuata*), lupines (*Lupinus* ssp.), and valley popcornflower (*Plagiobothrys canescens* var. *canescens*). Late-season wildflowers include spikeweed (*Centromadia fitchii),* clarkias (*Clarkia* ssp.), annual fireweed (*Epilobium brachycarpum*), and navarretia (*Navarretia* ssp.). Native perennial herbs such as milkweeds (*Asclepias* ssp.) and dwarf brodiaea (*Brodiaea terrestris*) are also found in low abundance.

1.3.2 Hydrology

Water enters the property from the east in two locations: one to the north and one near the center. The northern ephemeral drainage conveys water from east to west in a sinuous swale feature. Valley oak trees dominate the canopy with riparian trees such as Fremont cottonwood, red willow, and blue oak occurring occasionally. The understory is dominated by ripgut brome (*Bromus diandrus*) with occasional patches of a native perennial grass, creeping wild rye (*Elymus triticoides*). Other occasional species include the native narrowleaf milkweed (*Asclepias fascicularis*), non-native milk thistle (*Silybum marinum*), seaside barley (*Hordeum marinum*), and yellow star-thistle. The drainage supports seasonal pools.

The central drainage originates in the fallow fields on the property to the east which collects sheet flow from offsite. This small drainage, dominated by seaside barley, medusahead, and patches of Mexican rush (*Juncus mexicanus*), gathers water from plowed fields and carries water in a small channel for approximately 600 feet. Water in this drainage then enters a man-made stock pond. The stock pond supports a few red willow trees along its perimeter with the pool size variable throughout the wet season depending on precipitation and surface flow. Lotus sweetjuice (*Glinus lotoides*), hyssop loosestrife (*Lythrum hyssopifolia*), toad rush (*Juncus bufonius*), seaside barley, seaside heliotrope (*Heliotropium curassavicum* var. *oculatum*), common spikerush (*Eleocharis macrostachya*), and Bermuda grass (*Cynodon dactylon*) are found within and near the stock pond. Overflow from this stock pond is channeled to a subterranean drainage system that carries water under the adjacent housing development to the west.

Both the northern and central drainage are recorded in the National Hydrography Dataset (NHD). In this dataset, the central drainage is delineated as extending close to the eastern boundary of the Study Area and the northern drainage has a quarter mile long spur to the south (Figure 3). The National Wetlands Inventory (NWI) has a similar extent but a shorter spur and shorter central drainage. The spur on the northern drainage and the extension of the central drainage likely existed

at one time but have been altered through ranching practices such as plowing and road development. The stock pond is labeled as a Freshwater Pond wetland type in the NWI and the drainages are Riverine (Figure 4).

The USGS and United States Department of Agriculture (USDA)-Natural Resource Conservation Service (NRCS) developed nationally consistent watershed boundaries which range from a two digit code as the first level of classification (Hydrologic Unit Code [HUC] 2) to a 12 digit code for the most detailed watershed delineation (HUC12). The Study Area is in the Salinas watershed (HUC8) which is formed by Santa Lucia and Diablo ranges (Figure 5). The Salinas River flows north-northwest originating in the Los Padres National Forest and ending in Monterey Bay at the Pacific Ocean. The Study Area is approximately 2.75 miles east of the Salinas River. When water exits the Study Area in the northern drainage, it flows through housing developments as an open space, stormwater ditches, and underground sewer systems before reaching the Salinas. Figure 6 shows that the Study Area is dominated by an area of minimal flood hazard map unit in the National Flood Hazard Layer (FEMA 2019). A small section in the northwest portion of the Study Area, the western end of the northern drainage, is categorized as Zone A which is a one percent annual chance of flood hazard.

1.3.3 Soils

Six individual soil map units from the NRCS Soil Survey Geographic Database (SSURGO) overlap the Study Area: Arbuckle-Positas complex, Arbuckle-San Ysidiro complex, Cropley clay, Nacimiento-Los Osos complex, Rincon clay loam, and San Ysidro loam (USDA and NRCS 2019). These soil types are typically found on terraces and have alluvium parent material derived from calcareous or sedimentary rock. Slopes range from flat to 15 percent and the drainage class is well drained to moderately well drained. Soil pits were investigated in March and April 2019.

A custom soil report for the Study Area can be found as Appendix A.

1.3.4 Climate

The Climate Analysis for Wetlands Tables (WETS) for Paso Robles (Station ID 046730, 3 miles west of Study Area) indicates that average 30-year rainfall is 14.97 inches with maximum precipitation typically from January through March (Table 1).

TABLE 1. PRECIPITATION BY MONTH.

Data are provided in inches for the current rain year as well as the historical average.

Year	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1971-2000	0.02	0.05	0.33	0.58	1.35	1.95	3.34	3.39	2.9	0.79	0.23	0.03
2018-2019	0	0	0	0.28	3.23	1.12	5.3	6.72	3.01[1]	-	-	-

Rainfall was above the WETS range in November 2018, January 2019, and February 2019 (NOAA 2019). Chart 1 shows the precipitation range minimum calculated at 70 percent probability the

[1] Value from the City of Paso Robles website, NOAA had not reported March totals when this report was written.

total will be higher than than the monthly average between 1971 and 2000. The precipitation range maximum probability is calculated at 30 percent chance the total will be higher than the monthly average. This results in a range of expected precipitation for each month where the total precipitation is likely to fall in any given year.

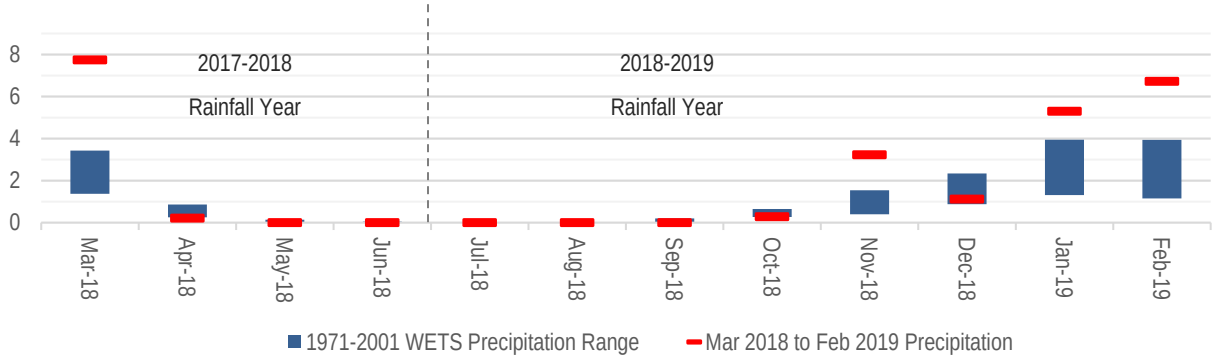


CHART 1. WETS PRECIPITATION AND RECENT 2018-2019 RAINFALL (INCHES)

WETS average range of precipitation from a probability analysis of 1971 to 2001 data compared to March 2018 to February 2019 precipitation. Data were retrieved from NOAA Regional Climate Centers in Paso Robles, CA (NOAA 2019).

2 REGULATORY FRAMEWORK

2.1 United States Army Corps of Engineers

Section 404 of the CWA authorizes the USACE to regulate activities that discharge dredged or fill material to wetlands and other waters of the United States. The term "waters of the United States" encompasses resources described by the Environmental Protection Agency (EPA) and the Corps regulations, 40 CFR (Code of Federal Regulations) § 230.3(s) and 33 CFR § 328.3(a). The geographic limits of relevant federal jurisdiction for non-tidal waters of the U.S. are defined at 33 CFR § 328.4(c). Terms within 40 CFR, such as "adjacency" and "tributary" are defined by the 2015 Clean Water Rule currently followed by USACE branches in California, and 22 other states.

The *Corps of Engineers Wetlands Delineation Manual* (hereafter "1987 Manual"; Environmental Laboratory 1987) defines wetlands (EPA regulations at 40 CFR § 230.3(t); USACE regulations at 33 CFR § 328.3(b)). Wetlands are considered "special aquatic sites" under the USACE definition. Special aquatic sites are afforded protection under the CWA (Sections 401 and 404). The 1987 Manual and various regional supplements describe the criteria that must be met to determine the presence of a wetland, the methods used to determine whether they are met, and the geographic extent of wetland areas identified in the field.

The USACE takes jurisdiction over wetlands that exhibit hydrology, hydric soil, and hydrophytic vegetation (three parameters) by the standard set forth in the Arid West Regional Supplement. These areas must also exhibit a significant nexus to a Traditionally Navigable Water (TNW). For non-wetland water features, USACE jurisdiction is limited to the Ordinary High Water Mark (OHWM).

2.2 Regional Water Quality Control Board

Recent March 2019 guidance from the RWQCB indicates that they have adopted the USACE policy of a "three-parameter wetland" but will also consider saturated, anaerobic features that lack vegetation, wetlands (SWRCB 2019).

> *An area is wetland if, under normal circumstances, (1) the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both; (2) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and (3) the area's vegetation is dominated by hydrophytes or the area lacks vegetation.*

They will also take jurisdiction over a non-wetland water to the OHWM. In contrast to the USACE, however, the RWQCB will take jurisdiction over isolated wetland features that do not have significant nexus to a TNW. In some cases, the RWQCB will take jurisdiction to the edge of riparian habitat surrounding the water or wetland, as CDFW takes jurisdiction over trees, shrubs, and grasslands associated with the wetted channel (the edge of riparian canopy).

2.3 California Department of Fish and Wildlife

CDFW found the USFWS wetland definition and classification system based on the 1979 Cowardin definition to be the most biologically valid (Cowardin et al. 1979). In general, CDFW will take jurisdiction over drainage or lake features with a bed and bank and will limit their

jurisdiction to the top of bank and may include adjacent wetland or riparian areas on a case by case basis.

3 DELINEATION METHODS

3.1 Overview of Sampling Methodology

Jurisdictional wetlands and other waters were identified using methods and guidelines described in the 1987 Manual, the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0)* (hereafter "2008 Supplement"; USACE 2008b), and *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (USACE 2008a). Site visits were made in the spring of 2019. Planned open spaces are mapped as jurisdictional waters without detailed delineation of wetland features. Proposed impacts to the northern drainage within proposed open space would require focused delineation of wetland inclusions. Focused delineation of wetland features in the vicinity of proposed road crossings was implemented for the purpose of future permitting efforts. This methodology is described in more detail in Section 4.1. Table 2 summarizes dates of field work and personnel attending each site visit.

TABLE 2. FIELD WORK LOG

Wetland delineation survey dates, action taken, and field personnel are provided.

Survey Date	Activities	Personnel
March 12, 2019	Reconnaissance survey	Jason Dart Jacqueline Tilligkeit
March 18, 2019	Aerial photography at northern drainage	Kyle Nessen Jessica Boone
March 26, 2019	Sample sites	Kristen Andersen Jacqueline Tilligkeit
April 4, 2019	OHWM assessments	Jacqueline Tilligkeit
April 16, 2019	Focused delineation	Jacqueline Tilligkeit LynneDee Althouse

3.1.1 Wetlands

Soil pits were dug by hand at twelve sampling sites based on the presence of hydrophytic vegetation, wetland hydrology, or low relief indicated potential wetland. For each wetland site an adjacent upland observational pit was dug to compare upland soil and vegetation features. Locations of all twelve sampling sites were recorded on the Jurisdictional Delineation Map (Figure 7) and USACE Arid West Region Wetland Determination Data Forms (Appendix B; updated sheet from 2010).

3.1.1.1 Wetland Hydrology

The presence or absence of wetland hydrology field indicators was assessed following methodology presented in the 1987 Manual and the 2008 Supplement. Wetland indicators included, but were not limited to, high water table, site topography, drift lines, drainage patterns, sediment deposits, inundation, observation of wet conditions during the growing season, and saturation of soils.

3.1.1.2 Wetland Soils

Soils were examined according to methodology presented in the 2008 Arid West Supplement and 1987 Manual. Hydric soil indicators were recognized by soil characteristics from the USDA-NRCS publication, *Field Indicators of Hydric Soils in the United States* (version 7.0; USDA-NRCS 2010) and the National Technical Committee for Hydric Soils (NTCHS) definition of hydric soils.

3.1.1.3 Wetland Vegetation

Vegetation in each stratum was identified to species and recorded. The indicator status of plants was confirmed by referring to the *National Wetland Plant List* (Lichvar *et al.* 2016). Species dominance was noted for each stratum using the "50/20 Rule." Dominance test was calculated for all samples.

3.1.1.4 Wetland Connectivity/Adjacency

Connectivity to Traditional Navigable Waters and their tributaries is established via field work where accessible, as well through analysis of aerial photographs, USGS topographic map, USGS National Hydrography Dataset, and site-specific topographic survey.

3.1.2 Non-Wetland Waters

Drainages were identified onsite as features that display evidence of hydrology but do not contain vegetation suggestive of wetlands. Evidence of OHWM was used to determine extent of Corps jurisdiction over these non-wetland waters of the U.S. The OHWM Manual (USACE 2010) lists and describes indicators associated with areas that become flooded or ponded but are not dominated by wetland vegetation and the duration of flooding, ponding, and/or near-surface soil saturation (less than or equal to 12 inches) is not sufficient to cause hydric soils to form or wetland hydrology conditions to occur. Ordinary High Water Mark was identified and noted according to guidance provided in the OHWM Manual.

3.1.2.1 OHWM Assessments

OHWM assessments were completed along each jurisdictional drainage in representative locations where there was a substantial change in either OHWM or TOB width. For each area, photographs were taken to document current conditions and hydrology and OHWM indicators were recorded and described based on the Arid West OHWM Manual and Datasheets. OHWM width and depth was also recorded. Photos are in Section 4 and locations of OHWM Assessments are shown on Figure 7.

3.1.2.2 Waters Connectivity/Adjacency

Connectivity to Traditional Navigable Waters and their tributaries is established via field work where accessible, as well through analysis of aerial photographs, United States Geographic Service (USGS) topographic map, USGS National Hydrography Dataset, and site-specific topographic survey. This connectivity determines whether the feature has "significant nexus" (i.e. it significantly affects the chemical, biological, or physical integrity of a Traditional Navigable Water).

3.2 Mapping Methodology

Airborne digital photographs of the Study Area were acquired on March 18, 2019 using a commercially available sUAV by Part 107 certified pilot and visual spotter. A georeferenced RGB orthomosaic image of the Study Area was generated from the acquired aerial images for baseline review. All flight operations were conducted within visual line of sight and below a maximum altitude of 200 feet above-ground level. The study area occurs in class E2 airspace and ATC authorization was acquired through the FAA UAS Data Exchange (confirmation number: ARMZZ116XR) prior to flying. Permission from the property owner was granted before flight.

Mapping efforts also utilized Samsung Galaxy Tab 4 tablets equipped with Garmin GLO GPS Receivers. Delineation boundaries were drawn using the AmigoCollect mapping application, aerial photography, site specific topography, and field notes. Existing datasets such as the National Hydrography Dataset and the USGS topographic maps were considered during mapping. Our results vary from these existing publications due to the finer scale and on-the-ground data collection techniques used in our work. GPS data, digitized notes, and photos were imported into Esri ArcGIS, a Geographic Information Systems software suite, and interpreted into maps. Maps were produced at a minimum scale of one map inch to 400 feet on the ground using field data and presented over the existing conditions CAD file from Wallace Group.

These delineation shapes are for planning purposes only. Wetland boundaries proximal to proposed improvements should be marked in the field by an environmental scientist and surveyed by a professional land surveyor with submeter accuracy.

4 TECHNICAL FINDINGS

The Study Area contains 0.24 acre of habitat that meets the definition of wetland by the USACE and RWQCB. An additional 4,594 feet and 1.26 acres of drainages that meets the definition of non-wetland waters also exists within the Study Area. Approximately 0.68 of the 1.26 acres has the potential to support non-persistent emergent wetlands. These wetlands may occupy less than 25 percent of the 0.68 acre. Approximately 0.02 acre of the 1.26 acres may be considered a wetland by RWQCB standards but not USACE. The following narrative description provides details of each feature's wetland vegetation, soil, and hydrology.

4.1 Northern Drainage

The northern drainage enters the Study Area at the eastern border under Hanson Road and flows west creating a braided stream across the northern half the Study Area. This drainage occasionally has multiple flow paths and has also been manipulated in areas where ranching or farming activities have occurred. Water enters the Study Area on the eastern property boundary, flows through oak riparian habitat dominated by oats, barley, bromes, mustard, and thistle, for approximately 2,230 feet before it enters a farmed field and then several sheep pastures. There are two crossings proposed in the Northern Drainage, therefore it was revisited after the water receded to identify any non-persistent emergent wetlands that may be present within the channel near the proposed crossing locations. These areas are referred to as the Focused Study Areas henceforth.

In the oak riparian habitat section of drainage, hydrology indicators include standing water, drift deposits, ripples, presence of bed and bank, and a strong presence of algal mats (Table 3, OHWM assessments A – G on Figure 7). The OHWM indicator was clear due to a change in average sediment texture, vegetation species, vegetation cover, as well as a break in bank slope.

4.1.1 Eastern Focused Study Area

The eastern Focused Study Area exists approximately 720 feet from the eastern boundary of the Study Area in the oak riparian habitat. It encompasses two drainage paths, one to the south that is straight and likely was ditched. Upland grasses such as ripgut brome, vetch, and yellow star-thistle are dominant in the southern drainage path. It has an OHWM width of approximately one to two feet wide and six inches to one foot deep. The berm is several feet taller on the north side of the drainage than on the south side.

The northern drainage path is a curved, oxbow section that has been partially bypassed by the creation of the southern ditch. In a portion of this drainage path there is a strong presence of hydrophytic species such as Italian rye grass (*Festuca perennis*, FAC) and common spikerush. Sample site 8 demonstrated sandy depletions below a dark clay surface horizon. As the vegetation changes to more upland grasses and bare ground downstream, the channel widens to almost 30 feet wide in some areas and was covered in dried algal mats during April site visits. After the confluence of the oxbow and the southern drainage path, the drainage narrows but continues to be bare ground and incised with a presence of bed and bank until another wetland inclusion where the population of Italian rye grass and common spikerush has increased.

In this Focused Study Area, 0.05 acre of wetlands, jurisdictional to the USACE and RWQCB were delineated in the northern oxbow area based on the presence of hydrophytic vegetation, hydrology,

and hydric soils. The remaining 0.10 acre of drainage in this Focused Study Area are non-wetland waters jurisdictional to the USACE and RWQCB.

Photo 1. View of soil pit at Sample Site 8 that showed evidence of depletions and redoximorphic concentrations. 04/16/2019

Photo 2. Dominant common spikerush in the oxbow wetland area. 04/16/2019

After the oak riparian, surface water flows through a barbed wire and hog fence that has gathered debris (Photo 3) and floods a recently plowed and planted farm field (Photo 4). The channel is widest and most shallow through the farm field that is routinely plowed (Table 3, OHWM assessments H and I).

Photo 3. Barbed wire and hog fence full of debris, farm field to the left in the picture and oak riprian to the right. View north. 03/12/2019.

Photo 4. Drainage through farm field from southern fence. View northeast. 03/12/2019.

4.1.2 Western Focused Study Area

Another crossing is proposed near the existing ranch road, therefore this area is described in detail and was visited later in the growing season to identify non-persistent emergent wetlands. The fence south of the plowed field splits the flow path before it enters a pasture. After the drainage is bisected by the fence, it is mostly unvegetated or supports upland grasses. The southern path through the pasture travels about 100 feet before there is a pile of riprap and rubble that slows the flow of water. This allows for the growth of hydrophytic vegetation such as hyssop loosestrife,

cudweed, (*Gnaphalium* sp.), knotweed (*Polygonum aviculare* ssp. *depressum*), and toad rush downstream and along the fringe of the pool. The northern flowpath, also supportive of upland grasses or unvegetated, travels along the fenceline for 170 feet before eroding under the fence and allowing water to enter the pool from the north. The center of the pond is inundated and anaerobic for prolonged periods and does not support vegetative growth. Aquatic invertebrates and their remains are prominent in and around the pool.

After pooling, a damaged pipe culvert, more than a foot higher than the pool elevation, conveys water under the western ranch access road to another sheep pasture. This area is dominated by seaside barley within the channel and foxtail barley along the banks, showing a clear change in vegetation species as the OHWM indicator.

In this Focused Study Area, 0.09 acre of wetlands, jurisdictional to the USACE and RWQCB were delineated around the fringe and at the mouth of the pool as well as through the western pasture where the drainage was dominated by seaside barley. The pool itself was unvegetated and may be considered a wetland by the RWQCB definition but would be a non-wetland water per USACE. The remaining 0.05 acre of drainage in this Focused Study Area are non-wetland waters jurisdictional to the USACE and RWQCB.

Photo 5. Fringe of pool with aquatic invertebrate remains and hydrophytes, 04/16/2019.

Photo 6. Soils in Sample Site 11 showed evidence of stratified layers, 04/18/2019.

Photo 7. Eastern sheep pasture and pool, view south from the ranch road, 03/26/2019.

Photo 8. View west towards culverts from southern flow path. Hydrophytes, algal mats, aquatic invertebrate remains, and salt crust present outside of standing water, 04/04/2019.

Photo 9. Western sheep pasture and drainage, view from culvert looking west, 03/26/2019.

Photo 10. Culverts underneath ranch road, view from western sheep pasture looking east, 03/26/2019.

The drainage continues westward where it passes under another ranch road via a small six inch culvert. During high flow periods, the water flows through the small culvert and over the ranch road before entering an incised channel through oak riparian habitat where it continues inside the Study Area for 828 feet. This reach is surrounded by upland grasses and the bed contained mudcracks and algae as a hydrology indicator in April 2019 (OHWM assessments K and L). The OHWM indicator is a change in vegetation cover and sediment texture and in some areas a break in bank slope.

Photo 11. Small culvert underneath ranch road on western side of western sheep pasture, road to the right of the photo, 03/26/2019.

Photo 12. View from the western edge of the western sheep pasture looking west across ranch road that shows evidence of flow and ponding, 03/26/2019.

For the purpose of this study, the entire drainage was mapped as a non-wetland water with wetland inclusions. Wetlands and non-wetlands were mapped in detail in the Focused Study Area. The total approximate distance of the Northern Drainage is 4,122 feet and the total area of the drainage is approximately 0.99 acre.

TABLE 3. NORTHERN DRAINAGE OHWM ASSESSMENTS

Location	OHWM Width (ft)	OHWM Depth (ft)	Hydrology Indicator	OHWM Indicator	Photograph
A	15	4	o Water stained leaves o Mudcracks	o Change in sediment texture o Change in vegetation cover o Break in bank slope	 04/04/2019
B	10	1.5	o Algal mats o Debris/drifts o Mudcracks	o Change in sediment texture o Change in vegetation cover o Change in vegetation species	 04/04/2019

Location	OHWM Width (ft)	OHWM Depth (ft)	Hydrology Indicator	OHWM Indicator	Photograph
C	8	0.5	o Algal mats o Debris/drifts o Mudcracks	o Change in sediment texture o Change in vegetation cover o Change in vegetation species	 04/04/2019
D	2	1	o Algal mats o Debris/drifts o Mudcracks o Bed/bank	o Change in sediment texture o Change in vegetation cover o Change in vegetation species o Break in bank slope	 04/04/2019

Location	OHWM Width (ft)	OHWM Depth (ft)	Hydrology Indicator	OHWM Indicator	Photograph
E	10	0.5	o Algal mats o Debris/drifts o Mudcracks	o Change in sediment texture o Change in vegetation cover o Change in vegetation species	 04/04/2019
F	2	1	o Algal mats o Debris/drifts o Mudcracks o Bed/bank	o Change in sediment texture o Change in vegetation cover o Change in vegetation species o Break in bank slope	 04/04/2019

Location	OHWM Width (ft)	OHWM Depth (ft)	Hydrology Indicator	OHWM Indicator	Photograph
G	6	2	o Standing water o Algal mats o Debris/drifts o Mudcracks o Bed/bank	o Change in sediment texture o Change in vegetation cover o Change in vegetation species o Break in bank slope	 03/12/2019
H	25	1	o Standing water o Algal mats o Mudcracks	o Change in vegetation cover	 03/12/2019

Location	OHWM Width (ft)	OHWM Depth (ft)	Hydrology Indicator	OHWM Indicator	Photograph
I	30	<0.5	o Standing water o Algal mats o Mudcracks	o Change in vegetation cover	 03/12/2019
J	15	0.5	o Algal mats o Debris/drifts o Mudcracks o Ripples	o Change in sediment texture o Change in vegetation cover o Change in vegetation species	 04/04/2019

Location	OHWM Width (ft)	OHWM Depth (ft)	Hydrology Indicator	OHWM Indicator	Photograph
K	4	0.5	o Mudcracks o Algal mats	o Change in sediment texture o Change in vegetation cover o Break in bank slope	 04/04/2019
L	4	0.5	o Mudcracks o Algal mats	o Change in sediment texture o Break in bank slope	 04/04/2019

4.2 Central Drainage and Pond

The Central Drainage begins at the north-south ranch road and flows west with a clear bed and bank. There was no sign of concentrated flow on the east side of the road and fence. Adjacent to the incised channel, there was a strong presence of medusahead and other upland grasses as well as Mexican rush. Sample Site 1, where Mexican rush and upland grasses were both dominant, was adjacent to the drainage and had no sign of hydric soils or hydrology.

Photo 13. View from the head of the Central Drainage looking west, 03/12/2019.

Photo 14. View north from the Central Drainage in the Sample Site 1 area; the darker grass is Mexican rush, 03/12/2019.

Downstream from Site 1, the convex part of the drainage supports mostly upland grasses with patches of Mexican rush. The OHWM width varied between one and a half to three feet in width and was demarcated by a presence of water, drift deposits, algal mats, or drainage patterns. Sample Site 5 was dug in the drainage within a patch of Mexican rush that contained hydrophytic vegetation dominance and hydrology in the form of saturation. However, this sample area and in observational soil pits nearby within the drainage, did not display evidence of hydric soil. The drainage feature appeared to not saturate for sufficient duration to produce anaerobic conditions in a typical year due to the sandy soil and sloping ground which conveys water from the drainage to the pond. The drainage prior to entering the pond is approximately 795 feet long and 0.13 acre.

Photo 15. View down into Central Drainage where Mexican rush is a dominant species, 03/26/2019.

Photo 16. View of sandy soil with no redoximorphic features in sample site within drainage where Mexican rush is dominant, 03/26/2019.

Prior to surface flow to the pond, velocity slows and water pools up to a foot deep, supporting large patches of common spikerush in the drainage, as it widens to a "V" shape at the mouth of the pond. This area contained various aquatic insects and tadpoles. Sample Site 3 revealed depletions and a reduced matrix in clay soil. Additionally, there is a fringe of common spikerush approximately three feet wide around most of the pond, though the middle (55 feet wide, 288 feet long, 0.28 acre) is unvegetated and several feet deep. The vegetated wetland portion of the pond makes up 0.04 acre and would be considered palustrine persistent emergent in the Cowardin classification.

Photo 17. View from the drainage looking west into the pond mouth with bunches of common spikerush, 03/26/2019.

Photo 18. Depleted clay soil at mouth of the pond with common spikerush, Sample Site 3, 03/26/2019.

Photo 19. Entrance of the pond with common spikerush on banks, view southwest, 03/26/2019.

Photo 20. View from south bank of the pond, fringe of common spikerush on banks, view northeast, 03/26/2019.

Additionally, on the northern side of the pond, Mexican rush dominated a small portion of the northern aspect of the berm. This hydrophyte is likely supported by water from the pond seeping through the berm. Sample Site 2 did not reveal hydrology nor hydric soil so the area was not delineated as wetland.

At the western end of the pond, there was an overflow drainage with flowing water on March 12, 2019 but not during subsequent site visits. During peak flows, surface water flows 107 feet west and south from the pond before exiting the Study Area through a storm drain drop inlet.

Photo 21. Overflow path out of western edge of pond, view west, 03/12/2019.

Photo 22. Overflow path into sewer inlet, view west, 03/12/2019.

TABLE 4. CENTRAL DRAINAGE OHWM ASSESSMENTS

Area	OHWM Width (ft)	OHWM Depth (ft)	Hydrology Indicator	OHWM Indicator	Photograph
M	1.5	1	o Water present o Algal mats o Debris/drifts o Mudcracks	o Change in sediment texture o Change in vegetation cover o Change in vegetation species o Break in bank slope	 03/12/2019
N	2	1.5	o Water present o Algal mats o Debris/drifts o Mudcracks	o Change in sediment texture o Change in vegetation cover o Change in vegetation species o Break in bank slope	 03/12/2019

4.3 Southern Corner Wetland

At the southwest corner of the Study Area there is a poor quality, weedy wetland supported by surface sheetflow and subsurface lateral return flow from the hills directly east. The elevation of the wetland is one to three feet lower than the adjacent Meadowlark Road and neighboring subdivision. Stormwater from surrounding, higher elevations flow to this corner where it is trapped and pools in the Study Area. The wetland showed evidence of hydrology in the form of biotic crust (up to 40 percent coverage in some areas), dominance of hydrophytic vegetation (toad rush and annual bluegrass, as well as a presence of an obligate species, hyssop loosestrife, and redox features within the top twelve inches.

Photo 23. High percentage of redoximorphic features in sandy clay loam soil in Sample Site 6, 03/26/2019.

Photo 24. Dominance of hydrophytic vegetation in Southern Corner Wetland, view west, 03/26/2019.

5 JURISDICTIONAL DELINEATION

The Study Area contains 0.24 acre of habitat that meets the definition of wetland by the USACE and RWQCB. An additional 4,594 feet and 1.26 acres of drainages that meets the definition of non-wetland waters also exists within the Study Area. Approximately 0.68 of the 1.26 acres has the potential to support non-persistent emergent wetlands. These wetlands may occupy less than 25 percent of the 0.68 acre. Approximately 0.02 acre of the 1.26 acres may be considered a wetland by RWQCB standards but not USACE.

The Northern Drainage flows from the eastern to the western boundary of the Study Area, has approximately 4,122 feet of streambed, covers 0.99 acre, and has the potential to support non-persistent emergent wetlands within the stream channel. Two Focused Study Areas were investigated later in the growing season after the waters had receded. Approximately 0.13 acre of non-persistent emergent wetlands (federal and state), 0.14 acre of non-wetland streambed (federal and state), and 0.02 acre of unvegetated pooling habitat that would be considered non-wetland by USACE standards but may be a wetland per RWQCB, were identified within the Focused Study Areas. OHWM indicators include changes in sediment texture, vegetation species and cover, and a break in bank slope. The adjacent upland area supports weedy non-hydrophytes. The remaining 0.68 acre of the Northern Drainage was delineated as non-wetland waters of the U.S. and state with less than 25 percent wetland inclusions.

The Central Drainage, including the overflow path out of the pond, is a 815 foot long (average OHWM width of 2 feet, 0.14 acre total area) non-wetland water that carries water to the Central Pond (0.28 acre) and associated persistent emergent wetland feature on the banks and mouth of the pond (0.06 acre). OHWM indicators include changes in sediment texture, vegetation species and cover, and a break in bank slope. The 2015 Clean Water Rule and the 2019 State Wetland Definition lists artificial, stock watering ponds as non-jurisdictional but since the pond has a jurisdictional drainage flowing to it and the pond will be converted as part of a large development project, it is considered jurisdictional for the purpose of this delineation.

Water pools in the southwestern corner of the property in the area delineated as the Southern Corner Wetland (0.05 acre). This area demonstrated hydrology, hydric soil, and a dominance of hydrophytic vegetation and would be classified as a persistent emergent palustrine wetland.

Aquatic feature jurisdictional area calculations are included in Table 5.

TABLE 5. JURISDICTIONAL AQUATIC FEATURE CHARACTERISTICS.

Feature	Feature Type	State	Federal
Northern Drainage	Stream with riparian and possible non-persistent emergent or unvegetated state wetlands	Jurisdictional Non-Wetland with Wetland Inclusions	Jurisdictional Non-Wetland with Wetland Inclusions
Eastern Focused Study Area			
Northern Wetland	Non-persistent emergent wetland	Jurisdictional Wetland	Jurisdictional Wetland
Northern Non-Wetland	Stream	Jurisdictional Non-Wetland	Jurisdictional Non-Wetland
Ditch Non-Wetland	Stream	Jurisdictional Non-Wetland	Jurisdictional Non-Wetland
Western Focused Study Area			
Fence Drainage	Stream	Jurisdictional Non-Wetland	Jurisdictional Non-Wetland
Pasture Drainage	Stream	Jurisdictional Non-Wetland	Jurisdictional Non-Wetland
Pool Fringe and Mouth	Non-persistent emergent wetland	Jurisdictional Wetland	Jurisdictional Wetland
Unvegetated Pool	Unvegetated wetland	Jurisdictional Wetland	Jurisdictional Non-Wetland
Seaside Barley Drainage	Non-persistent emergent wetland	Jurisdictional Wetland	Jurisdictional Wetland
Central Drainage	Stream	Jurisdictional Non-Wetland	Jurisdictional Non-Wetland
Central Pond Fringe	Persistent emergent wetland	Jurisdictional Wetland	Jurisdictional Wetland
Central Pond (Unvegetated)	Unvegetated stock pond with possible non-persistent emergent wetland	Jurisdictional Non-Wetland	Jurisdictional Non-Wetland
Southern Corner Wetland	Persistent emergent wetland	Jurisdictional Wetland	Jurisdictional Wetland

TABLE 6. JURISDICTIONAL AQUATIC FEATURE MEASUREMENTS.

Feature	Avg Appx OHWM Width (ft)	Avg Appx OHWM Depth (ft)	Length (ft)	Area (ac)	Area (sq ft)
Northern Drainage	Varies 2 to 30	Varies 0.5 to 4.5	4,122	0.99	43,012
Eastern Focused Study Area					
Northern Wetland	6	0.5 to 1	308	0.05	1974
Northern Non-Wetland	Varies 5 to 30	<0.5 to 1	81	0.07	3,107
Ditch Non-Wetland	2	1	259	0.03	1,108
Western Focused Study Area					
Fence Drainage	8	<0.5	189	0.03	1,517
Pasture Drainage	11	0.5	31	0.01	524
Pond Fringe and Mouth	13	0.5 to 1	117	0.05	2,347
Unvegetated Pool	15	1	47	0.02	738
Seaside Barley Drainage	9.5	1	152	0.03	1,449
Central Drainage	2	1	815	0.14	5,989
Central Pond Fringe	n/a	n/a	74	0.06	2,728
Central Pond (Unvegetated)	n/a	n/a	280	0.28	12,187
Southern Corner Wetland	n/a	n/a	119	0.05	2,075

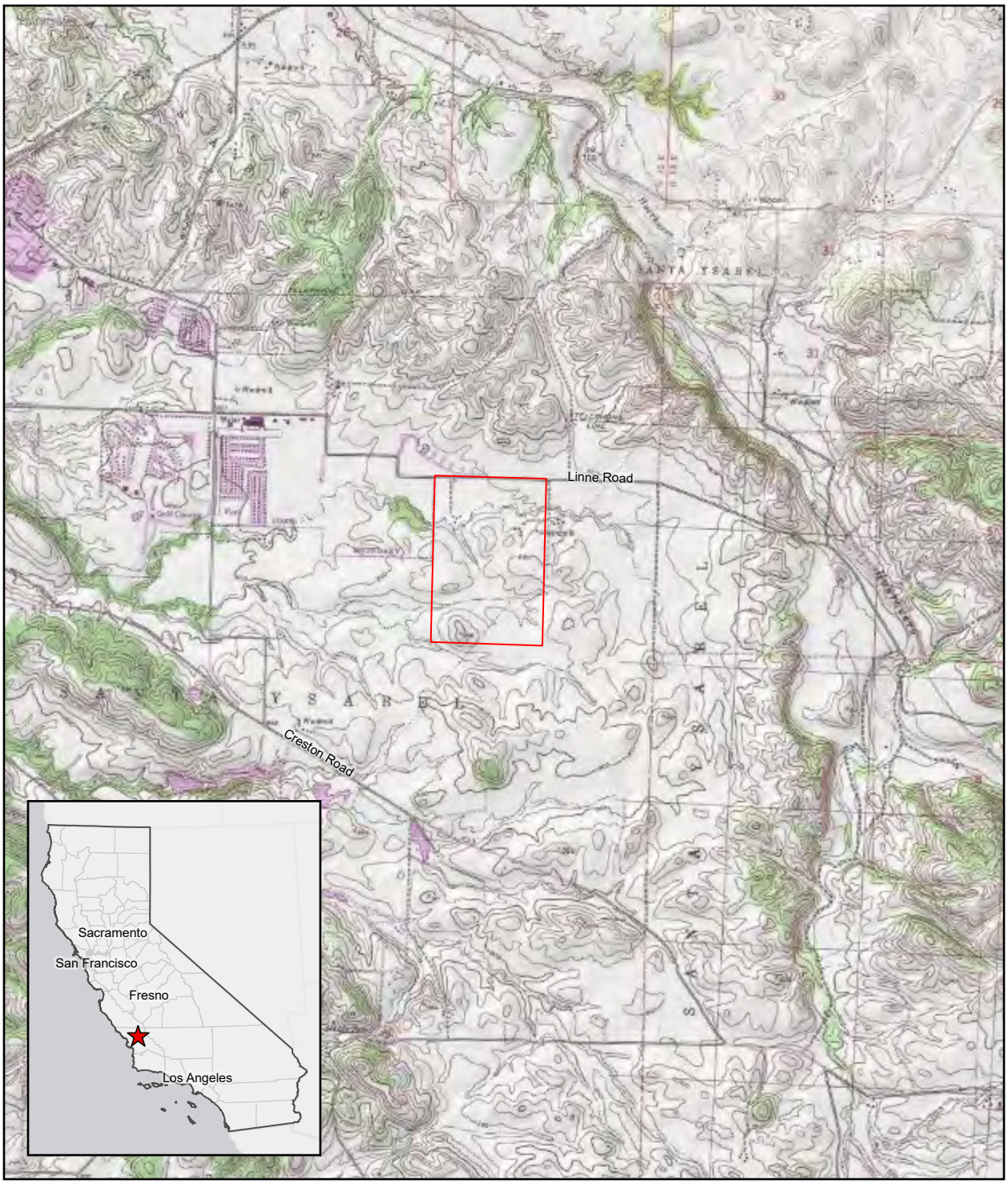
This report is subject to verification by the USACE and RWQCB.

6 FIGURES

- **Figure 1. United States Geological Survey Topographic Map**
- **Figure 2. Aerial Imagery History**
- **Figure 3. National Hydrography Dataset**
- **Figure 4. National Wetlands Inventory**
- **Figure 5. Hydrologic Unit Codes**
- **Figure 6. Federal Emergency Management Agency Flood Insurance Rate Map**
- **Figure 7. Potentially Jurisdictional Aquatic Features**

Reso A - Exhibit C2 (EIR Technical Appendix)

Figure 1. United States Geological Survey Topographic Map



Legend

Study Area

N

0 0.25 0.5 0.75 1 Mile

Olsen Ranch
Map Center: 120.63535°W 35.60441°N
Paso Robles, San Luis Obispo County

USGS Quadrangle: Templeton

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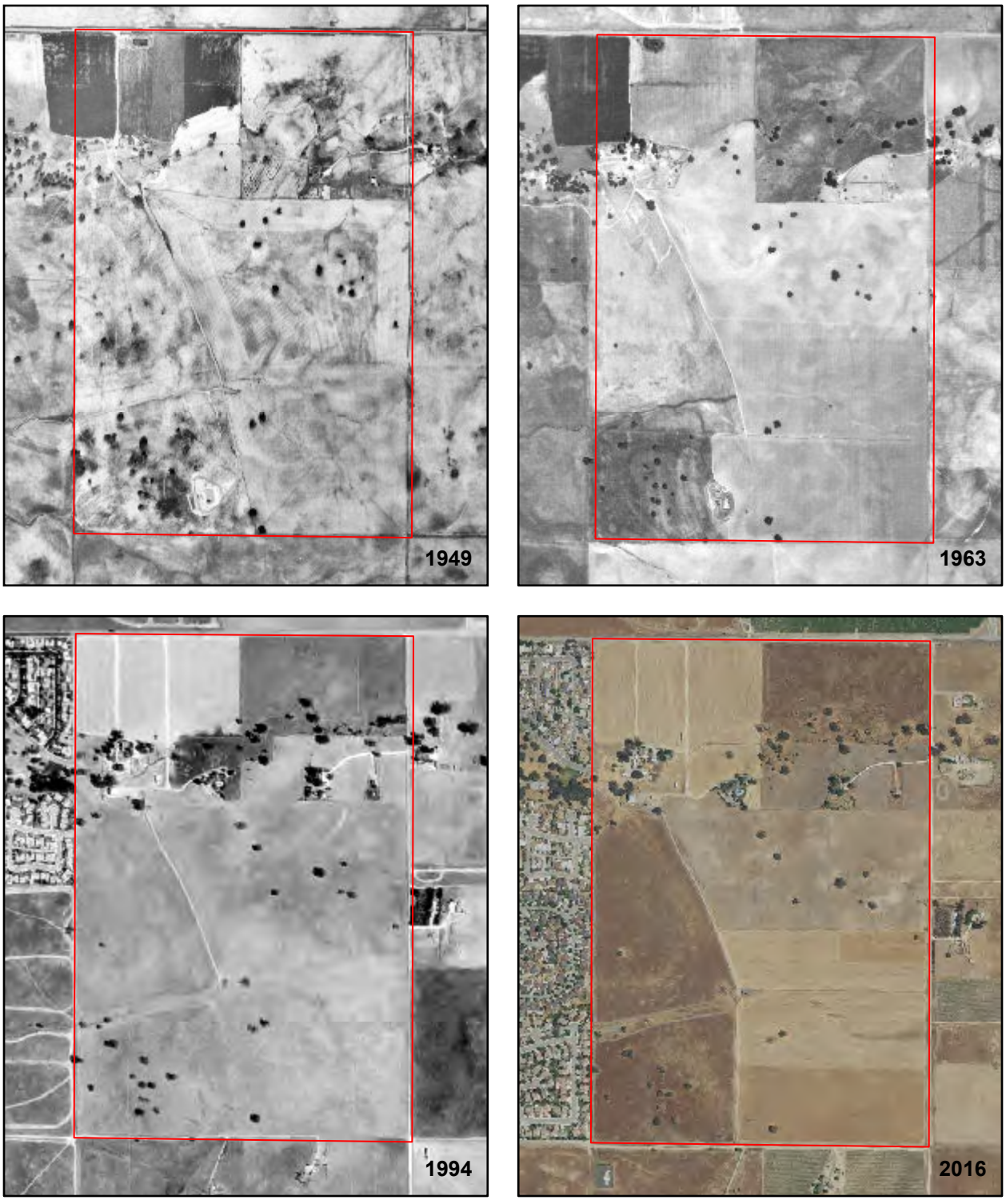
BIOLOGICAL AND ENVIRONMENTAL SERVICES

Map Updated:
April 05, 2019 09:44 AM by JBB

Reso A - Exhibit C2 (EIR Technical Appendix)

Figure 2. Aerial Imagery History



Legend

Study Area

N

0 0.25 0.5 Miles

Olsen Ranch
Map Center: 120°38'12"W 35°36'22"N
Paso Robles, San Luis Obispo County

Data Source: USDA NAIP, UCSB MIL, Google Earth

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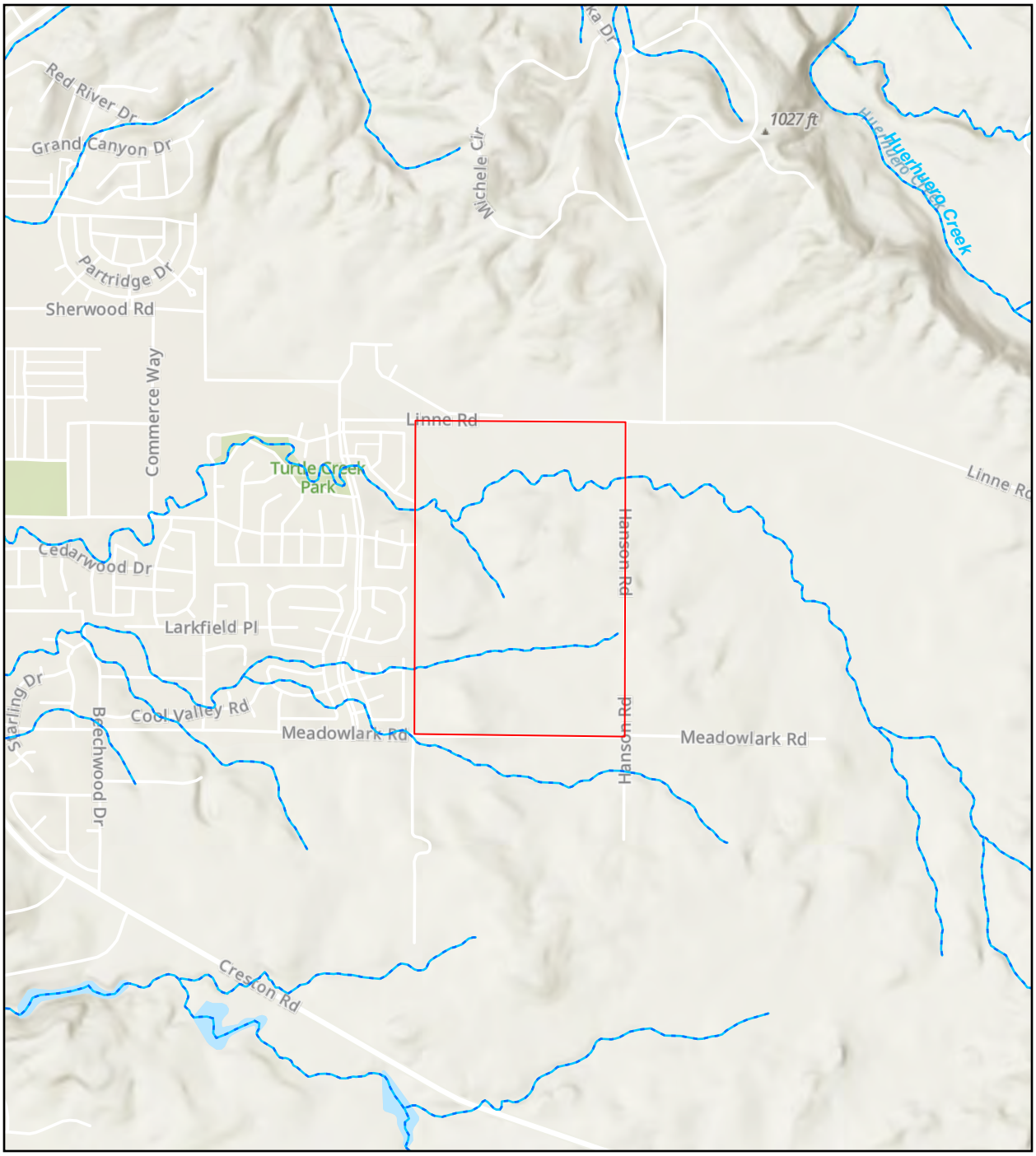
Map Updated:
April 05, 2019 09:44 AM by MMP

Reso A - Exhibit C2 (EIR Technical Appendix)

Figure 3. National Hydrography Dataset



Legend

- Study Area
- Drainages

N

0 0.25 0.5 Miles

Olsen Ranch
Map Center: 120.63674°W 35.60648°N
Paso Robles, San Luis Obispo County

Data Source: United States Geological Survey

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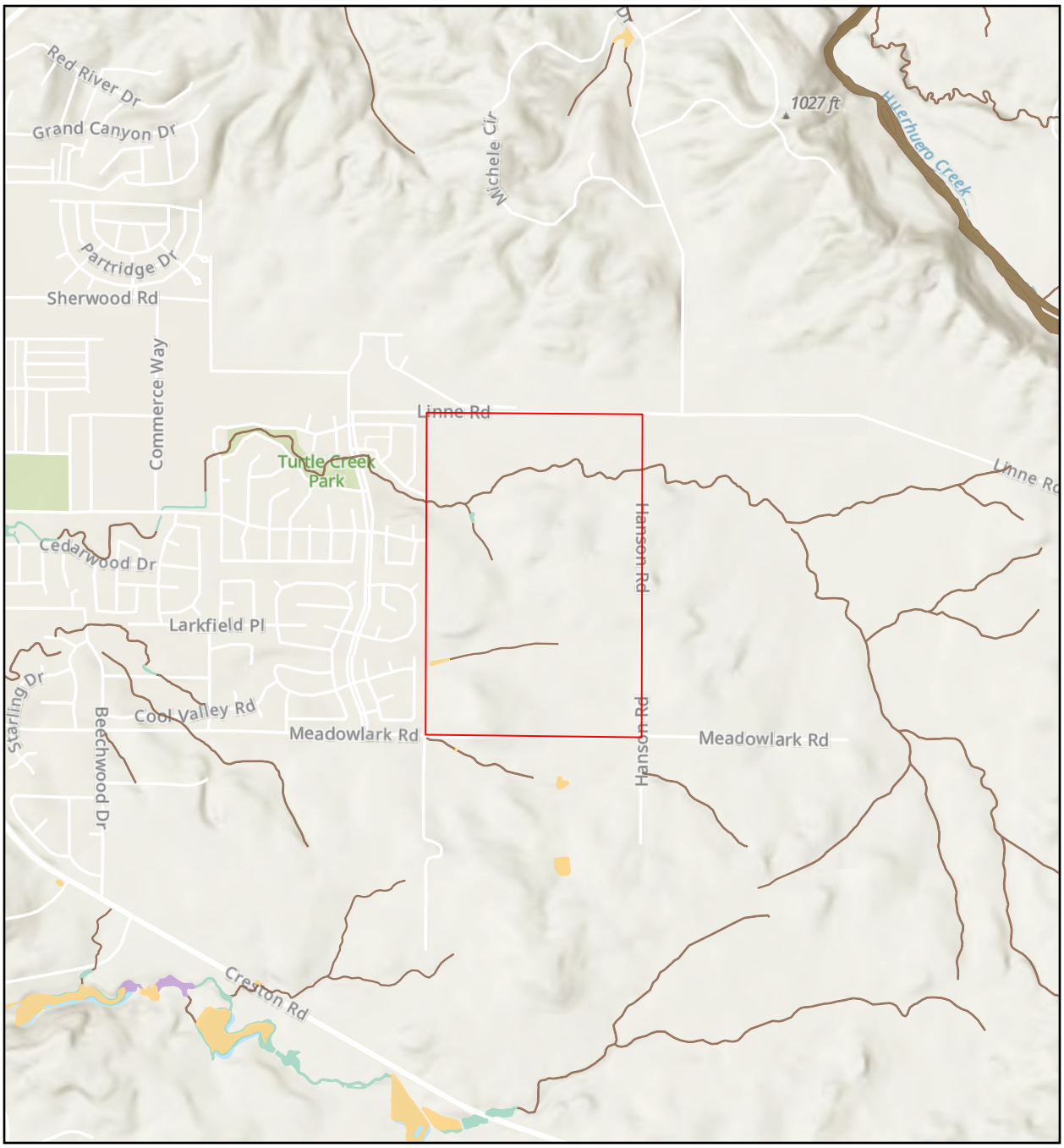
Map Updated:
April 05, 2019 09:45 AM by JBB

Reso A - Exhibit C2 (EIR Technical Appendix)

Figure 4. National Wetland Inventory



Legend

- Study Area
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Riverine

N

0 0.25 0.5 Miles

Olsen Ranch
Map Center: 120.63674°W 35.60648°N
Paso Robles, San Luis Obispo County

Data Source: United States Fish and Wildlife Service

ALTHOUSE AND MEADE, INC.
BIOLOGICAL AND ENVIRONMENTAL SERVICES

Map Updated:
April 05, 2019 09:46 AM by JBB

Reso A - Exhibit C2 (EIR Technical Appendix)

Figure 5. Hydrologic Unit Codes

Legend

- Study Area Location
- 1806000050405 (Mustard Creek - Salinas River)
- 1806000504 (Paso Robles Creek - Salinas River)
- 18060005 (Salinas)

N

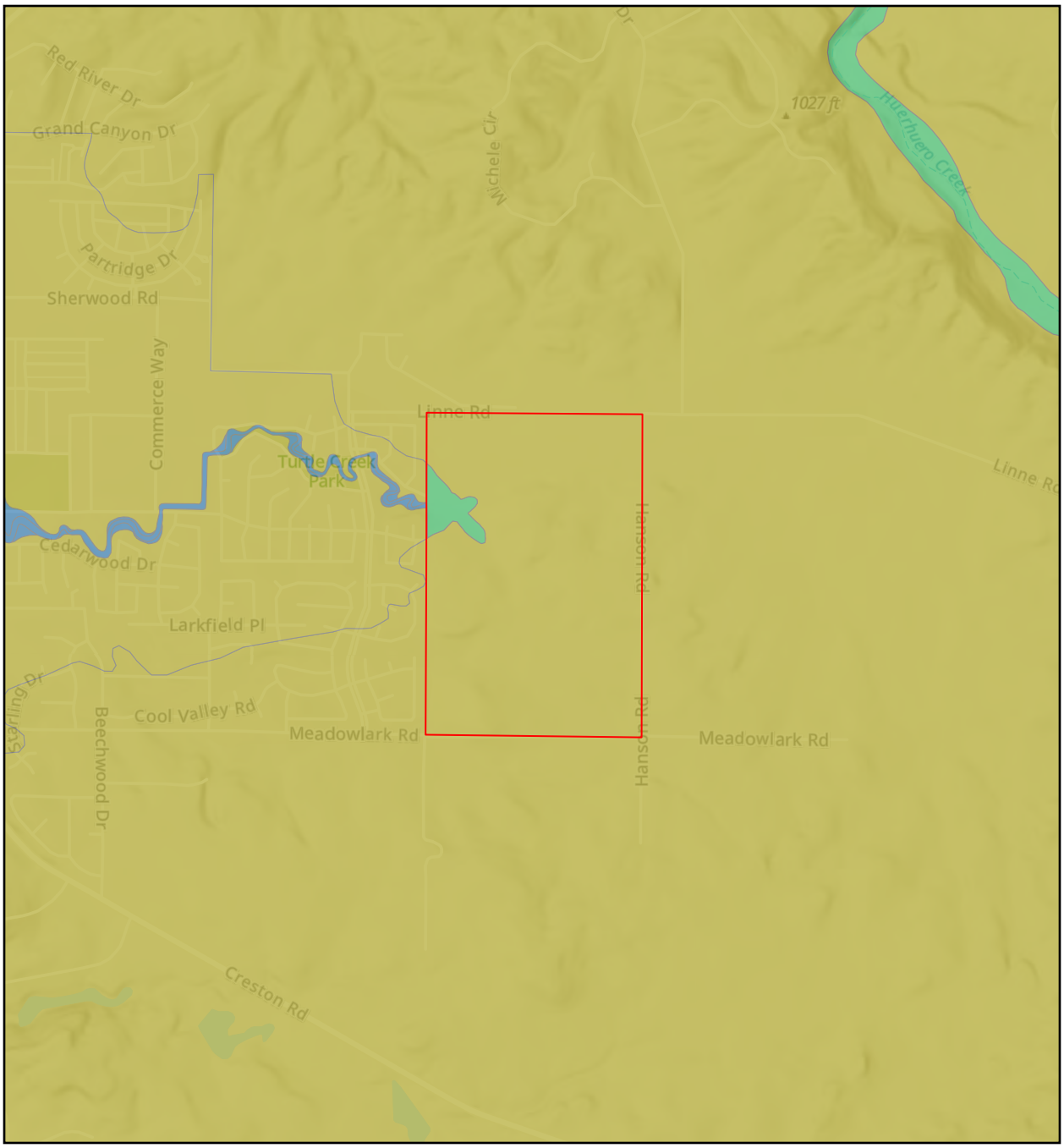
0 10 20 Miles

Olsen Ranch
Map Center: 121.03167°W 35.98504°N
Paso Robles, San Luis Obispo County

Data Source: United States Geological Survey

Reso A - Exhibit C2 (EIR Technical Appendix)

Figure 6. Federal Emergency Management Agency Flood Insurance Rate Map



Legend

Study Area

Flood Zone*

A

AE

X

N

0 0.25 0.5 Miles

*Flood Zone Definitions on Reverse Side

Olsen Ranch
Map Center: 120.63674°W 35.60648°N
Paso Robles, San Luis Obispo County

Data Source: United States Geological Survey

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Map Updated:
April 05, 2019 03:43 PM by JBB

FEMA/FIRM ZONE CLASSIFICATION

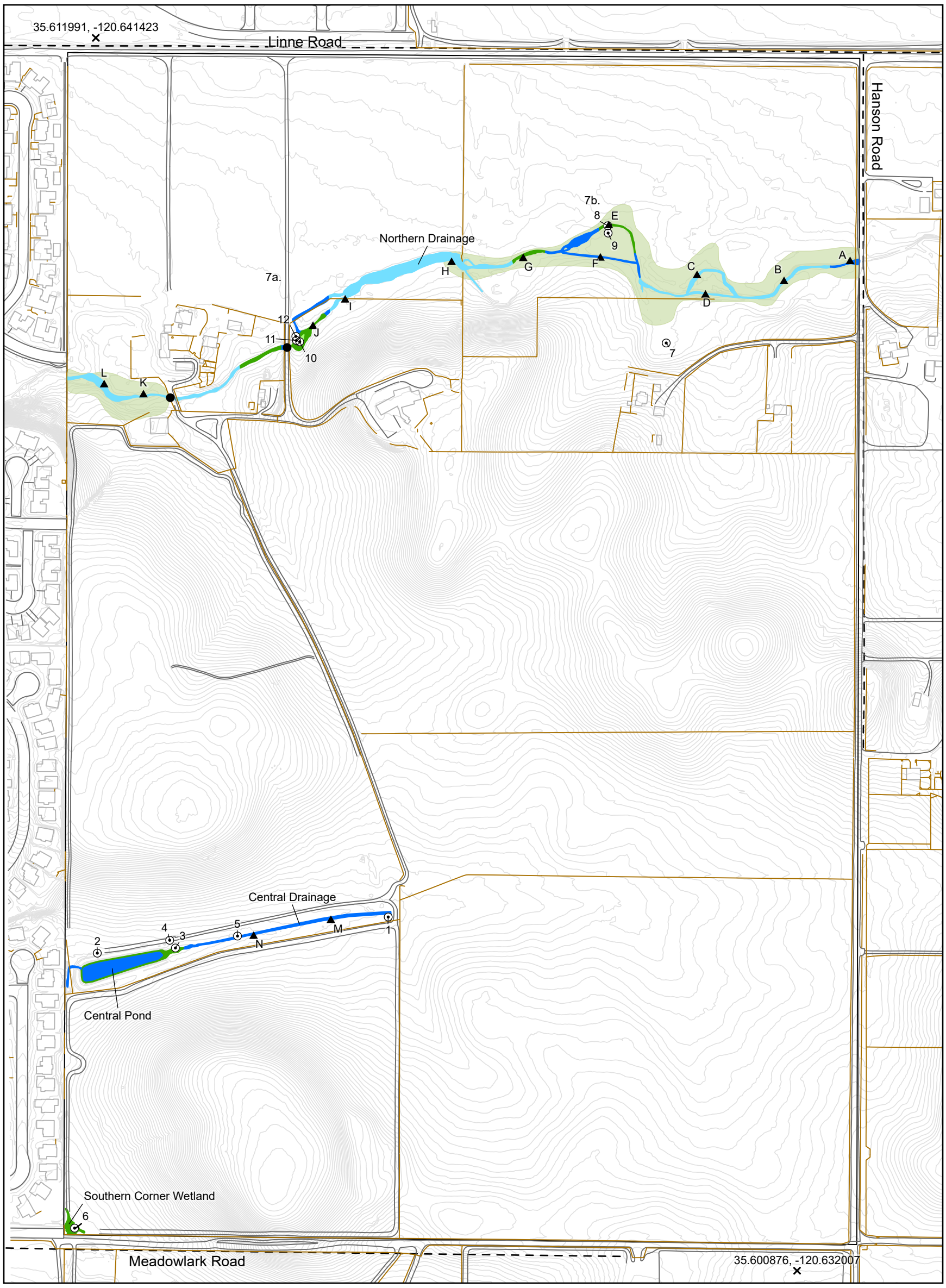
Moderate to Low Risk Areas

Zone	Description
B and X (shaded)	Area of moderate flood hazard, usually the area between the limits of the 100- year and 500-year floods. B Zones are also used to designate base floodplains of lesser hazards, such as areas protected by levees from 100-year flood, or shallow flooding areas with average depths of less than one foot or drainage areas less than 1 square mile.
C and X (unshaded)	Area of minimal flood hazard, usually depicted on FIRMs as above the 500-year flood level. Zone C may have ponding and local drainage problems that don't warrant a detailed study or designation as base floodplain. Zone X is the area determined to be outside the 500-year flood and protected by levee from 100- year flood.

High Risk Areas

Zone	Description
A	Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analyses are not performed for such areas; no depths or base flood elevations are shown within these zones.
AE	The base floodplain where base flood elevations are provided. AE Zones are now used on new format FIRMs instead of A1-A30 Zones.
A1-A30	These are known as numbered A Zones (e.g., A7 or A14). This is the base floodplain where the FIRM shows a BFE (old format).
AH	Areas with a 1% annual chance of shallow flooding, usually in the form of a pond, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.
AO	River or stream flood hazard areas, and areas with a 1% or greater chance of shallow flooding each year, usually in the form of sheet flow, with an average depth ranging from 1 to 3 feet. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Average flood depths derived from detailed analyses are shown within these zones.
AR	Areas with a temporarily increased flood risk due to the building or restoration of a flood control system (such as a levee or a dam). Mandatory flood insurance purchase requirements will apply, but rates will not exceed the rates for unnumbered A zones if the structure is built or restored in compliance with Zone AR floodplain management regulations.
A99	Areas with a 1% annual chance of flooding that will be protected by a Federal flood control system where construction has reached specified legal requirements. No depths or base flood elevations are shown within these zones.
V	Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26% chance of flooding over the life of a 30-year mortgage. No base flood elevations are shown within these zones.
VE, V1-30	Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26% chance of flooding over the life of a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones.

Figure 7. Potentially Jurisdictional Aquatic Features



Legend

- Study Area (254.1 acres)
- Site Control Point
- OHWM Assessment
- Sample Site
- Existing Crossing
- Fence
- Other Infrastructure
- Road
- Non-Wetland Waters of the U.S. and State (0.58 acres, 2,016 LF)
- State Wetland, Federal Non-Wetland (0.02 acre)
- Wetlands of the U.S. and State (0.24 acre)
- Non-Wetland Waters of the U.S. and State With Wetland Inclusions (0.68 acres, 2,578 LF)
- Riparian Habitat of the State (3.97 acres)

1 inch = 350 feet

N

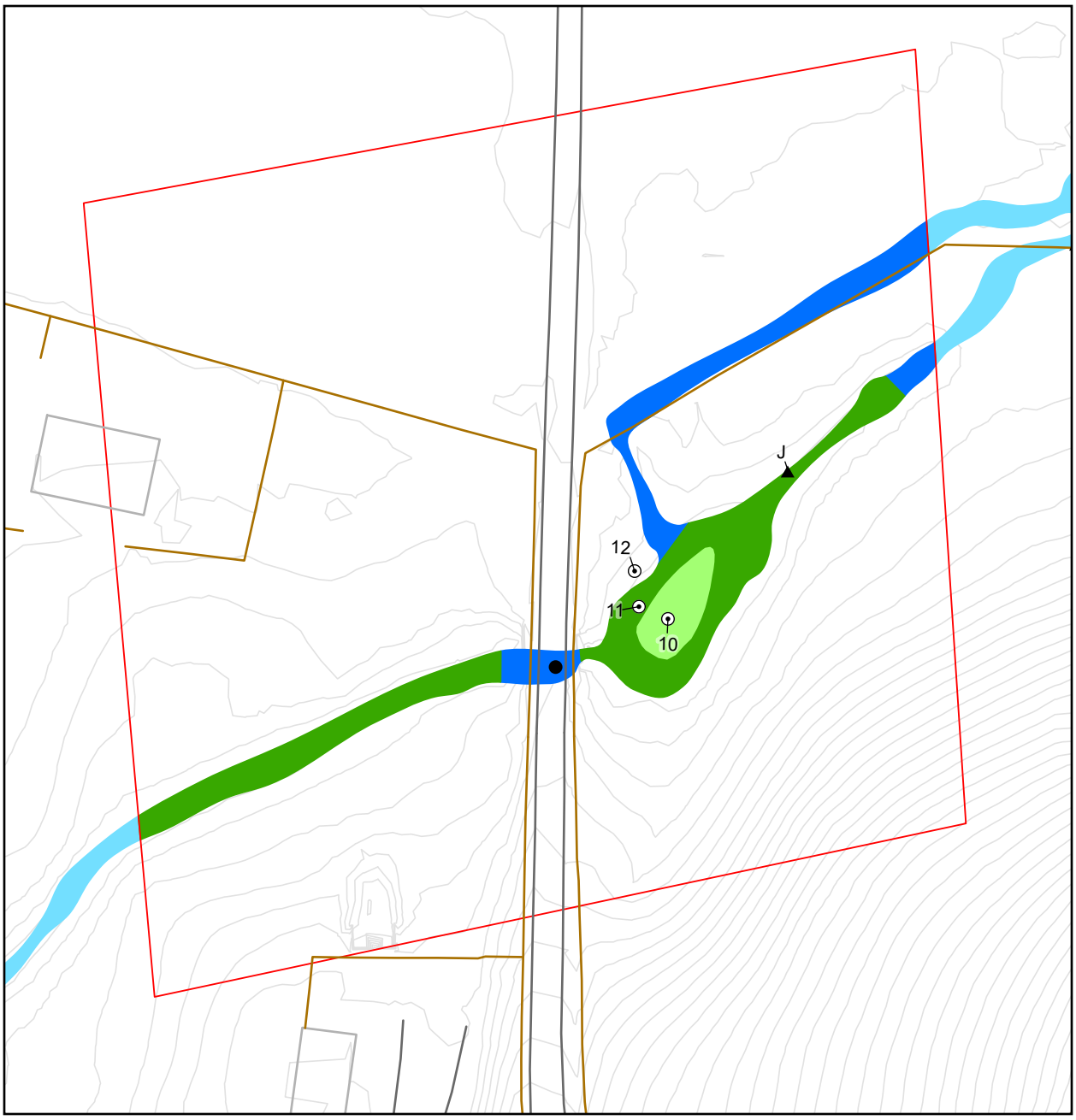
0 200 400 Feet

Olsen Ranch
Map Center: 120.63653°W 35.60651°N
Paso Robles, San Luis Obispo County

Contour Interval: 1-Foot
Site Investigator: Jacqueline Tillligkeit

Reso A - Exhibit C2 (EIR Technical Appendix)

Figure 7a. Potentially Jurisdictional Aquatic Features



Legend

- Focused Study Area
- Non-Wetland Waters of the U.S. and State
- Non-Wetland Waters of the U.S. and State With Wetland Inclusions
- State Wetland, Federal Non-Wetland
- Wetlands of the U.S. and State
- OHWM Assessment
- Sample Site
- Existing Crossing
- Fence
- Other Infrastructure
- Road

N

1 inch = 62.5 feet

0 25 50 Feet

Olsen Ranch
Map Center: 120.63868°W 35.60934°N
Paso Robles, San Luis Obispo County
Contour Interval: 1-Foot
Site Investigator: Jacqueline Tillligkeit

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Map Updated:
May 20, 2019 03:58 PM by JBB

Reso A - Exhibit C2 (EIR Technical Appendix)

Figure 7b. Potentially Jurisdictional Aquatic Features

Legend

- Focused Study Area
- Non-Wetland Waters of the U.S. and State
- Non-Wetland Waters of the U.S. and State With Wetland Inclusions
- Wetlands of the U.S. and State
- Riparian Habitat of the State
- ▲ OHWM Assessment
- ⊙ Sample Site
- Fence

N

1 inch = 50 feet

0 40 80 Feet

Olsen Ranch
Map Center: 120.63543°W 35.61019°N
Paso Robles, San Luis Obispo County
Contour Interval: 1-Foot
Site Investigator: Jacqueline Tillligkeit

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Map Updated:
May 22, 2019 11:35 AM by JBB

7 REFERENCES

33 CFR 320-332. Subsection of Regulations for Navigation and Navigable Waters. Text from Code of Federal Regulations. Available from: http://www.ecfr.gov. Accessed April 2019.

40 CFR 230. Section 404(b)(1) Guidelines for specification of disposal sites for dredged or fill material. Text from Code of Federal Regulations. Available at http://www.ecfr. gov. Accessed April 2019.

Cowardin, Lewis. M., Virgina Carter, Frances C. Golet, and Edward T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. U.S. Army Engineer Waterways Experiment Station, Vicksburg, Miss. Technical Report Y-87-1. 207

Federal Emergency Management Agency (FEMA). 2012. National Flood Hazard Layer. FIRM Panel 06079C0607G. Available from http://msc.fema.gov.

National Oceanic and Atmospheric Administration (NOAA). 2019. USDA Field Office Climate Data. Paso Robles (046730). Product generated by ACIS – NOAA Regional Climate Centers. Accessed April 2019.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/ Accessed March 2019.

State Water Resources Control Board (SWRCB). 2019. State Wetland Definition and Procedures for Discharges of Dredged or Fill Materials to Waters of the State. [For Inclusion in the Water Quality Control Plans for Inland Surface Waters and Enclosed Bays and Estuaries and Ocean Waters of California]. Accessed April 2019. Available from https://www.waterboards.ca.gov/water_issues/programs/cwa401/docs/wrapp/df_procedures_clean.pdf.

U.S. Army Corps of Engineers. 2008a. A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States. Ed. R.W. Lichvar and S.M. McColley. ERDC/CRREL TR-08-12. Hanover, NH: U.S. Army Engineer Research and Development Center.

_____. 2008b. A Regional supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0). Ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-08-28. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

_____. 2010. Updated Datasheet for the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the United States. Ed. K.E. Curtis and R.W. Lichvar. ERDC/CRREL TN-10-1. Hanover, NH: U.S. Army Engineer Research and Development Center.

U.S. Department of Agriculture. Natural Resources Conservation District. 2010. Field Indicators of Hydric Soils in the United States. Version 7.0. G.W. Hurt and L.M. Vasilas (eds.). USDA, NRCS in cooperation with the National Technical Committee for Hydric Soils (NTCHS).

8 APPENDICES

- **Appendix A. USDA Custom Soils Report**
- **Appendix B. Wetland Determination Data Forms**

APPENDIX A. USDA CUSTOM SOILS REPORT

United States Department of Agriculture

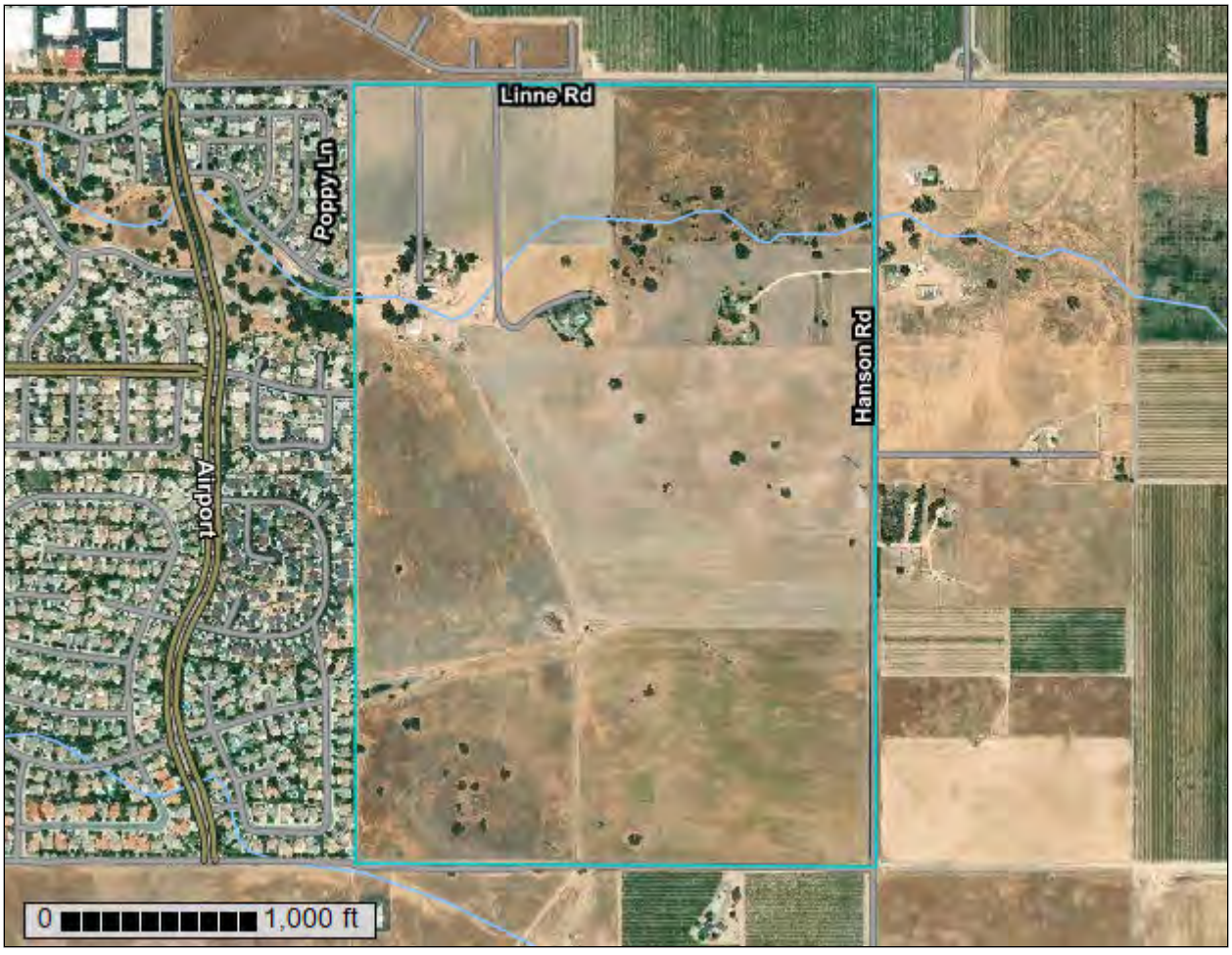
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for San Luis Obispo County, California, Paso Robles Area

Olsen Ranch



April 17, 2019

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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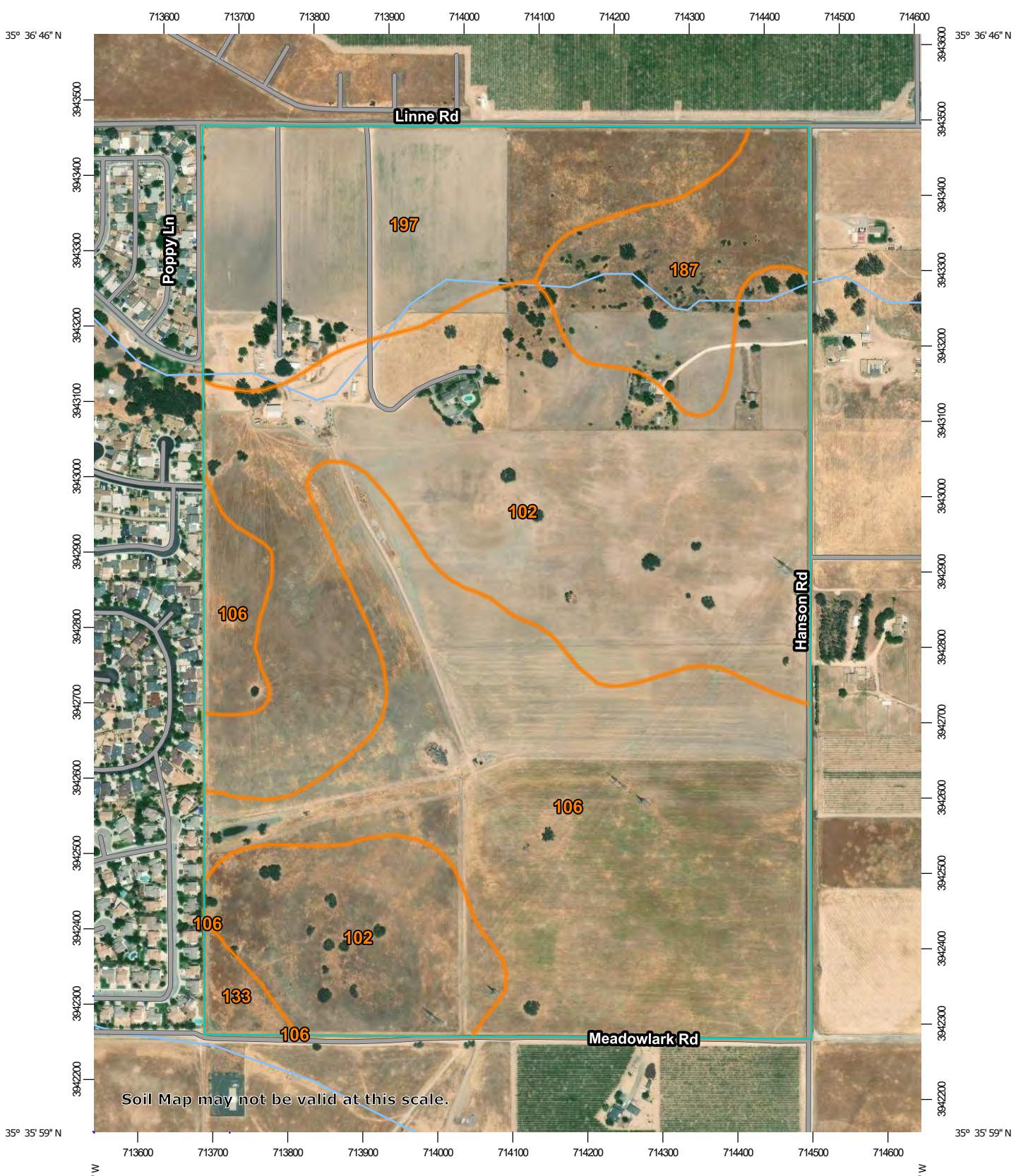
Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report

Soil Map



Map Scale: 1:7,110 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 100 200 400 600

Feet
0 300 600 1200 1800

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: San Luis Obispo County, California, Paso Robles Area
Survey Area Data: Version 12, Sep 14, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 17, 2016—Oct 1, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND	MAP INFORMATION
	imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
102	Arbuckle-Positas complex, 9 to 15 percent slopes	101.7	41.9%
106	Arbuckle-San Ysidro complex, 2 to 9 percent slopes	80.6	33.3%
133	Cropley clay, 2 to 9 percent slopes, MLRA 14	2.5	1.0%
187	Rincon clay loam, 0 to 2 percent slopes	18.7	7.7%
197	San Ysidro loam, 0 to 2 percent slopes, MLRA 14	38.9	16.1%
Totals for Area of Interest		**242.3**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

San Luis Obispo County, California, Paso Robles Area

102—Arbuckle-Positas complex, 9 to 15 percent slopes

Map Unit Setting

National map unit symbol: hbrk
Elevation: 600 to 1,500 feet
Mean annual precipitation: 12 to 20 inches
Mean annual air temperature: 60 to 61 degrees F
Frost-free period: 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Arbuckle and similar soils: 40 percent
Positas and similar soils: 30 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arbuckle

Setting

Landform: Terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium from mixed rock sources

Typical profile

H1 - 0 to 29 inches: fine sandy loam
H2 - 29 to 53 inches: sandy clay loam
H3 - 53 to 62 inches: stratified sandy loam to very gravelly sandy clay loam

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: COARSE LOAMY (R014XE003CA)
Hydric soil rating: No

Description of Positas

Setting

Landform: Terraces

Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium from mixed rock sources

Typical profile

H1 - 0 to 10 inches: coarse sandy loam
H2 - 10 to 28 inches: clay
H3 - 28 to 40 inches: sandy clay loam
H4 - 40 to 60 inches: stratified sandy loam to gravelly clay loam

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: 9 to 20 inches to abrupt textural change
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 1.2 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: COARSE LOAMY CLAYPAN (R014XE005CA)
Hydric soil rating: No

Minor Components

Greenfield, fine sandy loam

Percent of map unit: 10 percent
Hydric soil rating: No

Positas

Percent of map unit: 10 percent
Hydric soil rating: No

Cropley

Percent of map unit: 4 percent
Hydric soil rating: No

Hanford, fine sandy loam

Percent of map unit: 3 percent
Hydric soil rating: No

Unnamed, areas of 15 to 30 percent slope

Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, areas of 15 to 30 percent slope

Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, areas with cobbles on the surface

Percent of map unit: 1 percent
Hydric soil rating: No

106—Arbuckle-San Ysidro complex, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: hbrp
Elevation: 600 to 1,500 feet
Mean annual precipitation: 12 to 20 inches
Mean annual air temperature: 60 to 61 degrees F
Frost-free period: 200 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Arbuckle and similar soils: 40 percent
San ysidro and similar soils: 20 percent
Minor components: 39 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arbuckle

Setting

Landform: Terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium from mixed rock sources

Typical profile

H1 - 0 to 29 inches: fine sandy loam
H2 - 29 to 38 inches: sandy clay loam
H3 - 38 to 62 inches: stratified sandy loam to very gravelly sandy clay loam

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): 3e

Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: COARSE LOAMY (R014XE003CA)
Hydric soil rating: No

Description of San Ysidro

Setting

Landform: Terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from mixed rocks

Typical profile

H1 - 0 to 23 inches: loam
H2 - 23 to 38 inches: clay loam
H3 - 38 to 71 inches: sandy loam

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: 20 to 37 inches to abrupt textural change
Natural drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: LOAMY CLAYPAN (R014XE029CA)
Hydric soil rating: No

Minor Components

Greenfield, fine sandy loam

Percent of map unit: 14 percent
Hydric soil rating: No

Unnamed, similar to san ysidro soil

Percent of map unit: 10 percent
Hydric soil rating: No

Hanford, fine sandy loam

Percent of map unit: 5 percent
Hydric soil rating: No

Unnamed, simialr to arbuckle

Percent of map unit: 5 percent
Hydric soil rating: No

Cropley, clay

Percent of map unit: 2 percent

Hydric soil rating: No

Rincon, clay loam

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed

Percent of map unit: 1 percent
Landform: Drainageways
Hydric soil rating: Yes

133—Cropley clay, 2 to 9 percent slopes, MLRA 14

Map Unit Setting

National map unit symbol: 2tb9j
Elevation: 0 to 2,340 feet
Mean annual precipitation: 12 to 28 inches
Mean annual air temperature: 56 to 60 degrees F
Frost-free period: 270 to 365 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Cropley and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cropley

Setting

Landform: Alluvial fans, terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Base slope, tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from calcareous shale

Typical profile

A1 - 0 to 11 inches: clay
Bss1 - 11 to 51 inches: clay
BCk1 - 51 to 79 inches: sandy clay loam

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None

Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (1.0 to 3.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 5.0
Available water storage in profile: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: CLAYEY (R014XD001CA)
Hydric soil rating: No

Minor Components

Salinas

Percent of map unit: 3 percent
Landform: Terraces, alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Base slope, tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Los osos

Percent of map unit: 3 percent
Landform: Hillslopes, ridges
Landform position (two-dimensional): Backslope, shoulder, footslope, summit
Landform position (three-dimensional): Side slope
Down-slope shape: Convex, concave
Across-slope shape: Convex, concave
Hydric soil rating: No

Clear lake

Percent of map unit: 2 percent
Landform: Basin floors
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Hydric soil rating: Yes

Capay

Percent of map unit: 2 percent
Landform: Flood plains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Base slope, dip
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

187—Rincon clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hbv9
Elevation: 600 to 1,500 feet
Mean annual precipitation: 12 to 20 inches
Mean annual air temperature: 60 degrees F
Frost-free period: 200 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Rincon and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Rincon

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock

Typical profile

H1 - 0 to 18 inches: clay loam
H2 - 18 to 64 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: C
Ecological site: FINE LOAMY BOTTOM (R014XE025CA)
Hydric soil rating: No

Minor Components

Unnamed
Percent of map unit: 10 percent
Hydric soil rating: No

San ysidro, loam
Percent of map unit: 5 percent
Hydric soil rating: No

Cropley, clay
Percent of map unit: 3 percent
Hydric soil rating: No

Lockwood, shaly loam
Percent of map unit: 2 percent
Hydric soil rating: No

197—San Ysidro loam, 0 to 2 percent slopes, MLRA 14

Map Unit Setting
National map unit symbol: 2tyys
Elevation: 70 to 1,990 feet
Mean annual precipitation: 13 to 22 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 300 to 360 days
Farmland classification: Farmland of statewide importance

Map Unit Composition
San ysidro and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of San Ysidro

Setting
Landform: Alluvial fans, valley floors, terraces
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock

Typical profile
A - 0 to 23 inches: loam
B1 - 23 to 38 inches: clay loam
Bt2 - 38 to 64 inches: loam

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: 16 to 24 inches to abrupt textural change

Natural drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: LOAMY CLAYPAN (R014XE029CA)
Hydric soil rating: No

Minor Components

Arbuckle

Percent of map unit: 6 percent
Hydric soil rating: No

Rincon

Percent of map unit: 2 percent
Hydric soil rating: No

Solano

Percent of map unit: 2 percent
Hydric soil rating: No

Pleasanton, loam

Percent of map unit: 2 percent
Hydric soil rating: No

Pescadero

Percent of map unit: 1 percent
Landform: Basin floors
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Cropley, clay

Percent of map unit: 1 percent
Hydric soil rating: No

Palexeralfs

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

APPENDIX B. WETLAND DETERMINATION DATA FORMS

Reso A - Exhibit C2 (EIR Technical Appendix)

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Olsen City/County: Paso Robles Sampling Date: 3-12-19

Applicant/Owner: Olsen State: CA Sampling Point: 1

Investigator(s): J. Tillquist & J. Dart Section, Township, Range: T26S R13E

Landform (hillslope, terrace, etc.): Valley Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): LRRC Lat: 35.603992 Long: -120.637987 Datum: WGS84

Soil Map Unit Name: Arbuckle-San Ysidro complex NWI classification: riverine

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No ?	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

Remarks:
Mexican rush a dominant species likely with upland grasses that are current unidentifiables. No sign of hydrology/hydric soil even with puddles everywhere after a wet month.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: n/a)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: n/a)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: ____)			
1. Juncus mexicanus	70	Y	FACW
2. Unidentifiable grasses	80+	Y	
3.			
4.			
5.			
6.			
7.			
8.			
	____ = Total Cover		
Woody Vine Stratum (Plot size: n/a)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: ____ (A)

Total Number of Dominant Species Across All Strata: ____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: ____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ____

Remarks:
adjacent last year growth includes medusahead, annual barley. Dominance uncertain

Reso A - Exhibit C2 (EIR Technical Appendix)

SOIL

Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-12	10YR 2/2	100					C	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: none

Depth (inches): >17

Hydric Soil Present? Yes ____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): ____

Water Table Present? Yes ____ No ✓ Depth (inches): >12

Saturation Present? (includes capillary fringe) Yes ____ No ✓ Depth (inches): >12

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Adjacent to drainage but at a higher elevation/contour

Reso A - Exhibit C2 (EIR Technical Appendix)

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Olsen City/County: Paso Robles Sampling Date: 3-26-19

Applicant/Owner: Olsen State: CA Sampling Point: 2

Investigator(s): Tilghman Andersen Section, Township, Range: T26S R13E

Landform (hillslope, terrace, etc.): berm Local relief (concave, convex, none): convex Slope (%): 30

Subregion (LRR): LRRC Lat: 35.603695 Long: -120.690767 Datum: WGS84

Soil Map Unit Name: Arbuckle-San Ysidro NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No ✓	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ✓ No ____	
Wetland Hydrology Present?	Yes ____ No ✓	

Remarks:
On northern aspect of northern berm of stockpond.
Higher than average rainfall year.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: n/a)	Absolute % Cover	Dominant Species?	Indicator Status
1. -0-			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: n/a)			
1. -0-			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 1m x 1m)			
1. Juncus mexicanus	50	Y	FACW
2. Bromus diandrus	30	Y	UPL
3. Hordeum murinum	20	Y	UPL
4. Erodium sp	3	N	
5. Amsinckia sp	2	N	
6.			
7.			
8.			
	105	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1. -0-			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ____	x 1 =	____
FACW species ____	x 2 =	____
FAC species ____	x 3 =	____
FACU species ____	x 4 =	____
UPL species ____	x 5 =	____
Column Totals: ____ (A)		____ (B)

Prevalence Index = B/A = n/a

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks:

Reso A - Exhibit C2 (EIR Technical Appendix)

SOIL

Sampling Point: 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-2	10YR 3/2	100					SC	
2-12	10YR 3/2	20	10YR 5/8	75	RM	M	SC	(not depleted)
			10YR 5/8	5	C	PL		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ✓ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: none

Depth (inches): >12"

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): >12

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): >12

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Expected evidence of lateral flow through berm from pond water. No saturation or seeping.

Reso A - Exhibit C2 (EIR Technical Appendix)

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Olsen City/County: Paso Robles Sampling Date: 3-26-19

Applicant/Owner: Olsen State: CA Sampling Point: 3

Investigator(s): Tilghkeit, Andersen Section, Township, Range: T26S R13E

Landform (hillslope, terrace, etc.): drainage Local relief (concave, convex, none): concave Slope (%): 2

Subregion (LRR): LRR C Lat: 35.603697 Long: -120.639886 Datum: WGS84

Soil Map Unit Name: Arbuckle-San Ysidro NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ✓ No ____

Hydric Soil Present? Yes ✓ No ____

Wetland Hydrology Present? Yes ✓ No ____

Is the Sampled Area within a Wetland? Yes ✓ No ____

Remarks:
Mouth of ag ponds. Above average rainfall

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: n/a)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: n/a)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 2'x2')			
1. Eleocharis macrostachya	100	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: n/a)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:
- Upland adjacent Erodium, Medusahead
- Eleocharis macrostachya not on 2016 NWPL but assumed FACW or OBL

Reso A - Exhibit C2 (EIR Technical Appendix)

SOIL

Sampling Point: _____

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 4/1	85	10YR 4/6	15	RM	PL	C	depleted

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ✓ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: none

Depth (inches): 12

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- X Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No ___ Depth (inches): 0.5

Water Table Present? Yes X No ___ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): ___

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Reso A - Exhibit C2 (EIR Technical Appendix)

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Olsen City/County: Paso Robles Sampling Date: 3-26-19

Applicant/Owner: Olsen State: CA Sampling Point: 4

Investigator(s): Andersen, Tillgkeit Section, Township, Range: T26S R13E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 1

Subregion (LRR): LRRC Lat: 35.603767 Long: -120.639951 Datum: WGS84

Soil Map Unit Name: Arbuckle-San Ysidro complex NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ____	No ✓	

Remarks:
Upland a Above average rainfall

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: n/a)	Absolute % Cover	Dominant Species?	Indicator Status
1. ∅			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: n/a)			
1. ∅			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 1m x 1m)			
1. Hordeum murinum	70	Y	FACU
2. Capsella bursa-pastoris	5	N	
3. Festuca myuros	5	N	
4. Plagiobothrys canescens	5	N	
5. Erodium sp.	5	N	
6. Poa annua	5	N	
7. Bromus madritensis ssp. rubens	5	N	
8.			
	105 = Total Cover		
Woody Vine Stratum (Plot size: n/a)			
1. ∅			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ____	x 1 =	____
FACW species ____	x 2 =	____
FAC species ____	x 3 =	____
FACU species ____	x 4 =	____
UPL species ____	x 5 =	____
Column Totals: ____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks:

Reso A - Exhibit C2 (EIR Technical Appendix)

SOIL

Sampling Point: 4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR3/2	100					CL	
6-12	10YR3/2	97	10YR3/6	3			CL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: none

Depth (inches): > 12"

Hydric Soil Present? Yes ____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): ____

Water Table Present? Yes ____ No ✓ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No ✓ Depth (inches): ____

Wetland Hydrology Present? Yes ____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

upland

Reso A - Exhibit C2 (EIR Technical Appendix)

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Olsen City/County: Paso Robles Sampling Date: 3-26-19

Applicant/Owner: Olsen State: CA Sampling Point: 5

Investigator(s): Tilligkeit, Andersen Section, Township, Range: T26S R13E

Landform (hillslope, terrace, etc.): Drainage Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): LRR C Lat: 35.623809 Long: -120.639186 Datum: WGS84

Soil Map Unit Name: Arbuckle-San Ysidro NWI classification: Riverine

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No ✓	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ✓ No ____	
Wetland Hydrology Present?	Yes ✓ No ____	

Remarks:

In channel

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: n/a)			
1. Ø			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: n/a)			
1. Ø			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 1m x 1m)			
1. Bromus diandrus	30	Y	UPL
2. Hordeum murinum	30	Y	FACU
3. Juncus mexicanus	30	Y	FACW
4. Elymus caput-medusae	10	N	
5. Erodium sp.	5	N	
6. Capsella bursa-pastoris	5	N	
7.			
8.			
	110 = Total Cover		
Woody Vine Stratum (Plot size: n/a)			
1. Ø			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 10

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ____	x 1 =	____
FACW species ____	x 2 =	____
FAC species ____	x 3 =	____
FACU species ____	x 4 =	____
UPL species ____	x 5 =	____
Column Totals: ____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks:

Reso A - Exhibit C2 (EIR Technical Appendix)

SOIL

Sampling Point: 5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-12	10YR 3/2	100	-	-	-	-	SCL	sandy clay loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: none

Depth (inches): >12

Hydric Soil Present? Yes ____ No X

Remarks:

Sandy soil - no hydric indicators

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- X Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- X Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____

Water Table Present? Yes ____ No X Depth (inches): >12

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): >12

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Reso A - Exhibit C2 (EIR Technical Appendix)

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Olsen City/County: Paso Robles Sampling Date: 3-26-19

Applicant/Owner: Olsen State: CA Sampling Point: 6

Investigator(s): Andersen, Tilligkeit Section, Township, Range: T26S R13E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): LRR C Lat: 35.60111 Long: -120.69007 Datum: WGS84

Soil Map Unit Name: Cropley clay NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No X (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:
Area may be historically disturbed through firebreaks.
Not recently disturbed.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: n/a)	Absolute % Cover	Dominant Species?	Indicator Status
1. Ø			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: n/a)			
1. Ø			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 1m x 1m)			
1. Juncus bufonius	36	Y	FACW
2. Poa annua	15	Y	FAC
3. Fester (?)	10	N	FAC
4. Lythys (?)	5	N	OBL
5.			
6.			
7.			
8.			
	60 = Total Cover		
Woody Vine Stratum (Plot size: n/a)			
1. Ø			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 35 % Cover of Biotic Crust 40

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

Reso A - Exhibit C2 (EIR Technical Appendix)

SOIL

Sampling Point: 6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/2						SCL	
5-12+	10YR 3/2	20	10YR 5/6	80			SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: none

Depth (inches): >12

Hydric Soil Present? Yes ✓ No ___

Remarks:

Soil did not seem like a Cropley clay. Possibly sandier from deposition or disturbance.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ✓ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): >12

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): >12

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Reso A - Exhibit C2 (EIR Technical Appendix)

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Olsen City/County: Paso Robles Sampling Date: 4-16-19
Applicant/Owner: Olsen State: CA Sampling Point: 7
Investigator(s): Althouse + Tilghman Section, Township, Range: T26S R13E
Landform (hillslope, terrace, etc.): swale Local relief (concave, convex, none): concave Slope (%): 2
Subregion (LRR): LRR C Lat: 35.60429 Long: -120.639371 Datum: WGS84
Soil Map Unit Name: Rincon clay loam NWI classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✓ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ✓
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks: North of house beside drainage. High rainfall year, Owner of house said septic system flooded up this year. Site may have been influenced by leach field.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: n/a)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: n/a)			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
Herb Stratum (Plot size: 1m²)			
1. Calliandra	35	Y	OBL
2. Lythrum hyssopifolium	10	N	
3. Juncus bufonius	5	N	
4. Brassica spp.	10	N	
5. Calystegia spp.	5	N	
6. Epilobium spp.	1	N	
7. Tarweed	5	N	
8.			
	71 = Total Cover		
Woody Vine Stratum (Plot size: n/a)			
1.			
2.			
	0 = Total Cover		

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust 50

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
✓ Dominance Test is >50%
__ Prevalence Index is ≤3.0[1]
__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

Reso A - Exhibit C2 (EIR Technical Appendix)

SOIL

Sampling Point: 7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/1	100					L	
6-12	10YR 2/1	97	10YR 5/2	2	D	M	SL	
			10YR 5/6	1	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: none

Depth (inches): >12

Hydric Soil Present? Yes ___ No ✓

Remarks:

Likely not saturated annually

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- X Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- X Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- X Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): >12

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): >12

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No evidence of inundation in historical aerials

Reso A - Exhibit C2 (EIR Technical Appendix)

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Olsen City/County: Paso Robles Sampling Date: 4-16-19

Applicant/Owner: Olsen State: CA Sampling Point: 8

Investigator(s): Althouse + Tillinghast Section, Township, Range: T26S R13E

Landform (hillslope, terrace, etc.): stream Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): LRRC Lat: 35.610357 Long: -120.635038 Datum: WGS84

Soil Map Unit Name: Riacon clay loam NWI classification: Riverine

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✓ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:
Eastern bordered study area

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: n/a)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: n/a)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 5'ft)			
1. Eleocharis macrostachya	50	Y	FACW
2. Festuca perennis	30	Y	FAC
3. Rumex conglomeratus	2		
4. Polygonum monspeliensis	2		
5.			
6.			
7.			
8.			
	84 = Total Cover		
Woody Vine Stratum (Plot size: n/a)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 10 % Cover of Biotic Crust 30

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:
Eleocharis >50cm tall.
Festuca coming up in lower part of channel
Channel routed in ditch

Reso A - Exhibit C2 (EIR Technical Appendix)

SOIL

Sampling Point: 8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-3	10YR 2/1	100					C	
3-12+	10YR 2/1	23	10YR 5/1	85	D		SC	
			10YR 3/4	2	D			

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ✓ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: none

Depth (inches): >12

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ✓ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ✓ Sediment Deposits (B2) (**Riverine**)
- ✓ Drift Deposits (B3) (**Riverine**)
- ✓ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): >12

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): >12

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Reso A - Exhibit C2 (EIR Technical Appendix)

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Olsen City/County: Paso Robles Sampling Date: 4-16-19

Applicant/Owner: Olsen State: CA Sampling Point: 9

Investigator(s): Allhouse + Tillinghast Section, Township, Range: T26S R13E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 3

Subregion (LRR): LRR C Lat: 35.610305 Long: -120.635096 Datum: WGS84

Soil Map Unit Name: Rincon clay loam NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✓ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: n/a)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: n/a)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 1m)			
1. Vicia villosa	33	Y	UPL
2. Bromus diandrus	33	Y	UPL
3. Centaurea solstitialis	33	Y	UPL
4.			
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: n/a)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ____	x 1 =	____
FACW species ____	x 2 =	____
FAC species ____	x 3 =	____
FACU species ____	x 4 =	____
UPL species ____	x 5 =	____
Column Totals: ____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks:

Reso A - Exhibit C2 (EIR Technical Appendix)

SOIL

Sampling Point: 9

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 3/2						L	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: none

Depth (inches): >18

Hydric Soil Present? Yes ____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): ____

Water Table Present? Yes ____ No ✓ Depth (inches): >12

Saturation Present? (includes capillary fringe) Yes ____ No ✓ Depth (inches): >12

Wetland Hydrology Present? Yes ____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Reso A - Exhibit C2 (EIR Technical Appendix)

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Olsen City/County: Paso Robles Sampling Date: 4-16-19

Applicant/Owner: Olsen State: CA Sampling Point: 11

Investigator(s): A Hause & T. Tillquist Section, Township, Range: T26S R13E

Landform (hillslope, terrace, etc.): pool fringe Local relief (concave, convex, none): concave Slope (%): 3

Subregion (LRR): C RR C Lat: 35.609295 Long: -120.638594 Datum: WGS84

Soil Map Unit Name: Arbuckle-Positas complex NWI classification: riverine

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✓ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No ✓

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓ No ____	
Wetland Hydrology Present?	Yes ✓ No ____	

Remarks: High rainfall year, elevated culvert creating pond. Location is fringe of pond

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: n/a)			
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: n/a)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 1m²)			
1. Lythrum hyssopifolia	5	Y	OBL
2. Cynodon dactylon	5	Y	FACU
3. Polygonum aviculare ssp.	5	Y	FAC
4. Juncus bufonius	5	Y	FACW
5. Gnaphalium sp.	+		
6.			
7.			
8.			
	20 = Total Cover		
Woody Vine Stratum (Plot size: n/a)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 20 % Cover of Biotic Crust 60

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ____	x 1 =	____
FACW species ____	x 2 =	____
FAC species ____	x 3 =	____
FACU species ____	x 4 =	____
UPL species ____	x 5 =	____
Column Totals: ____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

Reso A - Exhibit C2 (EIR Technical Appendix)

SOIL

Sampling Point: 11

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 2/1	100					L	
5-12+	10YR 2/1	70	10YR 5/2	30	D	M	S	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ✓ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: none

Depth (inches): 7/2+

Hydric Soil Present? Yes ✓ No ___

Remarks:

Stripes of organic material through depleted sand

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ✓ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ✓ Salt Crust (B11)
- ✓ Biotic Crust (B12)
- ✓ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): ___

Water Table Present? Yes ___ No ___ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): ___

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Reso A - Exhibit C2 (EIR Technical Appendix)

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Olsen City/County: Paso Robles Sampling Date: 4-16-19

Applicant/Owner: Olsen State: CA Sampling Point: 10

Investigator(s): Althouse & Tillgkvist Section, Township, Range: T26S R13E

Landform (hillslope, terrace, etc.): pool Local relief (concave, convex, none): concave Slope (%): 5

Subregion (LRR): LRR C Lat: 35.609339 Long: -120.638511 Datum: WGS84

Soil Map Unit Name: Arbuckle-Positas complex NWI classification: Riverine

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:
Pool in drainage ditch culvert

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 100 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

Total Number of Dominant Species Across All Strata: _____ (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:
Unvegetated

Reso A - Exhibit C2 (EIR Technical Appendix)

SOIL

Sampling Point: 10

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ✓ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ✓ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

Ponded - detailed profile description not completed due to the presence of animal waste. Redox depletions present

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ✓ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ✓ No ___ Depth (inches): ~3

Water Table Present? Yes ___ No ___ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No ___ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Ponded since prior to 3/12/19

Reso A - Exhibit C2 (EIR Technical Appendix)

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Olsen City/County: Paso Robles Sampling Date: 4-16-19

Applicant/Owner: Olsen State: CA Sampling Point: 12

Investigator(s): Althouse + Tillquist Section, Township, Range: T26S R13E

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): convex Slope (%): 10

Subregion (LRR): LRRC Lat: 35.609333 Long: -120.638551 Datum: WGS84

Soil Map Unit Name: Arbuckle-Positas NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes _____ No ✓ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No ✓

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____ No ✓	
Wetland Hydrology Present?	Yes _____ No ✓	

Remarks:
bank of drainage near here

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: n/a)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: n/a)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: m^2)			
1. Hordeum murinum	100	Y	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: n/a)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No ✓

Remarks:

Reso A - Exhibit C2 (EIR Technical Appendix)

SOIL

Sampling Point: 12

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 3/2	100					L	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: none

Depth (inches): >12

Hydric Soil Present? Yes ____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): ____

Water Table Present? Yes ____ No ✓ Depth (inches): >12

Saturation Present? (includes capillary fringe) Yes ____ No ✓ Depth (inches): >12

Wetland Hydrology Present? Yes ____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Appendix E.1

Architectural Evaluation

Architectural Evaluation for the Olsen-Chandler Ranch Specific Plan, Paso Robles, San Luis Obispo County, California

JUNE 2019

PREPARED FOR

City of El Paso de Robles

PREPARED BY

SWCA Environmental Consultants

Reso A - Exhibit C2 (EIR Technical Appendix)

ARCHITECTURAL EVALUATION FOR THE OLSEN-CHANDLER RANCH SPECIFIC PLAN, PASO ROBLES, SAN LUIS OBISPO COUNTY, CALIFORNIA

Prepared for

City of El Paso de Robles
1000 Spring Street
Paso Robles, CA 93346
Attn: Darren Nash

Prepared by

Paula Juelke Carr, M.A., Senior Architectural Historian

SWCA Environmental Consultants
1422 Monterey Street, Suite C200
San Luis Obispo, CA 93401
(805) 543-7095
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SWCA Project No. 53059

June 2019

Reso A - Exhibit C2 (EIR Technical Appendix)

EXECUTIVE SUMMARY

SWCA Environmental Consultants (SWCA) has prepared this architectural evaluation of historic-period built environment resources (i.e., resources 50 years old or older) present at two ranch properties—the Olsen Ranch at 3014 Linne Road and the Gulart Ranch at 255 Hanson Road in the city of Paso Robles, San Luis Obispo County, California—in connection with environmental review under the California Environmental Quality Act (CEQA) for the proposed Olsen-Chandler Ranch Specific Plan (project). The project location occupies assessor parcels (Assessor's Parcel Numbers [APNs] 009-795-001 and 009-795-005). The project area limits are coterminous with the outer boundary of the two parcels.

Specifically, this report has been prepared, in conformance with California Code of Regulations Section 15064.5 and Public Resources Code Section 5024.1, to determine whether either of the two farmsteads possesses sufficient historical significance and sufficient integrity to meet the eligibility criteria for listing in the California Register of Historical Resources (CRHR) or to otherwise constitute historical resources for the purposes of CEQA.

This report concludes that, due to their lack of significance and integrity, neither of the historic-period farmsteads within the project area limits and evaluated as part of this study meets the eligibility criteria for listing in the CRHR or otherwise constitutes a historical resource for the purposes of CEQA.

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Appendices

Appendix A: California Department of Parks and Recreation 523 Forms Primary Records for the Gulart and Olsen Properties (Cultural Resource Management Services 2018)

Figures

Figure 1. Project vicinity map. 6
Figure 2. The West Coast Land Company, organized by real estate developer Chauncey Hatch Phillips, subdivided lands of the former Rancho Santa Ysabel in 1886 and promoted sales. The project vicinity is shown in red (San Luis Obispo County Maps Book A, p. 29). 10
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Figure 6. Jenssen grave marker, Paso Robles District Cemetery (Find a Grave 2019). 13
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INTRODUCTION

SWCA Environmental Consultants (SWCA) has prepared this architectural evaluation of historic-period built environment resources to supplement the Olsen-Chandler Inventory prepared by Cultural Resources Management Services (CRMS) in December 2018. The Olsen-Chandler Ranch Specific Plan (Specific Plan) encompasses the two ranch properties discussed in this report—the Olsen Ranchstead at 3045 Linne Road (Assessor's Parcel Number [APN] 009-795-001), and the Goulart Ranchstead at 255 Hanson Road (APN 009-795-005). The Specific Plan, currently under environmental review by the City of Paso Robles (City), entails the demolition of the built environment resources currently present on these two ranch properties.

METHODOLOGY

Historic-period built environment resources (i.e., resources 50 years old or older) are present in the project area. Under the California Environmental Quality Act (CEQA), such resources are considered part of the environment and are subject to review. This architectural evaluation will determine whether any of the historic-period resources on-site have sufficient significance and integrity to constitute historical resources for the purposes of CEQA. A project that may cause a substantial adverse effect on the significance of a historical resource is a project that may have a significant effect on the environment.[1]

The project area limits are coterminous with the outer boundaries of adjoining County of San Luis Obispo (County) APNs 009-795-001 and 0009-795-005 (Figure 1). The built environment resources were evaluated within the historical context of the city (Historic Resources Group 2010), the former Rancho Santa Ysabel (Storke 1891), biographical information about former owners of the subject property, and rural architectural building styles (Livingston 1995; McClelland 1989, revised 1999; Noble 1996; University of California, Davis 2008; Withington and Parenti 1999). The evaluation is based on a combination of observations made during a site visit to the property by SWCA on April 15, 2019; preliminary research in standard secondary sources; and archival research at the County Assessor's Office and County Recorder's Office, as well as desktop research conducted through online databases, including Ancestry.com, GenealogyBank.com, Newspapers.com, and the California Digital Newspaper Collection. SWCA Senior Architectural Historian Paula Juelke Carr, M.A., conducted the fieldwork, evaluation, and report preparation.

[1] CEQA is encoded in Sections 21000 et seq. of the California Public Resources Code (PRC), with Guidelines for implementation codified in California Code of Regulations (CCR) Title 14, Chapter 3, Sections 15000 et seq. The definition of "historical resources" is contained in Section 15064.5 of the State CEQA Guidelines.

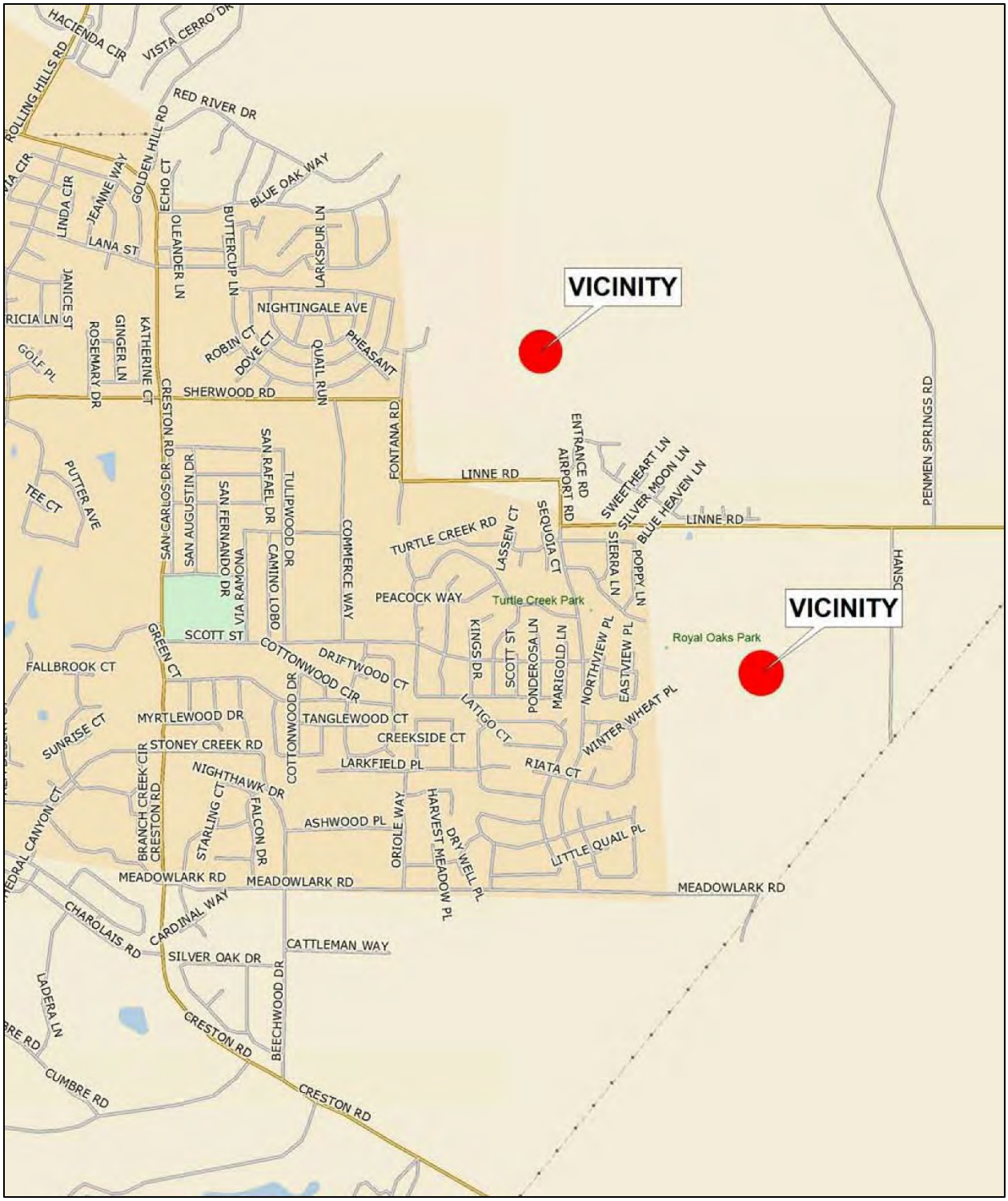


Figure 1. Project vicinity map.

HISTORIC CONTEXT

For the project area, the most relevant periods and themes from Paso Robles history relate to late nineteenth-century and early twentieth-century agricultural development. The *City of Paso Robles Historic Resources Survey* (Historic Resources Group 2010:14–31, passim) provides good background information on this period; excerpts are presented below:

> Critical to any discussion of Paso Robles is the understanding of its geographical location. Paso Robles is located in the Central Coast region of California, approximately 215 miles north of Los Angeles and 200 miles south of San Francisco. It is thirty-nine miles north of San Luis Obispo, and eight miles south of San Miguel. Both San Luis Obispo and San Miguel were homes to missions, and Paso Robles became an important mission outpost. Each mission was situated where there were large populations of Native Americans, and where the soil was fertile enough to sustain a settlement. In the late nineteenth century, Paso Robles emerged as the premier city of the booming upper Salinas Valley. With its central location at the juncture of the Salinas River and the Estrella plain, Paso Robles became the commercial capital of a vibrant regional economy. The river, hilly topography, quality of the soil, and climate also contributed to the development of the region's economy, based primarily on agriculture.
>
> Another critical natural feature in the city is the hot springs, which not only impacted the quality of the soil, but was renowned for its healing powers, making it a destination for area Native Americans, missionaries, and twentieth century tourists. While most of the artesian springs have been capped or no longer flow naturally, they were crucial to the development of the city as a tourist destination and settlement opportunity. It is the hot springs above all other factors that contributed to the establishment of Paso Robles and differentiated it from other similarly-sized cities in the region.
>
> The hot springs and their importance to the local economy was also the impetus for the Blackburn brothers and their partner Drury James to invest in the city, which led to the founding and development of Paso Robles. Through a series of transactions, the site of the present city core of Paso Robles and the Hot Springs Hotel became the joint property of the Blackburn brothers and Drury James, and their influence would be a driving force in the development of the city. Blackburn and James owned the land that became what is now Paso Robles; they laid the foundation for the agricultural development; they invested in the local tourism industry; and they participated in the planning of the town and devoted significant resources to its commercial and civic development. Like many other cities in California, Paso Robles was established and began a period of growth in the 1880s. In northern and southern California, this period was precipitated by the completion of the transcontinental railroad, which brought settlers from the east. In San Luis Obispo County, it was the Pacific Coast Railway and the completion of the Southern Pacific Railroad's coastal route running south from San Francisco which influenced the region's developmental history. By providing a direct link to San Francisco on the eastern slope of the Santa Lucia Mountains, the railroad opened the vast resources of the region to large-scale settlement.
>
> The coming of the railroad to San Luis Obispo was greatly anticipated. Plans were made for infrastructure improvements to handle the increase in population and to entice settlement in the area, and signage and other promotional ideas were discussed to draw attention to the area, which was almost unknown outside of the region. Newspapers also began running advertisements for local land auctions and to promote the benefits of the

region. In Paso Robles, an auction planned for late 1886 precipitated the establishment of the city's first newspaper, the Paso Robles Leader, by Horace George Wright in order to promote the sale. Eventually, this newspaper would merge with the Paso Robles Press, which is still in circulation today. Two weeks after the first train arrived in Paso Robles on October 31, 1886, a special train from San Francisco was commissioned to bring prospective land buyers to the area. On November 17th a "Grand Auction" was held, which resulted in the sale of 228 lots in Paso Robles, bringing in $35,000 in sales. Most of the purchased properties were farmlands, and not town lots. Similar auctions were held throughout the county, and rancho lands along the rail lines were subdivided in anticipation of a great influx of new residents. These subdivisions were mostly carried out by Chauncey Hatch Phillips' West Coast Land Company, who was also credited with persuading the railroad tycoons to build tracks through the region, including across Rancho El Paso de Robles. Despite local promotional efforts, however, San Luis Obispo County did not experience the expected tide of immigration once the railroad was in place. Census numbers show that between 1890 and 1900, the County population increased by just 565 people. Paso Robles showed growth during this period, with a permanent population increase from 827 to 1,224 residents. Great tracts of land that were subdivided along the railroad lines would remain undeveloped, many until a new tide of development occurred following World War II.

The development of ranching and agriculture as the region's main commercial enterprises played a critical role in the development of Paso Robles. Farming became widespread in the 1870s when the rancho land grants were subdivided into smaller parcels for individual farming and stock ranching…. The most significant crops during this period were the grain crops, primarily wheat and barley. Paso Robles became the commercial capital of a regional economy based on the export of wheat in the 1880s and 1890s. The goal for many farmers, however, was to slowly increase the size of their orchards and eventually replace wheat altogether. The long-term attraction of orchard crops was their much higher profit yields, as one acre of fruit will yield more profit than fifteen acres of wheat. They were successful in this venture, and between 1870 and 1910 California agriculture underwent a momentous transition in which specialty crops (primarily fruits, nuts, raisins, and wine grapes) completely eclipsed grain production.…

During this period the cooperative farming movement was established. The economic growth of the 1870s and 1880s led first to the establishment of the Grange, which was the country's first nationwide agricultural organization and was based on the principles of fraternal institutions. In addition, the related ideals of the Scandinavian Folk School Movement, which was transplanted to the United States by Norwegian, Swedish, and especially Danish immigrants who settled in the Midwest and along the Pacific Coast during the second half of the nineteenth century, was also influential in cooperative ideals taking hold in the region. From grass roots societies such as the Grange, the Farmer's Alliance Business Association organization emerged in 1891 and began actively marketing collective farming. In the Paso Robles area, a large Nordic influx during the 1870s and 1880s formed a third of the founders and stakeholders in the Farmers Alliance Business Association. The flourishing agricultural industry and ancillary businesses needed to support its growth gave the Farmers Alliance a strong foothold in Paso Robles. In the 1890s the Southern Pacific Railroad had established a four-way monopoly controlling commercial transportation, grain milling, grain warehousing and the local lumber supply. This monopoly allowed the Southern Pacific to demand that towns and cities who wanted rail connections absorb the costs of construction by providing cash subsidies, granting access to rights-of-way, and donating the land for railroad depots. In Paso Robles, a man named Richard Shackelford controlled railroad enterprises. In 1891

> Alliance members from San Luis Obispo and Monterey counties gathered to lay the foundation for a new cooperative flourmill to compete with the monopoly of the Southern Pacific Milling Company. They voted to unite and go into the grain warehousing business, founding the Farmers Alliance Business Association (FABA), which was formally incorporated on June 20, 1891. They purchased land from Daniel Blackburn and developed a site that fronted the Southern Pacific tracks…. With this foundation, The Farmers' Alliance Business Association continued to influence economic agricultural practices in Paso Robles. Although the political Populists Movement born from the Farmer's Alliance died out in 1896, the Alliance cooperatives left behind an enduring legacy that influenced the local economy of the upper Salinas Valley long into the twentieth century. The endurance of FABA as a private company preserved the vital competition established by the Alliance against Southern Pacific Milling Company.

A County Farm Bureau was founded in 1921, under the stimulus of the University of California State Agricultural Extension Service, which was very active in the Paso Robles area. Among the first Farm Bureau districts (referred to as "Farm Centers") to be organized, the majority were located in small communities in the hinterlands of Paso Robles: Shandon, Annette, Cholame, Las Pilitas, Park Hill, Union, Templeton, Creston, and Estrella. The Grain Improvement Association, a non-profit cooperative, was founded in 1940. Among the member benefits was access to the association's portable seed-cleaning and seed-treating apparatus—the first such machinery in the county (San Luis Obispo County Farm Bureau 2019).

Rancho Santa Ysabel Subdivision Lands

Lands in the project area are part of the 1886 Rancho Santa Ysabel Subdivision (Figure 2). The rancho (a former possession of Mission San Miguel Arcángel) became a Mexican land grant in 1846 but remained undeveloped. In 1886, the former rancho—comprising a vast amount of acreage on the east side of the Salinas River—was acquired by real estate mogul Chauncey Hatch Phillips' West Coast Land Company, along with parts of Rancho Paso Robles and Rancho Huer-Huero to the south (Storke 1891:157). This purchase was surveyed and subdivided; portions have become incorporated within the modern city limits of Paso Robles and Templeton. In 1891, however, Rancho Santa Ysabel was described (and promoted) as a fertile landscape for agriculture and ranching:

> The Santa Ysabel consists of 20,200 acres, adjoining the Rancho Paso de Robles at the northeast. For ten miles the Southern Pacific Railway runs along and within one-fourth mile of its boundary. It is covered with white and live-oak timber, although less thickly than the Paso de Robles. There are, substantially, 16,000 acres of plow land, the rest fruit and grazing land. The soil is rich and deep, and will produce wheat of the finest, barley, oats, corn, all fruits and vines, and olives. Wine and raisin-making will no doubt, be important industries of this section. On this rancho are twenty miles of running water, besides numerous living springs. Well water is had at ten to forty feet deep. (Storke 1891:162)

Although the project area is part of the former Rancho Santa Ysabel and therefore relates to the rancho's general history, none of the built environment resources on either of the subject parcels date from the nineteenth century or are associated with the initial development of the subdivision. Both parcels, however, have ranch buildings that were (or are still) part of the headquarters or ranchsteads of larger consolidated ranch properties that included adjacent parcels, as well as other parcels in the larger region. Both ranches have had multiple owners and exhibit buildings with a wide variety of construction dates. Lot numbers mentioned in the following sections correlate with those in Figure 3.

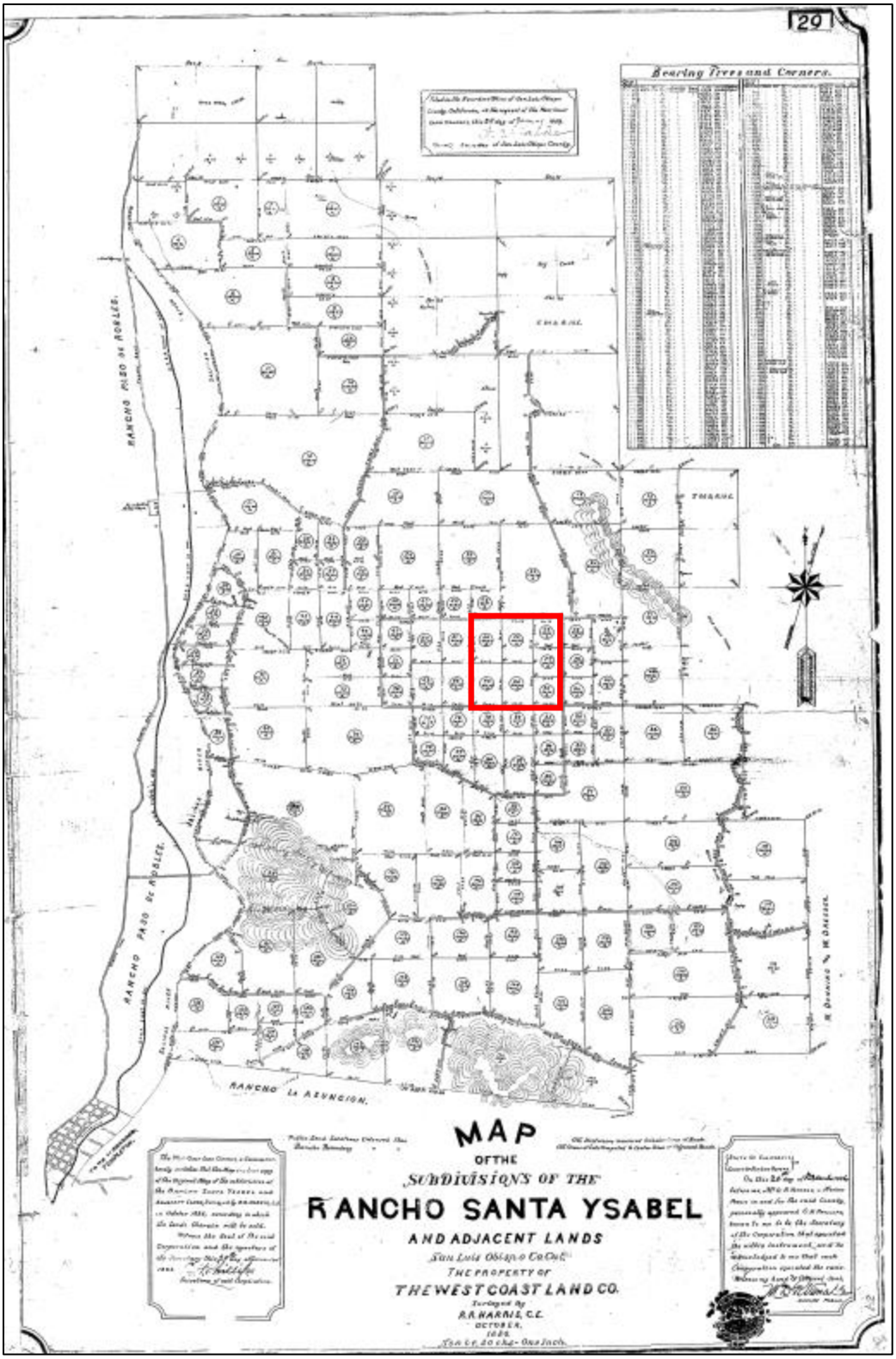


Figure 2. The West Coast Land Company, organized by real estate developer Chauncey Hatch Phillips, subdivided lands of the former Rancho Santa Ysabel in 1886 and promoted sales. The project vicinity is shown in red (San Luis Obispo County Maps Book A, p. 29).

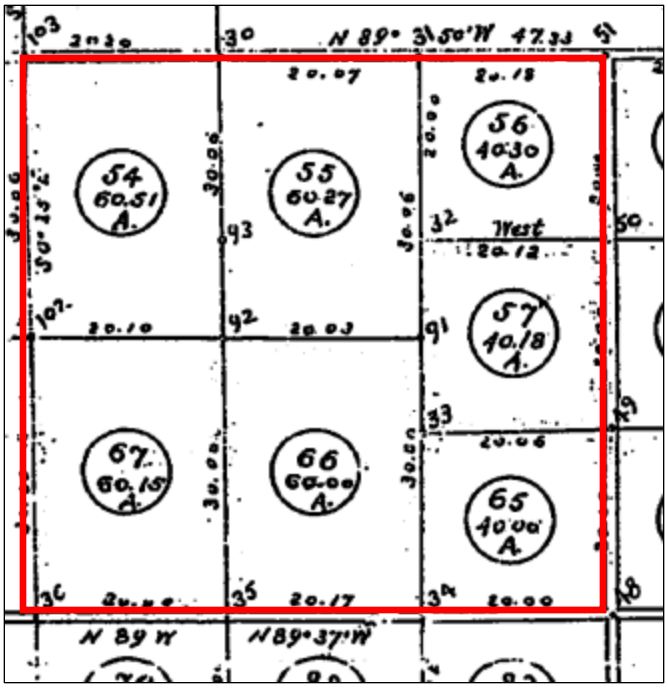


Figure 3. The lot numbers shown on the 1886 Rancho Santa Ysabel Subdivision map form the legal basis for modern parcels. Lots 55 and 56 are the present-day Olsen Ranch and Goulart Ranch, respectively.

Goulart Ranchstead (APN 009-795-005), 255 Hanson Road

JOHAN ARNOLD JENSSEN AND GUDRUN H. JENSSEN

Lot 56 of the 1886 Rancho Santa Ysabel Subdivision—the property now owned by the Goulart family—was developed as a ranch property in the 1920s by Norwegian immigrant Johan Arnold (John A.) Jenssen (1882–1924) (Figures 4 and 5) and his wife, Gudrun H. Jenssen. County Assessor records show a construction date of 1922 for the residence. Johan Jenssen arrived in the United States at the age of 27, settling in the Paso Robles area. In 1918 he became a naturalized U.S. citizen. The 1920 San Luis Obispo County Great Register lists his political affiliation as Socialist (very common at this time), and that he was employed as a truck driver for a foundry. Following an illness, John Jenssen died in Paso Robles on November 28, 1924 and is buried in the Paso Robles District Cemetery (Figure 6).

Port of

PORT OF San Francisco

MAY 20 1920, 19

I, J. O. DAVIS, Collector of the District of San Francisco, do hereby certify that the person described on page 2 hereof has produced to me proof in the manner directed by law, and I do hereby certify that the said person is a citizen of the United States of America.

Permission is hereby granted the holder to depart from the port above mentioned.

This card must be verified by a Customs Inspector on each subsequent departure of the holder before he is permitted to sail.

In witness whereof I have hereunto set my hand and seal of office this MAY 20 1920 day of ..... 19....

Collector of Customs.

The person described on page 2 hereof has been examined by me, and having produced satisfactory evidence of American citizenship, he is hereby granted permission to land.

This card must be verified by an Immigrant Inspector on each subsequent arrival of the holder before he is permitted to leave his vessel.

[SEAL.] Immigrant Inspector.

(Left thumb print.)

NAME John A. Jenssen

Nationality American

Place of holder's birth Norway

Place of father's birth "

Place of mother's birth "

If naturalized, where and when? Obispo,Cal.12/10/18 Nat.Cert.#1058001,Sup'r.Co.S.Luis

Age 38 on Apr.5 20 19 Height 6 0

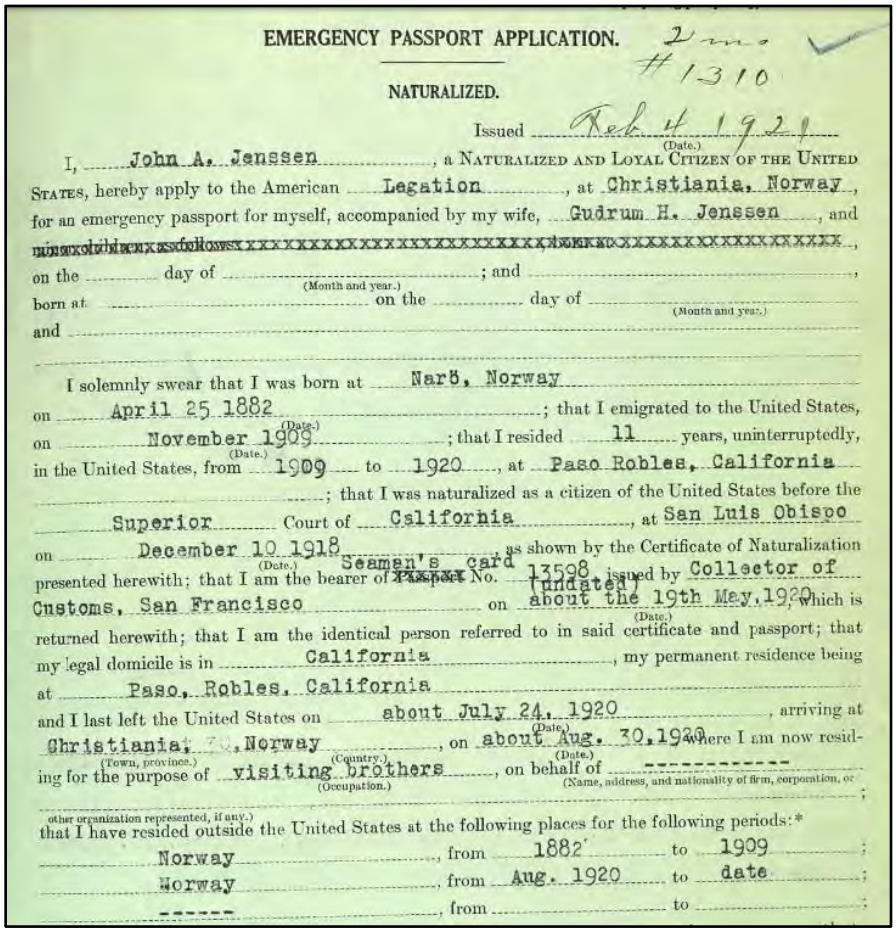
Vessel BAJA CALIF. Flag AMERICAN

Date of arrival May 15th, 1920

DESCRIPTION: Complexion light Hair lt.br.

Eyes blue Physical marks or peculiarities None vis.

Figure 4. Port of San Francisco authorization, May 20, 1920 (Ancestry 2019).



EMERGENCY PASSPORT APPLICATION. 2 mo. #1310

NATURALIZED.

Issued Feb 4 1921 (Date.)

I, John A. Jenssen, a NATURALIZED AND LOYAL CITIZEN OF THE UNITED STATES, hereby apply to the American Legation, at Christiania, Norway, for an emergency passport for myself, accompanied by my wife, Gudrum H. Jenssen, and ~~minor children as follows~~, on the ..... day of ..... (Month and year.); and ....., born at ..... on the ..... day of ..... (Month and year.) and .....

I solemnly swear that I was born at Narö, Norway on April 25 1882 (Date.); that I emigrated to the United States, on November 1909 (Date.); that I resided 11 years, uninterruptedly, in the United States, from 1909 to 1920, at Paso Robles, California; that I was naturalized as a citizen of the United States before the Superior Court of Csliforhia, at San Luis Obispo on December 10 1918 (Date.), as shown by the Certificate of Naturalization presented herewith; that I am the bearer of ~~Passport~~ Seamen's card No. 13598, issued by Collector of Customs, San Francisco on (undated) about the 19th May,1920 (Date.), which is returned herewith; that I am the identical person referred to in said certificate and passport; that my legal domicile is in California, my permanent residence being at Paso, Robles, California and I last left the United States on about July 24, 1920 (Date.), arriving at Christiania, [illegible], Norway (Town, province.) (Country.), on about Aug. 30,1920 (Date.), where I am now residing for the purpose of visiting brothers (Occupation.), on behalf of ---------- (Name, address, and nationality of firm, corporation, or other organization represented, if any.); that I have resided outside the United States at the following places for the following periods:*

Norway, from 1882 to 1909;

Norway, from Aug. 1920 to date;

------, from ..... to .....;

Figure 5. Passport Application, February 4, 1921 (Ancestry 2019).

Figure 6. Jenssen grave marker, Paso Robles District Cemetery (Find a Grave 2019).

On September 9, 1925, the San Luis Obispo Superior Court ordered that his whole estate, including a 1921 Ford touring car and Lot 56 of the Rancho Santa Ysabel Subdivision (the subject parcel), should be distributed to his widow, Gudrun (San Luis Obispo County Official Records Book 5:479). Gudrun evidently retained the farmstead, paying off one Bank of Italy mortgage and entering into another on September 17, 1926 (Official Records Book 20:23 and Book 17:162), and paying off the latter on July 8, 1930 (Official Records Book 91:36). The previous month, on June 14, 1930, Gudrun deeded all of Lot 56 (40.50 acres) to Grant and Parthenia Smart (Official Records Book 88:458–459).

The extended Smart family retained the property for 5 years, until June 6, 1935, when Grant and Parthenia's sons Leo (and wife Mae Smart) and Samuel (and wife Vivian Smart) sold Lot 56 to Theodore and Addie C. Freeman (Official Records Book 168:181).

THEODORE FREEMAN AND ADDIE CAMPBELL FREEMAN

In the 1920s, Theodore Freeman was a U.S. forest guard in the Pozo area (*San Luis Obispo Daily Telegram* 1929). After acquiring the subject property in 1935, the Freemans appear to have operated a turkey ranch there. In 1940, Freeman was one of five members of the board of directors for the newly organized Atascadero Turkey Growers' Association, a non-profit marketing group "established to encourage and foster the business of producing and marketing turkeys cooperatively, for reducing speculation and stabilizing markets . . . " (*San Luis Obispo Telegram-Tribune* 1940). Freeman died in July 1954; his obituary refers to him as a "retired turkey rancher of Creston Road," which is consistent with the subject property (*San Luis Obispo Telegram-Tribune* 1954).

Theodore's Freeman's brother Josiah and sister-in-law Addie Belle Freeman acquired extensive lands adjacent to and in the general vicinity of Theodore's property (Official Records Book 186:80-81)—Lot 51 (60.63 acres), Lot 54 (60.51 acres), Lot 55 (60.27 acres), Lot 57 (40.18 acres), Lot 65 (40.06 acres), and Lot 66 (60.0 acres). These lots are associated with the Olsen Ranch (discussed below).

OLIVER AND LIBERTY TIDROW

By 1936 other turkey growers had also acquired several adjacent parcels. On December 30 of that year, R. D. Freeman conveyed Lots 58, 59, 60, 63, and 64 of Rancho Santa Ysabel to Oliver Tidrow (and wife Liberty [Libbie]) and Walter Tidrow (and wife Paulina) (*San Luis Obispo Daily Telegram* 1937:11).

On August 12, 1942, Theodore and Addie C. Freeman sold their ranchstead (Lot 56), the subject parcel, to Oliver and Libbie Tidrow (Official Records Book 324:421). The new owners had previously ranched 40 acres on Volpi Road near the Salinas River for many years (Goulart family records). The Tidrows continued to raise turkeys on the property, acquiring Lot 70 and a portion of Lot 69 in 1948 (*San Luis Obispo Telegram-Tribune* 1948). The Tidrows lived in the ranch house (Figures 7 and 8), remodeling it extensively in 1957–1958, when they "pulled the old front away" (Goulart family records). In 1962 the Tidrows sold 540 acres to a man named Hanson, retaining 60 acres, presumably Lot 56 (Goulart family records).

Figure 7. Libbie Tidrow in front of ranch house, c1950, before house remodeling (Goulart family records).

Figure 8. Ranch house c1950 (Goulart family).

Figure 9. The extensively remodeled ranch house as it appears in 2019 (SWCA photograph).

Olsen Ranchstead (APN 009-795-001), 3045 Linne Road

County Assessor records document a construction date of 1930 for the main ranch residence. As suggested by the 1930 federal census, the property was first developed as a general farm by Josiah (Joe) Freeman (1887–c1937) and his wife, Addie B. Freeman (1893–1968). They are very likely responsible for building not only the residence but the tank house, horse barn, and storage barn—the oldest buildings on the subject parcel (Lot 55 of the 1886 Rancho Santa Ysabel Subdivision). The family had moved to the Paso Robles area from San Miguel; the 1920 San Luis Obispo County Great Register lists Josiah Freeman as a farmer there and, like many of his San Miguel neighbors, Freeman registered as a Socialist.

In November 1935, the Freemans mortgaged six parcels encompassing 320 acres (including the 60.27 acres that constituted Lot 55). The terms of the mortgage specified that the Freemans "keep the buildings now erected, or which may hereafter be erected on said premises insured . . . " (Official Records Book 186:81).

In October 1936, the Freemans entered into a crop and chattel mortgage that covered the produce of crop years 1936, 1937, and 1938 from 14 Rancho Santa Ysabel Subdivision parcels (Lots 51, 54, **55,** 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, and 88) and part of two others (Lots 89 and 90). Personal property was also covered by the mortgage, including farming equipment (seeder, two harrows, disk, mower, rake, a 1924 Graham truck, plow, and tractor), and 10 cows, 10 yearlings, and four horses (Official Records Book 195:334).

In October 1938, 2 years later, the widowed Addie B. Freeman entered into an updated crop and chattel mortgage that covered the produce of crop years 1938, 1939, and 1940 from a different array of 14 Rancho Santa Ysabel Subdivision parcels (Lots 51, 54, **55,** 57, 61, 62, 65, 66, 81, 82, 83, 84, 88, and 91) and portions of four others (Lots 89, 90, 106, and 108). Personal property also mortgaged included farming equipment (tractor, harvester, tractor disk harrow, seeder, plow, mower, rake, and Ford pickup), and 15 tons of hay, 230 sacks of seed wheat, 60 sacks of feed wheat, a bull, 16 cows, 16 yearlings, and three calves (Official Records Book 245:228).

The 1940 federal census identifies Addie B. Freeman as a chicken and dairy farmer, and notes that her place of residence, on Airport Road, was the same as it had been in 1935. Her 18-year-old son, Thomas, living in the same residence, is described as a grain farmer. These occupations, and the information provided in the crop and chattel mortgages, are entirely consistent with the type of farm and ranch buildings present on the subject parcel. They are also consistent with an array of disused farm implements (seeder, harrow, disk, and Fresno scraper) found on the property during the site visit.

Addie B. Freeman appears to have sold her ranch, in about 1944, to Giles James Curtis (January 1895–1956) and Leah Hastings Curtis (1895–1974). Curtis was born in Michigan but was in California by July 1916, when he married Leah Hastings in Santa Ana. His 1917 World War I draft registration form lists him as 22 years old, married, and working as a self-employed carpenter. The family remained in Fullerton until 1926, when they moved to the Pacific Grove area of Monterey, where Curtis continued to work as a carpenter. From 1929 through at least 1941 they lived in Watsonville, Santa Cruz County, where he worked as a general contractor. By 1944 the family had relocated to Paso Robles where they were ranching on the Creston Star Route (San Luis Obispo County Voter Registration). By 1946, however, they were back in Orange County, living in Yorba Linda.

The Curtises probably sold their property to oil developer C. O. Harper, who had owned a ranch near Sherwood Field (Paso Robles Airport) since 1944; certainly the Harpers owned Lot 55 by 1954. In May 1945, oil leases were signed on 6,800 acres in the project vicinity; Oliver and Liberty Tidrow, on Lot 56 in the project area, leased out 268 acres for oil prospecting (*San Luis Obispo Telegram-Tribune* 1945). In 1946 the same newspaper reported that acreage "around the Ralph Dayton ranch six miles northwest of Paso Robles, has been leased for test drilling for oil . . . done under sponsorship of 27 residents of Paso Robles and immediate vicinity who have joined in a partnership for the group . . . Drilling operation will be supervised by C. O. Harper, who has spent most of his business life in the oil business and is a member of the local combine. Harper has large oil interests in Santa Maria and Wilmington and has made his headquarters for the past two years at his ranch near Sherwood Field" (*San Luis Obispo Telegram-Tribune* 1946).

Charles Otto Harper and Cora B. Harper deeded Lots 51, 54, **55**, and 57 of the Rancho Santa Ysabel Subdivision to Vernon E. McKay and Frances C. McKay on July 16, 1954, reserving an easement to their 100-acre alfalfa tract "over the existing road until such time as another road has been provided by the County" (Official Records Book 765:437). The Harpers also deeded all of Lot 65 and portions of lots 57 and 66, as depicted on a February 28, 1956, record of survey map (San Luis Obispo County Maps Book 7:120).

The Olsen family, the current owners of the property, acquired Lot 55 in the late 1950s. Federal census records from 1920, 1930, and 1940 all document that the Olsen family, whose name is associated with the ranch property on Linne Road, was farming in Ventura County—in the Camarillo area at the foot of the Conejo Grade. In 1920 the head of the family, Oscar Ivan Olsen, Sr. (1895–1972), was working with his younger brother Ludwick (both of whom were born in the Conejo area). The 1940 census shows that Olsen was married to Theresa L. Olsen (1900–1987); their family included Arthelia, Eugenia, Mary, and Neil. At that time they were farming pink beans and delivering them to the Southern Pacific Warehouse in Piru (*Piru News* 1939). The Olsen family remained in Camarillo into the 1950s, when they relocated to San Luis Obispo County and acquired extensive acreage within the current project area and beyond. In 1957, the *San Luis Obispo Telegram-Tribune* reported:

> Two ranches in northern San Luis Obispo county are in the process of changing hands…. Oscar and Neil Olsen, formerly ranchers in the Camarillo area, have made arrangements of purchase the Les Erickson and Charles Harper ranches, totaling approximately 320 acres and located northeast and almost contiguous to [sic] the San Luis Obispo county airport near Paso Robles.

> According to Mees, the Olsens' move is the result of a real estate subdivision in the community to the south. The Olsens plan to operate…a combined cattle and farming setup. They will grow alfalfa and sugar beets in addition to running a herd of beef livestock. Neil Olsen, the son, is a student at Cal Poly and will assist his father in management of the ranch. (*San Luis Obispo Telegram-Tribune* 1957:2)

Neil B. Olsen and his wife Gisela H. Olsen are the current owners of the property.

EVALUATION OF ARCHITECTURAL RESOURCES IN PROJECT AREA OF POTENTIAL EFFECT

The architectural resources present at the Olsen Ranch, 3045 Linne Road, and the Goulart Ranch, 255 Hanson Road, are evaluated here, pursuant to CEQA, to determine whether they meet any of the eligibility criteria for listing in the California Register of Historical Resources (CRHR) or otherwise constitute "historical resources" for the purposes of CEQA. The CRHR includes buildings, sites, structures, objects, and districts significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California. Eligibility to the CRHR is demonstrated by meeting one or more of the following criteria:

- **Criterion 1:** Associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States;
- **Criterion 2:** Associated with the lives of persons important to local, California or national history;
- **Criterion 3:** Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; and/or
- **Criterion 4:** Has yielded or has the potential to yield, information important to the prehistory or history of the local area, California or the nation.

Evaluation Under Criterion 1

As part of the 1886 Rancho Santa Ysabel Subdivision, both of the subject parcels are associated with the local development of agriculture and livestock raising on the east side of the Salinas River. Grain and alfalfa growing, dairying, turkey ranching, and other more general farming pursuits were carried out on these parcels (and on adjacent parcels owned by the same families), but none of the built environment resources on either parcel contribute in significant ways to a better understanding of these important trends. Similarly, there is no potential for a historic landscape, as the former farmlands in the immediate vicinity have been subdivided and repurposed for residential, commercial, and even semi-industrial uses. Lacking significance in this regard, none of the resources present on either parcel meet eligibility Criterion 1.

Evaluation Under Criterion 2

The built environment resources on each of the subject parcels were constructed under a series of different owners engaged in different types of farming and ranching activities. The oldest resources on Lot 56—the Goulart property (the original Craftsman residence, wash house, and barn)—appear to have been built by Johan and Gudrun Larssen in the 1920s. However, the Larssens owned the property only briefly—Johan died in 1924 and Gudrun sold the ranch in 1930.

Subsequent owners, the Freemans and Tidrows, were turkey ranchers, a new land use probably represented by the two surviving sheds to the rear of the farmhouse. Theodore Freeman was associated with the Atascadero Turkey Growers' Association, an important cooperative marketing group in the region, beginning in the late 1920s and booming in the 1930s and 1940s (Atascadero Development Syndicate 1928; Petry 2012:76–84). Throughout the county, poultry raising was an extremely important economic stay during the Great Depression (the earlier emphasis on chicken production gradually shifted to an emphasis on turkey production). The most important buildings linked to the association—which had become the California Turkey Growers' Association—were the processing, packaging, and storage plants on Via Avenue, off Traffic Way, in Atascadero. In January 1939, the association announced that growers had shipped over 600,000 pounds of turkeys (Allan 2008:96). Theodore Freeman's role as an important turkey rancher is not well expressed by the remnant buildings on Lot 56.

Similarly, the 1930s-era grain growing, chicken production, and dairying started on Lot 55 by Joe and Addie B. Freeman—and continued by the widowed Addie and her son Thomas—were not especially important farming operations in the East Paso Robles region. Subsequent owners retained the property for relatively short periods, occasionally adding buildings to the ranchstead configuration. Beginning in 1957, two generations of the Olsen family have farmed and ranched on Lot 55, but their long tenure comes late in historic-period agricultural development. Their activities have continued existing trends that were already well established in the region, and they are not documented as introducing economically important crops or significant innovations in livestock raising.

Although actively engaged in farming and animal production, the Jenssens, Smarts, Freemans, Tidrows, Curtises, Harpers, McKays, and Olsens—whether individually or as a family—lack the level of historical significance necessary for eligibility under Criterion 2. Similarly, none of the more recent owners of the subject parcels have documented significance in local or regional history. Lacking significance in this regard, none of the resources present on either parcel within the project area limits meet eligibility Criterion 2 for listing in the CRHR.

Evaluation Under Criterion 3

None of the built environment resources within the project area limits are exceptional or significant in terms of architectural style. The residences are modest (and altered) examples of their 1920s–1930s types, incorporating no distinctive architectural features, building materials, or methods of construction. The barns, sheds, garages, and other outbuildings are all utilitarian structures typical of farm, ranch, and other rural properties throughout California. Lacking significance in this regard, none of the resources present on either parcel within the project area limits meet eligibility Criterion 2 for listing in the CRHR and integrity, none of the resources present on either parcel within the project area meet eligibility Criterion 3 for listing in the CRHR.

Evaluation under Criterion 4

Criterion 4 is almost exclusively applied to archaeological resources and is not pertinent to the historic-period built environment resources on either the Goulart Ranch or Olsen Ranch.

Evaluation for Integrity

In addition to possessing historical significance, eligible properties must retain sufficient integrity to convey that significance. The quality of integrity is evaluated in terms of seven aspects: location, design, setting, materials, workmanship, feeling, and association.

- **Location:** The farmsteads are in their original locations on Lots 55 and 56.
- **Design:** The primary residences on both parcels have been extensively altered and no longer convey a clear sense of their original appearance. All of the original horse and hay barns retain good integrity to the time of their construction and also make the largest contribution to the ranchsteads' respective identities as rural properties. As with most farm and ranch properties, the farmstead configurations have evolved to accommodate new activities, to replace buildings that are no longer serviceable, and to provide for new and larger types of mechanized equipment. Labor/secondary housing has also been added to the Olsen Ranch.
- **Setting:** The overall setting of these two ranch properties has fairly good integrity, despite the encroachment of dense residential development, as well as scattered commercial and industrial development, west of the Olsen Ranch. The interpolation of ranchettes on the landscape (large residences unattached to agricultural fields or livestock acreage) has begun to make an appearance in the project vicinity.
- **Materials:** Original materials are present on both parcels, especially in the large barns and some of the older sheds and other outbuildings. These buildings are interspersed with modern buildings and with buildings (such as the primary residences) that have been altered.
- **Workmanship:** To the extent that original materials are present, their level of workmanship is appropriate to their purpose and original design in a farmstead setting. Alterations and more recent buildings have added manufactured elements such as wall siding, vinyl windows, pole barns, and sheds to an otherwise hand-built array of farm buildings.
- **Feeling:** The Goulart Ranch has retained few outbuildings that help express its former use as a working ranch. The Olsen Ranch has retained considerably more farm structures, but lacks the kind of architectural cohesiveness that would be present if the land use had not repeatedly shifted.
- **Association:** Both properties are still associated with agricultural parcels and ongoing farming activities, but not to the extent that they appear flourishing and active.

CONCLUSIONS

Due to their lack of significance and integrity, neither of the historic-period farmsteads within the project area limits and evaluated as part of this study meets the eligibility criteria for listing in the CRHR or otherwise constitute historical resources for the purposes of CEQA.

Recommendations

- Retain the original 1920s–1930s hay barns, horse barn, and storage barn as the best preserved and most architecturally identifiable farmstead elements for reuse in the proposed project.

PREPARER'S QUALIFICATIONS

SWCA Senior Architectural Historian Paula Juelke Carr, M.A., meets the Secretary of the Interior's Standards for Professionally Qualified Staff as both historian and architectural historian. Ms. Carr has more than 25 years of experience in California history and architectural history, including more than 11 years as an Associate Environmental Planner (Architectural History) for the California Department of Transportation, District 5. She has been with SWCA since 2017.

REFERENCES CITED

Allan, L. W.

2008 *Atascadero: The Vision of One, the Work of Many*. Miracle Book Company.

Ancestry

2019 John A. Jenssen search results. Available at: https://www.ancestry.com/. Accessed May 8, 2019.

Atascadero Development Syndicate

1928 *Coming Atascadero: Poultry Center of the Pacific Coast*. Western Publishers, Atascadero, CA.

California Office of Historic Preservation

2019a California Historical Resources. Available at: http://ohp.parks.ca.gov/ListedResources/. Accessed March 29, 2019.

2019b California Register of Historical Resources, Criteria for Designation. Available at: http://ohp.parks.ca.gov/?page_id=21238. Accessed March 29, 2019.

Cultural Resource Management Services (CRMS)

2018 Department of Parks and Recreation (DPR) Primary Records. Prepared by CRMS for the Olsen-Chandler Inventory. December 2018.

Enright, Erin, Joshua Patterson, Jasmine Kidwell, and Maggie Wineland

2019 CONFIDENTIAL REPORT: *Cultural Resource Study for the Proposed Beechwood Residential Development Project, City of Paso Robles, California*. Prepared by Applied EarthWorks, Inc., for Firma Consultants, January 2019.

Find a Grave

2019 Johan Arnold Jenssen. Available at: https://www.findagrave.com/memorial/94577855/johan-arnold-jenssen. Accessed May 8, 2019.

Harris, R. R.

1886 Map of the Subdivisions of the Rancho Santa Ysabel and Adjacent Lands, San Luis Obispo Co., Cal., the Property of the West Coast Land Co. surveyed by R. R. Harris, C. E., October 1886 (filed with the San Luis Obispo County Recorder, January 25, 1889, Maps Book A, page 29). Available at: https://slocountypwd.org/MapFiles/MB/MB_000A/MB_000A_029_001.pdf. Accessed May 8, 2019.

Historic Resources Group

2010 *City of Paso Robles Historic Resources Survey.* Prepared for the City of Paso Robles. August 2010. Available at: https://www.prcity.com/DocumentCenter/View/14419/Historic-Resources-Survey-PDF. Accessed May 7, 2019.

Livingston, Dewey S.

1995 *A Good Life: Dairy Farming in the Olema Valley – A History of the Dairy and Beef Ranches of the Olema Valley and Lagunitas Canyon*. Golden Gate National Recreation Area and Point Reyes National Seashore. Available at: https://www.nps.gov/parkhistory/online_books/pore/dairy_farming.pdf. Accessed May 31, 2019.

McClelland, Linda Flint, J. Timothy Keller, Genevieve P. Keller, and Robert Z. Melnick

1989 *Guidelines for Evaluating and Documenting Rural Historic Landscapes.* National Register Bulletin 30. U. S. Department of the Interior, National Park Service. Revised 1999.

Morrison, Annie L., and John H. Haydon

2002 *Pioneers of San Luis Obispo County & Environs* (facsimile of 1917 edition). Friends of the Adobes, in association with Word Dancer Press, San Miguel, CA.

Noble, Allen G., and Richard K. Cleek

1996 *The Old Barn Book: A Field Guide North American Barns & Other Farm Structures*. Rutgers University Press, New Brunswick, NJ.

Petry, David

2012 *The Puritan Ice Companies: The Ice Empire of California's Central Coast*. The History Press Charleston, SC.

Piru News

1939 Beans are going to the warehouse. *Piru News* 24 August:1. California Digital Newspaper Collection. Available at: https://cdnc.ucr.edu/. Accessed June 17, 2019.

San Luis Obispo County Farm Bureau

2019 Our Farm Bureau History. Available at http://www.slofarmbureau.org/about/farm-bureau-history/. Accessed June 17, 2019.

San Luis Obispo Daily Telegram

1929 Brush Blaze Menace Told. *San Luis Obispo Daily Telegram* 18 June:5. Genealogy Bank. Available at https://www.genealogybank.com/newspapers/sourcelist/ca. Accessed June 17, 2019.

1935 Deeds. *San Luis Obispo Daily Telegram* 8 June:5. Genealogy Bank. Available at https://www.genealogybank.com/newspapers/sourcelist/ca. Accessed June 17, 2019.

1937 Deeds. *San Luis Obispo Daily Telegram* 29 January:11. Genealogy Bank. Available at https://www.genealogybank.com/newspapers/sourcelist/ca. Accessed June 17, 2019.

San Luis Obispo Telegram-Tribune

1940 Turkey Cooperative Started in County. *San Luis Obispo Telegram-Tribune* 22 March:8. Genealogy Bank. Available at https://www.genealogybank.com/newspapers/sourcelist/ca. Accessed June 17, 2019.

1945 6,800 Acres in Oil Lease. *San Luis Obispo Telegram-Tribune* 3 May:1. Genealogy Bank. Available at https://www.genealogybank.com/newspapers/sourcelist/ca. Accessed June 17, 2019.

1946 Oil Test Drilling to Start Soon Near Paso Robles. *San Luis Obispo Telegram-Tribune* 10 August:6. Genealogy Bank. Available at https://www.genealogybank.com/newspapers/sourcelist/ca. Accessed June 17, 2019.

1948 Deeds. *San Luis Obispo Telegram-Tribune* 9 February:6. Genealogy Bank. Available at https://www.genealogybank.com/newspapers/sourcelist/ca. Accessed June 17, 2019.

1954 Retired Rancher Dies Suddenly. *San Luis Obispo Telegram-Tribune* 5 July:2. Genealogy Bank. Available at https://www.genealogybank.com. Accessed June 17, 2019.

1957 Olsens Buy North County Ranches. *San Luis Obispo Telegram-Tribune* 19 October:2. Genealogy Bank. Available at https://www.genealogybank.com. Accessed June 17, 2019.

Storke, Yda Addis

1891 *A Memorial and Biographical History of the Counties of Santa Barbara, San Luis Obispo and Ventura, California*. Lewis Publishing Company, Chicago, IL.

University of California, Davis

2008 *A Spatial and Architectural Analysis of Agricultural Landscapes.* Prepared for California Department of Transportation (Caltrans), Task Order #90. University of California, Davis, College of Agriculture and Environmental Science, Department of Environmental Design/Landscape Architecture. July 2008.

Withington, Jack, and Ron Parenti

1999 *Historical Buildings of Sonoma County: A Pictorial Story of Yesterday's Rural Structures*. Third Wing Press, Penngrove, CA

APPENDIX A

California Department of Parks and Recreation 523 Forms
Primary Records for the Gulart and Olsen Properties
(Cultural Resource Management Services 2018)

Reso A - Exhibit C2 (EIR Technical Appendix)

Reso A - Exhibit C2 (EIR Technical Appendix)

State of California — The Resources Agency Primary # _____
DEPARTMENT OF PARKS AND RECREATION HRI # _____
PRIMARY RECORD Trinomial _____
NRHP Status Code _____
Other Listings _____
Review Code _____ Reviewer _____ Date _____

Page 1 **of** 8 ***Resource Name or #:** (Assigned by recorder) Goulart Farmsted
P1. Other Identifier: _____
***P2. Location:** ■ **Not for Publication** □ **Unrestricted** ***a. County** San Luis Obispo
and (P2c, P2e, and P2b or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad** Templeton **Date** 1979 **T** 25S **R** 12E ; ¼ **of** ¼ **of Sec** ; MD **B.M.**
c. Address 255 Hanson Road City Paso Robles Zip 93446
d. UTM: (Give more than one for large and/or linear resources) Zone 10S 714400 mE/ 3942900 mN
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)
APN: 009-795-005

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
A rural farm complex dating to 1920-1930. Features include a monitor barn, barn outbuilding, shed, concrete water tank, house, and laundry room. The house has been modified considerably in ca. 1980, to include a porch and a partial second story.

***P3b. Resource Attributes:** (List attributes and codes) AH-15 (FARM COMPLEX)

P4. Resources Present: ■ Building ■ Structure □ Object □ Site □ District □ Element of District □ Other (Isolates, etc.)
P5b. Description of Photo: (view, date, accession #) Photos listed on continuation sheet.

***P6. Date Constructed/Age and Source:** 1920-1930 ■ Historic □ Prehistoric □ Both _____

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects.)

Refer To Continuation Sheet Attached for Photographs and Descriptions.

***P7. Owner and Address:**
Goulart
255 Hanson Road
Paso Robles, CA 93446

***P8. Recorded by:** (Name, affiliation, and address) Rose
CRMS
829 Paso Robles Street
Paso Robles, CA 93446

***P9. Date Recorded:** 11/26/2018

***P10. Survey Type:** (Describe)
Phase I Surface Survey

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.")
Phase I (Olsen Ranch, LLC)

Attachments: □ NONE ■ Location Map ■ Continuation Sheet ■ Building, Structure, and Object Record
□ Archaeological Record □ District Record □ Linear Feature Record □ Milling Station Record □ Rock Art Record
□ Artifact Record □ Photograph Record ■ Sketch Map Other (List):

State of California — The Resources Agency Primary #
DEPARTMENT OF PARKS AND RECREATION HRI#

BUILDING, STRUCTURE, AND OBJECT RECORD

*NRHP Status Code

Page 2 of 8 *Resource Name or # (Assigned by recorder) Goulart Farmsted

B1. Historic Name: N/A

B2. Common Name: N/A

B3. Original Use: Farm Comloex B4. Present Use: Same

*B5. Architectural Style: California Ranch ca. 1920

*B6. Construction History: (Construction date, alterations, and date of alterations)
With exception of the residence, all buildings are as originally built. In about In about 1980 the residence was extensively remodeled to include a partial second floor and a very steep pitched roof.

*B7. Moved? ■No ☐Yes ☐Unknown Date: N/A Original Location: Current

*B8. Related Features:

B9a. Architect: Unknown b. Builder: Unknown

*B10. Significance: Theme Californa Ranch Area 15 Acres
Period of Significance Modern Property Type Farmsted Applicable Criteria Age
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

This a typical layout of early 20th century California farm complex. Most consisted of a residence, laundry room, outbuildings, water tank, and a barn.

AH 15

B11. Additional Resource Attributes: (List attributes and codes)

*B12. References: Phase I Survey
Olsen Ranch 212, LLC

B13. Remarks:

(Sketch Map with north arrow required.)

Refer To SKETCH MAP DPH 523K

*B14. Evaluator: Rose (crms)

*Date of Evaluation: 11/26/2018

(This space reserved for official comments.)

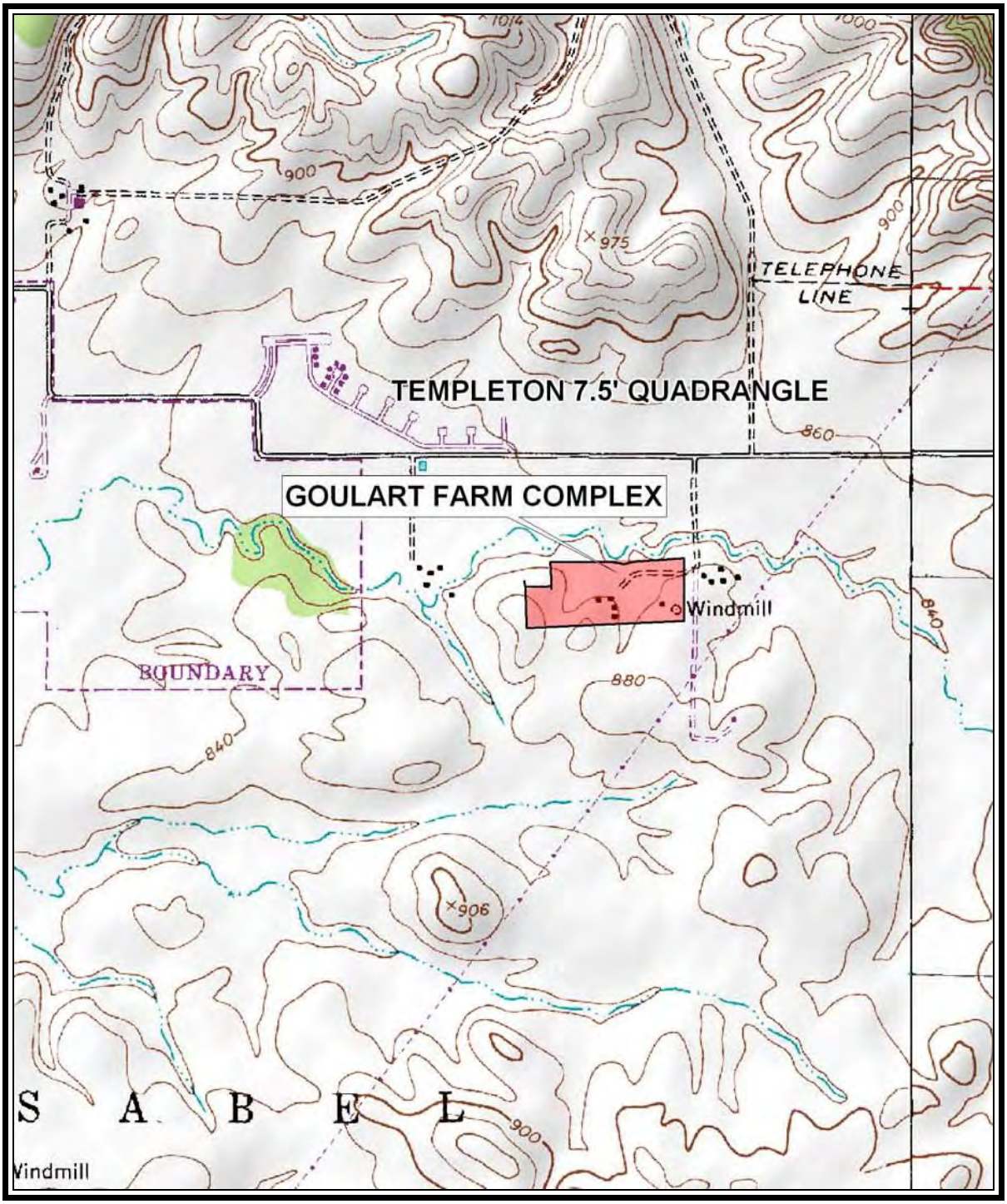
State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

Primary # _____
HRI# _____
Trinomial _____

Page 3 **of** 8 ***Resource Name or #** (Assigned by recorder) Goulart Farmsted

***Map Name:** Templeton **Scale:** 1:24000 ***Date of map:** 1979

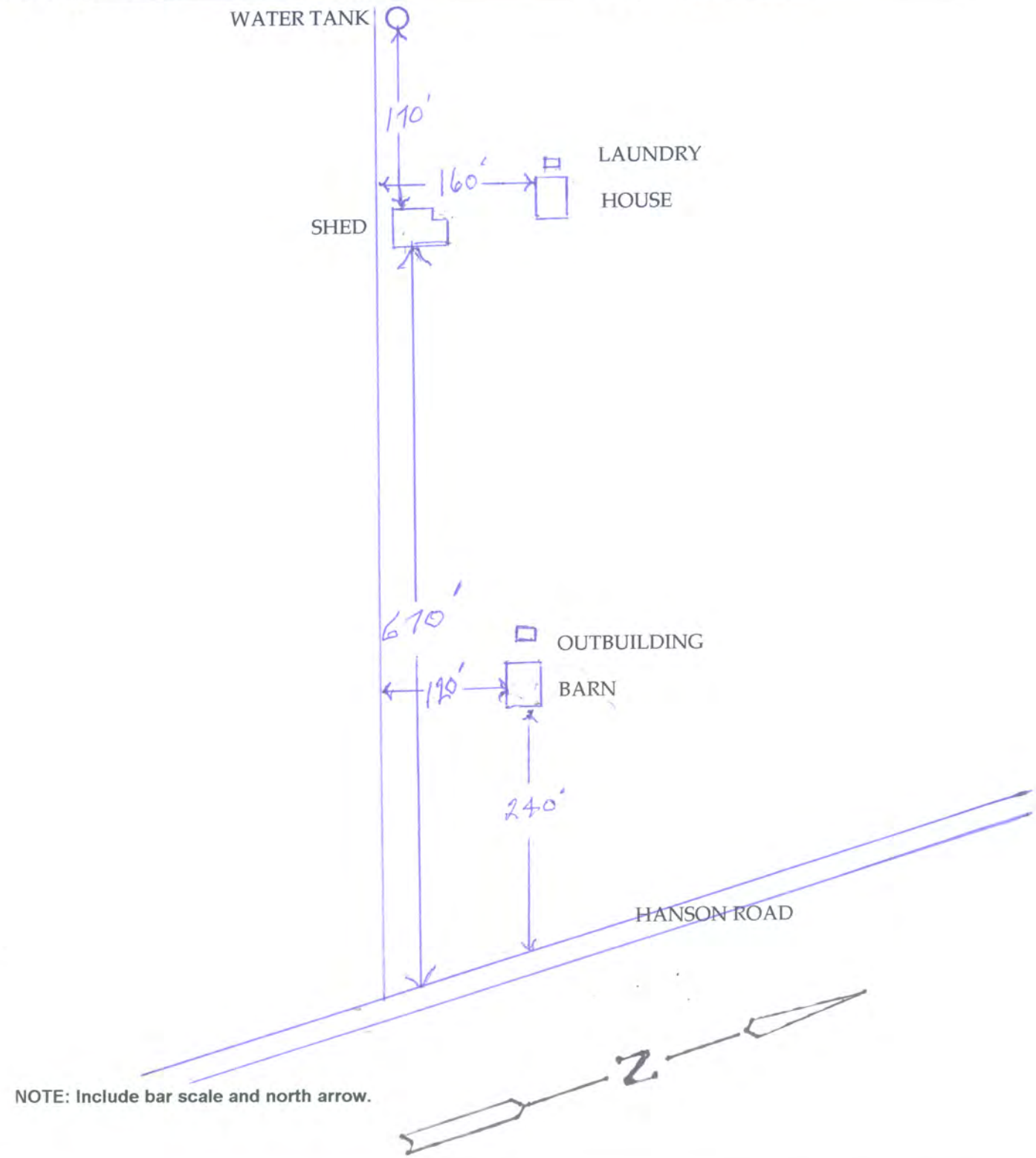


State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
SKETCH MAP

Primary # _____
HRI# _____
Trinomial _____

Page 4 of 8 *Resource Name or # (Assigned by recorder) Goulart Farmsted

Drawn by: Rose (CRMS) *Date of map: 11/26/2018



NOTE: Include bar scale and north arrow.

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary # _____
HRI # _____
Trinomial _____

Page 5 **of** 8 ***Resource Name or #** (Assigned by recorder) Goulart Farmsted
***Recorded by:** Rose (CRMS) ***Date** 11/26/2018 ■ Continuation ☐ Update

Monitor Barn-North Facade-Dimensions 40 Feet Across North Facade x 30 Feet Deep. Small Outbuilding To Right Dimensions ca. 8 feet On North Facade x 12 Feet Deep

Monitor Barn South and East Facade

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary # _____
HRI # _____
Trinomial _____

Page 6 **of** 8 ***Resource Name or #** (Assigned by recorder) Goulart Farmsted
***Recorded by:** Rose (CRMS) ***Date** 11/26/2018 ■ Continuation ☐ Update

Window Detail of Small Building Located Just West of Monitor Barn-East Facade

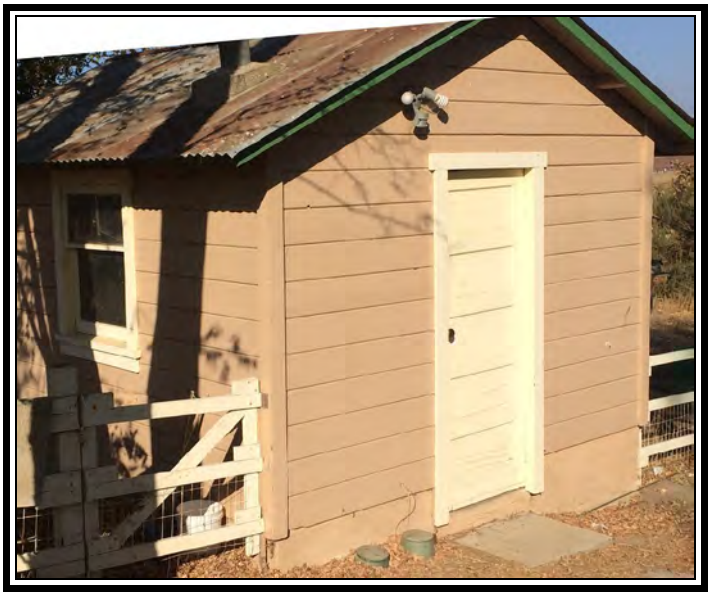
Abandoned Water Tank-View To Southwest-Tank Is ca. 15 Feet In Diameter and 7 Feet Tall

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary # _____
HRI # _____
Trinomial _____

Page 7 **of** 8 ***Resource Name or #** (Assigned by recorder) Goulart Farmsted
***Recorded by:** Rose (CRMS) ***Date** 11/26/2018 ■ Continuation ☐ Update

East Facade of Farm House-Build ca 1920-1930-Major Remodel ca 1980 w/Partial Second Story-Dimensions ca 30 Feet x 40 Feet



Laundry Room Immediately West of Farm House-Dimensions ca 9 Feet x 12 Feet.
A Toilet Inside Did Not Have A Date Stamp Inside The Tank Lid, But Showed Manufacturer as Germain Brothers Company, Saginaw, Michigan. Last Reference Found For Germain Bothers Is 1922.

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary # _____
HRI # _____
Trinomial _____

Page 8 **of** 8 *__Resource Name or #__ (Assigned by recorder) Goulart Farmsted
***Recorded by:** Rose (CRMS) ***Date** 11/26/2018 ■ Continuation □ Update

Redwood Shed Located Immediately South of the Farm House

1) Monitor Barn. Dimensions ca 40 feet across the front, and 30 feet deep. Typical 3 bay Monitor Barn. Concrete perimeter foundation. Full dimension 2 x 4 redwood construction with redwood exterior vertical planking. Corrugated iron roof.

2) Small Building West of Barn. Small utility building with concrete floor/foundation, and concrete stem wall about 3 feet high with remainder of walls typical redwood framing, and redwood sheathing on the outside. The roof is corrugated iron.

3) The Farm House. The original structure was built 1920-1930 as a single story residence. In about 1980, with occupation by the current owner, there was a major remodel to the home. A partial second story was added with a very steeply pitched roof. Also added on the south was a sunroom/porch.

4) Laundry Room. This structure was probably build at the same time as the house. It is of wood frame construction with clapboard exterior. The exterior was probably changed at the same time as the remodel. Inside the laundry room is a toilet with a 5 gallon tank. There was no date stamp on the inside of the tank lid, however, embossed inside was the manufacturer's name,, Germain Bothers Company, Saginaw, Michigan. The last reference found for Germain Bothers Company was a 1922 trade publication announcing the opening of their New York sales office.

4) Water Tank. The tank, now abandoned, is built of concrete, and is about 7 feet tall and 15 feet in diameter. There are the remains of a wooden sill on the top perimeter, indicating the once presence of a roof structure.

5) Shed. This wood frame outbuilding is somewhat of an irregular rectangle. Probably built about the same time as the barn. It has redwood planking exterior and galvanized iron roof. Dimensions are ca 20 feet x 40 feet.

Reso A - Exhibit C2 (EIR Technical Appendix)

State of California The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code
Other Listings _____
Review Code _____ Reviewer _____ Date _____

Page 1 **of** 5 ***Resource Name or #:** (Assigned by recorder) CRMS HR-1

P1. Other Identifier: 3014 Linne Road, Paso Robles CA 93466

***P2. Location:** __ **Not for Publication** X **Unrestricted**

***a. County** San Luis Obispo **and** (P2c, P2e, and P2b or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad** Templeton **Date** 1948/revised 1979 **T** 27S; **R** 12E ; __ of __ **of Sec** __ ; M.D. **B.M.**

c. Address 3014 Linne Road City Paso Robles Zip 93446

d. UTM: (Give more than one for large and/or linear resources) Zone 10S, 713900 mE/ 3942960 mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

This is a small ranch complex several of the structures are modern. There are two modern dwellings as well as assorted modern metal sheathed silos, and barns. There are four structures that are potentially historically significant. They are: a double bay redwood barn , a smaller shed/barn also constructed of redwood, a square water tower with a poured cement base and what appeares to be a heavily modified residence.

The owner stated that the property was occupied since the 1930s and that residences were modernized in the 1950s, the 1948 USGS map shows 5 structures at this location.

***P3b. Resource Attributes:** (List attributes and codes) HP2, HP33

***P4. Resources Present:** X Building X Structure __ Object __ Site __ District __ Element of District __Other (Isolates, etc.)

P5b. Description of Photo: (view, date, accession #) Farm complex looking west. Digital Photo #DSCN9247

***P6. Date Constructed/Age and Source:** X Historic __ Prehistoric __ Both

***P7. Owner and Address:**
Olsen Investments
3161 Linne Road,
Paso Robles CA 93446

***P8. Recorded by:** (Name, affiliation, and address) Todd Hannahs
Cultural Resource Management Services. 829 Paso Robles St.
Paso Robles Ca. 93446

***P9. Date Recorded:** 12/5/2018

***P10. Survey Type:** (Describe)
Visual / Walk over 15 meter spaced transects

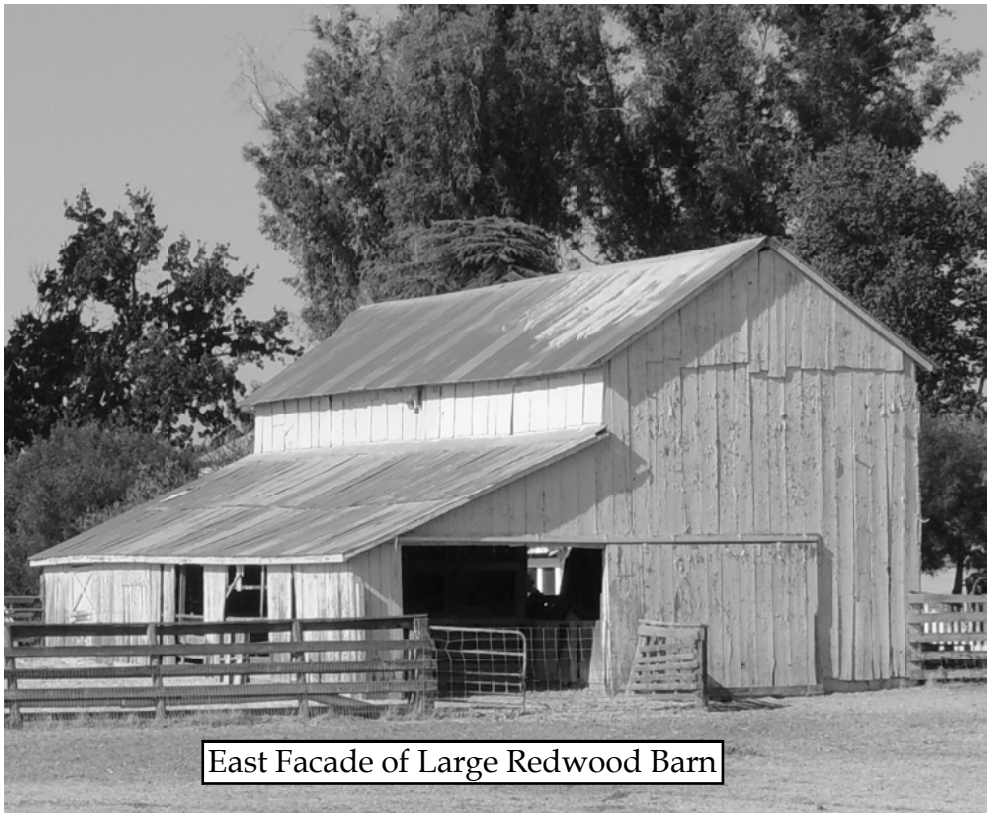
***P11. Report Citation** : (Cite survey report and other sources, or enter "none.")
Olsen-Chandler Inventory, December, 2018. Cultural Resource Management Services

***Attachments:** __NONE X Location Map X Continuation Sheet __Building, Structure, and Object Record
__Archaeological Record __District Record __Linear Feature Record __Milling Station Record __Rock Art Record
__Artifact Record __Photograph Record __ Other (List): _____

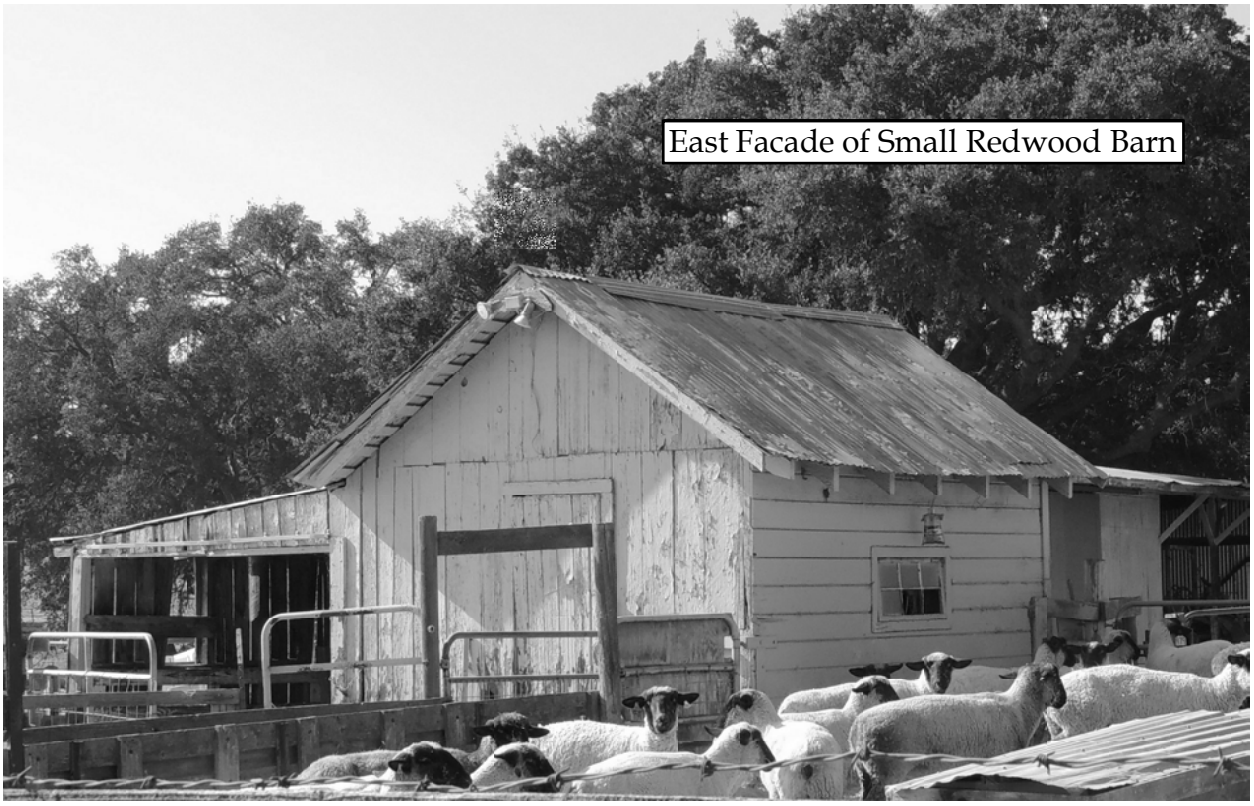
State of California The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary # _____
HRI # _____
Trinomial _____

Page 2 **of** 5 ***Resource Name or #** (Assigned by recorder) CRMS HR-1
***Recorded by:** Todd Hannahs ***Date** 12/5/2018
_X_ Continuation ___ Update



East Facade of Large Redwood Barn



East Facade of Small Redwood Barn

State of California The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary # _____
HRI # _____
Trinomial _____

Page 3 **of** 5 ***Resource Name or #** (Assigned by recorder) CRMS HR-1
***Recorded by:** Todd Hannahs ***Date** 12/5/2018
_X_ Continuation ___ Update

West Facade of Square Water Tower

State of California The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary # _____
HRI # _____
Trinomial _____

Page 4 **of** 5 ***Resource Name or #** (Assigned by recorder) CRMS HR-1
***Recorded by:** Todd Hannahs ***Date** 12/5/2018
_X_ Continuation ___ Update

Repurposed original Farm Residence.

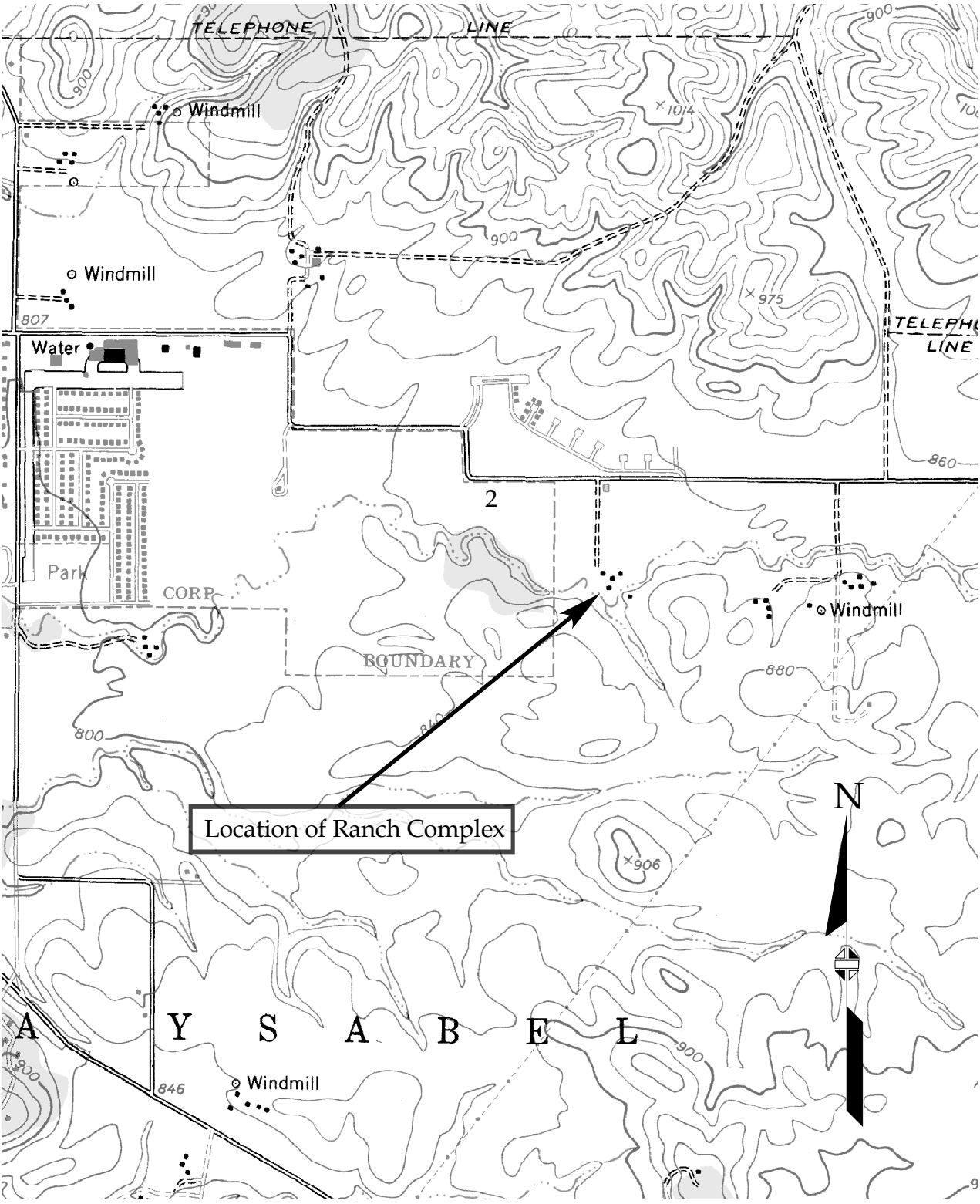
Modern Barn Addition

Reso A - Exhibit C2 (EIR Technical Appendix)

State of California The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary # _____
HRI # _____
Trinomial _____

Page 5 **of** 5 ***Resource Name or #** (Assigned by recorder) CRMS HR-1
***Recorded by:** Todd Hannahs ***Date** 12/5/2018
X Continuation ___ Update



Appendix E.2

Native American Consultation Notes

Olsen-South Chandler

- Consultation letter sent: August 29, 2018 by Susan DeCarli, City of Paso Robles to yak titʸu titʸu yak tilhini, North Chumash Tribal Council, Salinan Tribe of Monterey and San Luis Obispo Counties, Salinan Tribe of Monterey, San Luis Obispo, and San Benito Counties, Torres Martinez Desert Cahuilla Indians, Xolon Salinan Tribe
- Consultation requests received:
    - Northern Chumash Tribal Council –note, consultation request not received, courtesy consultation because of consultation request on Beechwood [6/28/19]
    - Salinan Tribe – October 11, 2018 via email by Patti Dunton (info@salinantribe.com) (requested reports, did not specifically request consultation)
    - yak titʸu titʸu yak tilhini – September 28, 2018 via email by Mona Olivas Tucker (olivas.mona@gmail.com)
- Reports sent to tribes that requested consultation: March 6, 2019
- Request to schedule consultation:
    - Salinan Tribe
        - March 6, 2019 – email to Patti Dunton (salinantribe@aol.com) from Brandi Cummings (brandi.cummings@swca.com) with a map of the three projects and a request to schedule the consultation meeting, the 18.12.17 CRMS report for OSC, the 12.06.xx Cogstone report for Gateway, and indicated the remainder of the reports would be via a separate email due to the file size
        - March 6, 2019 – email from Microsoft Outlook indicating the email to Patti was too large and wasn't delivered
        - March 6, 2019 – resend email to Patti Dunton (salinantribe@aol.com) from Brandi Cummings (brandi.cummings@swca.com) with a map of the three projects and a request to schedule the consultation meeting, the 12.06.xx Cogstone report, and indicated the remainder of the reports would be via two additional emails due to the file size
        - March 6, 2019 –email to Patti Dunton (salinantribe@aol.com) from Brandi Cummings (brandi.cummings@swca.com) with the 18.12.17 CRMS
        - April 8, 2019 – phone call to Patti Dunton (805-460-9202), received a message that the phone number is out of service
        - April 8, 2019 – phone call to Patti Dunton (805-423-5195) from Brandi Cummings (805-543-7095 x:6818), Patti indicated that Fred Segobia would be handling this consultation and that she would provide him the reports that were email and he would call me within the week
        - April 25, 2019 – phone call to Fred Segobia (831-385-1490) from Brandi Cummings (805-543-7095 x:6818), asked Fred about scheduling a tribal consultation meeting for all three projects, Fred indicated he was unaware of the consultation request and would have to confer with Patti, also indicated that he needed time to review the reports that were sent to Patti
        - May 10, 2019 – phone call to Fred Segobia (831-385-1490) from Brandi Cummings (805-543-7095 x:6818), left a voicemail asking to schedule consultation meeting

- May 17, 2019 – email to Fred Segobia (salinan.fs@gmail.com), Patti Dunton (salinantribe@aol.com), and Salinan Tribe main email (info@salinantribe.com) from Brandi Cummings (brandi.cummings@swca.com) seeking if the tribe is still interested in consulting on these projects; also sent a link to the reports
- May 20, 2019 – phone call from Fred Segobia (831-385-1490) to Brandi Cummings (805-543-7095 x:6818), scheduled consultation meeting for May 24, 2019
- May 24, 2019 – in person meeting with Warren Frace, Darren Nash, Darcey Delgado, Lori Wilson, Katie Banister, Brandi Cummings, and Fred Segobia at the Community Development Department, Fred explained the significance of the Salinan Tribe in the area and the importance of the area to the tribes in the area, Fred requested access to walk the three project site before making a determination
- June 11, 2019 – phone call from Brandi Cummings (805-543-7095 x:6818) to Fred Segobia (831-385-1490), voicemail to discuss site visit
- June 14, 2019 – phone call from Brandi Cummings (805-543-7095 x:6818) to Fred Segobia (831-385-1490), voicemail to discuss site visit
- June 18, 2019 – phone call from Fred Segobia (831-385-1490) to Brandi Cummings (805-543-7095 x:6818), voicemail returning 6/14/19 phone call
- June 20, 2019 – phone call from Brandi Cummings (805-543-7095 x:6818) to Fred Segobia (831-385-1490), voicemail to discuss site visit
- June 26, 2019 – phone call from Fred Segobia (831-385-1490) to Brandi Cummings (805-543-7095 x:6818), voicemail returning 6/20/19 phone call
- July 2, 2019 – phone call from Brandi Cummings (805-543-7095 x:6818) to Fred Segobia (831-385-1490), discussed the need for a site visit and possible dates
- July 9, 2019 – phone call from Brandi Cummings (805-543-7095 x:6818) to Fred Segobia (831-385-1490), voicemail regarding site visit schedule
- July 12, 2019 – phone call from Brandi Cummings (805-543-7095 x:6818) to Fred Segobia (831-385-1490), voicemail regarding site visit schedule
- July 12, 2019 – phone call from Fred Segobia (831-385-1490) to Brandi Cummings (805-543-7095 x:6818), voicemail regarding availability for a site visit

o Northern Chumash Tribal Council

- March 6, 2019 - email to Fred Collins (fcollins@northernchumash.com) from Brandi Cummings (brandi.cummings@swca.com) with a map of the three projects and a request to schedule the consultation meeting, the 18.12.17 CRMS report for OSC, the 12.06.xx Cogstone report for Gateway, and indicated the remainder of the reports would be via a separate email due to the file size
- March 6, 2019 - email to Fred Collins (fcollins@northernchumash.com) from Brandi Cummings (brandi.cummings@swca.com) with the 19.01.02 Applied Earthworks report for Beechwood and the 18.09.28 Applied Earthworks historic memo for Beechwood
- March 14, 2019 – email from Fred Collins (fcollins@northernchumash.com) to Brandi Cummings (brandi.cummings@swca.com) stating he would like to meet with the City and WCA to discuss the consultation process

        - March 18, 2019 - email to Fred Collins (fcollins@northernchumash.com) from Brandi Cummings (brandi.cummings@swca.com) proposing to meet on Thursday, March 21, 2019
        - March 19, 2019 - email from Fred Collins (fcollins@northernchumash.com) to Brandi Cummings (brandi.cummings@swca.com) stating March 21, 2019 is not good but perhaps the following week
        - March 19, 2019 - email to Fred Collins (fcollins@northernchumash.com) from Brandi Cummings (brandi.cummings@swca.com) proposing to meet on March 29, 2019
        - March 21, 2019 - email from Fred Collins (fcollins@northernchumash.com) to Brandi Cummings (brandi.cummings@swca.com) confirming March 29, 2019 meeting
        - March 29, 2019 – in person meeting with Warren Frace, Darren Nash, David Athey, Brandi Cummings, Fred Collins and Violet Sage Cavanaugh at the Community Development Department, NCTC indicated their dismay and lack of inclusion in development projects in the north county, and expressed concern that certain archaeologists were not properly portraying the Chumash in cultural reports, NCTC expressed their desire for the reports to be peer-reviewed
    - Yak titʸu titʸu yak tilhini
        - May 24, 2019 - email to Mona Tucker (olivas.mona@gmail.com) from Brandi Cummings (brandi.cummings@swca.com) with a request to schedule the consultation meeting, and a Dropbox link with a map of the three projects, the 18.12.17 CRMS report for OSC, the 12.06.xx Cogstone report for Gateway, and the 19.01.02 Applied Earthworks report for Beechwood
        - June 6, 2019 – follow up email to Mona Tucker (olivas.mona@gmail.com) from Brandi Cummings (brandi.cummings@swca.com) with a request to schedule the consultation meeting
        - June 6, 2019 –email from Mona Tucker (olivas.mona@gmail.com) to Brandi Cummings (brandi.cummings@swca.com) asking about name and location of the projects
        - June 7, 2019 – follow up email to Mona Tucker (olivas.mona@gmail.com) from Brandi Cummings (brandi.cummings@swca.com) with answer to name and location of projects, attach map to email and reference Dropbox link
        - June 14, 2019 – follow up email to Mona Tucker (olivas.mona@gmail.com) from Brandi Cummings (brandi.cummings@swca.com) with a request to schedule the consultation meeting
- Consultation Closure:
    - Salinan – ongoing
    - NCTC – ongoing
    - ytt – ongoing

Appendix F.1

Geotechnical Report

Earth Strata Geotechnical Services, Inc.
Geotechnical, Environmental and Materials Testing Consultants

November 20, 2018

Project No. 182139-10A

OLSEN 212 LLC
c/o Mike Naggar & Associates
445 South D Street
Perris, CA 92570

Subject: **Preliminary Geotechnical Interpretive Report, Proposed Olsen-Chandler Ranch Residential Development, Assessor's Parcel Numbers 009-795-001, 009-795-002, 009-795-003, 009-795-004, 009-795-005, 009-795-006, Located on the West Side of Hanson Road, South of Linne Road and North of Meadowlark Road, Assessor's Parcel Numbers 025-381-005, 025-381-001, 009-798-001, 009-798-002, 009-798-003, 009-796-002, 009-796-003, East of Fontana Road and North of Linne Road, City of El Paso de Robles, San Luis Obispo County, California**

Earth Strata Geotechnical Services is pleased to present our preliminary geotechnical interpretive report for the proposed Olsen-Chandler Ranch Residential Development, Assessor's Parcel Numbers 009-795-001 thru 009-795-006, located on the west side of Hanson Road, south of Linne Road, and north of Meadowlark Road, Assessor's Parcel Numbers 025-381-005, 025-381-001, 009-798-001 thru 009-798-003, 009-0796-002, and 009-796-003, located east of Fontana Road and north of Linne Road in the City of El Paso de Robles, San Luis Obispo County, California. This work was performed in accordance with the scope of work described in our proposal, dated August 22, 2018. The purpose of this study is to evaluate the nature, distribution, engineering properties, and geologic strata underlying the site with respect to the proposed development.

Earth Strata Geotechnical Services appreciates the opportunity to offer our consultation and advice on this project. In the event that you have any questions, please do not hesitate to contact the undersigned at your earliest convenience.

Respectfully submitted,

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Reso A - Exhibit C2 (EIR Technical Appendix)

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Figure 1 – Vicinity Map (Page 2)
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APPENDIX A – References (Rear of Text)
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APPENDIX D – Seismicity (Rear of Text)
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APPENDIX F – General Earthwork and Grading Specifications (Rear of Text)
Plate 1 – Geotechnical Map (In Pocket)

Reso A - Exhibit C2 (EIR Technical Appendix)

INTRODUCTION

Earth Strata Geotechnical Services is pleased to present our preliminary geotechnical interpretive report for the proposed development. The purpose of this study was to evaluate the nature, distribution, engineering properties, and geologic strata underlying the site with respect to the proposed development, and then provide preliminary grading and foundation design recommendations based on the plans you provided. The general location of the subject property is indicated on the Vicinity Map, Figure 1. The plans you provided were used as the base map to show geologic conditions within the subject site, see Geotechnical Map, Plate 1.

SITE DESCRIPTION

The subject property consists of two separate areas; the first area is located on the west side of Hanson Road, south of Linne Road, and north of Meadowlark Road; the second area is located east of Fontana Road and north of Linne Road, in the City of El Paso de Robles, San Luis Obispo County, California. The approximate location of the site is shown on the Vicinity Map, Figure 1.

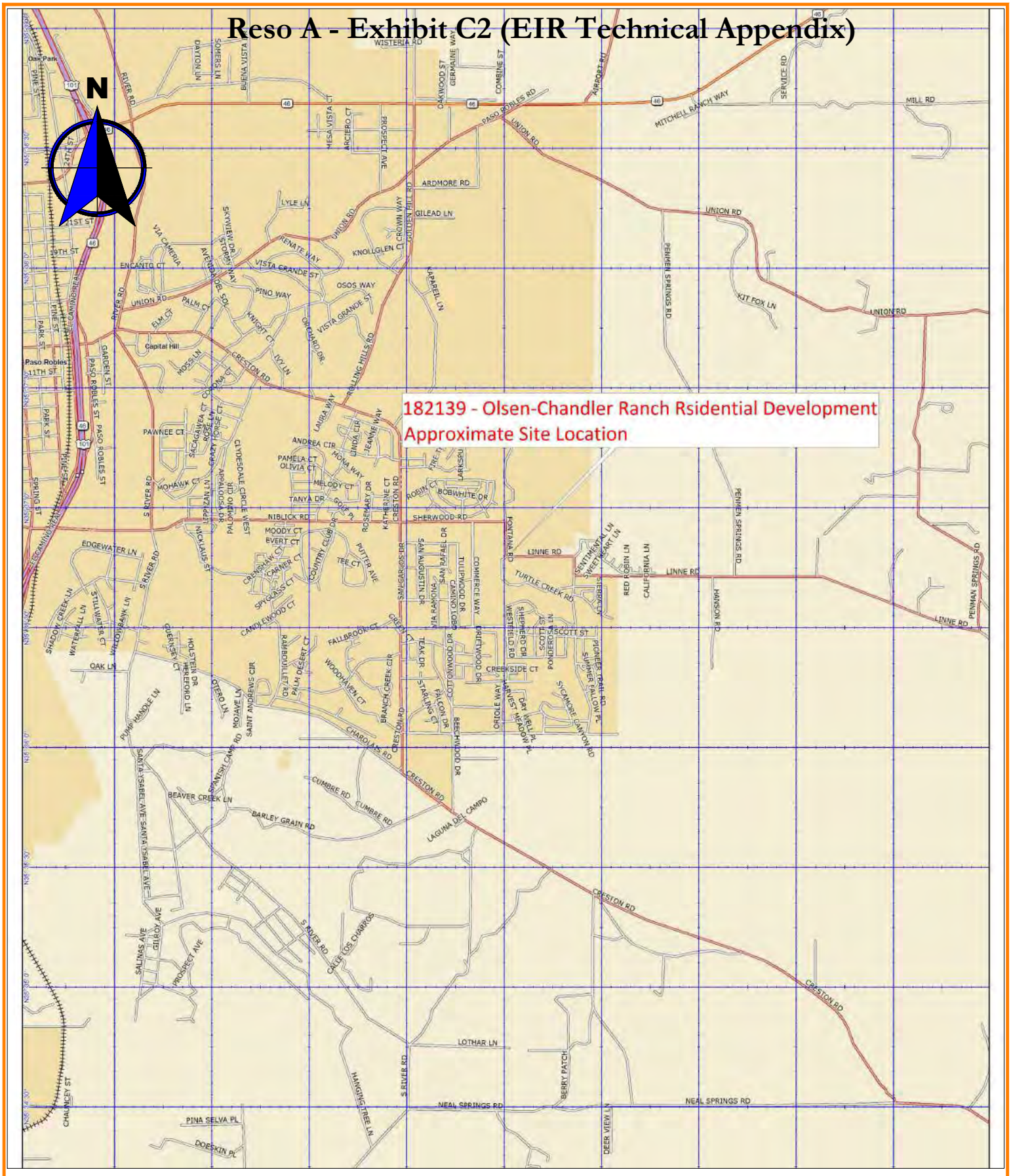
The subject property is comprised of approximately 350 acres of undeveloped land, as well as developed land with existing single-family residences. Topographic relief at the subject property is relatively moderate with the terrain being generally flat and hilly. Elevations at the site range from approximately 820 to 970 feet above mean sea level (msl), for a difference of about 150± feet across the entire site. Drainage within the subject property generally flows to the southwest in the area of the proposed Chandler Ranch and Centex, and to the north and northeast in the area of the proposed Olsen Ranch.

The site is currently bordered by residential developments and vacant property. Most of the vegetation on the site consists of moderate to dense amounts of annual weeds/grasses, along with small to large oak trees scattered across the entire subject site.

PROPOSED DEVELOPMENT AND GRADING

The proposed residential development is expected to consist of concrete, wood or steel framed one- and/or two-story structures utilizing slab on grade construction with associated streets, landscape areas, and utilities. The current development plans include 1,179 residential lots positioned throughout the site. The plans provided by you were utilized in our exploration and form the base for our Geotechnical Map, Plate 1.

Reso A - Exhibit C2 (EIR Technical Appendix)



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OLSEN-CHANDLER RANCH RESIDENTIAL DEVELOPMENT	182139-10A
VICINITY MAP	SCALE 1:40,625
OCT 2018	FIGURE 1

FIELD EXPLORATION AND LABORATORY TESTING

Field Exploration

Subsurface exploration within the subject site was performed on October 11, October 12, and October 13, 2018 for the exploratory excavations. A truck mounted hollow-stem-auger drill rig was utilized to drill 47 borings throughout the site to a maximum depth of 16.5 feet. A backhoe was utilized to excavate nine (9) test pits to a maximum depth of 13 feet. An underground utilities clearance was obtained from Underground Service Alert of Southern California, prior to the subsurface exploration.

Earth materials encountered during exploration were classified and logged in general accordance with the Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) of ASTM D 2488. Upon completion of laboratory testing, exploratory logs and sample descriptions may have been reconciled to reflect laboratory test results with regard to ASTM D 2487.

Associated with the subsurface exploration was the collection of bulk (disturbed) samples and relatively undisturbed samples of earth materials for laboratory testing and analysis. The relatively undisturbed samples were obtained with a 3 inch outside diameter modified California split-spoon sampler lined with 1-inch-high brass rings. Samples obtained using a hollow stem auger drill rig, were mechanically driven with successive 30 inch drops of a 140-pound automatic trip safety hammer. The blow count per one-foot increment was recorded in the boring logs. The central portions of the driven samples were placed in sealed containers and transported to our laboratory for testing and analysis. The approximate exploratory locations are shown on Plate 1 and descriptive logs are presented in Appendix B.

Laboratory Testing

Maximum dry density/optimum moisture content, expansion potential, pH, R-value, Atterberg limits, resistivity, sulfate content, chloride content, and in-situ density/moisture content were determined for selected undisturbed and bulk samples of earth materials, considered representative of those encountered. An evaluation of the test data is reflected throughout the Conclusions and Recommendations section of this report. A brief description of laboratory test criteria and summaries of test data are presented in Appendix C.

FINDINGS

Regional Geology

Regionally, the site is located in the Coast Ranges Geomorphic Province of California. The Coast Ranges are characterized by northwest trending mountain ranges with rounded summits and extensive folding and faulting. Most of the province is bounded by the sediment filled elongated Great Valley to the east and the Pacific Ocean to the west. The dominant structural geologic features reflect the northwest trend of the province. The San Francisco Bay area naturally subdivides the province, which is associated with a geologic structural depression. The San Andreas Fault trends to the northwest through the province and makes up the plate boundary between the Pacific Plate and North American Plate. The Hayward Fault is subparallel and east of the San Andreas Fault. The San Gregorio Fault is subparallel to the San Andreas Fault and lies to the southwest.

The Coast Ranges Province is primarily comprised of Cenozoic to Mesozoic marine and non-marine sedimentary deposits underlain by the Franciscan Formation or granitic rocks of the Salinian block. A map illustrating the regional geology is presented on the Regional Geologic Map, Figure 2.

Local Geology

The earth materials on the site are primarily comprised of topsoil, Quaternary alluvial materials, and bedrock. A general description of the dominant earth materials observed on the site is provided below:

- Topsoil (no map symbol): Residual topsoil, encountered in the upper 1 to 3 feet, blankets the site and underlying alluvium and bedrock. These materials were noted to be generally grayish white, brownish gray to grayish brown, medium brown to dark brown silty sand, sandy clay, and clayey sand which were very porous, dry to slightly moist and in a loose to medium dense state.

- Quaternary Alluvium (map symbol Qal): Quaternary alluvium was encountered below the topsoil and above the bedrock in the topographically lower areas of the subject site to a maximum depth of 14 feet below existing surface. These alluvial deposits consist predominately of interlayered pale yellow, brown, gray brown, orangeish brown, olive brown, yellowish brown, and brownish olive, fine to coarse grained silty sand, sandy silt, sandy clay, and occasional poorly-graded sand with varying amounts of clay and silt. These deposits were generally noted to be in a slightly moist to moist, loose to dense state.

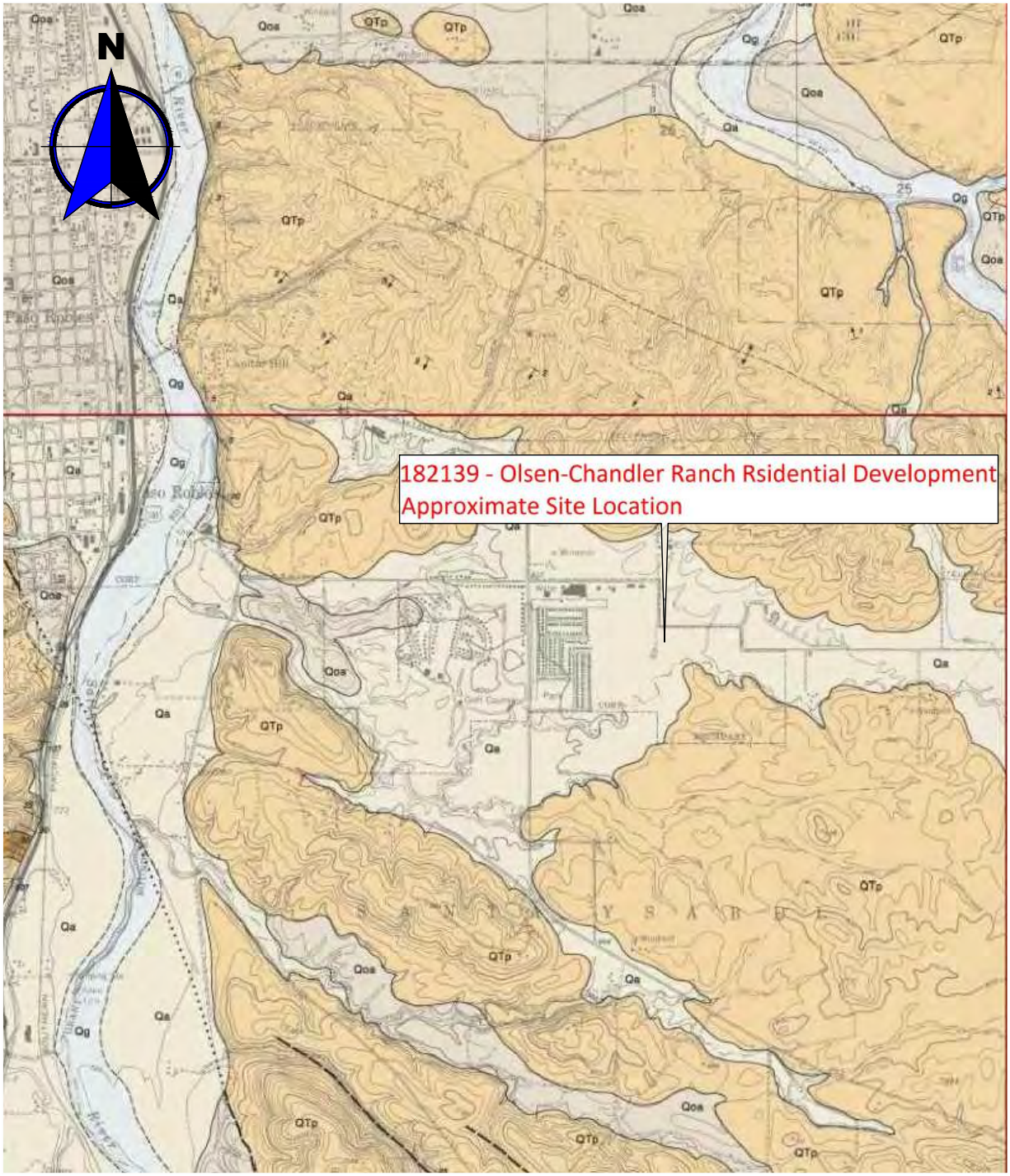
- Quaternary Paso Robles Formation (map symbol QTp): Paso Robles Formation bedrock was generally encountered below the topsoil and alluvial materials to the full depth of our exploration. These materials primarily consisted of olive gray, yellow brown, olive brown, to orangeish brown and pale yellow to pale brown, fine to coarse grained sandstone with varying amounts of silt and clay, sandy siltstone, claystone, and breccia. These materials were generally noted to be slightly moist to moist, and moderately hard to very hard.

Faulting

The project is located in a seismically active region and as a result, significant ground shaking will likely impact the site within the design life of the proposed project. The geologic structure of the entire southern California area is dominated by northwest-trending faults associated with the San Andreas Fault system, which accommodates for most of the right lateral movement associated with the relative motion between the Pacific and North American tectonic plates. Known active faults within this system include the Big Pine, Santa Ynez, Garlock, and San Andreas Faults.

No active faults are known to project through the site and the site is not located within an Alquist-Priolo Earthquake Fault Zone, established by the State of California to restrict the construction of new habitable structures across identifiable traces of known active faults. An active fault is defined by the State of California as having surface displacement within the past 11,000 years or during the Holocene geologic time period. Based on our mapping of the subject site, review of current and historical aerial imagery, lack of lineaments indicative of active faulting, and the data compiled during the preparation of this report, it is our interpretation that the potential for surface rupture to adversely impact the proposed structures is very low to remote.

Reso A - Exhibit C2 (EIR Technical Appendix)



LEGEND

Qa - Quaternary Alluvium

QTp - Quaternary Paso Robles Formation

REFERNCES: Dibblee, T.W., and Minch, J.A., 2004, Geologic map of the Templeton quadrangle, San Luis Obispo County, California: Dibblee Geological Foundation, Dibblee Foundation Map DF-135, scale 1:24,000

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OLSEN-CHANDLER RANCH RESIDENTIAL DEVELOPMENT		182139-10A
REGIONAL GEOLOGIC MAP	SCALE 1:40,625	
	OCT 2018	FIGURE 2

Based on our review of regional geologic maps and applicable computer programs (USGS 2008 Interactive Deaggregation, Caltrans ARS online, and USGS Earthquake Hazard Programs), the Rinconada Fault with an approximate source to site distance of 4.38 kilometers is the closest known active fault anticipated to produce the highest ground accelerations, with an anticipated maximum modal magnitude of 7.4. A list of faults as well as a list of significant historical seismic events within a 100km radius of the subject site are included in Appendix D.

Landslides

Landslide debris was not observed during our subsurface exploration and no ancient landslides are known to exist on the site. No landslides are known to exist, or have been mapped, in the vicinity of the site. Geologic mapping of the site conducted during our investigation reveal no geomorphic expressions indicative of landsliding.

CONCLUSIONS AND RECOMMENDATIONS

General

From geotechnical and engineering geologic points of view, the subject property is considered suitable for the proposed development, provided the following conclusions and recommendations are incorporated into the plans and are implemented during construction.

Earthwork

Earthwork and Grading

The provisions of the 2016 California Building Code (CBC), including the General Earthwork and Grading Specifications in the last Appendix of this report, should be applied to all earthwork and grading operations, as well as in accordance with all applicable grading codes and requirements of the appropriate reviewing agency. Unless specifically revised or amended herein, grading operations should also be performed in accordance with applicable provisions of our General Earthwork and Grading Specifications within the last appendix of this report.

Clearing and Grubbing

Vegetation including trees, grasses, weeds, brush, shrubs, or any other debris should be stripped from the areas to be graded and properly disposed of offsite. In addition, laborers should be utilized to remove any roots, branches, or other deleterious materials during grading operations.

Earth Strata Geotechnical Services should be notified at the appropriate times to provide observation and testing services during Clearing and Grubbing operations. Any buried structures or unanticipated conditions should be brought to our immediate attention.

Excavation Characteristics

Based on the results of our exploration and experience with similar projects in similar settings, the near surface earth materials, will be readily excavated with conventional earth moving equipment.

Groundwater

Groundwater was not observed during our subsurface exploration. It should be noted that localized groundwater could be encountered during grading due to the limited number of exploratory locations or other factors.

Subdrain systems should be installed in all canyon areas, buttresses, fill over cut slopes, and/or stabilization fills. The subdrain systems should be installed with a minimum of 10 feet of cover. All subdrain systems should be constructed per the specific guidelines provided within the General Earthwork and Grading Specifications found in the last appendix of this report.

Ground Preparation for Fill Areas

For each area to receive compacted fill, the removal of low density, compressible earth materials, such as topsoil, upper alluvial materials, and undocumented artificial fill, should continue until firm competent alluvium or bedrock is encountered. Removal excavations are subject to verification by the project engineer, geologist or their representative. Prior to placing compacted fills, the exposed bottom in each removal area should be scarified to a depth of 6 inches or more, watered or air dried as necessary to achieve near optimum moisture conditions and then compacted to a minimum of 90 percent of the maximum dry density determined by ASTM D 1557.

The intent of remedial grading is to diminish the potential for hydro-consolidation, slope instability, and/or settlement. Remedial grading should extend beyond the perimeter of the proposed structures a horizontal distance equal to the depth of excavation or a minimum of 5 feet, whichever is greater. For cursory purposes the anticipated removal depths are shown on the enclosed Geotechnical Map, Plate 1. In general, anticipated removal depths vary from 2 to 12 feet below existing grade.

Wet Removals

Wet alluvial materials will probably not be encountered within the low lying areas of the site. If removals of wet alluvial materials are required, special grading equipment and procedures can greatly reduce overall costs. Careful planning by an experienced grading contractor can reduce the need for special equipment, such as swamp cats, draglines, excavators, pumps, and top loading earthmovers. Possible solutions may include the placement of imported angular rock and/or geotextile ground reinforcement. More specific recommendations can be provided based on the actual conditions encountered. Drying or mixing of wet materials with dry materials will be needed to bring the wet materials to near optimum moisture prior to placing wet materials into compacted fills.

Oversize Rock

Oversize rock is not expected to be encountered during grading. Oversize rock that is encountered (i.e., rock exceeding a maximum dimension of 12 inches) should be disposed of offsite or stockpiled onsite and crushed for future use. The disposal of oversize rock is discussed in greater detail in General Earthwork and Grading Specifications within the last appendix of this report.

Compacted Fill Placement

Compacted fill materials should be placed in 6 to 8 inch maximum (uncompacted) lifts, watered or air dried as necessary to achieve uniform near optimum moisture content and then compacted to a minimum of 90 percent of the maximum dry density determined by ASTM D 1557.

Import Earth Materials

Should import earth materials be needed to achieve final design grades, all potential import materials should be free of deleterious/oversize materials, non-expansive, and approved by the project geotechnical consultant prior to delivery onsite.

Fill Slopes

When properly constructed, fill slopes up to 10 feet high with inclinations of 2:1 (h:v) or flatter are considered to be grossly stable. Keyways are required at the toe of all fill slopes higher than 5 feet and steeper than 5:1 (h:v). Keyways should be a minimum of 10 feet wide and 2 feet into competent earth materials, as measured on the downhill side. In order to establish keyway removals, backcuts should be cut no steeper than 1:1 or as recommended by the geotechnical engineer or engineering geologist. Compacted fill should be benched into competent earth materials.

Cut Slopes

When properly constructed, cut slopes into older alluvium or bedrock up to 10 feet high with inclinations of 2:1 (h:v) or flatter are considered grossly stable. Cut slopes should be observed by the engineering geologist or his representative during grading, but are anticipated to be stable.

Stabilization Fills

Currently, stabilization fills will not be required for cut slopes in the bedrock or alluvium. Our engineering geologist or his representative should be called to evaluate all slopes during grading. In the event that unfavorable geologic conditions are encountered, recommendations for stabilization fills or flatter slopes will be provided.

Fill Over Cut Slopes

The fill portion of fill over cut slopes should not be constructed until the cut portion of the slope has been cut to finish grade. The earth materials and geologic structure exposed along the cut slope should be evaluated with regard to suitability for compacted fills or foundations and for stability. If the cut materials are determined to be competent, then the construction of the keyway and subdrain system may commence or additional remedial recommendations will be provided.

Temporary Backcuts

It is the responsibility of the grading contractor to follow all Cal-OSHA requirements with regard to excavation safety. Where existing developments are upslope, adequate slope stability to protect those developments must be maintained. Temporary backcuts will be required to accomplish

removals of unsuitable materials and possibly, to perform canyon removals, stabilization fills, and/or keyways. Backcuts should be excavated at a gradient of 1:1 (h:v) or flatter. Flatter backcuts may be required where geologic structure or earth materials are unfavorable. It is imperative that grading schedules minimize the exposure time of the unsupported excavations. All excavations should be stabilized within 30 days of initial excavation.

Cut/Fill Transitions

Cut/fill transitions should be eliminated from all building areas where the depth of fill placed within the "fill" portion exceeds proposed footing depths. This is to diminish distress to structures resulting from excessive differential settlement. The entire foundation of each structure should be founded on a uniform bearing material. This should be accomplished by overexcavating the "cut" portion and replacing the excavated materials as properly compacted fill. Refer to the following table for recommended depths of overexcavation.

DEPTH OF FILL ("fill" portion)	DEPTH OF OVEREXCAVATION ("cut" portion)
Up to 5 feet	Equal Depth
5 to 10 feet	5 feet
Greater than 10 feet	One-half the thickness of fill placed on the "fill" portion (10 feet maximum)

Overexcavation of the "cut" portion should extend beyond the building perimeter a horizontal distance equal to the depth of overexcavation or a minimum of 5 feet, whichever is greater.

Cut Areas

In cut areas, an area a minimum of 5 feet beyond the footprint of the proposed structures should overexcavated until; competent bottoms are achieved; to a minimum 3 feet below the proposed foundations; or per the Overexcavation Table above; (whichever is greater) and replaced with compacted fill. Final determination of areas that require overexcavation should be determined in the field by a representative of Earth Strata Geotechnical Services.

Shrinkage, Bulking and Subsidence

Volumetric changes in earth material quantities will occur when poorly consolidated earth materials are replaced with properly compacted fill. Estimates of the percent shrinkage/bulking factors for the various geologic units observed on the subject property are based on in-place densities and on the estimated average percent of relative compaction achieved during grading.

GEOLOGIC UNIT	SHRINKAGE (%)
Topsoil	10 to 15
Alluvium	10 to 15
Paso Robles Formation	5 to 10

Subsidence from scarification and recompaction of exposed bottom surfaces is expected to be negligible to approximately 0.01 foot.

The estimates of shrinkage/bulking and subsidence are intended as an aid for project engineers in determining earthwork quantities. Since many variables can affect the accuracy of these estimates, they should be used with caution and contingency plans should be in place for balancing the project.

Settlement Monitoring

Compacted fills greater than 30 feet deep will require settlement monuments. Monuments will be required at the base and surface of deep compacted fills in order to monitor post grading settlement of alluvial materials and consolidation of fill materials.

It is our recommendation, that the grading contractor be responsible for the construction and protection of all settlement monuments. Surface monuments may consist of 5± foot lengths of 1-inch diameter pipe driven into the ground and furnished with a suitable, well defined measuring point, see Settlement Monument Detail in the General Earthwork and Grading Specifications within the last appendix of this report. Locations of settlement monuments will be determined when detailed grading plans are available.

The settlement monuments should be surveyed by the civil engineer weekly for the first 4 weeks, bi-weekly for 8 weeks, and then monthly until the observed settlement has reached tolerable limits. Construction should not take place in areas of deep fill until settlement monitoring has been performed for at least 3 months and the areas of concern have been approved for construction by the geotechnical engineer.

To reduce the total length of time required for settlement monitoring, the lower half of the compacted fill may be compacted to a minimum of 92 percent.

Geotechnical Observations

Clearing operations, removal of unsuitable materials, and general grading procedures should be observed by the project geotechnical consultant or his representative. No compacted fill should be placed without observations by the geotechnical consultant or his representative to verify the adequacy of the removals.

The project geotechnical consultant or his representative should be present to observe grading operations and to check that minimum compaction requirements and proper lift thicknesses are being met, as well as to verify compliance with the other recommendations presented herein.

Post Grading Considerations

Slope Landscaping and Maintenance

Adequate slope and building pad drainage is essential for the long term performance of the subject site. The gross stability of graded slopes should not be adversely affected, provided all drainage provisions are properly constructed and maintained. Engineered slopes should be landscaped with deep rooted, drought tolerant maintenance free plant species, as recommended by the project landscape architect.

Site Drainage

Control of site drainage is important for the performance of the proposed project. Roof gutters are recommended for the proposed structures. Pad and roof drainage should be collected and transferred to driveways, adjacent streets, storm-drain facilities, or other locations approved by the building official in non-erosive drainage devices. Drainage should not be allowed to pond on the pad or against any foundation or retaining wall. Drainage should not be allowed to flow uncontrolled over any descending slope. Planters located within retaining wall backfill should be sealed to prevent moisture intrusion into the backfill. Planters located next to structures should be sealed to the depth of the footings. Drainage control devices require periodic cleaning, testing and maintenance to remain effective.

At a minimum, pad drainage should be designed at the minimum gradients required by the CBC. To divert water away from foundations, the ground surface adjacent to foundations should also be graded at the minimum gradients required per the CBC.

Utility Trenches

All utility trench backfill should be compacted at near optimum moisture to a minimum of 90 percent of the maximum dry density determined by ASTM D 1557. For utility trench backfill within pavement areas the upper 12 inches of subgrade materials should be compacted to 95 percent of the maximum dry density determined by ASTM D 1557. This includes within the street right-of-ways, utility easements, under footings, sidewalks, driveways and building floor slabs, as well as within or adjacent to any slopes. Backfill should be placed in approximately 6 to 8 inch maximum loose lifts and then mechanically compacted with a hydro-hammer, rolling with a sheepsfoot, pneumatic tampers, or similar equipment. The utility trenches should be tested by the project geotechnical engineer or their representative to verify minimum compaction requirements are obtained.

In order to minimize the penetration of moisture below building slabs, all utility trenches should be backfilled with compacted fill, lean concrete or concrete slurry where they undercut the perimeter foundation. Utility trenches that are proposed parallel to any building footings (interior and/or exterior trenches), should not be located within a 1:1 (h:v) plane projected downward from the outside bottom edge of the footing.

SEISMIC DESIGN CONSIDERATIONS

Ground Motions

Structures are required to be designed and constructed to resist the effects of seismic ground motions as provided in the 2016 California Building Code Section 1613. The design is dependent on the site class, occupancy category I, II, III, or IV, mapped spectral accelerations for short periods (S_s), and mapped spectral acceleration for a 1-second period (S_1).

In order for structural design to comply with the 2016 CBC, the USGS "US Seismic Design Maps" online tool was used to compile spectral accelerations for the subject property based on data and maps jointly compiled by the United States Geological Survey (USGS) and the California Geological Survey (CGS). The

data found in the following table is based on the Maximum Considered Earthquake (MCE) with 5% damped ground motions having a 2% probability of being exceeded in 50 years (2,475 year return period).

The seismic design coefficients were determined by a combination of the site class, mapped spectral accelerations, and occupancy category. The following seismic design coefficients should be implemented during design of the proposed structures. Summaries of the Seismic Hazard Deaggregation graphs and test data are presented in Appendix D.

2016 CBC	FACTOR
Site Location	Latitude: 35.611658˚ (North) Longitude: -120.640850˚(West)
Site Class	D
Mapped Spectral Accelerations for short periods, S_S	1.352 g
Mapped Spectral Accelerations for 1-Second Period, S_1	0.500 g
Maximum Considered Earthquake Spectral Response Acceleration for Short Periods, S_{MS}	1.352 g
Maximum Considered Earthquake Spectral Response Acceleration for 1-Second Period, S_{M1}	0.750 g
Design Spectral Response Acceleration for Short Periods, S_{DS}	0.901 g
Design Spectral Response Acceleration for 1-Second Period, S_{D1}	0.500 g
Seismic Design Category	D
Importance Factor Based on Occupancy Category	II

We performed the probabilistic seismic hazard assessment for the site in accordance with the 2016 CBC, Section 1803.5.11 and 1803.5.12. The probabilistic seismic hazard maps and data files were jointly prepared by the United States Geological Survey (USGS) and the California Geological Survey (CGS) and can be found at the CGS Probabilistic Seismic Hazards Mapping Ground Motion Page. Actual ground shaking intensities at the site may be substantially higher or lower based on complex variables such as the near source directivity effects, depth and consistency of earth materials, topography, geologic structure, direction of fault rupture, and seismic wave reflection, refraction, and attenuation rates. The mean peak ground acceleration was calculated to be 0.501g.

Secondary Seismic Hazards

Secondary effects of seismic shaking considered as potential hazards include several types of ground failure as well as induced flooding. Different types of ground failure, which could occur as a consequence of severe ground shaking at the site, include landslides, ground lurching, shallow ground rupture, and liquefaction/lateral spreading. The probability of occurrence of each type of ground failure depends on the severity of the earthquake, distance from faults, topography, the state of subsurface earth materials, groundwater conditions, and other factors. Based on our experience, subsurface exploration, and laboratory testing, all of the above secondary effects of seismic activity are considered unlikely.

Seismically induced flooding is normally a consequence of a tsunami (seismic sea wave), a seiche (i.e., a wave-like oscillation of surface water in an enclosed basin that may be initiated by a strong earthquake) or failure of a major reservoir or retention system up gradient of the site. Since the site is at an elevation of more than 800 feet above mean sea level and is located more than 15 miles inland from the nearest

coastline of the Pacific Ocean, the potential for seismically induced flooding due to a tsunami is considered nonexistent. Since no enclosed bodies of water lie adjacent to or up gradient of the site, the likelihood for induced flooding due to a dam failure or a seiche overcoming the dam's freeboard is considered nonexistent.

Liquefaction and Lateral Spreading

Liquefaction occurs as a result of a substantial loss of shear strength or shearing resistance in loose, saturated, cohesionless earth materials subjected to earthquake induced ground shaking. Potential impacts from liquefaction include loss of bearing capacity, liquefaction related settlement, lateral movements, and surface manifestation such as sand boils. Seismically induced settlement occurs when loose sandy soils become denser when subjected to shaking during an earthquake. The three factors determining whether a site is likely to be subject to liquefaction include seismic shaking, type and consistency of earth materials, and groundwater level. The proposed structures will be supported by compacted fill, competent alluvium, and competent bedrock, with lack of shallow groundwater. As such, the potential for earthquake induced liquefaction and lateral spreading beneath the proposed structures is considered very low to remote due to the recommended compacted fill, relatively low groundwater level, and the dense nature of the deeper onsite earth materials.

TENTATIVE FOUNDATION DESIGN RECOMMENDATIONS

General

Provided grading is performed in accordance with the recommendations of this report, shallow foundations are considered feasible for support of the proposed structures. Tentative foundation recommendations are provided herein and graphic presentations of relevant recommendations may also be included on the enclosed map.

Allowable Bearing Values

An allowable bearing value of 2,000 pounds per square foot (psf) is recommended for design of 24-inch square pad footings and 12-inch-wide continuous footings founded at a minimum depth of 12 inches below the lowest adjacent final grade. This value may be increased by 20 percent for each additional 1-foot of width and/or depth to a maximum value of 2,500 psf. Recommended allowable bearing values include both dead and frequently applied live loads and may be increased by one third when designing for short duration wind or seismic forces.

Settlement

Based on the settlement characteristics of the earth materials that underlie the building sites and the anticipated loading, we estimate that the maximum total settlement of the footings will be less than approximately ¾ inch. Differential settlement is expected to be about ½ inch over a horizontal distance of approximately 20 feet, for an angular distortion ratio of 1:480. It is anticipated that the majority of the settlement will occur during construction or shortly after the initial application of loading.

The above settlement estimates are based on the assumption that the grading and construction are performed in accordance with the recommendations presented in this report and that the project geotechnical consultant will observe or test the earth material conditions in the footing excavations.

Lateral Resistance

Passive earth pressure of 250 psf per foot of depth to a maximum value of 2,500 psf may be used to establish lateral bearing resistance for footings. For areas coved with hardscape, passive earth pressure may be taken from the surface. For areas without hardscape, the upper 12 inches of the soil profile must be neglected when calculating passive earth pressure. A coefficient of friction of 0.36 times the dead load forces may be used between concrete and the supporting earth materials to determine lateral sliding resistance. The above values may be increased by one-third when designing for short duration wind or seismic forces. When combining passive and friction for lateral resistance, the passive component should be reduced by one third. In no case shall the lateral sliding resistance exceed one-half the dead load for clay, sandy clay, sandy silty clay, silty clay, and clayey silt.

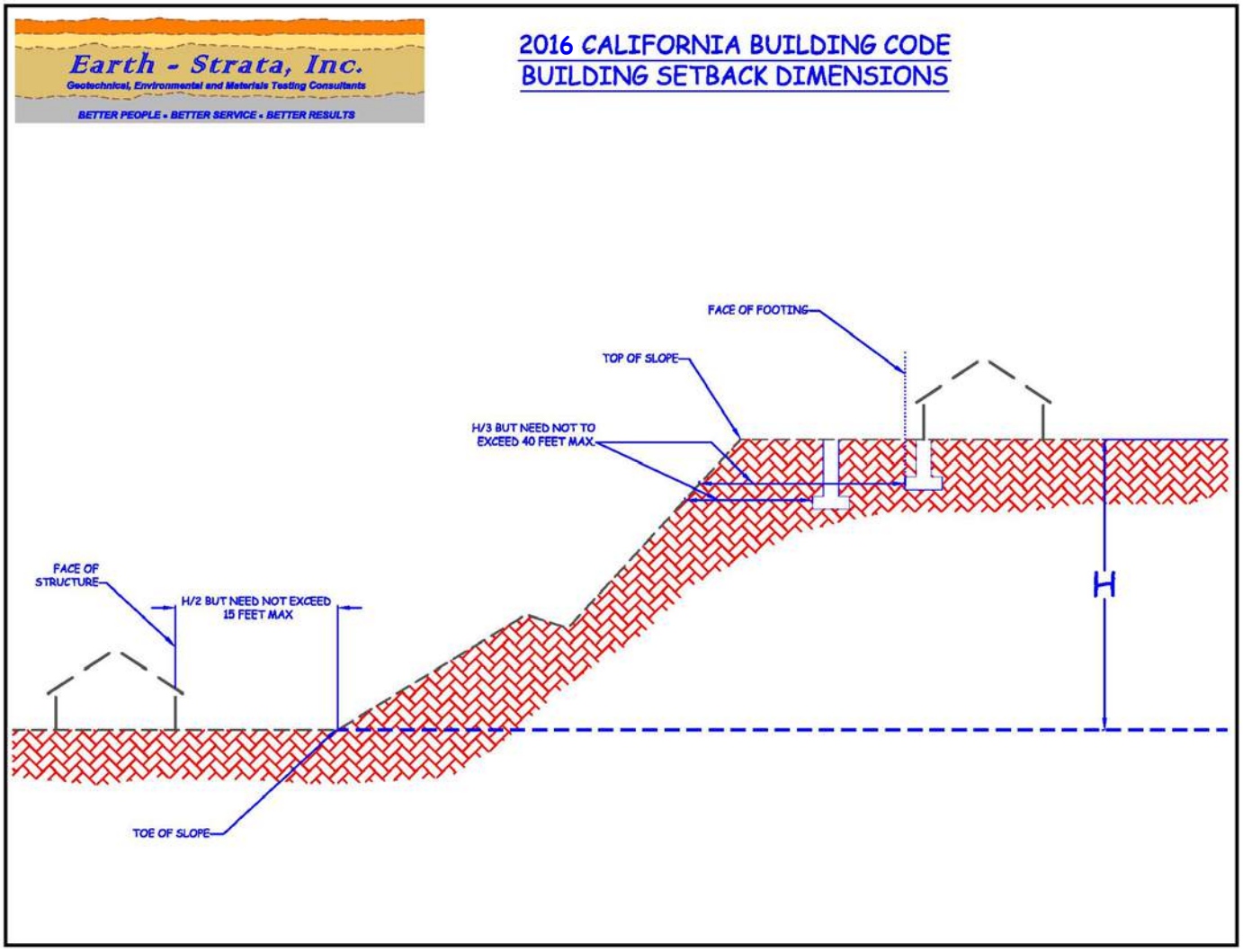
The above lateral resistance values are based on footings for an entire structure being placed directly against either compacted fill or competent alluvium or competent bedrock.

Structural Setbacks and Building Clearance

Structural setbacks are required per the 2016 California Building Code (CBC). Additional structural setbacks are not required due to geologic or geotechnical conditions within the site. Improvements constructed in close proximity to natural or properly engineered and compacted slopes can, over time, be affected by natural processes including gravity forces, weathering, and long term secondary settlement. As a result, the CBC requires that buildings and structures be setback or footings deepened to resist the influence of these processes.

For structures that are planned near ascending and descending slopes, the footings should be embedded to satisfy the requirements presented in the CBC, Section 1808.7 as illustrated in the following Foundation Clearances from Slopes diagram.

FOUNDATION CLEARANCES FROM SLOPES



When determining the required clearance from ascending slopes with a retaining wall at the toe, the height of the slope shall be measured from the top of the wall to the top of the slope.

Foundation Observations

In accordance with the 2016 CBC and prior to the placement of forms, concrete, or steel, all foundation excavations should be observed by the geologist, engineer, or his representative to verify that they have been excavated into competent bearing materials. The excavations should be per the approved plans, moistened, cleaned of all loose materials, trimmed neat, level, and square. Any moisture softened earth materials should be removed prior to steel or concrete placement.

Earth materials from foundation excavations should not be placed in slab on grade areas unless the materials are tested for expansion potential and compacted to a minimum of 90 percent of the maximum dry density.

Expansive Soil Considerations

Preliminary laboratory test results indicate onsite earth materials exhibit an expansion potential of **VERY LOW, LOW, MEDIUM, and HIGH** as classified in accordance with 2016 CBC Section 1803.5.3 and ASTM D4829. Additional, testing for expansive soil conditions should be conducted upon completion of rough grading. The following recommendations should be considered the very minimum requirements, for the earth materials tested. It is common practice for the project architect or structural engineer to require additional slab thickness, footing sizes, and/or reinforcement. The preliminary design and construction recommendations herein are intended for the various levels of expansion potential anticipated at the completion of rough grading.

Very Low Expansion Potential (Expansion Index of 20 or Less)

Our laboratory test results indicate that the earth materials onsite exhibit a **VERY LOW** expansion potential as classified in accordance with 2016 CBC Section 1803.5.3 and ASTM D4829. Since the onsite earth materials exhibit expansion indices of 20 or less, the design of slab on ground foundations is exempt from the procedures outlined in Section 1808.6.1 or 1808.6.2.

Footings

- Exterior continuous footings may be founded at the minimum depths below the lowest adjacent final grade (i.e. 12-inch minimum depth for one-story, 18-inch minimum depth for two-story, and 24-inch minimum depth for three-story construction). Interior continuous footings for one-, two-, and three-story construction may be founded at a minimum depth of 12 inches below the lowest adjacent final grade. All continuous footings should have a minimum width of 12, 15, and 18 inches, for one-, two-, and three-story structures, respectively per Table 1809.7 of the 2016 CBC, and should be reinforced with a minimum of two (2) No. 4 bars, one (1) top and one (1) bottom.

- Exterior pad footings intended to support roof overhangs, such as second story decks, patio covers and similar construction should be a minimum of 24 inches square and founded at a minimum depth of 18 inches below the lowest adjacent final grade. No special reinforcement of the pad footings will be required.

Building Floor Slabs

- Building floor slabs should be a minimum of 4 inches thick and reinforced with a minimum of No. 3 bars spaced a maximum of 24 inches on center, each way. All floor slab reinforcement should be supported on concrete chairs or bricks to ensure the desired placement at mid-depth.

- Interior floor slabs, within living or moisture sensitive areas, should be underlain by a minimum 10-mil thick moisture/vapor barrier to help reduce the upward migration of moisture from the underlying earth materials. The moisture/vapor barrier used should meet the performance standards of an ASTM E 1745 Class A material, and be properly installed in accordance with ACI publication 318-05. It is the responsibility of the contractor to ensure that the moisture/vapor barriers are free of openings, rips, or punctures prior to placing concrete. As an option for

additional moisture reduction, higher strength concrete, such as a minimum 28-day compressive strength of 5,000 pounds per square inch (psi) may be used. Ultimately, the design of the moisture/vapor barrier system and recommendations for concrete placement and curing are the purview of the foundation engineer, taking into consideration the project requirements provided by the architect and owner.

- Garage floor slabs should be a minimum of 4 inches thick and should be reinforced in a similar manner as living area floor slabs. Garage floor slabs should be placed separately from adjacent wall footings with a positive separation maintained with ⅜ inch minimum felt expansion joint materials and quartered with weakened plane joints. A 12-inch-wide turn down founded at the same depth as adjacent footings should be provided across garage entrances. The turn down should be reinforced with a minimum of two (2) No. 4 bars, one (1) top and one (1) bottom.

- The subgrade earth materials below all floor slabs should be pre-watered to promote uniform curing of the concrete and minimize the development of shrinkage cracks, prior to placing concrete. The pre-watering should be verified by Earth Strata Geotechnical Services during construction.

Low Expansion Potential (Expansion Index of 21 to 50)

Our laboratory test results indicate that the earth materials onsite exhibit a **LOW** expansion potential as classified in accordance with 2016 CBC Section 1803.5.3 and ASTM D4829. Accordingly, the CBC specifies that slab on ground foundations (floor slabs) resting on earth materials with expansion indices greater than 20, require special design considerations in accordance with 2016 CBC Sections 1808.6.1 and 1808.6.2. The design procedures are based on the thickness and plasticity index of the various earth materials within the upper 15 feet of the proposed structure. For preliminary design purposes, we have assumed an effective plasticity index of 12.

Footings

- Exterior continuous footings may be founded at the minimum depths below the lowest adjacent final grade (i.e. 12-inch minimum depth for one-story, 18-inch minimum depth for two-story, and 24-inch minimum depth for three-story construction). Interior continuous footings for one-, two-, and three-story construction may be founded at a minimum depth of 12 inches below the lowest adjacent final grade. All continuous footings should have a minimum width of 12, 15, and 18 inches, for one-, two-, and three-story structures, respectively, and should be reinforced with a minimum of two (2) No. 4 bars, one (1) top and one (1) bottom.

- Exterior pad footings intended to support roof overhangs, such as second story decks, patio covers and similar construction should be a minimum of 24 inches square and founded at a minimum depth of 18 inches below the lowest adjacent final grade. The pad footings should be reinforced with a minimum of No. 4 bars spaced a maximum of 18 inches on center, each way, and should be placed near the bottom-third of the footings.

Building Floor Slabs

- The project architect or structural engineer should evaluate minimum floor slab thickness and

reinforcement in accordance with 2016 CBC Section 1808.6.2 based on an assumed effective plasticity index of 12. Building floor slabs should be a minimum of 4 inches thick and reinforced with a minimum of No. 3 bars spaced a maximum of 18 inches on center, each way. All floor slab reinforcement should be supported on concrete chairs or bricks to ensure the desired placement at mid-depth.

- Interior floor slabs, within living or moisture sensitive areas, should be underlain by a minimum 10-mil thick moisture/vapor barrier to help reduce the upward migration of moisture from the underlying earth materials. The moisture/vapor barrier used should meet the performance standards of an ASTM E 1745 Class A material, and be properly installed in accordance with ACI publication 318-05. It is the responsibility of the contractor to ensure that the moisture/vapor barriers are free of openings, rips, or punctures prior to placing concrete. As an option for additional moisture reduction, higher strength concrete, such as a minimum 28-day compressive strength of 5,000 pounds per square inch (psi) may be used. Ultimately, the design of the moisture/vapor barrier system and recommendations for concrete placement and curing are the purview of the foundation engineer, taking into consideration the project requirements provided by the architect and owner.

- Garage floor slabs should be a minimum of 4 inches thick and should be reinforced in a similar manner as living area floor slabs. Garage floor slabs should be placed separately from adjacent wall footings with a positive separation maintained with ⅜ inch minimum felt expansion joint materials and quartered with weakened plane joints. A 12-inch-wide turn down founded at the same depth as adjacent footings should be provided across garage entrances. The turn down should be reinforced with a minimum of two (2) No. 4 bars, one (1) top and one (1) bottom.

- The subgrade earth materials below all floor slabs should be pre-watered to achieve a moisture content that is at least equal or slightly greater than optimum moisture content, prior to placing concrete. This moisture content should penetrate a minimum depth of 12 inches into the subgrade earth materials. The pre-watering should be verified by Earth Strata Geotechnical Services during construction.

Medium Expansion Potential (Expansion Index of 51 to 90)

Our laboratory test results indicate that the earth materials onsite exhibit a **MEDIUM** expansion potential as classified in accordance with in 2016 CBC Section 1803.5.3 and ASTM D4829. Accordingly, the CBC specifies that slab on ground foundations (floor slabs) resting on earth materials with expansion indices greater than 20, require special design considerations in accordance with 2016 CBC Sections 1808.6.1 and 1808.6.2. The design procedures are based on the thickness and plasticity index of the various earth materials within the upper 15 feet of the proposed structure. For preliminary design purposes, we have assumed an effective plasticity index of 16.

Footings

- Exterior continuous footings for both one- and two-story construction should be founded at a minimum depth of 18 inches below the lowest adjacent final grade. Exterior continuous footings for three-story construction may be founded at a minimum depth of 24 inches below the lowest adjacent final grade. Interior continuous footings for one-, two-, and three-story construction

may be founded at a minimum depth of 12 inches below the lowest adjacent final grade. All continuous footings should have a minimum width of 12, 15, and 18 inches, for one-, two-, and three-story structures, respectively, and should be reinforced with a minimum of two (2) No. 4 bars, one (1) top and one (1) bottom.

- Exterior pad footings intended to support roof overhangs, such as second story decks, patio covers and similar construction should be a minimum of 24 inches square and founded at a minimum depth of 18 inches below the lowest adjacent final grade. The pad footings should be reinforced with a minimum of No. 4 bars spaced a maximum of 18 inches on center, each way, and should be placed near the bottom-third of the footings.

Building Floor Slabs

- The project architect or structural engineer should evaluate minimum floor slab thickness and reinforcement in accordance with 2016 CBC Section 1808.6.2 based on an assumed effective plasticity index of 16. Building floor slabs should be a minimum of 4 inches thick and reinforced with a minimum of No. 3 bars spaced a maximum of 18 inches on center, each way. All floor slab reinforcement should be supported on concrete chairs or bricks to ensure the desired placement at mid-depth.

- Interior floor slabs, within living or moisture sensitive areas, should be underlain by a minimum 10-mil thick moisture/vapor barrier to help reduce the upward migration of moisture from the underlying earth materials. The moisture/vapor barrier used should meet the performance standards of an ASTM E 1745 Class A material, and be properly installed in accordance with ACI publication 318-05. It is the responsibility of the contractor to ensure that the moisture/vapor barriers are free of openings, rips, or punctures prior to placing concrete. As an option for additional moisture reduction, higher strength concrete, such as a minimum 28-day compressive strength of 5,000 pounds per square inch (psi) may be used. Ultimately, the design of the moisture/vapor barrier system and recommendations for concrete placement and curing are the purview of the foundation engineer, taking into consideration the project requirements provided by the architect and owner.

- Garage floor slabs should be a minimum of 5 inches thick and should be reinforced in a similar manner as living area floor slabs. Garage floor slabs should be placed separately from adjacent wall footings with a positive separation maintained with ⅜ inch minimum felt expansion joint materials and quartered with weakened plane joints. A 12-inch-wide turn down founded at the same depth as adjacent footings should be provided across garage entrances. The turn down should be reinforced with a minimum of two (2) No. 4 bars, one (1) top and one (1) bottom.

- The subgrade earth materials below all floor slabs should be pre-watered to achieve a moisture content that is at least 2 percent over optimum moisture content, prior to placing concrete. This moisture content should penetrate a minimum depth of 18 inches into the subgrade earth materials. The pre-watering should be verified and tested by Earth Strata Geotechnical Services during construction.

High Expansion Potential (Expansion Index of 91 to 130)

Our laboratory test results indicate that the earth materials onsite exhibit a **HIGH** expansion potential as classified in accordance with in 2016 CBC Section 1803.5.3 and ASTM D4829. Accordingly, the CBC specifies that slab on ground foundations (floor slabs) resting on earth materials with expansion indices greater than 20, require special design considerations in accordance with 2016 CBC Sections 1808.6.1 and 1808.6.2. The design procedures are based on the thickness and plasticity index of the various earth materials within the upper 15 feet of the proposed structure. For preliminary design purposes, we have assumed an effective plasticity index of 20.

Footings

- Exterior continuous footings for one-, two-, and three-story construction should be founded at a minimum depth of 24 inches below the lowest adjacent final grade. Interior continuous footings for one-, two-, and three-story construction may be founded at a minimum depth of 18 inches below the lowest adjacent final grade. All continuous footings should have a minimum width of 12, 15, and 18 inches, for one-, two-, and three-story structures, respectively, and should be reinforced with a minimum of four (4) No. 4 bars, two (2) top and two (2) bottom.

- Exterior pad footings intended to support roof overhangs, such as second story decks, patio covers and similar construction should be a minimum of 24 inches square and founded at a minimum depth of 24 inches below the lowest adjacent final grade. The pad footings should be reinforced with a minimum of No. 4 bars spaced a maximum of 16 inches on center, each way, and should be placed near the bottom-third of the footings.

Building Floor Slabs

- The project architect or structural engineer should evaluate minimum floor slab thickness and reinforcement in accordance with 2016 CBC Section 1808.6.2 based on an assumed effective plasticity index of 20. Building floor slabs should be a minimum of 5 inches thick and reinforced with a minimum of No. 4 bars spaced a maximum of 18 inches on center, each way. All floor slab reinforcement should be supported on concrete chairs or bricks to ensure the desired placement at mid-depth.

- Interior floor slabs, within living or moisture sensitive areas, should be underlain by a minimum 10-mil thick moisture/vapor barrier to help reduce the upward migration of moisture from the underlying earth materials. The moisture/vapor barrier used should meet the performance standards of an ASTM E 1745 Class A material, and be properly installed in accordance with ACI publication 318-05. It is the responsibility of the contractor to ensure that the moisture/vapor barriers are free of openings, rips, or punctures prior to placing concrete. As an option for additional moisture reduction, higher strength concrete, such as a minimum 28-day compressive strength of 5,000 pounds per square inch (psi) may be used. Ultimately, the design of the moisture/vapor barrier system and recommendations for concrete placement and curing are the purview of the foundation engineer, taking into consideration the project requirements provided by the architect and owner.

- Garage floor slabs should have a minimum slab thickness of 5 inches on at least 4 inches of base

and should be reinforced in a similar manner as living area floor slabs. Garage floor slabs should be placed separately from adjacent wall footings with a positive separation maintained with ⅜ inch minimum felt expansion joint materials and quartered with weakened plane joints. A 12-inch-wide by 24-inch-deep turn down founded at the same depth as adjacent footings should be provided across garage entrances. The turn down should be reinforced with a minimum of four (4) No. 4 bars, two (2) top and two (2) bottom.

- The subgrade earth materials below all floor slabs should be presoaked to achieve a moisture content that is at least 4 percent over optimum moisture content. This moisture content should penetrate to a minimum depth of 24 inches into the subgrade earth materials. Presaturation of the subgrade earth materials will promote uniform curing of the concrete, expand earth materials, and minimize the development of shrinkage cracks. The pre-watering should be verified and tested by Earth Strata Geotechnical Services during construction.

Post Tensioned Slab/Foundation Design Recommendations

In lieu of the proceeding foundation recommendations, post tensioned slabs may be used to support the proposed structures. We recommend that the foundation engineer design the foundation system using the Preliminary Post Tensioned Foundation Slab Design table below. These parameters have been provided in general accordance with Post Tensioned Design. Alternate designs addressing the effects of expansive earth materials are allowed per 2016 CBC Section 1808.6.2. When utilizing these parameters, the foundation engineer should design the foundation system in accordance with the allowable deflection criteria of applicable codes and per the requirements of the structural engineer/architect.

It should be noted that the post tensioned design methodology is partially based on the assumption that soil moisture changes around and underneath post tensioned slabs, are influenced only by climate conditions. Soil moisture change below slabs is the major factor in foundation damages relating to expansive soil. However, the design methodology has no consideration for presaturation, owner irrigation, or other non-climate related influences on the moisture content of subgrade earth materials. In recognition of these factors, we modified the geotechnical parameters determined from this methodology to account for reasonable irrigation practices and proper homeowner maintenance. Additionally, we recommend that prior to excavating footings, slab subgrades be presoaked to a depth of 12 inches and maintained at above optimum moisture until placing concrete. Furthermore, we recommend that the moisture content of the earth materials around the immediate perimeter and below the slab be presaturated to at least 1% above optimum moisture content just prior to placing concrete. The pre-watering should be verified and tested by Earth Strata Geotechnical Services during construction.

The following geotechnical parameters assume that areas adjacent to the foundations, which are planted and irrigated, will be designed with proper drainage to prevent water from ponding. Water ponding near the foundation causes significant moisture change below the foundation. Our recommendations do not account for excessive irrigation and/or incorrect landscape design. Planters placed adjacent to the foundation, should be designed with an effective drainage system or liners, to prevent moisture infiltration below the foundation. Some lifting of the perimeter foundation beam should be expected even with properly constructed planters. Based on our experience monitoring sites with similar earth materials, elevated moisture contents below the foundation perimeter due to incorrect landscaping irrigation or maintenance, can result in uplift at the perimeter foundation relative to the central portion of the slab.

Future owners should be informed and educated of the importance in maintaining a consistent level of moisture within the earth materials around the structures. Future owners should also be informed of the potential negative consequences of either excessive watering, or allowing expansive earth materials to become too dry. Earth materials will shrink as they dry, followed by swelling during the rainy winter season, or when irrigation is resumed. This will cause distress to site improvements and structures.

Preliminary Post Tensioned Foundation Slab Design

PARAMETER	VALUE			
Expansion Index	Very Low[1]	Low[1]	Medium[1]	High[1]
Percent Finer than 0.002 mm in the Fraction Passing the No. 200 Sieve	< 20 percent (assumed)	< 20 percent (assumed)	< 30 percent (assumed)	< 40 percent (assumed)
Type of Clay Mineral	Montmorillonite (assumed)	Montmorillonite (assumed)	Montmorillonite (assumed)	Montmorillonite (assumed)
Thornthwaite Moisture Index	+20	+20	+20	+20
Depth to Constant Soil Suction	7 feet	7 feet	7 feet	7 feet
Constant Soil Suction	P.F. 3.6	P.F. 3.6	P.F. 3.6	P.F. 3.6
Moisture Velocity	0.7 inches/month	0.7 inches/month	0.7 inches/month	0.7 inches/month
Center Lift — Edge moisture variation distance, e_m / Center lift, y_m	5.5 feet / 1.5 inches	5.5 feet / 2.0 inches	5.5 feet / 2.5 inches	5.5 feet / 3.0 inches
Edge Lift — Edge moisture variation distance, e_m / Edge lift, y_m	2.5 feet / 0.4 inches	3.0 feet / 0.8 inches	3.5 feet / 1.0 inches	4.0 feet / 1.5 inches
Soluble Sulfate Content for Design of Concrete Mixtures in Contact with Earth Materials	Negligible	Negligible	Negligible	Negligible
Modulus of Subgrade Reaction, k (assuming presaturation as indicated below)	200 pci	200 pci	120 pci	120 pci
Minimum Perimeter Foundation Embedment	12	18	24	24
Perimeter Foundation Reinforcement	--	--	--	2 No. 5 Bars (or equivalent)[2]
Under Slab Moisture/Vapor Barrier and Sand Layer	10-mil thick moisture/vapor barrier meeting the requirements of a ASTM E 1745 Class A material			

1. Obtained by laboratory testing.
2. Recommendations for foundation reinforcement are ultimately the purview of the foundation/structural engineer based upon the geotechnical criteria presented in this report, and structural engineering considerations.

Corrosivity

Corrosion is defined by the National Association of Corrosion Engineers (NACE) as "a deterioration of a substance or its properties because of a reaction with its environment." From a geotechnical viewpoint, the "substances" are the reinforced concrete foundations or buried metallic elements (not surrounded by concrete) and the "environment" is the prevailing earth materials in contact with them. Many factors can contribute to corrosivity, including the presence of chlorides, sulfates, salts, organic materials, different

oxygen levels, poor drainage, different soil types, and moisture content. It is not considered practical or realistic to test for all of the factors which may contribute to corrosivity.

The potential for concrete exposure to chlorides is based upon the recognized Caltrans reference standard "Bridge Design Specifications", under Subsection 8.22.1 of that document, Caltrans has determined that "Corrosive water or soil contains more than 500 parts per million (ppm) of chlorides". Based on limited preliminary laboratory testing, the onsite earth materials have chloride contents *less* than 500 ppm. As such, specific requirements resulting from elevated chloride contents are not required.

Specific guidelines for concrete mix design are provided in 2016 CBC Section 1904.1 and ACI 318, Section 4.3 Table 4.3.1 when the soluble sulfate content of earth materials exceeds 0.1 percent by weight. Based on limited preliminary laboratory testing, the onsite earth materials are classified in accordance with Table 4.3.1 as having a *negligible* sulfate exposure condition. Therefore, structural concrete in contact with onsite earth materials should utilize Type I or II.

Based on our laboratory testing of resistivity, the onsite earth materials in contact with buried steel should be considered *corrosive*. Additionally, pH values below 9.7 are recognized as being corrosive to most common metallic components including, copper, steel, iron, and aluminum. The pH values for the earth materials tested were *lower* than 9.7. Therefore, any steel or metallic materials that are exposed to the earth materials should be encased in concrete or other measures should be taken to provide corrosion protection.

If building slabs are to be post tensioned, the post tensioning cables should be encased in concrete and/or encapsulated in accordance with the Post Tensioning Institute Guide Specifications. Post tensioning cable end plate anchors and nuts also need to be protected if exposed. If the anchor plates and nuts are in a recess in the edge of the concrete slab, the recess should be filled in with a non-shrink, non-porous, moisture-insensitive epoxy grout so that the anchorage assembly and the end of the cable are completely encased and isolated from the soil. A standard non-shrink, non-metallic cementitious grout may be used only when the post tension anchoring assembly is polyethylene encapsulated similar to that offered by Hayes Industries, LTD or O'Strand, Inc.

The preliminary test results for corrosivity are based on limited samples, and the initiation of grading may blend various earth materials together. This blending or imported material could alter and increase the detrimental properties of the onsite earth materials. Accordingly, additional testing for chlorides and sulfates along with testing for pH and resistivity should be performed upon completion of grading. Laboratory test results are presented in Appendix C.

RETAINING WALLS

Active and At-Rest Earth Pressures

Foundations may be designed in accordance with the recommendations provided in the Tentative Foundation Design Recommendation section of this report. The following table provides the minimum recommended equivalent fluid pressures for design of retaining walls a maximum of 8 feet high. The active earth pressure should be used for design of unrestrained retaining walls, which are free to tilt slightly. The at-rest earth pressure should be used for design of retaining walls that are restrained at the top, such as basement walls, curved walls with no joints, or walls restrained at corners. For curved walls, active

pressure may be used if tilting is acceptable and construction joints are provided at each angle point and at a minimum of 15 foot intervals along the curved segments.

MINIMUM STATIC EQUIVALENT FLUID PRESSURES (pcf) (VERY LOW TO LOW EXPANSION INDEX)		
PRESSURE TYPE	BACKSLOPE CONDITION	
	LEVEL	2:1 (h:v)
Active Earth Pressure	40	63
At-Rest Earth Pressure	60	95

MINIMUM STATIC EQUIVALENT FLUID PRESSURES (pcf) (MEDIUM EXPANSION INDEX)		
PRESSURE TYPE	BACKSLOPE CONDITION	
	LEVEL	2:1 (h:v)
Active Earth Pressure	45	75
At-Rest Earth Pressure	68	110

MINIMUM STATIC EQUIVALENT FLUID PRESSURES (pcf) (HIGH EXPANSION INDEX)		
PRESSURE TYPE	BACKSLOPE CONDITION	
	LEVEL	2:1 (h:v)
Active Earth Pressure	50	87
At-Rest Earth Pressure	75	125

The retaining wall parameters provided do not account for hydrostatic pressure behind the retaining walls. Therefore, the subdrain system is a very important part of the design. All retaining walls should be designed to resist surcharge loads imposed by other nearby walls, structures, or vehicles should be added to the above earth pressures, if the additional loads are being applied within a 1.5:1 (h:v) plane projected up from the heel of the retaining wall footing. As a way of minimizing surcharge loads and the settlement potential of nearby buildings, the footings for the building can be deepened below the 1.5:1 (h:v)plane projected up from the heel of the retaining wall footing.

Upon request and under a separate scope of work, more detailed analyses can be performed to address equivalent fluid pressures with regard to stepped retaining walls, actual retaining wall heights, actual backfill inclinations, specific backfill materials, higher retaining walls requiring earthquake design motions, etc.

Subdrain System

We recommend a perforated pipe and gravel subdrain system be provided behind all proposed retaining walls to prevent the buildup of hydrostatic pressure behind the proposed retaining walls. The perforated pipe should consist of 4-inch minimum diameter Schedule 40 PVC or ABS SDR-35, placed with the perforations facing down. The pipe should be surrounded by 1 cubic foot per foot of ¾- or 1½ inch open graded gravel wrapped in filter fabric. The filter fabric should consist of Mirafi 140N or equivalent to prevent infiltration of fines and subsequent clogging of the subdrain system.

In lieu of a perforated pipe and gravel subdrain system, weep holes or open vertical masonry joints may be provided in the lowest row of block exposed to the air to prevent the buildup of hydrostatic pressure behind the proposed retaining walls. Weep holes should be a minimum of 3 inches in diameter and provided at intervals of at least every 6 feet along the wall. Open vertical masonry joints should be provided at a minimum of 32 inch intervals. A continuous gravel fill, a minimum of 1 cubic foot per foot, should be placed behind the weep holes or open masonry joints. The gravel should be wrapped in filter fabric consisting of Mirafi 140N or equivalent.

The retaining walls should be adequately coated on the backfilled side of the walls with a proven waterproofing compound by an experienced professional to inhibit infiltration of moisture through the walls.

Temporary Excavations

All excavations should be made in accordance with Cal-OSHA requirements. Earth Strata Geotechnical Services is not responsible for job site safety.

Retaining Wall Backfill

Retaining wall backfill materials should be approved by the geotechnical engineer or his representative prior to placement as compacted fill. Retaining wall backfill should be placed in lifts no greater than 6 to 8 inches, watered or air dried as necessary to achieve near optimum moisture contents. All retaining wall backfill should be compacted to a minimum of 90 percent of the maximum dry density as determined by ASTM D 1557. Retaining wall backfill should be capped with a paved surface drain.

CONCRETE FLATWORK

Thickness and Joint Spacing

Concrete sidewalks and patio type slabs should be at least 3½ inches thick and provided with construction or expansion joints every 6 feet or less, to reduce the potential for excessive cracking. Concrete driveway slabs should be at least 4 inches thick and provided with construction or expansion joints every 10 feet or less, and for earth materials having a **MEDIUM** to **VERY HIGH** expansion potential the edges of the driveway slabs should be thickened to 6 inches.

Subgrade Preparation

In order to reduce the potential for unsightly cracking, subgrade earth materials underlying concrete flatwork should be compacted at near optimum moisture to a minimum of 90 percent of the maximum dry density determined by ASTM D 1557and then moistened to optimum or slightly above optimum moisture content. This moisture should extend to a depth of 12 inches below subgrade and be maintained prior to placement of concrete. Pre-watering of the earth materials prior to placing concrete will promote uniform curing of the concrete and minimize the development of shrinkage cracks. The project geotechnical engineer or his representative should verify the density and moisture content of the earth materials and the depth of moisture penetration prior to placing concrete.

Cracking within concrete flatwork is often a result of factors such as the use of too high a water to cement ratio and/or inadequate steps taken to prevent moisture loss during the curing of the concrete. Concrete distress can be reduced by proper concrete mix design and proper placement and curing of the concrete. Minor cracking within concrete flatwork is normal and should be expected.

PRELIMINARY ASPHALTIC CONCRETE PAVEMENT DESIGN

Laboratory testing of representative earth materials indicate an R-value of 6 or 21 are feasible for preliminary pavement design. The following table includes our minimum recommended asphaltic concrete pavement sections calculated in accordance with the State of California design procedures using assumed Traffic Indices. Final pavement design should be based on sampling and testing of post grading conditions. Alternative pavement sections and calculation sheets have been provided within the appendices of this report.

PRELIMINARY ASPHALTIC CONCRETE PAVEMENT DESIGN				
PARAMETERS	**CUL-DE-SAC**	**RESIDENTIAL STREETS**	**RESIDENTIAL COLLECTOR STREETS/ENTRANCES**	**MAJOR ARTERIAL**
Assumed Traffic Index	5.0	6.0	7.0	9.0
Design R-Value	6	6	6	6
AC Thickness (feet)	0.25	0.25	0.33	0.46
AB Thickness (feet)	0.80	1.10	1.25	1.25

Notes: AC – Asphaltic Concrete
AB – Aggregate Base

PRELIMINARY ASPHALTIC CONCRETE PAVEMENT DESIGN				
PARAMETERS	**CUL-DE-SAC**	**RESIDENTIAL STREETS**	**RESIDENTIAL COLLECTOR STREETS/ENTRANCES**	**MAJOR ARTERIAL**
Assumed Traffic Index	5.0	6.0	7.0	9.0
Design R-Value	21	21	21	21
AC Thickness (feet)	0.25	0.25	0.33	0.46
AB Thickness (feet)	0.55	0.85	0.95	1.00

Notes: AC – Asphaltic Concrete
AB – Aggregate Base

The subgrade earth materials immediately below the aggregate base (base) should be compacted to a minimum of 95 percent of the maximum dry density determined by ASTM D 1557 to a minimum depth of 12 inches. Base materials should be compacted to a minimum of 95 percent of the maximum dry density determined by ASTM D 1557.

Base materials should consist of Class 2 aggregate base conforming to Section 26-1.02B of the State of California Standard Specifications or crushed aggregate base conforming to Section 200-2 of the Standard Specifications for Public Works Construction (Greenbook). Base materials should be compacted at or slightly below optimum moisture content. Asphaltic concrete materials and construction operations should conform to Section 203 of the Greenbook.

GRADING PLAN REVIEW AND CONSTRUCTION SERVICES

This report has been prepared for the exclusive use of **OLSEN 212 LLC** and their authorized representative. It likely does not contain sufficient information for other parties or other uses. Earth Strata Geotechnical Services should be engaged to review the final design plans and specifications prior to construction. This is to verify that the recommendations contained in this report have been properly incorporated into the project plans and specifications. Should Earth Strata Geotechnical Services not be accorded the opportunity to review the project plans and specifications, we are not responsibility for misinterpretation of our recommendations.

We recommend that Earth Strata Geotechnical Services be retained to provide geologic and geotechnical engineering services during grading and foundation excavation phases of the work. In order to allow for design changes in the event that the subsurface conditions differ from those anticipated prior to construction.

Earth Strata Geotechnical Services should review any changes in the project and modify and approve in writing the conclusions and recommendations of this report. This report and the drawings contained within are intended for design input purposes only and are not intended to act as construction drawings or specifications. In the event that conditions encountered during grading or construction operations appear to be different than those indicated in this report, this office should be notified immediately, as revisions may be required.

REPORT LIMITATIONS

Our services were performed using the degree of care and skill ordinarily exercised, under similar circumstances, by reputable soils engineers and geologists, practicing at the time and location this report was prepared. No other warranty, expressed or implied, is made as to the conclusions and professional advice included in this report.

Earth materials vary in type, strength, and other geotechnical properties between points of observation and exploration. Groundwater and moisture conditions can also vary due to natural processes or the works of man on this or adjacent properties. As a result, we do not and cannot have complete knowledge of the subsurface conditions beneath the subject property. No practical study can completely eliminate uncertainty with regard to the anticipated geotechnical conditions in connection with a subject property. The conclusions and recommendations within this report are based upon the findings at the points of observation and are subject to confirmation by Earth Strata Geotechnical Services based on the conditions revealed during grading and construction.

This report was prepared with the understanding that it is the responsibility of the owner or their representative, to ensure that the conclusions and recommendations contained herein are brought to the attention of the other project consultants and are incorporated into the plans and specifications. The owners' contractor should properly implement the conclusions and recommendations during grading and

construction, and notify the owner if they consider any of the recommendations presented herein to be unsafe or unsuitable.

APPENDIX A

REFERENCES

Reso A - Exhibit C2 (EIR Technical Appendix)

APPENDIX A

References

California Building Standards Commission, 2016, *2016 California Building Code, California Code of Regulations Title 24, Part 2, Volume 2 of 2,* Based on 2012 International Building Code.

DeLorme, 2004, (www.delorme.com) *Topo USA*®.

Dibblee, T.W., and Minch, J.A., 2004, *Geologic Map of the Templeton Quadrangle, San Luis Obispo County, California:* Dibblee Geological Foundation, Dibblee Foundation Map DF-135.

Hart, Earl W. and Bryant, William A., *1997, Fault Rupture Hazard Zones in California, CDMG Special Publication 42,* revised 2003.

Irvine Geotechnical, 2001, Mult Calc 2000, October 10.

National Association of Corrosion Engineers, 1984, *Corrosion Basics An Introduction*, page 191.

Southern California Earthquake Center (SCEC), 1999, *Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction Hazards in California,* March.

APPENDIX B

EXPLORATORY LOGS

Reso A - Exhibit C2 (EIR Technical Appendix)

Geotechnical Boring Log B-1

Date: October 11, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0		0-5'				**Topsoil:**
					SM	Silty SAND; brownish gray, dry, loose to medium dense, fine to coarse sand
	49	2.5'	113.1	17.5		**Quaternary Alluvium (Qa):**
					CL	Sandy CLAY; orangeish brown, moist, very dense, fine to coarse sand
5	55	5'	121.1	9.0		
	24	7.5'	87.0	27.0		**Quaternary Paso Robles Formation (QTp):**
						Sandy CLAYSTONE; light olive brown, slighlty moist, medium dense, fine to coarse
						sand with gravel, trace calcite
10	83/11"	10'	107.0	19.9		Yellowish brown, very dense below 10 feet
15	50	15'	114.2	15.5		SANDSTONE with Clay; brownish yellow, moist, hard, fine to coarse sand,
						trace gravel
						Total Depth: 16.5 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-2

Date: October 11, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil**
					SM	Silty SAND; grayish brown, dry, loose to medium dense, fine to coarse sand
	26	2.5'	115.3	13.1		**Quaternary Alluvium (Qa)**
					CL	Sandy CLAY; dark grayish brown, moist, medium dense, fine to medium sand
5						
	33	5'	111.5	5.7	SP-SM	Poorly-Graded SAND with Silt; pale brown, moist, dense, fine to medium sand,
						trace calcite
	43	7.5'	113.2	10.7		Pale yellow below 7 feet
10						
	34	10'	120.4	8.4		
						Quaternary Paso Robles Formation (QTp)
	46	12.5'	122.1	5.3		SANDSTONE with Clay; pale yellow, moist, hard, fine to coarse sand, trace
						gravel
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-3

Date: October 11, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil**
					SM	Silty SAND; grayish brown, dry, medium dense, fine to coarse sand
	15	2.5'	109.4	10.2		**Quaternary Alluvium (Qa)**
					CL	Sandy CLAY; dark grayish brown, slighlty moist, medium dense, fine to medium
5						sand
	32	5'	114.1	10.8	SP-SM	Poorly-Graded SAND with Silt; pale yellow, slighlty moist, dense, fine to medium
						sand
	57	7.5'	-	2.5		**Quaternary Paso Robles Formation (QTp)**
						Silty SANDSTONE; pale yellow, slightly moist, very hard, fine to coarse grained,
						trace gravel
10	34	10'	119.5	11.4		Fine grained below 10 feet
	31	12.5'	108.1	13.3		
						Total Depth: 14 feet
15						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-4

Date: October 11, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0		0-5'				**Topsoil**
					SM	Silty SAND; medium brown, dry to slightly moist, loose, fine to medium sand
	14	2.5'	118.2	10.5		**Quaternary Alluvium (Qa)**
					CL	Sandy CLAY; dark grayish brown, slightly moist, medium dense, fine to medium
						sand
5	44	5'	120.4	10.5	SC	Clayey SAND; yellowish brown, moist, dense, fine to medium sand
	33	7.5'	114.3	6.5		
					SP-SC	Poorly-Graded SAND with Clay; yellowish brown, moist, dense, fine to medium
						sand
10	28	10'	113.4	10.6		Pale yellow, medium dense below 10 feet
	58	12.5'	119.9	12.7		**Quaternary Paso Robles Formation (QTp)**
						SANDSTONE with Clay; yellowish brown, very hard, fine to coarse grained
						Total Depth: 14 feet
15						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-5

Date: October 11, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil**
					SM	Silty SAND; grayish white, dry, loose to medium dense, fine to coarse sand
	22	2.5'	115.0	13.7		**Quaternary Alluvium (Qa)**
					SC	Clayey SAND; yellowish brown, slightly moist, medium dense, fine to coarse
						sand, trace calcite
5	31	5'	120.3	11.3	SP-SC	Poorly-Graded SAND with Clay; yellowish brown, moist, dense, fine to medium
						sand
	31	7.5'	124.2	8.6		Pale yellow below 7.5 feet
10	32	10'	118.4	12..6		Trace gravel below 10 feet
	28	12.5'	119.6	8.1		
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-6

Date: October 11, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Quaternary Alluvium (Qa)**
	70/10"	2.5'	101.2	13.4	ML	Sandy SILT; grayish brown, dry, soft, fine to coarse sand
					SC-SM	Clayey SAND with Silt; yellowish brown, slightly moist, very dense, fine to medium sand
5	63	5'	113.7	14.5		
	16	7.5'	104.2	15.1	SP-SC	Poorly-Graded SAND with Clay; yellowish brown, moist, medium dense, fine to medium sand
10	21	10'	116.2	13.4		
	23	12.5'	112.4	19.3		
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-7

Date: October 11, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Quaternary Alluvium (Qa)**
					SM	Silty SAND; gray, dry, dense, fine to coarse sand
	32	2.5'	71.1	18.6	SC	Clayey SAND; orangeish brown, slightly moist, dense, fine to coarse sand
5	29	5'	123.3	9.0	CL	Sandy CLAY; orangeish brown, slightly moist, medium dense, fine to medium sand
	28	7.5'	105.3	8.0		Pale yellow, trace gravel below 7 feet
10	28	10'	114.0	13.0	SP-SC	Poorly-Graded SAND with Clay; orangeish brown, moist, medium dense, fine to coarse sand
	26	12.5'	108.1	7.3		Brownish yellow below 12 feet
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-8

Date: October 11, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0		0-5'				**Quaternary Allulvium (Qa)**
					CL	Sandy CLAY; olive brown, moist, medium dense, fine to coarse sand
	18	2.5'	106.3	16.7		
5	17	5'	114.1	12.8		
	41	7.5'	109.9	9.0		**Quaternary Paso Robles Formation (QTp)**
						BRECCIA; olive brown, moist, hard, fine to coarse sand
10	34	10'	-	-		No Recovery at 10 feet
	35	12.5'	111.6	17.8		Clayey SANDSTONE; olive yellow, moist, hard, fine to medium sand
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-9

Date: October 11, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Quaternary Alluvium (Qa)**
	38	2.5'	102.3	14.3	SM	Silty SAND; grayish brown, slightly moist, dense, fine to medium sand
5	48	5'	111.3	7.9	SP-SC	Poorly-Graded SAND with Clay; light reddish brown, slightly moist, dense, fine to coarse sand
	13	7.5'	105.5	20.4	CL	Sandy CLAY; olive yellow, moist, very stiff, fine to coarse sand
10	24	10'	108.8	14.1		
	31	12.5'	107.9	8.8		Pale yellow, dense below 12 feet
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-10

Date: October 11, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Quaternary Alluvium (Qa)**
	41	2.5'	112.5	8.8	SC	Clayey SAND; yellowish brown, moist, dense, fine to coarse sand, trace calcite
5	15	5'	111.0	10.1	SP-SC	Poorly-Graded SAND with Clay; pale yellow, medium brown, moist, medium dense, fine to medium sand
	9	7.5'	105.5	18.4		Loose, fine sand with gravel 7 to 10 feet
10	13	10'	95.2	7.1		
	18	12.5'	113.1	14.9	SP	Poorly-Graded SAND; brownish orange, moist, medium dense, fine to coarse sand
15						Total Depth: 14 feet No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-11

Date: October 11, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Quaternary Alluvium (Qa)**
	21	2.5'	101.8	18.0	CL	Sandy CLAY; yellow brown, moist, medium dense, fine to medium sand, trace calcite
5	15	5'	111.9	17.3		
	45	7.5'	117.4	6.6		**Quaternary Paso Robles Formation (QTp)**
						SANDSTONE with Clay; yellowish brown, moist, hard, fine to medium sand, trace gravel
10	58	10'	111.7	10.3		Very hard 10 to 12 feet
	46	12.5'	102.1	7.4		Hard below 12 feet
15						Total Depth: 14 feet No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-12

Date: October 11, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Quaternary Alluvium (Qa)**
	27	2.5'	107.4	17.7	CL	Sandy CLAY; olive brown, moist, medium dense, fine to medium sand
5	19	5'	103.1	13.0	ML	Sandy SILT; pale yellow, slightly moist, stiff, fine sand
	23	7.5'	104.9	14.2		Orangish brown, very stiff 7 to 10 feet
10	51	10'	114.4	9.3		Olive brown 10 to 12 feet
	43	12.5'	112.4	17.0		Orangeish brown below 12 feet
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-13

Date: October 11, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Quaternary Alluvium (Qa)**
	20	2.5'	97.6	18.5	ML	Sandy SILT; yellow brown, slightly moist, stiff, fine to medium sand
5						**Quaternary Paso Robles Formation (QTp)**
	68	5'	113.2	16.4		Sandy SILTSTONE; pale yellow, slightly moist, very hard, fine to medium sand
	71	7.5'	111.9	13.3		Orange brown below 7 feet
10	56	10'	109.9	13.8		
	43	12.5'	114.3	10.8		Hard below 12 feet
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-14

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil**
					SM	Silty SAND; light brown, dry, medium dense, fine to medium sand, trace gravel
	39	2.5'	116.3	8.5	CL	Sandy CLAY; dark brown, dry, very stiff, fine sand
5						**Quaternary Paso Robles Formation (QTp)**
	41	5'	99.9	13.3		Silty SANDSTONE; yellowish brown, dry, hard, fine to medium sand, trace clay
	51	7.5'	104.4	21.2		Brownish yellow below 7.5 feet
10	54	10'	103.9	21.6		Sandy SILTSTONE; pale yellow to pale brown, dry, very hard, fine sand
	59	12.5'	108.8	4.2		
						Silty SANDSTONE; pale yellow, dry, fine to coarse sand
						Total Depth: 14 feet
15						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-15

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil**
	69	2.5'	111.9	16.6	SM	Silty SAND; brownish gray, dry, medium dense, fine to coarse sand
						Quaternary Paso Robles Formation (QTp)
5	40	5'	109.1	15.5		Sandy SILTSTONE; pale yellow, dry, hard to very hard, fine sand, abundant calcite
	62	7.5'	112.0	8.1		Silty SANDSTONE; pale yellow, dry, very hard, fine to medium sand
10	76	10'	114.9	8.6		Orangeish brown below 10 feet
	54	12.5'	106.2	7.5		
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-16

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil**
					SM	Silty SAND; brownish gray, dry, dense, fine to coarse sand
	48	2.5'	102.5	11.4		**Quaternary Paso Robles Formation (QTp)**
						Silty SANDSTONE; yellow, dry, hard, fine to coarse sand with gravel
5	49	5'	104.3	23.6		Sandy SILTSTONE; yellowish brown to olive gray, moist, hard, fine sand
	39	7.5'	116.9	10.8		Silty SANDSTONE; yellowish brown, slightly moist, hard to very hard, fine to coarse sand, trace gravel and clay
10	55	10'	106.4	8.5		
	60	12.5'	109.0	8.0		
15						Total Depth: 14 feet No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-17

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil**
					SM	Silty SAND; brownish gray, dry, medium dense, fine to coarse sand
	46	2.5'	117.4	10.0		**Quaternary Paso Robles Formation (QTp)**
						Silty SANDSTONE with Clay; reddish brown, slightly moist, hard, fine to coarse
						sand with gravel, abundant calcite
5	26	5'	106.0	21.8		SILTSTONE; orangeish brown, slightly moist, moderately hard, fine sand, trace
						calcite
	20	7.5'	102.3	20.4		
10	26	10'	99.9	25.1		Pale yellow below 10 feet
	37	12.5'	116.5	16.1		Hard below 12 feet
						Total Depth: 14 feet
15						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-18

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Quaternary Alluvium (Qa)**
	53	2.5'	111.2	13.4	SM	Silty SAND; brownish gray, dry, medium dense, fine to coarse sand
						Quaternary Paso Robles Formation (QTp)
5	31	5'	108.2	21.0		Sandy CLAYSTONE; orangeish brown, slightly moist, dense, fine sand
	37	7.5'	104.5	16.2		Silty SANDSTONE; yellow brown, slightly moist, hard, fine sand
10	18	10'	95.9	27.3		SILTSTONE; gray, slightly moist, moderately hard
						Sandy SILTSTONE; grayish brown, slightly moist, moderately hard, fine sand
15	23	15'	120.5	13.5		
						Total Depth: 16.5 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-19

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ**
Drilling Company: Drilling It	**Type of Rig: dms-9630**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Quaternary Alluvium (Qa):**
					SM	Silty SAND; brownish gray, slightly moist, medium dense, fine to coarse sand,
	21	2.5'	94.9	11.6		trace gravel
5						**Quaternary Paso Robles Formation (QTp):**
	40	5'	112.0	11.9		Silty SANDSTONE; brownish gray, slightly moist, hard, fine to coarse sand,
						trace gravel
	56	7.5'	98.3	14.2		Orangish rbown below 7 feet
						Abundant gravel below 10 feet
10	53	10'	102.7	8.0		
	50	12.5'	90.9	14.1		
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-20

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ**
Drilling Company: Drilling It	**Type of Rig: dms-9630**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					ML	Sandy SILT; grayish brown, dry, medium dense, fine to medium sand
	29	2.5'	90.9	26.6		**Quaternary Paso Robles Formation (QTp):**
						Sandy SILTSTONE; brownish gray, slightly moist, moderately hard, fine sand,
						abundant calcite
5	23	5'	89.3	26.2		Olive gray, hard from 5 to 8 feet
	31	7.5'	112.3	16.6		
10	51	10'	111.7	8.9		Orangish brown, very hard below 10 feet
						Silty SANDSTONE; orangish brown, slightly moist, hard, fine to coarse sand,
						trace gravel
15	44	15'	115.1	10.3		
						Total Depth: 16.5 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-21

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ**
Drilling Company: Drilling It	**Type of Rig: dms-9630**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0		0-5'				**Topsoil:**
					SM	Silty SAND; grayish brown, dry, loose, fine to coarse sand
	10	2.5'	122.4	10.6		**Quaternary Alluvium (Qa):**
					SC	Clayey SAND; dark blackish brown, moist, loose, fine to coarse sand, trace gravel
5	41	5'	118.7	11.5		**Quaternary Paso Robles Formation (QTp):**
						Sandy CLAYSTONE; olive brown, moist, hard, fine to coarse sand, trace gravel
	20	7.5'	103.1	25.7		Sandy SILTSTONE; olive brown, moist, moderately hard, fine to medium sand
10	42	10'	101.4	28.1		Hard, wet from 10 to 15 feet
15	25	15'	96.9	28.1		Orange, moist, moderately hard below 15 feet
						Total Depth: 16.5 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-22

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ**
Drilling Company: Drilling It	**Type of Rig: dms-9630**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SC	Clayey SAND; black, slightly moist, loose to medium dense
	13	2.5'	118.0	13.5		**Quaternary Alluvium (Qa):**
					CL	Sandy CLAY; olive gray, moist, medium dense, fine to coarse sand, trace gravel
5	52	5'	107.4	21.7		**Quaternary Paso Roles Formation (QTp):**
						SILTSTONE; olive brown, dry to slightly moist, very hard, fine sand
	58	7.5'	99.7	26.9		
10	64	10'	103.4	19.8		
15	32	15'	90.1	32.3		Moderately hard, moist, below 15 feet
						Total Depth: 16.5 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-23

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ**
Drilling Company: Drilling It	**Type of Rig: dms-9630**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; dark brown, slightly moist, loose to medium dense, fine to coarse sand
	41	2.5'	-	-		**Quaternary Paso Robles Formation (QTp):**
						Sandy CLAY; dark gray brown, slightly moist, dense, fine to coarse sand, weathered
5						
	52	5'	93.6	24.5		Sandy SILTSTONE; olive brown, moist, hard, fine to medium sand
						Orange to pale yellow, moderately hard below 7 feet
	25	7.5'	96.9	28.5		
10	29	10'	98.1	28.5		
15	28	15'	106.9	13.9		
						Total Depth: 16.5 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-24

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SC	Sandy CLAY; light brown, dry, medium dense, fine to coarse sand
	45	2.5'	122.3	11.9		
						Quaternary Paso Robles Formation (QTp:)
5						
	45	5'	119.6	8.0	SM	Silty SANDSTONE; brownish yellow to yellowish brown, slightly moist, dense,
						fine to medium sand
	40	7.5'	122.0	9.7		
						Trace gravel below 7 1/2 feet
10						
	41	10'	100.6	26.6	ML	Sandy SILTSTONE; olive gray, slightly moist, very stiff, fine to medium sand
	54	12.5'	116.0	9.9		
					SP-SM	Poorly-graded SANDSTONE with Silt; yellowish brown, dry, very dense, fine
15						to coarse sand with trace gravel
						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-25

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					CL	Sandy CLAY; brown, dry, stiff, fine to medium sand with trace gravel
	55	2.5'	112.6	8.9		
						Quaternary Paso Robles Formation (QTp):
						Silty SANDSTONE; brownish yellow to yellowish brown, slightly moist, dense
5	45	5'	109.2	14.4		fine to medium sand with trace clay
	33	7.5'	119.5	9.8		Dark yellowish brown below 5 feet
						Olive gray to yellow brown, moist, fine sand below 7.5 feet
10	33	10'	108.2	15.0		
	62	12.5'	109.5	9.8		Very Dense below 12.5 feet
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-26

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
						Clayey SAND; dry, brown, medium dense, fine to medium sand
	25	2.5'	107.6	11.0		**Quaternary Paso Robles Formation (QTp):**
						Silty SANDSTONE; brownish yellow, slightly moist, dense, fine to medium
						sand with trace clay
5	62	5'	117.3	14.8		
	44	7.5'	109.5	16.5		
10	40	10'	108.9	17.5		Fine sand below 10 feet
	19	12.5'	107.6	9.9		Pale yellow to brownish yellow, fine to medium sand below 12.5 feet
15						
						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-27

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
						Clayey SAND; dark brown, dry, medium dense, fine to medium sand
	80	2.5'	109.6	14.9		**Quaternary Paso Robles Formation (QTp):**
					SM	Silty SANDSTONE; brownish yellow, dry, very dense, fine to medium sand
5						
	43	5'	117.9	14.7		Fine sand below 5 feet
	39	7.5'	107.1	16.0	ML	Sandy SILTSTONE; yellowish brown, moist, very stiff, fine sand
10	40	10'	-	-		
	31	12.5'	100.3	13.3	SM	Silty SANDSTONE; pale yellow, slightly moist, dense, fine to medium sand
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-28

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SC	Clayey SAND; dark brown, dry, medium dense, fine to coarse sand
	42	2.5'	117.3	9.4		
						Quaternary Paso Robles Formation (QTp):
						Silty SANDSTONE; light yellowish brown, dry, dense, fine to coarse sand with
5	34	5'	115.9	10.8		trace clay and gravel
						Poorly-graded SANDSTONE with Clay; pale olive, moist, dense, fine to coarse sand
	36	7.5'	107.4	10.5		with trace gravel
						Clayey SANDSTONE; yellowish brown, slightly moist, dense, fine to coarse sand
10	71	10'	113.3	9.7		Very dense below 10 feet
	41	12.5'	113.2	13.3		Sandy SILTSTONE; pale olive, moist, very stiff, fine sand
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-29

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SC	Clayey SAND; brown, dry, medium dense, fine to coarse sand
	42	2.5'	115.3	6.6		
						Quaternary Paso Robles Formation (QTp):
					SP-SM	Poorly-graded SAND with Silt; yellowish brown, slightly moist, dense, fine to
5	36	5'	112.9	13.4		coarse sand with trace clay
	47	7.5'	110.5	14.9	SM	Silty SANDSTONE; yellowish brown, slighty moist, dense, fine to medium sand
						with trace clay
10	36	10'	119.0	12.9		
	50/5"	12.5'	110.4	7.2		
15						
						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-30

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					CL	Sandy CLAY; dark brown, dry, stiff, fine to coarse sand with trace gravel
	14	2.5'	108.5	20.4		
						Quaternary Paso Robles Formation (QTp):
						Poorly-graded SANDSTONE with Clay; yellowish brown, slightly moist, very
5	56	5'	116.8	8.8		dense, fine to coarse sand with trace gravel
	41	7.5'	116.3	16.5		
10	44	10'	101.3	24.1		Sandy SILTSTONE; yellow brown, slightly moist, very stiff, fine sand
	43	12.5'	112.7	15.1		
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-31

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SC	Clayey SAND; dark brown, dry, medium dense, fine to coarse sand
	54	2.5'	106.1	18.9		**Quaternary Paso Robles Formation (QTp):**
						Silty SANDSTONE; yellowish brown, slightly moist, very dense fine to medium
						sand with trace clay
5	52	5'	111.2	19.7		
	43	7.5'	118.1	13.1		Light grayish brown, dense
10	38	10'	116.0	14.5		Light grayish brown to pale olive, moist below 10 feet
	40	12.5'	102.4	20.1		
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-32

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; light grayish brown, moist, dense, fine to medium sand
	38	2.5'	99.2	21.2		
						Quaternary Paso Robles Formation (QTp):
						Silty SANDSTONE; light grayish brown, moist, dense, fine to medium sand
5	49	5'	107.8	14.8		
	36	7.5'	96.2	7.2		
						Poorly-graded SANDSTONE with Silt; yellowish brown, dry, dense, fine to coarse
						sand with gravel
10	49	10'	105.1	21.4		
	45	12.5'	103.3	22.5		
15						
						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-33

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					CL	Sandy CLAY; dark brown, moist, stiff, fine sand
	13	2.5'	104.2	16.1		
						Quaternary Paso Robles Formation (QTp):
						Sandy SILTSTONE; light grayish brown, slightly moist, firm, fine sand
5	26	5'	100.5	23.4		Very stiff below 5 feet
	35	7.5'	104.0	8.6		Yellowish brown below 7.5 feet
10	52	10'	107.3	22.4		Poorly-graded SANDSTONE with Silt; yellowish brown, slightly moist, very dense
	50	12.5'	113.3	15.2		
15						
						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-34

Date: October 13, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0		0-5'				**Topsoil:**
						Sandy SILT; brown, slightly mosit, stiff, fine to medium sand
	84/7"	2.5'	118.4	10.6		**Quaternary Paso Robles Formation (QTp):**
						Silty SANDSTONE; yellowish brown, slightly moist, very dense, fine to coarse sand
						with gravel
5	62	5'	124.8	6.6		BRECCIA; yellowish brown, slightly moist, very dense, fine to coarse gravel
						and sand
	89/11"	7.5'	112.7	10.6		
10	REF/5"	10'	101.2	6.3		Practical Refusal at 10.5 feet
						Total Depth: 10.5 feet
						No Groundwater
15						
20						
25						
30						

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Geotechnical Boring Log B-35

Date: October 13, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
						Sandy SILT; brown, dry, stiff, fine to medium sand
	40	2.5'	89.2	20.4		**Quaternary Alluvium (Qa):**
					ML	Sandy SILT; light grayish brown, slightly moist, very stiff, fine sand
5						
	22	5'	101.1	22.8		Pale yellow, moist below 5 feet
	8	7.5'	98.5	24.5		Light yellowish brown, moist, firm below 7.5 feet
10						
	16	10'	107.6	17.5	CL	CLAY; light grayish brown, moist, stiff below 10 feet
	17	12.5'	96.0	20.9		
15						
						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-36

Date: October 13, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
						Silty SAND; yellowish brown, moist, medium dense, fine to coarse sand with
	26	2.5'	96.0	17.6		trace clay
						Quaternary Paso Robles Formation (QTp):
						Sandy SILTSTONE; yellowish brown, slightly moist, very stiff to hard, fine to
5	78/11"	5'	106.6	17.8		medium sand with trace gravel
	17	7.5'	106.3	18.3		
10	40	10'	100.1	11.1		Abundant gravel below 10 feet
	80/11"	12.5'	-	-		BRECCIA; brownish yellow, moist, very dense, fine to coarse gravel
15						Total Depth: 13.5 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-37

Date: October 13, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					ML	Sandy SILT; dark brown, dry, stiff, fine to coarse sand
	20	2.5'	110.4	14.4		**Quaternary Paso Robles Formation (QTp):**
						Silty SANDSTONE; yellowish brown, moist, medium dense, fine to coarse sand
						with trace gravel
5	26	5'	109.1	16.2		
	23	7.5'	90.2	19.2		Abundant gravel below 7.5 feet
						Sandy SILTSTONE; brownish yellow to yellowish brown, moist, very stiff, fine
10	26	10'	100.3	16.1		sand
	39	12.5'	104.8	14.0		Silty SANDSTONE; brownish yellow, dry, dense, fine to medium sand
15						
						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-38

Date: October 13, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0		0-5'				**Topsoil:**
					CL	Sandy CLAY; dark brown, stiff, fine to coarse sand with gravel
	67	2.5'	109.2	12.9		
						Quaternary Paso Robles Formation (QTp):
						Silty SANDSTONE; yellowish brown, slightly moist, dense to very dense, fine
5	33	5'	101.2	21.5		to medium sand
	41	7.5'	109.0	20.1		Sandy SILTSTONE; yellowish brown, slightly moist, fine sand
10	REF/5"	10'	108.7	10.4		Silty SANDSTONE; yellowish brown, slightly moist, very dense, fine to medium
						sand
	52	12.5'	107.4	3.6		Fine to coarse sand below 12.5 feet
15						
						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-39

Date: October 13, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					CL	Sandy CLAY; brown, dry, very stiff, fine to medium sand
	50	2.5'	114.3	14.9		
						Quaternary Paso Robles Formation (QTp):
						Sandy SILTSTONE; very pale brown, dry, hard, fine sand
5	52	5'	102.6	13.1		
	52	7.5'	106.8	18.7		Yellowish brown below 7.5 feet
10	47	10'	92.2	18.4		
	42	12.5'	110.6	18.0		
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-40

Date: October 13, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Quaternary Paso Robles Formation (QTp):**
						Poorly-graded SANDSTONE with Silt; light grayish brown to pale yellow, dry
	REF/3"	2.5'	113.5	12.0		very dense, fine to coarse sand with gravel
5	87/11"	5'	112.2	8.8		Poorly-graded SANDSTONE with Clay; moist, very dense, fine to coarse sand
						Practical Refusal at 6.5 feet
						Total Depth: 6.5 feet
10						No Groundwater
15						
20						
25						
30						

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Geotechnical Boring Log B-41

Date: October 13, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					ML	Sandy SILT; brown, dry, dense, fine to coarse sand with gravel
	70/11"	2.5'	95.4	11.3		
						Quaternary Paso Robles Formation (QTp):
						BRECCIA; pale yellow, dry, very dense, fine to coarse gravel
5	REF/5"	5'	119.8	5.6		
						Practical Refusal at 6 feet
						Total Depth: 6 feet
						No Groundwater
10						
15						
20						
25						
30						

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Geotechnical Boring Log B-42

Date: October 13, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
						Silty SAND;dark brown, dry, medium dense, fine to coarse sand
	89	2.5'	107.3	8.5		with trace gravel
						Quaternary Paso Robles Formation (QTp):
						Silty SANDSTONE; yellowish brown, slightly moist, very dense, fine to coarse
5	50	5'	119.8	12.1		sand
	41	7.5'	115.6	16.4		
10	43	10'	117.7	16.1		Sandy SILTSTONE; yellowish brown, moist, very stiff, fine sand
	46	12.5'	113.2	17.6		Light olive brown below 12.5 feet
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-43

Date: October 13, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
						Clayey SAND; dark brown, dry, dense, fine to coarse sand
	33	2.5'	111.5	11.1		
						Quaternary Paso Robles Formation (QTp):
						Silty SANDSTONE; yellowish brown, slightly moist, dense, fine to medium
5	39	5'	99.9	22.7		sand
						Sandy SILTSTONE; yellowish brown, slightly moist, very stiff, fine sand
	22	7.5'	106.5	17.6		with gravel
10	46	10'	99.7	18.1		
	39	12.5'	103.2	21.8		
15						
						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-44

Date: October 13, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; brown, dry, medium dense, fine to coarse sand
	5	2.5'	81.9	12.5		
						Quaternary Paso Robles Formation (QTp):
						Sandy SILTSTONE; pale olive, moist, very stiff, fine sand
5	35	5'	100.6	22.3		
	31	7.5'	118.2	15.0		Silty SANDSTONE; brown, slightly moist, dense, fine to coarse sand with trace gravel
10	33	10'	82.9	34.3		BRECCIA; olive, moist, dense, fine to coarse gravel
	43	12.5'	115.7	13.7		Sandy SILTSTONE; pale olive, moist, very stiff, fine sand
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-45

Date: October 13, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					ML	Sandy SILT; dark brown, dry, medium dense, fine sand
	39	2.5'	112.9	16.5		
						Quaternary Paso Robles Formation (QTp):
						Sandy SILTSTONE; light grayish brown, slightly moist, fine sand
5	78	5'	110.5	20.8		
						Pale olive below 5 feet
	41	7.5'	100.5	7.4		
						Poorly-graded SANDSTONE; olive, slightly moist, dense, fine to coarse sand with
						gravel
10	28	10'	100.6	15.0		
	44	12.5'	94.0	28.4		Sandy SILTSTONE; yellowish brown, moist, very stiff, fine sand with gravel
15						
						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-46

Date: October 13, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					CL	Sandy CLAY; dark brown, dry, stiff, fine sand with trace gravel
	35	2.5'	105.1	16.5		
						Quaternary Paso Robles Formation (QTp):
						Sandy SILTSTONE; yellowish brown, slightly moist, stiff, fine sand
5	31	5'	97.1	17.8		
	28	7.5'	92.8	25.1		
10	REF/5"	10'	101.8	20.0		
	49	12.5'	106.9	21.4		
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-47

Date: October 13, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					CL	Sandy CLAY; dark brown, dry, stiff, fine sand
	27	2.5'	85.4	19.1		
						Quaternary Paso Robles Formation (QTp):
						BRECCIA; yellowish brown, slightly moist, moderately hard, fine to coarse sand
5	22	5'	94.2	27.3		Sandy SILTSTONE; yellowish brown, moist, moderately hard, fine sand
	30	7.5'	98.0	26.3		
10	27	10'	96.2	26.0		
						BRECCIA; pale yellow, moist, moderately hard, fine to coarse sand
	24	12.5'	95.9	22.8		
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Test Pit Log TP-1

Date: October 13, 2018	**Project Name: Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ**
Drilling Company: Drilling It	**Type of Rig: Backhoe**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; grayish brown, dry, medium dense, fine to medium sand
						Quaternary Paso Robles Formation (QTp):
						Silty SANDSTONE with Gravel; grayish brown, slightly moist, fine to coarse sand
						Clayey SILTSTONE; reddish brown, slightly moist, dense, fine to coarse sand
5						Silty SANDSTONE; reddish orange/brown, slightly moist, dense, trace gravel,
						fine to coarse sand
10						Total Depth: 10 feet
						No Groundwater
15						
20						
25						
30						

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Geotechnical Test Pit Log TP-2

Date: October 13, 2018	**Project Name: Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ**
Drilling Company: Drilling It	**Type of Rig: Backhoe**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; orangish brown, slightly moist, loose, fine to coarse sand, trace gravel
						Quaternary Paso Robles Formation (QTp):
						Silty SANDSTONE with Gravel; orangish brown, dry, hard
						Olive brown, trace clay from 4 to 6 feet
5						
						Sandy SILTSTONE; grayish brown, moist, hard, fine to coarse sand
10						Total Depth: 10 feet
						No Grounddwater
15						
20						
25						
30						

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Geotechnical Test Pit Log TP-3

Date: October 13, 2018	**Project Name: Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ**
Drilling Company: Drilling It	**Type of Rig: Backhoe**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; grayish brown, dry, medium dense, fine to coarse sand
						Quaternary Paso Robles Formation (QTp):
						Silty SANDSTONE with Gravel; orangish brown, dry, very hard
5						
						Sandy SILTSTONE; olive brown, slightly moist, dense, fine sand, trace gravel
						Total Depth: 6 feet
						No Groundwater
10						
15						
20						
25						
30						

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Geotechnical Test Pit Log TP-4

Date: October 13, 2018	**Project Name: Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ**
Drilling Company: Drilling It	**Type of Rig: Backhoe**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; grayish brown, dry, very dense, fine to coarse sand
						Quaternary Paso Robles Formation (QTp):
						Gravelly CLAYSTONE; olive gray, moist, very hard, fine to medium sand
5						Clayey SANDSTONE; orangish brown, moist, very hard, fine to coarse sand,
						trace gravel
						SILTSTONE; gray, moist, very hard
10						Total Depth: 11 feet
						No Groundwater
15						
20						
25						
30						

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Geotechnical Test Pit Log TP-5

Date: October 13, 2018	**Project Name: Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ**
Drilling Company: Drilling It	**Type of Rig: Backhoe**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; brownish gray, dry, medium dense, fine to coarse sand
						Quaternary Paso Robles Formation (QTp):
						Sandy CLAYSTONE; brown, slightly moist, very hard, fine to coarse sand, trace gravel
						Sandy SILTSTONE; yellow brown, slightly moist, hard, fine to medium sand
5						
						Total Depth: 7 feet
						No Groundwater
10						
15						
20						
25						
30						

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Geotechnical Test Pit Log TP-6

Date: October 13, 2018	**Project Name: Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ**
Drilling Company: Drilling It	**Type of Rig: Backhoe**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; grayish brown, dry, fine to coarse sand
						Quaternary Paso Robles Formation (QTp):
						CLAYSTONE; dark gray brown, slightly moist, hard
						Sandy SILTSTONE; orange brown, dry, hard, fine to medium sand
5						
						Total Depth: 7 feet
						No Groundwater
10						
15						
20						
25						
30						

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Geotechnical Test Pit Log TP-7

Date: October 13, 2018	**Project Name: Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ**
Drilling Company: Drilling It	**Type of Rig: Backhoe**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; gray brown, dry, medium dense, fine to coarse sand
						Quaternary Alluvium (Qa):
					CL	Sandy CLAY; dark grayish brown, moist, dense, fine to coarse sand
					ML	Sandy SILT; olive gray, slightly moist, dense, fine to medium sand
5						
10						
						Total Depth: 11 feet
						No Groundwater
15						
20						
25						
30						

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Geotechnical Test Pit Log TP-8

Date: October 13, 2018	**Project Name: Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ**
Drilling Company: Drilling It	**Type of Rig: Backhoe**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; grayish brown, dry, loose, fine to coarse
						Quaternary Alluvium (Qa):
					CL	Sandy CLAY; gray brown, moist, fine to medium sand
					ML	Sandy SILT; grayish olive brown, moist, dense, fine to medium sand
5						
						Quaternary Paso Robles Formation (QTp):
						Sandy SILTSTONE; olive yellow, moist, hard, fine to medium sand
10						
						Total Depth: 13 feet
						No Groundwater
15						
20						
25						
30						

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Geotechnical Test Pit Log TP-9

Date: October 13, 2018	**Project Name: Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ**
Drilling Company: Drilling It	**Type of Rig: Backhoe**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; grayish brown, dry, loose to medium dense, fine to coarse sand,
						trace gravel
						Quaternary Paso Robles Formation (QTp):
						Sandy CLAYSTONE; dark gray brown, moist, hard, fine to coarse sand, trace gravel
5						Sandy SILTSTONE; yellowish brown to olive brown, slightly moist, moderately hard,
						fine sand
10						Total Depth: 9 feet
						No Groundwater
15						
20						
25						
30						

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APPENDIX C

LABORATORY PROCEDURES AND TEST RESULTS

APPENDIX C

Laboratory Procedures and Test Results

Laboratory testing provided quantitative and qualitative data involving the relevant engineering properties of the representative earth materials selected for testing. The representative samples were tested in general accordance with American Society for Testing and Materials (ASTM) procedures and/or California Test Methods (CTM).

Soil Classification: Earth materials encountered during exploration were classified and logged in general accordance with the Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) of ASTM D 2488. Upon completion of laboratory testing, exploratory logs and sample descriptions were reconciled to reflect laboratory test results with regard to ASTM D 2487.

Atterberg Limits: The Atterberg limits of select samples were determined using the guidelines of ASTM D 4318 for engineering classification of fine materials. The test results are presented in the table below.

SAMPLE LOCATION	MATERIAL DESCRIPTION	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	ASTM SYMBOL
B-8 @ 0-5 feet	Sandy CLAY	27	16	11	CL
B-18 @ 0-5 feet	Silty CLAY with SAND	31	23	8	ML-CL
B-21 @ 0-5 feet	Clayey SAND	15	16	-1	Non Plastic
B-34 @ 0-5 feet	Sandy CLAY	31	20	11	CL

Moisture and Density Tests: For select samples moisture content was determined using the guidelines of ASTM D 2216 and dry density determinations were made using the guidelines of ASTM D 2937. These tests were performed on relatively undisturbed samples and the test results are presented on the exploratory logs.

Maximum Density Tests: The maximum dry density and optimum moisture content of representative samples were determined using the guidelines of ASTM D 1557. The test results are presented in the table below.

SAMPLE LOCATION	MATERIAL DESCRIPTION	MAXIMUM DRY DENSITY (pcf)	OPTIMUM MOISTURE CONTENT (%)
B-8 @ 0-5 feet	Sandy CLAY	114.0	13.5
B-18 @ 0-5 feet	Silty CLAY with SAND	111.5	12.0
B-21 @ 0-5 feet	Clayey SAND	126.0	8.5
B-34 @ 0-5 feet	Sandy CLAY	116.0	12.5

Reso A - Exhibit C2 (EIR Technical Appendix)

Expansion Index: The expansion potential of representative samples was evaluated using the guidelines of ASTM D 4829. The test results are presented in the table below.

SAMPLE LOCATION	MATERIAL DESCRIPTION	EXPANSION INDEX	EXPANSION POTENTIAL
B-1 @ 0-5 feet	Sandy CLAY	24	Low
B-8 @ 0-5 feet	Sandy CLAY	72	Medium
B-18 @ 0-5 feet	Silty CLAY with SAND	100	High
B-21 @ 0-5 feet	Clayey SAND	51	Medium
B-34 @ 0-5 feet	Sandy CLAY	71	Medium

R-Value: The R-value of representative samples was determined using the guidelines of CTM 301. The test results are presented in the table below.

SAMPLE LOCATION	MATERIAL DESCRIPTION	R-VALUE
B-8 @ 0-5 feet	Sandy CLAY	6
B-11 @ 0-5 feet	Clayey SAND	21
B-18 @ 0-5 feet	Sandy CLAY	9
B-21 @ 0-5 feet	Clayey SAND	28

Minimum Resistivity and pH Tests: Minimum resistivity and pH Tests of select samples were performed using the guidelines of CTM 643. The test results are presented in the table below.

SAMPLE LOCATION	MATERIAL DESCRIPTION	pH	MINIMUM RESISTIVITY (ohm-cm)
B-1 @ 0-5 feet	Sandy CLAY	7.5	870
B-8 @ 0-5 feet	Sandy CLAY	6.9	970
B-18 @ 0-5 feet	Silty CLAY with SAND	6.7	910
B-21 @ 0-5 feet	Clayey SAND	6.7	1,020
B-34 @ 0-5 feet	Sandy CLAY	7.2	960

Soluble Sulfate: The soluble sulfate content of select samples was determined using the guidelines of CTM 417. The test results are presented in the table below.

SAMPLE LOCATION	MATERIAL DESCRIPTION	SULFATE CONTENT (% by weight)	SULFATE EXPOSURE
B-1 @ 0-5 feet	Sandy CLAY	0.003	Negligible
B-8 @ 0-5 feet	Sandy CLAY	0.005	Negligible
B-18 @ 0-5 feet	Silty CLAY with SAND	0.005	Negligible
B-21 @ 0-5 feet	Clayey SAND	0.005	Negligible
B-34 @ 0-5 feet	Sandy CLAY	0.004	Negligible

Reso A - Exhibit C2 (EIR Technical Appendix)

Chloride Content: Chloride content of select samples was determined using the guidelines of CTM 422. The test results are presented in the table below.

SAMPLE LOCATION	MATERIAL DESCRIPTION	CHLORIDE CONTENT (ppm)
B-1 @ 0-5 feet	Sandy CLAY	200
B-8 @ 0-5 feet	Sandy CLAY	280
B-18 @ 0-5 feet	Silty CLAY with SAND	110
B-21 @ 0-5 feet	Clayey SAND	270
B-34 @ 0-5 feet	Sandy CLAY	70

APPENDIX D

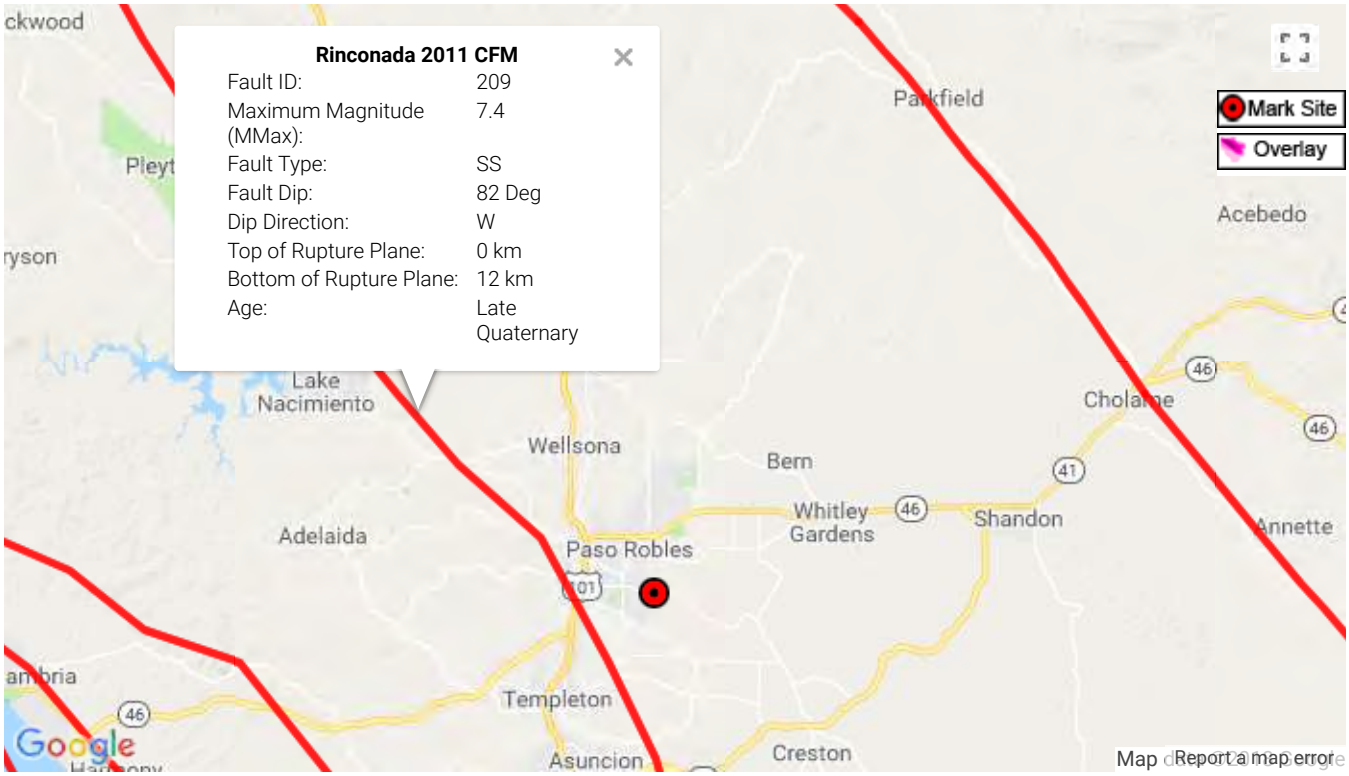
SEISMICITY

CALIFORNIA DEPARTMENT OF
TRANSPORTATION

Caltrans ARS Online (v2.3.09)

This web-based tool calculates both deterministic and probabilistic acceleration response spectra for any location in California based on criteria provided in *Appendix B of Caltrans Seismic Design Criteria*. More...

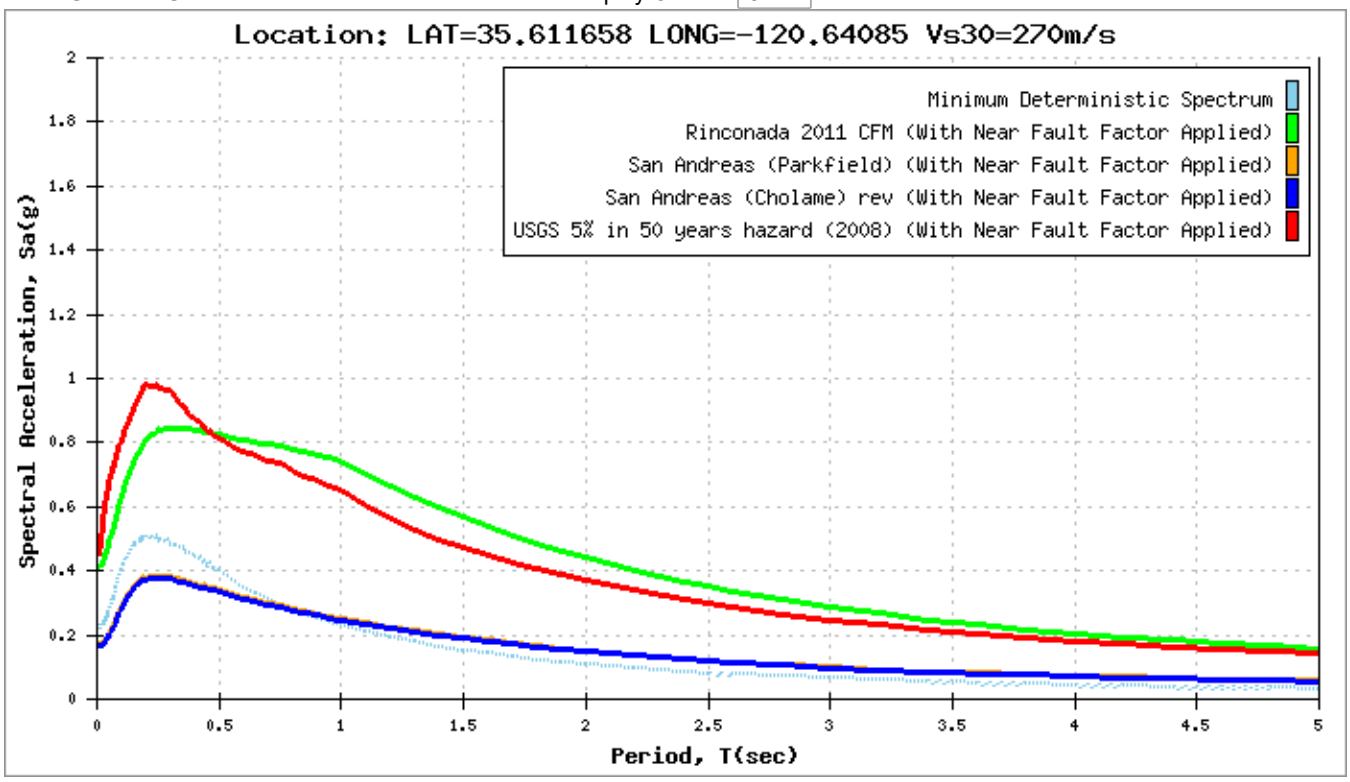
SELECT SITE LOCATION



Latitude: 35.611658 **Longitude:** -120.64085 ***V*S30:** 270 m/s Calculate

Reso A - Exhibit C2 (EIR Technical Appendix)

CALCULATED SPECTRA Display Curves: 3



Tabular Data | Envelope Only | Hide Near Fault | Axis Scale | Show Basin

Apply Near Fault Adjustment To:

NOTE: Caltrans SDC requires application of a Near Fault Adjustment factor for sites less than 25 km (Rrup) from the causative fault.

☑ Deterministic Spectrum Using

4.38 Km Rinconada 2011 CFM

33.77 Km San Andreas (Parkfield)

34.67 Km San Andreas (Cholame) rev

☑ Probabilistic Spectrum Using

4.38 Km (Recommend Performing Deaggregation To Verify)

◉ Show Spectrum with Adjustment Only

○ Show Spectrum with and without near fault Adjustment

OK

U.S. Geological Survey - Earthquake Hazards Program

2008 National Seismic Hazard Maps - Source Parameters

New Search

Distance in Kilometers	Name	State	Pref Slip Rate (mm/yr)	Dip (degrees)	Dip Dir	Slip Sense	Rupture Top (km)	Rupture Bottom (km)	Length (km)
5.57	Rinconada	CA	1	90	V	strike slip	0	10	191
32.11	San Juan	CA	1	90	V	strike slip	0	13	68
33.54	S. San Andreas;PK+CH+CC+BB+NM	CA	n/a	90	V	strike slip	0.1	12	245
33.54	S. San Andreas;PK+CH+CC+BB	CA	n/a	90	V	strike slip	0.1	12	208
33.54	S. San Andreas;PK	CA	34	90	V	strike slip	4	6	36
33.54	S. San Andreas;PK+CH+CC+BB+NM+SM+NSB+SSB+BG+CO	CA	n/a	86		strike slip	0.1	13	548
33.54	S. San Andreas;PK+CH+CC+BB+NM+SM+NSB+SSB+BG	CA	n/a	86		strike slip	0.1	13	479
33.54	S. San Andreas;PK+CH+CC+BB+NM+SM+NSB+SSB	CA	n/a	90	V	strike slip	0.1	13	421
33.54	S. San Andreas;PK+CH+CC+BB+NM+SM+NSB	CA	n/a	90	V	strike slip	0.1	13	377
33.54	S. San Andreas;PK+CH+CC	CA	n/a	90	V	strike slip	0.2	11	158
33.54	S. San Andreas;PK+CH	CA	n/a	90	V	strike slip	0.4	8	99
33.54	S. San Andreas;PK+CH+CC+BB+NM+SM	CA	n/a	90	V	strike slip	0.1	13	342
34.49	S. San Andreas;CH+CC	CA	n/a	90	V	strike slip	0	14	122
34.49	S. San Andreas;CH+CC+BB+NM+SM	CA	n/a	90	V	strike slip	0	14	306
34.49	S. San Andreas;CH	CA	34	90	V	strike slip	0	12	63
34.49	S. San Andreas;CH+CC+BB+NM+SM+NSB+SSB+BG+CO	CA	n/a	86		strike slip	0.1	13	512
34.49	S. San Andreas;CH+CC+BB+NM	CA	n/a	90	V	strike slip	0	14	208
34.49	S. San Andreas;CH+CC+BB	CA	n/a	90	V	strike	0	14	171

						slip			
34.49	S. San Andreas;CH+CC+BB+NM+SM+NSB+SSB+BG	CA	n/a	86		strike slip	0	14	442
34.49	S. San Andreas;CH+CC+BB+NM+SM+NSB+SSB	CA	n/a	90	V	strike slip	0	14	384
34.49	S. San Andreas;CH+CC+BB+NM+SM+NSB	CA	n/a	90	V	strike slip	0	14	341
36.94	Los Osos	CA	0.5	45	SW	thrust	0	10	44
42.25	Hosgri	CA	2.5	80	E	strike slip	0	7	171
43.96	San Andreas fault - creeping segment	CA	34	90	V	strike slip	0		125
49.46	San Luis Range (So Margin)	CA	0.2	45	N	thrust	0	10	64
73.32	Great Valley 14 (Kettleman Hills)	CA	1.5	22	W	thrust	8.1	22	24
75.29	Casmalia (Orcutt Frontal)	CA	0.3	75	SW	reverse	0	10	29
76.29	Great Valley 13 (Coalinga)	CA	1.5	15	W	thrust	9.1	15	32
77.62	S. San Andreas;CC+BB+NM+SM	CA	n/a	90	V	strike slip	0	14	243
77.62	S. San Andreas;CC+BB+NM	CA	n/a	90	V	strike slip	0	15	146
77.62	S. San Andreas;CC+BB	CA	n/a	90	V	strike slip	0	15	109
77.62	S. San Andreas;CC+BB+NM+SM+NSB+SSB+BG+CO	CA	n/a	86		strike slip	0.1	13	449
77.62	S. San Andreas;CC	CA	34	90	V	strike slip	0	15	59
77.62	S. San Andreas;CC+BB+NM+SM+NSB+SSB+BG	CA	n/a	85		strike slip	0	14	380
77.62	S. San Andreas;CC+BB+NM+SM+NSB+SSB	CA	n/a	90	V	strike slip	0	14	322
77.62	S. San Andreas;CC+BB+NM+SM+NSB	CA	n/a	90	V	strike slip	0	14	279
82.54	Lions Head	CA	0.02	75	NE	reverse	0	10	41
84.95	Great Valley 12	CA	1.5	15	W	thrust	7	10	17
99.02	Los Alamos-West Baseline	CA	0.7	30	S	thrust	0	10	28
99.54	Great Valley 11	CA	1.5	15	W	thrust	7	10	24

Search Results

4 of 4 earthquakes in map area.

Click for more information

6.5	**Central California** 2003-12-22 19:15:56 (UTC)	8.4 km
6.7	**Central California** 1983-05-02 23:42:38 (UTC)	9.6 km
6.2	**28km NW of Cambria, CA** 1952-11-22 07:46:36 (UTC)	6.0 km
6.9	**offshore Central California** 1927-11-04 13:51:03 (UTC)	10.0 km

Didn't find what you were looking for?

- Check your Settings.
- Which earthquakes are included on the map and list?
- Felt something not shown – report it here.

USGS Design Maps Summary Report

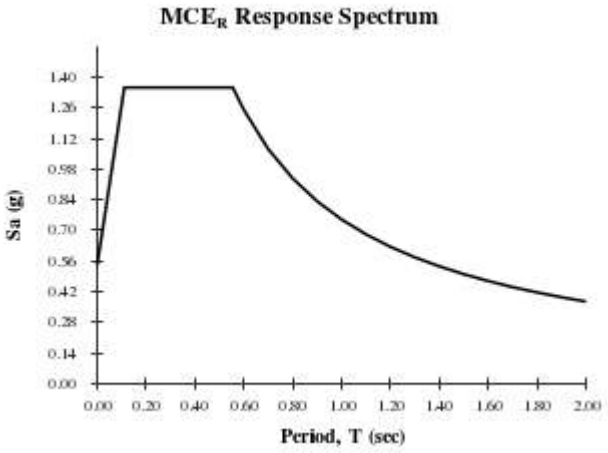
User–Specified Input

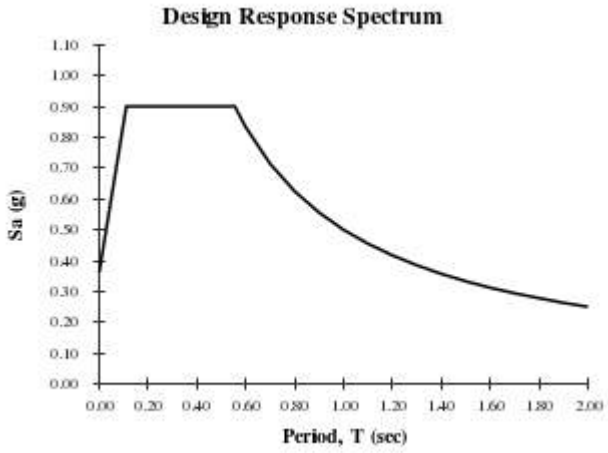
Building Code Reference Document	ASCE 7-10 Standard (which utilizes USGS hazard data available in 2008)
Site Coordinates	35.61166°N, 120.64085°W
Site Soil Classification	Site Class D – "Stiff Soil"
Risk Category	I/II/III

USGS–Provided Output

S_S =	1.352 g	S_{MS} =	1.352 g	S_{DS} =	0.901 g
S_1 =	0.500 g	S_{M1} =	0.750 g	S_{D1} =	0.500 g

For information on how the SS and S1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the "2009 NEHRP" building code reference document.





For PGA_M, T_L, C_{RS}, and C_{R1} values, please view the detailed report.

Although this information is a product of the U.S. Geological Survey, we provide no warranty, expressed or implied, as to the accuracy of the data contained therein. This tool is not a substitute for technical subject-matter knowledge.

USGS Design Maps Detailed Report

ASCE 7-10 Standard (35.61166°N, 120.64085°W)

Site Class D – "Stiff Soil", Risk Category I/II/III

Section 11.4.1 — Mapped Acceleration Parameters

Note: Ground motion values provided below are for the direction of maximum horizontal spectral response acceleration. They have been converted from corresponding geometric mean ground motions computed by the USGS by applying factors of 1.1 (to obtain S_S) and 1.3 (to obtain S_1). Maps in the 2010 ASCE-7 Standard are provided for Site Class B. Adjustments for other Site Classes are made, as needed, in Section 11.4.3.

From Figure 22-1 [1]	S_S = 1.352 g
From Figure 22-2 [2]	S_1 = 0.500 g

Section 11.4.2 — Site Class

The authority having jurisdiction (not the USGS), site-specific geotechnical data, and/or the default has classified the site as Site Class D, based on the site soil properties in accordance with Chapter 20.

Table 20.3–1 Site Classification

Site Class	$\overline{v}_s$	$\overline{N}$ or $\overline{N}_{ch}$	$\overline{s}_u$
A. Hard Rock	>5,000 ft/s	N/A	N/A
B. Rock	2,500 to 5,000 ft/s	N/A	N/A
C. Very dense soil and soft rock	1,200 to 2,500 ft/s	>50	>2,000 psf
D. Stiff Soil	600 to 1,200 ft/s	15 to 50	1,000 to 2,000 psf
E. Soft clay soil	<600 ft/s	<15	<1,000 psf
	Any profile with more than 10 ft of soil having the characteristics: • Plasticity index *PI* > 20, • Moisture content *w* ≥ 40%, and • Undrained shear strength $\overline{s}_u$ < 500 psf		
F. Soils requiring site response analysis in accordance with Section 21.1	See Section 20.3.1		

For SI: 1ft/s = 0.3048 m/s 1lb/ft² = 0.0479 kN/m²

Section 11.4.3 — Site Coefficients and Risk–Targeted Maximum Considered Earthquake (MCE_R) Spectral Response Acceleration Parameters

Table 11.4–1: Site Coefficient F_a

Site Class	Mapped MCE_R Spectral Response Acceleration Parameter at Short Period				
	$S_S \leq 0.25$	$S_S = 0.50$	$S_S = 0.75$	$S_S = 1.00$	$S_S \geq 1.25$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight–line interpolation for intermediate values of S_S

For Site Class = D and S_S = 1.352 g, F_a = 1.000

Table 11.4–2: Site Coefficient F_v

Site Class	Mapped MCE_R Spectral Response Acceleration Parameter at 1–s Period				
	$S_1 \leq 0.10$	$S_1 = 0.20$	$S_1 = 0.30$	$S_1 = 0.40$	$S_1 \geq 0.50$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.7	1.6	1.5	1.4	1.3
D	2.4	2.0	1.8	1.6	1.5
E	3.5	3.2	2.8	2.4	2.4
F	See Section 11.4.7 of ASCE 7				

Note: Use straight–line interpolation for intermediate values of S_1

For Site Class = D and S_1 = 0.500 g, F_v = 1.500

Equation (11.4–1): $S_{MS} = F_a S_S = 1.000 \times 1.352 = 1.352$ g

---

Equation (11.4–2): $S_{M1} = F_v S_1 = 1.500 \times 0.500 = 0.750$ g

---

Section 11.4.4 — Design Spectral Acceleration Parameters

Equation (11.4–3): $S_{DS} = \frac{2}{3} S_{MS} = \frac{2}{3} \times 1.352 = 0.901$ g

---

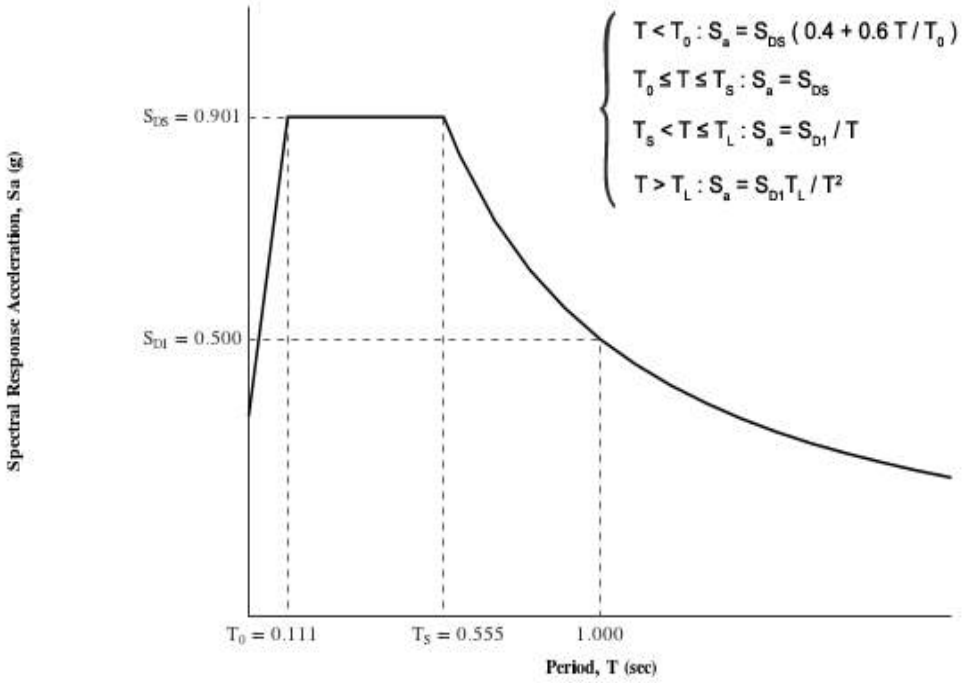
Equation (11.4–4): $S_{D1} = \frac{2}{3} S_{M1} = \frac{2}{3} \times 0.750 = 0.500$ g

---

Section 11.4.5 — Design Response Spectrum

From Figure 22-12 [3] $T_L = 12$ seconds

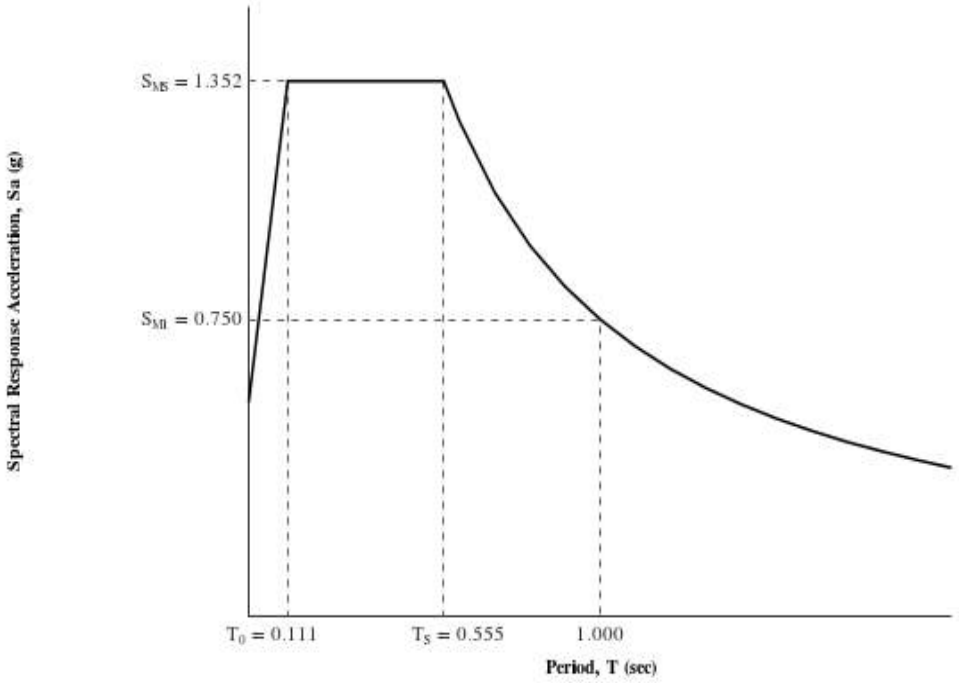
Figure 11.4–1: Design Response Spectrum



Reso A - Exhibit C2 (EIR Technical Appendix)

Section 11.4.6 — Risk-Targeted Maximum Considered Earthquake (MCE_R) Response Spectrum

The MCE_R Response Spectrum is determined by multiplying the design response spectrum above by 1.5.



Section 11.8.3 — Additional Geotechnical Investigation Report Requirements for Seismic Design Categories D through F

From Figure 22-7 [4] PGA = 0.501

Equation (11.8–1): $PGA_M = F_{PGA}PGA = 1.000 \times 0.501 = 0.501$ g

Table 11.8–1: Site Coefficient F_{PGA}

Site Class	Mapped MCE Geometric Mean Peak Ground Acceleration, PGA				
	PGA ≤ 0.10	PGA = 0.20	PGA = 0.30	PGA = 0.40	PGA ≥ 0.50
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight–line interpolation for intermediate values of PGA

For Site Class = D and PGA = 0.501 g, F_{PGA} = 1.000

Section 21.2.1.1 — Method 1 (from Chapter 21 – Site-Specific Ground Motion Procedures for Seismic Design)

From Figure 22-17 [5] C_{RS} = 1.045

From Figure 22-18 [6] C_{R1} = 1.006

Section 11.6 — Seismic Design Category

Table 11.6-1 Seismic Design Category Based on Short Period Response Acceleration Parameter

VALUE OF S_{DS}	RISK CATEGORY		
	I or II	III	IV
$S_{DS} < 0.167g$	A	A	A
$0.167g \le S_{DS} < 0.33g$	B	B	C
$0.33g \le S_{DS} < 0.50g$	C	C	D
$0.50g \le S_{DS}$	D	D	D

For Risk Category = I and S_{DS} = 0.901 g, Seismic Design Category = D

Table 11.6-2 Seismic Design Category Based on 1-S Period Response Acceleration Parameter

VALUE OF S_{D1}	RISK CATEGORY		
	I or II	III	IV
$S_{D1} < 0.067g$	A	A	A
$0.067g \le S_{D1} < 0.133g$	B	B	C
$0.133g \le S_{D1} < 0.20g$	C	C	D
$0.20g \le S_{D1}$	D	D	D

For Risk Category = I and S_{D1} = 0.500 g, Seismic Design Category = D

Note: When S_1 is greater than or equal to 0.75g, the Seismic Design Category is **E** for buildings in Risk Categories I, II, and III, and **F** for those in Risk Category IV, irrespective of the above.

Seismic Design Category ≡ "the more severe design category in accordance with Table 11.6-1 or 11.6-2" = D

Note: See Section 11.6 for alternative approaches to calculating Seismic Design Category.

References

1. *Figure 22-1*: https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-1.pdf
2. *Figure 22-2*: https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-2.pdf
3. *Figure 22-12*: https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-12.pdf
4. *Figure 22-7*: https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-7.pdf
5. *Figure 22-17*: https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-17.pdf
6. *Figure 22-18*: https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-18.pdf

APPENDIX E

ASPHALTIC CONCRETE PAVEMENT CALCULATIONS

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CALCULATION SHEET # **AutoParking (Boring B-8)**

CALTRANS METHOD FOR DESIGN OF FLEXIBLE PAVEMENT

Input "R" value or "CBR" of native soil	6	
Type of Index Property - "R" value or "CBR" (C or R)	R	R Value
R Value used for Caltrans Method	6	
Input Traffic Index (TI)	5	
Calculated Total Gravel Equivalent (GE)	1.504	feet
Calculated Total Gravel Equivalent (GE)	18.048	inches
Calculated Gravel Factor (Gf) for A/C paving	2.53	
Gravel Factor for Base Course (Gf)	1.1	

Pavement sections provided below are considered equal; but, do not reflect reviewing agency minimums.

Gravel Equivalent GE (feet)	GE (inches)	Delta (inches)	INCHES A/C Section Thickness (inches)	INCHES Minimum Base (inches)	FEET A/C Section Thickness (feet)	FEET Minimum Base (feet)
0.63	7.60	10.44	3.0	9.6	0.25	0.80
0.74	8.87	9.18	3.5	8.4	0.29	0.70
0.76	9.13	8.92	3.6	8.4	0.30	0.70
0.84	10.14	7.91	4.0	7.2	0.33	0.60
0.89	10.65	7.40	4.2	6.6	0.35	0.55
0.95	11.41	6.64	4.5	6.0	0.38	0.50
1.01	12.17	5.88	4.8	5.4	0.40	0.45
1.06	12.67	5.37	5.0	4.8	0.42	0.40
1.27	15.21	2.84	6.0	2.4	0.50	0.20
2.11	25.35	-7.30	10.0		0.83	
2.53	30.42	-12.37	12.0		1.00	

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CALCULATION SHEET # **AutoDrives (Boring B-8)**

CALTRANS METHOD FOR DESIGN OF FLEXIBLE PAVEMENT

Input "R" value or "CBR" of native soil	6	
Type of Index Property - "R" value or "CBR" (C or R)	R	R Value
R Value used for Caltrans Method	6	
Input Traffic Index (TI)	6	
Calculated Total Gravel Equivalent (GE)	1.8048	feet
Calculated Total Gravel Equivalent (GE)	21.6576	inches
Calculated Gravel Factor (Gf) for A/C paving	2.31	
Gravel Factor for Base Course (Gf)	1.1	

Pavement sections provided below are considered equal; but, do not reflect reviewing agency minimums.

Gravel Equivalent GE (feet)	GE (inches)	Delta (inches)	INCHES A/C Section Thickness (inches)	INCHES Minimum Base (inches)	FEET A/C Section Thickness (feet)	FEET Minimum Base (feet)
0.58	6.94	14.72	3.0	13.2	0.25	1.10
0.67	8.10	13.56	3.5	12.6	0.29	1.05
0.69	8.33	13.33	3.6	12.0	0.30	1.00
0.77	9.26	12.40	4.0	11.4	0.33	0.95
0.81	9.72	11.94	4.2	10.8	0.35	0.90
0.87	10.41	11.25	4.5	10.2	0.38	0.85
0.93	11.11	10.55	4.8	9.6	0.40	0.80
0.96	11.57	10.09	5.0	9.0	0.42	0.75
1.16	13.88	7.77	6.0	7.2	0.50	0.60
1.93	23.14	-1.48	10.0		0.83	
2.31	27.77	-6.11	12.0		1.00	

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CALCULATION SHEET # **Entrances (Boring B-8)**

CALTRANS METHOD FOR DESIGN OF FLEXIBLE PAVEMENT

Input "R" value or "CBR" of native soil	6	
Type of Index Property - "R" value or "CBR" (C or R)	R	R Value
R Value used for Caltrans Method	6	
Input Traffic Index (TI)	7	
Calculated Total Gravel Equivalent (GE)	2.1056	feet
Calculated Total Gravel Equivalent (GE)	25.2672	inches
Calculated Gravel Factor (Gf) for A/C paving	2.14	
Gravel Factor for Base Course (Gf)	1.1	

Pavement sections provided below are considered equal; but, do not reflect reviewing agency minimums.

Gravel Equivalent GE (feet)	GE (inches)	Delta (inches)	INCHES A/C Section Thickness (inches)	INCHES Minimum Base (inches)	FEET A/C Section Thickness (feet)	FEET Minimum Base (feet)
0.54	6.43	18.84	3.0	17.4	0.25	1.45
0.62	7.50	17.77	3.5	16.2	0.29	1.35
0.64	7.71	17.56	3.6	16.2	0.30	1.35
0.71	8.57	16.70	4.0	15.0	0.33	1.25
0.75	9.00	16.27	4.2	15.0	0.35	1.25
0.80	9.64	15.63	4.5	14.4	0.38	1.20
0.86	10.28	14.98	4.8	13.8	0.40	1.15
0.89	10.71	14.56	5.0	13.2	0.42	1.10
1.07	12.85	12.41	6.0	11.4	0.50	0.95
1.79	21.42	3.84	10.0	3.6	0.83	0.30
2.14	25.71	-0.44	12.0		1.00	

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CALCULATION SHEET # **Major Arterial (Boring B-8)**

CALTRANS METHOD FOR DESIGN OF FLEXIBLE PAVEMENT

Input "R" value or "CBR" of native soil	6	
Type of Index Property - "R" value or "CBR" (C or R)	R	R Value
R Value used for Caltrans Method	6	
Input Traffic Index (TI)	9	
Calculated Total Gravel Equivalent (GE)	2.7072	feet
Calculated Total Gravel Equivalent (GE)	32.4864	inches
Calculated Gravel Factor (Gf) for A/C paving	1.89	
Gravel Factor for Base Course (Gf)	1.1	

Pavement sections provided below are considered equal; but, do not reflect reviewing agency minimums.

Gravel Equivalent GE (feet)	Gravel Equivalent GE (inches)	Delta (inches)	INCHES A/C Section Thickness (inches)	INCHES Minimum Base (inches)	FEET A/C Section Thickness (feet)	FEET Minimum Base (feet)
0.47	5.67	26.82	3.0	24.6	0.25	2.05
0.55	6.61	25.87	3.5	23.4	0.29	1.95
0.57	6.80	25.68	3.6	23.4	0.30	1.95
0.63	7.56	24.93	4.0	22.8	0.33	1.90
0.66	7.94	24.55	4.2	22.2	0.35	1.85
0.71	8.50	23.98	4.5	21.6	0.38	1.80
0.76	9.07	23.42	4.8	21.0	0.40	1.75
0.79	9.45	23.04	5.0	21.0	0.42	1.75
0.94	11.34	21.15	6.0	19.2	0.50	1.60
1.57	18.89	13.59	10.0	12.6	0.83	1.05
1.89	22.67	9.81	12.0	9.0	1.00	0.75

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CALCULATION SHEET # **AutoParking (Boring B-11)**

CALTRANS METHOD FOR DESIGN OF FLEXIBLE PAVEMENT

Input "R" value or "CBR" of native soil	21	
Type of Index Property - "R" value or "CBR" (C or R)	R	R Value
R Value used for Caltrans Method	21	
Input Traffic Index (TI)	5	
Calculated Total Gravel Equivalent (GE)	1.264	feet
Calculated Total Gravel Equivalent (GE)	15.168	inches
Calculated Gravel Factor (Gf) for A/C paving	2.53	
Gravel Factor for Base Course (Gf)	1.1	

Pavement sections provided below are considered equal; but, do not reflect reviewing agency minimums.

Gravel Equivalent GE (feet)	GE (inches)	Delta (inches)	INCHES A/C Section Thickness (inches)	INCHES Minimum Base (inches)	FEET A/C Section Thickness (feet)	FEET Minimum Base (feet)
0.63	7.60	7.56	3.0	6.6	0.25	0.55
0.74	8.87	6.30	3.5	6.0	0.29	0.50
0.76	9.13	6.04	3.6	5.4	0.30	0.45
0.84	10.14	5.03	4.0	4.8	0.33	0.40
0.89	10.65	4.52	4.2	4.2	0.35	0.35
0.95	11.41	3.76	4.5	3.6	0.38	0.30
1.01	12.17	3.00	4.8	3.0	0.40	0.25
1.06	12.67	2.49	5.0	2.4	0.42	0.20
1.27	15.21	-0.04	6.0		0.50	
2.11	25.35	-10.18	10.0		0.83	
2.53	30.42	-15.25	12.0		1.00	

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CALCULATION SHEET # **AutoDrives (Boring B-11)**

CALTRANS METHOD FOR DESIGN OF FLEXIBLE PAVEMENT

Input "R" value or "CBR" of native soil	21	
Type of Index Property - "R" value or "CBR" (C or R)	R	R Value
R Value used for Caltrans Method	21	
Input Traffic Index (TI)	6	
Calculated Total Gravel Equivalent (GE)	1.5168	feet
Calculated Total Gravel Equivalent (GE)	18.2016	inches
Calculated Gravel Factor (Gf) for A/C paving	2.31	
Gravel Factor for Base Course (Gf)	1.1	

Pavement sections provided below are considered equal; but, do not reflect reviewing agency minimums.

Gravel Equivalent GE (feet)	GE (inches)	Delta (inches)	INCHES A/C Section Thickness (inches)	INCHES Minimum Base (inches)	FEET A/C Section Thickness (feet)	FEET Minimum Base (feet)
0.58	6.94	11.26	3.0	10.2	0.25	0.85
0.67	8.10	10.10	3.5	9.0	0.29	0.75
0.69	8.33	9.87	3.6	9.0	0.30	0.75
0.77	9.26	8.95	4.0	8.4	0.33	0.70
0.81	9.72	8.48	4.2	7.8	0.35	0.65
0.87	10.41	7.79	4.5	7.2	0.38	0.60
0.93	11.11	7.09	4.8	6.6	0.40	0.55
0.96	11.57	6.63	5.0	6.0	0.42	0.50
1.16	13.88	4.32	6.0	4.2	0.50	0.35
1.93	23.14	-4.94	10.0		0.83	
2.31	27.77	-9.57	12.0		1.00	

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CALCULATION SHEET # **Entrances (Boring B-11)**

CALTRANS METHOD FOR DESIGN OF FLEXIBLE PAVEMENT

Input "R" value or "CBR" of native soil	21	
Type of Index Property - "R" value or "CBR" (C or R)	R	R Value
R Value used for Caltrans Method	21	
Input Traffic Index (TI)	7	
Calculated Total Gravel Equivalent (GE)	1.7696	feet
Calculated Total Gravel Equivalent (GE)	21.2352	inches
Calculated Gravel Factor (Gf) for A/C paving	2.14	
Gravel Factor for Base Course (Gf)	1.1	

Pavement sections provided below are considered equal; but, do not reflect reviewing agency minimums.

Gravel Equivalent GE (feet)	GE (inches)	Delta (inches)	INCHES A/C Section Thickness (inches)	INCHES Minimum Base (inches)	FEET A/C Section Thickness (feet)	FEET Minimum Base (feet)
0.54	6.43	14.81	3.0	13.2	0.25	1.10
0.62	7.50	13.74	3.5	12.6	0.29	1.05
0.64	7.71	13.52	3.6	12.0	0.30	1.00
0.71	8.57	12.67	4.0	11.4	0.33	0.95
0.75	9.00	12.24	4.2	11.4	0.35	0.95
0.80	9.64	11.60	4.5	10.8	0.38	0.90
0.86	10.28	10.95	4.8	10.2	0.40	0.85
0.89	10.71	10.52	5.0	9.6	0.42	0.80
1.07	12.85	8.38	6.0	7.8	0.50	0.65
1.79	21.42	-0.19	10.0		0.83	
2.14	25.71	-4.47	12.0		1.00	

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CALCULATION SHEET # **Major Arterial (Boring B-11)**

CALTRANS METHOD FOR DESIGN OF FLEXIBLE PAVEMENT

Input "R" value or "CBR" of native soil	21	
Type of Index Property - "R" value or "CBR" (C or R)	R	R Value
R Value used for Caltrans Method	21	
Input Traffic Index (TI)	9	
Calculated Total Gravel Equivalent (GE)	2.2752	feet
Calculated Total Gravel Equivalent (GE)	27.3024	inches
Calculated Gravel Factor (Gf) for A/C paving	1.89	
Gravel Factor for Base Course (Gf)	1.1	

Pavement sections provided below are considered equal; but, do not reflect reviewing agency minimums.

Gravel Equivalent GE (feet)	GE (inches)	Delta (inches)	INCHES A/C Section Thickness (inches)	INCHES Minimum Base (inches)	FEET A/C Section Thickness (feet)	FEET Minimum Base (feet)
0.47	5.67	21.63	3.0	19.8	0.25	1.65
0.55	6.61	20.69	3.5	18.6	0.29	1.55
0.57	6.80	20.50	3.6	18.6	0.30	1.55
0.63	7.56	19.75	4.0	18.0	0.33	1.50
0.66	7.94	19.37	4.2	17.4	0.35	1.45
0.71	8.50	18.80	4.5	16.8	0.38	1.40
0.76	9.07	18.23	4.8	16.8	0.40	1.40
0.79	9.45	17.86	5.0	16.2	0.42	1.35
0.94	11.34	15.97	6.0	14.4	0.50	1.20
1.57	18.89	8.41	10.0	7.8	0.83	0.65
1.89	22.67	4.63	12.0	4.2	1.00	0.35

APPENDIX F

GENERAL EARTHWORK AND GRADING SPECIFICATIONS

EARTH-STRATA

General Earthwork and Grading Specifications

General

Intent: These General Earthwork and Grading Specifications are intended to be the minimum requirements for the grading and earthwork shown on the approved grading plan(s) and/or indicated in the geotechnical report(s). These General Earthwork and Grading Specifications should be considered a part of the recommendations contained in the geotechnical report(s) and if they are in conflict with the geotechnical report(s), the specific recommendations in the geotechnical report shall supersede these more general specifications. Observations made during earthwork operations by the project Geotechnical Consultant may result in new or revised recommendations that may supersede these specifications and/or the recommendations in the geotechnical report(s).

The Geotechnical Consultant of Record: The Owner shall employ a qualified Geotechnical Consultant of Record (Geotechnical Consultant), prior to commencement of grading or construction. The Geotechnical Consultant shall be responsible for reviewing the approved geotechnical report(s) and accepting the adequacy of the preliminary geotechnical findings, conclusions, and recommendations prior to the commencement of the grading or construction.

Prior to commencement of grading or construction, the Owner shall coordinate with the Geotechnical Consultant, and Earthwork Contractor (Contractor) to schedule sufficient personnel for the appropriate level of observation, mapping, and compaction testing.

During earthwork and grading operations, the Geotechnical Consultant shall observe, map, and document the subsurface conditions to confirm assumptions made during the geotechnical design phase of the project. Should the observed conditions differ significantly from the interpretive assumptions made during the design phase, the Geotechnical Consultant shall recommend appropriate changes to accommodate the observed conditions, and notify the reviewing agency where required.

The Geotechnical Consultant shall observe the moisture conditioning and processing of the excavations and fill materials. The Geotechnical Consultant should perform periodic relative density testing of fill materials to verify that the attained level of compaction is being accomplished as specified.

The Earthwork Contractor: The Earthwork Contractor (Contractor) shall be qualified, experienced, and knowledgeable in earthwork logistics, preparation and processing of earth materials to receive compacted fill, moisture-conditioning and processing of fill, and compacting fill. The Contractor shall be provided with the approved grading plans and geotechnical report(s) for his review and acceptance of responsibilities, prior to commencement of grading. The Contractor shall be solely responsible for performing the grading in accordance with the approved grading plans and geotechnical report(s). Prior to commencement of grading, the Contractor shall prepare and submit to the Owner and the Geotechnical Consultant a work plan that indicates the sequence of earthwork grading, the number of "equipment" of work and the estimated quantities of daily earthwork contemplated for the site. The Contractor shall inform the Owner and the Geotechnical Consultant of work schedule changes and revisions to the work plan at least 24 hours in advance of such changes so that appropriate personnel will be available for observation and testing. No assumptions shall be made by the Contractor with regard to whether the Geotechnical Consultant is aware of all grading operations.

It is the sole responsibility of the Contractor to provide adequate equipment and methods to accomplish the earthwork operations in accordance with the applicable grading codes and agency ordinances, these specifications, and the recommendations in the approved geotechnical report(s) and grading plan(s). At the sole discretion of the Geotechnical Consultant, any unsatisfactory conditions, such as unsuitable earth materials, improper moisture conditioning, inadequate compaction, insufficient buttress keyway size, adverse weather conditions, etc., resulting in a quality of work less than required in the approved grading plans and geotechnical report(s), the Geotechnical Consultant shall reject the work and may recommend to the Owner that grading be stopped until conditions are corrected.

Preparation of Areas for Compacted Fill

Clearing and Grubbing: Vegetation, such as brush, grass, roots, and other deleterious material shall be sufficiently removed and properly disposed in a method acceptable to the Owner, Geotechnical Consultant, and governing agencies.

The Geotechnical Consultant shall evaluate the extent of these removals on a site by site basis. Earth materials to be placed as compacted fill shall not contain more than 1 percent organic materials (by volume). No compacted fill lift shall contain more than 10 percent organic matter.

Should potentially hazardous materials be encountered, the Contractor shall stop work in the affected area, and a hazardous materials specialist shall immediately be consulted to evaluate the potentially hazardous materials, prior to continuing to work in that area.

It is our understanding that the State of California defines most refined petroleum products (gasoline, diesel fuel, motor oil, grease, coolant, etc.) as hazardous waste. As such, indiscriminate dumping or spillage of these fluids may constitute a misdemeanor, punishable by fines and/or imprisonment, and shall be prohibited. The contractor is responsible for all hazardous waste related to his operations. The Geotechnical Consultant does not have expertise in this area. If hazardous waste is a concern, then the Owner should contract the services of a qualified environmental assessor.

Processing: Exposed earth materials that have been observed to be satisfactory for support of compacted fill by the Geotechnical Consultant shall be scarified to a minimum depth of 6 inches. Exposed earth materials that are not observed to be satisfactory shall be removed or alternative recommendations may be provided by the Geotechnical Consultant. Scarification shall continue until the exposed earth materials are broken down and free of oversize material and the working surface is reasonably uniform, flat, and free of uneven features that would inhibit uniform compaction. The earth materials should be moistened or air dried to near optimum moisture content, prior to compaction.

Overexcavation: The Cut Lot Typical Detail and Cut/Fill Transition Lot Typical Detail, included herein provides a graphic illustration that depicts typical overexcavation recommendations made in the approved geotechnical report(s) and/or grading plan(s).

Keyways and Benching: Where fills are to be placed on slopes steeper than 5:1 (horizontal to vertical units), the ground shall be thoroughly benched as compacted fill is placed. Please see the three Keyway and Benching Typical Details with subtitles Cut Over Fill Slope, Fill Over Cut Slope, and Fill Slope for a graphic illustration. The lowest bench or smallest keyway shall be a minimum of 15 feet wide (or ½ the proposed slope height) and at least 2 feet into competent earth materials as advised by the Geotechnical Consultant. Typical benches shall be excavated a minimum height of 4 feet into competent earth materials or as recommended by the Geotechnical Consultant. Fill placed on slopes steeper than 5:1 should be thoroughly benched or otherwise excavated to provide a flat subgrade for the compacted fill.

Evaluation/Acceptance of Bottom Excavations: All areas to receive compacted fill (bottom excavations), including removal excavations, processed areas, keyways, and benching, shall be observed, mapped, general elevations recorded, and/or tested prior to being accepted by the Geotechnical Consultant as suitable to receive compacted fill. The Contractor shall obtain a written acceptance from the Geotechnical Consultant prior to placing compacted fill. A licensed surveyor shall provide the survey control for determining elevations of bottom excavations, processed areas, keyways, and

benching. The Geotechnical Consultant is not responsible for erroneously located, fills, subdrain systems, or excavations.

Fill Materials

General: Earth material to be used as compacted fill should to a large extent be free of organic matter and other deleterious substances as evaluated and accepted by the Geotechnical Consultant.

Oversize: Oversize material is rock that does not break down into smaller pieces and has a maximum diameter greater than 8 inches. Oversize rock shall not be included within compacted fill unless specific methods and guidelines acceptable to the Geotechnical Consultant are followed. For examples of methods and guidelines of oversize rock placement see the enclosed Oversize Rock Disposal Detail. The inclusion of oversize materials in the compacted fill shall only be acceptable if the oversize material is completely surrounded by compacted fill or thoroughly jetted granular materials. No oversize material shall be placed within 10 vertical feet of finish grade or within 2 feet of proposed utilities or underground improvements.

Import: Should imported earth materials be required, the proposed import materials shall meet the requirements of the Geotechnical Consultant. Well graded, very low expansion potential earth materials free of organic matter and other deleterious substances are usually sought after as import materials. However, it is generally in the Owners best interest that potential import earth materials are provided to the Geotechnical Consultant to determine their suitability for the intended purpose. At least 48 hours should be allotted for the appropriate laboratory testing to be performed, prior to starting the import operations.

Fill Placement and Compaction Procedures

Fill Layers: Fill materials shall be placed in areas prepared to receive fill in nearly horizontal layers not exceeding 8 inches in loose thickness. Thicker layers may be accepted by the Geotechnical Consultant, provided field density testing indicates that the grading procedures can adequately compact the thicker layers. Each layer of fill shall be spread evenly and thoroughly mixed to obtain uniformity within the earth materials and consistent moisture throughout the fill.

Moisture Conditioning of Fill: Earth materials to be placed as compacted fill shall be watered, dried, blended, and/or mixed, as needed to obtain relatively uniform moisture contents that are at or slightly above optimum. The maximum density and optimum moisture content tests should be performed in accordance with the American Society of Testing and Materials (ASTM test method D1557-00).

Compaction of Fill: After each layer has been moisture-conditioned, mixed, and evenly spread, it should be uniformly compacted to a minimum of 90 percent of maximum dry density as determined by ASTM test method D1557-00. Compaction equipment shall be adequately sized and be either specifically designed for compaction of earth materials or be proven to consistently achieve the required level of compaction.

Compaction of Fill Slopes: In addition to normal compaction procedures specified above, additional effort to obtain compaction on slopes is needed. This may be accomplished by backrolling of slopes with sheepsfoot rollers as the fill is being placed, by overbuilding the fill slopes, or by other methods producing results that are satisfactory to the Geotechnical Consultant. Upon completion of grading, relative compaction of the fill and the slope face shall be a minimum of 90 percent of maximum density per ASTM test method D1557-00.

Compaction Testing of Fill: Field tests for moisture content and relative density of the compacted fill earth materials shall be periodically performed by the Geotechnical Consultant. The location and frequency of tests shall be at the Geotechnical Consultant's discretion based on field observations. Compaction test locations will not necessarily be random. The test locations may or may not be selected to verify minimum compaction requirements in areas that are typically prone to inadequate compaction, such as close to slope faces and near benching.

Frequency of Compaction Testing: Compaction tests shall be taken at minimum intervals of every 2 vertical feet and/or per 1,000 cubic yards of compacted materials placed. Additionally, as a guideline, at least one (1) test shall be taken on slope faces for each 5,000 square feet of slope face and/or for each 10 vertical feet of slope. The Contractor shall assure that fill placement is such that the testing schedule described herein can be accomplished by the Geotechnical Consultant. The Contractor shall stop or slow down the earthwork operations to a safe level so that these minimum standards can be obtained.

Compaction Test Locations: The approximate elevation and horizontal coordinates of each test location shall be documented by the Geotechnical Consultant. The Contractor shall coordinate with the Surveyor to assure that sufficient grade stakes are established. This will provide the Geotechnical Consultant with sufficient accuracy to determine the approximate test locations and elevations. The Geotechnical Consultant can not be responsible for staking erroneously located by the Surveyor or Contractor. A minimum of two grade stakes should be provided at a maximum horizontal distance of 100 feet and vertical difference of less than 5 feet.

Subdrain System Installation

Subdrain systems shall be installed in accordance with the approved geotechnical report(s), the approved grading plan, and the typical details provided herein. The Geotechnical Consultant may recommend additional subdrain systems and/or changes to the subdrain systems described herein, with regard to the extent, location, grade, or material depending on conditions encountered during grading or other factors. All subdrain systems shall be surveyed by a licensed land surveyor (except for retaining wall subdrain systems) to verify line and grade after installation and prior to burial. Adequate time should be allowed by the Contractor to complete these surveys.

Excavation

All excavations and over-excavations for remedial purposes shall be evaluated by the Geotechnical Consultant during grading operations. Remedial removal depths indicated on the geotechnical plans are estimates only. The actual removal depths and extent shall be determined by the Geotechnical Consultant based on the field evaluation of exposed conditions during grading operations. Where fill over cut slopes are planned, the cut portion of the slope shall be excavated, evaluated, and accepted by the Geotechnical Consultant prior to placement of the fill portion of the proposed slope, unless specifically addressed by the Geotechnical Consultant. Typical details for cut over fill slopes and fill over cut slopes are provided herein.

Trench Backfill

1) The Contractor shall follow all OHSA and Cal/OSHA requirements for trench excavation safety.

2) Bedding and backfill of utility trenches shall be done in accordance with the applicable provisions in the Standard Specifications of Public Works Construction. Bedding materials shall have a Sand Equivalency more than 30 (SE>30). The bedding shall be placed to 1 foot over the conduit and thoroughly jetting to provide densification. Backfill should be compacted to a minimum of 90 percent of maximum dry density, from 1 foot above the top of the conduit to the surface.

3) Jetting of the bedding materials around the conduits shall be observed by the Geotechnical Consultant.

4) The Geotechnical Consultant shall test trench backfill for the minimum compaction requirements recommended herein. At least one test should be conducted for every 300 linear feet of trench and for each 2 vertical feet of backfill.

5) For trench backfill the lift thicknesses shall not exceed those allowed in the Standard Specifications of Public Works Construction, unless the Contractor can demonstrate to the Geotechnical Consultant that the fill lift can be compacted to the minimum relative compaction by his alternative equipment or method.

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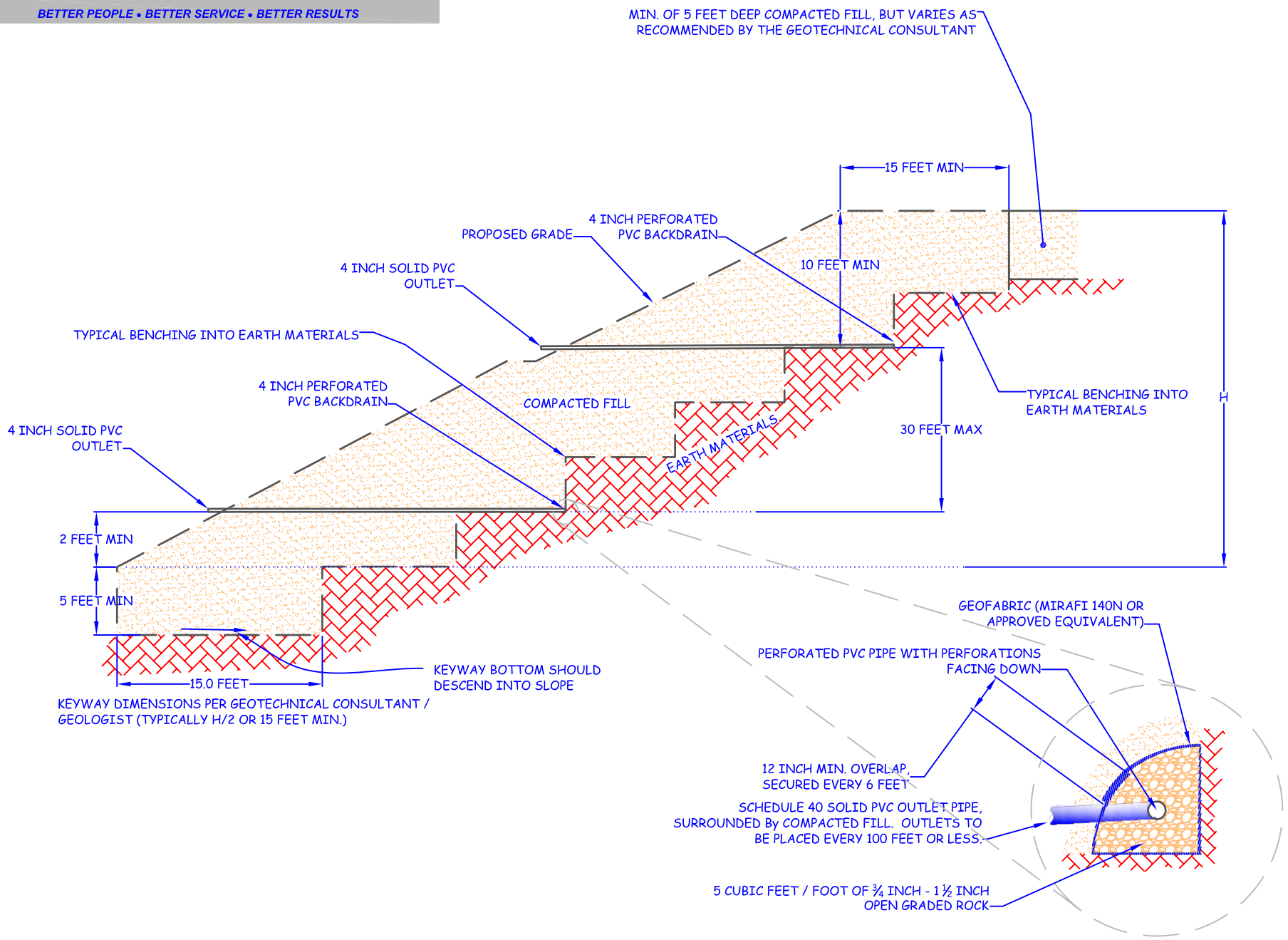
STABILIZATION FILL TYPICAL DETAIL



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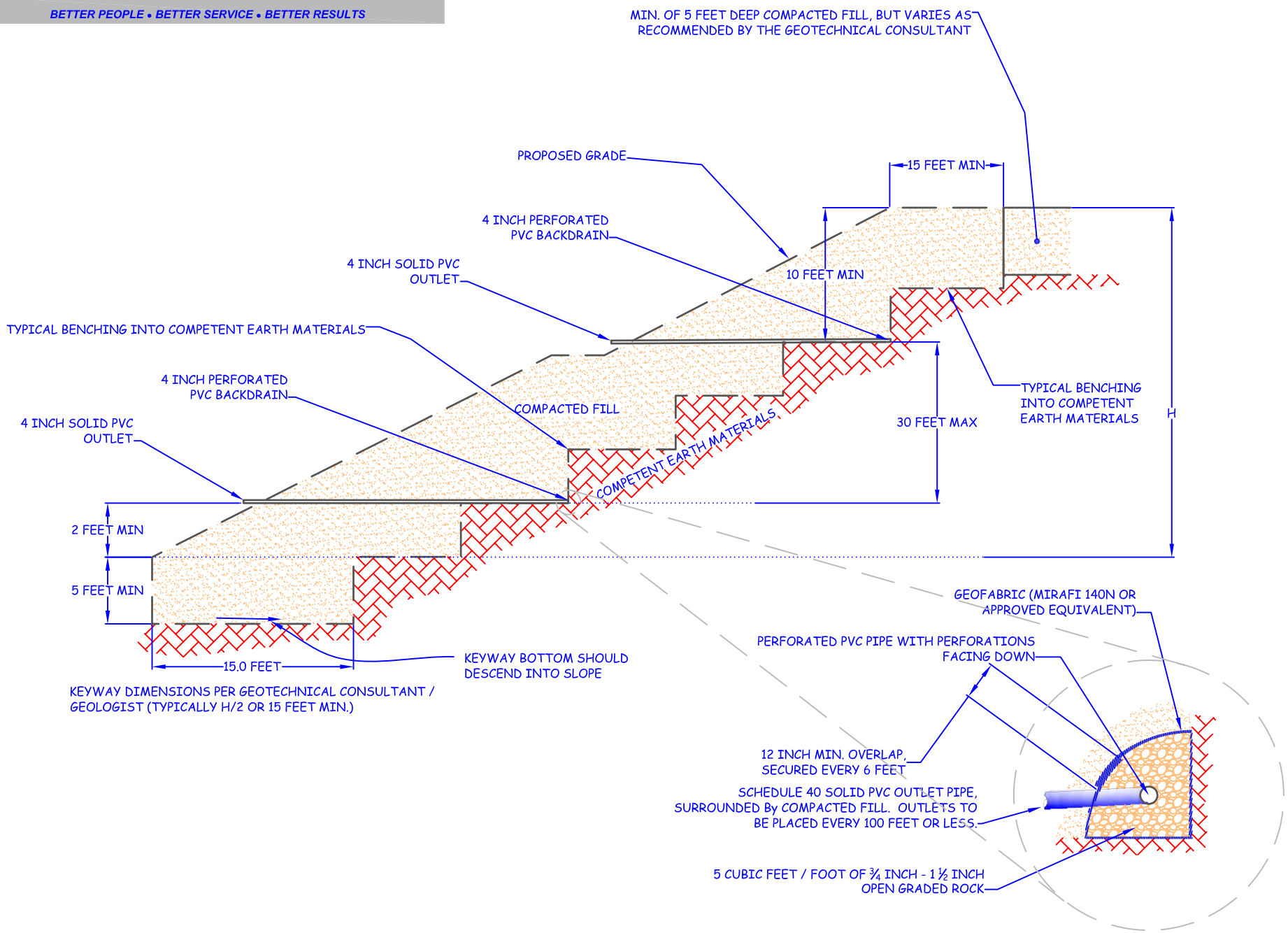
BUTTRESS TYPICAL DETAIL



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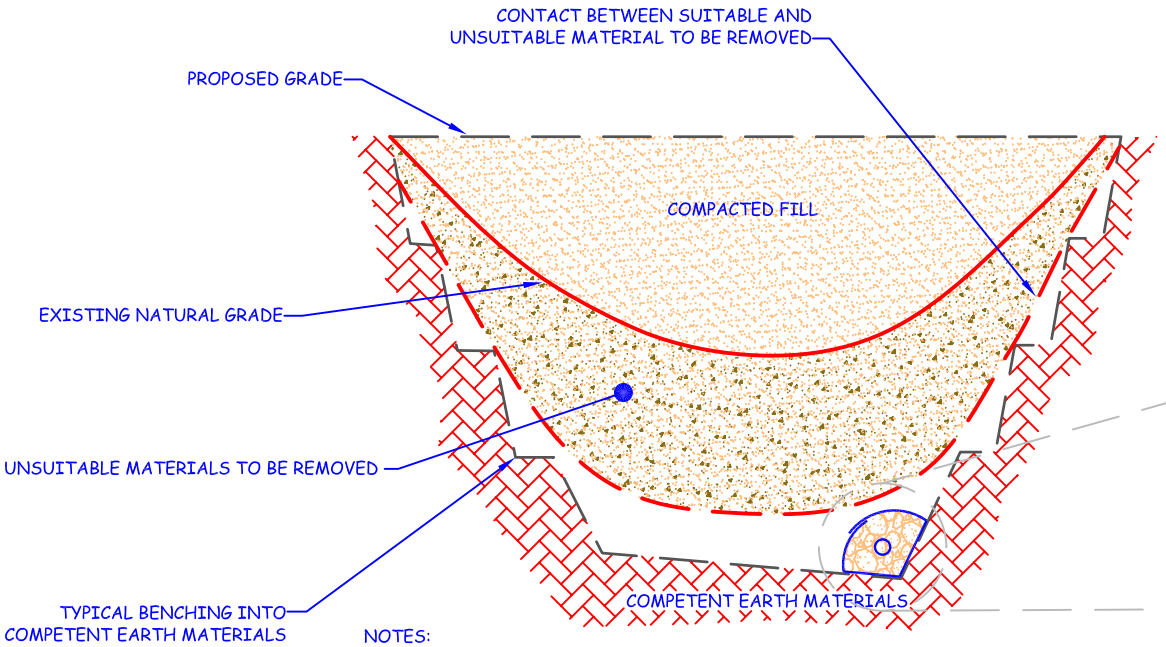
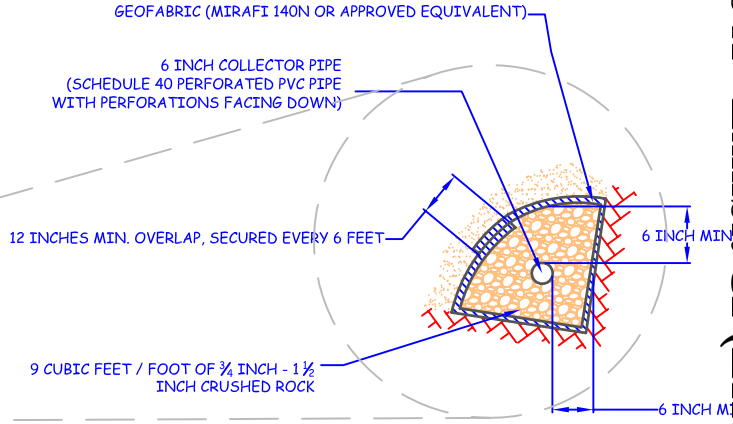
CANYON SUBDRAIN SYSTEM TYPICAL DETAIL

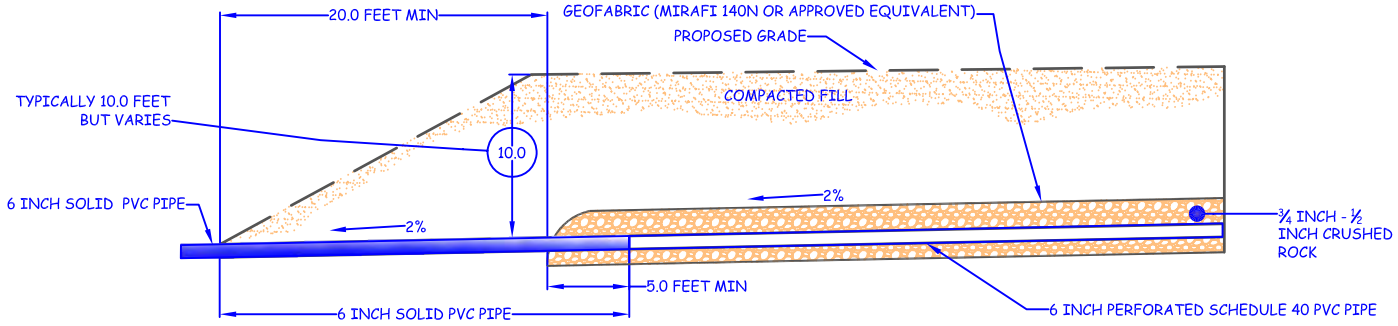




NOTES:
1 - CONTINUOUS RUNS IN EXCESS OF 500 FEET LONG WILL REQUIRE AN 8 INCH DIAMETER PIPE.

2 - FINAL 20 FEET OF PIPE AT OUTLET WILL BE SOLID AND BACKFILLED WITH COMPACTED FINE-GRAINED EARTH MATERIALS.

CANYON SUBDRAIN TYPICAL OUTLET



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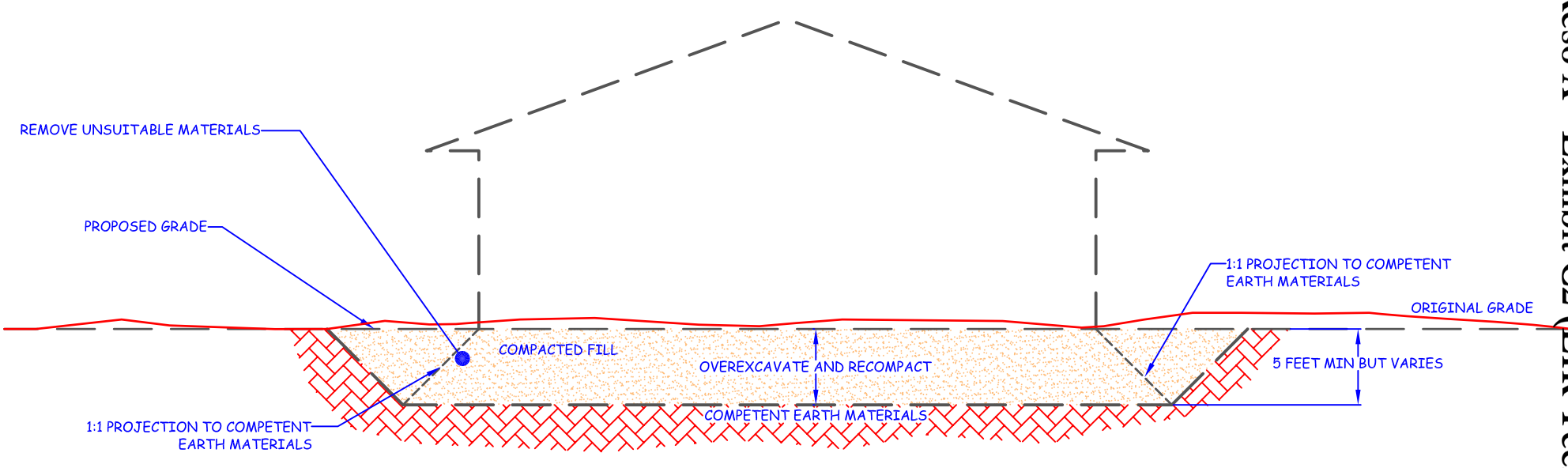
CUT LOT TYPICAL DETAIL



NOTE: REMOVAL BOTTOMS SHOULD BE GRADED WITH A MINIMUM 2% FALL TOWARDS STREET OR OTHER SUITABLE AREA (AS DETERMINED BY THE GEOTECHNICAL CONSULTANT) TO AVOID PONDING BELOW THE BUILDING

NOTE: WHERE DESIGN CUT LOTS ARE EXCAVATED ENTIRELY INTO COMPETENT EARTH MATERIALS, OVEREXCAVATION MAY STILL BY NEEDED FOR HARD-ROCK CONDITIONS OR MATERIALS WITH VARIABLE EXPANSION POTENTIALS

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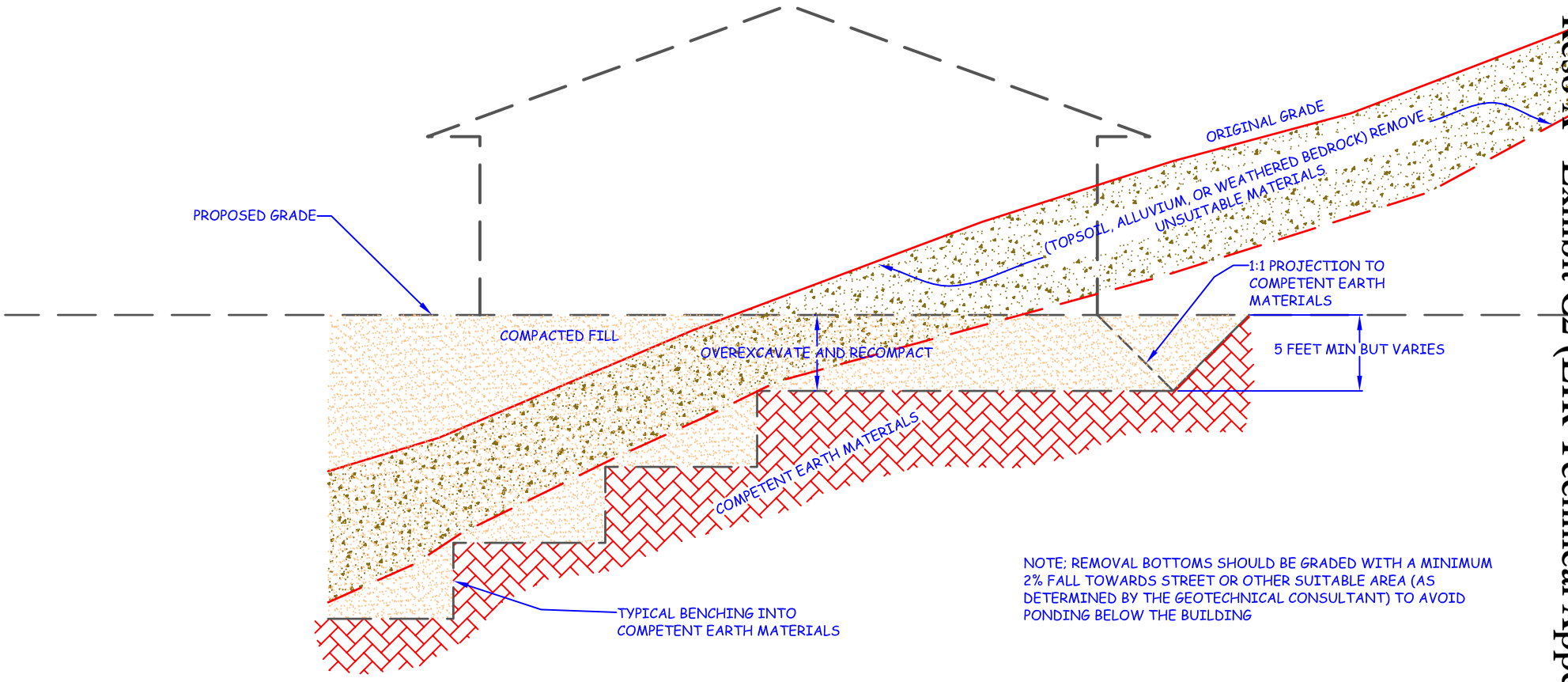
CUT / FILL TRANSITION LOT TYPICAL DETAIL



NOTE; REMOVAL BOTTOMS SHOULD BE GRADED WITH A MINIMUM 2% FALL TOWARDS STREET OR OTHER SUITABLE AREA (AS DETERMINED BY THE GEOTECHNICAL CONSULTANT) TO AVOID PONDING BELOW THE BUILDING

NOTE: WHERE DESIGN CUT LOTS ARE EXCAVATED ENTIRELY INTO COMPETENT EARTH MATERIALS, OVEREXCAVATION MAY STILL BY NEEDED FOR HARD-ROCK CONDITIONS OR MATERIALS WITH VARIABLE EXPANSION POTENTIALS

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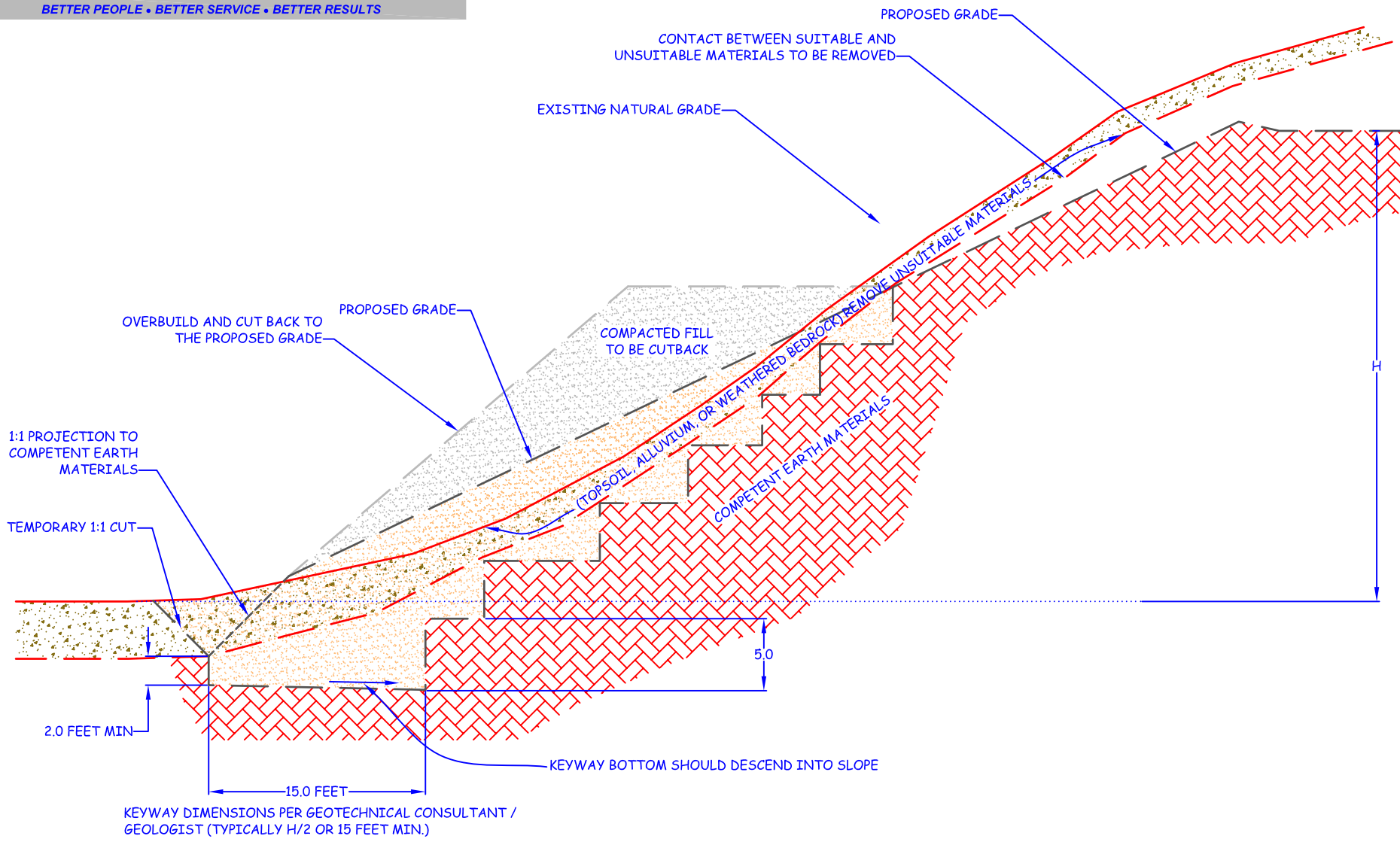
KEYWAY & BENCHING TYPICAL DETAILS
CUT OVER FILL SLOPE



NOTE:

NATURAL SLOPES STEEPER THAN 5:1 (H:V) MUST BE BENCHED INTO COMPETENT EARTH MATERIALS

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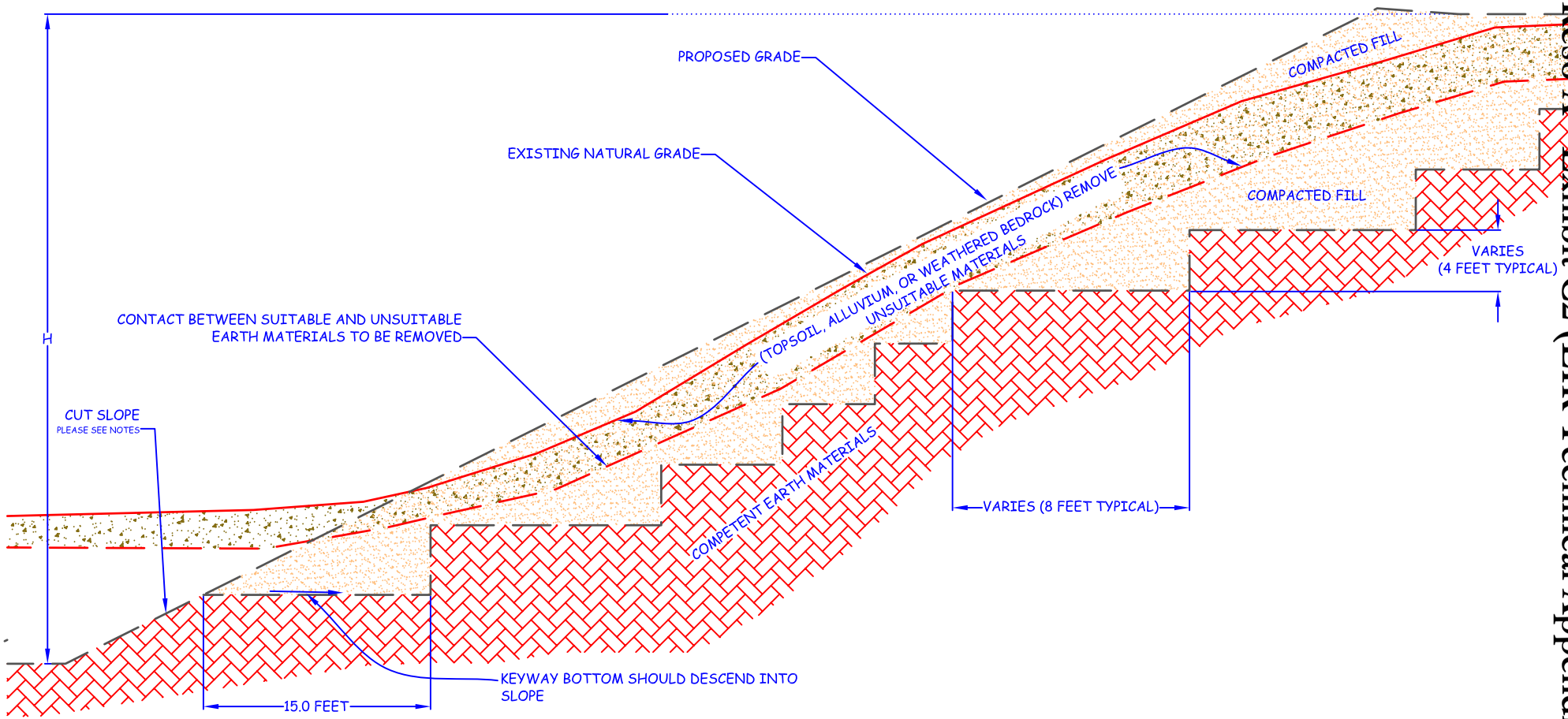
KEYWAY & BENCHING TYPICAL DETAILS
FILL OVER CUT SLOPE



KEYWAY DIMENSIONS PER GEOTECHNICAL CONSULTANT / GEOLOGIST (TYPICALLY H/2 OR 15 FEET MIN.)

NOTES:

NATURAL SLOPES STEEPER THAN 5:1 (H:V) MUST BE BENCHED INTO COMPETENT EARTH MATERIALS

THE CUT SLOPE MUST BE CONSTRUCTED FIRST

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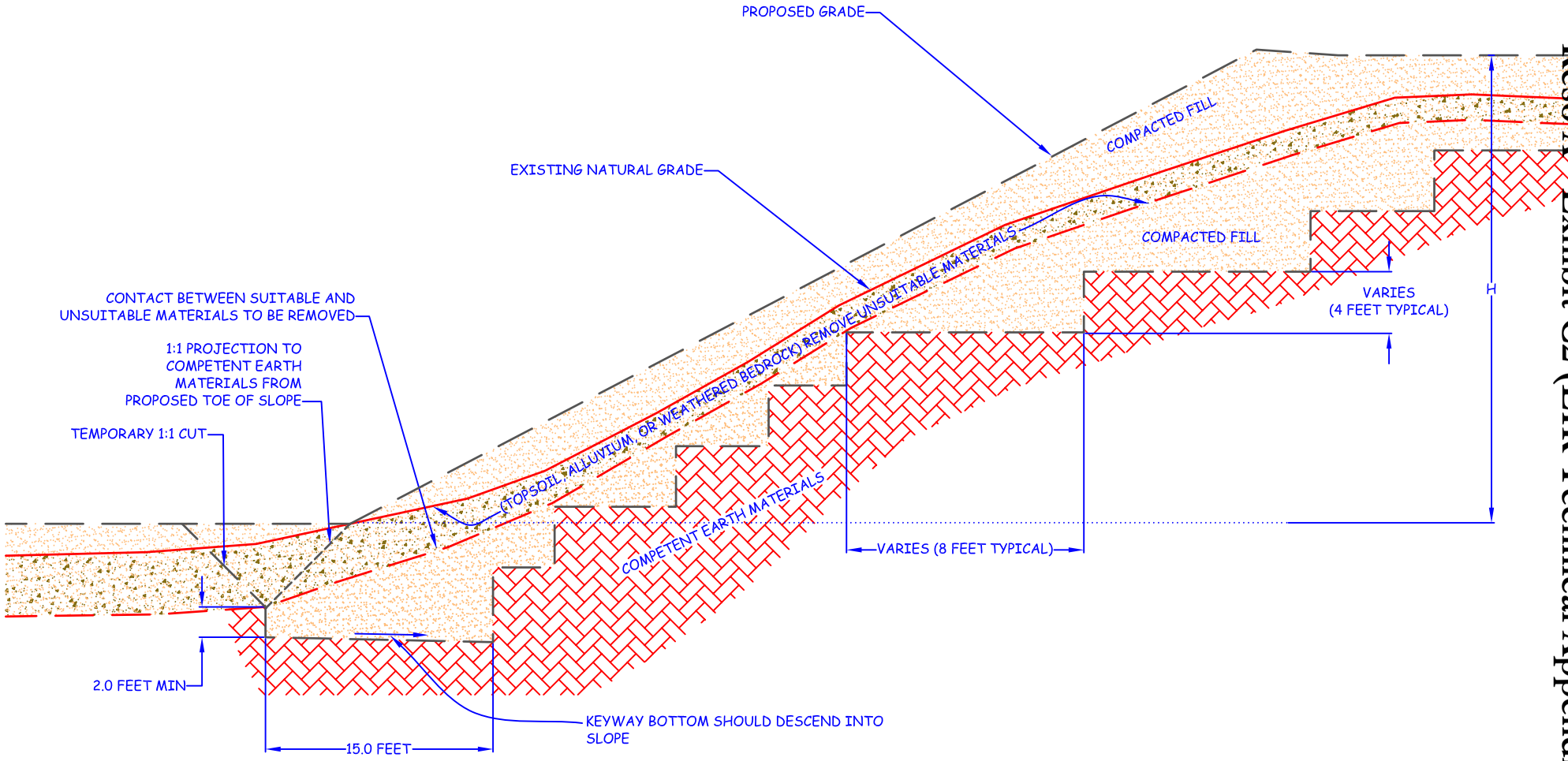
KEYWAY & BENCHING TYPICAL DETAILS
FILL SLOPE



NOTES:

NATURAL SLOPES STEEPER THAN 5:1 (H:V) MUST BE BENCHED INTO COMPETENT EARTH MATERIALS

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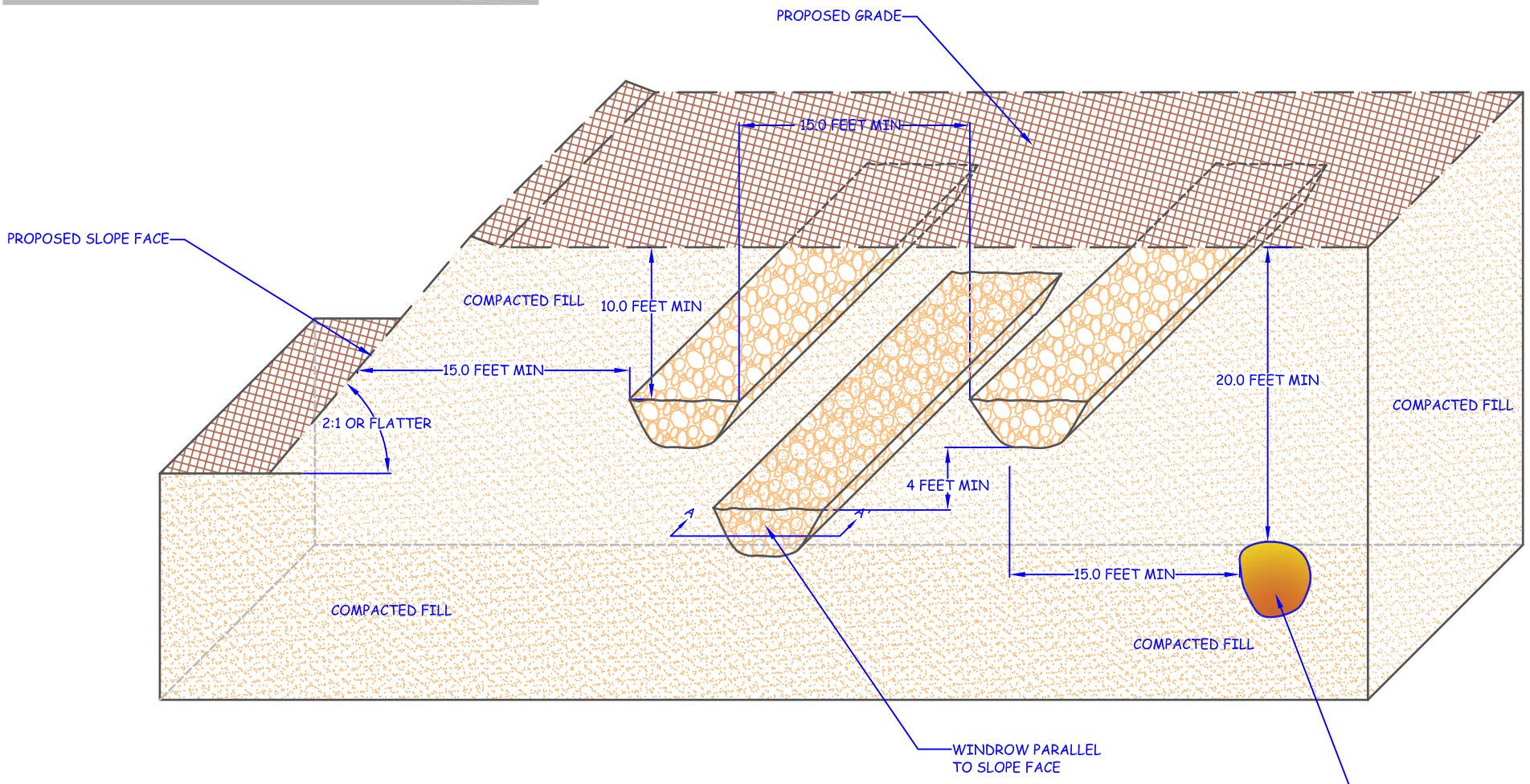
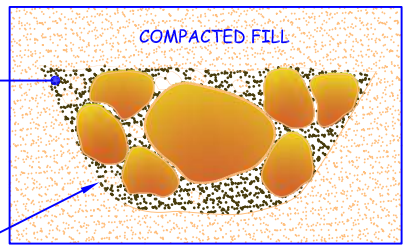
OVERSIZE ROCK TYPICAL DETAIL



CROSS SECTION A-A'



JETTING OF APPROVED
GRANULAR MATERIAL

EXCAVATED TRENCH
OR DOZER V-CUT

NOTES:

OVERSIZE ROCK IS LARGER THAN
8 INCHES IN MAX DIAMETER

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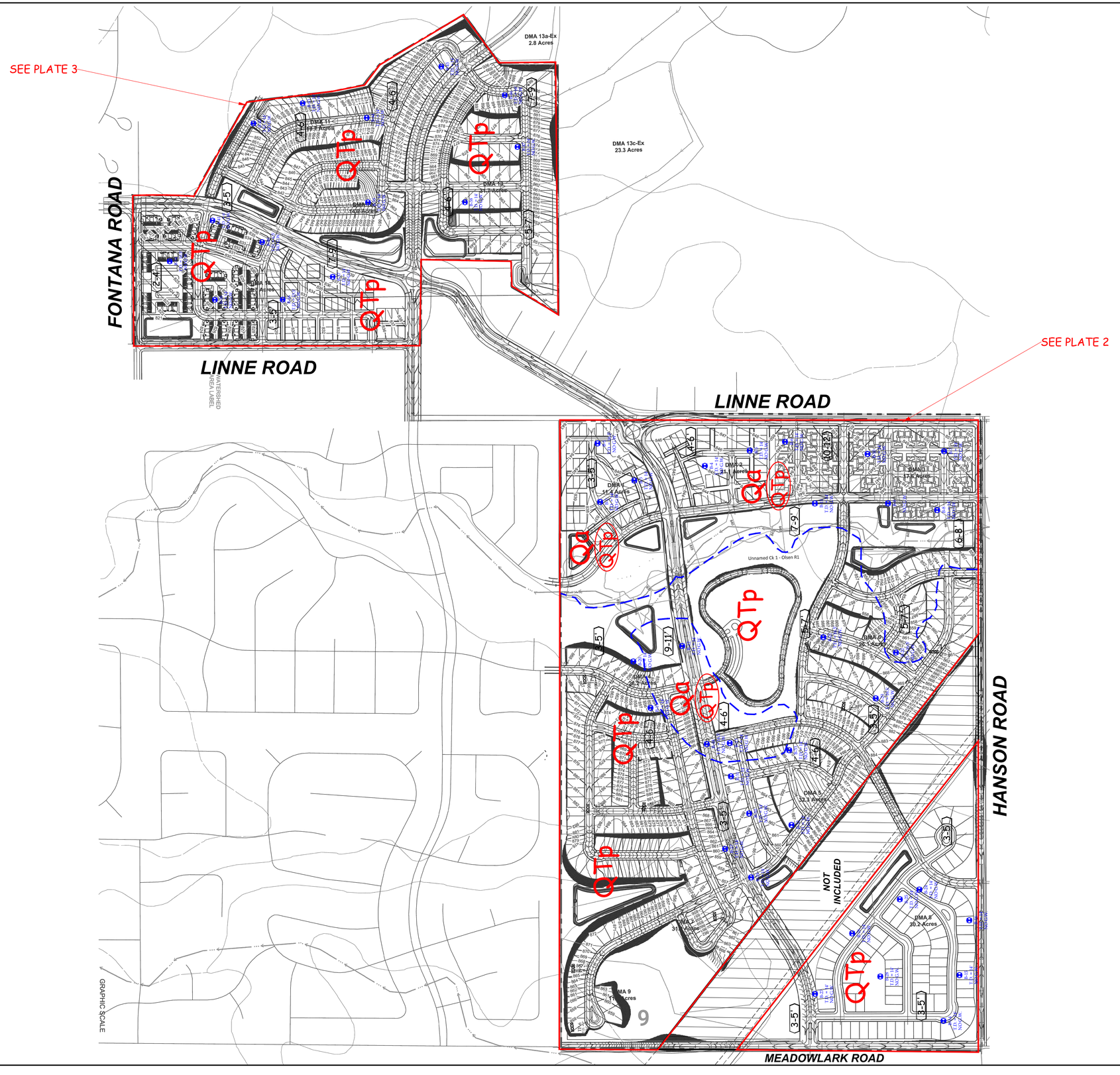

LEGEND

Locations are Approximate

Geologic Units

Qa - Quaternary Alluvium

QTp - Quaternary Paso Robles Formation (Circled Where Buried)

Symbols

- Limits of Report
- Geologic Contact
- Boring Location
  B-47
  T.D. = 14'
  NO G.W.
  Including Total Depth and Depth to Groundwater
- Test Pit Location
  TP-8
  T.D. = 4'
  NO G.W.
  Including Total Depth and Depth to Groundwater

North

OVERALL SITE MAP

LOCATED SOUTH OF LINNE ROAD AND NORTH OF MEADOWLARK ROAD
CITY OF PASO ROBLES, SAN LUIS OBISPO COUNTY, CALILFORNIA
APN 009-795-001, 009-795-002, 009-795-003, 009-795-004, 009-795-005, AND 009-795-006

PROJECT	OLSEN-CHANDLER RANCH RESIDENTIAL DEVELOPMENT		
CLIENT	MR. MIKE NAGGAR		
PROJECT NO.	182139-10A		
DATE	OCTOBER 2018		
SCALE	1:300		
DWG XREFS			
REVISION			
DRAWN BY	JDG	PLATE	1 OF 3

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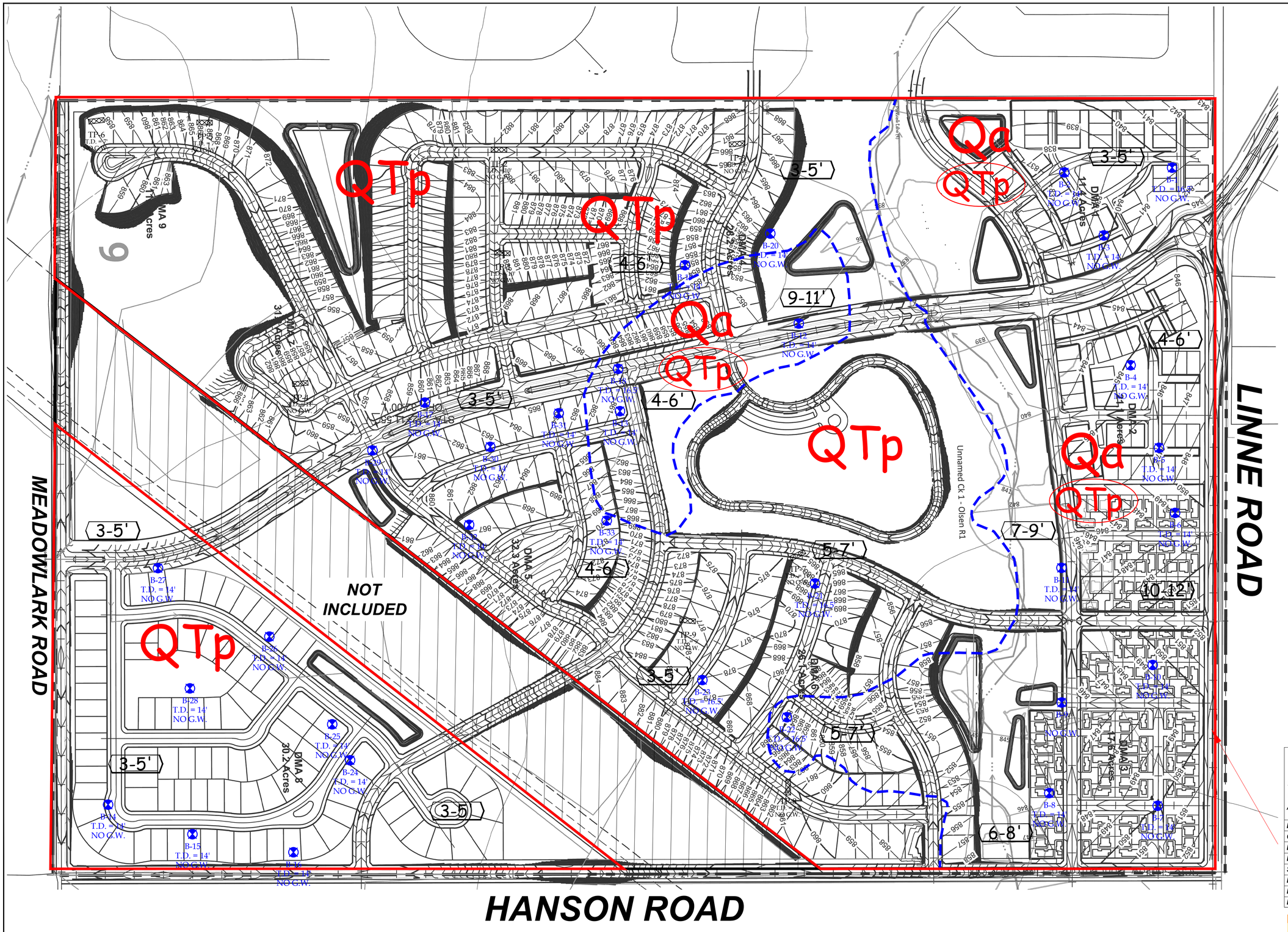
www.ESGSINC.com (951) 397-8315



LEGEND

Locations are Approximate

Geologic Units

- Qa - Quaternary Alluvium
- QTp - Quaternary Paso Robles Formation (Circled Where Buried)

Symbols

- Limits of Report
- Geologic Contact
- B-47, T.D. = 14', NO G.W. - Boring Location, Including Total Depth and Depth to Groundwater
- TP-8, T.D. = 4', NO G.W. - Test Pit Location, Including Total Depth and Depth to Groundwater
- (2-12') - Recommended Removal Depths

North

0 150' 200'

GEOTECHNICAL MAP

LOCATED SOUTH OF LINNE ROAD AND NORTH OF MEADOWLARK ROAD
CITY OF PASO ROBLES, SAN LUIS OBISPO COUNTY, CALILFORNIA
APN 009-795-001, 009-795-002, 009-795-003, 009-795-004, 009-795-005, AND 009-795-006

PROJECT	OLSEN-CHANDLER RANCH RESIDENTIAL DEVELOPMENT		
CLIENT	MR. MIKE NAGGAR		
PROJECT NO.	182139-10A		
DATE	OCTOBER 2018		
SCALE	1:150		
DWG XREFS			
REVISION			
DRAWN BY	JDG	PLATE	2 OF 3

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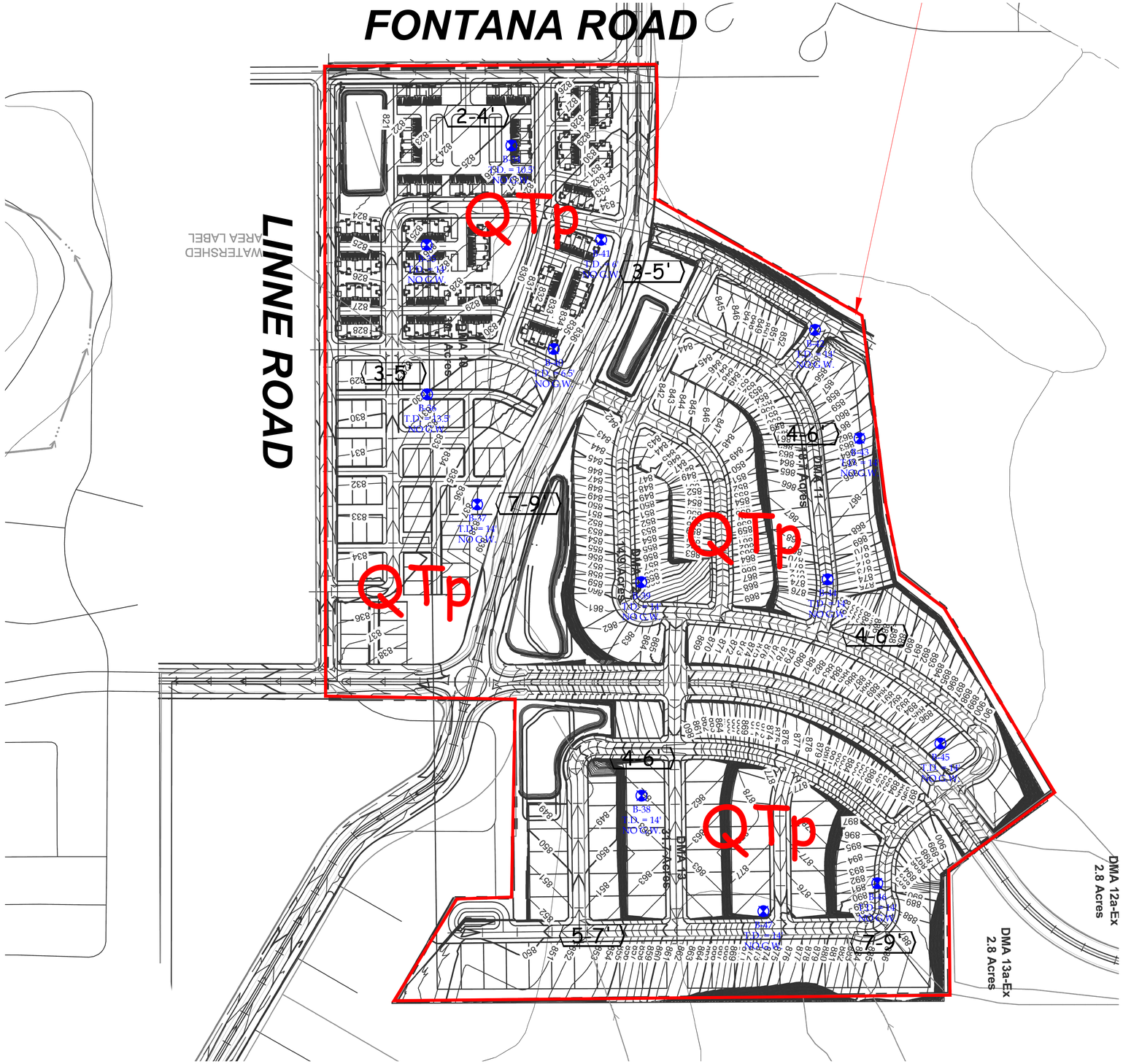

LEGEND

Locations are Approximate

Geologic Units

Qa	-	Quaternary Alluvium
QTp	-	Quaternary Paso Robles Formation (Circled Where Buried)

Symbols

	-	Limits of Report
	-	Geologic Contact
B-47 T.D. = 14' NO G.W.	-	Boring Location Including Total Depth and Depth to Groundwater
2-12'	-	Recommended Removal Depths

North

0 150' 200'

GEOTECHNICAL MAP

LOCATED EAST OF FONTANA ROAD AND NORTH OF LINNE ROAD
CITY OF PASO ROBLES, SAN LUIS OBISPO COUNTY, CALILFORNIA

APN 025-381-005, 025-381-001, 009-798-001, 009-798-002, 009-798-003, 009-796-002, AND 009796-003

PROJECT	OLSEN-CHANDLER RANCH RESIDENTIAL DEVELOPMENT		
CLIENT	MR. MIKE NAGGAR		
PROJECT NO.	182139-10A		
DATE	OCTOBER 2018		
SCALE	1:150		
DWG XREFS			
REVISION			
DRAWN BY	JDG	PLATE	3 OF 3

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Appendix F.2

Preliminary Drainage Report and Hydraulic Analysis

Reso A - Exhibit C2 (EIR Technical Appendix)

PRELIMINARY DRAINAGE REPORT
OLSEN-CHANDLER RANCH
SPECIFIC PLAN AND VESTING TENTATIVE TRACT MAP

Prepared for
Olsen 212, LLC

Submitted by

WALLACE GROUP

Job Number: 1465.0001
January 31, 2019

Reso A - Exhibit C2 (EIR Technical Appendix)

CERTIFICATION

Preparation of this report included efforts by the following persons:
In accordance with the provisions of Section 6700 of the Business and Professions Code of the State of California, this report was prepared by or under the direction of the following Civil Engineer, licensed in the State of California:

ENGINEER IN RESPONSIBLE CHARGE:

01/31/2019

Debra Tumler, PE C55205 — Date
Senior Civil Engineer

Byron J. Glenn, PE C51519 — Date
Senior Civil Engineer
Project Manager

Reso A - Exhibit C2 (EIR Technical Appendix)

PRELIMINARY DRAINAGE REPORT
OLSEN-CHANDLER RANCH
SPECIFIC PLAN AND TENTATIVE TRACT MAP

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Reso A - Exhibit C2 (EIR Technical Appendix)

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PRELIMINARY DRAINAGE REPORT
OLSEN-CHANDLER RANCH
SPECIFIC PLAN AND VESTING TENTATIVE TRACT MAPS

INTRODUCTION

The purpose of this report is to present a Preliminary Master Drainage Study for the Olsen-Chandler Ranch Specific Plan and corresponding Vesting Tentative Tract Maps (VTTM). This Specific Plan (SP) consists of two distinct large parcels known as Olsen Ranch and South Chandler Ranch. Because the two properties do not share a common boundary, a Vesting Tentative Map will be required for each property. This Preliminary Drainage Report addresses the existing and proposed drainage patterns for both parcels.

The SP will also include the existing Our Town subdivision as well as APN 009-798-003 commonly known as the Centex Parcel (currently owned by the Fuentez Family Trust), APN 009-798-001 and 002, APN 009-796-002 and 003. This Drainage Report analyzes stormwater runoff impacting the entire SP area and provides drainage solutions within the SP to regulate stormwater runoff discharges from adversely impacting the City's existing storm drain infrastructure. The SP is located in the southeastern corner of the City of Paso Robles and encompasses an area of approximately 355 acres and drains from the east and the northeast westward toward the Salinas River (Figure 1).

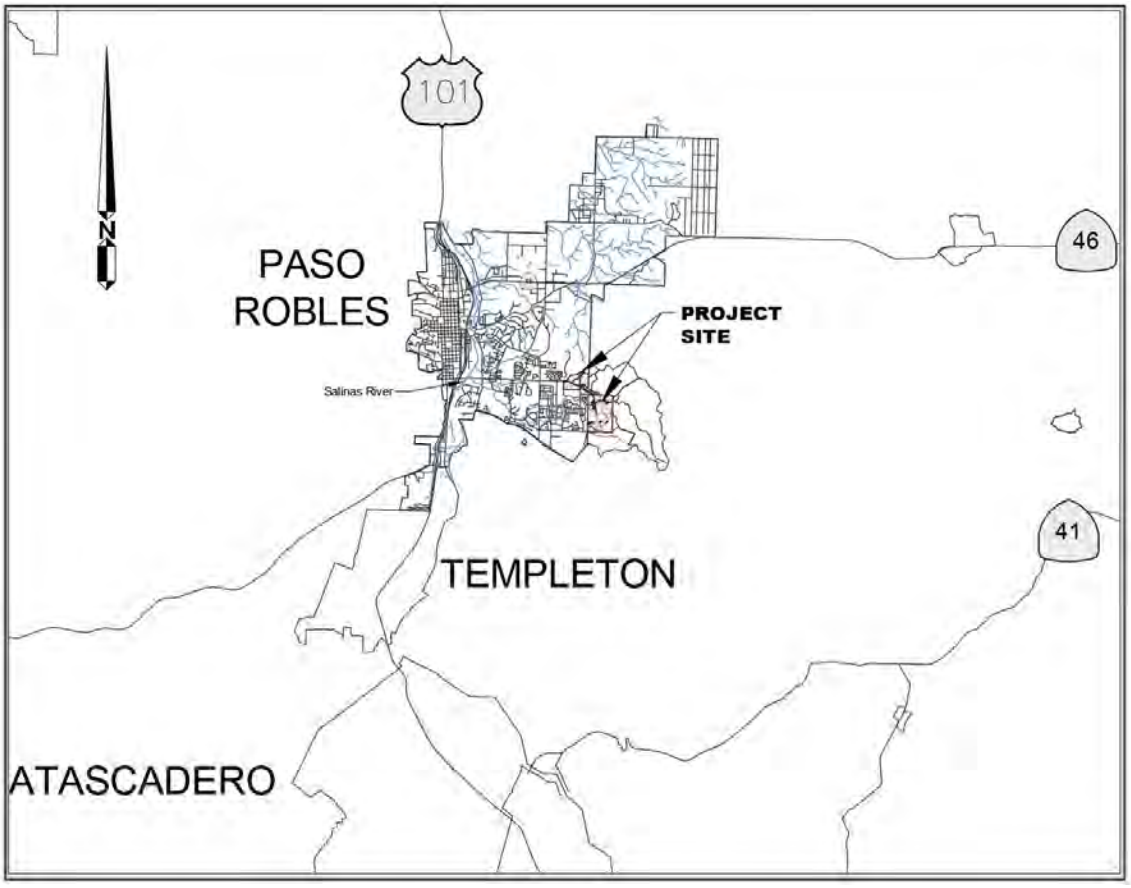


Figure 1 – Vicinity Map

Olsen Ranch is located north of Meadowlark Road, west of Hanson Road, south of Linne Road and east of existing residential subdivisions. The project's primary access is at Linne Road, Meadowlark Road and Airport Road. The property has been occupied by residential structures

and ancillary structures for many years. The property is bounded to the north by Vineyards, the Our Town subdivision to the northwest and existing residential subdivisions to the west. Figure 2 shows the location of the Olsen-Chandler Ranch Development.

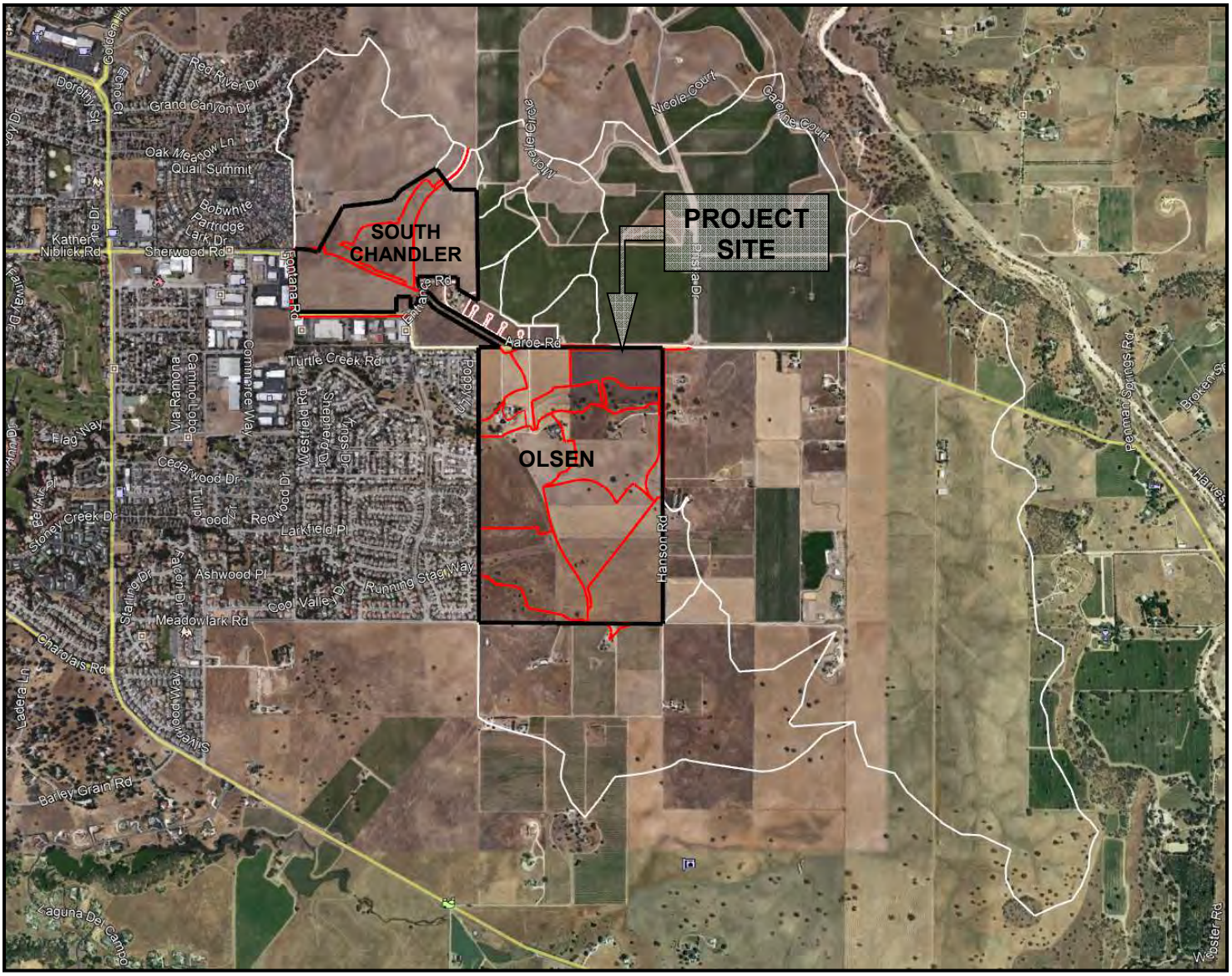


Figure 2 – Project Location Map

South Chandler Ranch is located east of Fontana Road, north of Linne Road and northwest of the Linne Road / Airport Road intersection. The project's primary access will be from Linne Road, the extension of Sherwood Road to the east, and the extension of Airport Road to the north. The property is bounded to the north by undeveloped land, to the east by Vineyard and to the south by an existing industrial development. The Our Town subdivision lies to the southeast.

EXISTING SITE CONDITIONS

The Olsen Parcel consists of approximately 242.5 acres on rolling hills with a wide flatter plain along the northern quarter of the property. The topography varies and follows the hilly terrain along the southern two thirds of the site then flattens out in grade along its northern boundary. Vegetation on Olsen Ranch currently consists of scattered oak tree clusters and annual grasses. A natural drainage known as Un-Named Creek #1 in the San Luis Obispo County Flood Insurance

Study (FIS) is located at the foot of the hilly terrain and the broad plain exists northward to Linne Road. A large PG&E electrical easement crosses the southeast portion of the site from the southwest to the northeast.

The South Chandler Parcel consists of approximately 83.7 acres and currently consists of undeveloped land with annual grass coverage. The topography of South Chandler Ranch is relatively mild along the southern portion then increases in grade from the site's midpoint to its northern boundary.

SOIL SURVEY

The project's **Preliminary Geotechnical Interpretive Report** was prepared by Earth Strata Geotechnical Services, Inc, November 20, 2018, Project No. 182139-10A. This report describes the local geology, faulting and presents findings from soil borings and excavated test pits. The soils on the site are primarily Quaternary Alluvium (Qal) and Quaternary Paso Robles Formation (QTp). The Qal soils reach a maximum depth of approximately 14-feet. These deposits consist predominately of fine to coarse grained silty sand, sandy silt, sandy clay and occasionally poorly graded sand with varying amount of clay and silt.

The QTp is bedrock and is generally encountered below the top soil and alluvium materials. This soil group consists of fine to coarse grained sandstone with varying amount of silt and clay, sandy siltstone, claystone, and breccia.

The presence of the hard bedrock material outlined above may inhibit potential infiltration of stormwater runoff. The Preliminary Geotechnical Interpretive Report showed that 40 of the 47 borings showed the Quaternary Paso Robles Formation (QTp) at a depth less than 10 feet.

The various soil types and their descriptions are further described by the NCRS (formerly USDA) SCS Soil Survey of SLO County CA Paso Robles Area 1983. These soils are the Arbuckle-Positas Complex (Unit 102), Arbuckle-Ysidro Complex (Unit 106), Cropley Clay (Unit 133), Nacemiento-Los Osos Complex (Unit 179), Rincon Clay Loam (Unit 187) and San Ysidro Loam (Unit 197).

The Arbuckle-Positas Complex consists of 40% Arbuckle fine sandy loam is very deep and well drained and has a moderately slow permeability. The Arbuckle soils are suitable for building sites. Moderate shrink/swell potential and low strength are limitations for dwellings and buildings but can be overcome if proper design and installation procedures are used. The complex also consists of 30% Positas coarse sandy loam. This soil is very deep and well drained and formed in alluvium derived from mixed rocks and has very slow permeability. The surface runoff is medium, and erosion hazard is moderate. The Positas soils have a high shrink/swell potential therefore creating severe limitations to building construction. The hydrologic soil group is B.

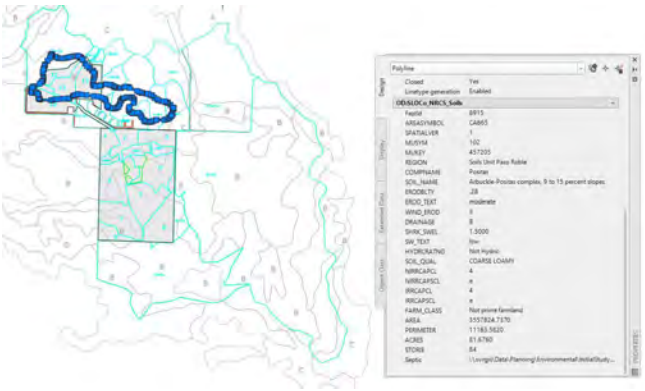


Figure 3 - NRCS Soils GIS Data

The Arbuckle-San Ysidro Complex consists of 40% Arbuckle fine sandy loam, 20% San Yisidro loam and 15% Greenfield fine sandy loam. The Arbuckle is very deep and well drained. The San

Ysidro is also very deep and moderately well drained with very slow permeability. Runoff is medium and the hazard of erosion is moderate. The San Ysidro has a high shrink swell potential creating severe limitations for building sites, roads and foundations. These structures need to be designed to prevent damage caused by shrinking and swelling of sub soil. The hydrologic soil group is B.

The Cropley Clay, located on 2-9% slopes, is a very deep gently to moderately sloping well drained soil formed in alluvium derived from sedimentary rock. The soil has slow permeability and the hazard of erosion is moderate. The shrink swell potential is high therefore the soil has severe limitations for building sites. The hydrologic soil group is D.

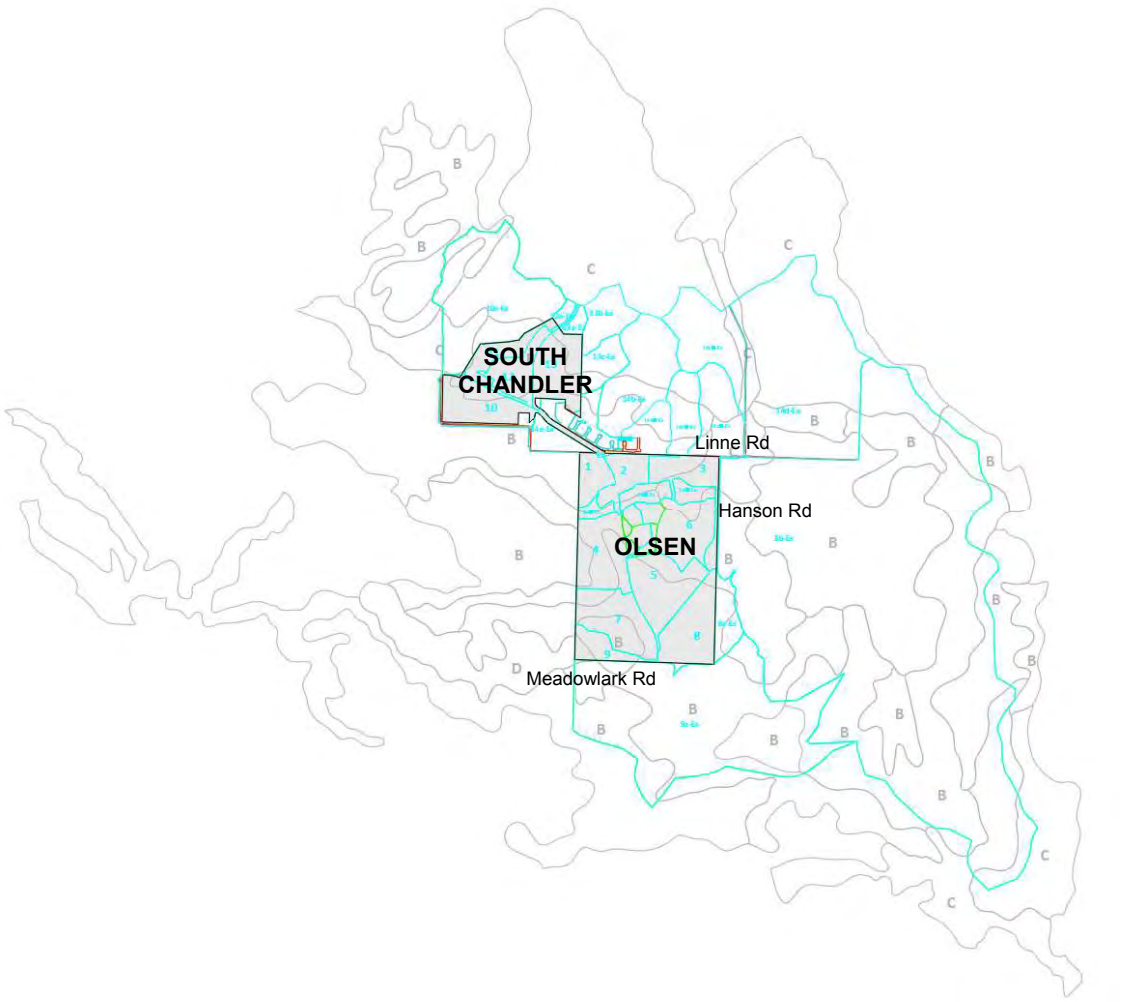


Figure 4 - Natural Resources Conservation Service (NRCS) Soil Drainage Ratings

The Nacimiento-Los Osos complex is located on 9 to 30% slopes moderately steep soils on hills. The complex consists of 30% Nacimiento silty clay loam and 20% Los Osos clay loam with the remaining 50% of the complex is made up of variable loamy soils. The Nacimiento soils exhibit moderately slow permeability and the Los Osos soils have slow permeability therefore surface runoff is rapid and the hazard of erosion is high. The complex exhibits a high shrink swell potential. The hydrologic soil group is C.

The Rincon Clay Loam is located on 0-1% slopes is a very deep and well-drained soil. It formed in alluvium from sedimentary rocks and is located on alluvial fans. The soil has slow permeability with high water capacity so surface runoff is slow with low erosion hazard. The soil exhibits a high shrink swell potential creating severe limitations for building sites. The hydrologic soil group is C.

The San Ysidro Loam is located on 0 – 2% slopes and is very deep and moderately well drained soil that formed in alluvium derived from mixed rocks. This soil has very slow permeability. Runoff is slow and erosion is slight, however the soil has a high shrink swell potential. The hydrologic soils group is B. The NRCS Soils Map is included as Figure 5. A copy of the NRCS soils hydrologic index is provided in Appendix.

Figure 5 - NRCS Soils Survey Map & Data

PROPOSED SITE CONDITIONS

The proposed development will divide the South Chandler Ranch and Olsen Ranch into 23 planning areas, with each planning area being defined as a specific use with a specific density. At the time of development, the South Chandler parcel will be bisected in a north-south direction by Airport Road and an east-west direction by Sherwood Road. Chandler Ranch is divided into 7 Planning Areas (1-7). Planning Areas 1 and 2 are proposed to be a high residential development consisting of 60 apartment units on 2.93 acres and 108 townhome units on 6.42 acres. Planning Area 3 is proposed to be a medium density residential development consisting of 48, 40-ft x 80-ft lots on 5.9 acres. The multi-family and small lot units are located on the flatter portion of

parcel south of the proposed Sherwood Road extension where natural slopes range from 1.0 to 1.5%.

Planning Areas 4 and 5 will consist of 173 units single-family residential units ranging in size from 5,500 to 7,700 square foot lots on a total of approximately 56.23 acres. The large lots are located north of Sherwood Road on terrain with an average slope between 3.0 and 6.0%. Airport Road is proposed to be extended northward between Planning areas 4 and 5. It is anticipated that small retaining walls will be required along the side yards of these units located on streets greater than 3.0%. The Project summary for the individual parcels which make up the SP is outlined below within Figure 6.

Planning Area 6 is located at the southwest corner of Planning Area 4 and consists of a small farmers market commercial area located on approximately 0.47 acres. Planning Area 7 is located at the northwest corner of Planning Area 3 and will consist of a small private recreation center on approximately 0.61 acres. Planning Areas 8, 9 and 10 are outside of this proposed development but are included in the overall SP. Planning Areas 8 and 9 are currently undeveloped, however Planning Area 10 is the approved Our Town development.

Figure 6 - Proposed Land Use Map

Olsen Ranch consists of Planning Areas 11 through 23 and is bisected in a north-south direction by Sherwood Road. An existing drainage way known as Turtle Creek (Un-named Creek #1 per the FIS) flows through the northern half of the site from Hanson Road to the western boundary. Proposed land uses will consist of a variety of residential units from apartments and townhomes to single-family residential units ranging in size from 3,200 to 7,700 square foot lots.

Planning Area 11 and 12 are proposed to be a medium density residential development consisting of 97, 40-ft x 80-ft lots on 16.2 acres. These planning areas are separated by the proposed Sherwood Road alignment. Planning Area 13 is also proposed to be a medium density residential development, but the product is a cluster development consisting of 129 units on 15 acres. The small lot residential units are located on the flatter portion of the parcel north of Turtle Creek and south of Linne Road, where natural slopes range from 0.5 to 1.5%. Planning Areas 11 through 13 lie north of Planning Area 14 which is the natural open space area containing Turtle Creek. Planning Area 14 consists of approximately 22 acres.

Planning Areas 15 and 17 through 20 and 23 are proposed to be low density residential lots consisting of 413 single-family residential units ranging in size from 5,500 to 7,700 square foot lots on a total of approximately 129 acres located south of Turtle Creek on rolling terrain with an average slope between 1 and 12%. Sherwood Road provides access and utilities to these planning areas. It is anticipated that small retaining walls will be required along the rear and side yards of these units.

Planning Area 16 is a proposed private recreational facility located on approximately 20.88 acres. Planning Area 21 lies within the PG&E easement and will be programmed for use as a community park. Planning Area 22 will also be a planned community park.

The proposed land plan was developed utilizing the natural terrain's existing contouring to minimize the grading of existing knolls to the maximum extent possible while maintaining design standards for roadway horizontal and vertical alignments and preliminary design of the individual single-family lots. Preliminary earthwork calculations combining both the South Chandler and Olsen Parcels reveal that approximately one million yards of earth will be moved.

The overall cut ranges from a few inches to about 22.5 feet on the Chandler parcel with a maximum fill of 24 feet. The average fill across the site is approximately 1.7 feet. The overall cut ranges from a few inches to about 24 feet on the Olsen parcel with a maximum fill of 20 feet. The average cut across the site is approximately 1.4 feet.

Stormwater runoff will be intercepted by conventional onsite storm drain systems and discharged into detention ponds for each proposed development parcel within Chandler Ranch and Olsen Ranch. Peak stormwater runoff will be controlled with the use of detention basins prior to discharge into the City's system. Runoff from storm events greater than the 95th percentile will be detained back to historic levels to help ensure the existing City storm drain infrastructure is not adversely impacted and maintains its current function as it does today. The storm drain system will be designed to convey the 25-year storm event. Runoff from the 95th percentile storm event will be discharged into stormwater management facilities and retained for infiltration.

Stormwater quality control will be managed per the requirements outlined within the Central Coast Regional Water Quality Control Board's (RWQCB) Resolution R3-2012-0032 and the City of Paso Robles Engineering Design Standards. The goal of the RWQCB is to treat stormwater at its

source in the hope to infiltrate the 95th percentile rainfall event. Bio-retention swales and pervious pavers are proposed throughout the residential developments to help capture and treat the 95th percentile event. The 2-year and the 10-year storm events are required to be detained back to historic levels. In addition to the RWQCB post construction requirements for stormwater management, the detention basins will be sized to detain up to the 100-year storm event back to historic levels for flood control.

WATERSHED DESCRIPTION

Watershed Description

The Olsen Chandler Specific Plan lies within three major watersheds that confluence approximately 1.4 miles west of Olsen Ranch, ultimately discharging into the Salinas River. These include the Northern, Central and Southern Watersheds. The Northern Watershed encompasses approximately 537 acres including South Chandler Ranch. The Central Watershed encompasses approximately 863 acres including the northern two thirds of Olsen Ranch. The Southern Watershed encompasses approximately 109 acres and includes the lower third of Olsen Ranch, as denoted by the grey shaded area (Figure 7).

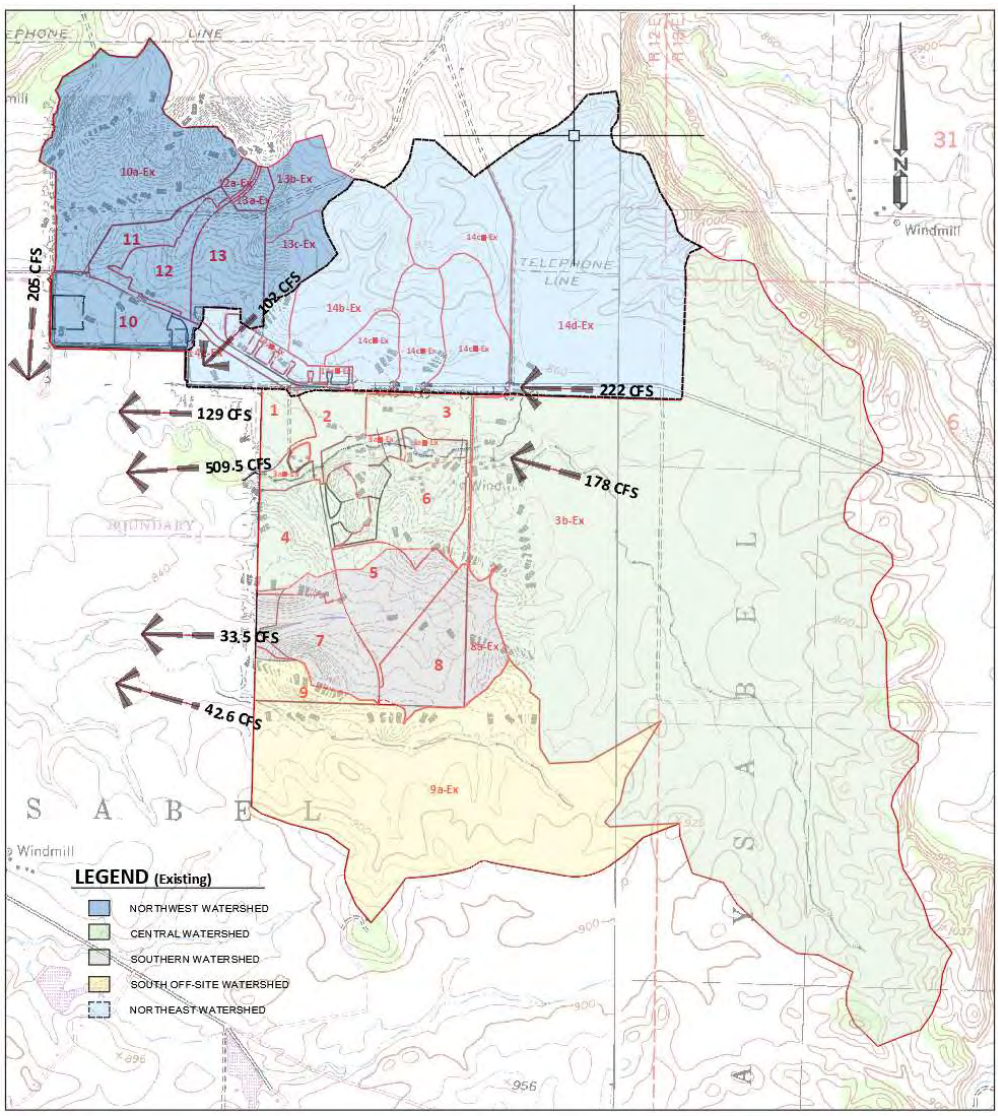


Figure 7 - Olsen Property Existing Drainage Areas

The Northern Watershed is divided into the Easterly and Westerly Sub-watersheds. The Easterly Sub-watershed consists of the Gran Cielo Vineyard development, the Our Town development and undeveloped property east of Airport Road. According to the Drainage Study prepared for the Gran Cielo development entitled "**Tract No. 2526 Grading and Drainage Report Summary**", prepared by Vaughan Surveys, Inc, August 2003;

> *"Existing stormwater runoff currently flows along and over Linne Road to other properties south of Linne Road. The basin is designed to preserve existing flow patterns within the watershed in accordance with County Section 11-351.1500"*.

Stormwater runoff generated within the Easterly Sub-watershed of the Northern Watershed will, therefore, overtop Linne Road and flow into the Central Watershed as it has historically from major storm events. The report shows that stormwater runoff within the Gran Cielo development sheet flows overland and is routed through onsite roadways and culverts along Priska Drive (Gran Cielo entry) to Linne Road. Flows are then intercepted by small rectangular detention areas along the northern side of Linne Road. The report references the ability of these detention areas to detain up to the 50-year storm event,

> *"The Linne Road Basin is designed to retain the Q50 volumes…."*.

Six, 30-inch corrugate metal pipes (CMP) are located underneath Priska Drive to convey flows to the west and into a series of retention structures. Stormwater runoff along Linne Road appears to split with a large percentage of the flow spilling over the Linne Road centerline and to the south for all storm events, following historic drainage paths to Un-Named Creek No. 1 along the northern portion of Olsen Ranch.

Runoff from the vineyard areas upstream of Our Town development sheet flows to the deteriorating roadway (Aaroe Road) located within the Our Town development with a curb and gutter section capable of conveying flows northwest to a low point. Flows impacting this low point are conveyed across the Centex Parcel in a relatively flat undefined channel to the intersection of Linne Road and Airport Road. A small amount of flow from the Gran Cielo development is conveyed to the west within a small ditch along Linne Road where it is combined with stormwater runoff from Our Town and upstream watersheds at the intersection of Airport Road and Linne Road. These combined flows are then discharged through a culvert and into an existing earthen channel behind the Sherwood Industrial Park. The earthen channel is approximately 24 feet wide at the top, 5-feet deep and has a 2:1 side slope.

The Westerly Sub-watershed consists of the South Chandler Ranch property. Stormwater runoff from this sub-watershed sheet flows to roadside ditches along Fontana Road and Linne Road and join at the roadway intersection. Stormwater runoff is then conveyed underground to an open channel located approximately 300 feet south of the Linne Road and Fontana Road intersection, where this runoff confluences with flows from the Easterly Sub-watershed.

The Central Watershed encompasses approximately 864 acres including the northern portion of Olsen Ranch. Stormwater runoff from this area is conveyed across the Olsen parcel through the Un-Named Creek No. 1 to the western boundary, south of Parkview Drive. The creek then enters a defined channel known as Turtle Creek where flows are conveyed to the west. Flows from the Central Watershed then combine with flows from the Northern Watershed within the earth lined channel located west of Turtle Creek Road and Brookhill Drive (Figure 8).

The Southern Watershed consists of 109 acres and encompasses the southern portion of Olsen Ranch. Runoff from this watershed currently flows into a man-made stock pond where flows from small rain events are retained. A storm drain system within Running Stag Way has been extended to the Olsen Ranch boundary to intercept storm flows and convey them to the west.

A fourth watershed exists south of the Olsen parcel that appears to discharge flows within Meadowlark Road at the southwest corner of the Olsen Parcel. The drainage area within Olsen Ranch contributing runoff to this point is approximately 11.4 acres. This small onsite basin contributes flow to the larger 212 acre watershed south of the project site. According to the City, the proposed Beechwood Specific Plan area south of Meadowlark Road will mitigate for this offsite flow and reduce any flooding potential at this location.

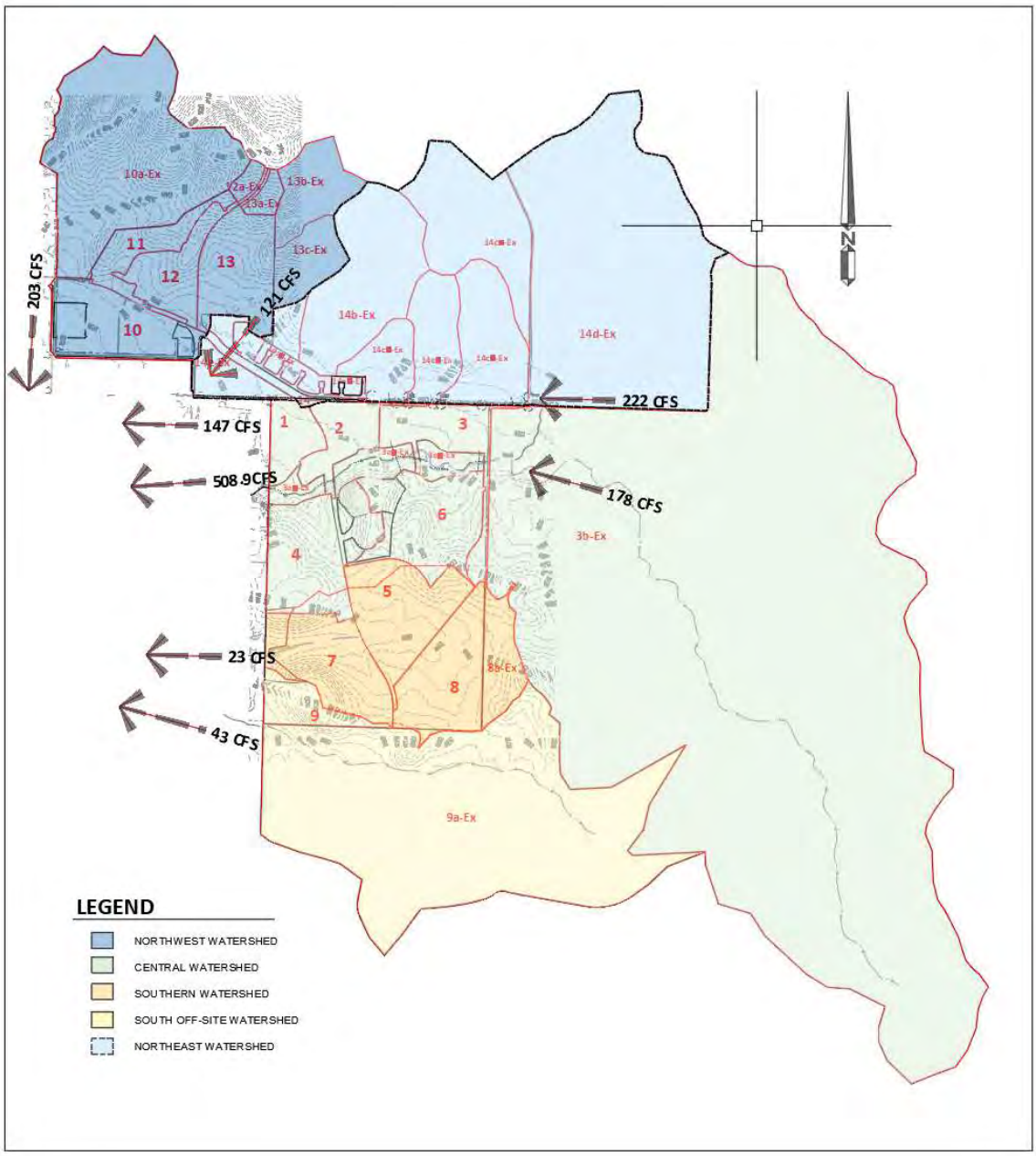


Figure 8 - Watershed Description

Existing Watershed Descriptions

There are 34 existing Drainage Management Areas (DMA), as shown in Figures 7 & 8. Table 1 provides a summary of each DMA location, size and type of existing ground coverage.

Table 1 - Watershed Description

DMA	Location	Area	Coverage
1	Northwest Corner of Olsen parcel	11.24	Grasses, non-grazed
2	North side of Olsen parcel west of Sherwood	14.64	Grasses, non-grazed
3	North side of Olsen parcel east of Sherwood	21.50	Grasses, non-grazed
3a(1)-Ex	Undeveloped Creek Area	4.16	Grasses, non-grazed
3a(2)-Ex	Undeveloped Creek Area	7.90	Grasses, non-grazed
3a(3)-Ex	Undeveloped Creek Area	6.00	Grasses, non-grazed
3b-Ex	Off-site Run-on flowing to easterly property boundary at Hansen Road	757.08	Grasses, non-grazed
4	West central portion of Olsen parcel south of Creek	38.71	Grasses, non-grazed
5	South central portion of Olsen parcel NW of Transmission Line Easement	32.70	Grasses, non-grazed
6	East central portion of Olsen parcel south of Creek	34.04	Grasses, non-grazed
7	Southwestern portion of Olsen parcel south of DMA 4	31.37	Grasses, non-grazed
8	Southeast corner of Olsen parcel	30.49	Grasses, non-grazed
8a-Ex	Off-site Run-on	14.20	Grasses, non-grazed
9	Southwest corner of Olsen parcel	11.45	Grasses, non-grazed
9a-Ex	Off-site property flowing west to Existing Meadowbrook Road	212.02	Grasses, non-grazed
10	Southern portion of South Chandler parcel north of Linne Road	30.69	Grasses, non-grazed
10a-Ex	Existing Ranch Land with Barn & Residence	94.11	Grasses, non-grazed
11	Northwester portion of South Chandler parcel, north of DMA 10	14.46	Grasses, non-grazed
12	Central South Chandler parcel southeast east of DMA 11	17.57	Grasses, non-grazed
12a-Ex		2.63	Grasses, non-grazed
13	Northeast South Chandler east of DMA 11	27.74	Grasses, non-grazed
13a-Ex		3.51	Grasses, non-grazed
13b-Ex	Tract 2526 – Estates Vineyard	18.46	Crop, Vineyard rows w/ grass
13c-Ex	Tract 2526 – Estates Vineyard	14.41	Crop, Vineyard rows w/ grass
14	Sherwood Road	8.67	Grasses, non-grazed
14a(1)-Ex	Our Town	13.08	High Density SFR
14a(2)-Ex	Our Town	2.44	High Density SFR
14b-Ex	Tract 2526 – Estates Vineyard	50.21	Crop, Vineyard rows w/ grass
14c-Ex	Tract 2526 – Estates Vineyard	43.68	Crop, Vineyard rows w/ grass
14c(1)-Ex	Tract 2526 – Estates Vineyard	30.21	Crop, Vineyard rows w/ grass
14c(2)-Ex	Tract 2526 – Estates Vineyard	19.69	Crop, Vineyard rows w/ grass
14c(3)-Ex	Tract 2526 – Estates Vineyard	13.78	Crop, Vineyard rows w/ grass
14d-Ex	Tract 2526 – Estates Vineyard	166.74	Crop, Vineyard rows w/ grass
14e-Ex	Tract 2526 – Estates Vineyard	10.89	Crop, Vineyard rows w/ grass

Proposed On-Site Drainage Basin Descriptions

There are 14 on-site drainage basins (Figures 7 and 8). Table 2 provides a summary of each sub-catchment location, area and land use.

Table 2 - Proposed Onsite Watershed Descriptions

DMA	Location	Area (ac)	Land Use
1	Northwest Corner of Olsen parcel	11.9	Medium Density Residential
2	North side of Olsen parcel east of DMA 1	15.8	Medium Density Residential
3	North side of Olsen parcel east of DMA 2	23.4	Medium Density Residential
4	West central portion of Olsen parcel south of DMA 1	29.1	Low Density Residential
5	South central portion of Olsen parcel east of southern end of DMA 4	32.7	Low Density Residential
6	East central portion of Olsen parcel south of DMA 3	33.9	Low Density Residential
7	Southwestern portion of Olsen parcel south of DMA 4	31.3	Low Density Residential
8	Southeast corner of Olsen parcel	29.8	Low Density Residential
9	Southwest corner of Olsen parcel	11.4	Low Density Residential
10	Southern portion of South Chandler parcel north of Linne Road	31.2	Medium Density Residential High Density Residential Neighborhood Commercial
11	Northwester portion of South Chandler parcel, north of DMA 10	16.7	Low Density Residential
12	Central South Chandler parcel southeast east of DMA 11	15.5	Low Density Residential
13	Northeast South Chandler east of DMA 11	27.5	Low Density Residential
14	Sherwood Road Right-of-Way	15.2	Medium Density Residential

FLOOD HAZARD

The portion of the Un-Named Creek No. 1 located at the western edge of Olsen Ranch is within a FEMA Flood Hazard Zone A as shown on the **Flood Insurance Rate Map (FIRM) Panel No. 06079C0607G**, effective date November 16, 2012 (Figure 5). **The Flood Insurance Study (FIS) for San Luis Obispo County** including Unnamed Creek No. 1 (Turtle Creek) was revalidated in 2017.

The proposed land plan proposes lots that will be impacted by this current mapped flood zone, therefore modification of the Zone A area will be required. An application for a Letter of Map Revision (LOMR) will be submitted to FEMA to modify the creek's current flood zone for the existing non-development condition. Upon FEMA approval of this LOMR a Conditional Letter of Map Revision (CLOMR) will be submitted to FEMA which outlines the proposed land plan and development grading. Once the CLOMR has been accepted by FEMA and the grading completed and certified, a second LOMR will be submitted to FEMA for the final map revision.

Figure 9 - FEMA Floodplain Map

HYDROLOGIC METHODOLOGY AND CRITERIA

The hydrologic analysis utilized the **The HydroCAD Stormwater Modeling System, Version 10,** computer program to determine the runoff from the 95th percentile, 2-, 10-, 25-, 50- and 100-year storm events. **HydroCAD** is a computer aided design program for modeling the hydrology and hydraulics of stormwater runoff. It is based largely on techniques developed by the NRCS TR-55 program and combined with other hydrologic and hydraulic calculations. For a given rainfall event, these techniques are used to generate hydrographs throughout the contributing watersheds. **HydroCAD** has the ability to route these hydrographs to specific design points where multiple hydrographs can be combined to estimate total flow rate. **HydroCAD** is designed to handle time varying flows as required for bio-retention/detention basin design and utilizes rating curves with information input by the user to determine outflow, flow volumes and total water surface elevation within any retention/detention basin structure.

The program uses the SCS loss rate method by assuming infiltration properties of a sub-area represented by the runoff curve number (CN). The CN values assumed for this report are outlined below. The minimum time of concentration was calculated using methods within TR-55.

Hydrologic Analysis

The following parameters were used in the **HydroCAD** model:

- Runoff Method: SCS TR-55
- Storm Distribution: NRCS Type 1, 24-hour with the NRCS Unit Hydrograph
- 24-hour Storm Depths: City of Paso Robles Engineering Standards; Intensity-Duration-Frequency (IDF) Curves. Table 1 summarizes the precipitation values used for each design storm event.
- Curve Numbers (CN) were applied for impervious and pervious (undeveloped) areas per the NRCS, with Antecedent Moisture Condition (AMC) of 2.
- Time of Concentration (Tc): Calculated per NCRS TR-55 procedures.

TABLE 3 - PRECIPITATION VALUES

24-Hour Duration

Design Storm (year)	Precipitation (inches)
95th	**1.40**
2	**2.33**
10	**3.60**
25	**4.20**
50	**4.60**
100	**5.10**

As stated above the precipitation values used for this study were based on the IDF curves within the City of Paso Robles Engineering Standards. These values are slightly less than the NOAA 14 Atlas Point Precipitation Frequency Estimates within the study area. The IDF curves were utilized to maintain consistency with the City's storm drain facility design and other drainage studies completed within the City.

Table 4 outlines the individual subarea hydrologic parameters

TABLE 4 - INDIVIDUAL DRAINAGE MANAGEMENT AREA HYDROLOGIC PARAMETERS

DMA	Total Area (ac)	Existing Tc (min)	Proposed Tc (min)	Existing Weighted CN	Proposed Weighted CN
1	11.24	10	10	58	81
2	14.64	11.5	15.8	58	81
3	21.50	16.9	16.9	63	92
3a(1)-Ex	4.16	10	15.7	58	58
3a(2)-Ex	7.90	10	20.7	61	61
3a(3)-Ex	6.00	10	25.7	69	69
3b-Ex	757.08	45.5	45.5	60	60
4	38.71	14.2	14.2	59	84
5	32.70	21.2	21.2	58	72
6	34.04	20.1	20.1	60	84
7	31.37	23.2	23.2	58	73
8	30.49	28.8	28.8	58	82
8a-Ex	14.20	16.5	16.5	58	58
9	11.45	22.3	22.3	62	68
9a-Ex	212.02	51.3	51.3	58	58
10	30.69	22.6	22.6	60	84
10a-Ex	94.11	11	11	67	67
11	14.46	11.1	11.1	59	82
12	17.57	10	10	59	82
12a-Ex	2.63	10	10	71	71
13	27.74	10	10	61	83
13a-Ex	3.51	10	10	71	71
13b-Ex	18.46	10	10	82	82
13c-Ex	14.41	10	10	80	80
14	8.67	10	10	79	91
14a(1)-Ex	13.08	10	10	81	81
14a(2)-Ex	2.44	10	10	89	89
14b-Ex	50.21	13.4	13.4	79	79
14c(0)-Ex	43.68	24.5	24.5	82	82
14c(1)-Ex	30.21	13.6	13.6	81	81
14c(2)-Ex	19.69	13.2	13.2	77	77
14c(3)-Ex	13.78	12.6	12.6	75	75
14d-Ex	166.74	19.4	19.4	80	80
14e-Ex	10.89	10	10	61	61

Peak Flow Calculations

Results of the **HydroCAD** model are summarized in Tables 5. A more detailed **HydroCAD** report for the existing conditions is included in Appendix H. See Appendix for schematic diagram of Existing Conditions Model node type, number and naming information.

TABLE 5 – EXISTING PEAK FLOW SUMMARY

EXISTING CONDITIONS								
HydroCAD Node Type	DMA or HC Node Number	Drainage Management Area (DMA) or Node Name	95th PERCENTILE STORM	2 YEAR STORM	10 YEAR STORM	25 YEAR STORM	50 YEAR STORM	100 YEAR STORM
Subcat	1	Subcat 1	0.0	0.1	1.0	2.5	3.8	5.6
Subcat	2	Subcat 2	0.0	0.1	1.1	3.0	4.6	6.8
Subcat	3	Subcat 3	0.0	0.4	3.7	6.9	9.3	12.6
Subcat	3a{(1)}-Ex	Subcat 3a{(1)}-Ex	0.0	0.0	0.4	0.9	1.4	2.1
Subcat	3a{(2)}-Ex	Subcat 3a{(2)}-Ex	0.0	0.1	1.3	2.7	3.7	5.2
Subcat	3a{(3)}-Ex	Subcat 3a{(3)}-Ex	0.0	0.4	2.8	4.2	5.3	6.6
Subcat	3b-Ex	Subcat 3b-Ex	0.2	8.3	47.4	90.8	126.7	178.4
Subcat	4	Subcat 4	0.3	0.6	3.5	8.0	11.8	17.2
Subcat	5	Subcat 5	0.0	0.3	2.0	4.5	7.0	10.6
Subcat	6	Subcat 6	0.0	0.4	3.0	6.7	9.7	14.0
Subcat	7	Subcat 7	0.0	0.3	1.9	4.1	6.3	9.6
Subcat	8	Subcat 8	0.0	0.3	1.7	3.5	5.2	8.0
Subcat	8a-Ex	Subcat 8a-Ex	0.0	0.1	0.9	2.3	3.6	5.4
Subcat	9	Subcat 9	0.0	0.2	1.4	2.7	3.8	5.2
Subcat	9a-Ex	Subcat 9a-Ex	0.0	1.9	9.8	18.6	26.7	38.6
Subcat	10	Subcat 10	0.6	1.0	3.4	6.5	9.0	12.5
Subcat	10a-Ex	Subcat 10a-Ex	0.3	3.4	34.6	54.9	69.7	89.2
Subcat	11	Subcat 11	0.0	0.1	1.5	3.6	5.2	7.6
Subcat	12	Subcat 12	0.0	0.2	1.9	4.6	6.7	9.7
Subcat	12a-Ex	Subcat 12a-Ex	0.0	0.3	1.5	2.1	2.6	3.2
Subcat	13	Subcat 13	0.0	0.3	4.7	9.5	13.1	18.2
Subcat	13a-Ex	Subcat 13a-Ex	0.0	0.4	1.9	2.8	3.5	4.3
Subcat	13b-Ex	Subcat 13b-Ex	1.9	8.6	20.2	26.2	30.3	35.5
Subcat	13c-Ex	Subcat 13c-Ex	0.9	5.6	14.2	18.8	21.9	25.8
Subcat	14	Subcat 14	3.2	5.5	9.0	11.0	12.5	14.4
Subcat	14a{(1)}-Ex	Subcat 14a{(1)}-Ex	0.0	0.2	3.5	6.2	8.1	10.7
Subcat	14a{(2)}-Ex	Subcat 14a{(2)}-Ex	0.5	0.9	1.5	2.0	2.4	2.9
Subcat	14b-Ex	Subcat 14b-Ex	2.0	15.5	41.4	55.2	64.7	76.8
Subcat	14c{(0)}-Ex	Subcat 14c{(0)}-Ex	2.8	13.1	31.2	40.6	47.1	55.3
Subcat	14c{(1)}-Ex	Subcat 14c{(1)}-Ex	2.4	11.6	28.0	36.5	42.4	49.9
Subcat	14c{(2)}-Ex	Subcat 14c{(2)}-Ex	0.4	4.9	14.5	19.7	23.4	28.0
Subcat	14c{(3)}-Ex	Subcat 14c{(3)}-Ex	0.2	2.7	9.2	12.7	15.2	18.4
Subcat	14d-Ex	Subcat 14d-Ex	7.7	47.4	121.8	160.9	188.0	222.4
Subcat	14e-Ex	Subcat 14e-Ex	0.5	0.8	2.1	3.7	5.1	6.9
Reach	6R	Reach 1c	0.3	8.5	58.8	125.7	180.5	257.3
Reach	7R	Reach 1b	3.6	52.5	201.9	304.3	383.9	492.1
Reach	8R	Reach 1a	3.6	51.4	204.9	312.4	395.8	509.5
Reach	17R	Reach 1d	0.0	0.0	19.7	45.0	64.3	90.3
Reach	18R	Linne Road Grassed Chl	4.7	11.0	17.8	20.6	22.4	24.6
Pond	17P	Gran Cielo Dwy	7.6	46.4	121.4	160.6	187.6	222.1
Pond	18P	GC-CkD1	9.3	65.6	146.0	174.6	192.8	215.1
Pond	19P	GC-CkD2	8.6	48.2	95.1	112.0	122.9	136.1
Pond	20P	GC-CkD3	8.5	41.3	70.8	81.9	89.2	98.1
Link	3a {1,2+3}	Comb Un-dev Ck Flow	3.6	51.4	204.9	312.4	395.8	509.5
Link	5L	Outlet To Tract #1632 Ex. 36" SD	0.0	1.0	6.4	14.2	22.1	33.5
Link	6L	To Existing Meadowlark Road	0.0	2.0	10.5	20.6	29.5	42.6
Link	7L	DMA 13	2.8	14.6	40.9	57.1	68.7	83.7
Link	8L	DMA 8	0.0	0.4	2.6	5.7	8.8	13.3
Link	9L	DMA 12	0.0	0.3	3.4	6.7	9.3	12.9
Link	10L	To Linne Road Channel	4.9	12.1	18.6	21.4	23.3	25.7
Link	11L	To Fontana Road SD	3.4	18.9	83.4	128.4	161.4	205.4
Link	15L	Sherwood/Niblick LP Xing	5.0	20.9	53.8	72.3	85.2	101.9
Link	16L	Airport & Linne Road SD	6.2	23.2	69.0	92.3	108.4	129.2
Link	19L	14c{0+1}-Ex	5.2	24.5	59.1	77.0	89.3	104.9
Link	22L	Linne Rd Overtopping Ex.Flow #2and#3	3.7	38.1	84.5	102.2	113.6	127.8
Link	23L	Linne Rd Overtop #1	0.0	19.5	60.7	76.6	86.9	99.6

The City of Paso Robles Drainage criteria states that for all storm events the post construction peak flows are to be equal to or less than the pre-project (existing) condition. Table 6 outlines the developed peak flow rates after detention, demonstrating that after stormwater detention, peak flows are reduced for all storm frequencies. Peak flow hydrographs results can be found in Appendix I.

TABLE 6 – PROPOSED PEAK FLOW SUMMARY

PROPOSED CONDITIONS								
HydroCAD Node Type	HydroCAD Node Number	Subcatchment/DMA, Reach, Pond or Link Name	95th PERCENTILE STORM	2 YEAR STORM	10 YEAR STORM	25 YEAR STORM	50 YEAR STORM	100 YEAR STORM
Subcat	1	Subcat 1	4.7	8.1	13.1	15.9	17.9	20.5
Subcat	2	Subcat 2	5.0	8.8	14.2	17.2	19.3	22.1
Subcat	3	Subcat 3	9.9	17.3	28.4	33.8	37.4	42.0
Subcat	3a{(1)}-Ex	Subcat 3a(1)-Ex	0.0	0.0	0.4	0.9	1.4	2.1
Subcat	3a{(2)}-Ex	Subcat 3a(2)-Ex	0.0	0.1	1.3	2.7	3.7	5.2
Subcat	3a{(3)}-Ex	Subcat 3a{(3)}-Ex	0.0	0.4	2.8	4.2	5.3	6.6
Subcat	3b-Ex	Subcat 3b-Ex	0.2	8.3	47.4	90.8	126.7	178.4
Subcat	4	Subcat 4	13.3	23.5	41.4	50.9	57.4	65.8
Subcat	5	Subcat 5	5.1	8.9	16.3	21.4	25.0	29.9
Subcat	6	Subcat 6	9.5	17.0	30.6	37.8	42.8	49.1
Subcat	7	Subcat 7	5.1	9.0	16.1	20.8	24.2	28.7
Subcat	8	Subcat 8	6.9	12.2	21.4	26.4	29.9	34.4
Subcat	8a-Ex	Subcat 8a-Ex	0.0	0.1	0.9	2.3	3.6	5.4
Subcat	9	Subcat 9	1.0	1.7	3.9	5.5	6.7	8.2
Subcat	9a-Ex	Subcat 9a-Ex	0.0	1.9	9.8	18.6	26.7	38.6
Subcat	10	Subcat 10	9.5	16.5	27.2	32.9	36.9	42.0
Subcat	10a-Ex	Subcat 10a-Ex	0.3	3.4	34.7	55.1	69.9	89.5
Subcat	11	Subcat 11	5.2	9.1	16.4	20.3	22.9	26.3
Subcat	12	Subcat 12	6.4	11.1	20.0	24.8	28.1	32.4
Subcat	12a-Ex	Subcat 12a-Ex	0.0	0.3	1.5	2.1	2.6	3.2
Subcat	13	Subcat 13	10.1	18.2	33.4	41.3	46.7	53.7
Subcat	13a-Ex	Subcat 13a-Ex	0.0	0.4	1.9	2.8	3.5	4.3
Subcat	13b-Ex	Subcat 13b-Ex	1.9	8.6	20.3	26.3	30.4	35.6
Subcat	13c-Ex	Subcat 13c-Ex	0.9	5.6	14.3	18.8	21.9	25.9
Subcat	14	Subcat 14	4.2	7.9	13.6	16.3	18.2	20.5
Subcat	14a{(1)}-Ex	Subcat 14a(1)-Ex	3.8	7.2	14.3	18.0	20.5	23.8
Subcat	14a{(2)}-Ex	Subcat 14a{(2)}-Ex	1.3	2.3	3.7	4.4	4.9	5.5
Subcat	14b-Ex	Subcat 14b-Ex	2.0	15.5	41.5	55.3	64.8	77.0
Subcat	14c{(0)}-Ex	Subcat 14c{(0)}-Ex	2.8	13.1	31.3	40.7	47.2	55.4
Subcat	14c{(1)}-Ex	Subcat 14c{(1)}-Ex	2.4	11.6	28.1	36.6	42.5	50.0
Subcat	14c{(2)}-Ex	Subcat 14c{(2)}-Ex	0.4	5.0	14.6	19.9	23.5	28.2
Subcat	14c{(3)}-Ex	Subcat 14c{(3)}-Ex	0.2	2.8	9.2	12.7	15.2	18.5
Subcat	14d-Ex	Subcat 14d-Ex	7.7	47.5	122.1	161.3	188.4	223.0
Subcat	14e-Ex	Subcat 14e-Ex	0.5	0.8	2.1	3.8	5.1	6.9
Reach	6R	Un-named Creek 1c	0.2	8.3	56.1	120.8	173.7	248.0
Reach	7R	Creek XS 1b	11.1	62.7	193.1	281.4	347.3	434.5
Reach	8R	Creek 1b	11.1	62.2	192.8	280.9	346.7	434.0

TABLE 6 – PROPOSED PEAK FLOW SUMMARY (Continued)

HydroCAD Node Type	HydroCAD Node Number	Subcatchment/DMA, Reach, Pond or Link Name	95th PERCENTILE STORM	2 YEAR STORM	10 YEAR STORM	25 YEAR STORM	50 YEAR STORM	100 YEAR STORM
Reach	17R	Reach 1d	0.0	0.0	19.7	45.1	64.4	90.4
Reach	Ex Chl	RCP Dbl Arch 59x36 Outlet	12.5	70.0	136.2	149.0	156.0	163.5
Pond	1P	SD Inlet with Bypass SD	0.3	3.4	35.5	57.9	73.3	93.8
Pond	2P	60" SD MH	4.1	8.3	13.7	16.3	18.0	20.2
Pond	15P	SD System 42" HDPE	0.0	0.0	17.0	37.0	51.1	68.7
Pond	16P	Dbl Conc. Arch Culvert (37x23)	1.3	2.6	10.8	15.3	17.7	20.8
Pond	17P	Gran Cielo Dwy	7.6	46.4	121.7	161.0	188.1	222.7
Pond	18P	GC-CkD1	12.5	70.4	149.2	175.3	192.5	213.5
Pond	19P	GC-CkD2	0.3	1.5	19.7	40.0	53.6	70.7
Pond	20P	GC-CkD3	0.5	2.2	25.5	44.0	54.4	66.3
Pond	B1	Basin 1	0.9	3.9	14.8	30.3	36.6	43.9
Pond	B10	Basin 10	0.7	1.5	4.5	7.4	10.6	15.1
Pond	B11	Basin 11	0.2	1.0	3.7	5.5	7.8	10.5
Pond	B12	Basin 12	0.3	0.7	2.5	3.2	4.0	5.6
Pond	B13	Basin 13	1.2	5.0	35.0	62.5	84.6	108.6
Pond	B4	Basin 4	1.3	3.0	15.2	20.1	24.2	34.7
Pond	B5	Basin 5	0.5	1.3	4.7	7.5	9.7	12.7
Pond	B6	Basin 6	1.0	5.2	16.2	23.8	28.0	32.4
Pond	B7	Basin 7	0.8	2.0	8.1	13.1	17.5	24.2
Pond	B8	Basin 8	0.7	1.5	6.4	13.0	18.2	25.2
Pond	B9	Basin 9	0.5	1.0	2.5	3.6	4.3	5.1
Pond	Ex SD	Tract #1632 Ex. 36" SD Outlet	0.0	1.0	7.0	11.9	16.2	22.9
Pond	MC Q	SD System	8.6	17.2	28.2	33.6	37.2	41.8
Pond	SD	42" HDPE SD	0.5	1.9	10.1	19.6	26.8	36.4
Link	1L	DS Tailwater	0.0	1.0	7.0	11.9	16.2	22.9
Link	6L	To Existing Meadowlark Road	0.5	2.1	11.6	22.1	31.0	43.7
Link	10L	To Linne Road Channel	1.3	2.6	10.8	15.3	17.7	20.8
Link	11L	To Fontana Road SD	1.2	7.8	60.9	111.6	154.0	203.2
Link	15L	Sherwood/Niblick LP Xing	9.8	30.6	69.2	89.4	103.3	121.2
Link	16L	Airport & Linne Road SD	11.6	34.0	79.5	106.3	124.5	147.3
Link	22L	Linne Rd Ex Bypass Flow	0.0	0.0	17.0	37.0	51.1	68.7
Link	Ck Qa	100 Yr WSE in Creek (a)	11.2	63.7	217.1	327.1	403.9	508.9
Link	Ck Qb	100 Yr WSE in Creek (b)	0.8	4.9	15.8	23.4	27.6	32.0

See Appendix I for schematic diagram of Proposed Conditions HydroCAD Model node type, number and naming information. The appendix contains hydrograph results of each sub-catchment, reach, pond and link combining flows referenced above. A more detailed review of how the flows split and are carried downstream can be found in Table 11 of Appendix I.

HYDRAULIC METHODOLOGY AND CRITERIA

Detention Basin Outlet Design

The hydraulic analysis of the detention basin was calculated within the **HydroCAD Stormwater Modeling System, Version 10,** computer program during the pond routing sub-routine. The program utilized the general orifice and weir equations to determine the quantity of outflow from the basin based on available head.

Basin Volume Analysis

The **HydroCAD** model performed a continuous flow routing of the proposed 13 detention basins required to mitigate the proposed development peak flow rates back to historic levels at the property boundary per the City of Paso Robles Drainage Design guidelines. Table 7 summarizes the proposed detention basin characteristics that result in a reduced outflow at five key downstream discharge locations.

TABLE 7 – PRELIMINARY DETENTION BASIN SUMMARY

100 Year Storm Detention Route
Proposed Conditions

Detention Pond Number	Detention Pond Name	Rainfall Depth (inches)	Inflow Peak (cfs)	Inflow Area (acres)	Outflow Total Peak (cfs)	Outflow Total Peak Time (hours)	Peak Elevation (feet)	Peak Storage (acre-feet)	Top Elevation (feet)	Top Storage (acre-feet)
B1	Basin 1	5.1	143.08	47.388	43.86	10.61	838.35	7.075	839.35	8.595
B4	Basin 4	5.1	65.77	38.712	34.66	10.29	840.12	3.32	842.5	5.149
B5	Basin 5	5.1	29.91	32.696	12.7	10.72	848.15	1.797	852	4.099
B6	Basin 6	5.1	49.06	34.039	32.41	10.28	851.88	2.255	854.4	3.598
B7	Basin 7	5.1	53.39	108.754	24.18	11.97	843.21	5.229	847	11.849
B8	Basin 8	5.1	39.82	44.689	25.2	10.48	857.85	2.582	859	3.387
B9	Basin 9	5.1	8.24	11.446	5.1	10.45	849.37	0.219	853	1.119
B10	Basin 10	5.1	42.03	30.685	15.14	10.82	818.33	3.554	820	5.425
B11	Basin 11	5.1	26.34	14.461	10.51	10.34	834.16	1.37	836	2.037
B12	Basin 12	5.1	35.58	20.201	5.64	11.06	838.7	2.202	841	3.803
B13	Basin 13	5.1	119.46	64.115	108.58	10.01	844.19	3.165	846	4.267

TABLE 8 - BASIN PEAK FLOW RATE COMPARISON BETWEEN PRE- AND POST DEVELOPMENT

Design Point	Location/Node Name	Storm Event Peak Flow (cfs)					
		10-YR EXISTING	10-YR PROPOSED	25-YR EXISTING	25-YR PROPOSED	100-YR EXISITNG	100-YR PROPOSED
B*	Airport & Linne Rd SD	69	79.5	92	106.3	129	147.3
C	Comb Un-dev Ck Flow/ Ck Qa	205	217.1	312	327.1	510	508.9
D	Outlet to Tract #1632 Ex. 36"SD	6	7.0	14	11.9	34	22.9
E	To Existing Meadowlark Road	11	11.6	21	22.1	43	43.7
K	To Fontana Road SD	83	60.9	128	111.6	205	203.2

* Note: Modeling developed to show actual existing Our Town conditions and future "Proposed" buildout has a flow increase.

Comparison of Previous Drainage Reports

During the preparation of this report, several existing drainage reports and hydrology models were reviewed for comparison of watershed delineation and routing, hydrologic parameters and total runoff. These reports include the following:

- **City of Paso Robles Master Drainage Plan**, prepared by WRC, 2006.
- **Flood Insurance Study for San Luis Obispo County, Un-named Creek (Turtle Creek)**, 1979.
- **Tract No. 2526 Grading and Drainage Report Summary**, prepared by Vaughan Surveys, Inc, August 2003
- **Sherwood Industrial Park Drainage Analysis**, prepared by Boyle Engineering, April 2005.

The overall hydrologic comparison is outlined in Table 5.

TABLE 9 - COMPARISON WITH PREVIOUS DRAINAGE REPORTS

HYDROLOGY STUDY	PREPARED BY	DATE	Q100	BASIN AREA	Q/AC	HYDROLOGY METHOD	CURVE NUMBER	Tc	PRECIPITATION	STORM DURATION	AGENCY STANDARDS
			cfs	ac	cfs/ac			min	inches	hours	
At Our Town											
Gran Cielo Winery	Vaughan	2003	151	260.8	0.58	Rational Method	0.35 (Rational runoff coefficient)	24	2.4 "/hr	10	SLO County
Olsen Chandler Specific Plan	Wallace	2018	66	259.4	1.85	HydroCAD, SCS Unit Hydrograph	80	25.2	5.1	24	City of Paso Robles
At Turtle Creek											
Sherwood Industrial Park	Boyle	2005	254	1316	0.19	HydroCAD	75	256.4	5.1	24	City of Paso Robles
Turtle Creek FIS		1979	410	1280	0.32	HEC-1, 2 hr storm pattern for 24 hour duration/ log pearson Type III distribution	basin parameters based on reconstruction of 1969 Salinas River flood event			24	FEMA
Olsen Chandler Specific Plan	Wallace	2018	464	870.5	0.68	HydroCAD, SCs Unit Hydrograph	60	45.5	5.1	24	City of Paso Robles

Differences in the stormwater runoff rates between studies were noted and may be attributed to differences in the hydrograph time steps, differences in storm durations, determination of cure number (CN), calculation of the time of concentration (Tc) as well as the hydrologic method used to estimate peak flows. It was difficult to compare this study to the Master Drainage Plan since the hydrologic models nor watershed maps were available for review. The comparison with the Sherwood Industrial Park study showed a 50% increase in flow rates at a common design point. The large difference in flow may be attributed to the long Tc value of the Central Watershed (254 min compared to 45.5min).

The results of the this **HydroCAD** model appear to be in-line with the FIS adopted flowrate within Un-Named Creek No. 1 upstream of Turtle Creek. The FIS utilized the Us Army Corp of Engineers HEC-1 computer model. This study was completed using the NRCS TR-55 method and utilized current design requirements and parameters for the hydrologic analysis. Although flow rates may be higher than the FIS analysis, we are comfortable with the results of both models and they compare relatively well.

STORMWATER MANAGEMENT REQUIREMENTS

The California Regional Quality Control Board (CRWQCB) prepared new water quality design standards per **Resolution No. R#-2013-0032 "Post-Construction Stormwater Management Requirements for Development Projects in the Central Coast Region, Attachment 1",** adopted March 2014. This Resolution outlines stormwater management requirements for development projects in the Central Coast Region and defines four post-construction requirements to help maintain water quality and the hydrologic health of the watershed. These requirements are based on the projects type, size and regional location. The proposed development lies within Watershed Management Zone (WMZ) 1.

These four post construction requirements include the following for regulated projects:

1. Site Design and Runoff Reduction
2. Water Quality Treatment
3. Runoff Retention
4. Peak Flow Management

A Preliminary Stormwater Control Plan has been prepared under separate cover, in accordance with the Post-Construction Requirements. This SWCP is conceptual in nature and provides general guidelines to potential water quality techniques and design solutions. As each planning Area submits development plans for construction permitting, a final SWCP that details the exact methods of stormwater quality control as well as final design recommendations for stormwater conveyance and detention will be required.

Erosion and Sediment Control

The proposed project will disturb more than one acre, and therefore a Storm Water Pollution Prevention Plan (SWPPP) is required per the State General Construction Permit. As each Planning Area submits development plans for construction permitting, an Erosion and Sediment Control Plan will be required. Graded areas should be re-vegetated with an erosion control seed mix to provide long term protection from erosion. All inlet facilities should be protected with fiber rolls and all drainage outlets will be protected with a rip rap energy dissipator.

CONCLUSION AND RECOMMENDATIONS

Summary

The proposed South Chandler-Olsen Ranch Specific Plan covers an area of approximately 355 acres in the City of Paso Robles, California. The proposed development will result in the construction of approximately 1,028 residential units. Roadway and utility infrastructure will be constructed to support the development. The overall drainage area from the SP impacting the existing City infrastructure is approximately 2.8 square miles. Stormwater runoff from the project area will be conveyed to four distinct areas.

The Northern Easterly Sub-watershed discharges historic flow rates to Linne Road, where flows overtop the roadway and flow into Un-Named Creek No. 1 through the Central Watershed. For the proposed developed condition, stormwater runoff will be intercepted by storm drain systems prior to flows overtopping Linne Road and will be conveyed to Un-Named Creek No. 1 (Turtle Creek). The Central Watershed will discharge flows at historic levels into Turtle Creek along the western boundary of Olsen Ranch.

A small amount of flow from the Easterly Sub-watershed will combine with flows from the Northern Westerly Sub-watershed and discharge at the intersections of Linne Road and Airport Road and Linne Road and Fontana Road.

The Southern Watershed will discharge runoff into the detention basin formed from the existing stock pond near the southwest corner of Olsen Ranch. Detained flows will enter the City's storm drain system within Running Stag Way. All three major watersheds will confluence approximately 1.4 miles downstream ultimately discharging into the Salinas River.

The proposed drainage conveyance system will consist of water quality control features, storm inlets and storm drains and detention basins. Proposed developed flows will be detained to historic levels for the 2- through the 100-year event before discharging into Turtle Creek or offsite into the City's stormwater conveyance system.

A hydraulic analysis will be performed on the Un-Named Creek No. 1 to ensure water surface elevations at the project's boundary are not above current conditions. This model will also define the proposed creek crossings as defined in the SP Land Plan. The hydraulic analysis will be submitted under a separate cover.

APPENDICES

A. Existing & Proposed Watershed Mapping
B. Flood Insurance Rate Map with 100-Year Flood Boundary
C. Soils Survey Map & Soils Index
D. City of Paso Robles Rainfall Data
E. Runoff Curve Number Data
F. Time of Concentration Calculations
G. 2, 5, 10, 50 & 100-Year Storm Event Peak Flow Summary for Existing and Proposed Conditions
H. Existing Hydrograph Analysis
I. Proposed Hydrograph Modeling with Detention Basin Sizing

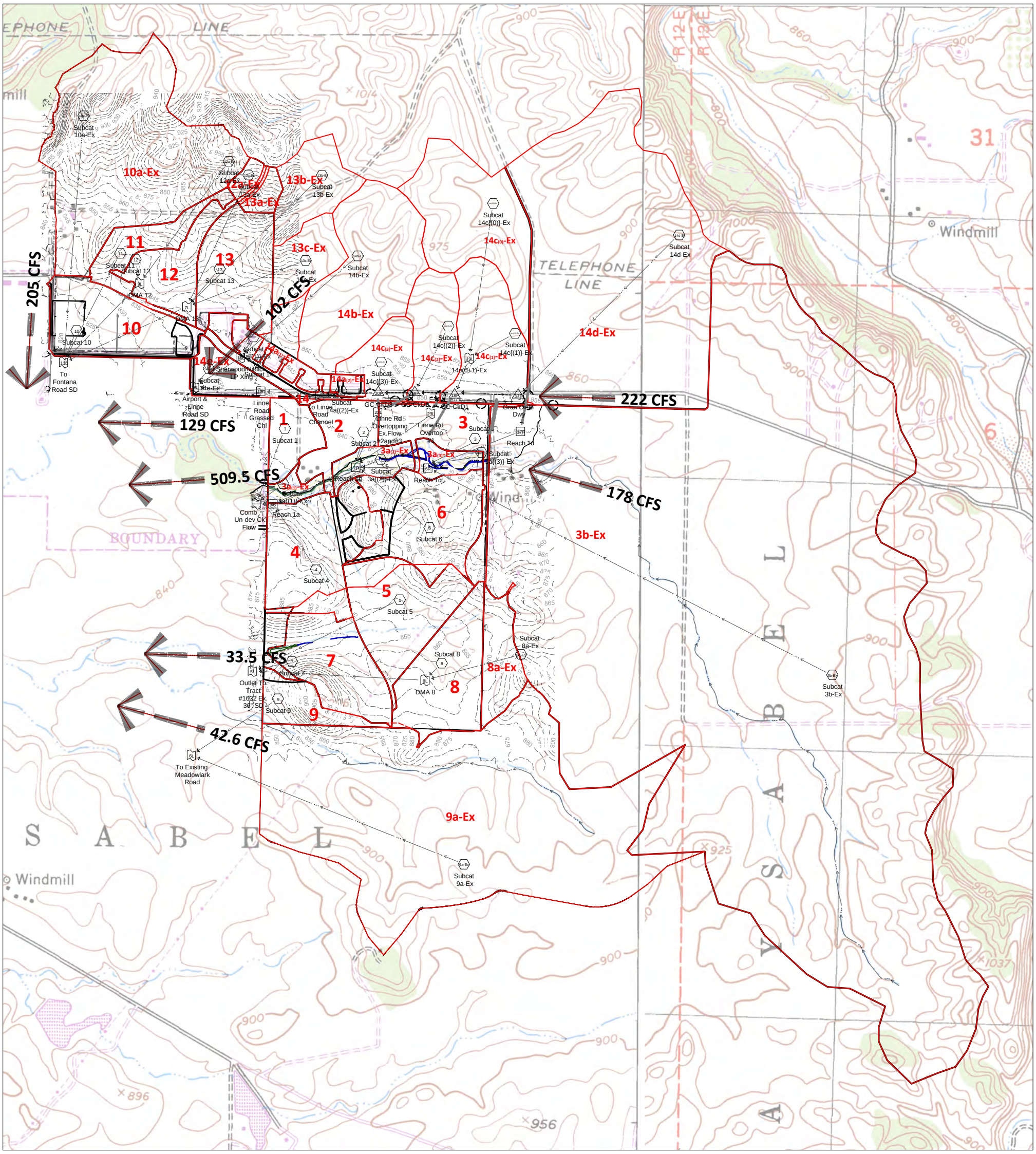
Reso A - Exhibit C2 (EIR Technical Appendix)

Appendix A

Existing & Proposed Watershed Mapping

Reso A - Exhibit C2 (EIR Technical Appendix)

OLSEN-CHANDLER RANCH PROJECTS
EXISTING CONDITIONS HYDROLOGY MAPPING
100 Year Storm Event
Exhibit 1



WALLACE GROUP®
1465.01
1/28/2019

GRAPHIC SCALE

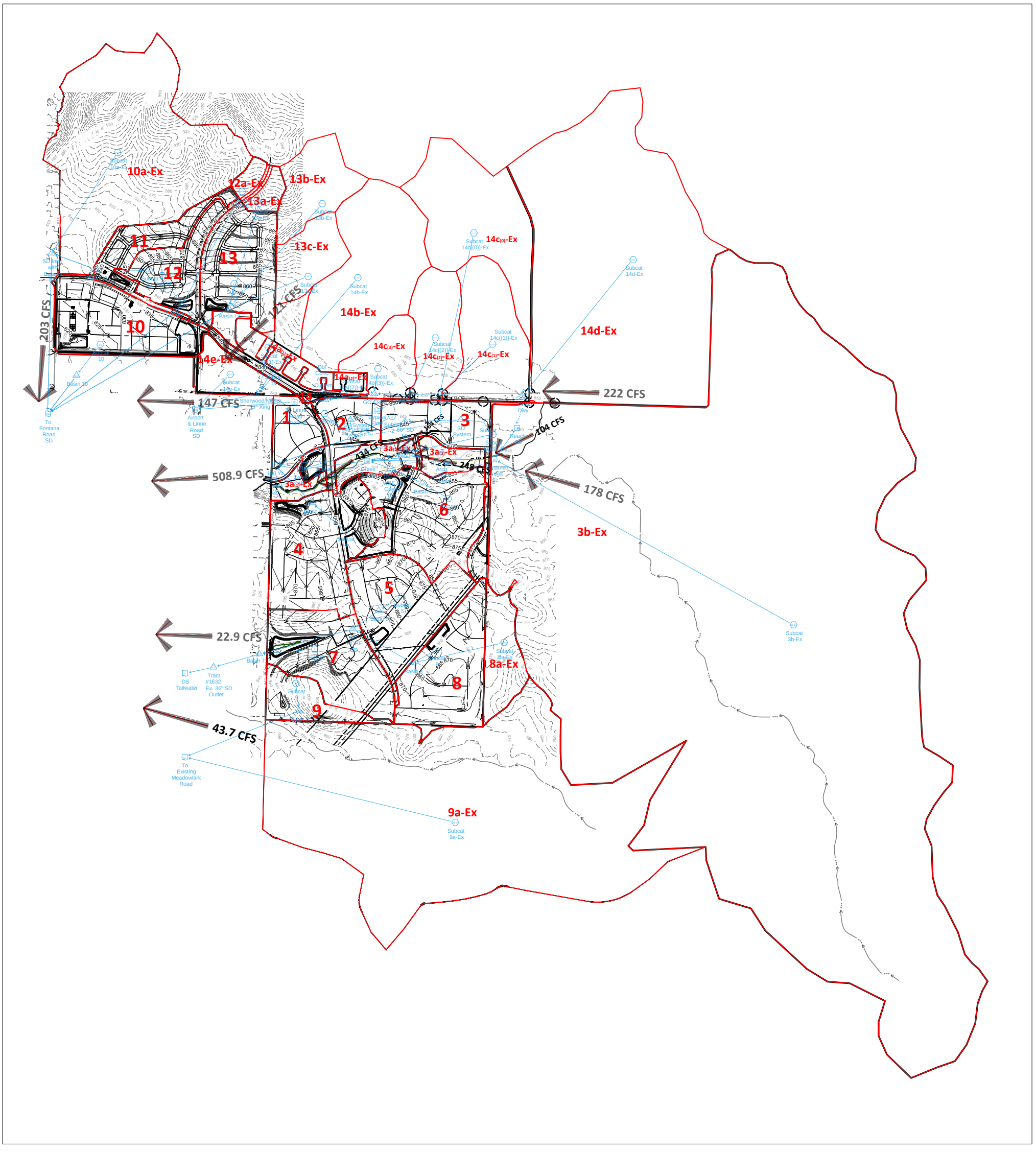
0 600 1200 2400

(IN FEET)

1 IN = 1200 FT

Reso A - Exhibit C2 (EIR Technical Appendix)

OLSEN-CHANDLER RANCH PROJECTS
PROPOSED CONDITIONS HYDROLOGY MODEL
100 Year Storm Event
Exhibit 2



WALLACE GROUP®

GRAPHIC SCALE

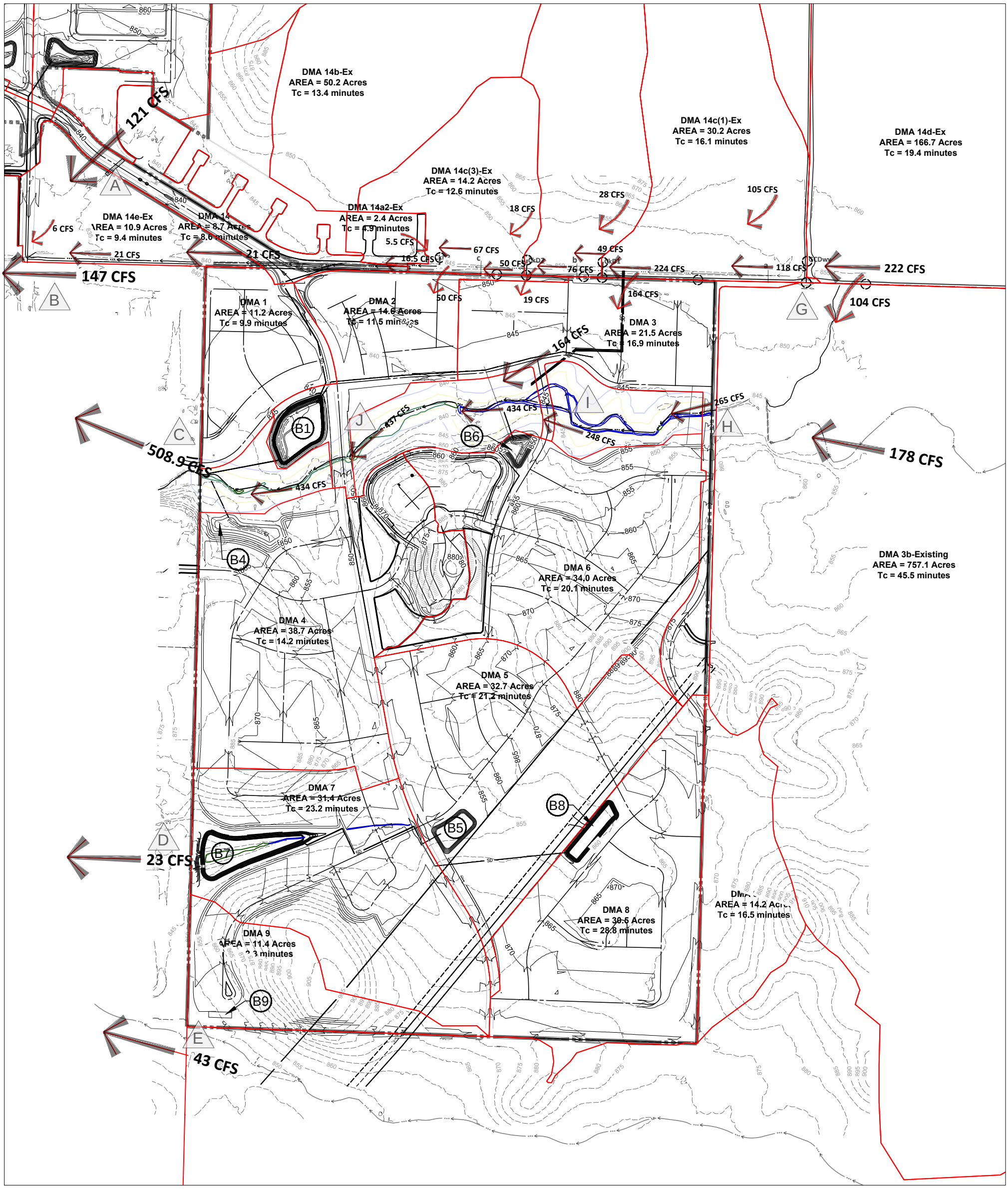
0 600 1200 2400

(IN FEET)

1 IN = 1200 FT

Reso A - Exhibit C2 (EIR Technical Appendix)

OLSEN RANCH PROJECT
PROPOSED CONDITIONS HYDROLOGY MODEL
100 Year Storm Event
Exhibit 3



Development Status	Node Type	Detention Pond Number	Detention Pond Name	Rainfall Depth (inches)	Inflow Peak (cfs)	Inflow Area (acres)	Outflow Total Peak (cfs)	Outflow Total Peak Time (hours)	Peak Elevation (feet)	Peak Storage (acre-feet)	Top Elevation (feet)
Existing North of Jane Road	Pond	17P	Gran Cielo Dwy	5.1	222.96	166.738	222.66	9.99	855.19	0.285	856.24
	Pond	18P	GC CxD1	5.1	223.8	240.622	213.46	10.03	850.06	0.483	852
	Pond	19P	GC CxD2	5.1	76.4	260.311	70.68	10.07	849.41	0.624	850
	Pond	20P	GC CxD3	5.1	67.1	274.094	66.32	10.06	845.96	0.301	846.5
Proposed or Other Property	Pond	B1	Basin 1	5.1	143.08	47.388	43.86	10.61	838.35	7.075	839.35
	Pond	B4	Basin 4	5.1	115.77	38.712	34.46	10.29	840.12	3.32	842.5
	Pond	B5	Basin 5	5.1	29.41	32.646	12.7	10.72	848.15	1.797	850
	Pond	B6	Basin 6	5.1	49.06	34.039	32.41	10.28	851.88	2.255	854.4
	Pond	B7	Basin 7	5.1	53.39	108.754	24.18	11.97	843.21	5.225	847
	Pond	B8	Basin 8	5.1	39.82	44.689	25.2	10.18	857.85	2.582	859
	Pond	B9	Basin 9	5.1	8.24	11.446	5.1	10.45	849.37	0.215	853

LEGEND

- A — COMBINED FLOW POINT OF INTEREST
- B7 — DETENTION BASIN IDENTIFICATION
- CFS — 100 YEAR - 24 HOUR PEAK FLOW

GRAPHIC SCALE

0 250 500 1000

(IN FEET)

1 IN = 500 FT

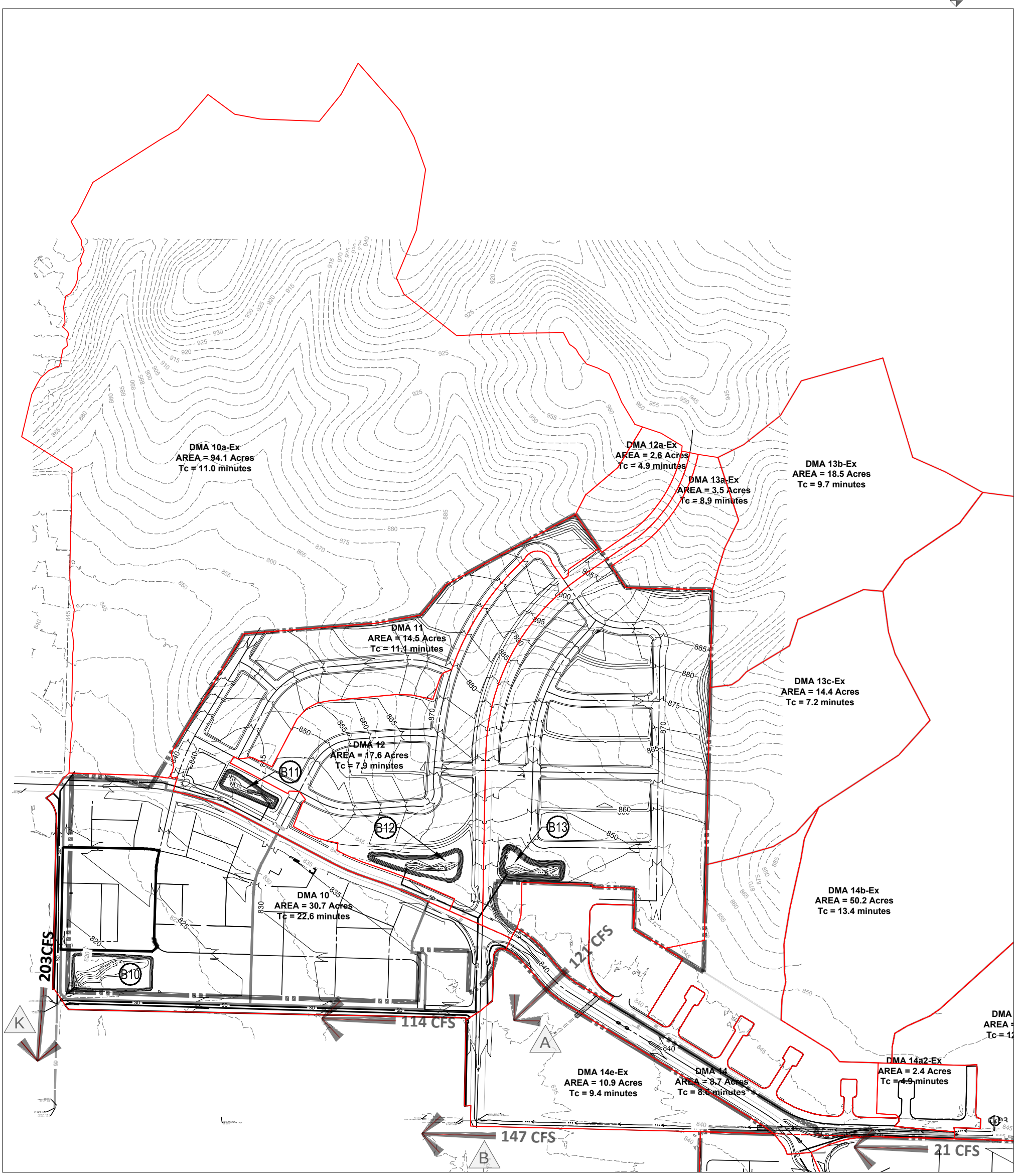
WALLACE GROUP®

1465.01

1/31/2019

Reso A - Exhibit C2 (EIR Technical Appendix)

CHANDLER RANCH PROJECT
PROPOSED CONDITIONS HYDROLOGY MODEL
100 Year Storm Event
Exhibit 4



Detention Pond Number	Detention Pond Name	Rainfall Depth (inches)	Inflow Peak (cfs)	Inflow Area (acres)	Outflow Total Peak (cfs)	Outflow Total Peak Time (hours)	Peak Elevation (feet)	Peak Storage (acre-feet)	Top Elevation (feet)	Top Storage (acre-feet)
B10	Basin 10	5.1	42.03	30.685	15.14	10.82	818.33	3.554	820	5.425
B11	Basin 11	5.1	26.34	14.451	10.51	10.34	834.16	1.37	836	2.037
B12	Basin 12	5.1	35.58	20.201	5.64	11.06	838.7	2.202	841	3.803
B13	Basin 13	5.1	119.46	64.115	108.58	10.01	844.19	3.165	846	4.767

WALLACE GROUP®
1465.01
1/31/2019

LEGEND

A — COMBINED FLOW POINT OF INTEREST

B7 — DETENTION BASIN IDENTIFICATION

CFS — 100 YEAR - 24 HOUR PEAK FLOW

GRAPHIC SCALE

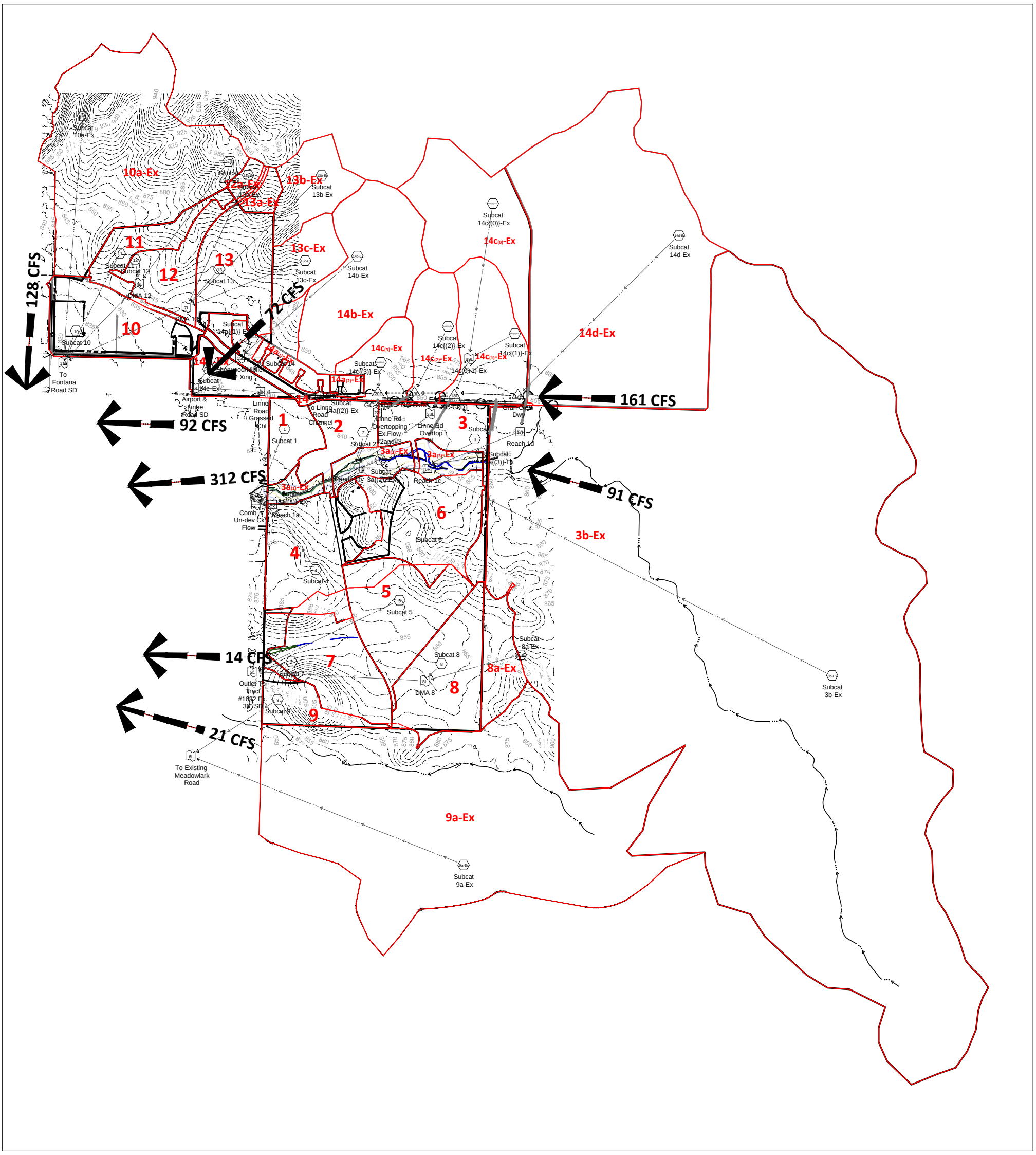
0 200 400 800

(IN FEET)

1 IN = 400 FT

Reso A - Exhibit C2 (EIR Technical Appendix)

OLSEN-CHANDLER RANCH PROJECTS
EXISTING CONDITIONS HYDROLOGY MAPPING
25 Year Storm Event
Exhibit 5



WALLACE GROUP®
1465.01
1/28/2019

GRAPHIC SCALE

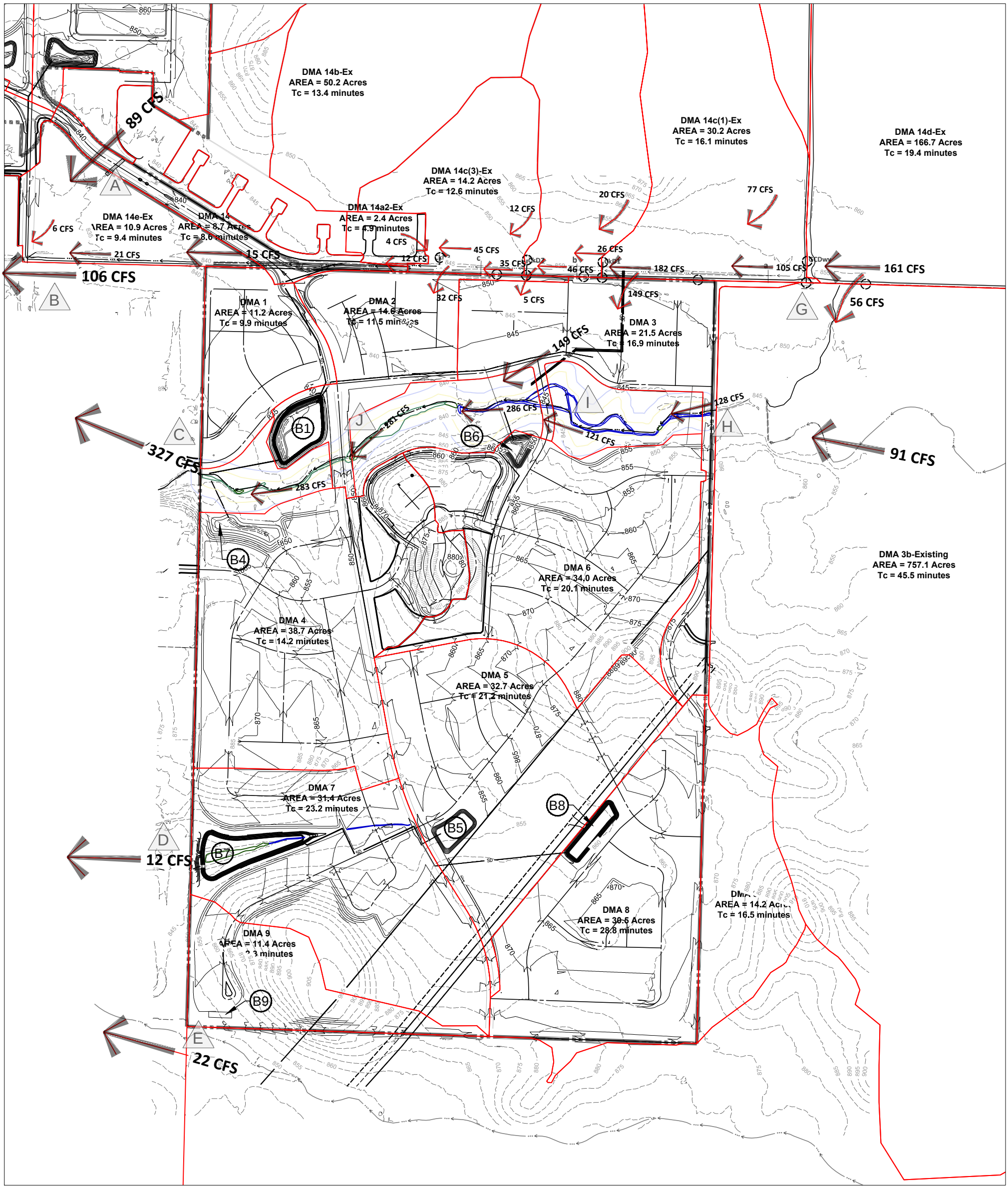
0 600 1200 2400

(IN FEET)

1 IN = 1200 FT

Reso A - Exhibit C2 (EIR Technical Appendix)

OLSEN RANCH PROJECT
PROPOSED CONDITIONS HYDROLOGY MODEL
25 Year Storm Event
Exhibit 6



WALLACE GROUP®
1465.01
1/31/2019

LEGEND

- A — COMBINED FLOW POINT OF INTEREST
- B7 — DETENTION BASIN IDENTIFICATION
- CFS — 25 YEAR - 24 HOUR PEAK FLOW

GRAPHIC SCALE

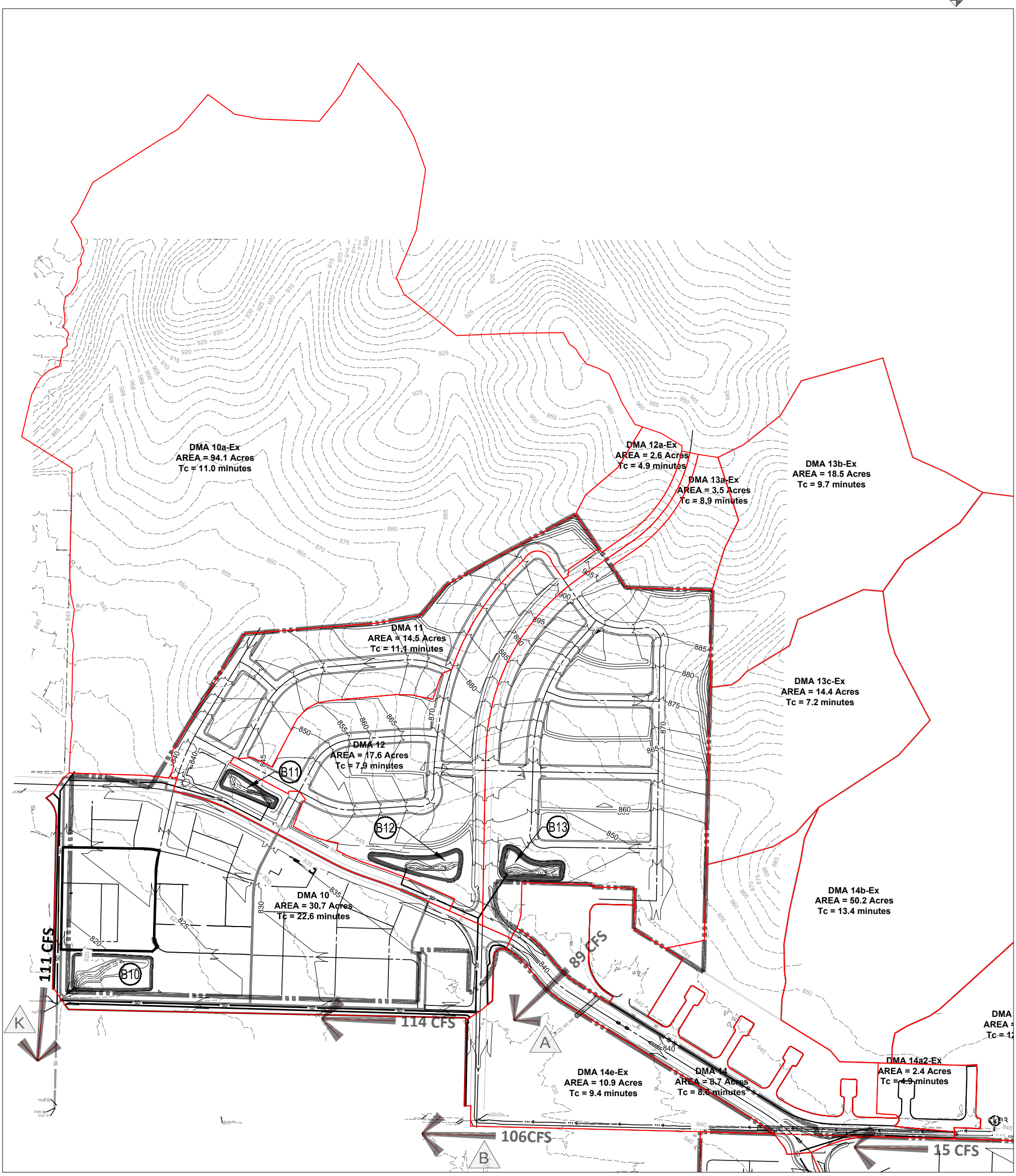
0 250 500 1000

(IN FEET)

1 IN = 500 FT

Reso A - Exhibit C2 (EIR Technical Appendix)

CHANDLER RANCH PROJECT
PROPOSED CONDITIONS HYDROLOGY MODEL
25 Year Storm Event
Exhibit 7



WALLACE GROUP®
1465.01
1/31/2019

LEGEND

- A — COMBINED FLOW POINT OF INTEREST
- B7 — DETENTION BASIN IDENTIFICATION
- CFS — 25 YEAR - 24 HOUR PEAK FLOW

GRAPHIC SCALE

0 200 400 800

(IN FEET)

1 IN = 400 FT

Reso A - Exhibit C2 (EIR Technical Appendix)

INSERT SLEEVE FOR FULL SIZE PLANS

Appendix B

Flood Insurance Rate Map with 100-Year Flood Boundary

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations (BFEs) shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Universal Transverse Mercator (UTM) Zone 10. The **horizontal datum** was NAD83, GRS80 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242** or visit its website at http://www.ngs.noaa.gov/.

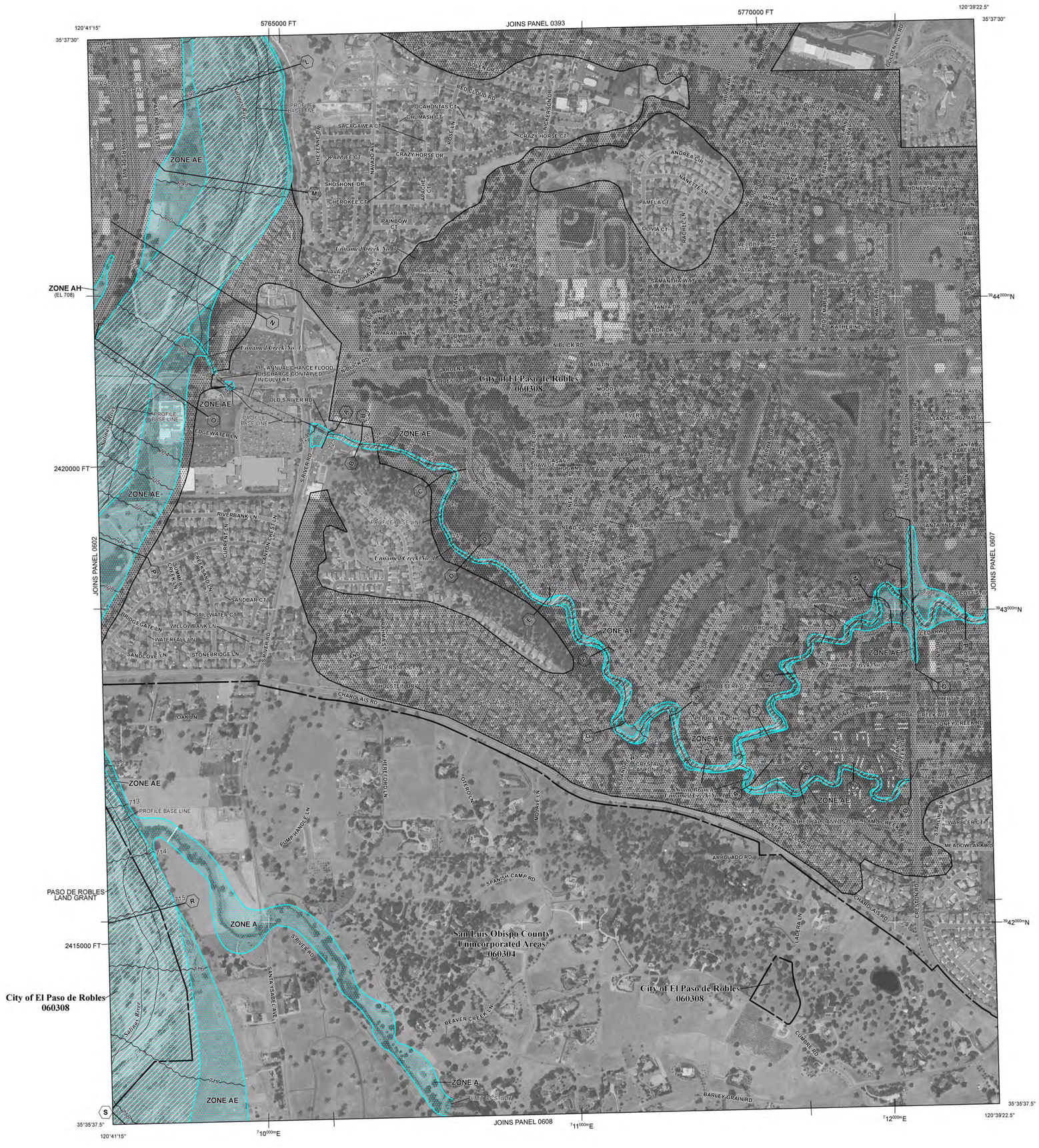
Base map information shown on this FIRM was derived from digital orthophotography collected by the U.S. Department of Agriculture Farm Service Agency under its National Agriculture Imagery Program (NAIP). This imagery was flown in 2010 and was produced with a 1-meter ground sample distance.

This map reflects more detailed and up-to-date **stream channel configurations** than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- A–A — Cross section line
- 23–23 — Transect line
- 97°07'30", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4275000mE — 1000-meter Universal Transverse Mercator grid values, zone 10
- 6000000 FT — 5000-foot grid ticks: California State Plane coordinate system, Zone V (FIPSZONE = 405), Lambert projection
- DX5510$_X$ — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories List on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
August 28, 2008

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
November 16, 2012 - to update corporate limits, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 250 500 750 1,000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0606G

FIRM

FLOOD INSURANCE RATE MAP

SAN LUIS OBISPO COUNTY, CALIFORNIA AND INCORPORATED AREAS

PANEL 606 OF 2050

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
EL PASO DE ROBLES, CITY OF	060308	0606	G
SAN LUIS OBISPO COUNTY	060304	0606	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06079C0606G

MAP REVISED
NOVEMBER 16, 2012

Federal Emergency Management Agency

NOTES TO USERS

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LEGEND

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ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

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ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities
513 — Base Flood Elevation line and value; elevation in feet*
(EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*
* Referenced to the North American Vertical Datum of 1988
A — A — Cross section line
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6000000 FT — 5000-foot grid ticks: California State Plane coordinate system, Zone V (FIPSZONE = 405), Lambert projection
DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories List on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 28, 2008

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
November 16, 2012 - to update corporate limits, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

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MAP SCALE 1" = 500'

250 0 250 500 750 1,000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0607G

FIRM

FLOOD INSURANCE RATE MAP

SAN LUIS OBISPO COUNTY, CALIFORNIA AND INCORPORATED AREAS

PANEL 607 OF 2050

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
EL PASO DE ROBLES, CITY OF	060308	0607	G
SAN LUIS OBISPO COUNTY	060304	0607	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06079C0607G

MAP REVISED
NOVEMBER 16, 2012

Federal Emergency Management Agency

Table 10: Summary of Discharges, continued

Flooding Source	Location	Drainage Area (Square Miles)	Peak Discharge (cfs)					
			10% Annual Chance	4% Annual Chance	2% Annual Chance	1% Annual Chance Existing	1% Annual Chance Future	0.2% Annual Chance
Unnamed Creek No. 1	At confluence with Salinas River	5.7	190	*	910	1,180	*	1,650
Unnamed Creek No. 1	At River Road	5.0	120	*	730	960	*	1,350
Unnamed Creek No. 1	At confluence of South Branch Unnamed Creek No. 1	3.3	100	*	510	670	*	930
Unnamed Creek No. 1	Approximately ~~15.7~~ 4.3 miles upstream of Salinas River confluence Upstream of Creston Road	~~2.0~~	~~30~~	*	300	410	*	580
Unnamed Creek No. 3	At River Road	1.0	70	*	270	330	*	460
Willow Creek	At Mouth	3.3	490	*	1,500	2,200	*	4,800
Yerba Buena Creek	At Union Pacific Railroad	4.4	1,040	*	2,150	2,570	*	3,310
Yerba Buena Creek	Approximately 3,000 feet upstream of Encina Avenue	3.5	830	*	1,720	2,050	*	*

*Not calculated for this Flood Risk Project

[1]Channel flow only; does not include overflow from channel

[2]Reduced or constant flow values due to capacity restriction

[3]Data not available

[4]Decrease in discharge due to overbank storage

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	1,850	37	206	4.6	724.8	724.8	725.8	1.0
B	2,205	46	255	3.7	725.9	725.9	726.5	0.6
C	3,285	30	100	9.6	740.8	740.8	740.8	0.0
D	4,375	50	190	5.1	751.0	751.0	751.0	0.0
E	5,334	40	230	4.2	756.0	756.0	756.1	0.1
F	6,401	35	130	7.4	758.9	758.9	759.8	0.9
G	7,418	45	160	6.0	763.1	763.1	763.9	0.8
H	8,308	50	170	5.6	767.3	767.3	767.8	0.5
I	9,048	65	190	5.1	771.1	771.1	771.2	0.1
J	10,038	30	150	4.5	775.5	775.5	775.7	0.2
K	10,968	65	230	2.9	779.7	779.7	779.7	0.0
L	11,728	50	170	3.9	785.6	785.6	785.6	0.0
M	12,753	35	80	8.4	791.1	791.1	791.1	0.0
N	13,198	30	130	5.2	796.2	796.2	796.5	0.3
O	13,353	85	260	2.5	801.1	801.1	801.8	0.7
P	14,190	75	230	2.3	801.2	801.2	802.1	0.9
Q	15,005	75	140	3.7	804.2	804.2	804.3	0.1
R	15,725	40	140	3.7	807.0	807.0	807.1	0.1
S	16,370	80	310	1.7	808.0	808.0	808.2	0.2
T	16,700	60	270	1.8	811.0	811.0	811.3	0.3
U	17,736	50	210	2.3	811.2	811.2	811.5	0.3
V	18,750	20	80	5.8	815.9	815.9	816.8	0.9
W	19,445	30	120	3.9	820.0	820.0	820.4	0.4
X	20,641	30	80	5.8	823.7	823.7	823.9	0.2
Y	21,466	35	60	7.3	828.4	828.4	828.4	0.0
Z	22,271	30	110	4.0	831.3	831.3	832.0	0.7

[1]Feet above confluence with Salinas River

TABLE 24

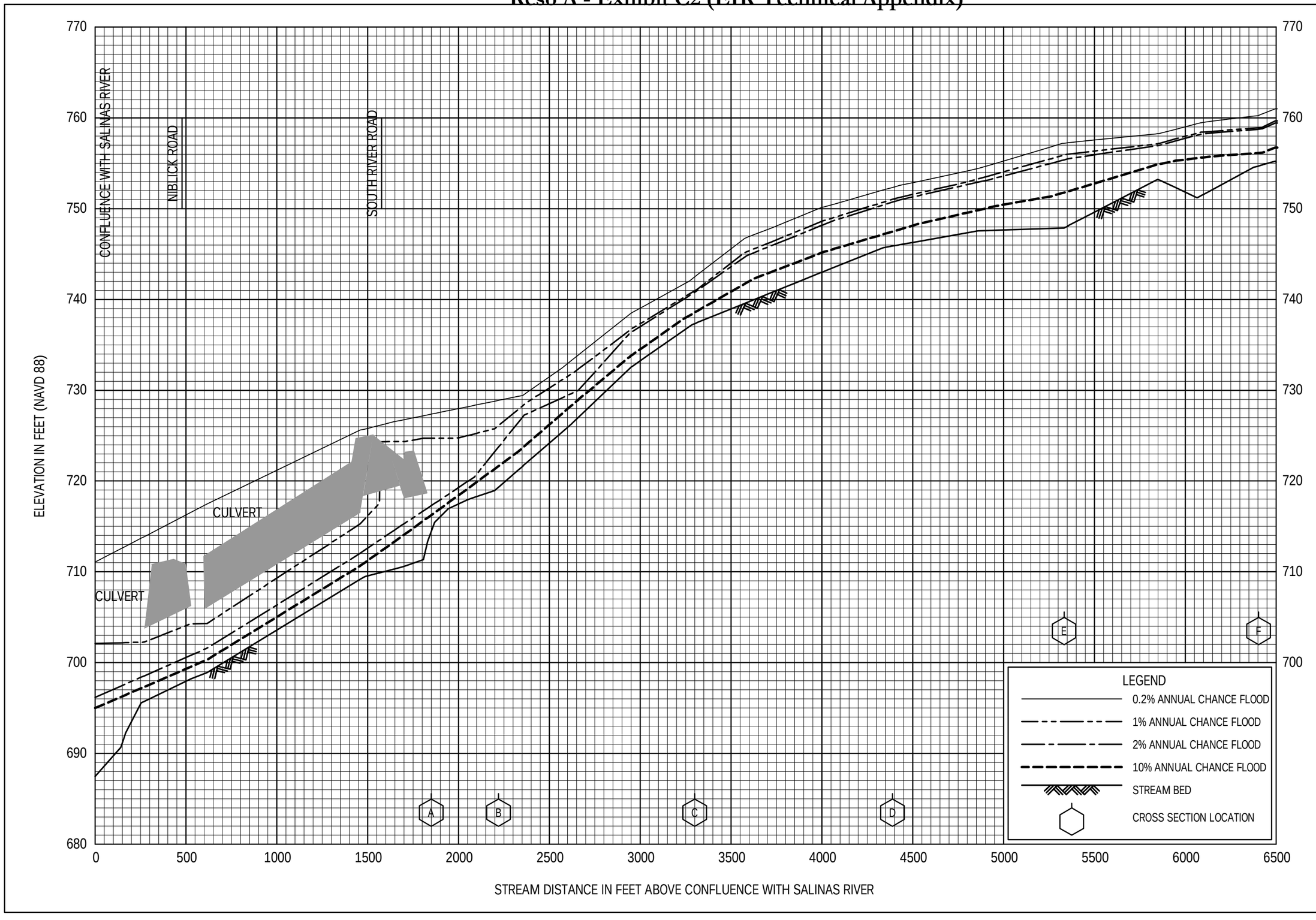
FEDERAL EMERGENCY MANAGEMENT AGENCY

SAN LUIS OBISPO COUNTY, CALIFORNIA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: UNNAMED CREEK NO. 1



FLOOD PROFILES

UNNAMED CREEK NO. 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

SAN LUIS OBISPO COUNTY, CA

AND INCORPORATED AREAS

94P

CONFLUENCE OF SOUTH BRANCH
UNNAMED CREEK NO. 1

ELEVATION IN FEET (NAVD 88)

820
810
800
790
780
770
760
750
740
730

6500 7000 7500 8000 8500 9000 9500 10000 10500 11000 11500 12000 12500 13000

STREAM DISTANCE IN FEET ABOVE CONFLUENCE WITH SALINAS RIVER

G H I J K L M

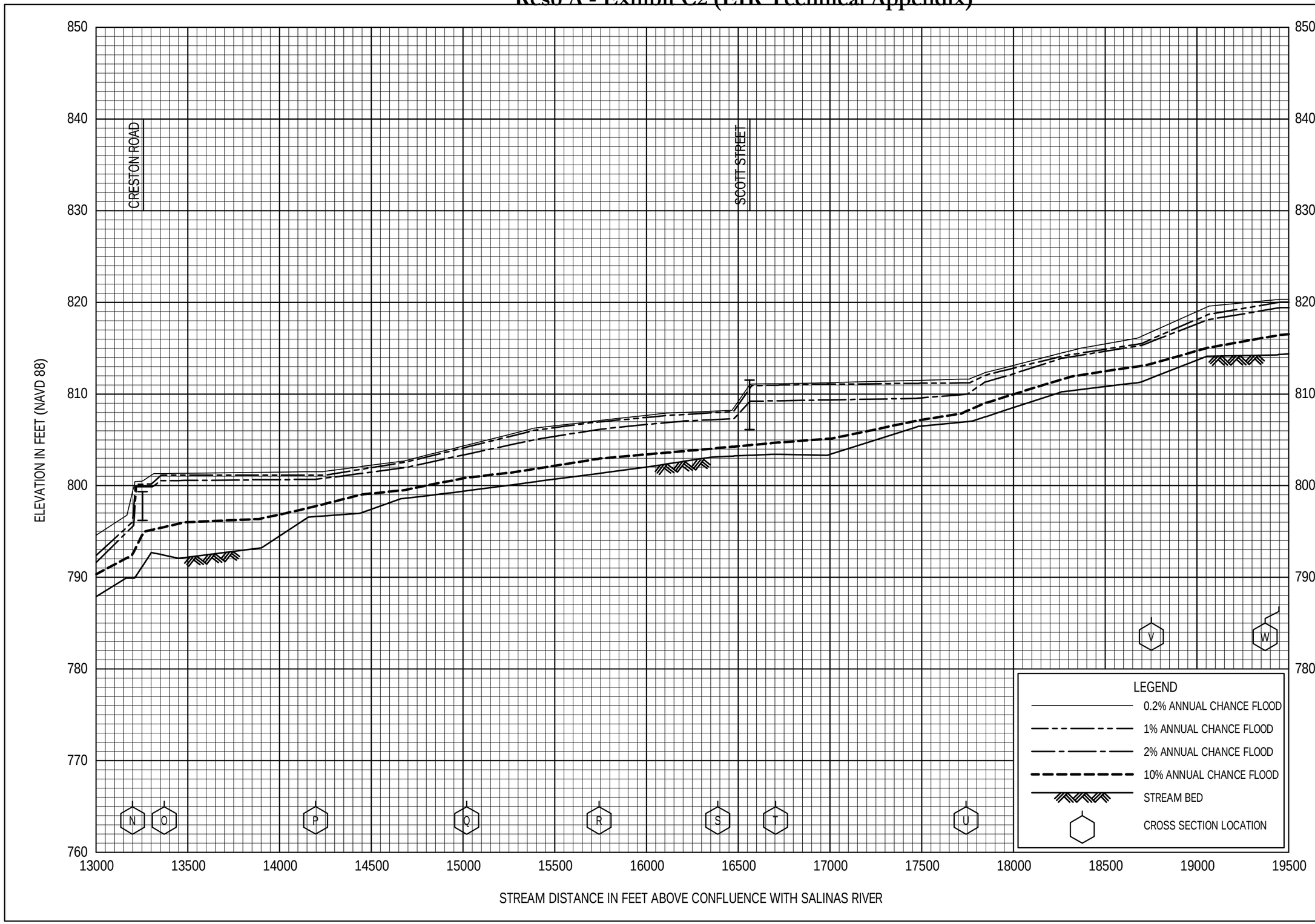
LEGEND
- 0.2% ANNUAL CHANCE FLOOD
- 1% ANNUAL CHANCE FLOOD
- 2% ANNUAL CHANCE FLOOD
- 10% ANNUAL CHANCE FLOOD
- STREAM BED
- CROSS SECTION LOCATION

FLOOD PROFILES

UNNAMED CREEK NO. 1

FEDERAL EMERGENCY MANAGEMENT AGENCY
SAN LUIS OBISPO COUNTY, CA
AND INCORPORATED AREAS

95P



FLOOD PROFILES

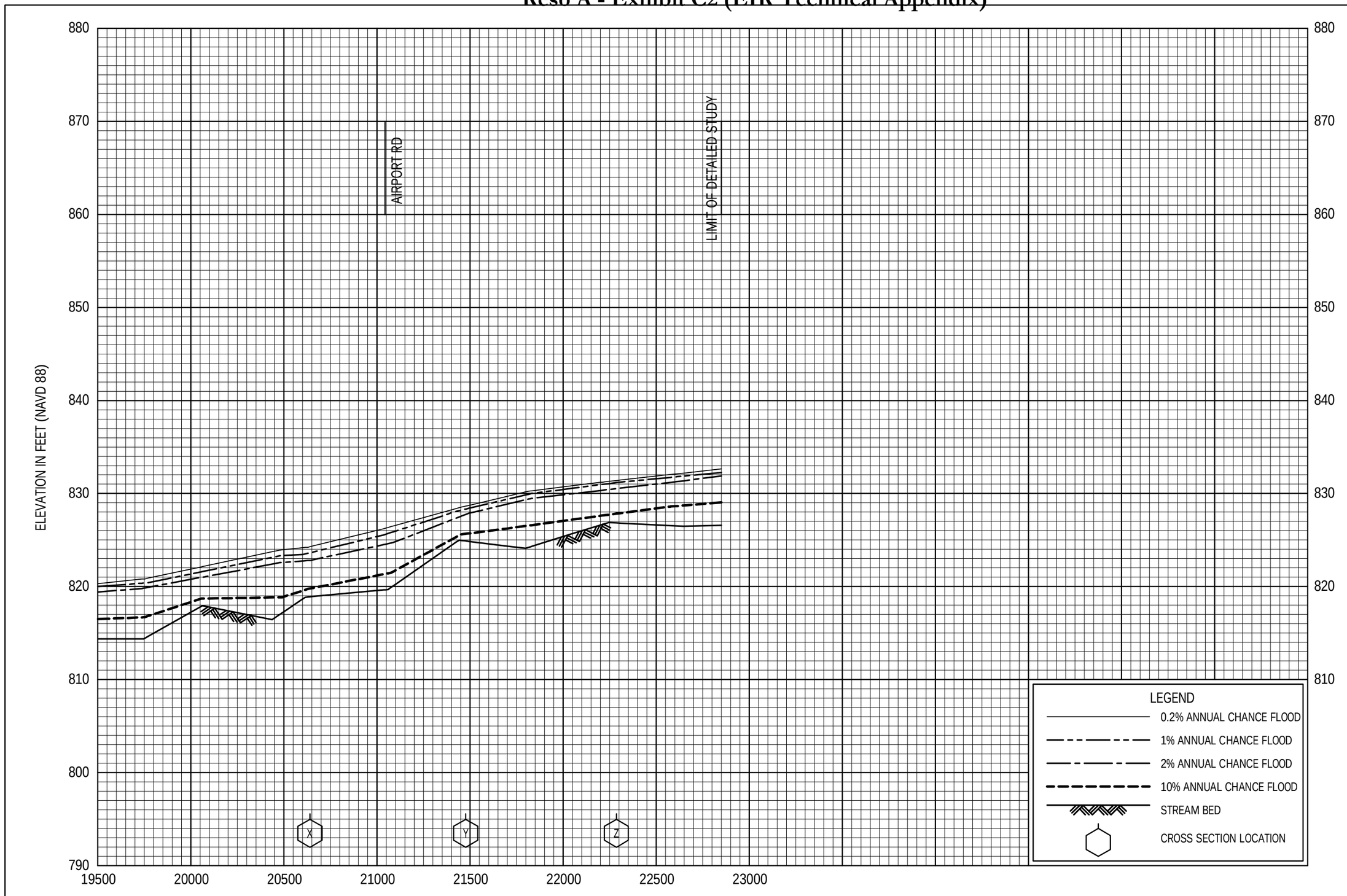
UNNAMED CREEK NO. 1

FEDERAL EMERGENCY MANAGEMENT AGENCY

SAN LUIS OBISPO COUNTY, CA

AND INCORPORATED AREAS

96P



FLOOD PROFILES

UNNAMED CREEK NO. 1

FEDERAL EMERGENCY MANAGEMENT AGENCY
SAN LUIS OBISPO COUNTY, CA
AND INCORPORATED AREAS

97P

Appendix C

Soils Survey Map & Soils Index

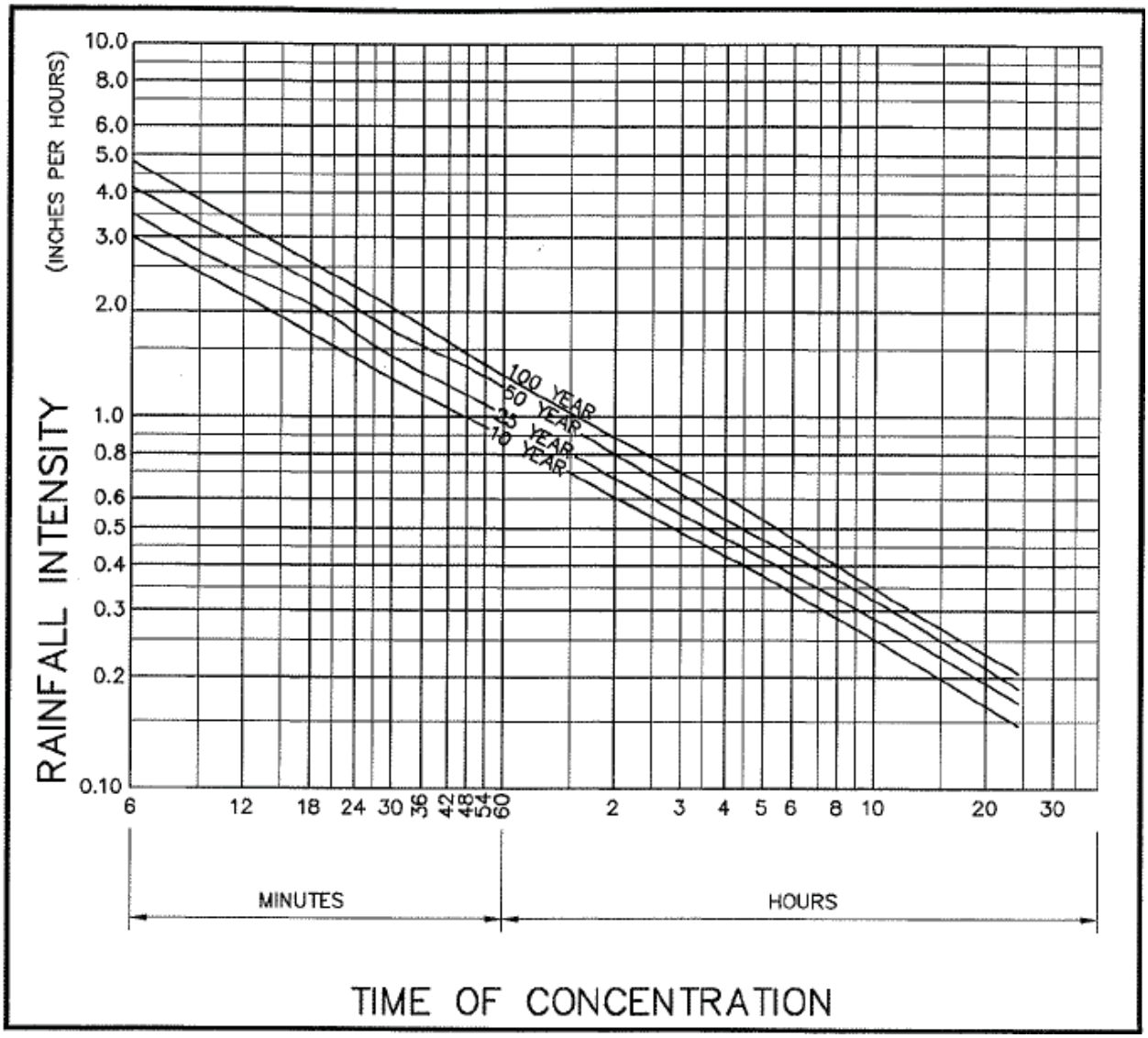
Reso A - Exhibit C2 (EIR Technical Appendix)

Appendix D

City of Paso Robles Rainfall Data

Reso A - Exhibit C2 (EIR Technical Appendix)

Reso A - Exhibit C2 (EIR Technical Appendix)



2. Closed Conduits

Design considerations for closed conduits are as follows:

- Pipe friction losses determined by Manning's equation.
- Entrance and exit losses.
- Tail-water impacts.
- Entrance control headwater.

For each length of pipe, the hydraulic grade line (hgl) at the pipe entrance and exit shall be determined assuming both inlet control and outlet control. The more restrictive shall control. The storm drain system shall be designed to meet the following conditions:

1. The hydraulic grade line shall be a minimum of 0.50 feet below the elevation of inlet grates and manhole covers of all structures for a design storm of 25 years. Said gradient shall be shown on the profile for storm drain systems.
2. Minimum pipe diameter allowable on any public storm drain shall be 18 inches.
3. Storm drain systems shall be designed for the 25-year storm. In a sump condition a secondary overland flow shall be included such that during the 100-year storm, all buildings or first floor elevations shall be at least one foot (1') above the 100-year storm.
4. Street capacity shall be defined as the 10-year storm confined between the crown of the street and the top of curb. Where the street capacity is exceeded at either the curb or the crown, a storm drain or other approved facility shall be provided to convey the excess flows. In all cases, the 100-year storm shall be contained within the right-of-way.

Cross culvert design shall be determined on the basis of a twenty-five year storm with no head. The hydraulic entrance condition shall be such that the 25-year discharge will have the specified freeboard in the upstream channel or waterway and that the 100-year discharge will be contained within the banks of the upstream waterway or drainage easement. The entrance to the closed conduit minor waterway may be submerged provided that the above criteria are satisfied. The invert elevation of the closed conduit entrance shall not be set lower than the natural flowline of the waterway or open channel flowing into it.

3. Open Channels

Open channels shall be designed based on Manning's equation. The impacts of culverts, bridges or other structures affecting the hydraulic performance of the channel shall be considered as appropriate.

The City Engineer may require more complete analysis if he/she determines conditions merit a more thorough study. This additional analysis may include determination of the water surface profile, analysis of critical sections, and analysis of erosion and/or sedimentation.

Maximum velocity for channels flowing full shall be limited to preclude erosion. Freeboard of at least one foot based on 25-year volumes shall be provided for all channels. Lining treatments shall extend to the full height of freeboard. The 100-year discharge shall be contained within the banks or within the easement established for the channel. For natural waterways, the design flow may be allowed in the natural overflow area.

4. Retention Basins

Storm water retention for flood control purposes shall be applied as determined by the design engineer; typically where downstream conditions are constrained and properties are threatened or have been flooded in conditions existing prior to upstream development. Criteria for the design of retention basins may be reviewed on a case by case basis. Typically, the volume of storage for flood control purposes is based upon the post-development 100-year, 24-hour storm event.

5. Detention Basins

A detention basin is defined as a holding facility where the rate of flow from the basin is limited to that rate historically occurring prior to development. The volume of storage of a detention basin shall be determined by theoretically matching the historical hydrograph of flows leaving the previously undeveloped land under consideration.

6. Storm Drain Alignment Criteria

Storm drain lines shall be parallel with street centerlines to the extent practical and typically twelve feet southerly or easterly of the centerline **(Standard Detail U-1)**.

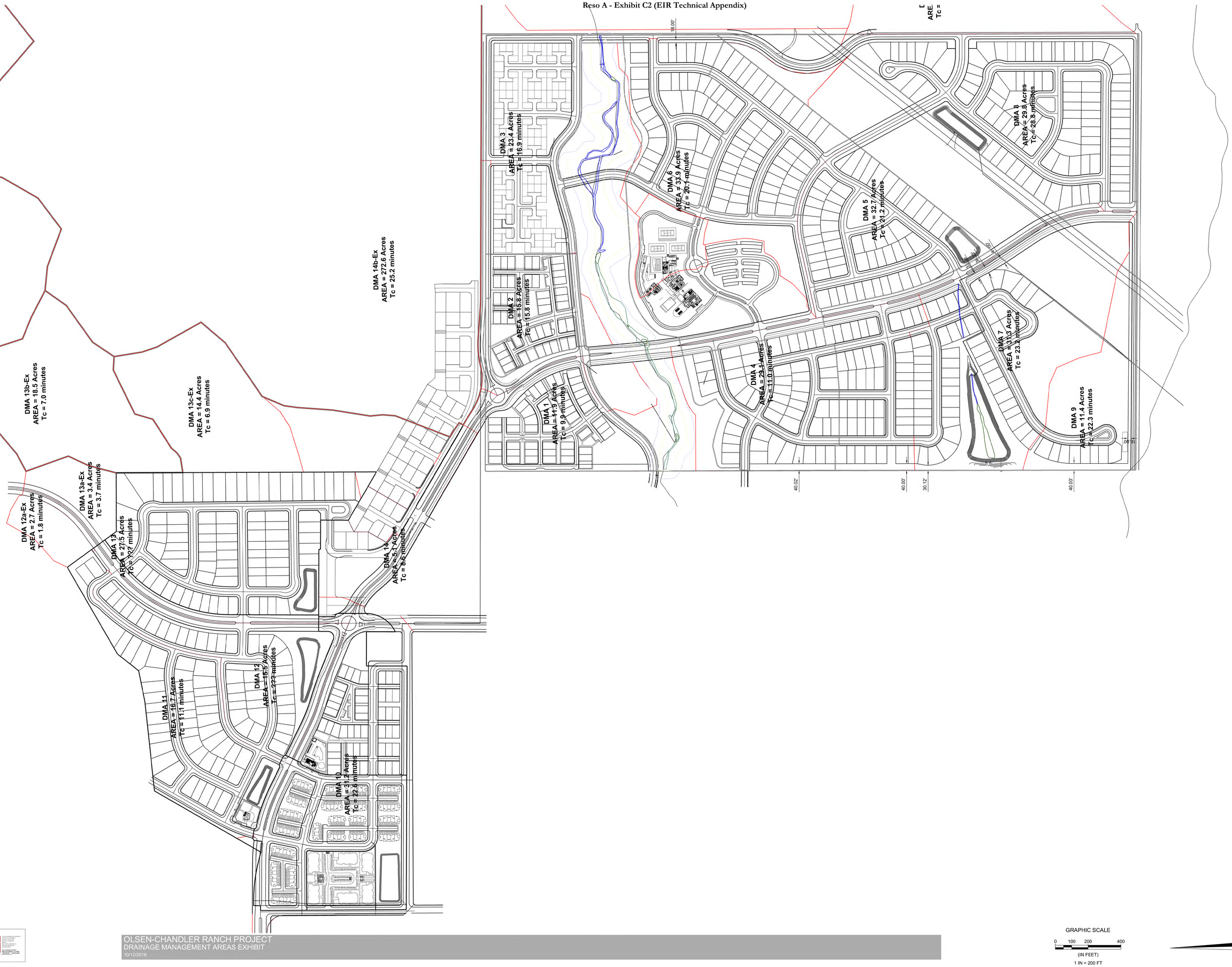
Appendix E

Runoff Curve Number Data

Reso A - Exhibit C2 (EIR Technical Appendix)

OLSEN-CHANDLER PROJECT
CURVE NUMBER (CN) DATA

Density Type	Units/Acre	Avg SF	Avg Area Lot Coverage Calcs	% Impervious	Impervious Area, SF	Std Slab Area, SF	CN # vs Soil Type A	B	C	D
Urban Commercial/Apts				85%			89	92	94	95
Urban Industrial/MF				72%			81	88	91	93
Motor Court SF	16 DU	2723	2256	80%	2187	1245	86	91	93	94
Small Lot SF (40x80s)	12 DU	3630	3200	54%	1967	1418	71	81	87	90
1/8 Acre or less (Townhomes)	8 DU	5445		65%	3539		77	85	90	92
Residential SF	6 DU	7260	6600	58%	4226	3065	73	82	88	90
1/4 Acre Lots	4 DU	10890		38%	4138		61	75	83	87



OLSEN-CHANDLER RANCH PROJECT
DRAINAGE MANAGEMENT AREAS EXHIBIT
10/12/2018

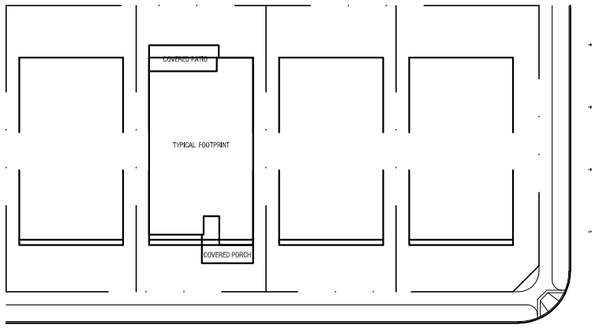
GRAPHIC SCALE
0 100 200 400
(IN FEET)
1 IN = 200 FT

Reso A - Exhibit C2 (EIR Technical Appendix)

LOT COVERAGE CALCULATIONS

Development Type	# Units	Lot Area, SF	FP Area SF	Patio Area SF	Dwy Area SF	Total Impervious SF	% Impervious	
SFR								
50x110	1	5500	2596	471	352	3419	62%	
SFR								
60x110	1	6600	2996	360	368	3724	56%	
SFR								
70x110	1	7700	3604	392	320	4316	56%	
		6600	3065			3820	58%	Average % Imp
						58%		
Small Lot SF								
40x80	1	3200	1418	268	48	1734	54%	
Motorcourt SF	2	2546	1421	83	506	2010	79%	
	2	2025	1109	54	506	1669	82%	
	2	2196	1207	35	506	1748	80%	
		2256	1245					
		16334	SF				80%	Average % Imp
		0.37	Ac					
		21.5	# of Courts					
		129	# of Units					
		8.06	Total Acres					
		16	DU					

Reso A - Exhibit C2 (EIR Technical Appendix)



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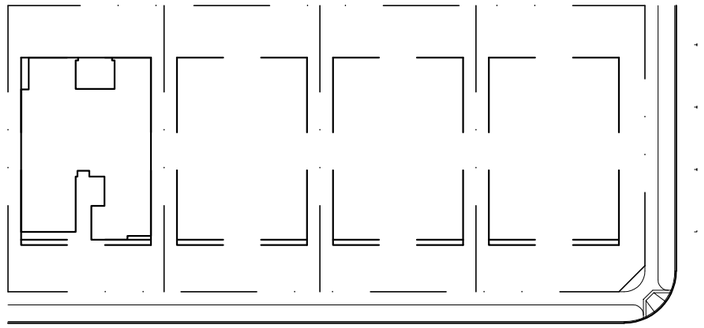

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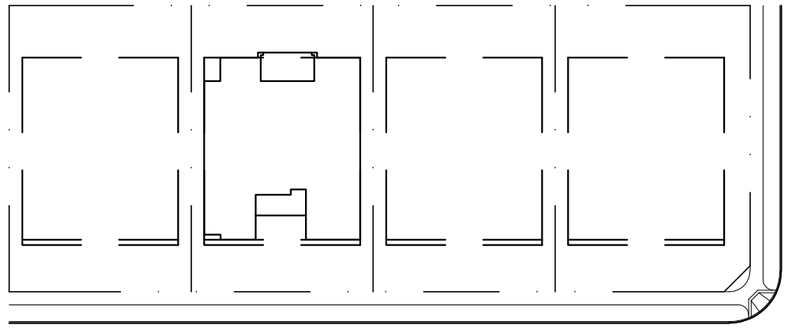

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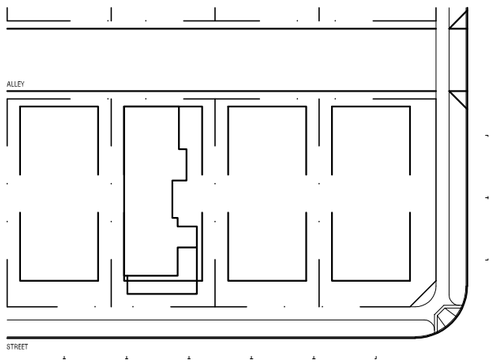

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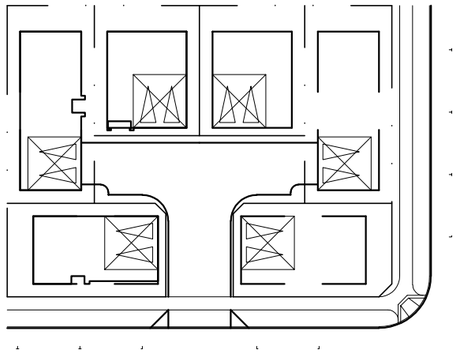
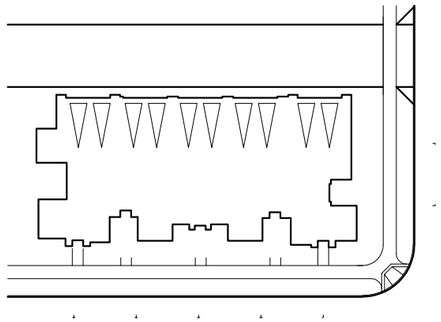


Motorcourts



Townhomes

Reso A - Exhibit C2 (EIR Technical Appendix)

OLSEN CHANDLER PROJECT

CALCULATING CN VALUES FROM EXISTING PERCENT IMPERVIOUS

Percent Impervious	Soil A	Soil B	Soil C	Soil D
0	39	61	74	80
5	42	63	75	81
10	45	65	76	82
15	48	67	78	83
20	51	68	79	84
25	54	70	80	85
30	57	72	81	85
35	60	74	82	86
38	61	75	83	87
40	63	76	84	87
45	66	78	85	88
50	69	80	86	89
54	71	81	87	90
55	71	81	87	90
58	73	82	88	90
60	74	83	88	91
65	77	85	90	92
70	80	87	91	93
72	81	88	91	93
75	83	89	92	94
80	86	91	93	94
85	89	92	94	95
90	92	94	96	96
95	95	96	97	97
100	98	98	98	98

$CN_{0\%}$	A	B	C	D
Open space (lawns, parks, golf courses, cemeteries, etc.)				
Good condition (grass cover > 75%)[2]	39	61	74	80

Calculating Custom CN Values from percent impervious cover values

$$CN_{n\%}=CN_{0\%}+(n\%/100)*(98-CN_{0\%})$$

Meadow, cont. grass, non-grazed[1]	30	58	71	78

1 Meadow value not used as $CN_{0\%}$ for NRCS values

2 Adjustment made to Open space (lawns, parks, golf courses, cemeteries, etc.) NRCS Table2-2a

Table 2-2a Runoff curve numbers for urban areas 1/

Cover description: Cover type and hydrologic condition	Average percent impervious area 2/	Curve numbers for hydrologic soil group: A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.) 3/:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98

Table 2-2a Runoff curve numbers for urban areas [1/]

Cover description: Cover type and hydrologic condition	Average percent impervious area [2/]	Curve numbers for hydrologic soil group: A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.) [3/]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) [4/]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation) [5/]		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

1 Average runoff condition, and $I_a = 0.2S$.

2 The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

3 CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

4 Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

5 Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

Appendix F

Time of Concentration Calculations

Reso A - Exhibit C2 (EIR Technical Appendix)

Flow Type

Specifies the flow segment type. The SCS flow types are available if the Time of Concentration method for the flow path is set to TR-55.

- SCS Sheet Flow:

  Sheet flow is a very shallow flow over plane surfaces. It is the first component of Tc and starts at the

  length of sheet flow rarely exceeds a few hundred feet. The maximum length of sheet flow is 300 ft. Data used to compute the sheet flow are the length of flow, the slope, the 2-year 24-hour rainfall amount, and the ground roughness as measured by Manning's n.

- SCS Shallow Flow:

  Shallow concentrated flow type normally occurs after a maximum of 300 feet of sheet flow. The average velocity of shallow concentrated flow is determined by watershed slope and channel material (paved or unpaved). Typical areas where shallow flow occurs are in swales between houses and the gutter section of a roadway.

- SCS Channel Flow:

  Channel flow type begins where surveyed channel cross section information has been obtained, where channels are visible on aerial photographs, or where streams are indicated on USGS quadrangle sheets.

- User-Defined: Available if the Time of Concentration method for the flow path is set to User-Defined.

Reso A - Exhibit C2 (EIR Technical Appendix)

OLSEN-CHANDLER Tc CALCULATION

DMA ID	Segment	Flow Type	Length	Slope	2-yr 24-hr rainfall	Surface Type	Manning's Roughness	Cross-sectional Area	Wetted Perimeter	Velocity	Time	Time, hr	Time, minutes
	1	SCS Sheet Flow	379.910'	3.59%	3.600"		0.025				0.084 hr	0.084	5.04
3a-Ex	2	SCS Shallow Concentrated Flow	1087.215'	3.59%		Short Grass Pasture					0.228 hr	0.228	13.68
	3	SCS Channel Flow	3250.662'	0.50%			0.03	86.80 Sq. Ft.	112.400'	2 mi/h	0.305 hr	0.305	18.3
												0.617	37.02
	1	SCS Sheet Flow	305.342'	16.24%	3.600"		0.02				0.032 hr	0.032	1.92
3b-Ex	2	SCS Shallow Concentrated Flow	591.384'	5.48%		Short Grass Pasture					0.100 hr	0.100	6
	3	SCS Channel Flow	10279.669'	0.77%			0.035	36.00 Sq. Ft.	26.500'	3 mi/h	0.625 hr	0.625	37.5
												0.757	45.42
	1	SCS Sheet Flow	455.191'	5.49%	3.600"		0.03				0.095 hr	0.095	5.7
7b-Ex	2	SCS Shallow Concentrated Flow	1271.308'	1.57%		Unpaved					0.175 hr	0.175	10.5
	3	SCS Channel Flow	1795.434'	0.76%			0.035	22.00 Sq. Ft.	27.000'	2 mi/h	0.154 hr	0.154	9.24
												0.424	25.44
	1	SCS Shallow Concentrated Flow	304.263'	3.40%		Short Grass Pasture					0.065 hr	0.065	3.9
8a-Ex	2	SCS Shallow Concentrated Flow	905.175'	2.96%		Short Grass Pasture					0.209 hr	0.209	12.54
												0.274	16.44
	1	SCS Sheet Flow	315.440'	7.29%	3.600"		0.025				0.055 hr	0.055	3.3
9a-Ex	2	SCS Shallow Concentrated Flow	1160.772'	0.34%		Grassed Waterway					0.369 hr	0.369	22.14
	3	SCS Channel Flow	4908.918'	0.59%			0.02	60.00 Sq. Ft.	145.700'	2 mi/h	0.431 hr	0.431	25.86
												0.855	51.3
	1	SCS Sheet Flow	303.777'	10.74%	3.600"		0.03				0.053 hr	0.053	3.18
10a-Ex	2	SCS Shallow Concentrated Flow	325.219'	10.74%		Grassed Waterway					0.018 hr	0.018	1.08
	3	SCS Channel Flow	2627.001'	3.95%			0.025	20.00 Sq. Ft.	48.600'	4 mi/h	0.111 hr	0.111	6.66
												0.182	10.92
	1	SCS Sheet Flow	266.460'	6.70%	3.600"		0.025				0.050 hr	0.050	3
12a-Ex	2	SCS Shallow Concentrated Flow	279.715'	12.18%		Short Grass Pasture					0.032 hr	0.032	1.92
												0.082	4.92
	1	SCS Sheet Flow	290.998'	9.39%	3.600"		0.025				0.046 hr	0.046	2.76
13a-Ex	2	SCS Shallow Concentrated Flow	222.096'	12.95%		Short Grass Pasture					0.024 hr	0.024	1.44
	3	SCS Channel Flow	387.610'	0.46%			0.03	4.00 Sq. Ft.	15.000'	1 mi/h	0.077 hr	0.077	4.62
												0.147	8.82
	1	SCS Sheet Flow	375.335'	2.20%	3.600"		0.025				0.102 hr	0.102	6.12
13b-Ex	2	SCS Shallow Concentrated Flow	577.495'	12.90%		Grassed Waterway					0.030 hr	0.030	1.8
	3	SCS Channel Flow	845.156'	15.07%			0.03	8.00 Sq. Ft.	30.000'	5 mi/h	0.029 hr	0.029	1.74
												0.161	9.66
	1	SCS Sheet Flow	305.027'	6.28%	3.600"		0.03				0.066 hr	0.066	3.96
14a(1)-Ex	2	SCS Shallow Concentrated Flow	578.291'	4.52%		Unpaved					0.047 hr	0.047	2.82
	3	SCS Channel Flow	691.285'	0.82%			0.016	2.90 Sq. Ft.	5.000'	4 mi/h	0.033 hr	0.033	1.98
												0.146	8.76
14a(2)-Ex	1	SCS Sheet Flow	135.194'	2.11%	3.600"		0.015				0.030 hr	0.030	1.8
	2	SCS Shallow Concentrated Flow	336.187'	0.81%		Paved					0.051 hr	0.051	3.06
												0.081	4.86
	1	SCS Sheet Flow	287.412'	8.70%	3.600"		0.02				0.040 hr	0.040	2.4
14b-Ex	2	SCS Shallow Concentrated Flow	493.578'	10.72%		Unpaved					0.026 hr	0.026	1.56
	3	SCS Channel Flow	1977.740'	2.85%			0.03	8.00 Sq. Ft.	30.000'	2 mi/h	0.158 hr	0.158	9.48
												0.224	13.44
	1	SCS Sheet Flow	304.403'	9.86%	3.600"		0.03				0.055 hr	0.055	3.3
14c(0)-Ex	2	SCS Shallow Concentrated Flow	1119.934'	5.02%		Short Grass Pasture					0.198 hr	0.198	11.88
	3	SCS Channel Flow	2028.461'	0.93%			0.025	2.34 Sq. Ft.	4.640'	2 mi/h	0.155 hr	0.155	9.3
												0.408	24.48
	1	SCS Sheet Flow	241.012'	16.60%	3.600"		0.02				0.027 hr	0.027	1.62
14c(1)-Ex	2	SCS Shallow Concentrated Flow	897.291'	7.05%		Grassed Waterway					0.063 hr	0.063	3.78
	3	SCS Channel Flow	1694.208'	1.65%			0.03	4.00 Sq. Ft.	15.000'	2 mi/h	0.178 hr	0.178	10.68
												0.268	16.08
	1	SCS Sheet Flow	259.134'	1.54%	3.600"		0.03				0.101 hr	0.101	6.06
14c(2)-Ex	2	SCS Shallow Concentrated Flow	815.596'	10.10%		Short Grass Pasture					0.102 hr	0.102	6.12
	3	SCS Channel Flow	1042.846'	3.83%			0.027	88.30 Sq. Ft.	46.300'	11 mi/h	0.017 hr	0.017	1.02
												0.220	13.2
	1	SCS Sheet Flow	278.005'	8.00%	3.600"		0.02				0.040 hr	0.040	2.4
14c(3)-Ex	2	SCS Shallow Concentrated Flow	1205.666'	2.75%		Unpaved					0.125 hr	0.125	7.5
	3	SCS Channel Flow	336.894'	0.72%			0.025	4.00 Sq. Ft.	15.000'	1 mi/h	0.045 hr	0.045	2.7
												0.210	12.6
	1	SCS Sheet Flow	470.419'	13.60%	3.600"		0.025				0.059 hr	0.059	3.54
14d-Ex	2	SCS Shallow Concentrated Flow	935.646'	6.28%		Short Grass Pasture					0.148 hr	0.148	8.88
	3	SCS Channel Flow	2130.948'	2.64%			0.03	2.34 Sq. Ft.	4.640'	3 mi/h	0.116 hr	0.116	6.96
												0.323	19.38
	1	SCS Channel Flow	1189.288'	0.88%			0.028	40.00 Sq. Ft.	145.700'	1 mi/h	0.157 hr	0.157	9.42
14e-Ex													
1	1	SCS Shallow Concentrated Flow	1183.734'	0.95%		Paved					0.166 hr	0.166	9.96
	1	SCS Shallow Concentrated Flow	795.039'	0.88%		Paved					0.116 hr	0.116	6.96
2	2	SCS Channel Flow	912.824'	0.44%			0.015	4.00 Sq. Ft.	15.000'	2 mi/h	0.093 hr	0.093	5.58
												0.375	22.5
	1	SCS Sheet Flow	321.610'	0.23%	3.600"		0.02				0.185 hr	0.185	11.1
3	2	SCS Shallow Concentrated Flow	501.122'	0.92%		Paved					0.071 hr	0.071	4.26
	3	SCS Channel Flow	730.069'	0.75%			0.012	4.90 Sq. Ft.	7.850'	5 mi/h	0.026 hr	0.026	1.56
												0.282	16.92
	1	SCS Sheet Flow	466.871'	3.25%	3.600"		0.03				0.120 hr	0.120	7.2
4	2	SCS Shallow Concentrated Flow	776.281'	3.06%		Paved					0.061 hr	0.061	3.66
	3	SCS Channel Flow	834.377'	1.82%			0.015	0.80 Sq. Ft.	4.670'	3 mi/h	0.056 hr	0.056	3.36
												0.237	14.22
	1	SCS Sheet Flow	246.682'	7.44%	3.600"		0.035				0.059 hr	0.059	3.54
5	2	SCS Shallow Concentrated Flow	835.195'	3.14%		Short Grass Pasture					0.187 hr	0.187	11.22
	3	SCS Channel Flow	668.373'	0.70%			0.03	4.00 Sq. Ft.	15.000'	1 mi/h	0.108 hr	0.108	6.48
												0.354	21.24
	1	SCS Sheet Flow	183.509'	0.45%	3.600"		0.03				0.125 hr	0.125	7.5
6	2	SCS Shallow Concentrated Flow	1182.531'	2.45%		Paved					0.103 hr	0.103	6.18
	3	SCS Channel Flow	878.606'	1.70%			0.035	4.00 Sq. Ft.	15.000'	2 mi/h	0.106 hr	0.106	6.36
												0.334	20.04
	1	SCS Sheet Flow	300.583'	7.79%	3.600"		0.03				0.059 hr	0.059	3.54
7	2	SCS Shallow Concentrated Flow	461.020'	4.57%		Paved					0.029 hr	0.029	1.74
	3	SCS Channel Flow	2085.262'	0.89%			0.03	4.00 Sq. Ft.	15.000'	1 mi/h	0.298 hr	0.298	17.88
												0.386	23.16

Reso A - Exhibit C2 (EIR Technical Appendix)

OLSEN-CHANDLER Tc CALCULATION

	1 SCS Sheet Flow	294.522'	0.34%	3.600"		0.03				0.205 hr	0.205	12.3
8	2 SCS Shallow Concentrated Flow	773.900'	1.00%		Grassed Waterway					0.143 hr	0.143	8.58
	3 SCS Channel Flow	1144.617'	1.41%			0.015	0.80 Sq. Ft.	8.670'	2 mi/h	0.132 hr	0.132	7.92
											0.480	28.8
	1 SCS Sheet Flow	301.643'	0.50%	2.330"		0.03				0.222 hr	0.222	13.32
9	2 SCS Shallow Concentrated Flow	662.324'	3.50%		Short Grass Pasture					0.140 hr	0.140	8.4
	3 SCS Channel Flow	414.746'	1.60%			0.035	4.00 Sq. Ft.	15.000'	2 mi/h	0.052 hr	0.052	3.12
											0.414	24.84
	1 SCS Shallow Concentrated Flow	2120.314'	0.94%		Unpaved					0.377 hr	0.377	22.62
10												
	1 SCS Sheet Flow	149.214'	1.77%	3.600"		0.02				0.044 hr	0.044	2.64
11	2 SCS Shallow Concentrated Flow	1819.927'	3.20%		Paved					0.139 hr	0.139	8.34
	3 SCS Channel Flow	141.018'	8.75%			0.012	2.98 Sq. Ft.	5.000'	18 mi/h	0.002 hr	0.002	0.12
											0.185	11.1
	1 SCS Shallow Concentrated Flow	1646.005'	5.90%		Paved					0.093 hr	0.093	5.58
12	2 SCS Channel Flow	1393.252'	2.03%			0.015	2.90 Sq. Ft.	5.000'	7 mi/h	0.039 hr	0.039	2.34
											0.132	7.92
	1 SCS Sheet Flow	238.459'	6.43%	3.600"		0.02				0.039 hr	0.039	2.34
13	2 SCS Shallow Concentrated Flow	865.755'	3.92%		Paved					0.060 hr	0.060	3.6
	3 SCS Channel Flow	657.308'	1.98%			0.015	4.00 Sq. Ft.	15.000'	4 mi/h	0.032 hr	0.032	1.92
											0.131	7.86
	1 SCS Shallow Concentrated Flow	877.862'	0.70%		Paved					0.143 hr	0.143	8.58
14												

Appendix G

2, 5, 10, 50 & 100-Year Storm Event Peak Flow Summary
for Existing and Proposed Conditions

Existing Conditions

TABLE 5 - Peak Flow Summary

EXISTING CONDITIONS								
HydroCAD Node Type	DMA or HC Node Number	Drainage Management Area (DMA) or Node Name	95th PERCENTILE STORM	2 YEAR STORM	10 YEAR STORM	25 YEAR STORM	50 YEAR STORM	100 YEAR STORM
Subcat	1	Subcat 1	0.0	0.1	1.0	2.5	3.8	5.6
Subcat	2	Subcat 2	0.0	0.1	1.1	3.0	4.6	6.8
Subcat	3	Subcat 3	0.0	0.4	3.7	6.9	9.3	12.6
Subcat	3a{(1)}-Ex	Subcat 3a{(1)}-Ex	0.0	0.0	0.4	0.9	1.4	2.1
Subcat	3a{(2)}-Ex	Subcat 3a{(2)}-Ex	0.0	0.1	1.3	2.7	3.7	5.2
Subcat	3a{(3)}-Ex	Subcat 3a{(3)}-Ex	0.0	0.4	2.8	4.2	5.3	6.6
Subcat	3b-Ex	Subcat 3b-Ex	0.2	8.3	47.4	90.8	126.7	178.4
Subcat	4	Subcat 4	0.3	0.6	3.5	8.0	11.8	17.2
Subcat	5	Subcat 5	0.0	0.3	2.0	4.5	7.0	10.6
Subcat	6	Subcat 6	0.0	0.4	3.0	6.7	9.7	14.0
Subcat	7	Subcat 7	0.0	0.3	1.9	4.1	6.3	9.6
Subcat	8	Subcat 8	0.0	0.3	1.7	3.5	5.2	8.0
Subcat	8a-Ex	Subcat 8a-Ex	0.0	0.1	0.9	2.3	3.6	5.4
Subcat	9	Subcat 9	0.0	0.2	1.4	2.7	3.8	5.2
Subcat	9a-Ex	Subcat 9a-Ex	0.0	1.9	9.8	18.6	26.7	38.6
Subcat	10	Subcat 10	0.6	1.0	3.4	6.5	9.0	12.5
Subcat	10a-Ex	Subcat 10a-Ex	0.3	3.4	34.6	54.9	69.7	89.2
Subcat	11	Subcat 11	0.0	0.1	1.5	3.6	5.2	7.6
Subcat	12	Subcat 12	0.0	0.2	1.9	4.6	6.7	9.7
Subcat	12a-Ex	Subcat 12a-Ex	0.0	0.3	1.5	2.1	2.6	3.2
Subcat	13	Subcat 13	0.0	0.3	4.7	9.5	13.1	18.2
Subcat	13a-Ex	Subcat 13a-Ex	0.0	0.4	1.9	2.8	3.5	4.3
Subcat	13b-Ex	Subcat 13b-Ex	1.9	8.6	20.2	26.2	30.3	35.5
Subcat	13c-Ex	Subcat 13c-Ex	0.9	5.6	14.2	18.8	21.9	25.8
Subcat	14	Subcat 14	3.2	5.5	9.0	11.0	12.5	14.4
Subcat	14a{(1)}-Ex	Subcat 14a{(1)}-Ex	0.0	0.2	3.5	6.2	8.1	10.7
Subcat	14a{(2)}-Ex	Subcat 14a{(2)}-Ex	0.5	0.9	1.5	2.0	2.4	2.9
Subcat	14b-Ex	Subcat 14b-Ex	2.0	15.5	41.4	55.2	64.7	76.8
Subcat	14c{(0)}-Ex	Subcat 14c{(0)}-Ex	2.8	13.1	31.2	40.6	47.1	55.3
Subcat	14c{(1)}-Ex	Subcat 14c{(1)}-Ex	2.4	11.6	28.0	36.5	42.4	49.9
Subcat	14c{(2)}-Ex	Subcat 14c{(2)}-Ex	0.4	4.9	14.5	19.7	23.4	28.0
Subcat	14c{(3)}-Ex	Subcat 14c{(3)}-Ex	0.2	2.7	9.2	12.7	15.2	18.4
Subcat	14d-Ex	Subcat 14d-Ex	7.7	47.4	121.8	160.9	188.0	222.4
Subcat	14e-Ex	Subcat 14e-Ex	0.5	0.8	2.1	3.7	5.1	6.9
Reach	6R	Reach 1c	0.3	8.5	58.8	125.7	180.5	257.3
Reach	7R	Reach 1b	3.6	52.5	201.9	304.3	383.9	492.1
Reach	8R	Reach 1a	3.6	51.4	204.9	312.4	395.8	509.5
Reach	17R	Reach 1d	0.0	0.0	19.7	45.0	64.3	90.3
Reach	18R	Linne Road Grassed Chl	4.7	11.0	17.8	20.6	22.4	24.6
Pond	17P	Gran Cielo Dwy	7.6	46.4	121.4	160.6	187.6	222.1
Pond	18P	GC-CkD1	9.3	65.6	146.0	174.6	192.8	215.1
Pond	19P	GC-CkD2	8.6	48.2	95.1	112.0	122.9	136.1
Pond	20P	GC-CkD3	8.5	41.3	70.8	81.9	89.2	98.1
Link	3a (1,2+3)	Comb Un-dev Ck Flow	3.6	51.4	204.9	312.4	395.8	509.5
Link	5L	Outlet To Tract #1632 Ex. 36" SD	0.0	1.0	6.4	14.2	22.1	33.5
Link	6L	To Existing Meadowlark Road	0.0	2.0	10.5	20.6	29.5	42.6
Link	7L	DMA 13	2.8	14.6	40.9	57.1	68.7	83.7
Link	8L	DMA 8	0.0	0.4	2.6	5.7	8.8	13.3
Link	9L	DMA 12	0.0	0.3	3.4	6.7	9.3	12.9
Link	10L	To Linne Road Channel	4.9	12.1	18.6	21.4	23.3	25.7
Link	11L	To Fontana Road SD	3.4	18.9	83.4	128.4	161.4	205.4
Link	15L	Sherwood/Niblick LP Xing	5.0	20.9	53.8	72.3	85.2	101.9
Link	16L	Airport & Linne Road SD	6.2	23.2	69.0	92.3	108.4	129.2
Link	19L	14c(0+1)-Ex	5.2	24.5	59.1	77.0	89.3	104.9
Link	22L	Linne Rd Overtopping Ex.Flow #2and#3	3.7	38.1	84.5	102.2	113.6	127.8
Link	23L	Linne Rd Overtop #1	0.0	19.5	60.7	76.6	86.9	99.6

Reso A - Exhibit C2 (EIR Technical Appendix)

TABLE 10 - HYDROGRAPH ANALYSIS

EXISTING CONDITIONS RESULTS

Type	Number	Name	Event	Rainfall Depth (inches)	Inflow Peak (cfs)	Inflow Area (acres)	Imperv. Inflow Area (%)	Discarded Outflow Peak (cfs)	Primary Routing	Primary Outflow Peak (cfs)	Secondary Routing	Secondary Outflow Peak (cfs)	Tertiary Routing	Tertiary Outflow Peak (cfs)	Outflow Total Peak (cfs)	Peak Elevation (feet)	Peak Elevation Time (hours)	Peak Storage (acre-feet)
Subcat	1	Subcat 1		1.4	0	0	0	0	8R	0		0		0	0	0	0	0
Subcat	2	Subcat 2		1.4	0	0	0	0	8R	0		0		0	0	0	0	0
Subcat	3	Subcat 3		1.4	0	0	0	0	7R	0.03		0		0	0	0	0	0
Subcat	3a{(1)}-Ex	Subcat 3a{(1)}-Ex		1.4	0	0	0	0	8R	0		0		0	0	0	0	0
Subcat	3a{(2)}-Ex	Subcat 3a{(2)}-Ex		1.4	0	0	0	0	7R	0.01		0		0	0	0	0	0
Subcat	3a{(3)}-Ex	Subcat 3a{(3)}-Ex		1.4	0	0	0	0	6R	0.03		0		0	0	0	0	0
Subcat	3b-Ex	Subcat 3b-Ex		1.4	0	0	0	0	6R	0.23		0		0	0	0	0	0
Subcat	4	Subcat 4		1.4	0	0	0	0	8R	0.34		0		0	0	0	0	0
Subcat	5	Subcat 5		1.4	0	0	0	0	5L	0		0		0	0	0	0	0
Subcat	6	Subcat 6		1.4	0	0	0	0	7R	0.01		0		0	0	0	0	0
Subcat	7	Subcat 7		1.4	0	0	0	0	5L	0		0		0	0	0	0	0
Subcat	8	Subcat 8		1.4	0	0	0	0	8L	0		0		0	0	0	0	0
Subcat	8a-Ex	Subcat 8a-Ex		1.4	0	0	0	0	8L	0		0		0	0	0	0	0
Subcat	9	Subcat 9		1.4	0	0	0	0	6L	0.01		0		0	0	0	0	0
Subcat	9a-Ex	Subcat 9a-Ex		1.4	0	0	0	0	6L	0		0		0	0	0	0	0
Subcat	10	Subcat 10		1.4	0	0	0	0	11L	0.59		0		0	0	0	0	0
Subcat	10a-Ex	Subcat 10a-Ex		1.4	0	0	0	0	11L	0.33		0		0	0	0	0	0
Subcat	11	Subcat 11		1.4	0	0	0	0	11L	0		0		0	0	0	0	0
Subcat	12	Subcat 12		1.4	0	0	0	0	9L	0		0		0	0	0	0	0
Subcat	12a-Ex	Subcat 12a-Ex		1.4	0	0	0	0	9L	0.02		0		0	0	0	0	0
Subcat	13	Subcat 13		1.4	0	0	0	0	7L	0.02		0		0	0	0	0	0
Subcat	13a-Ex	Subcat 13a-Ex		1.4	0	0	0	0	7L	0.02		0		0	0	0	0	0
Subcat	13b-Ex	Subcat 13b-Ex		1.4	0	0	0	0	7L	1.92		0		0	0	0	0	0
Subcat	13c-Ex	Subcat 13c-Ex		1.4	0	0	0	0	7L	0.92		0		0	0	0	0	0
Subcat	14	Subcat 14		1.4	0	0	0	0	15L	3.17		0		0	0	0	0	0
Subcat	14a{(1)}-Ex	Subcat 14a{(1)}-Ex		1.4	0	0	0	0	15L	0.02		0		0	0	0	0	0
Subcat	14a{(2)}-Ex	Subcat 14a{(2)}-Ex		1.4	0	0	0	0	10L	0.52		0		0	0	0	0	0
Subcat	14b-Ex	Subcat 14b-Ex		1.4	0	0	0	0	15L	1.96		0		0	0	0	0	0
Subcat	14c{(0)}-Ex	Subcat 14c{(0)}-Ex		1.4	0	0	0	0	19L	2.81		0		0	0	0	0	0
Subcat	14c{(1)}-Ex	Subcat 14c{(1)}-Ex		1.4	0	0	0	0	19L	2.36		0		0	0	0	0	0
Subcat	14c{(2)}-Ex	Subcat 14c{(2)}-Ex		1.4	0	0	0	0	19P	0.4		0		0	0	0	0	0
Subcat	14c{(3)}-Ex	Subcat 14c{(3)}-Ex		1.4	0	0	0	0	20P	0.16		0		0	0	0	0	0
Subcat	14d-Ex	Subcat 14d-Ex		1.4	0	0	0	0	17P	7.7		0		0	0	0	0	0
Subcat	14e-Ex	Subcat 14e-Ex		1.4	0	0	0	0	16L	0.47		0		0	0	0	0	0
Reach	6R	Reach 1c		1.4	0.25	763.083	0	0	7R	0.25		0		0	0	841.44	24.01	0.001
Reach	7R	Reach 1b		1.4	3.74	826.518	0	0	8R	3.59		0		0	0	838.89	11.22	0.023
Reach	8R	Reach 1a		1.4	3.65	895.282	0.06	0	3a (1,2+3)	3.57		0		0	0	833.09	11.31	0.021
Reach	17R	Reach 1d		1.4	0	0	0	0	6R	0		0		0	0	853.6	0.1	0
Reach	18R	Linne Road Grassed Chl		1.4	4.87	276.531	1.18	0	16L	4.68		0		0	0	841.78	11.4	0.056
Pond	17P	Gran Cielo Dwy		1.4	7.7	166.738	0.91	0	18P	7.55	18P	0	17R	0	7.55	853.35	10.09	0.023
Pond	18P	GC-CkD1		1.4	12.48	240.622	1.05	0	19P	1.06	19P	8.26	23L	0	9.26	849.96	10.61	0.455
Pond	19P	GC-CkD2		1.4	9.62	260.311	0.97	0	20P	1.07	20P	7.56	22L	0	8.63	848.44	10.94	0.286
Pond	20P	GC-CkD3		1.4	8.78	274.094	0.92	0	10L	3.44	10L	1.35	22L	3.74	8.54	845.35	11.09	0.183
Link	3a (1,2+3)	Comb Un-dev Ck Flow		1.4	3.57	895.282	0.06	0		3.57		0		0	0	0	0.1	0
Link	5L	Outlet To Tract #1632 Ex. 36" SD		1.4	0	108.759	0	0		0		0		0	0	0	0.1	0
Link	6L	To Existing Meadowlark Road		1.4	0.01	223.467	0	0		0.01		0		0	0	0	0.1	0
Link	7L	DMA 13		1.4	2.83	64.115	0	0	11L	2.83		0		0	0	0	0.1	0
Link	8L	DMA 8		1.4	0	44.689	0	0	5L	0		0		0	0	0	0.1	0
Link	9L	DMA 12		1.4	0.02	20.201	0	0	11L	0.02		0		0	0	0	0.1	0
Link	10L	To Linne Road Channel		1.4	4.87	276.531	1.18	0	18R	4.87		0		0	0	0	0.1	0
Link	11L	To Fontana Road SD		1.4	3.42	223.567	0.53	0		3.42		0		0	0	0	0.1	0
Link	15L	Sherwood/Niblick LP Xing		1.4	5.01	71.958	6.18	0	16L	5.01		0		0	0	0	0.1	0
Link	16L	Airport & Linne Road SD		1.4	6.2	359.38	2.33	0		6.2		0		0	0	0	0.1	0
Link	19L	14c(0+1)-Ex		1.4	5.17	73.884	1.37	0	18P	5.17		0		0	0	0	0.1	0
Link	22L	Linne Rd Overtopping Ex.Flow #2ar		1.4	3.74	0	0	0	7R	3.74		0		0	0	0	0.1	0
Link	23L	Linne Rd Overtop #1		1.4	0	0	0	0	7R	0		0		0	0	0	0.1	0

_95th Percentile Storm

Reso A - Exhibit C2 (EIR Technical Appendix)

TABLE 10 - HYDROGRAPH ANALYSIS

EXISTING CONDITIONS RESULTS

Type	Number	Name	Event	Rainfall Depth (inches)	Inflow Peak (cfs)	Inflow Area (acres)	Imperv. Inflow Area (%)	Discarded Outflow Peak (cfs)	Primary Routing	Primary Outflow Peak (cfs)	Secondary Routing	Secondary Outflow Peak (cfs)	Tertiary Routing	Tertiary Outflow Peak (cfs)	Outflow Total Peak (cfs)	Peak Elevation (feet)	Peak Elevation Time (hours)	Peak Storage (acre-feet)
Subcat	1	Subcat 1	1 Year	1.61	0	0	0	0	8R	0.01		0		0	0	0	0	0
Subcat	2	Subcat 2		1.61	0	0	0	0	8R	0.01		0		0	0	0	0	0
Subcat	3	Subcat 3		1.61	0	0	0	0	7R	0.08		0		0	0	0	0	0
Subcat	3a{(1)}-Ex	Subcat 3a{(1)}-Ex		1.61	0	0	0	0	8R	0		0		0	0	0	0	0
Subcat	3a{(2)}-Ex	Subcat 3a{(2)}-Ex		1.61	0	0	0	0	7R	0.02		0		0	0	0	0	0
Subcat	3a{(3)}-Ex	Subcat 3a{(3)}-Ex		1.61	0	0	0	0	6R	0.05		0		0	0	0	0	0
Subcat	3b-Ex	Subcat 3b-Ex		1.61	0	0	0	0	6R	1.34		0		0	0	0	0	0
Subcat	4	Subcat 4		1.61	0	0	0	0	8R	0.4		0		0	0	0	0	0
Subcat	5	Subcat 5		1.61	0	0	0	0	5L	0.03		0		0	0	0	0	0
Subcat	6	Subcat 6		1.61	0	0	0	0	7R	0.06		0		0	0	0	0	0
Subcat	7	Subcat 7		1.61	0	0	0	0	5L	0.03		0		0	0	0	0	0
Subcat	8	Subcat 8		1.61	0	0	0	0	8L	0.03		0		0	0	0	0	0
Subcat	8a-Ex	Subcat 8a-Ex		1.61	0	0	0	0	8L	0.01		0		0	0	0	0	0
Subcat	9	Subcat 9		1.61	0	0	0	0	6L	0.03		0		0	0	0	0	0
Subcat	9a-Ex	Subcat 9a-Ex		1.61	0	0	0	0	6L	0.19		0		0	0	0	0	0
Subcat	10	Subcat 10		1.61	0	0	0	0	11L	0.69		0		0	0	0	0	0
Subcat	10a-Ex	Subcat 10a-Ex		1.61	0	0	0	0	11L	0.6		0		0	0	0	0	0
Subcat	11	Subcat 11		1.61	0	0	0	0	11L	0.02		0		0	0	0	0	0
Subcat	12	Subcat 12		1.61	0	0	0	0	9L	0.02		0		0	0	0	0	0
Subcat	12a-Ex	Subcat 12a-Ex		1.61	0	0	0	0	9L	0.03		0		0	0	0	0	0
Subcat	13	Subcat 13		1.61	0	0	0	0	7L	0.06		0		0	0	0	0	0
Subcat	13a-Ex	Subcat 13a-Ex		1.61	0	0	0	0	7L	0.04		0		0	0	0	0	0
Subcat	13b-Ex	Subcat 13b-Ex		1.61	0	0	0	0	7L	3.2		0		0	0	0	0	0
Subcat	13c-Ex	Subcat 13c-Ex		1.61	0	0	0	0	7L	1.77		0		0	0	0	0	0
Subcat	14	Subcat 14		1.61	0	0	0	0	15L	3.7		0		0	0	0	0	0
Subcat	14a{(1)}-Ex	Subcat 14a{(1)}-Ex		1.61	0	0	0	0	15L	0.05		0		0	0	0	0	0
Subcat	14a{(2)}-Ex	Subcat 14a{(2)}-Ex		1.61	0	0	0	0	10L	0.61		0		0	0	0	0	0
Subcat	14b-Ex	Subcat 14b-Ex		1.61	0	0	0	0	15L	4.28		0		0	0	0	0	0
Subcat	14c{(0)}-Ex	Subcat 14c{(0)}-Ex		1.61	0	0	0	0	19L	4.73		0		0	0	0	0	0
Subcat	14c{(1)}-Ex	Subcat 14c{(1)}-Ex		1.61	0	0	0	0	19L	4.08		0		0	0	0	0	0
Subcat	14c{(2)}-Ex	Subcat 14c{(2)}-Ex		1.61	0	0	0	0	19P	1.02		0		0	0	0	0	0
Subcat	14c{(3)}-Ex	Subcat 14c{(3)}-Ex		1.61	0	0	0	0	20P	0.38		0		0	0	0	0	0
Subcat	14d-Ex	Subcat 14d-Ex		1.61	0	0	0	0	17P	14.7		0		0	0	0	0	0
Subcat	14e-Ex	Subcat 14e-Ex		1.61	0	0	0	0	16L	0.55		0		0	0	0	0	0
Reach	6R	Reach 1c		1.61	1.38	763.083	0	0	7R	1.38		0		0	0	841.48	22.71	0.006
Reach	7R	Reach 1b		1.61	10.23	826.518	0	0	8R	9.7		0		0	0	839.01	10.76	0.062
Reach	8R	Reach 1a		1.61	9.8	895.282	0.06	0	3a (1,2+3)	9.49		0		0	0	833.25	10.86	0.056
Reach	17R	Reach 1d		1.61	0	0	0	0	6R	0		0		0	0	853.6	0.1	0
Reach	18R	Linne Road Grassed Chl		1.61	6.79	276.531	1.18	0	16L	6.35		0		0	0	841.85	10.93	0.076
Pond	17P	Gran Cielo Dwy		1.61	14.7	166.738	0.91	0	18P	14.34	18P	0	17R	0	14.34	853.55	10.05	0.04
Pond	18P	GC-CkD1		1.61	22.87	240.622	1.05	0	19P	1.11	19P	16.28	23L	0.54	17.78	850.2	10.38	0.551
Pond	19P	GC-CkD2		1.61	18.04	260.311	0.97	0	20P	1.14	20P	15.5	22L	0	16.64	848.7	10.57	0.353
Pond	20P	GC-CkD3		1.61	16.97	274.094	0.92	0	10L	4.14	10L	2.53	22L	9.96	16.63	845.49	10.66	0.218
Link	3a (1,2+3)	Comb Un-dev Ck Flow		1.61	9.49	895.282	0.06	0		9.49		0		0	0	0	0.1	0
Link	5L	Outlet To Tract #1632 Ex. 36" SD		1.61	0.1	108.759	0	0		0.1		0		0	0	0	0.1	0
Link	6L	To Existing Meadowlark Road		1.61	0.22	223.467	0	0		0.22		0		0	0	0	0.1	0
Link	7L	DMA 13		1.61	4.97	64.115	0	0	11L	4.97		0		0	0	0	0.1	0
Link	8L	DMA 8		1.61	0.04	44.689	0	0	5L	0.04		0		0	0	0	0.1	0
Link	9L	DMA 12		1.61	0.04	20.201	0	0	11L	0.04		0		0	0	0	0.1	0
Link	10L	To Linne Road Channel		1.61	6.79	276.531	1.18	0	18R	6.79		0		0	0	0	0.1	0
Link	11L	To Fontana Road SD		1.61	5.66	223.567	0.53	0		5.66		0		0	0	0	0.1	0
Link	15L	Sherwood/Niblick LP Xing		1.61	7.86	71.958	6.18	0	16L	7.86		0		0	0	0	0.1	0
Link	16L	Airport & Linne Road SD		1.61	8.9	359.38	2.33	0		8.9		0		0	0	0	0.1	0
Link	19L	14c(0+1)-Ex		1.61	8.8	73.884	1.37	0	18P	8.8		0		0	0	0	0.1	0
Link	22L	Linne Rd Overtopping Ex.Flow #2ar		1.61	9.96	0	0	0	7R	9.96		0		0	0	0	0.1	0
Link	23L	Linne Rd Overtop #1		1.61	0.54	0	0	0	7R	0.54		0		0	0	0	0.1	0

Reso A - Exhibit C2 (EIR Technical Appendix)

TABLE 10 - HYDROGRAPH ANALYSIS

EXISTING CONDITIONS RESULTS

Type	Number	Name	Event	Rainfall Depth (inches)	Inflow Peak (cfs)	Inflow Area (acres)	Imperv. Inflow Area (%)	Discarded Outflow Peak (cfs)	Primary Routing	Primary Outflow Peak (cfs)	Secondary Routing	Secondary Outflow Peak (cfs)	Tertiary Routing	Tertiary Outflow Peak (cfs)	Outflow Total Peak (cfs)	Peak Elevation (feet)	Peak Elevation Time (hours)	Peak Storage (acre-feet)
Subcat	1	Subcat 1	2 Year	2.33	0	0	0	0	8R	0.1		0		0	0	0	0	0
Subcat	2	Subcat 2		2.33	0	0	0	0	8R	0.13		0		0	0	0	0	0
Subcat	3	Subcat 3		2.33	0	0	0	0	7R	0.35		0		0	0	0	0	0
Subcat	3a{(1)}-Ex	Subcat 3a{(1)}-Ex		2.33	0	0	0	0	8R	0.04		0		0	0	0	0	0
Subcat	3a{(2)}-Ex	Subcat 3a{(2)}-Ex		2.33	0	0	0	0	7R	0.1		0		0	0	0	0	0
Subcat	3a{(3)}-Ex	Subcat 3a{(3)}-Ex		2.33	0	0	0	0	6R	0.43		0		0	0	0	0	0
Subcat	3b-Ex	Subcat 3b-Ex		2.33	0	0	0	0	6R	8.34		0		0	0	0	0	0
Subcat	4	Subcat 4		2.33	0	0	0	0	8R	0.6		0		0	0	0	0	0
Subcat	5	Subcat 5		2.33	0	0	0	0	5L	0.29		0		0	0	0	0	0
Subcat	6	Subcat 6		2.33	0	0	0	0	7R	0.38		0		0	0	0	0	0
Subcat	7	Subcat 7		2.33	0	0	0	0	5L	0.28		0		0	0	0	0	0
Subcat	8	Subcat 8		2.33	0	0	0	0	8L	0.27		0		0	0	0	0	0
Subcat	8a-Ex	Subcat 8a-Ex		2.33	0	0	0	0	8L	0.13		0		0	0	0	0	0
Subcat	9	Subcat 9		2.33	0	0	0	0	6L	0.16		0		0	0	0	0	0
Subcat	9a-Ex	Subcat 9a-Ex		2.33	0	0	0	0	6L	1.86		0		0	0	0	0	0
Subcat	10	Subcat 10		2.33	0	0	0	0	11L	1.03		0		0	0	0	0	0
Subcat	10a-Ex	Subcat 10a-Ex		2.33	0	0	0	0	11L	3.41		0		0	0	0	0	0
Subcat	11	Subcat 11		2.33	0	0	0	0	11L	0.14		0		0	0	0	0	0
Subcat	12	Subcat 12		2.33	0	0	0	0	9L	0.17		0		0	0	0	0	0
Subcat	12a-Ex	Subcat 12a-Ex		2.33	0	0	0	0	9L	0.3		0		0	0	0	0	0
Subcat	13	Subcat 13		2.33	0	0	0	0	7L	0.34		0		0	0	0	0	0
Subcat	13a-Ex	Subcat 13a-Ex		2.33	0	0	0	0	7L	0.4		0		0	0	0	0	0
Subcat	13b-Ex	Subcat 13b-Ex		2.33	0	0	0	0	7L	8.6		0		0	0	0	0	0
Subcat	13c-Ex	Subcat 13c-Ex		2.33	0	0	0	0	7L	5.61		0		0	0	0	0	0
Subcat	14	Subcat 14		2.33	0	0	0	0	15L	5.51		0		0	0	0	0	0
Subcat	14a{(1)}-Ex	Subcat 14a{(1)}-Ex		2.33	0	0	0	0	15L	0.24		0		0	0	0	0	0
Subcat	14a{(2)}-Ex	Subcat 14a{(2)}-Ex		2.33	0	0	0	0	10L	0.9		0		0	0	0	0	0
Subcat	14b-Ex	Subcat 14b-Ex		2.33	0	0	0	0	15L	15.48		0		0	0	0	0	0
Subcat	14c{(0)}-Ex	Subcat 14c{(0)}-Ex		2.33	0	0	0	0	19L	13.05		0		0	0	0	0	0
Subcat	14c{(1)}-Ex	Subcat 14c{(1)}-Ex		2.33	0	0	0	0	19L	11.56		0		0	0	0	0	0
Subcat	14c{(2)}-Ex	Subcat 14c{(2)}-Ex		2.33	0	0	0	0	19P	4.92		0		0	0	0	0	0
Subcat	14c{(3)}-Ex	Subcat 14c{(3)}-Ex		2.33	0	0	0	0	20P	2.74		0		0	0	0	0	0
Subcat	14d-Ex	Subcat 14d-Ex		2.33	0	0	0	0	17P	47.37		0		0	0	0	0	0
Subcat	14e-Ex	Subcat 14e-Ex		2.33	0	0	0	0	16L	0.82		0		0	0	0	0	0
Reach	6R	Reach 1c		2.33	8.47	763.083	0	0	7R	8.47		0		0	0	841.75	18.15	0.038
Reach	7R	Reach 1b		2.33	56.49	826.518	0	0	8R	52.52		0		0	0	839.83	10.28	0.336
Reach	8R	Reach 1a		2.33	52.83	895.282	0.06	0	3a (1,2+3)	51.36		0		0	0	834.2	10.35	0.289
Reach	17R	Reach 1d		2.33	0	0	0	0	6R	0		0		0	0	853.6	0.1	0
Reach	18R	Linne Road Grassed Chl		2.33	12.12	276.531	1.18	0	16L	11.03		0		0	0	842.04	10.47	0.133
Pond	17P	Gran Cielo Dwy		2.33	47.37	166.738	0.91	0	18P	46.35	18P	0	17R	0	46.35	854.16	10.03	0.113
Pond	18P	GC-CkD1		2.33	70.33	240.622	1.05	0	19P	1.14	19P	45.19	23L	19.48	65.63	850.77	10.09	0.827
Pond	19P	GC-CkD2		2.33	50.3	260.311	0.97	0	20P	1.26	20P	38.35	22L	8.61	48.22	849.2	10.17	0.519
Pond	20P	GC-CkD3		2.33	41.64	274.094	0.92	0	10L	5.5	10L	6.18	22L	29.57	41.26	845.77	10.22	0.296
Link	3a (1,2+3)	Comb Un-dev Ck Flow		2.33	51.36	895.282	0.06	0		51.36		0		0	0	0	0.1	0
Link	5L	Outlet To Tract #1632 Ex. 36" SD		2.33	0.96	108.759	0	0		0.96		0		0	0	0	0.1	0
Link	6L	To Existing Meadowlark Road		2.33	2.01	223.467	0	0		2.01		0		0	0	0	0.1	0
Link	7L	DMA 13		2.33	14.61	64.115	0	0	11L	14.61		0		0	0	0	0.1	0
Link	8L	DMA 8		2.33	0.39	44.689	0	0	5L	0.39		0		0	0	0	0.1	0
Link	9L	DMA 12		2.33	0.3	20.201	0	0	11L	0.3		0		0	0	0	0.1	0
Link	10L	To Linne Road Channel		2.33	12.12	276.531	1.18	0	18R	12.12		0		0	0	0	0.1	0
Link	11L	To Fontana Road SD		2.33	18.93	223.567	0.53	0		18.93		0		0	0	0	0.1	0
Link	15L	Sherwood/Niblick LP Xing		2.33	20.94	71.958	6.18	0	16L	20.94		0		0	0	0	0.1	0
Link	16L	Airport & Linne Road SD		2.33	23.19	359.38	2.33	0		23.19		0		0	0	0	0.1	0
Link	19L	14c(0+1)-Ex		2.33	24.54	73.884	1.37	0	18P	24.54		0		0	0	0	0.1	0
Link	22L	Linne Rd Overtopping Ex.Flow #2ar		2.33	38.07	0	0	0	7R	38.07		0		0	0	0	0.1	0
Link	23L	Linne Rd Overtop #1		2.33	19.48	0	0	0	7R	19.48		0		0	0	0	0.1	0

Reso A - Exhibit C2 (EIR Technical Appendix)

TABLE 10 - HYDROGRAPH ANALYSIS

EXISTING CONDITIONS RESULTS

Type	Number	Name	Event	Rainfall Depth (inches)	Inflow Peak (cfs)	Inflow Area (acres)	Imperv. Inflow Area (%)	Discarded Outflow Peak (cfs)	Primary Routing	Primary Outflow Peak (cfs)	Secondary Routing	Secondary Outflow Peak (cfs)	Tertiary Routing	Tertiary Outflow Peak (cfs)	Outflow Total Peak (cfs)	Peak Elevation (feet)	Peak Elevation Time (hours)	Peak Storage (acre-feet)
Subcat	1	Subcat 1	5 Year	3.27	0	0	0	0	8R	0.45		0		0	0	0	0	0
Subcat	2	Subcat 2		3.27	0	0	0	0	8R	0.58		0		0	0	0	0	0
Subcat	3	Subcat 3		3.27	0	0	0	0	7R	2.25		0		0	0	0	0	0
Subcat	3a{(1)}-Ex	Subcat 3a{(1)}-Ex		3.27	0	0	0	0	8R	0.17		0		0	0	0	0	0
Subcat	3a{(2)}-Ex	Subcat 3a{(2)}-Ex		3.27	0	0	0	0	7R	0.73		0		0	0	0	0	0
Subcat	3a{(3)}-Ex	Subcat 3a{(3)}-Ex		3.27	0	0	0	0	6R	2.08		0		0	0	0	0	0
Subcat	3b-Ex	Subcat 3b-Ex		3.27	0	0	0	0	6R	31.08		0		0	0	0	0	0
Subcat	4	Subcat 4		3.27	0	0	0	0	8R	1.83		0		0	0	0	0	0
Subcat	5	Subcat 5		3.27	0	0	0	0	5L	1.13		0		0	0	0	0	0
Subcat	6	Subcat 6		3.27	0	0	0	0	7R	1.8		0		0	0	0	0	0
Subcat	7	Subcat 7		3.27	0	0	0	0	5L	1.07		0		0	0	0	0	0
Subcat	8	Subcat 8		3.27	0	0	0	0	8L	1.02		0		0	0	0	0	0
Subcat	8a-Ex	Subcat 8a-Ex		3.27	0	0	0	0	8L	0.52		0		0	0	0	0	0
Subcat	9	Subcat 9		3.27	0	0	0	0	6L	0.84		0		0	0	0	0	0
Subcat	9a-Ex	Subcat 9a-Ex		3.27	0	0	0	0	6L	6.78		0		0	0	0	0	0
Subcat	10	Subcat 10		3.27	0	0	0	0	11L	2.25		0		0	0	0	0	0
Subcat	10a-Ex	Subcat 10a-Ex		3.27	0	0	0	0	11L	24.53		0		0	0	0	0	0
Subcat	11	Subcat 11		3.27	0	0	0	0	11L	0.71		0		0	0	0	0	0
Subcat	12	Subcat 12		3.27	0	0	0	0	9L	0.88		0		0	0	0	0	0
Subcat	12a-Ex	Subcat 12a-Ex		3.27	0	0	0	0	9L	1.11		0		0	0	0	0	0
Subcat	13	Subcat 13		3.27	0	0	0	0	7L	2.57		0		0	0	0	0	0
Subcat	13a-Ex	Subcat 13a-Ex		3.27	0	0	0	0	7L	1.48		0		0	0	0	0	0
Subcat	13b-Ex	Subcat 13b-Ex		3.27	0	0	0	0	7L	17.05		0		0	0	0	0	0
Subcat	13c-Ex	Subcat 13c-Ex		3.27	0	0	0	0	7L	11.85		0		0	0	0	0	0
Subcat	14	Subcat 14		3.27	0	0	0	0	15L	7.94		0		0	0	0	0	0
Subcat	14a{(1)}-Ex	Subcat 14a{(1)}-Ex		3.27	0	0	0	0	15L	2.28		0		0	0	0	0	0
Subcat	14a{(2)}-Ex	Subcat 14a{(2)}-Ex		3.27	0	0	0	0	10L	1.32		0		0	0	0	0	0
Subcat	14b-Ex	Subcat 14b-Ex		3.27	0	0	0	0	15L	34.16		0		0	0	0	0	0
Subcat	14c{(0)}-Ex	Subcat 14c{(0)}-Ex		3.27	0	0	0	0	19L	26.22		0		0	0	0	0	0
Subcat	14c{(1)}-Ex	Subcat 14c{(1)}-Ex		3.27	0	0	0	0	19L	23.46		0		0	0	0	0	0
Subcat	14c{(2)}-Ex	Subcat 14c{(2)}-Ex		3.27	0	0	0	0	19P	11.81		0		0	0	0	0	0
Subcat	14c{(3)}-Ex	Subcat 14c{(3)}-Ex		3.27	0	0	0	0	20P	7.32		0		0	0	0	0	0
Subcat	14d-Ex	Subcat 14d-Ex		3.27	0	0	0	0	17P	101.03		0		0	0	0	0	0
Subcat	14e-Ex	Subcat 14e-Ex		3.27	0	0	0	0	16L	1.44		0		0	0	0	0	0
Reach	6R	Reach 1c		3.27	31.59	763.083	0	0	7R	31.58		0		0	0	842.61	11.57	0.141
Reach	7R	Reach 1b		3.27	155.47	826.518	0	0	8R	152.43		0		0	0	840.14	10.2	0.785
Reach	8R	Reach 1a		3.27	155.36	895.282	0.06	0	3a (1,2+3)	153.38		0		0	0	834.41	10.25	0.678
Reach	17R	Reach 1d		3.27	14.92	0	0	0	6R	8.61		0		0	0	853.93	10.11	0.103
Reach	18R	Linne Road Grassed Chl		3.27	17.06	276.531	1.18	0	16L	16.31		0		0	0	842.17	10.24	0.183
Pond	17P	Gran Cielo Dwy		3.27	101.03	166.738	0.91	0	18P	85.76	18P	0	17R	14.92	100.69	854.74	10	0.205
Pond	18P	GC-CkD1		3.27	135.17	240.622	1.05	0	19P	1.05	19P	76.55	23L	51.56	129.11	851.28	10.06	1.103
Pond	19P	GC-CkD2		3.27	88.09	260.311	0.97	0	20P	1.33	20P	57.64	22L	26.25	85.22	849.52	10.12	0.693
Pond	20P	GC-CkD3		3.27	64.69	274.094	0.92	0	10L	6.32	10L	9.87	22L	48.22	64.4	845.95	10.13	0.356
Link	3a (1,2+3)	Comb Un-dev Ck Flow		3.27	153.38	895.282	0.06	0		153.38		0		0	0	0	0.1	0
Link	5L	Outlet To Tract #1632 Ex. 36" SD		3.27	3.69	108.759	0	0		3.69		0		0	0	0	0.1	0
Link	6L	To Existing Meadowlark Road		3.27	7.3	223.467	0	0		7.3		0		0	0	0	0.1	0
Link	7L	DMA 13		3.27	32.76	64.115	0	0	11L	32.76		0		0	0	0	0.1	0
Link	8L	DMA 8		3.27	1.5	44.689	0	0	5L	1.5		0		0	0	0	0.1	0
Link	9L	DMA 12		3.27	1.95	20.201	0	0	11L	1.95		0		0	0	0	0.1	0
Link	10L	To Linne Road Channel		3.27	17.06	276.531	1.18	0	18R	17.06		0		0	0	0	0.1	0
Link	11L	To Fontana Road SD		3.27	61.85	223.567	0.53	0		61.85		0		0	0	0	0.1	0
Link	15L	Sherwood/Niblick LP Xing		3.27	44.29	71.958	6.18	0	16L	44.29		0		0	0	0	0.1	0
Link	16L	Airport & Linne Road SD		3.27	57.36	359.38	2.33	0		57.36		0		0	0	0	0.1	0
Link	19L	14c(0+1)-Ex		3.27	49.6	73.884	1.37	0	18P	49.6		0		0	0	0	0.1	0
Link	22L	Linne Rd Overtopping Ex.Flow #2ar		3.27	74.45	0	0	0	7R	74.45		0		0	0	0	0.1	0
Link	23L	Linne Rd Overtop #1		3.27	51.56	0	0	0	7R	51.56		0		0	0	0	0.1	0

Reso A - Exhibit C2 (EIR Technical Appendix)

TABLE 10 - HYDROGRAPH ANALYSIS

EXISTING CONDITIONS RESULTS

Type	Number	Name	Event	Rainfall Depth (inches)	Inflow Peak (cfs)	Inflow Area (acres)	Imperv. Inflow Area (%)	Discarded Outflow Peak (cfs)	Primary Routing	Primary Outflow Peak (cfs)	Secondary Routing	Secondary Outflow Peak (cfs)	Tertiary Routing	Tertiary Outflow Peak (cfs)	Outflow Total Peak (cfs)	Peak Elevation (feet)	Peak Elevation Time (hours)	Peak Storage (acre-feet)
Subcat	1	Subcat 1	10 Year	3.6	0	0	0	0	8R	0.95		0		0	0	0	0	0
Subcat	2	Subcat 2		3.6	0	0	0	0	8R	1.13		0		0	0	0	0	0
Subcat	3	Subcat 3		3.6	0	0	0	0	7R	3.7		0		0	0	0	0	0
Subcat	3a{(1)}-Ex	Subcat 3a{(1)}-Ex		3.6	0	0	0	0	8R	0.35		0		0	0	0	0	0
Subcat	3a{(2)}-Ex	Subcat 3a{(2)}-Ex		3.6	0	0	0	0	7R	1.33		0		0	0	0	0	0
Subcat	3a{(3)}-Ex	Subcat 3a{(3)}-Ex		3.6	0	0	0	0	6R	2.8		0		0	0	0	0	0
Subcat	3b-Ex	Subcat 3b-Ex		3.6	0	0	0	0	6R	47.38		0		0	0	0	0	0
Subcat	4	Subcat 4		3.6	0	0	0	0	8R	3.46		0		0	0	0	0	0
Subcat	5	Subcat 5		3.6	0	0	0	0	5L	1.99		0		0	0	0	0	0
Subcat	6	Subcat 6		3.6	0	0	0	0	7R	3.02		0		0	0	0	0	0
Subcat	7	Subcat 7		3.6	0	0	0	0	5L	1.85		0		0	0	0	0	0
Subcat	8	Subcat 8		3.6	0	0	0	0	8L	1.67		0		0	0	0	0	0
Subcat	8a-Ex	Subcat 8a-Ex		3.6	0	0	0	0	8L	0.93		0		0	0	0	0	0
Subcat	9	Subcat 9		3.6	0	0	0	0	6L	1.38		0		0	0	0	0	0
Subcat	9a-Ex	Subcat 9a-Ex		3.6	0	0	0	0	6L	9.77		0		0	0	0	0	0
Subcat	10	Subcat 10		3.6	0	0	0	0	11L	3.44		0		0	0	0	0	0
Subcat	10a-Ex	Subcat 10a-Ex		3.6	0	0	0	0	11L	34.57		0		0	0	0	0	0
Subcat	11	Subcat 11		3.6	0	0	0	0	11L	1.49		0		0	0	0	0	0
Subcat	12	Subcat 12		3.6	0	0	0	0	9L	1.93		0		0	0	0	0	0
Subcat	12a-Ex	Subcat 12a-Ex		3.6	0	0	0	0	9L	1.45		0		0	0	0	0	0
Subcat	13	Subcat 13		3.6	0	0	0	0	7L	4.66		0		0	0	0	0	0
Subcat	13a-Ex	Subcat 13a-Ex		3.6	0	0	0	0	7L	1.93		0		0	0	0	0	0
Subcat	13b-Ex	Subcat 13b-Ex		3.6	0	0	0	0	7L	20.23		0		0	0	0	0	0
Subcat	13c-Ex	Subcat 13c-Ex		3.6	0	0	0	0	7L	14.24		0		0	0	0	0	0
Subcat	14	Subcat 14		3.6	0	0	0	0	15L	8.97		0		0	0	0	0	0
Subcat	14a{(1)}-Ex	Subcat 14a{(1)}-Ex		3.6	0	0	0	0	15L	3.53		0		0	0	0	0	0
Subcat	14a{(2)}-Ex	Subcat 14a{(2)}-Ex		3.6	0	0	0	0	10L	1.54		0		0	0	0	0	0
Subcat	14b-Ex	Subcat 14b-Ex		3.6	0	0	0	0	15L	41.39		0		0	0	0	0	0
Subcat	14c{(0)}-Ex	Subcat 14c{(0)}-Ex		3.6	0	0	0	0	19L	31.22		0		0	0	0	0	0
Subcat	14c{(1)}-Ex	Subcat 14c{(1)}-Ex		3.6	0	0	0	0	19L	28		0		0	0	0	0	0
Subcat	14c{(2)}-Ex	Subcat 14c{(2)}-Ex		3.6	0	0	0	0	19P	14.53		0		0	0	0	0	0
Subcat	14c{(3)}-Ex	Subcat 14c{(3)}-Ex		3.6	0	0	0	0	20P	9.15		0		0	0	0	0	0
Subcat	14d-Ex	Subcat 14d-Ex		3.6	0	0	0	0	17P	121.75		0		0	0	0	0	0
Subcat	14e-Ex	Subcat 14e-Ex		3.6	0	0	0	0	16L	2.09		0		0	0	0	0	0
Reach	6R	Reach 1c		3.6	60.06	763.083	0	0	7R	58.8		0		0	0	843.62	10.22	0.263
Reach	7R	Reach 1b		3.6	205.56	826.518	0	0	8R	201.89		0		0	0	840.22	10.19	0.985
Reach	8R	Reach 1a		3.6	207.3	895.282	0.06	0	3a (1,2+3)	204.85		0		0	0	834.52	10.25	0.864
Reach	17R	Reach 1d		3.6	28.12	0	0	0	6R	19.66		0		0	0	854.03	10.1	0.191
Reach	18R	Linne Road Grassed Chl		3.6	18.58	276.531	1.18	0	16L	17.83		0		0	0	842.19	10.22	0.194
Pond	17P	Gran Cielo Dwy		3.6	121.75	166.738	0.91	0	18P	93.28	18P	0	17R	28.12	121.4	854.84	10	0.224
Pond	18P	GC-CkD1		3.6	152.23	240.622	1.05	0	19P	1.04	19P	84.29	23L	60.65	145.98	851.4	10.05	1.174
Pond	19P	GC-CkD2		3.6	98.58	260.311	0.97	0	20P	1.34	20P	62.45	22L	31.29	95.08	849.6	10.11	0.742
Pond	20P	GC-CkD3		3.6	71.09	274.094	0.92	0	10L	6.49	10L	11.02	22L	53.24	70.75	846	10.11	0.371
Link	3a (1,2+3)	Comb Un-dev Ck Flow		3.6	204.85	895.282	0.06	0		204.85		0		0	0	0	0.1	0
Link	5L	Outlet To Tract #1632 Ex. 36" SD		3.6	6.41	108.759	0	0		6.41		0		0	0	0	0.1	0
Link	6L	To Existing Meadowlark Road		3.6	10.54	223.467	0	0		10.54		0		0	0	0	0.1	0
Link	7L	DMA 13		3.6	40.91	64.115	0	0	11L	40.91		0		0	0	0	0.1	0
Link	8L	DMA 8		3.6	2.57	44.689	0	0	5L	2.57		0		0	0	0	0.1	0
Link	9L	DMA 12		3.6	3.35	20.201	0	0	11L	3.35		0		0	0	0	0.1	0
Link	10L	To Linne Road Channel		3.6	18.58	276.531	1.18	0	18R	18.58		0		0	0	0	0.1	0
Link	11L	To Fontana Road SD		3.6	83.44	223.567	0.53	0		83.44		0		0	0	0	0.1	0
Link	15L	Sherwood/Niblick LP Xing		3.6	53.82	71.958	6.18	0	16L	53.82		0		0	0	0	0.1	0
Link	16L	Airport & Linne Road SD		3.6	68.98	359.38	2.33	0		68.98		0		0	0	0	0.1	0
Link	19L	14c(0+1)-Ex		3.6	59.11	73.884	1.37	0	18P	59.11		0		0	0	0	0.1	0
Link	22L	Linne Rd Overtopping Ex.Flow #2ar		3.6	84.51	0	0	0	7R	84.51		0		0	0	0	0.1	0
Link	23L	Linne Rd Overtop #1		3.6	60.65	0	0	0	7R	60.65		0		0	0	0	0.1	0

Reso A - Exhibit C2 (EIR Technical Appendix)

TABLE 10 - HYDROGRAPH ANALYSIS

EXISTING CONDITIONS RESULTS

Type	Number	Name	Event	Rainfall Depth (inches)	Inflow Peak (cfs)	Inflow Area (acres)	Imperv. Inflow Area (%)	Discarded Outflow Peak (cfs)	Primary Routing	Primary Outflow Peak (cfs)	Secondary Routing	Secondary Outflow Peak (cfs)	Tertiary Routing	Tertiary Outflow Peak (cfs)	Outflow Total Peak (cfs)	Peak Elevation (feet)	Peak Elevation Time (hours)	Peak Storage (acre-feet)
Subcat	1	Subcat 1	25 Year	4.2	0	0	0	0	8R	2.5		0		0	0	0	0	0
Subcat	2	Subcat 2		4.2	0	0	0	0	8R	3.01		0		0	0	0	0	0
Subcat	3	Subcat 3		4.2	0	0	0	0	7R	6.9		0		0	0	0	0	0
Subcat	3a{(1)}-Ex	Subcat 3a{(1)}-Ex		4.2	0	0	0	0	8R	0.93		0		0	0	0	0	0
Subcat	3a{(2)}-Ex	Subcat 3a{(2)}-Ex		4.2	0	0	0	0	7R	2.69		0		0	0	0	0	0
Subcat	3a{(3)}-Ex	Subcat 3a{(3)}-Ex		4.2	0	0	0	0	6R	4.24		0		0	0	0	0	0
Subcat	3b-Ex	Subcat 3b-Ex		4.2	0	0	0	0	6R	90.76		0		0	0	0	0	0
Subcat	4	Subcat 4		4.2	0	0	0	0	8R	7.97		0		0	0	0	0	0
Subcat	5	Subcat 5		4.2	0	0	0	0	5L	4.51		0		0	0	0	0	0
Subcat	6	Subcat 6		4.2	0	0	0	0	7R	6.69		0		0	0	0	0	0
Subcat	7	Subcat 7		4.2	0	0	0	0	5L	4.06		0		0	0	0	0	0
Subcat	8	Subcat 8		4.2	0	0	0	0	8L	3.54		0		0	0	0	0	0
Subcat	8a-Ex	Subcat 8a-Ex		4.2	0	0	0	0	8L	2.33		0		0	0	0	0	0
Subcat	9	Subcat 9		4.2	0	0	0	0	6L	2.73		0		0	0	0	0	0
Subcat	9a-Ex	Subcat 9a-Ex		4.2	0	0	0	0	6L	18.56		0		0	0	0	0	0
Subcat	10	Subcat 10		4.2	0	0	0	0	11L	6.47		0		0	0	0	0	0
Subcat	10a-Ex	Subcat 10a-Ex		4.2	0	0	0	0	11L	54.9		0		0	0	0	0	0
Subcat	11	Subcat 11		4.2	0	0	0	0	11L	3.56		0		0	0	0	0	0
Subcat	12	Subcat 12		4.2	0	0	0	0	9L	4.57		0		0	0	0	0	0
Subcat	12a-Ex	Subcat 12a-Ex		4.2	0	0	0	0	9L	2.12		0		0	0	0	0	0
Subcat	13	Subcat 13		4.2	0	0	0	0	7L	9.46		0		0	0	0	0	0
Subcat	13a-Ex	Subcat 13a-Ex		4.2	0	0	0	0	7L	2.83		0		0	0	0	0	0
Subcat	13b-Ex	Subcat 13b-Ex		4.2	0	0	0	0	7L	26.22		0		0	0	0	0	0
Subcat	13c-Ex	Subcat 13c-Ex		4.2	0	0	0	0	7L	18.75		0		0	0	0	0	0
Subcat	14	Subcat 14		4.2	0	0	0	0	15L	11.03		0		0	0	0	0	0
Subcat	14a{(1)}-Ex	Subcat 14a{(1)}-Ex		4.2	0	0	0	0	15L	6.16		0		0	0	0	0	0
Subcat	14a{(2)}-Ex	Subcat 14a{(2)}-Ex		4.2	0	0	0	0	10L	2.02		0		0	0	0	0	0
Subcat	14b-Ex	Subcat 14b-Ex		4.2	0	0	0	0	15L	55.16		0		0	0	0	0	0
Subcat	14c{(0)}-Ex	Subcat 14c{(0)}-Ex		4.2	0	0	0	0	19L	40.63		0		0	0	0	0	0
Subcat	14c{(1)}-Ex	Subcat 14c{(1)}-Ex		4.2	0	0	0	0	19L	36.54		0		0	0	0	0	0
Subcat	14c{(2)}-Ex	Subcat 14c{(2)}-Ex		4.2	0	0	0	0	19P	19.74		0		0	0	0	0	0
Subcat	14c{(3)}-Ex	Subcat 14c{(3)}-Ex		4.2	0	0	0	0	20P	12.7		0		0	0	0	0	0
Subcat	14d-Ex	Subcat 14d-Ex		4.2	0	0	0	0	17P	160.94		0		0	0	0	0	0
Subcat	14e-Ex	Subcat 14e-Ex		4.2	0	0	0	0	16L	3.74		0		0	0	0	0	0
Reach	6R	Reach 1c		4.2	131.45	763.083	0	0	7R	125.68		0		0	0	844.16	10.22	0.678
Reach	7R	Reach 1b		4.2	308.8	826.518	0	0	8R	304.34		0		0	0	840.37	10.19	1.387
Reach	8R	Reach 1a		4.2	315.66	895.282	0.06	0	3a (1,2+3)	312.43		0		0	0	834.73	10.24	1.243
Reach	17R	Reach 1d		4.2	55.87	0	0	0	6R	45.04		0		0	0	854.18	10.08	0.356
Reach	18R	Linne Road Grassed Chl		4.2	21.44	276.531	1.18	0	16L	20.56		0		0	0	842.22	10.18	0.214
Pond	17P	Gran Cielo Dwy		4.2	160.94	166.738	0.91	0	18P	104.69	18P	0.01	17R	55.87	160.58	855	10	0.252
Pond	18P	GC-CkD1		4.2	181.62	240.622	1.05	0	19P	1.04	19P	96.98	23L	76.59	174.59	851.6	10.04	1.293
Pond	19P	GC-CkD2		4.2	116.37	260.311	0.97	0	20P	1.37	20P	70.51	22L	40.16	112.03	849.72	10.09	0.827
Pond	20P	GC-CkD3		4.2	82.3	274.094	0.92	0	10L	6.72	10L	13.2	22L	62.01	81.94	846.07	10.09	0.396
Link	3a (1,2+3)	Comb Un-dev Ck Flow		4.2	312.43	895.282	0.06	0		312.43		0		0	0	0	0.1	0
Link	5L	Outlet To Tract #1632 Ex. 36" SD		4.2	14.23	108.759	0	0		14.23		0		0	0	0	0.1	0
Link	6L	To Existing Meadowlark Road		4.2	20.59	223.467	0	0		20.59		0		0	0	0	0.1	0
Link	7L	DMA 13		4.2	57.14	64.115	0	0	11L	57.14		0		0	0	0	0.1	0
Link	8L	DMA 8		4.2	5.66	44.689	0	0	5L	5.66		0		0	0	0	0.1	0
Link	9L	DMA 12		4.2	6.67	20.201	0	0	11L	6.67		0		0	0	0	0.1	0
Link	10L	To Linne Road Channel		4.2	21.44	276.531	1.18	0	18R	21.44		0		0	0	0	0.1	0
Link	11L	To Fontana Road SD		4.2	128.36	223.567	0.53	0		128.36		0		0	0	0	0.1	0
Link	15L	Sherwood/Niblick LP Xing		4.2	72.28	71.958	6.18	0	16L	72.28		0		0	0	0	0.1	0
Link	16L	Airport & Linne Road SD		4.2	92.25	359.38	2.33	0		92.25		0		0	0	0	0.1	0
Link	19L	14c(0+1)-Ex		4.2	77.03	73.884	1.37	0	18P	77.03		0		0	0	0	0.1	0
Link	22L	Linne Rd Overtopping Ex.Flow #2ar		4.2	102.17	0	0	0	7R	102.17		0		0	0	0	0.1	0
Link	23L	Linne Rd Overtop #1		4.2	76.59	0	0	0	7R	76.59		0		0	0	0	0.1	0

Reso A - Exhibit C2 (EIR Technical Appendix)

TABLE 10 - HYDROGRAPH ANALYSIS

EXISTING CONDITIONS RESULTS

Type	Number	Name	Event	Rainfall Depth (inches)	Inflow Peak (cfs)	Inflow Area (acres)	Imperv. Inflow Area (%)	Discarded Outflow Peak (cfs)	Primary Routing	Primary Outflow Peak (cfs)	Secondary Routing	Secondary Outflow Peak (cfs)	Tertiary Routing	Tertiary Outflow Peak (cfs)	Outflow Total Peak (cfs)	Peak Elevation (feet)	Peak Elevation Time (hours)	Peak Storage (acre-feet)
Subcat	1	Subcat 1	50 Year	4.6	0	0	0	0	8R	3.79		0		0	0	0	0	0
Subcat	2	Subcat 2		4.6	0	0	0	0	8R	4.58		0		0	0	0	0	0
Subcat	3	Subcat 3		4.6	0	0	0	0	7R	9.32		0		0	0	0	0	0
Subcat	3a{(1)}-Ex	Subcat 3a{(1)}-Ex		4.6	0	0	0	0	8R	1.4		0		0	0	0	0	0
Subcat	3a{(2)}-Ex	Subcat 3a{(2)}-Ex		4.6	0	0	0	0	7R	3.74		0		0	0	0	0	0
Subcat	3a{(3)}-Ex	Subcat 3a{(3)}-Ex		4.6	0	0	0	0	6R	5.27		0		0	0	0	0	0
Subcat	3b-Ex	Subcat 3b-Ex		4.6	0	0	0	0	6R	126.69		0		0	0	0	0	0
Subcat	4	Subcat 4		4.6	0	0	0	0	8R	11.77		0		0	0	0	0	0
Subcat	5	Subcat 5		4.6	0	0	0	0	5L	6.98		0		0	0	0	0	0
Subcat	6	Subcat 6		4.6	0	0	0	0	7R	9.74		0		0	0	0	0	0
Subcat	7	Subcat 7		4.6	0	0	0	0	5L	6.29		0		0	0	0	0	0
Subcat	8	Subcat 8		4.6	0	0	0	0	8L	5.24		0		0	0	0	0	0
Subcat	8a-Ex	Subcat 8a-Ex		4.6	0	0	0	0	8L	3.59		0		0	0	0	0	0
Subcat	9	Subcat 9		4.6	0	0	0	0	6L	3.79		0		0	0	0	0	0
Subcat	9a-Ex	Subcat 9a-Ex		4.6	0	0	0	0	6L	26.71		0		0	0	0	0	0
Subcat	10	Subcat 10		4.6	0	0	0	0	11L	8.96		0		0	0	0	0	0
Subcat	10a-Ex	Subcat 10a-Ex		4.6	0	0	0	0	11L	69.66		0		0	0	0	0	0
Subcat	11	Subcat 11		4.6	0	0	0	0	11L	5.23		0		0	0	0	0	0
Subcat	12	Subcat 12		4.6	0	0	0	0	9L	6.71		0		0	0	0	0	0
Subcat	12a-Ex	Subcat 12a-Ex		4.6	0	0	0	0	9L	2.6		0		0	0	0	0	0
Subcat	13	Subcat 13		4.6	0	0	0	0	7L	13.14		0		0	0	0	0	0
Subcat	13a-Ex	Subcat 13a-Ex		4.6	0	0	0	0	7L	3.46		0		0	0	0	0	0
Subcat	13b-Ex	Subcat 13b-Ex		4.6	0	0	0	0	7L	30.32		0		0	0	0	0	0
Subcat	13c-Ex	Subcat 13c-Ex		4.6	0	0	0	0	7L	21.86		0		0	0	0	0	0
Subcat	14	Subcat 14		4.6	0	0	0	0	15L	12.51		0		0	0	0	0	0
Subcat	14a{(1)}-Ex	Subcat 14a{(1)}-Ex		4.6	0	0	0	0	15L	8.1		0		0	0	0	0	0
Subcat	14a{(2)}-Ex	Subcat 14a{(2)}-Ex		4.6	0	0	0	0	10L	2.38		0		0	0	0	0	0
Subcat	14b-Ex	Subcat 14b-Ex		4.6	0	0	0	0	15L	64.67		0		0	0	0	0	0
Subcat	14c{(0)}-Ex	Subcat 14c{(0)}-Ex		4.6	0	0	0	0	19L	47.07		0		0	0	0	0	0
Subcat	14c{(1)}-Ex	Subcat 14c{(1)}-Ex		4.6	0	0	0	0	19L	42.4		0		0	0	0	0	0
Subcat	14c{(2)}-Ex	Subcat 14c{(2)}-Ex		4.6	0	0	0	0	19P	23.37		0		0	0	0	0	0
Subcat	14c{(3)}-Ex	Subcat 14c{(3)}-Ex		4.6	0	0	0	0	20P	15.2		0		0	0	0	0	0
Subcat	14d-Ex	Subcat 14d-Ex		4.6	0	0	0	0	17P	187.95		0		0	0	0	0	0
Subcat	14e-Ex	Subcat 14e-Ex		4.6	0	0	0	0	16L	5.07		0		0	0	0	0	0
Reach	6R	Reach 1c		4.6	189.25	763.083	0	0	7R	180.48		0		0	0	844.35	10.2	1.016
Reach	7R	Reach 1b		4.6	389.56	826.518	0	0	8R	383.89		0		0	0	840.48	10.19	1.694
Reach	8R	Reach 1a		4.6	399.94	895.282	0.06	0	3a (1,2+3)	395.78		0		0	0	834.89	10.23	1.533
Reach	17R	Reach 1d		4.6	76.42	0	0	0	6R	64.34		0		0	0	854.26	10.07	0.466
Reach	18R	Linne Road Grassed Chl		4.6	23.31	276.531	1.18	0	16L	22.35		0		0	0	842.25	10.17	0.226
Pond	17P	Gran Cielo Dwy		4.6	187.95	166.738	0.91	0	18P	111	18P	0.18	17R	76.42	187.59	855.09	10	0.269
Pond	18P	GC-CkD1		4.6	200.39	240.622	1.05	0	19P	1.05	19P	104.88	23L	86.9	192.8	851.71	10.04	1.367
Pond	19P	GC-CkD2		4.6	127.8	260.311	0.97	0	20P	1.38	20P	75.57	22L	45.89	122.85	849.79	10.09	0.883
Pond	20P	GC-CkD3		4.6	89.57	274.094	0.92	0	10L	6.84	10L	14.63	22L	67.73	89.2	846.11	10.08	0.412
Link	3a (1,2+3)	Comb Un-dev Ck Flow		4.6	395.78	895.282	0.06	0		395.78		0		0	0	0	0.1	0
Link	5L	Outlet To Tract #1632 Ex. 36" SD		4.6	22.05	108.759	0	0		22.05		0		0	0	0	0.1	0
Link	6L	To Existing Meadowlark Road		4.6	29.53	223.467	0	0		29.53		0		0	0	0	0.1	0
Link	7L	DMA 13		4.6	68.68	64.115	0	0	11L	68.68		0		0	0	0	0.1	0
Link	8L	DMA 8		4.6	8.78	44.689	0	0	5L	8.78		0		0	0	0	0.1	0
Link	9L	DMA 12		4.6	9.29	20.201	0	0	11L	9.29		0		0	0	0	0.1	0
Link	10L	To Linne Road Channel		4.6	23.31	276.531	1.18	0	18R	23.31		0		0	0	0	0.1	0
Link	11L	To Fontana Road SD		4.6	161.42	223.567	0.53	0		161.42		0		0	0	0	0.1	0
Link	15L	Sherwood/Niblick LP Xing		4.6	85.22	71.958	6.18	0	16L	85.22		0		0	0	0	0.1	0
Link	16L	Airport & Linne Road SD		4.6	108.41	359.38	2.33	0		108.41		0		0	0	0	0.1	0
Link	19L	14c(0+1)-Ex		4.6	89.31	73.884	1.37	0	18P	89.31		0		0	0	0	0.1	0
Link	22L	Linne Rd Overtopping Ex.Flow #2ar		4.6	113.61	0	0	0	7R	113.61		0		0	0	0	0.1	0
Link	23L	Linne Rd Overtop #1		4.6	86.9	0	0	0	7R	86.9		0		0	0	0	0.1	0

Reso A - Exhibit C2 (EIR Technical Appendix)

TABLE 10 - HYDROGRAPH ANALYSIS

EXISTING CONDITIONS RESULTS

Type	Number	Name	Event	Rainfall Depth (inches)	Inflow Peak (cfs)	Inflow Area (acres)	Imperv. Inflow Area (%)	Discarded Outflow Peak (cfs)	Primary Routing	Primary Outflow Peak (cfs)	Secondary Routing	Secondary Outflow Peak (cfs)	Tertiary Routing	Tertiary Outflow Peak (cfs)	Outflow Total Peak (cfs)	Peak Elevation (feet)	Peak Elevation Time (hours)	Peak Storage (acre-feet)
Subcat	1	Subcat 1	100 Year	5.1	0	0	0	0	8R	5.61		0		0	0	0	0	0
Subcat	2	Subcat 2		5.1	0	0	0	0	8R	6.82		0		0	0	0	0	0
Subcat	3	Subcat 3		5.1	0	0	0	0	7R	12.6		0		0	0	0	0	0
Subcat	3a{(1)}-Ex	Subcat 3a{(1)}-Ex		5.1	0	0	0	0	8R	2.08		0		0	0	0	0	0
Subcat	3a{(2)}-Ex	Subcat 3a{(2)}-Ex		5.1	0	0	0	0	7R	5.17		0		0	0	0	0	0
Subcat	3a{(3)}-Ex	Subcat 3a{(3)}-Ex		5.1	0	0	0	0	6R	6.63		0		0	0	0	0	0
Subcat	3b-Ex	Subcat 3b-Ex		5.1	0	0	0	0	6R	178.43		0		0	0	0	0	0
Subcat	4	Subcat 4		5.1	0	0	0	0	8R	17.15		0		0	0	0	0	0
Subcat	5	Subcat 5		5.1	0	0	0	0	5L	10.59		0		0	0	0	0	0
Subcat	6	Subcat 6		5.1	0	0	0	0	7R	13.97		0		0	0	0	0	0
Subcat	7	Subcat 7		5.1	0	0	0	0	5L	9.56		0		0	0	0	0	0
Subcat	8	Subcat 8		5.1	0	0	0	0	8L	7.96		0		0	0	0	0	0
Subcat	8a-Ex	Subcat 8a-Ex		5.1	0	0	0	0	8L	5.39		0		0	0	0	0	0
Subcat	9	Subcat 9		5.1	0	0	0	0	6L	5.24		0		0	0	0	0	0
Subcat	9a-Ex	Subcat 9a-Ex		5.1	0	0	0	0	6L	38.64		0		0	0	0	0	0
Subcat	10	Subcat 10		5.1	0	0	0	0	11L	12.48		0		0	0	0	0	0
Subcat	10a-Ex	Subcat 10a-Ex		5.1	0	0	0	0	11L	89.24		0		0	0	0	0	0
Subcat	11	Subcat 11		5.1	0	0	0	0	11L	7.56		0		0	0	0	0	0
Subcat	12	Subcat 12		5.1	0	0	0	0	9L	9.66		0		0	0	0	0	0
Subcat	12a-Ex	Subcat 12a-Ex		5.1	0	0	0	0	9L	3.22		0		0	0	0	0	0
Subcat	13	Subcat 13		5.1	0	0	0	0	7L	18.16		0		0	0	0	0	0
Subcat	13a-Ex	Subcat 13a-Ex		5.1	0	0	0	0	7L	4.29		0		0	0	0	0	0
Subcat	13b-Ex	Subcat 13b-Ex		5.1	0	0	0	0	7L	35.51		0		0	0	0	0	0
Subcat	13c-Ex	Subcat 13c-Ex		5.1	0	0	0	0	7L	25.83		0		0	0	0	0	0
Subcat	14	Subcat 14		5.1	0	0	0	0	15L	14.43		0		0	0	0	0	0
Subcat	14a{(1)}-Ex	Subcat 14a{(1)}-Ex		5.1	0	0	0	0	15L	10.7		0		0	0	0	0	0
Subcat	14a{(2)}-Ex	Subcat 14a{(2)}-Ex		5.1	0	0	0	0	10L	2.86		0		0	0	0	0	0
Subcat	14b-Ex	Subcat 14b-Ex		5.1	0	0	0	0	15L	76.84		0		0	0	0	0	0
Subcat	14c{(0)}-Ex	Subcat 14c{(0)}-Ex		5.1	0	0	0	0	19L	55.26		0		0	0	0	0	0
Subcat	14c{(1)}-Ex	Subcat 14c{(1)}-Ex		5.1	0	0	0	0	19L	49.85		0		0	0	0	0	0
Subcat	14c{(2)}-Ex	Subcat 14c{(2)}-Ex		5.1	0	0	0	0	19P	28.04		0		0	0	0	0	0
Subcat	14c{(3)}-Ex	Subcat 14c{(3)}-Ex		5.1	0	0	0	0	20P	18.42		0		0	0	0	0	0
Subcat	14d-Ex	Subcat 14d-Ex		5.1	0	0	0	0	17P	222.44		0		0	0	0	0	0
Subcat	14e-Ex	Subcat 14e-Ex		5.1	0	0	0	0	16L	6.91		0		0	0	0	0	0
Reach	6R	Reach 1c		5.1	270.35	763.083	0	0	7R	257.28		0		0	0	844.61	10.18	1.485
Reach	7R	Reach 1b		5.1	499.45	826.518	0	0	8R	492.11		0		0	0	840.63	10.18	2.107
Reach	8R	Reach 1a		5.1	514.9	895.282	0.06	0	3a (1,2+3)	509.5		0		0	0	835.11	10.23	1.926
Reach	17R	Reach 1d		5.1	103.48	0	0	0	6R	90.29		0		0	0	854.34	10.06	0.601
Reach	18R	Linne Road Grassed Chl		5.1	25.65	276.531	1.18	0	16L	24.58		0		0	0	842.28	10.15	0.241
Pond	17P	Gran Cielo Dwy		5.1	222.44	166.738	0.91	0	18P	117.95	18P	0.65	17R	103.48	222.08	855.19	9.99	0.288
Pond	18P	GC-CkD1		5.1	223.44	240.622	1.05	0	19P	1.07	19P	114.4	23L	99.64	215.08	851.86	10.04	1.458
Pond	19P	GC-CkD2		5.1	141.95	260.311	0.97	0	20P	1.4	20P	81.7	22L	53	136.09	849.87	10.08	0.954
Pond	20P	GC-CkD3		5.1	98.57	274.094	0.92	0	10L	6.94	10L	16.42	22L	74.78	98.14	846.16	10.07	0.43
Link	3a (1,2+3)	Comb Un-dev Ck Flow		5.1	509.5	895.282	0.06	0		509.5		0		0	0	0	0.1	0
Link	5L	Outlet To Tract #1632 Ex. 36" SD		5.1	33.49	108.759	0	0		33.49		0		0	0	0	0.1	0
Link	6L	To Existing Meadowlark Road		5.1	42.63	223.467	0	0		42.63		0		0	0	0	0.1	0
Link	7L	DMA 13		5.1	83.7	64.115	0	0	11L	83.7		0		0	0	0	0.1	0
Link	8L	DMA 8		5.1	13.34	44.689	0	0	5L	13.34		0		0	0	0	0.1	0
Link	9L	DMA 12		5.1	12.87	20.201	0	0	11L	12.87		0		0	0	0	0.1	0
Link	10L	To Linne Road Channel		5.1	25.65	276.531	1.18	0	18R	25.65		0		0	0	0	0.1	0
Link	11L	To Fontana Road SD		5.1	205.41	223.567	0.53	0		205.41		0		0	0	0	0.1	0
Link	15L	Sherwood/Niblick LP Xing		5.1	101.91	71.958	6.18	0	16L	101.91		0		0	0	0	0.1	0
Link	16L	Airport & Linne Road SD		5.1	129.17	359.38	2.33	0		129.17		0		0	0	0	0.1	0
Link	19L	14c(0+1)-Ex		5.1	104.93	73.884	1.37	0	18P	104.93		0		0	0	0	0.1	0
Link	22L	Linne Rd Overtopping Ex.Flow #2ar		5.1	127.75	0	0	0	7R	127.75		0		0	0	0	0.1	0
Link	23L	Linne Rd Overtop #1		5.1	99.64	0	0	0	7R	99.64		0		0	0	0	0.1	0

Proposed Conditions

Reso A - Exhibit C2 (EIR Technical Appendix)

TABLE 6 - Peak Flow Summary

PROPOSED CONDITIONS								
HydroCAD Node Type	HydroCAD Node Number	Subcatchment/DMA, Reach, Pond or Link Name	95th PERCENTILE STORM	2 YEAR STORM	10 YEAR STORM	25 YEAR STORM	50 YEAR STORM	100 YEAR STORM
Subcat	1	Subcat 1	4.7	8.1	13.1	15.9	17.9	20.5
Subcat	2	Subcat 2	5.0	8.8	14.2	17.2	19.3	22.1
Subcat	3	Subcat 3	9.9	17.3	28.4	33.8	37.4	42.0
Subcat	3a{(1)}-Ex	Subcat 3a(1)-Ex	0.0	0.0	0.4	0.9	1.4	2.1
Subcat	3a{(2)}-Ex	Subcat 3a(2)-Ex	0.0	0.1	1.3	2.7	3.7	5.2
Subcat	3a{(3)}-Ex	Subcat 3a{(3)}-Ex	0.0	0.4	2.8	4.2	5.3	6.6
Subcat	3b-Ex	Subcat 3b-Ex	0.2	8.3	47.4	90.8	126.7	178.4
Subcat	4	Subcat 4	13.3	23.5	41.4	50.9	57.4	65.8
Subcat	5	Subcat 5	5.1	8.9	16.3	21.4	25.0	29.9
Subcat	6	Subcat 6	9.5	17.0	30.6	37.8	42.8	49.1
Subcat	7	Subcat 7	5.1	9.0	16.1	20.8	24.2	28.7
Subcat	8	Subcat 8	6.9	12.2	21.4	26.4	29.9	34.4
Subcat	8a-Ex	Subcat 8a-Ex	0.0	0.1	0.9	2.3	3.6	5.4
Subcat	9	Subcat 9	1.0	1.7	3.9	5.5	6.7	8.2
Subcat	9a-Ex	Subcat 9a-Ex	0.0	1.9	9.8	18.6	26.7	38.6
Subcat	10	Subcat 10	9.5	16.5	27.2	32.9	36.9	42.0
Subcat	10a-Ex	Subcat 10a-Ex	0.3	3.4	34.7	55.1	69.9	89.5
Subcat	11	Subcat 11	5.2	9.1	16.4	20.3	22.9	26.3
Subcat	12	Subcat 12	6.4	11.1	20.0	24.8	28.1	32.4
Subcat	12a-Ex	Subcat 12a-Ex	0.0	0.3	1.5	2.1	2.6	3.2
Subcat	13	Subcat 13	10.1	18.2	33.4	41.3	46.7	53.7
Subcat	13a-Ex	Subcat 13a-Ex	0.0	0.4	1.9	2.8	3.5	4.3
Subcat	13b-Ex	Subcat 13b-Ex	1.9	8.6	20.3	26.3	30.4	35.6
Subcat	13c-Ex	Subcat 13c-Ex	0.9	5.6	14.3	18.8	21.9	25.9
Subcat	14	Subcat 14	4.2	7.9	13.6	16.3	18.2	20.5
Subcat	14a{(1)}-Ex	Subcat 14a(1)-Ex	3.8	7.2	14.3	18.0	20.5	23.8
Subcat	14a{(2)}-Ex	Subcat 14a{(2)}-Ex	1.3	2.3	3.7	4.4	4.9	5.5
Subcat	14b-Ex	Subcat 14b-Ex	2.0	15.5	41.5	55.3	64.8	77.0
Subcat	14c{(0)}-Ex	Subcat 14c{(0)}-Ex	2.8	13.1	31.3	40.7	47.2	55.4
Subcat	14c{(1)}-Ex	Subcat 14c{(1)}-Ex	2.4	11.6	28.1	36.6	42.5	50.0
Subcat	14c{(2)}-Ex	Subcat 14c{(2)}-Ex	0.4	5.0	14.6	19.9	23.5	28.2
Subcat	14c{(3)}-Ex	Subcat 14c{(3)}-Ex	0.2	2.8	9.2	12.7	15.2	18.5
Subcat	14d-Ex	Subcat 14d-Ex	7.7	47.5	122.1	161.3	188.4	223.0
Subcat	14e-Ex	Subcat 14e-Ex	0.5	0.8	2.1	3.8	5.1	6.9
Reach	6R	Un-named Creek 1c	0.2	8.3	56.1	120.8	173.7	248.0
Reach	7R	Creek XS 1b	11.1	62.7	193.1	281.4	347.3	434.5
Reach	8R	Creek 1b	11.1	62.2	192.8	280.9	346.7	434.0

Reso A - Exhibit C2 (EIR Technical Appendix)

TABLE 6 - Peak Flow Summary

HydroCAD Node Type	HydroCAD Node Number	Subcatchment/DMA, Reach, Pond or Link Name	95th PERCENTILE STORM	2 YEAR STORM	10 YEAR STORM	25 YEAR STORM	50 YEAR STORM	100 YEAR STORM
Reach	17R	Reach 1d	0.0	0.0	19.7	45.1	64.4	90.4
Reach	Ex Chl	RCP Dbl Arch 59x36 Outlet	12.5	70.0	136.2	149.0	156.0	163.5
Pond	1P	SD Inlet with Bypass SD	0.3	3.4	35.5	57.9	73.3	93.8
Pond	2P	60" SD MH	4.1	8.3	13.7	16.3	18.0	20.2
Pond	15P	SD System 42" HDPE	0.0	0.0	17.0	37.0	51.1	68.7
Pond	16P	Dbl Conc. Arch Culvert (37x23)	1.3	2.6	10.8	15.3	17.7	20.8
Pond	17P	Gran Cielo Dwy	7.6	46.4	121.7	161.0	188.1	222.7
Pond	18P	GC-CkD1	12.5	70.4	149.2	175.3	192.5	213.5
Pond	19P	GC-CkD2	0.3	1.5	19.7	40.0	53.6	70.7
Pond	20P	GC-CkD3	0.5	2.2	25.5	44.0	54.4	66.3
Pond	B1	Basin 1	0.9	3.9	14.8	30.3	36.6	43.9
Pond	B10	Basin 10	0.7	1.5	4.5	7.4	10.6	15.1
Pond	B11	Basin 11	0.2	1.0	3.7	5.5	7.8	10.5
Pond	B12	Basin 12	0.3	0.7	2.5	3.2	4.0	5.6
Pond	B13	Basin 13	1.2	5.0	35.0	62.5	84.6	108.6
Pond	B4	Basin 4	1.3	3.0	15.2	20.1	24.2	34.7
Pond	B5	Basin 5	0.5	1.3	4.7	7.5	9.7	12.7
Pond	B6	Basin 6	1.0	5.2	16.2	23.8	28.0	32.4
Pond	B7	Basin 7	0.8	2.0	8.1	13.1	17.5	24.2
Pond	B8	Basin 8	0.7	1.5	6.4	13.0	18.2	25.2
Pond	B9	Basin 9	0.5	1.0	2.5	3.6	4.3	5.1
Pond	Ex SD	Tract #1632 Ex. 36" SD Outlet	0.0	1.0	7.0	11.9	16.2	22.9
Pond	MC Q	SD System	8.6	17.2	28.2	33.6	37.2	41.8
Pond	SD	42" HDPE SD	0.5	1.9	10.1	19.6	26.8	36.4
Link	1L	DS Tailwater	0.0	1.0	7.0	11.9	16.2	22.9
Link	6L	To Existing Meadowlark Road	0.5	2.1	11.6	22.1	31.0	43.7
Link	10L	To Linne Road Channel	1.3	2.6	10.8	15.3	17.7	20.8
Link	11L	To Fontana Road SD	1.2	7.8	60.9	111.6	154.0	203.2
Link	15L	Sherwood/Niblick LP Xing	9.8	30.6	69.2	89.4	103.3	121.2
Link	16L	Airport & Linne Road SD	11.6	34.0	79.5	106.3	124.5	147.3
Link	22L	Linne Rd Ex Bypass Flow	0.0	0.0	17.0	37.0	51.1	68.7
Link	Ck Qa	100 Yr WSE in Creek (a)	11.2	63.7	217.1	327.1	403.9	508.9
Link	Ck Qb	100 Yr WSE in Creek (b)	0.8	4.9	15.8	23.4	27.6	32.0

TABLE 11 - HYDROGRAPH ANALYSIS

PROPOSED CONDITIONS RESULTS																		
Node Type	Node Number	Node Name	Event	Rainfall Depth (inches)	Inflow Peak (cfs)	Inflow Area (acres)	Imperv. Inflow Area (%)	Discarded Outflow Peak (cfs)	Primary Routing	Primary Outflow Peak (cfs)	Secondary Routing	Secondary Outflow Peak (cfs)	Tertiary Routing	Tertiary Outflow Peak (cfs)	Outflow Total Peak (cfs)	Peak Elevation (feet)	Peak Elevation Time (hours)	Peak Storage (acre-feet)
Subcat	1	Subcat 1		1.4	0	0	0	0	B1	4.66		0		0	0	0	0	0
Subcat	2	Subcat 2		1.4	0	0	0	0	B1	5.04		0		0	0	0	0	0
Subcat	3	Subcat 3		1.4	0	0	0	0	MC Q	9.89		0		0	0	0	0	0
Subcat	3a{(1)}-Ex	Subcat 3a(1)-Ex		1.4	0	0	0	0	Ck Qa	0		0		0	0	0	0	0
Subcat	3a{(2)}-Ex	Subcat 3a(2)-Ex		1.4	0	0	0	0	8R	0.01		0		0	0	0	0	0
Subcat	3a{(3)}-Ex	Subcat 3a{(3)}-Ex		1.4	0	0	0	0	7R	0.03		0		0	0	0	0	0
Subcat	3b-Ex	Subcat 3b-Ex		1.4	0	0	0	0	6R	0.23		0		0	0	0	0	0
Subcat	4	Subcat 4		1.4	0	0	0	0	B4	13.34		0		0	0	0	0	0
Subcat	5	Subcat 5		1.4	0	0	0	0	B5	5.11		0		0	0	0	0	0
Subcat	6	Subcat 6		1.4	0	0	0	0	B6	9.46		0		0	0	0	0	0
Subcat	7	Subcat 7		1.4	0	0	0	0	B7	5.13		0		0	0	0	0	0
Subcat	8	Subcat 8		1.4	0	0	0	0	B8	6.93		0		0	0	0	0	0
Subcat	8a-Ex	Subcat 8a-Ex		1.4	0	0	0	0	B8	0		0		0	0	0	0	0
Subcat	9	Subcat 9		1.4	0	0	0	0	B9	1		0		0	0	0	0	0
Subcat	9a-Ex	Subcat 9a-Ex		1.4	0	0	0	0	6L	0		0		0	0	0	0	0
Subcat	10	Subcat 10		1.4	0	0	0	0	B10	9.47		0		0	0	0	0	0
Subcat	10a-Ex	Subcat 10a-Ex		1.4	0	0	0	0	1P	0.33		0		0	0	0	0	0
Subcat	11	Subcat 11		1.4	0	0	0	0	B11	5.17		0		0	0	0	0	0
Subcat	12	Subcat 12		1.4	0	0	0	0	B12	6.36		0		0	0	0	0	0
Subcat	12a-Ex	Subcat 12a-Ex		1.4	0	0	0	0	B12	0.02		0		0	0	0	0	0
Subcat	13	Subcat 13		1.4	0	0	0	0	B13	10.14		0		0	0	0	0	0
Subcat	13a-Ex	Subcat 13a-Ex		1.4	0	0	0	0	B13	0.02		0		0	0	0	0	0
Subcat	13b-Ex	Subcat 13b-Ex		1.4	0	0	0	0	B13	1.93		0		0	0	0	0	0
Subcat	13c-Ex	Subcat 13c-Ex		1.4	0	0	0	0	B13	0.92		0		0	0	0	0	0
Subcat	14	Subcat 14		1.4	0	0	0	0	15L	4.21		0		0	0	0	0	0
Subcat	14a{(1)}-Ex	Subcat 14a(1)-Ex		1.4	0	0	0	0	15L	3.77		0		0	0	0	0	0
Subcat	14a{(2)}-Ex	Subcat 14a{(2)}-Ex		1.4	0	0	0	0	16P	1.31		0		0	0	0	0	0
Subcat	14b-Ex	Subcat 14b-Ex		1.4	0	0	0	0	15L	1.97		0		0	0	0	0	0
Subcat	14c{(0)}-Ex	Subcat 14c{(0)}-Ex		1.4	0	0	0	0	18P	2.82		0		0	0	0	0	0
Subcat	14c{(1)}-Ex	Subcat 14c{(1)}-Ex		1.4	0	0	0	0	18P	2.38		0		0	0	0	0	0
Subcat	14c{(2)}-Ex	Subcat 14c{(2)}-Ex		1.4	0	0	0	0	19P	0.41		0		0	0	0	0	0
Subcat	14c{(3)}-Ex	Subcat 14c{(3)}-Ex		1.4	0	0	0	0	20P	0.16		0		0	0	0	0	0
Subcat	14d-Ex	Subcat 14d-Ex		1.4	0	0	0	0	17P	7.71		0		0	0	0	0	0
Subcat	14e-Ex	Subcat 14e-Ex		1.4	0	0	0	0	16L	0.47		0		0	0	0	0	0
Reach	6R	Un-named Creek 1c		1.4	0.23	757.079	0	0	7R	0.23		0		0	0	841.49	24.02	0.001
Reach	7R	Creek XS 1b		1.4	12.45	797.122	2.24	0	8R	11.11		0		0	0	839.41	10.36	0.152
Reach	8R	Creek 1b		1.4	11.11	805.022	2.22	0	Ck Qa	11.08		0		0	0	833.45	10.4	0.031
Reach	17R	Reach 1d		1.4	0	0	0	0	6R	0		0		0	0	853.6	0.01	0
Reach	Ex Chl	RCP Dbl Arch 59x36 Outlet		1.4	12.48	0	0	0	7R	12.45		0		0	0	841.13	10.08	0.02
Pond	1P	SD Inlet with Bypass SD		1.4	0.33	108.566	6.93	0	11L	0.33	11L	0		0	0.33	824.53	19.74	0
Pond	2P	60" SD MH		1.4	4.12	21.5	80	0	B1	4.12	B1	0		0	4.12	839.33	10.06	0
Pond	15P	SD System 42" HDPE		1.4	0	0	0	0	B1	0		0		0	0	844.17	0.85	0
Pond	16P	Dbl Conc. Arch Culvert (37x23)		1.4	1.31	276.531	1.6	0	10L	1.31		0		0	1.31	843.78	9.96	0
Pond	17P	Gran Cielo Dwy		1.4	7.71	166.738	0.91	0	18P	7.55	18P	0	17R	0	7.55	853.35	10.08	0.023
Pond	18P	GC-CkD1		1.4	12.48	240.622	1.05	0	19P	0	19P	0	Ex Chl	12.48	12.48	847.34	10.06	0.047
Pond	19P	GC-CkD2		1.4	0.41	260.311	0.99	0	20P	0.32	20P	0	22L	0	0.32	846.55	11.62	0.017
Pond	20P	GC-CkD3		1.4	0.48	274.094	0.94	0	16P	0.45	16P	0	22L	0	0.45	844.59	13.17	0.045
Pond	B1	Basin 1		1.4	16.44	47.388	67.98	0.91	Ck Qa	0	Ck Qa	0		0	0.91	834.16	19.68	1.559
Pond	B10	Basin 10		1.4	9.47	30.685	61.94	0.67	11L	0	11L	0		0	0.67	815.9	18.17	1.153
Pond	B11	Basin 11		1.4	5.17	14.461	52	0.17	1P	0	1P	0		0	0.17	830.96	23.18	0.527
Pond	B12	Basin 12		1.4	6.36	20.201	44.06	0.31	11L	0	11L	0		0	0.31	835.66	19.49	0.549
Pond	B13	Basin 13		1.4	12.88	64.115	22.11	0.31	11L	0.91	11L	0		0	1.22	839.94	15.55	1.188
Pond	B4	Basin 4		1.4	13.34	38.712	55.38	0.4	Ck Qa	0.88	Ck Qa	0		0	1.28	836.28	13.17	1.122
Pond	B5	Basin 5		1.4	5.11	32.696	30.34	0.31	SD	0.22		0		0	0.53	845.12	13.76	0.421
Pond	B6	Basin 6		1.4	9.46	34.039	52.56	0.26	Ck Qb	0.75	Ck Qb	0		0	1.01	848.49	13.68	0.958
Pond	B7	Basin 7		1.4	5.13	108.754	33.3	0.84	Ex SD	0		0		0	0.84	839.85	18.68	0.559
Pond	B8	Basin 8		1.4	6.93	44.689	35.47	0.38	SD	0.32		0		0	0.7	854.68	15.34	0.751
Pond	B9	Basin 9		1.4	1	11.446	17.36	0	6L	0.51		0		0	0.51	848.33	10.5	0.047
Pond	Ex SD	Tract #1632 Ex. 36" SD Outlet		1.4	0	108.754	33.3	0	1L	0		0		0	0	836	0.01	0
Pond	MC Q	SD System		1.4	9.89	21.5	80	0.1	2P	4.12	B1	4.36		0	8.58	845.68	10.06	0.493
Pond	SD	42" HDPE SD		1.4	0.54	77.385	33.3	0	B7	0.54		0		0	0.54	844.44	14.16	0
Link	1L	DS Tailwater		1.4	0	108.754	33.3	0		0		0		0	0	835	0.01	0
Link	6L	To Existing Meadowlark Road		1.4	0.51	223.467	0.89	0		0.51		0		0	0	0	0.01	0
Link	10L	To Linne Road Channel		1.4	1.31	276.531	1.6	0	16L	1.31		0		0	0	0	0.01	0
Link	11L	To Fontana Road SD		1.4	1.17	223.567	22.19	0		1.17		0		0	0	0	0.01	0
Link	15L	Sherwood/Niblick LP Xing		1.4	9.77	71.958	15.52	0	16L	9.77		0		0	0	0	0.01	0
Link	16L	Airport & Linne Road SD		1.4	11.55	359.38	4.52	0		11.55		0		0	0	0	0.01	0
Link	17L	Flow at Creek XS 1c		1.4	0	0	0	0		0		0		0	0	836.3	0.01	0
Link	22L	Linne Rd Ex Bypass Flow		1.4	0	0	0	0	15P	0		0		0	0	0	0.01	0
Link	Ck Qa	100 Yr WSE in Creek (a)		1.4	11.15	895.287	7.99	0		11.15		0		0	0	0	0.01	0
Link	Ck Qb	100 Yr WSE in Creek (b)		1.4	0.75	34.039	52.56	0	7R	0.75		0		0	0	842.5	0.01	0

_95th Percentile Storm

TABLE 11 - HYDROGRAPH ANALYSIS

PROPOSED CONDITIONS RESULTS																		
Node Type	Node Number	Node Name	Event	Rainfall Depth (inches)	Inflow Peak (cfs)	Inflow Area (acres)	Imperv. Inflow Area (%)	Discarded Outflow Peak (cfs)	Primary Routing	Primary Outflow Peak (cfs)	Secondary Routing	Secondary Outflow Peak (cfs)	Tertiary Routing	Tertiary Outflow Peak (cfs)	Outflow Total Peak (cfs)	Peak Elevation (feet)	Peak Elevation Time (hours)	Peak Storage (acre-feet)
Subcat	1	Subcat 1		1.61	0	0	0	0	B1	5.45		0		0	0	0	0	0
Subcat	2	Subcat 2		1.61	0	0	0	0	B1	5.89		0		0	0	0	0	0
Subcat	3	Subcat 3		1.61	0	0	0	0	MC Q	11.57		0		0	0	0	0	0
Subcat	3a{(1)}-Ex	Subcat 3a(1)-Ex		1.61	0	0	0	0	Ck Qa	0		0		0	0	0	0	0
Subcat	3a{(2)}-Ex	Subcat 3a(2)-Ex		1.61	0	0	0	0	8R	0.02		0		0	0	0	0	0
Subcat	3a{(3)}-Ex	Subcat 3a{(3)}-Ex		1.61	0	0	0	0	7R	0.05		0		0	0	0	0	0
Subcat	3b-Ex	Subcat 3b-Ex		1.61	0	0	0	0	6R	1.34		0		0	0	0	0	0
Subcat	4	Subcat 4		1.61	0	0	0	0	B4	15.59		0		0	0	0	0	0
Subcat	5	Subcat 5		1.61	0	0	0	0	B5	5.97		0		0	0	0	0	0
Subcat	6	Subcat 6		1.61	0	0	0	0	B6	11.07		0		0	0	0	0	0
Subcat	7	Subcat 7		1.61	0	0	0	0	B7	6		0		0	0	0	0	0
Subcat	8	Subcat 8		1.61	0	0	0	0	B8	8.11		0		0	0	0	0	0
Subcat	8a-Ex	Subcat 8a-Ex		1.61	0	0	0	0	B8	0.01		0		0	0	0	0	0
Subcat	9	Subcat 9		1.61	0	0	0	0	B9	1.17		0		0	0	0	0	0
Subcat	9a-Ex	Subcat 9a-Ex		1.61	0	0	0	0	6L	0.19		0		0	0	0	0	0
Subcat	10	Subcat 10		1.61	0	0	0	0	B10	11.08		0		0	0	0	0	0
Subcat	10a-Ex	Subcat 10a-Ex		1.61	0	0	0	0	1P	0.6		0		0	0	0	0	0
Subcat	11	Subcat 11		1.61	0	0	0	0	B11	6.04		0		0	0	0	0	0
Subcat	12	Subcat 12		1.61	0	0	0	0	B12	7.43		0		0	0	0	0	0
Subcat	12a-Ex	Subcat 12a-Ex		1.61	0	0	0	0	B12	0.03		0		0	0	0	0	0
Subcat	13	Subcat 13		1.61	0	0	0	0	B13	11.84		0		0	0	0	0	0
Subcat	13a-Ex	Subcat 13a-Ex		1.61	0	0	0	0	B13	0.04		0		0	0	0	0	0
Subcat	13b-Ex	Subcat 13b-Ex		1.61	0	0	0	0	B13	3.21		0		0	0	0	0	0
Subcat	13c-Ex	Subcat 13c-Ex		1.61	0	0	0	0	B13	1.78		0		0	0	0	0	0
Subcat	14	Subcat 14		1.61	0	0	0	0	15L	4.99		0		0	0	0	0	0
Subcat	14a{(1)}-Ex	Subcat 14a(1)-Ex		1.61	0	0	0	0	15L	4.41		0		0	0	0	0	0
Subcat	14a{(2)}-Ex	Subcat 14a{(2)}-Ex		1.61	0	0	0	0	16P	1.54		0		0	0	0	0	0
Subcat	14b-Ex	Subcat 14b-Ex		1.61	0	0	0	0	15L	4.3		0		0	0	0	0	0
Subcat	14c{(0)}-Ex	Subcat 14c{(0)}-Ex		1.61	0	0	0	0	18P	4.74		0		0	0	0	0	0
Subcat	14c{(1)}-Ex	Subcat 14c{(1)}-Ex		1.61	0	0	0	0	18P	4.1		0		0	0	0	0	0
Subcat	14c{(2)}-Ex	Subcat 14c{(2)}-Ex		1.61	0	0	0	0	19P	1.06		0		0	0	0	0	0
Subcat	14c{(3)}-Ex	Subcat 14c{(3)}-Ex		1.61	0	0	0	0	20P	0.38		0		0	0	0	0	0
Subcat	14d-Ex	Subcat 14d-Ex		1.61	0	0	0	0	17P	14.73		0		0	0	0	0	0
Subcat	14e-Ex	Subcat 14e-Ex		1.61	0	0	0	0	16L	0.55		0		0	0	0	0	0
Reach	6R	Un-named Creek 1c	1 Year	1.61	1.34	757.079	0	0	7R	1.34		0		0	0	841.54	22.78	0.007
Reach	7R	Creek XS 1b		1.61	22.77	797.122	2.24	0	8R	19.91		0		0	0	839.55	10.26	0.236
Reach	8R	Creek 1b		1.61	19.91	805.022	2.22	0	Ck Qa	19.83		0		0	0	833.8	10.3	0.056
Reach	17R	Reach 1d		1.61	0	0	0	0	6R	0		0		0	0	853.6	0.01	0
Reach	Ex Chl	RCP Dbl Arch 59x36 Outlet		1.61	22.84	0	0	0	7R	22.77		0		0	0	841.23	10.05	0.032
Pond	1P	SD Inlet with Bypass SD		1.61	0.6	108.566	6.93	0	11L	0.6	11L	0		0	0.6	824.55	18.19	0
Pond	2P	60" SD MH		1.61	5.51	21.5	80	0	B1	5.51	B1	0		0	5.51	839.46	9.99	0
Pond	15P	SD System 42" HDPE		1.61	0	0	0	0	B1	0		0		0	0	844.17	0.85	0
Pond	16P	Dbl Conc. Arch Culvert (37x23)		1.61	1.54	276.531	1.6	0	10L	1.54		0		0	1.54	843.8	9.96	0
Pond	17P	Gran Cielo Dwy		1.61	14.73	166.738	0.91	0	18P	14.33	18P	0	17R	0	14.33	853.55	10.04	0.04
Pond	18P	GC-CkD1		1.61	22.86	240.622	1.05	0	19P	0	19P	0	Ex Chl	22.84	22.84	847.51	10.03	0.054
Pond	19P	GC-CkD2		1.61	1.06	260.311	0.99	0	20P	0.51	20P	0	22L	0	0.51	846.84	11.27	0.036
Pond	20P	GC-CkD3		1.61	0.82	274.094	0.94	0	16P	0.75	16P	0	22L	0	0.75	844.7	12.5	0.06
Pond	B1	Basin 1		1.61	22.52	47.388	67.98	0.93	Ck Qa	0.33	Ck Qa	0		0	1.26	834.45	17.9	1.914
Pond	B10	Basin 10		1.61	11.08	30.685	61.94	0.73	11L	0	11L	0		0	0.73	816.15	19.33	1.384
Pond	B11	Basin 11		1.61	6.04	14.461	52	0.19	1P	0	1P	0		0	0.19	831.54	23.9	0.652
Pond	B12	Basin 12		1.61	7.43	20.201	44.06	0.37	11L	0	11L	0		0	0.37	835.94	19.86	0.664
Pond	B13	Basin 13		1.61	16.74	64.115	22.11	0.32	11L	1.73	11L	0		0	2.05	840.14	13.16	1.26
Pond	B4	Basin 4		1.61	15.59	38.712	55.38	0.42	Ck Qa	1.18	Ck Qa	0		0	1.6	836.62	13.01	1.285
Pond	B5	Basin 5		1.61	5.97	32.696	30.34	0.31	SD	0.3		0		0	0.61	845.33	13.78	0.507
Pond	B6	Basin 6		1.61	11.07	34.039	52.56	0.27	Ck Qb	1.16	Ck Qb	0		0	1.43	848.91	12.96	1.091
Pond	B7	Basin 7		1.61	6.04	108.754	33.3	0.96	Ex SD	0		0		0	0.96	840.01	21.35	0.751
Pond	B8	Basin 8		1.61	8.11	44.689	35.47	0.4	SD	0.37		0		0	0.77	855.05	16.96	0.934
Pond	B9	Basin 9		1.61	1.17	11.446	17.36	0	6L	0.62		0		0	0.62	848.37	10.47	0.053
Pond	Ex SD	Tract #1632 Ex. 36" SD Outlet		1.61	0	108.754	33.3	0	1L	0		0		0	0	836	0.01	0
Pond	MC Q	SD System		1.61	11.57	21.5	80	0.1	2P	5.51	B1	5.84		0	11.45	845.72	9.99	0.497
Pond	SD	42" HDPE SD		1.61	0.67	77.385	33.3	0	B7	0.67		0		0	0.67	844.47	14.51	0
Link	1L	DS Tailwater		1.61	0	108.754	33.3	0		0		0		0	0	835	0.01	0
Link	6L	To Existing Meadowlark Road		1.61	0.62	223.467	0.89	0		0.62		0		0	0	0	0.01	0
Link	10L	To Linne Road Channel		1.61	1.54	276.531	1.6	0	16L	1.54		0		0	0	0	0.01	0
Link	11L	To Fontana Road SD		1.61	2.22	223.567	22.19	0		2.22		0		0	0	0	0.01	0
Link	15L	Sherwood/Niblick LP Xing		1.61	13.51	71.958	15.52	0	16L	13.51		0		0	0	0	0.01	0
Link	16L	Airport & Linne Road SD		1.61	15.58	359.38	4.52	0		15.58		0		0	0	0	0.01	0
Link	17L	Flow at Creek XS 1c		1.61	0	0	0	0		0		0		0	0	836.3	0.01	0
Link	22L	Linne Rd Ex Bypass Flow		1.61	0	0	0	0	15P	0		0		0	0	0	0.01	0
Link	Ck Qa	100 Yr WSE in Creek (a)		1.61	20.42	895.287	7.99	0		20.42		0		0	0	0	0.01	0
Link	Ck Qb	100 Yr WSE in Creek (b)		1.61	1.16	34.039	52.56	0	7R	1.16		0		0	0	842.5	0.01	0

TABLE 11 - HYDROGRAPH ANALYSIS

PROPOSED CONDITIONS RESULTS																		
Node Type	Node Number	Node Name	Event	Rainfall Depth (inches)	Inflow Peak (cfs)	Inflow Area (acres)	Imperv. Inflow Area (%)	Discarded Outflow Peak (cfs)	Primary Routing	Primary Outflow Peak (cfs)	Secondary Routing	Secondary Outflow Peak (cfs)	Tertiary Routing	Tertiary Outflow Peak (cfs)	Outflow Total Peak (cfs)	Peak Elevation (feet)	Peak Elevation Time (hours)	Peak Storage (acre-feet)
Subcat	1	Subcat 1		2.33	0	0	0	0	B1	8.11		0		0	0	0	0	0
Subcat	2	Subcat 2		2.33	0	0	0	0	B1	8.78		0		0	0	0	0	0
Subcat	3	Subcat 3		2.33	0	0	0	0	MC Q	17.34		0		0	0	0	0	0
Subcat	3a{(1)}-Ex	Subcat 3a(1)-Ex		2.33	0	0	0	0	Ck Qa	0.04		0		0	0	0	0	0
Subcat	3a{(2)}-Ex	Subcat 3a(2)-Ex		2.33	0	0	0	0	8R	#REF!		0		0	0	0	0	0
Subcat	3a{(3)}-Ex	Subcat 3a{(3)}-Ex		2.33	0	0	0	0	7R	#REF!		0		0	0	0	0	0
Subcat	3b-Ex	Subcat 3b-Ex		2.33	0	0	0	0	6R	8.34		0		0	0	0	0	0
Subcat	4	Subcat 4		2.33	0	0	0	0	B4	23.47		0		0	0	0	0	0
Subcat	5	Subcat 5		2.33	0	0	0	0	B5	8.91		0		0	0	0	0	0
Subcat	6	Subcat 6		2.33	0	0	0	0	B6	16.99		0		0	0	0	0	0
Subcat	7	Subcat 7		2.33	0	0	0	0	B7	8.96		0		0	0	0	0	0
Subcat	8	Subcat 8		2.33	0	0	0	0	B8	12.19		0		0	0	0	0	0
Subcat	8a-Ex	Subcat 8a-Ex		2.33	0	0	0	0	B8	0.13		0		0	0	0	0	0
Subcat	9	Subcat 9		2.33	0	0	0	0	B9	1.74		0		0	0	0	0	0
Subcat	9a-Ex	Subcat 9a-Ex		2.33	0	0	0	0	6L	1.86		0		0	0	0	0	0
Subcat	10	Subcat 10		2.33	0	0	0	0	B10	16.54		0		0	0	0	0	0
Subcat	10a-Ex	Subcat 10a-Ex		2.33	0	0	0	0	1P	3.41		0		0	0	0	0	0
Subcat	11	Subcat 11		2.33	0	0	0	0	B11	9.1		0		0	0	0	0	0
Subcat	12	Subcat 12		2.33	0	0	0	0	B12	11.12		0		0	0	0	0	0
Subcat	12a-Ex	Subcat 12a-Ex		2.33	0	0	0	0	B12	0.3		0		0	0	0	0	0
Subcat	13	Subcat 13		2.33	0	0	0	0	B13	18.23		0		0	0	0	0	0
Subcat	13a-Ex	Subcat 13a-Ex		2.33	0	0	0	0	B13	0.41		0		0	0	0	0	0
Subcat	13b-Ex	Subcat 13b-Ex		2.33	0	0	0	0	B13	8.62		0		0	0	0	0	0
Subcat	13c-Ex	Subcat 13c-Ex		2.33	0	0	0	0	B13	5.63		0		0	0	0	0	0
Subcat	14	Subcat 14		2.33	0	0	0	0	15L	7.93		0		0	0	0	0	0
Subcat	14a{(1)}-Ex	Subcat 14a(1)-Ex		2.33	0	0	0	0	15L	7.22		0		0	0	0	0	0
Subcat	14a{(2)}-Ex	Subcat 14a{(2)}-Ex		2.33	0	0	0	0	16P	2.29		0		0	0	0	0	0
Subcat	14b-Ex	Subcat 14b-Ex		2.33	0	0	0	0	15L	15.53		0		0	0	0	0	0
Subcat	14c{(0)}-Ex	Subcat 14c{(0)}-Ex		2.33	0	0	0	0	18P	13.08		0		0	0	0	0	0
Subcat	14c{(1)}-Ex	Subcat 14c{(1)}-Ex		2.33	0	0	0	0	18P	11.59		0		0	0	0	0	0
Subcat	14c{(2)}-Ex	Subcat 14c{(2)}-Ex		2.33	0	0	0	0	19P	4.98		0		0	0	0	0	0
Subcat	14c{(3)}-Ex	Subcat 14c{(3)}-Ex		2.33	0	0	0	0	20P	2.75		0		0	0	0	0	0
Subcat	14d-Ex	Subcat 14d-Ex		2.33	0	0	0	0	17P	47.53		0		0	0	0	0	0
Subcat	14e-Ex	Subcat 14e-Ex		2.33	0	0	0	0	16L	0.82		0		0	0	0	0	0
Reach	6R	Un-named Creek 1c	2 Year	2.33	8.34	757.079	0	0	7R	8.34		0		0	0	841.86	18.2	0.046
Reach	7R	Creek XS 1b		2.33	71.04	797.122	2.24	0	8R	62.7		0		0	0	839.95	10.16	0.619
Reach	8R	Creek 1b		2.33	62.7	805.022	2.22	0	Ck Qa	62.2		0		0	0	835.52	10.21	0.176
Reach	17R	Reach 1d		2.33	0	0	0	0	6R	0		0		0	0	853.6	0.01	0
Reach	Ex Chl	RCP Dbl Arch 59x36 Outlet		2.33	70.21	0	0	0	7R	70.04		0		0	0	841.48	10.02	0.074
Pond	1P	SD Inlet with Bypass SD		2.33	3.41	108.566	6.93	0	11L	3.41	11L	0		0	3.41	824.64	10.27	0
Pond	2P	60" SD MH		2.33	8.31	21.5	80	0	B1	8.31	B1	0		0	8.31	839.69	9.99	0
Pond	15P	SD System 42" HDPE		2.33	0	0	0	0	B1	0		0		0	0	844.17	0.85	0
Pond	16P	Dbl Conc. Arch Culvert (37x23)		2.33	2.62	276.531	1.6	0	10L	2.62		0		0	2.62	843.88	9.99	0
Pond	17P	Gran Cielo Dwy		2.33	47.53	166.738	0.91	0	18P	46.4	18P	0	17R	0	46.4	854.16	10.02	0.114
Pond	18P	GC-CkD1		2.33	70.49	240.622	1.05	0	19P	0.19	19P	0	Ex Chl	70.21	70.4	848.08	10.01	0.081
Pond	19P	GC-CkD2		2.33	5.16	260.311	0.99	0	20P	0.95	20P	0.54	22L	0	1.49	848.01	10.96	0.191
Pond	20P	GC-CkD3		2.33	3.41	274.094	0.94	0	16P	2.17	16P	0.04	22L	0	2.21	845.08	11.26	0.123
Pond	B1	Basin 1		2.33	33.8	47.388	67.98	0.96	Ck Qa	2.98	Ck Qa	0		0	3.94	834.95	12.43	2.513
Pond	B10	Basin 10		2.33	16.54	30.685	61.94	0.77	11L	0.7	11L	0		0	1.47	816.9	15.89	2.096
Pond	B11	Basin 11		2.33	9.1	14.461	52	0.21	1P	0.79	1P	0		0	1	832.03	12.68	0.766
Pond	B12	Basin 12		2.33	11.41	20.201	44.06	0.43	11L	0.29	11L	0		0	0.72	836.87	18.3	1.133
Pond	B13	Basin 13		2.33	32.84	64.115	22.11	0.38	11L	4.63	11L	0		0	5.01	841.67	11.7	1.893
Pond	B4	Basin 4		2.33	23.47	38.712	55.38	0.48	Ck Qa	2.53	Ck Qa	0		0	3.01	837.92	12.33	1.953
Pond	B5	Basin 5		2.33	8.91	32.696	30.34	0.34	SD	0.91		0		0	1.25	846.09	13.45	0.823
Pond	B6	Basin 6		2.33	16.99	34.039	52.56	0.3	Ck Qb	4.94	Ck Qb	0		0	5.24	849.79	10.89	1.388
Pond	B7	Basin 7		2.33	9.38	108.754	33.3	1.05	Ex SD	0.96		0		0	2.01	841.02	21.83	2.059
Pond	B8	Basin 8		2.33	12.19	44.689	35.47	0.46	SD	1.05		0		0	1.51	856.21	15.62	1.565
Pond	B9	Basin 9		2.33	1.74	11.446	17.36	0	6L	1.02		0		0	1.02	848.48	10.42	0.07
Pond	Ex SD	Tract #1632 Ex. 36" SD Outlet		2.33	0.96	108.754	33.3	0	1L	0.96		0		0	0.96	836.36	21.84	0
Pond	MC Q	SD System		2.33	17.34	21.5	80	0.11	2P	8.31	B1	8.8		0	17.22	845.79	9.99	0.505
Pond	SD	42" HDPE SD		2.33	1.91	77.385	33.3	0	B7	1.91		0		0	1.91	844.69	14.52	0
Link	1L	DS Tailwater		2.33	0.96	108.754	33.3	0		0.96		0		0	0	835	0.01	0
Link	6L	To Existing Meadowlark Road		2.33	2.11	223.467	0.89	0		2.11		0		0	0	0	0.01	0
Link	10L	To Linne Road Channel		2.33	2.62	276.531	1.6	0	16L	2.62		0		0	0	0	0.01	0
Link	11L	To Fontana Road SD		2.33	7.83	223.567	22.19	0		7.83		0		0	0	0	0.01	0
Link	15L	Sherwood/Niblick LP Xing		2.33	30.55	71.958	15.52	0	16L	30.55		0		0	0	0	0.01	0
Link	16L	Airport & Linne Road SD		2.33	33.97	359.38	4.52	0		33.97		0		0	0	0	0.01	0
Link	17L	Flow at Creek XS 1c		2.33	0	0	0	0		0		0		0	0	836.3	0.01	0
Link	22L	Linne Rd Ex Bypass Flow		2.33	0	0	0	0	15P	0		0		0	0	0	0.01	0
Link	Ck Qa	100 Yr WSE in Creek (a)		2.33	63.67	895.287	7.99	0		63.67		0		0	0	0	0.01	0
Link	Ck Qb	100 Yr WSE in Creek (b)		2.33	4.94	34.039	52.56	0	7R	4.94		0		0	0	842.5	0.01	0

Reso A - Exhibit C2 (EIR Technical Appendix)

TABLE 11 - HYDROGRAPH ANALYSIS

PROPOSED CONDITIONS RESULTS																		
Node Type	Node Number	Node Name	Event	Rainfall Depth (inches)	Inflow Peak (cfs)	Inflow Area (acres)	Imperv. Inflow Area (%)	Discarded Outflow Peak (cfs)	Primary Routing	Primary Outflow Peak (cfs)	Secondary Routing	Secondary Outflow Peak (cfs)	Tertiary Routing	Tertiary Outflow Peak (cfs)	Outflow Total Peak (cfs)	Peak Elevation (feet)	Peak Elevation Time (hours)	Peak Storage (acre-feet)
Subcat	1	Subcat 1		3.27	0	0	0	0	B1	11.65		0		0	0	0	0	0
Subcat	2	Subcat 2		3.27	0	0	0	0	B1	12.62		0		0	0	0	0	0
Subcat	3	Subcat 3		3.27	0	0	0	0	MC Q	25.44		0		0	0	0	0	0
Subcat	3a{(1)}-Ex	Subcat 3a(1)-Ex		3.27	0	0	0	0	Ck Qa	#REF!		0		0	0	0	0	0
Subcat	3a{(2)}-Ex	Subcat 3a(2)-Ex		3.27	0	0	0	0	8R	#REF!		0		0	0	0	0	0
Subcat	3a{(3)}-Ex	Subcat 3a{(3)}-Ex		3.27	0	0	0	0	7R	#REF!		0		0	0	0	0	0
Subcat	3b-Ex	Subcat 3b-Ex		3.27	0	0	0	0	6R	31.08		0		0	0	0	0	0
Subcat	4	Subcat 4		3.27	0	0	0	0	B4	36.4		0		0	0	0	0	0
Subcat	5	Subcat 5		3.27	0	0	0	0	B5	13.89		0		0	0	0	0	0
Subcat	6	Subcat 6		3.27	0	0	0	0	B6	26.85		0		0	0	0	0	0
Subcat	7	Subcat 7		3.27	0	0	0	0	B7	13.8		0		0	0	0	0	0
Subcat	8	Subcat 8		3.27	0	0	0	0	B8	18.78		0		0	0	0	0	0
Subcat	8a-Ex	Subcat 8a-Ex		3.27	0	0	0	0	B8	0.52		0		0	0	0	0	0
Subcat	9	Subcat 9		3.27	0	0	0	0	B9	3.11		0		0	0	0	0	0
Subcat	9a-Ex	Subcat 9a-Ex		3.27	0	0	0	0	6L	6.78		0		0	0	0	0	0
Subcat	10	Subcat 10		3.27	0	0	0	0	B10	24.16		0		0	0	0	0	0
Subcat	10a-Ex	Subcat 10a-Ex		3.27	0	0	0	0	1P	24.63		0		0	0	0	0	0
Subcat	11	Subcat 11		3.27	0	0	0	0	B11	14.34		0		0	0	0	0	0
Subcat	12	Subcat 12		3.27	0	0	0	0	B12	17.47		0		0	0	0	0	0
Subcat	12a-Ex	Subcat 12a-Ex		3.27	0	0	0	0	B12	1.11		0		0	0	0	0	0
Subcat	13	Subcat 13		3.27	0	0	0	0	B13	29.21		0		0	0	0	0	0
Subcat	13a-Ex	Subcat 13a-Ex		3.27	0	0	0	0	B13	1.49		0		0	0	0	0	0
Subcat	13b-Ex	Subcat 13b-Ex		3.27	0	0	0	0	B13	17.09		0		0	0	0	0	0
Subcat	13c-Ex	Subcat 13c-Ex		3.27	0	0	0	0	B13	11.87		0		0	0	0	0	0
Subcat	14	Subcat 14		3.27	0	0	0	0	15L	12.06		0		0	0	0	0	0
Subcat	14a{(1)}-Ex	Subcat 14a(1)-Ex		3.27	0	0	0	0	15L	12.3		0		0	0	0	0	0
Subcat	14a{(2)}-Ex	Subcat 14a{(2)}-Ex		3.27	0	0	0	0	16P	3.3		0		0	0	0	0	0
Subcat	14b-Ex	Subcat 14b-Ex		3.27	0	0	0	0	15L	34.25		0		0	0	0	0	0
Subcat	14c{(0)}-Ex	Subcat 14c{(0)}-Ex		3.27	0	0	0	0	18P	26.29		0		0	0	0	0	0
Subcat	14c{(1)}-Ex	Subcat 14c{(1)}-Ex		3.27	0	0	0	0	18P	23.52		0		0	0	0	0	0
Subcat	14c{(2)}-Ex	Subcat 14c{(2)}-Ex		3.27	0	0	0	0	19P	11.9		0		0	0	0	0	0
Subcat	14c{(3)}-Ex	Subcat 14c{(3)}-Ex		3.27	0	0	0	0	20P	7.34		0		0	0	0	0	0
Subcat	14d-Ex	Subcat 14d-Ex		3.27	0	0	0	0	17P	101.36		0		0	0	0	0	0
Subcat	14e-Ex	Subcat 14e-Ex		3.27	0	0	0	0	16L	1.44		0		0	0	0	0	0
Reach	6R	Un-named Creek 1c	5 Year	3.27	31.11	757.079	0	0	7R	31.1		0		0	0	842.91	11.61	0.172
Reach	7R	Creek XS 1b		3.27	155.78	797.122	2.24	0	8R	151.25		0		0	0	840.32	10.22	1.238
Reach	8R	Creek 1b		3.27	151.75	805.022	2.22	0	Ck Qa	150.08		0		0	0	835.86	10.27	0.53
Reach	17R	Reach 1d		3.27	15.06	0	0	0	6R	8.66		0		0	0	853.93	10.1	0.103
Reach	Ex Chl	RCP Dbl Arch 59x36 Outlet		3.27	127.28	0	0	0	7R	127.2		0		0	0	841.66	10.03	0.116
Pond	1P	SD Inlet with Bypass SD		3.27	24.63	108.566	6.93	0	11L	24.63	11L	0		0	24.63	825.04	9.98	0
Pond	2P	60" SD MH		3.27	12.22	21.5	80	0	B1	12.22	B1	0		0	12.22	839.97	9.99	0
Pond	15P	SD System 42" HDPE		3.27	8.49	0	0	0	B1	8.49		0		0	8.49	844.34	10.19	0
Pond	16P	Dbl Conc. Arch Culvert (37x23)		3.27	8.06	276.531	1.6	0	10L	8.06		0		0	8.06	844.18	10.14	0
Pond	17P	Gran Cielo Dwy		3.27	101.36	166.738	0.91	0	18P	85.85	18P	0	17R	15.06	100.91	854.74	10	0.205
Pond	18P	GC-CkD1		3.27	135.42	240.622	1.05	0	19P	0.65	19P	5.16	Ex Chl	127.28	133	848.84	10.02	0.163
Pond	19P	GC-CkD2		3.27	17.12	260.311	0.99	0	20P	1.09	20P	9.21	22L	0	10.3	848.51	10.14	0.302
Pond	20P	GC-CkD3		3.27	15.67	274.094	0.94	0	16P	3.99	16P	2.26	22L	8.49	14.75	845.46	10.19	0.21
Pond	B1	Basin 1		3.27	49.24	47.388	67.98	1.02	Ck Qa	9.63	Ck Qa	0		0	10.65	835.93	11.12	3.753
Pond	B10	Basin 10		3.27	24.16	30.685	61.94	0.8	11L	2.71	11L	0		0	3.51	817.46	12.86	2.653
Pond	B11	Basin 11		3.27	14.34	14.461	52	0.23	1P	2.88	1P	0		0	3.11	832.65	10.73	0.922
Pond	B12	Basin 12		3.27	18.57	20.201	44.06	0.45	11L	1.62	11L	0		0	2.08	837.3	12.63	1.363
Pond	B13	Basin 13		3.27	59.63	64.115	22.11	0.43	11L	23.88	11L	0		0	24.31	843.07	10.31	2.561
Pond	B4	Basin 4		3.27	36.4	38.712	55.38	0.52	Ck Qa	11.42	Ck Qa	0		0	11.94	838.69	10.57	2.4
Pond	B5	Basin 5		3.27	13.89	32.696	30.34	0.37	SD	3.09		0		0	3.45	846.82	11.51	1.152
Pond	B6	Basin 6		3.27	26.85	34.039	52.56	0.35	Ck Qb	11.64	Ck Qb	0		0	12	850.86	10.57	1.798
Pond	B7	Basin 7		3.27	14.56	108.754	33.3	1.11	Ex SD	5.13		0		0	6.24	841.67	15.63	2.955
Pond	B8	Basin 8		3.27	19.07	44.689	35.47	0.5	SD	3.61		0		0	4.11	857.14	12.6	2.124
Pond	B9	Basin 9		3.27	3.11	11.446	17.36	0	6L	2.01		0		0	2.01	848.7	10.45	0.104
Pond	Ex SD	Tract #1632 Ex. 36" SD Outlet		3.27	5.13	108.754	33.3	0	1L	5.13		0		0	5.13	836.85	15.63	0
Pond	MC Q	SD System		3.27	25.44	21.5	80	0.11	2P	12.22	B1	12.94		0	25.28	845.88	9.99	0.516
Pond	SD	42" HDPE SD		3.27	6.5	77.385	33.3	0	B7	6.5		0		0	6.5	845.13	12.39	0
Link	1L	DS Tailwater		3.27	5.13	108.754	33.3	0		5.13		0		0	0	835	0.01	0
Link	6L	To Existing Meadowlark Road		3.27	7.7	223.467	0.89	0		7.7		0		0	0	0	0.01	0
Link	10L	To Linne Road Channel		3.27	8.06	276.531	1.6	0	16L	8.06		0		0	0	0	0.01	0
Link	11L	To Fontana Road SD		3.27	41.11	223.567	22.19	0		41.11		0		0	0	0	0.01	0
Link	15L	Sherwood/Niblick LP Xing		3.27	58.46	71.958	15.52	0	16L	58.46		0		0	0	0	0.01	0
Link	16L	Airport & Linne Road SD		3.27	65.84	359.38	4.52	0		65.84		0		0	0	0	0.01	0
Link	17L	Flow at Creek XS 1c		3.27	0	0	0	0		0		0		0	0	836.3	0.01	0
Link	22L	Linne Rd Ex Bypass Flow		3.27	8.49	0	0	0	15P	8.49		0		0	0	0	0.01	0
Link	Ck Qa	100 Yr WSE in Creek (a)		3.27	164	895.287	7.99	0		164		0		0	0	0	0.01	0
Link	Ck Qb	100 Yr WSE in Creek (b)		3.27	11.64	34.039	52.56	0	7R	11.64		0		0	0	842.5	0.01	0

TABLE 11 - HYDROGRAPH ANALYSIS

PROPOSED CONDITIONS RESULTS																		
Node Type	Node Number	Node Name	Event	Rainfall Depth (inches)	Inflow Peak (cfs)	Inflow Area (acres)	Imperv. Inflow Area (%)	Discarded Outflow Peak (cfs)	Primary Routing	Primary Outflow Peak (cfs)	Secondary Routing	Secondary Outflow Peak (cfs)	Tertiary Routing	Tertiary Outflow Peak (cfs)	Outflow Total Peak (cfs)	Peak Elevation (feet)	Peak Elevation Time (hours)	Peak Storage (acre-feet)
Subcat	1	Subcat 1		3.6	0	0	0	0	B1	13.08		0		0	0	0	0	0
Subcat	2	Subcat 2		3.6	0	0	0	0	B1	14.16		0		0	0	0	0	0
Subcat	3	Subcat 3		3.6	0	0	0	0	MC Q	28.37		0		0	0	0	0	0
Subcat	3a{(1)}-Ex	Subcat 3a(1)-Ex		3.6	0	0	0	0	Ck Qa	#REF!		0		0	0	0	0	0
Subcat	3a{(2)}-Ex	Subcat 3a(2)-Ex		3.6	0	0	0	0	8R	#REF!		0		0	0	0	0	0
Subcat	3a{(3)}-Ex	Subcat 3a{(3)}-Ex		3.6	0	0	0	0	7R	#REF!		0		0	0	0	0	0
Subcat	3b-Ex	Subcat 3b-Ex		3.6	0	0	0	0	6R	47.38		0		0	0	0	0	0
Subcat	4	Subcat 4		3.6	0	0	0	0	B4	41.42		0		0	0	0	0	0
Subcat	5	Subcat 5		3.6	0	0	0	0	B5	16.32		0		0	0	0	0	0
Subcat	6	Subcat 6		3.6	0	0	0	0	B6	30.64		0		0	0	0	0	0
Subcat	7	Subcat 7		3.6	0	0	0	0	B7	16.07		0		0	0	0	0	0
Subcat	8	Subcat 8		3.6	0	0	0	0	B8	21.4		0		0	0	0	0	0
Subcat	8a-Ex	Subcat 8a-Ex		3.6	0	0	0	0	B8	0.93		0		0	0	0	0	0
Subcat	9	Subcat 9		3.6	0	0	0	0	B9	3.86		0		0	0	0	0	0
Subcat	9a-Ex	Subcat 9a-Ex		3.6	0	0	0	0	6L	9.77		0		0	0	0	0	0
Subcat	10	Subcat 10		3.6	0	0	0	0	B10	27.15		0		0	0	0	0	0
Subcat	10a-Ex	Subcat 10a-Ex		3.6	0	0	0	0	1P	34.7		0		0	0	0	0	0
Subcat	11	Subcat 11		3.6	0	0	0	0	B11	16.38		0		0	0	0	0	0
Subcat	12	Subcat 12		3.6	0	0	0	0	B12	19.99		0		0	0	0	0	0
Subcat	12a-Ex	Subcat 12a-Ex		3.6	0	0	0	0	B12	1.45		0		0	0	0	0	0
Subcat	13	Subcat 13		3.6	0	0	0	0	B13	33.4		0		0	0	0	0	0
Subcat	13a-Ex	Subcat 13a-Ex		3.6	0	0	0	0	B13	1.94		0		0	0	0	0	0
Subcat	13b-Ex	Subcat 13b-Ex		3.6	0	0	0	0	B13	20.29		0		0	0	0	0	0
Subcat	13c-Ex	Subcat 13c-Ex		3.6	0	0	0	0	B13	14.27		0		0	0	0	0	0
Subcat	14	Subcat 14		3.6	0	0	0	0	15L	13.55		0		0	0	0	0	0
Subcat	14a{(1)}-Ex	Subcat 14a(1)-Ex		3.6	0	0	0	0	15L	14.25		0		0	0	0	0	0
Subcat	14a{(2)}-Ex	Subcat 14a{(2)}-Ex		3.6	0	0	0	0	16P	3.69		0		0	0	0	0	0
Subcat	14b-Ex	Subcat 14b-Ex		3.6	0	0	0	0	15L	41.5		0		0	0	0	0	0
Subcat	14c{(0)}-Ex	Subcat 14c{(0)}-Ex		3.6	0	0	0	0	18P	31.3		0		0	0	0	0	0
Subcat	14c{(1)}-Ex	Subcat 14c{(1)}-Ex		3.6	0	0	0	0	18P	28.06		0		0	0	0	0	0
Subcat	14c{(2)}-Ex	Subcat 14c{(2)}-Ex		3.6	0	0	0	0	19P	14.62		0		0	0	0	0	0
Subcat	14c{(3)}-Ex	Subcat 14c{(3)}-Ex		3.6	0	0	0	0	20P	9.18		0		0	0	0	0	0
Subcat	14d-Ex	Subcat 14d-Ex		3.6	0	0	0	0	17P	122.07		0		0	0	0	0	0
Subcat	14e-Ex	Subcat 14e-Ex		3.6	0	0	0	0	16L	2.1		0		0	0	0	0	0
Reach	6R	Un-named Creek 1c	10 Year	3.6	58.19	757.079	0	0	7R	56.05		0		0	0	844.01	10.26	0.315
Reach	7R	Creek XS 1b		3.6	196.79	797.122	2.24	0	8R	193.14		0		0	0	840.44	10.27	1.495
Reach	8R	Creek 1b		3.6	193.95	805.022	2.22	0	Ck Qa	192.75		0		0	0	836.02	10.33	0.696
Reach	17R	Reach 1d		3.6	28.32	0	0	0	6R	19.69		0		0	0	854.03	10.09	0.191
Reach	Ex Chl	RCP Dbl Arch 59x36 Outlet		3.6	136.21	0	0	0	7R	136.16		0		0	0	841.68	10.03	0.122
Pond	1P	SD Inlet with Bypass SD		3.6	35.45	108.566	6.93	0	11L	35.45	11L	0		0	35.45	825.19	9.99	0
Pond	2P	60" SD MH		3.6	13.65	21.5	80	0	B1	13.65	B1	0		0	13.65	840.06	9.99	0
Pond	15P	SD System 42" HDPE		3.6	17.03	0	0	0	B1	17.03		0		0	17.03	844.4	10.14	0
Pond	16P	Dbl Conc. Arch Culvert (37x23)		3.6	10.83	276.531	1.6	0	10L	10.83		0		0	10.83	844.3	10.11	0
Pond	17P	Gran Cielo Dwy		3.6	122.07	166.738	0.91	0	18P	93.38	18P	0	17R	28.32	121.7	854.84	9.99	0.224
Pond	18P	GC-CkD1		3.6	152.52	240.622	1.05	0	19P	0.64	19P	12.52	Ex Chl	136.21	149.21	849.1	10.02	0.209
Pond	19P	GC-CkD2		3.6	27.17	260.311	0.99	0	20P	1.16	20P	18.4	22L	0.1	19.65	848.77	10.11	0.374
Pond	20P	GC-CkD3		3.6	26.7	274.094	0.94	0	16P	4.72	16P	3.87	22L	16.95	25.54	845.61	10.14	0.25
Pond	B1	Basin 1		3.6	61.24	47.388	67.98	1.05	Ck Qa	13.77	Ck Qa	0		0	14.82	836.34	10.93	4.294
Pond	B10	Basin 10		3.6	27.15	30.685	61.94	0.82	11L	3.68	11L	0		0	4.5	817.66	12.3	2.861
Pond	B11	Basin 11		3.6	16.38	14.461	52	0.24	1P	3.46	1P	0		0	3.7	833	10.69	1.019
Pond	B12	Basin 12		3.6	21.44	20.201	44.06	0.47	11L	2.02	11L	0		0	2.49	837.54	12.37	1.502
Pond	B13	Basin 13		3.6	69.87	64.115	22.11	0.44	11L	34.55	11L	0		0	34.99	843.39	10.22	2.73
Pond	B4	Basin 4		3.6	41.42	38.712	55.38	0.54	Ck Qa	14.66	Ck Qa	0		0	15.2	838.95	10.5	2.555
Pond	B5	Basin 5		3.6	16.32	32.696	30.34	0.38	SD	4.28		0		0	4.65	847.07	11.22	1.268
Pond	B6	Basin 6		3.6	30.64	34.039	52.56	0.37	Ck Qb	15.84	Ck Qb	0		0	16.21	851.09	10.45	1.896
Pond	B7	Basin 7		3.6	17.05	108.754	33.3	1.14	Ex SD	6.98		0		0	8.12	841.95	14.56	3.351
Pond	B8	Basin 8		3.6	22.23	44.689	35.47	0.51	SD	5.93		0		0	6.44	857.36	11.62	2.263
Pond	B9	Basin 9		3.6	3.86	11.446	17.36	0	6L	2.51		0		0	2.51	848.8	10.44	0.12
Pond	Ex SD	Tract #1632 Ex. 36" SD Outlet		3.6	6.98	108.754	33.3	0	1L	6.98		0		0	6.98	837	14.56	0
Pond	MC Q	SD System		3.6	28.37	21.5	80	0.11	2P	13.65	B1	14.45		0	28.21	845.91	9.99	0.519
Pond	SD	42" HDPE SD		3.6	10.07	77.385	33.3	0	B7	10.07		0		0	10.07	845.37	11.64	0
Link	1L	DS Tailwater		3.6	6.98	108.754	33.3	0		6.98		0		0	0	835	0.01	0
Link	6L	To Existing Meadowlark Road		3.6	11.61	223.467	0.89	0		11.61		0		0	0	0	0.01	0
Link	10L	To Linne Road Channel		3.6	10.83	276.531	1.6	0	16L	10.83		0		0	0	0	0.01	0
Link	11L	To Fontana Road SD		3.6	60.91	223.567	22.19	0		60.91		0		0	0	0	0.01	0
Link	15L	Sherwood/Niblick LP Xing		3.6	69.15	71.958	15.52	0	16L	69.15		0		0	0	0	0.01	0
Link	16L	Airport & Linne Road SD		3.6	79.54	359.38	4.52	0		79.54		0		0	0	0	0.01	0
Link	17L	Flow at Creek XS 1c		3.6	0	0	0	0		0		0		0	0	836.3	0.01	0
Link	22L	Linne Rd Ex Bypass Flow		3.6	17.03	0	0	0	15P	17.03		0		0	0	0	0.01	0
Link	Ck Qa	100 Yr WSE in Creek (a)		3.6	217.11	895.287	7.99	0		217.11		0		0	0	0	0.01	0
Link	Ck Qb	100 Yr WSE in Creek (b)		3.6	15.84	34.039	52.56	0	7R	15.84		0		0	0	842.5	0.01	0

TABLE 11 - HYDROGRAPH ANALYSIS

PROPOSED CONDITIONS RESULTS																		
Node Type	Node Number	Node Name	Event	Rainfall Depth (inches)	Inflow Peak (cfs)	Inflow Area (acres)	Imperv. Inflow Area (%)	Discarded Outflow Peak (cfs)	Primary Routing	Primary Outflow Peak (cfs)	Secondary Routing	Secondary Outflow Peak (cfs)	Tertiary Routing	Tertiary Outflow Peak (cfs)	Outflow Total Peak (cfs)	Peak Elevation (feet)	Peak Elevation Time (hours)	Peak Storage (acre-feet)
Subcat	1	Subcat 1		4.2	0	0	0	0	B1	15.92		0		0	0	0	0	0
Subcat	2	Subcat 2		4.2	0	0	0	0	B1	17.18		0		0	0	0	0	0
Subcat	3	Subcat 3		4.2	0	0	0	0	MC Q	33.79		0		0	0	0	0	0
Subcat	3a{(1)}-Ex	Subcat 3a(1)-Ex		4.2	0	0	0	0	Ck Qa	#REF!		0		0	0	0	0	0
Subcat	3a{(2)}-Ex	Subcat 3a(2)-Ex		4.2	0	0	0	0	8R	#REF!		0		0	0	0	0	0
Subcat	3a{(3)}-Ex	Subcat 3a{(3)}-Ex		4.2	0	0	0	0	7R	#REF!		0		0	0	0	0	0
Subcat	3b-Ex	Subcat 3b-Ex		4.2	0	0	0	0	6R	90.77		0		0	0	0	0	0
Subcat	4	Subcat 4		4.2	0	0	0	0	B4	50.91		0		0	0	0	0	0
Subcat	5	Subcat 5		4.2	0	0	0	0	B5	21.35		0		0	0	0	0	0
Subcat	6	Subcat 6		4.2	0	0	0	0	B6	37.81		0		0	0	0	0	0
Subcat	7	Subcat 7		4.2	0	0	0	0	B7	20.76		0		0	0	0	0	0
Subcat	8	Subcat 8		4.2	0	0	0	0	B8	26.42		0		0	0	0	0	0
Subcat	8a-Ex	Subcat 8a-Ex		4.2	0	0	0	0	B8	2.34		0		0	0	0	0	0
Subcat	9	Subcat 9		4.2	0	0	0	0	B9	5.46		0		0	0	0	0	0
Subcat	9a-Ex	Subcat 9a-Ex		4.2	0	0	0	0	6L	18.56		0		0	0	0	0	0
Subcat	10	Subcat 10		4.2	0	0	0	0	B10	32.9		0		0	0	0	0	0
Subcat	10a-Ex	Subcat 10a-Ex		4.2	0	0	0	0	1P	55.07		0		0	0	0	0	0
Subcat	11	Subcat 11		4.2	0	0	0	0	B11	20.25		0		0	0	0	0	0
Subcat	12	Subcat 12		4.2	0	0	0	0	B12	24.79		0		0	0	0	0	0
Subcat	12a-Ex	Subcat 12a-Ex		4.2	0	0	0	0	B12	2.12		0		0	0	0	0	0
Subcat	13	Subcat 13		4.2	0	0	0	0	B13	41.3		0		0	0	0	0	0
Subcat	13a-Ex	Subcat 13a-Ex		4.2	0	0	0	0	B13	2.83		0		0	0	0	0	0
Subcat	13b-Ex	Subcat 13b-Ex		4.2	0	0	0	0	B13	26.29		0		0	0	0	0	0
Subcat	13c-Ex	Subcat 13c-Ex		4.2	0	0	0	0	B13	18.8		0		0	0	0	0	0
Subcat	14	Subcat 14		4.2	0	0	0	0	15L	16.31		0		0	0	0	0	0
Subcat	14a{(1)}-Ex	Subcat 14a(1)-Ex		4.2	0	0	0	0	15L	17.95		0		0	0	0	0	0
Subcat	14a{(2)}-Ex	Subcat 14a{(2)}-Ex		4.2	0	0	0	0	16P	4.41		0		0	0	0	0	0
Subcat	14b-Ex	Subcat 14b-Ex		4.2	0	0	0	0	15L	55.28		0		0	0	0	0	0
Subcat	14c{(0)}-Ex	Subcat 14c{(0)}-Ex		4.2	0	0	0	0	18P	40.74		0		0	0	0	0	0
Subcat	14c{(1)}-Ex	Subcat 14c{(1)}-Ex		4.2	0	0	0	0	18P	36.62		0		0	0	0	0	0
Subcat	14c{(2)}-Ex	Subcat 14c{(2)}-Ex		4.2	0	0	0	0	19P	19.85		0		0	0	0	0	0
Subcat	14c{(3)}-Ex	Subcat 14c{(3)}-Ex		4.2	0	0	0	0	20P	12.74		0		0	0	0	0	0
Subcat	14d-Ex	Subcat 14d-Ex		4.2	0	0	0	0	17P	161.34		0		0	0	0	0	0
Subcat	14e-Ex	Subcat 14e-Ex		4.2	0	0	0	0	16L	3.76		0		0	0	0	0	0
Reach	6R	Un-named Creek 1c	25 Year	4.2	128.4	757.079	0	0	7R	120.77		0		0	0	844.29	10.24	0.825
Reach	7R	Creek XS 1b		4.2	285.9	797.122	2.24	0	8R	281.36		0		0	0	840.64	10.29	1.995
Reach	8R	Creek 1b		4.2	282.85	805.022	2.22	0	Ck Qa	280.93		0		0	0	836.34	10.34	1.037
Reach	17R	Reach 1d		4.2	56.21	0	0	0	6R	45.09		0		0	0	854.18	10.07	0.357
Reach	Ex Chl	RCP Dbl Arch 59x36 Outlet		4.2	149.04	0	0	0	7R	149		0		0	0	841.72	10.04	0.13
Pond	1P	SD Inlet with Bypass SD		4.2	57.87	108.566	6.93	0	11L	57.87	11L	0		0	57.87	825.45	9.98	0
Pond	2P	60" SD MH		4.2	16.26	21.5	80	0	B1	16.26	B1	0		0	16.26	840.22	9.99	0
Pond	15P	SD System 42" HDPE		4.2	36.99	0	0	0	B1	36.99		0		0	36.99	844.52	10.09	0
Pond	16P	Dbl Conc. Arch Culvert (37x23)		4.2	15.27	276.531	1.6	0	10L	15.27		0		0	15.27	844.48	10.07	0
Pond	17P	Gran Cielo Dwy		4.2	161.34	166.738	0.91	0	18P	104.8	18P	0.01	17R	56.21	161.03	855	9.99	0.253
Pond	18P	GC-CkD1		4.2	181.92	240.622	1.05	0	19P	0.6	19P	25.9	Ex Chl	149.04	175.31	849.52	10.03	0.309
Pond	19P	GC-CkD2		4.2	45.55	260.311	0.99	0	20P	1.23	20P	33.35	22L	5.36	39.95	849.11	10.08	0.48
Pond	20P	GC-CkD3		4.2	45.11	274.094	0.94	0	16P	5.62	16P	6.57	22L	31.77	43.97	845.79	10.1	0.304
Pond	B1	Basin 1		4.2	93.8	47.388	67.98	1.09	Ck Qa	29.18	Ck Qa	0		0	30.26	837	10.6	5.171
Pond	B10	Basin 10		4.2	32.9	30.685	61.94	0.84	11L	6.57	11L	0		0	7.4	817.99	11.45	3.196
Pond	B11	Basin 11		4.2	20.25	14.461	52	0.26	1P	5.24	1P	0		0	5.5	833.6	10.55	1.193
Pond	B12	Basin 12		4.2	26.91	20.201	44.06	0.49	11L	2.71	11L	0		0	3.2	838.07	12.16	1.809
Pond	B13	Basin 13		4.2	89.2	64.115	22.11	0.46	11L	62.05	11L	0		0	62.52	843.86	10.09	2.981
Pond	B4	Basin 4		4.2	50.91	38.712	55.38	0.57	Ck Qa	19.48	Ck Qa	0		0	20.05	839.49	10.46	2.897
Pond	B5	Basin 5		4.2	21.35	32.696	30.34	0.39	SD	7.13		0		0	7.52	847.51	10.91	1.476
Pond	B6	Basin 6		4.2	37.81	34.039	52.56	0.38	Ck Qb	23.43	Ck Qb	0		0	23.8	851.4	10.32	2.036
Pond	B7	Basin 7		4.2	28.12	108.754	33.3	1.2	Ex SD	11.9		0		0	13.1	842.46	13.1	4.094
Pond	B8	Basin 8		4.2	28.75	44.689	35.47	0.53	SD	12.49		0		0	13.01	857.57	10.87	2.399
Pond	B9	Basin 9		4.2	5.46	11.446	17.36	0	6L	3.56		0		0	3.56	849	10.42	0.153
Pond	Ex SD	Tract #1632 Ex. 36" SD Outlet		4.2	11.9	108.754	33.3	0	1L	11.9		0		0	11.9	837.33	13.1	0
Pond	MC Q	SD System		4.2	33.79	21.5	80	0.12	2P	16.26	B1	17.22		0	33.6	845.96	9.99	0.526
Pond	SD	42" HDPE SD		4.2	19.61	77.385	33.3	0	B7	19.61		0		0	19.61	845.86	10.93	0
Link	1L	DS Tailwater		4.2	11.9	108.754	33.3	0		11.9		0		0	0	835	0.01	0
Link	6L	To Existing Meadowlark Road		4.2	22.1	223.467	0.89	0		22.1		0		0	0	0	0.01	0
Link	10L	To Linne Road Channel		4.2	15.27	276.531	1.6	0	16L	15.27		0		0	0	0	0.01	0
Link	11L	To Fontana Road SD		4.2	111.64	223.567	22.19	0		111.64		0		0	0	0	0.01	0
Link	15L	Sherwood/Niblick LP Xing		4.2	89.39	71.958	15.52	0	16L	89.39		0		0	0	0	0.01	0
Link	16L	Airport & Linne Road SD		4.2	106.29	359.38	4.52	0		106.29		0		0	0	0	0.01	0
Link	17L	Flow at Creek XS 1c		4.2	0	0	0	0		0		0		0	0	836.3	0.01	0
Link	22L	Linne Rd Ex Bypass Flow		4.2	36.99	0	0	0	15P	36.99		0		0	0	0	0.01	0
Link	Ck Qa	100 Yr WSE in Creek (a)		4.2	327.05	895.287	7.99	0		327.05		0		0	0	0	0.01	0
Link	Ck Qb	100 Yr WSE in Creek (b)		4.2	23.43	34.039	52.56	0	7R	23.43		0		0	0	842.5	0.01	0

TABLE 11 - HYDROGRAPH ANALYSIS

PROPOSED CONDITIONS RESULTS																		
Node Type	Node Number	Node Name	Event	Rainfall Depth (inches)	Inflow Peak (cfs)	Inflow Area (acres)	Imperv. Inflow Area (%)	Discarded Outflow Peak (cfs)	Primary Routing	Primary Outflow Peak (cfs)	Secondary Routing	Secondary Outflow Peak (cfs)	Tertiary Routing	Tertiary Outflow Peak (cfs)	Outflow Total Peak (cfs)	Peak Elevation (feet)	Peak Elevation Time (hours)	Peak Storage (acre-feet)
Subcat	1	Subcat 1		4.6	0	0	0	0	B1	17.91		0		0	0	0	0	0
Subcat	2	Subcat 2		4.6	0	0	0	0	B1	19.32		0		0	0	0	0	0
Subcat	3	Subcat 3		4.6	0	0	0	0	MC Q	37.43		0		0	0	0	0	0
Subcat	3a{(1)}-Ex	Subcat 3a(1)-Ex		4.6	0	0	0	0	Ck Qa	#REF!		0		0	0	0	0	0
Subcat	3a{(2)}-Ex	Subcat 3a(2)-Ex		4.6	0	0	0	0	8R	#REF!		0		0	0	0	0	0
Subcat	3a{(3)}-Ex	Subcat 3a{(3)}-Ex		4.6	0	0	0	0	7R	#REF!		0		0	0	0	0	0
Subcat	3b-Ex	Subcat 3b-Ex		4.6	0	0	0	0	6R	126.69		0		0	0	0	0	0
Subcat	4	Subcat 4		4.6	0	0	0	0	B4	57.43		0		0	0	0	0	0
Subcat	5	Subcat 5		4.6	0	0	0	0	B5	25.03		0		0	0	0	0	0
Subcat	6	Subcat 6		4.6	0	0	0	0	B6	42.75		0		0	0	0	0	0
Subcat	7	Subcat 7		4.6	0	0	0	0	B7	24.19		0		0	0	0	0	0
Subcat	8	Subcat 8		4.6	0	0	0	0	B8	29.92		0		0	0	0	0	0
Subcat	8a-Ex	Subcat 8a-Ex		4.6	0	0	0	0	B8	3.6		0		0	0	0	0	0
Subcat	9	Subcat 9		4.6	0	0	0	0	B9	6.65		0		0	0	0	0	0
Subcat	9a-Ex	Subcat 9a-Ex		4.6	0	0	0	0	6L	26.71		0		0	0	0	0	0
Subcat	10	Subcat 10		4.6	0	0	0	0	B10	36.9		0		0	0	0	0	0
Subcat	10a-Ex	Subcat 10a-Ex		4.6	0	0	0	0	1P	69.86		0		0	0	0	0	0
Subcat	11	Subcat 11		4.6	0	0	0	0	B11	22.92		0		0	0	0	0	0
Subcat	12	Subcat 12		4.6	0	0	0	0	B12	28.11		0		0	0	0	0	0
Subcat	12a-Ex	Subcat 12a-Ex		4.6	0	0	0	0	B12	2.6		0		0	0	0	0	0
Subcat	13	Subcat 13		4.6	0	0	0	0	B13	46.73		0		0	0	0	0	0
Subcat	13a-Ex	Subcat 13a-Ex		4.6	0	0	0	0	B13	3.47		0		0	0	0	0	0
Subcat	13b-Ex	Subcat 13b-Ex		4.6	0	0	0	0	B13	30.39		0		0	0	0	0	0
Subcat	13c-Ex	Subcat 13c-Ex		4.6	0	0	0	0	B13	21.92		0		0	0	0	0	0
Subcat	14	Subcat 14		4.6	0	0	0	0	15L	18.17		0		0	0	0	0	0
Subcat	14a{(1)}-Ex	Subcat 14a(1)-Ex		4.6	0	0	0	0	15L	20.51		0		0	0	0	0	0
Subcat	14a{(2)}-Ex	Subcat 14a{(2)}-Ex		4.6	0	0	0	0	16P	4.9		0		0	0	0	0	0
Subcat	14b-Ex	Subcat 14b-Ex		4.6	0	0	0	0	15L	64.81		0		0	0	0	0	0
Subcat	14c{(0)}-Ex	Subcat 14c{(0)}-Ex		4.6	0	0	0	0	18P	47.2		0		0	0	0	0	0
Subcat	14c{(1)}-Ex	Subcat 14c{(1)}-Ex		4.6	0	0	0	0	18P	42.49		0		0	0	0	0	0
Subcat	14c{(2)}-Ex	Subcat 14c{(2)}-Ex		4.6	0	0	0	0	19P	23.48		0		0	0	0	0	0
Subcat	14c{(3)}-Ex	Subcat 14c{(3)}-Ex		4.6	0	0	0	0	20P	15.23		0		0	0	0	0	0
Subcat	14d-Ex	Subcat 14d-Ex		4.6	0	0	0	0	17P	188.4		0		0	0	0	0	0
Subcat	14e-Ex	Subcat 14e-Ex		4.6	0	0	0	0	16L	5.09		0		0	0	0	0	0
Reach	6R	Un-named Creek 1c	50 Year	4.6	185.3	757.079	0	0	7R	173.74		0		0	0	844.52	10.23	1.228
Reach	7R	Creek XS 1b		4.6	352.23	797.122	2.24	0	8R	347.28		0		0	0	840.77	10.27	2.327
Reach	8R	Creek 1b		4.6	349.3	805.022	2.22	0	Ck Qa	346.69		0		0	0	836.59	10.33	1.292
Reach	17R	Reach 1d		4.6	76.79	0	0	0	6R	64.43		0		0	0	854.26	10.06	0.466
Reach	Ex Chl	RCP Dbl Arch 59x36 Outlet		4.6	156.05	0	0	0	7R	156.01		0		0	0	841.73	10.04	0.135
Pond	1P	SD Inlet with Bypass SD		4.6	73.26	108.566	6.93	0	11L	73.26	11L	0		0	73.26	825.62	9.98	0
Pond	2P	60" SD MH		4.6	18.03	21.5	80	0	B1	18.03	B1	0		0	18.03	840.33	9.99	0
Pond	15P	SD System 42" HDPE		4.6	51.1	0	0	0	B1	51.1		0		0	51.1	844.59	10.08	0
Pond	16P	Dbl Conc. Arch Culvert (37x23)		4.6	17.74	276.531	1.6	0	10L	17.74		0		0	17.74	844.57	10.05	0
Pond	17P	Gran Cielo Dwy		4.6	188.4	166.738	0.91	0	18P	111.11	18P	0.18	17R	76.79	188.08	855.09	9.99	0.269
Pond	18P	GC-CkD1		4.6	200.71	240.622	1.05	0	19P	0.59	19P	35.96	Ex Chl	156.05	192.48	849.76	10.04	0.384
Pond	19P	GC-CkD2		4.6	58.68	260.311	0.99	0	20P	1.27	20P	41.32	22L	10.96	53.55	849.25	10.07	0.543
Pond	20P	GC-CkD3		4.6	55.32	274.094	0.94	0	16P	6.01	16P	8.13	22L	40.2	54.35	845.88	10.09	0.332
Pond	B1	Basin 1		4.6	115.89	47.388	67.98	1.12	Ck Qa	35.49	Ck Qa	0		0	36.61	837.56	10.6	5.949
Pond	B10	Basin 10		4.6	36.9	30.685	61.94	0.85	11L	9.72	11L	0		0	10.57	818.15	11.07	3.364
Pond	B11	Basin 11		4.6	22.92	14.461	52	0.27	1P	7.55	1P	0		0	7.82	833.87	10.42	1.278
Pond	B12	Basin 12		4.6	30.7	20.201	44.06	0.51	11L	3.48	11L	0		0	3.99	838.38	11.75	1.998
Pond	B13	Basin 13		4.6	102.5	64.115	22.11	0.47	11L	84.13	11L	0		0	84.6	844.03	10.04	3.076
Pond	B4	Basin 4		4.6	57.43	38.712	55.38	0.59	Ck Qa	23.63	Ck Qa	0		0	24.21	839.85	10.42	3.14
Pond	B5	Basin 5		4.6	25.03	32.696	30.34	0.41	SD	9.31		0		0	9.72	847.79	10.8	1.616
Pond	B6	Basin 6		4.6	42.75	34.039	52.56	0.38	Ck Qb	27.62	Ck Qb	0		0	28	851.6	10.29	2.127
Pond	B7	Basin 7		4.6	38.88	108.754	33.3	1.23	Ex SD	16.23		0		0	17.47	842.8	12.48	4.603
Pond	B8	Basin 8		4.6	33.51	44.689	35.47	0.53	SD	17.63		0		0	18.16	857.7	10.65	2.483
Pond	B9	Basin 9		4.6	6.65	11.446	17.36	0	6L	4.29		0		0	4.29	849.15	10.42	0.179
Pond	Ex SD	Tract #1632 Ex. 36" SD Outlet		4.6	16.23	108.754	33.3	0	1L	16.23		0		0	16.23	837.58	12.48	0
Pond	MC Q	SD System		4.6	37.43	21.5	80	0.12	2P	18.03	B1	19.09		0	37.24	845.99	9.99	0.53
Pond	SD	42" HDPE SD		4.6	26.8	77.385	33.3	0	B7	26.8		0		0	26.8	846.18	10.74	0
Link	1L	DS Tailwater		4.6	16.23	108.754	33.3	0		16.23		0		0	0	835	0.01	0
Link	6L	To Existing Meadowlark Road		4.6	31	223.467	0.89	0		31		0		0	0	0	0.01	0
Link	10L	To Linne Road Channel		4.6	17.74	276.531	1.6	0	16L	17.74		0		0	0	0	0.01	0
Link	11L	To Fontana Road SD		4.6	154.03	223.567	22.19	0		154.03		0		0	0	0	0.01	0
Link	15L	Sherwood/Niblick LP Xing		4.6	103.34	71.958	15.52	0	16L	103.34		0		0	0	0	0.01	0
Link	16L	Airport & Linne Road SD		4.6	124.53	359.38	4.52	0		124.53		0		0	0	0	0.01	0
Link	17L	Flow at Creek XS 1c		4.6	0	0	0	0		0		0		0	0	836.3	0.01	0
Link	22L	Linne Rd Ex Bypass Flow		4.6	51.1	0	0	0	15P	51.1		0		0	0	0	0.01	0
Link	Ck Qa	100 Yr WSE in Creek (a)		4.6	403.91	895.287	7.99	0		403.91		0		0	0	0	0.01	0
Link	Ck Qb	100 Yr WSE in Creek (b)		4.6	27.62	34.039	52.56	0	7R	27.62		0		0	0	842.5	0.01	0

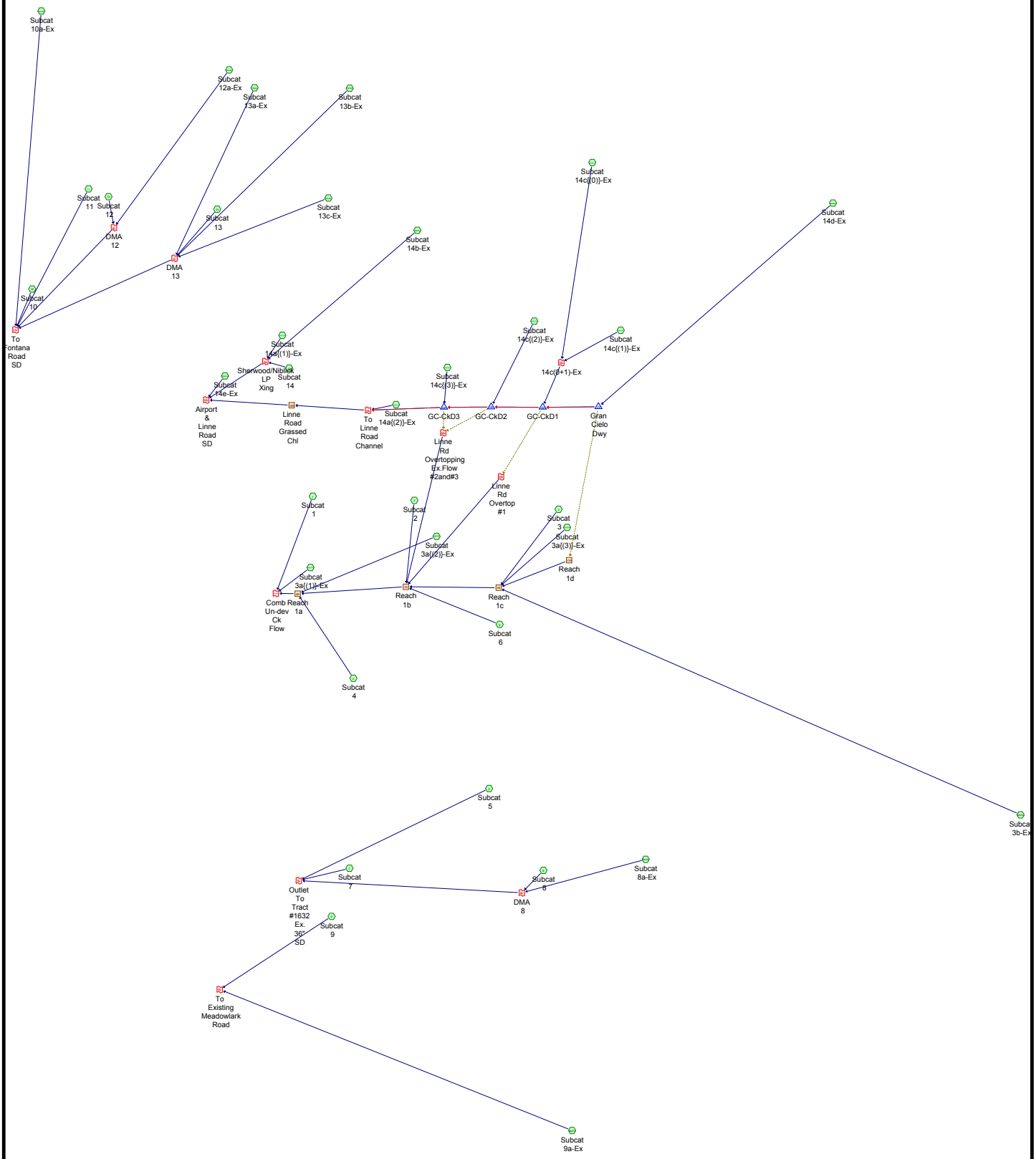
TABLE 11 - HYDROGRAPH ANALYSIS

PROPOSED CONDITIONS RESULTS																		
Node Type	Node Number	Node Name	Event	Rainfall Depth (inches)	Inflow Peak (cfs)	Inflow Area (acres)	Imperv. Inflow Area (%)	Discarded Outflow Peak (cfs)	Primary Routing	Primary Outflow Peak (cfs)	Secondary Routing	Secondary Outflow Peak (cfs)	Tertiary Routing	Tertiary Outflow Peak (cfs)	Outflow Total Peak (cfs)	Peak Elevation (feet)	Peak Elevation Time (hours)	Peak Storage (acre-feet)
Subcat	1	Subcat 1		5.1	0	0	0	0	B1	20.49		0		0	0	0	0	0
Subcat	2	Subcat 2		5.1	0	0	0	0	B1	22.09		0		0	0	0	0	0
Subcat	3	Subcat 3		5.1	0	0	0	0	MC Q	42.04		0		0	0	0	0	0
Subcat	3a{(1)}-Ex	Subcat 3a(1)-Ex		5.1	0	0	0	0	Ck Qa	#REF!		0		0	0	0	0	0
Subcat	3a{(2)}-Ex	Subcat 3a(2)-Ex		5.1	0	0	0	0	8R	#REF!		0		0	0	0	0	0
Subcat	3a{(3)}-Ex	Subcat 3a{(3)}-Ex		5.1	0	0	0	0	7R	#REF!		0		0	0	0	0	0
Subcat	3b-Ex	Subcat 3b-Ex		5.1	0	0	0	0	6R	178.44		0		0	0	0	0	0
Subcat	4	Subcat 4		5.1	0	0	0	0	B4	65.77		0		0	0	0	0	0
Subcat	5	Subcat 5		5.1	0	0	0	0	B5	29.91		0		0	0	0	0	0
Subcat	6	Subcat 6		5.1	0	0	0	0	B6	49.06		0		0	0	0	0	0
Subcat	7	Subcat 7		5.1	0	0	0	0	B7	28.7		0		0	0	0	0	0
Subcat	8	Subcat 8		5.1	0	0	0	0	B8	34.41		0		0	0	0	0	0
Subcat	8a-Ex	Subcat 8a-Ex		5.1	0	0	0	0	B8	5.42		0		0	0	0	0	0
Subcat	9	Subcat 9		5.1	0	0	0	0	B9	8.24		0		0	0	0	0	0
Subcat	9a-Ex	Subcat 9a-Ex		5.1	0	0	0	0	6L	38.64		0		0	0	0	0	0
Subcat	10	Subcat 10		5.1	0	0	0	0	B10	42.03		0		0	0	0	0	0
Subcat	10a-Ex	Subcat 10a-Ex		5.1	0	0	0	0	1P	89.48		0		0	0	0	0	0
Subcat	11	Subcat 11		5.1	0	0	0	0	B11	26.34		0		0	0	0	0	0
Subcat	12	Subcat 12		5.1	0	0	0	0	B12	32.36		0		0	0	0	0	0
Subcat	12a-Ex	Subcat 12a-Ex		5.1	0	0	0	0	B12	3.23		0		0	0	0	0	0
Subcat	13	Subcat 13		5.1	0	0	0	0	B13	53.68		0		0	0	0	0	0
Subcat	13a-Ex	Subcat 13a-Ex		5.1	0	0	0	0	B13	4.3		0		0	0	0	0	0
Subcat	13b-Ex	Subcat 13b-Ex		5.1	0	0	0	0	B13	35.59		0		0	0	0	0	0
Subcat	13c-Ex	Subcat 13c-Ex		5.1	0	0	0	0	B13	25.89		0		0	0	0	0	0
Subcat	14	Subcat 14		5.1	0	0	0	0	15L	20.52		0		0	0	0	0	0
Subcat	14a{(1)}-Ex	Subcat 14a(1)-Ex		5.1	0	0	0	0	15L	23.79		0		0	0	0	0	0
Subcat	14a{(2)}-Ex	Subcat 14a{(2)}-Ex		5.1	0	0	0	0	16P	5.52		0		0	0	0	0	0
Subcat	14b-Ex	Subcat 14b-Ex		5.1	0	0	0	0	15L	77.01		0		0	0	0	0	0
Subcat	14c{(0)}-Ex	Subcat 14c{(0)}-Ex		5.1	0	0	0	0	18P	55.41		0		0	0	0	0	0
Subcat	14c{(1)}-Ex	Subcat 14c{(1)}-Ex		5.1	0	0	0	0	18P	49.95		0		0	0	0	0	0
Subcat	14c{(2)}-Ex	Subcat 14c{(2)}-Ex		5.1	0	0	0	0	19P	28.16		0		0	0	0	0	0
Subcat	14c{(3)}-Ex	Subcat 14c{(3)}-Ex		5.1	0	0	0	0	20P	18.46		0		0	0	0	0	0
Subcat	14d-Ex	Subcat 14d-Ex		5.1	0	0	0	0	17P	222.96		0		0	0	0	0	0
Subcat	14e-Ex	Subcat 14e-Ex		5.1	0	0	0	0	16L	6.93		0		0	0	0	0	0
Reach	6R	Un-named Creek 1c	100 Year	5.1	265.18	757.079	0	0	7R	248.04		0		0	0	844.83	10.21	1.79
Reach	7R	Creek XS 1b		5.1	440.1	797.122	2.24	0	8R	434.53		0		0	0	840.91	10.26	2.737
Reach	8R	Creek 1b		5.1	437.31	805.022	2.22	0	Ck Qa	433.95		0		0	0	836.91	10.32	1.628
Reach	17R	Reach 1d		5.1	103.94	0	0	0	6R	90.36		0		0	0	854.34	10.06	0.601
Reach	Ex Chl	RCP Dbl Arch 59x36 Outlet		5.1	163.56	0	0	0	7R	163.52		0		0	0	841.75	10.05	0.14
Pond	1P	SD Inlet with Bypass SD		5.1	93.81	108.566	6.93	0	11L	93.81	11L	0		0	93.81	825.82	9.98	0
Pond	2P	60" SD MH		5.1	20.2	21.5	80	0	B1	20.2	B1	0		0	20.2	840.46	9.99	0
Pond	15P	SD System 42" HDPE		5.1	68.7	0	0	0	B1	68.7		0		0	68.7	844.66	10.08	0
Pond	16P	Dbl Conc. Arch Culvert (37x23)		5.1	20.76	276.531	1.6	0	10L	20.76		0		0	20.76	844.69	10.04	0
Pond	17P	Gran Cielo Dwy		5.1	222.96	166.738	0.91	0	18P	118.06	18P	0.66	17R	103.94	222.66	855.19	9.99	0.289
Pond	18P	GC-CkD1		5.1	223.8	240.622	1.05	0	19P	0.62	19P	49.36	Ex Chl	163.56	213.46	850.03	10.04	0.483
Pond	19P	GC-CkD2		5.1	76.4	260.311	0.99	0	20P	1.3	20P	50.4	22L	18.98	70.68	849.41	10.07	0.624
Pond	20P	GC-CkD3		5.1	67.1	274.094	0.94	0	16P	6.37	16P	10.21	22L	49.73	66.32	845.96	10.08	0.361
Pond	B1	Basin 1		5.1	143.08	47.388	67.98	1.18	Ck Qa	42.68	Ck Qa	0		0	43.86	838.35	10.61	7.075
Pond	B10	Basin 10		5.1	42.03	30.685	61.94	0.86	11L	14.28	11L	0		0	15.14	818.33	10.82	3.554
Pond	B11	Basin 11		5.1	26.34	14.461	52	0.28	1P	10.23	1P	0		0	10.51	834.16	10.34	1.37
Pond	B12	Basin 12		5.1	35.58	20.201	44.06	0.53	11L	5.12	11L	0		0	5.64	838.7	11.06	2.202
Pond	B13	Basin 13		5.1	119.46	64.115	22.11	0.48	11L	108.1	11L	0		0	108.58	844.19	10.01	3.165
Pond	B4	Basin 4		5.1	65.77	38.712	55.38	0.6	Ck Qa	34.06	Ck Qa	0		0	34.66	840.12	10.29	3.32
Pond	B5	Basin 5		5.1	29.91	32.696	30.34	0.42	SD	12.28		0		0	12.7	848.15	10.7	1.797
Pond	B6	Basin 6		5.1	49.06	34.039	52.56	0.39	Ck Qb	32.02	Ck Qb	0		0	32.41	851.88	10.28	2.255
Pond	B7	Basin 7		5.1	53.39	108.754	33.3	1.28	Ex SD	22.91		0		0	24.18	843.21	11.97	5.229
Pond	B8	Basin 8		5.1	39.82	44.689	35.47	0.54	SD	24.66		0		0	25.2	857.85	10.48	2.582
Pond	B9	Basin 9		5.1	8.24	11.446	17.36	0	6L	5.1		0		0	5.1	849.37	10.45	0.219
Pond	Ex SD	Tract #1632 Ex. 36" SD Outlet		5.1	22.91	108.754	33.3	0	1L	22.91		0		0	22.91	837.94	11.97	0
Pond	MC Q	SD System		5.1	42.04	21.5	80	0.12	2P	20.2	B1	21.51		0	41.83	846.03	9.99	0.535
Pond	SD	42" HDPE SD		5.1	36.4	77.385	33.3	0	B7	36.4		0		0	36.4	846.57	10.6	0
Link	1L	DS Tailwater		5.1	22.91	108.754	33.3	0		22.91		0		0	0	835	0.01	0
Link	6L	To Existing Meadowlark Road		5.1	43.71	223.467	0.89	0		43.71		0		0	0	0	0.01	0
Link	10L	To Linne Road Channel		5.1	20.76	276.531	1.6	0	16L	20.76		0		0	0	0	0.01	0
Link	11L	To Fontana Road SD		5.1	203.22	223.567	22.19	0		203.22		0		0	0	0	0.01	0
Link	15L	Sherwood/Niblick LP Xing		5.1	121.15	71.958	15.52	0	16L	121.15		0		0	0	0	0.01	0
Link	16L	Airport & Linne Road SD		5.1	147.31	359.38	4.52	0		147.31		0		0	0	0	0.01	0
Link	17L	Flow at Creek XS 1c		5.1	0	0	0	0		0		0		0	0	836.3	0.01	0
Link	22L	Linne Rd Ex Bypass Flow		5.1	68.7	0	0	0	15P	68.7		0		0	0	0	0.01	0
Link	Ck Qa	100 Yr WSE in Creek (a)		5.1	508.89	895.287	7.99	0		508.89		0		0	0	0	0.01	0
Link	Ck Qb	100 Yr WSE in Creek (b)		5.1	32.02	34.039	52.56	0	7R	32.02		0		0	0	842.5	0.01	0

Appendix H

Existing Hydrograph Analysis

Reso A - Exhibit C2 (EIR Technical Appendix)



Subcat | Reach | Pond | Link

Routing Diagram for _2019-01-21_1465.01 O-C Ex Conds Hydl_City Precip_18P BCW-w

Prepared by Wallace Group, Printed 1/24/2019

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.765	68	1 acre lots, 20% imp, HSG B (4)
1,241.335	58	Meadow, non-grazed, HSG B (1, 2, 3, 3a{(1)}-Ex, 3a{(2)}-Ex, 3a{(3)}-Ex, 3b-Ex, 4, 5, 6, 7, 8, 8a-Ex, 9, 9a-Ex, 10, 10a-Ex, 11, 12, 13, 14, 14a{(1)}-Ex, 14a{(2)}-Ex, 14c{(2)}-Ex, 14e-Ex)
193.436	71	Meadow, non-grazed, HSG C (3, 3a{(2)}-Ex, 3a{(3)}-Ex, 3b-Ex, 6, 10, 10a-Ex, 11, 12, 12a-Ex, 13, 13a-Ex, 14d-Ex)
2.803	78	Meadow, non-grazed, HSG D (9, 9a-Ex)
0.918	77	Natural western desert, HSG B (10, 14e-Ex)
7.553	98	Paved roads w/curbs & sewers, HSG B (10, 14, 14a{(2)}-Ex, 14c{(1)}-Ex, 14d-Ex, 14e-Ex)
2.005	98	Paved roads w/curbs & sewers, HSG C (3, 3b-Ex, 14c{(0)}-Ex, 14c{(1)}-Ex, 14d-Ex)
107.281	75	Row crops, SR + CR, Good, HSG B (13, 13c-Ex, 14a{(1)}-Ex, 14a{(2)}-Ex, 14b-Ex, 14c{(1)}-Ex, 14c{(2)}-Ex, 14c{(3)}-Ex, 14d-Ex)
252.359	82	Row crops, SR + CR, Good, HSG C (13b-Ex, 13c-Ex, 14b-Ex, 14c{(0)}-Ex, 14c{(1)}-Ex, 14c{(2)}-Ex, 14d-Ex)
1,810.455	**64**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
1,359.852	HSG B	1, 2, 3, 3a{(1)}-Ex, 3a{(2)}-Ex, 3a{(3)}-Ex, 3b-Ex, 4, 5, 6, 7, 8, 8a-Ex, 9, 9a-Ex, 10, 10a-Ex, 11, 12, 13, 13c-Ex, 14, 14a{(1)}-Ex, 14a{(2)}-Ex, 14b-Ex, 14c{(1)}-Ex, 14c{(2)}-Ex, 14c{(3)}-Ex, 14d-Ex, 14e-Ex
447.800	HSG C	3, 3a{(2)}-Ex, 3a{(3)}-Ex, 3b-Ex, 6, 10, 10a-Ex, 11, 12, 12a-Ex, 13, 13a-Ex, 13b-Ex, 13c-Ex, 14b-Ex, 14c{(0)}-Ex, 14c{(1)}-Ex, 14c{(2)}-Ex, 14d-Ex
2.803	HSG D	9, 9a-Ex
0.000	Other	
1,810.455		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	2.765	0.000	0.000	0.000	2.765	1 acre lots, 20% imp	4
0.000	1,241.335	193.436	2.803	0.000	1,437.574	Meadow, non-grazed	1, 2, 3, 3a{(1)}-Ex, 3a{(2)}-Ex, 3a{(3)}-Ex, 3b-Ex, 4, 5, 6, 7, 8, 8a-Ex, 9, 9a-Ex, 10, 10a-Ex, 11, 12, 12a-Ex, 13, 13a-Ex, 14, 14a{(1)}-Ex, 14a{(2)}-Ex, 14c{(2)}-Ex, 14d-Ex, 14e-Ex
0.000	0.918	0.000	0.000	0.000	0.918	Natural western desert	10, 14e-Ex
0.000	7.553	2.005	0.000	0.000	9.557	Paved roads w/curbs & sewers	3, 3b-Ex, 10, 14, 14a{(2)}-Ex, 14c{(0)}-Ex, 14c{(1)}-Ex, 14d-Ex, 14e-Ex
0.000	107.281	252.359	0.000	0.000	359.640	Row crops, SR + CR, Good	13, 13b-Ex, 13c-Ex, 14a{(1)}-Ex, 14a{(2)}-Ex, 14b-Ex, 14c{(0)}-Ex, 14c{(1)}-Ex, 14c{(2)}-Ex, 14c{(3)}-Ex, 14d-Ex
0.000	**1,359.852**	**447.800**	**2.803**	**0.000**	**1,810.455**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	17P	852.84	851.76	77.0	0.0140	0.025	30.0	0.0	0.0
2	18P	847.69	847.67	26.0	0.0008	0.010	6.0	0.0	0.0
3	19P	846.12	845.98	26.0	0.0054	0.010	6.0	0.0	0.0
4	20P	844.22	843.98	26.0	0.0092	0.021	18.0	0.0	0.0

Time span=0.10-56.00 hrs, dt=0.02 hrs, 2796 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=11.244 ac 0.00% Impervious Runoff Depth=0.10"
Tc=10.0 min CN=58/0 Runoff=0.10 cfs 0.090 af

Subcatchment2: Subcat 2 Runoff Area=14.644 ac 0.00% Impervious Runoff Depth=0.10"
Tc=11.5 min CN=58/0 Runoff=0.13 cfs 0.117 af

Subcatchment3: Subcat 3 Runoff Area=21.500 ac 0.02% Impervious Runoff Depth=0.19"
Tc=16.9 min CN=63/98 Runoff=0.35 cfs 0.341 af

Subcatchment3a{(1)}-Ex: Subcat 3a{(1)}-Ex Runoff Area=4.164 ac 0.00% Impervious Runoff Depth=0.10"
Tc=10.0 min CN=58/0 Runoff=0.04 cfs 0.033 af

Subcatchment3a{(2)}-Ex: Subcat 3a{(2)}-Ex Runoff Area=7.900 ac 0.00% Impervious Runoff Depth=0.15"
Tc=10.0 min CN=61/0 Runoff=0.10 cfs 0.098 af

Subcatchment3a{(3)}-Ex: Subcat 3a{(3)}-Ex Runoff Area=6.004 ac 0.00% Impervious Runoff Depth=0.35"
Tc=10.0 min CN=69/0 Runoff=0.43 cfs 0.173 af

Subcatchment3b-Ex: Subcat 3b-Ex Runoff Area=757.079 ac 0.00% Impervious Runoff Depth=0.13"
Tc=45.5 min CN=60/98 Runoff=8.34 cfs 8.178 af

Subcatchment4: Subcat 4 Runoff Area=38.712 ac 1.43% Impervious Runoff Depth=0.12"
Tc=14.2 min CN=58/98 Runoff=0.60 cfs 0.401 af

Subcatchment5: Subcat 5 Runoff Area=32.700 ac 0.00% Impervious Runoff Depth=0.10"
Tc=21.2 min CN=58/0 Runoff=0.29 cfs 0.261 af

Subcatchment6: Subcat 6 Runoff Area=34.035 ac 0.00% Impervious Runoff Depth=0.13"
Tc=20.1 min CN=60/0 Runoff=0.38 cfs 0.368 af

Subcatchment7: Subcat 7 Runoff Area=31.369 ac 0.00% Impervious Runoff Depth=0.10"
Tc=23.2 min CN=58/0 Runoff=0.28 cfs 0.250 af

Subcatchment8: Subcat 8 Runoff Area=30.487 ac 0.00% Impervious Runoff Depth=0.10"
Tc=28.8 min CN=58/0 Runoff=0.27 cfs 0.243 af

Subcatchment8a-Ex: Subcat 8a-Ex Runoff Area=14.202 ac 0.00% Impervious Runoff Depth=0.10"
Tc=16.5 min CN=58/0 Runoff=0.13 cfs 0.113 af

Subcatchment9: Subcat 9 Runoff Area=11.446 ac 0.00% Impervious Runoff Depth=0.17"
Tc=22.3 min CN=62/0 Runoff=0.16 cfs 0.161 af

Subcatchment9a-Ex: Subcat 9a-Ex Runoff Area=212.022 ac 0.00% Impervious Runoff Depth=0.10"
Flow Length=4,909' Tc=51.3 min CN=58/0 Runoff=1.86 cfs 1.691 af

Subcatchment10: Subcat 10 Runoff Area=30.685 ac 3.88% Impervious Runoff Depth=0.19"
Tc=22.6 min CN=59/98 Runoff=1.03 cfs 0.484 af

Subcatchment10a-Ex: Subcat 10a-Ex Runoff Area=94.105 ac 0.00% Impervious Runoff Depth=0.29"
Tc=11.0 min CN=67/0 Runoff=3.41 cfs 2.262 af

Subcatchment11: Subcat 11 Runoff Area=14.461 ac 0.00% Impervious Runoff Depth=0.11"
Tc=11.1 min CN=59/0 Runoff=0.14 cfs 0.135 af

Subcatchment12: Subcat 12 Runoff Area=17.572 ac 0.00% Impervious Runoff Depth=0.11"
Tc=10.0 min CN=59/0 Runoff=0.17 cfs 0.164 af

Subcatchment12a-Ex: Subcat 12a-Ex Runoff Area=2.629 ac 0.00% Impervious Runoff Depth=0.41"
Tc=10.0 min CN=71/0 Runoff=0.30 cfs 0.090 af

Subcatchment13: Subcat 13 Runoff Area=27.742 ac 0.00% Impervious Runoff Depth=0.15"
Flow Length=1,750' Tc=10.0 min CN=61/0 Runoff=0.34 cfs 0.343 af

Subcatchment13a-Ex: Subcat 13a-Ex Runoff Area=3.505 ac 0.00% Impervious Runoff Depth=0.41"
Tc=10.0 min CN=71/0 Runoff=0.40 cfs 0.119 af

Subcatchment13b-Ex: Subcat 13b-Ex Runoff Area=18.461 ac 0.00% Impervious Runoff Depth=0.88"
Tc=10.0 min CN=82/0 Runoff=8.60 cfs 1.346 af

Subcatchment13c-Ex: Subcat 13c-Ex Runoff Area=14.407 ac 0.00% Impervious Runoff Depth=0.77"
Tc=10.0 min CN=80/0 Runoff=5.61 cfs 0.929 af

Subcatchment14: Subcat 14 Runoff Area=8.669 ac 51.27% Impervious Runoff Depth=1.12"
Tc=10.0 min CN=58/98 Runoff=5.51 cfs 0.812 af

Subcatchment14a{(1)}-Ex: Subcat 14a{(1)}-Ex Runoff Area=13.081 ac 0.00% Impervious Runoff Depth=0.21"
Tc=10.0 min CN=64/0 Runoff=0.24 cfs 0.232 af

Subcatchment14a{(2)}-Ex: Subcat 14a{(2)}-Ex Runoff Area=2.438 ac 29.80% Impervious Runoff Depth=0.69"
Tc=10.0 min CN=58/98 Runoff=0.90 cfs 0.141 af

Subcatchment14b-Ex: Subcat 14b-Ex Runoff Area=50.209 ac 0.00% Impervious Runoff Depth=0.73"
Tc=13.4 min CN=79/0 Runoff=15.48 cfs 3.036 af

Subcatchment14c{(0)}-Ex: Subcat 14c{(0)}-Ex Runoff Area=43.677 ac 1.21% Impervious Runoff Depth=0.89"
Tc=24.5 min CN=82/98 Runoff=13.05 cfs 3.239 af

Subcatchment14c{(1)}-Ex: Subcat 14c{(1)}-Ex Runoff Area=30.208 ac 1.61% Impervious Runoff Depth=0.84"
Tc=13.6 min CN=81/98 Runoff=11.56 cfs 2.124 af

Subcatchment14c{(2)}-Ex: Subcat 14c{(2)}-Ex Runoff Area=19.689 ac 0.00% Impervious Runoff Depth=0.64"
Tc=13.2 min CN=77/0 Runoff=4.92 cfs 1.044 af

Subcatchment14c{(3)}-Ex: Subcat 14c{(3)}-Ex Runoff Area=13.782 ac 0.00% Impervious Runoff Depth=0.55"
Tc=12.6 min CN=75/0 Runoff=2.74 cfs 0.636 af

Subcatchment14d-Ex: Subcat 14d-Ex Runoff Area=166.738 ac 0.91% Impervious Runoff Depth=0.79"
Tc=19.4 min CN=80/98 Runoff=47.37 cfs 10.915 af

Subcatchment14e-Ex: Subcat 14e-Ex Runoff Area=10.890 ac 6.05% Impervious Runoff Depth=0.22"
Tc=10.0 min CN=58/98 Runoff=0.82 cfs 0.197 af

Reach 6R: Reach 1c Avg. Flow Depth=0.33' Max Vel=4.26 fps Inflow=8.78 cfs 8.692 af
n=0.024 L=830.0' S=0.0031 '/' Capacity=4,878.97 cfs Outflow=8.78 cfs 8.692 af

Reach 7R: Reach 1b Avg. Flow Depth=1.01' Max Vel=3.17 fps Inflow=56.46 cfs 19.384 af
n=0.024 L=883.0' S=0.0066 '/' Capacity=8,865.90 cfs Outflow=52.49 cfs 19.384 af

Reach 8R: Reach 1a Avg. Flow Depth=1.20' Max Vel=2.38 fps Inflow=52.81 cfs 19.883 af
n=0.024 L=583.0' S=0.0034 '/' Capacity=6,396.21 cfs Outflow=51.34 cfs 19.883 af

Reach 17R: Reach 1d Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.027 L=841.0' S=0.0110 '/' Capacity=1,276.84 cfs Outflow=0.00 cfs 0.000 af

Reach 18R: Linne Road Grassed Chl Avg. Flow Depth=0.44' Max Vel=2.27 fps Inflow=12.12 cfs 7.815 af
n=0.030 L=1,190.0' S=0.0087 '/' Capacity=66.25 cfs Outflow=11.03 cfs 7.815 af

Pond 17P: Gran Cielo Dwy Peak Elev=854.16' Storage=4,940 cf Inflow=47.37 cfs 10.915 af
Primary=46.35 cfs 10.915 af Secondary=0.00 cfs 0.000 af Tertiary=0.00 cfs 0.000 af Outflow=46.35 cfs 10.915 af

Pond 18P: GC-CkD1 Peak Elev=850.77' Storage=36,035 cf Inflow=70.33 cfs 16.278 af
Primary=1.14 cfs 1.454 af Secondary=45.19 cfs 13.651 af Tertiary=19.48 cfs 1.110 af Outflow=65.63 cfs 16.215 af

Pond 19P: GC-CkD2 Peak Elev=849.20' Storage=22,607 cf Inflow=50.30 cfs 16.149 af
Primary=1.26 cfs 1.832 af Secondary=38.35 cfs 13.888 af Tertiary=8.61 cfs 0.427 af Outflow=48.22 cfs 16.147 af

Pond 20P: GC-CkD3 Peak Elev=845.77' Storage=12,910 cf Inflow=41.64 cfs 16.356 af
Primary=5.50 cfs 5.240 af Secondary=6.18 cfs 2.434 af Tertiary=29.57 cfs 8.670 af Outflow=41.26 cfs 16.344 af

Link 3a (1,2+3)-Ex: Comb Un-dev Ck Flow Inflow=51.34 cfs 20.006 af
Primary=51.34 cfs 20.006 af

Link 5L: Outlet To Tract #1632 Ex. 36" SD Inflow=0.96 cfs 0.867 af
Primary=0.96 cfs 0.867 af

Link 6L: To Existing Meadowlark Road Inflow=2.01 cfs 1.852 af
Primary=2.01 cfs 1.852 af

Link 7L: DMA 13 Inflow=14.61 cfs 2.738 af
Primary=14.61 cfs 2.738 af

Link 8L: DMA 8 Inflow=0.39 cfs 0.356 af
Primary=0.39 cfs 0.356 af

Link 9L: DMA 12 Inflow=0.30 cfs 0.254 af
Primary=0.30 cfs 0.254 af

Link 10L: To Linne Road Channel Inflow=12.12 cfs 7.815 af
Primary=12.12 cfs 7.815 af

Link 11L: To Fontana Road SD Inflow=18.93 cfs 5.872 af
Primary=18.93 cfs 5.872 af

Link 15L: Sherwood/NiblickLP Xing Inflow=20.94 cfs 4.080 af
Primary=20.94 cfs 4.080 af

Link 16L: Airport & Linne Road SD Inflow=23.19 cfs 12.092 af
Primary=23.19 cfs 12.092 af

Link 19L: 14c(0+1)-Ex Inflow=24.54 cfs 5.363 af
Primary=24.54 cfs 5.363 af

Link 22L: Linne Rd OvertoppingEx.Flow #2and#3 Inflow=38.07 cfs 9.098 af
Primary=38.07 cfs 9.098 af

Link 23L: Linne Rd Overtop #1 Inflow=19.48 cfs 1.110 af
Primary=19.48 cfs 1.110 af

Total Runoff Area = 1,810.455 ac Runoff Volume = 40.765 af Average Runoff Depth = 0.27"
99.44% Pervious = 1,800.345 ac 0.56% Impervious = 10.110 ac

Summary for Subcatchment 1: Subcat 1

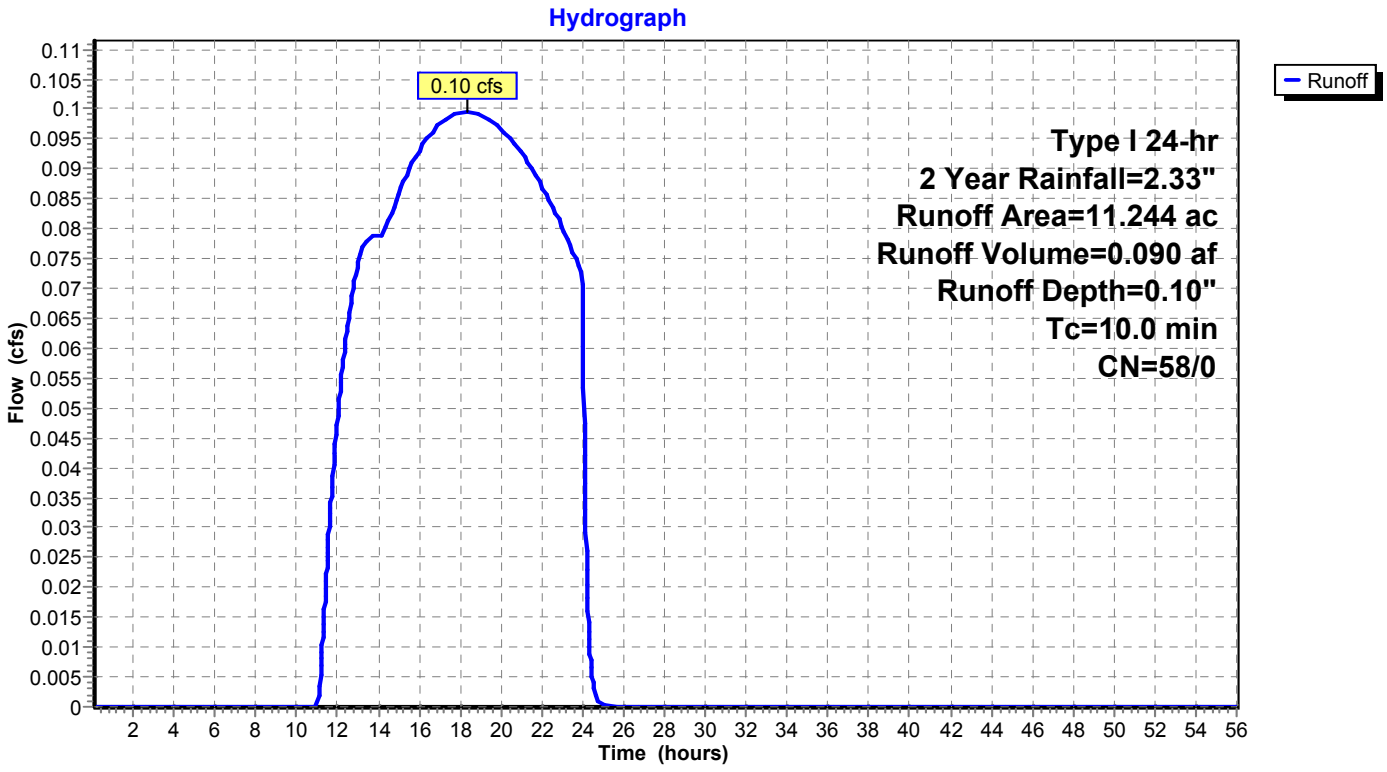
Runoff = 0.10 cfs @ 18.34 hrs, Volume= 0.090 af, Depth= 0.10"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
11.244	58	Meadow, non-grazed, HSG B
11.244	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9					**Direct Entry, SCS per Catchment Area CAD Info**
9.9	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

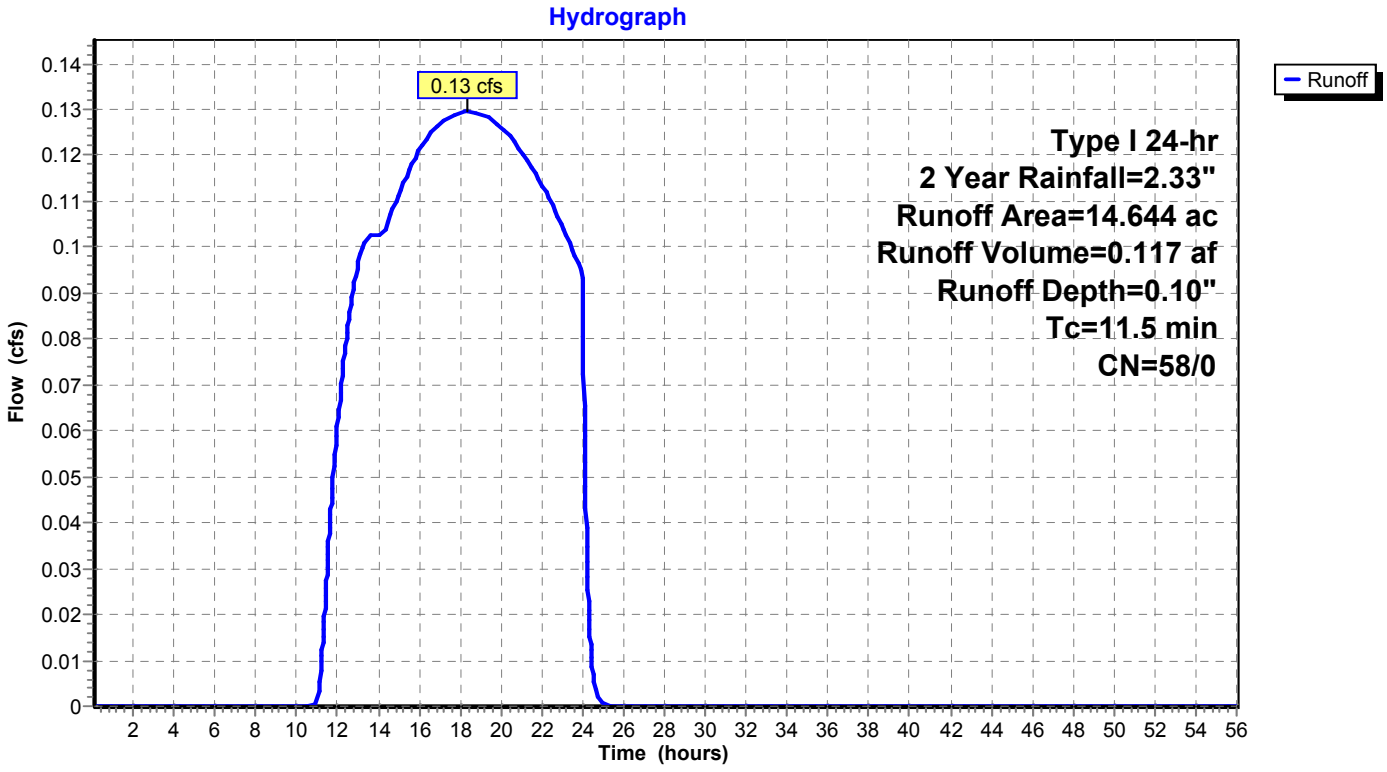
Runoff = 0.13 cfs @ 18.37 hrs, Volume= 0.117 af, Depth= 0.10"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
0.574	58	Meadow, non-grazed, HSG B
14.070	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
14.644	58	Weighted Average
14.644	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5					**Direct Entry, SCS per Catchment Area CAD Info**

Subcatchment 2: Subcat 2



Summary for Subcatchment 3: Subcat 3

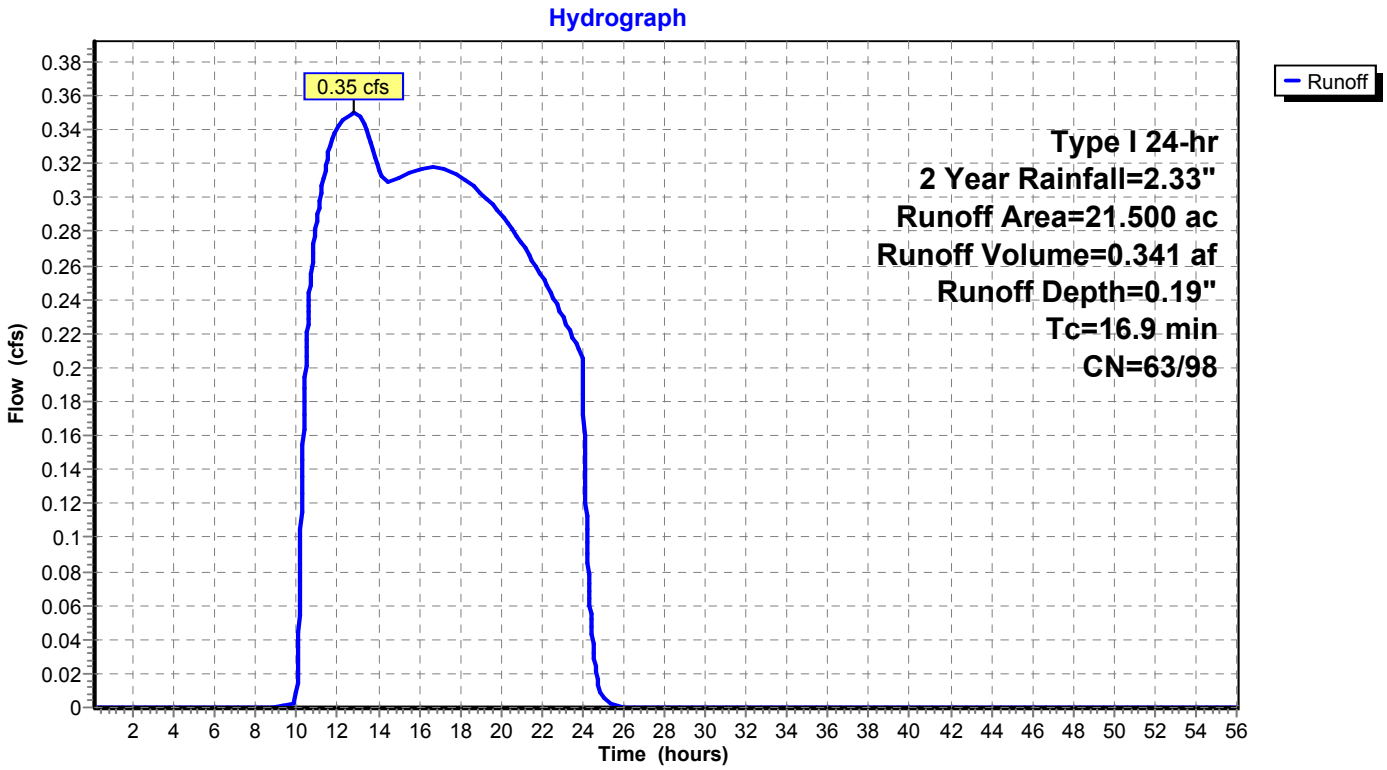
Runoff = 0.35 cfs @ 12.76 hrs, Volume= 0.341 af, Depth= 0.19"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
4.338	58	Meadow, non-grazed, HSG B
8.761	58	Meadow, non-grazed, HSG B
8.398	71	Meadow, non-grazed, HSG C
0.003	98	Paved roads w/curbs & sewers, HSG C
21.500	63	Weighted Average
21.497	63	99.98% Pervious Area
0.003	98	0.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.9					**Direct Entry, SCS per Catchment Area CAD Info**

Subcatchment 3: Subcat 3



Summary for Subcatchment 3a{(1)}-Ex: Subcat 3a{(1)}-Ex

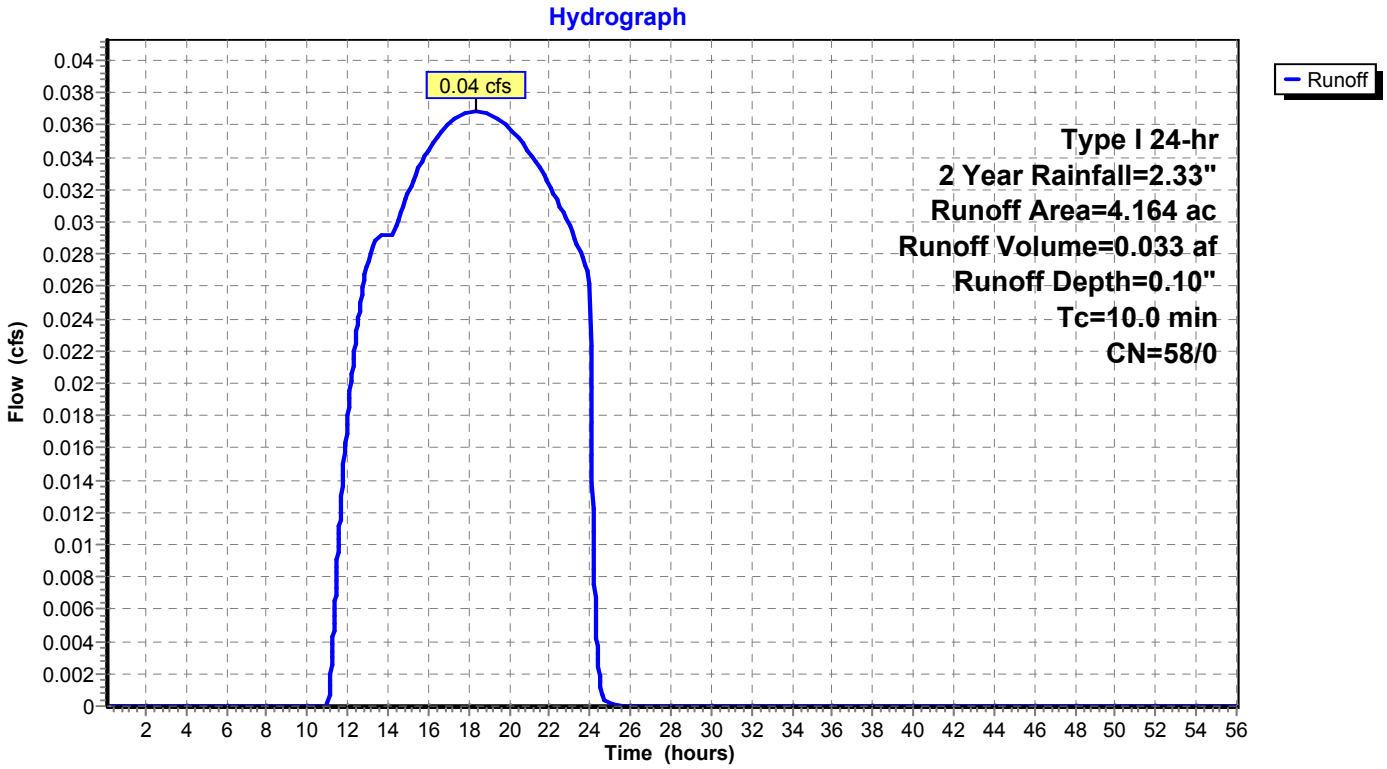
Runoff = 0.04 cfs @ 18.34 hrs, Volume= 0.033 af, Depth= 0.10"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
2.302	58	Meadow, non-grazed, HSG B
1.861	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
4.164	58	Weighted Average
4.164	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1					**Direct Entry,**
6.1	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 3a{(1)}-Ex: Subcat 3a{(1)}-Ex



Summary for Subcatchment 3a{(2)}-Ex: Subcat 3a{(2)}-Ex

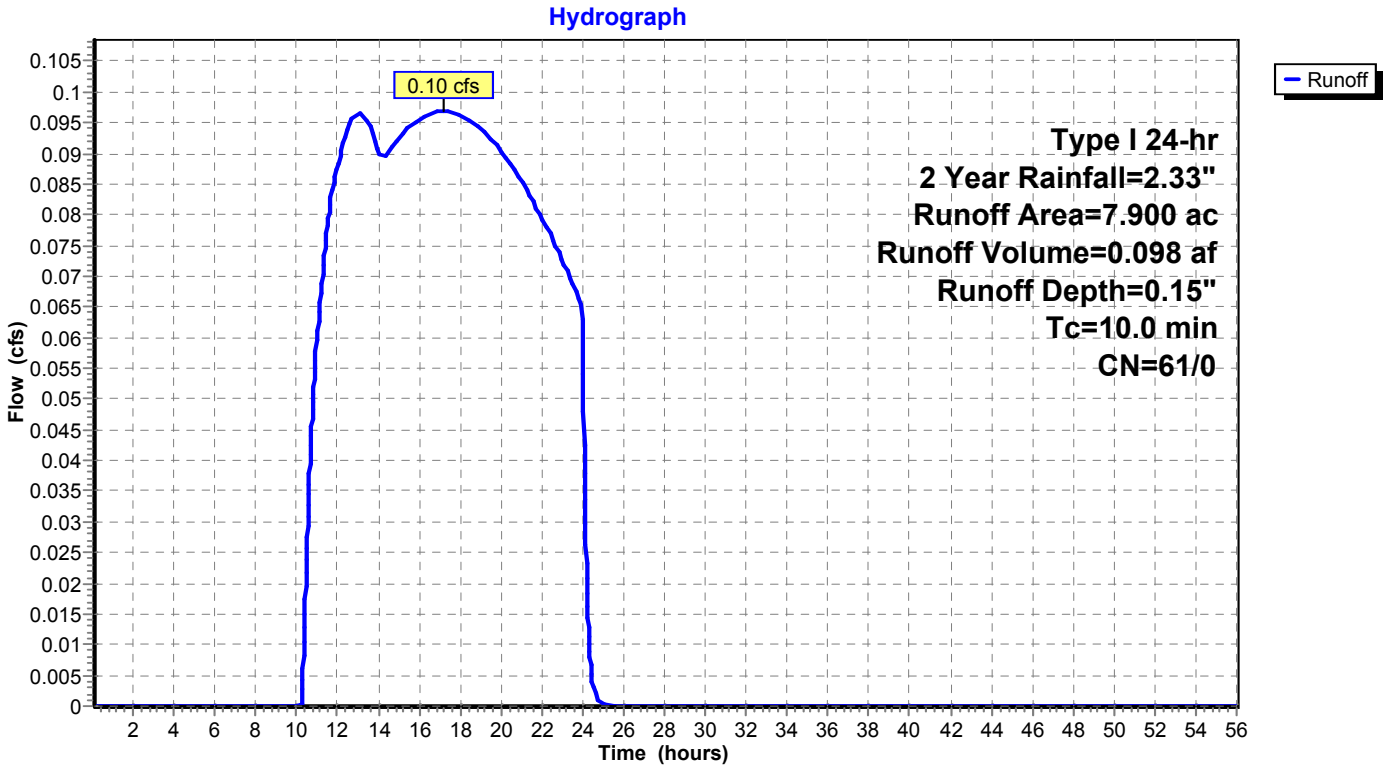
Runoff = 0.10 cfs @ 17.16 hrs, Volume= 0.098 af, Depth= 0.15"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
3.124	58	Meadow, non-grazed, HSG B
2.841	58	Meadow, non-grazed, HSG B
1.936	71	Meadow, non-grazed, HSG C
7.900	61	Weighted Average
7.900	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1					**Direct Entry,**
6.1	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 3a{(2)}-Ex: Subcat 3a{(2)}-Ex



Summary for Subcatchment 3a{(3)}-Ex: Subcat 3a{(3)}-Ex

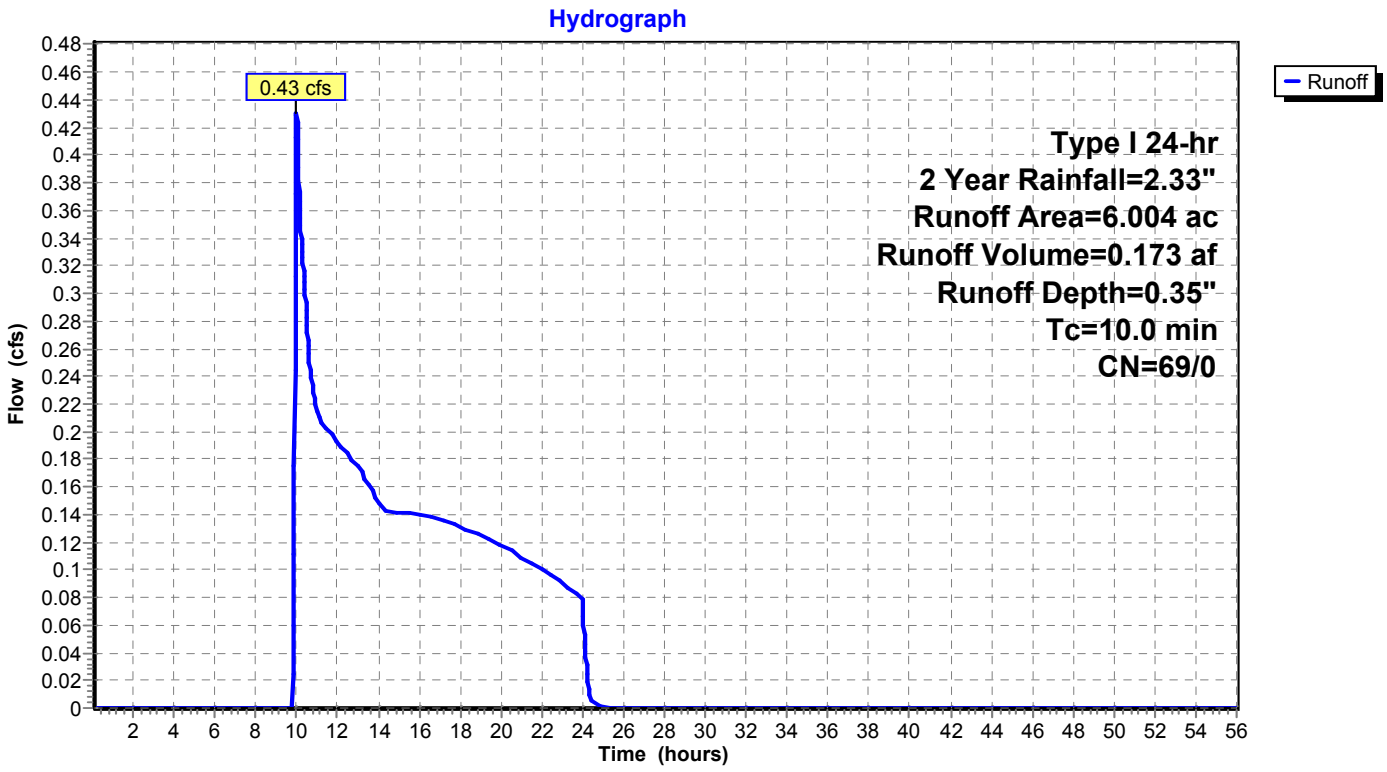
Runoff = 0.43 cfs @ 10.00 hrs, Volume= 0.173 af, Depth= 0.35"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
1.129	58	Meadow, non-grazed, HSG B
4.876	71	Meadow, non-grazed, HSG C
6.004	69	Weighted Average
6.004	69	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1					**Direct Entry, 14c{(2)}-Ex**
6.1	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 3a{(3)}-Ex: Subcat 3a{(3)}-Ex



Summary for Subcatchment 3b-Ex: Subcat 3b-Ex

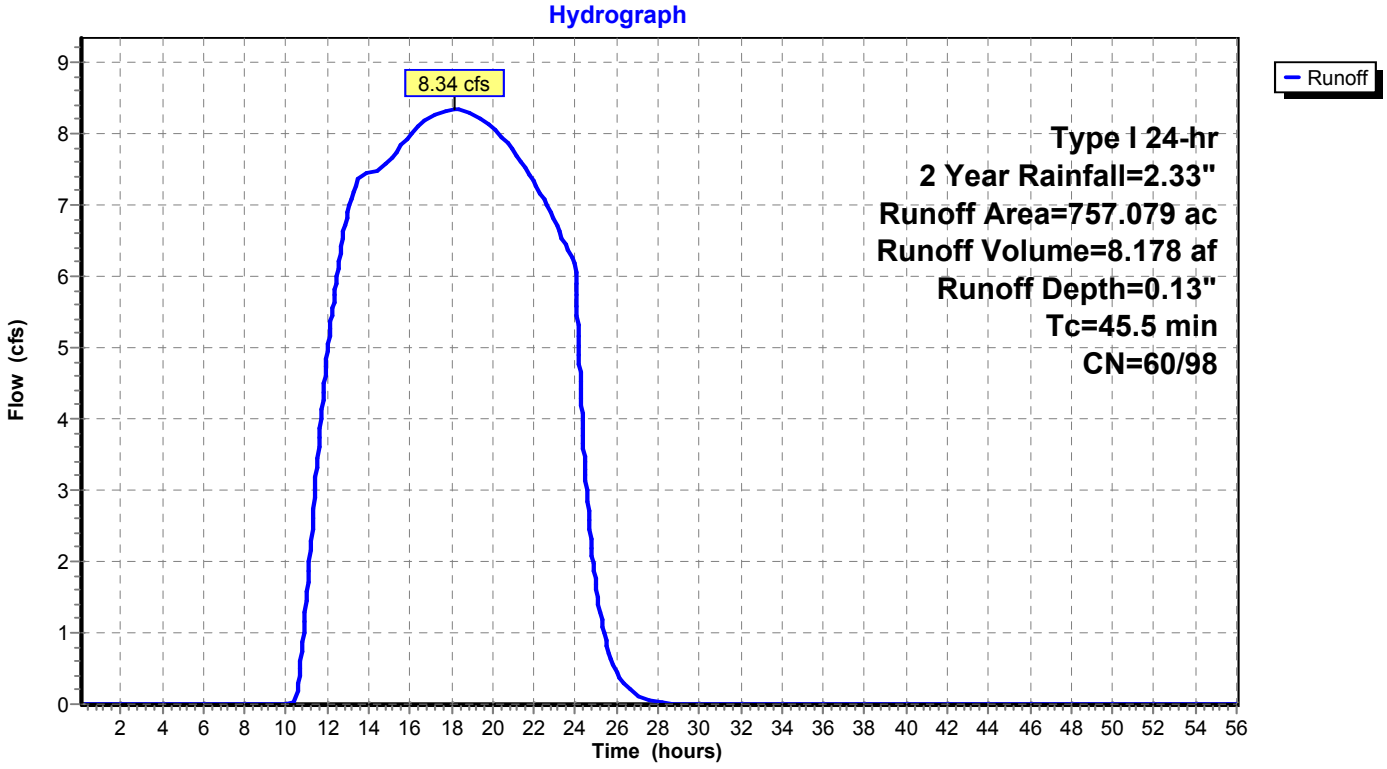
Runoff = 8.34 cfs @ 18.14 hrs, Volume= 8.178 af, Depth= 0.13"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
234.658	58	Meadow, non-grazed, HSG B
36.169	58	Meadow, non-grazed, HSG B
0.022	58	Meadow, non-grazed, HSG B
51.779	58	Meadow, non-grazed, HSG B
10.304	58	Meadow, non-grazed, HSG B
28.620	58	Meadow, non-grazed, HSG B
28.650	58	Meadow, non-grazed, HSG B
67.424	58	Meadow, non-grazed, HSG B
203.020	58	Meadow, non-grazed, HSG B
26.053	71	Meadow, non-grazed, HSG C
12.803	71	Meadow, non-grazed, HSG C
44.268	71	Meadow, non-grazed, HSG C
13.308	71	Meadow, non-grazed, HSG C
0.001	98	Paved roads w/curbs & sewers, HSG C
757.079	60	Weighted Average
757.078	60	100.00% Pervious Area
0.001	98	0.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
45.5					**Direct Entry, SCS Method taken from Catchment in ACAD file**

Subcatchment 3b-Ex: Subcat 3b-Ex



Summary for Subcatchment 4: Subcat 4

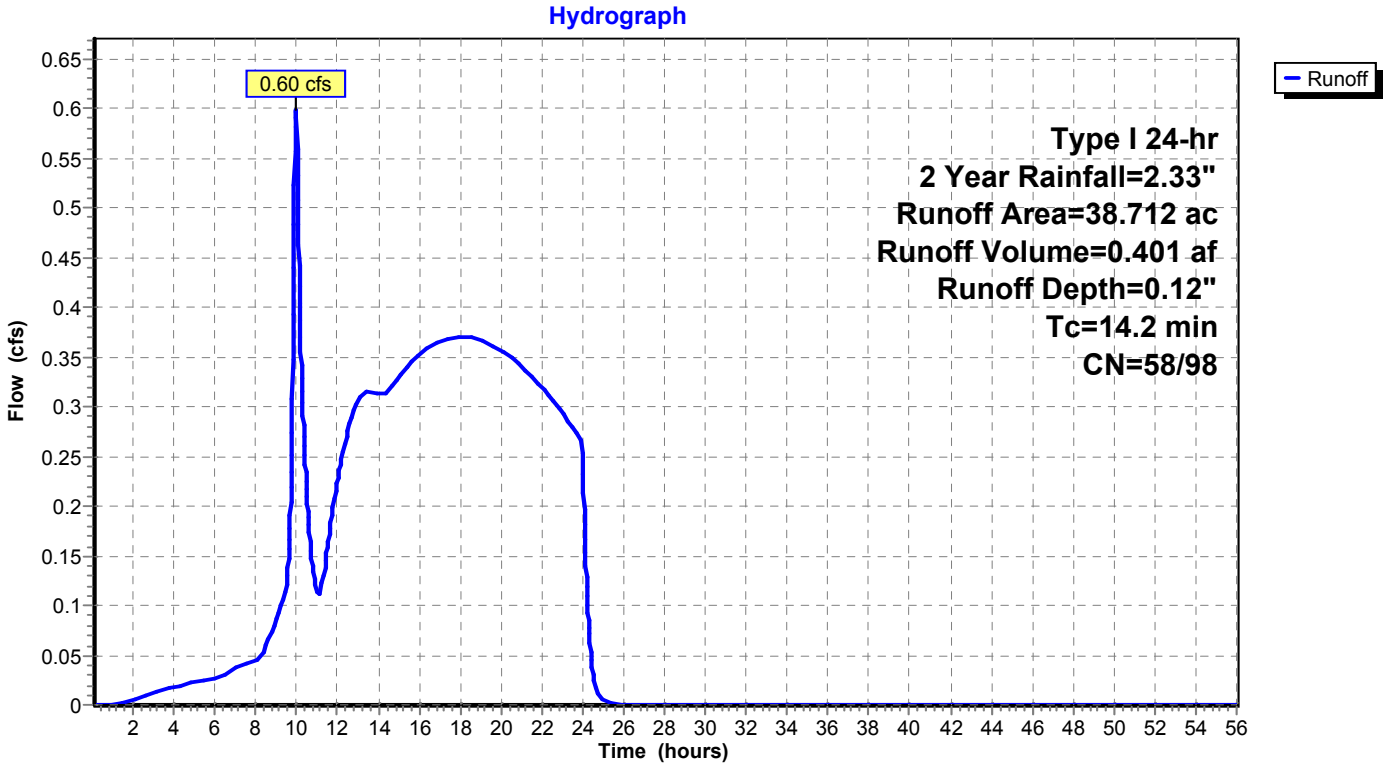
Runoff = 0.60 cfs @ 9.97 hrs, Volume= 0.401 af, Depth= 0.12"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
2.765	68	1 acre lots, 20% imp, HSG B
0.000	58	Meadow, non-grazed, HSG B
7.644	58	Meadow, non-grazed, HSG B
0.126	58	Meadow, non-grazed, HSG B
5.342	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
20.803	58	Meadow, non-grazed, HSG B
0.971	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
1.061	58	Meadow, non-grazed, HSG B
38.712	59	Weighted Average
38.159	58	98.57% Pervious Area
0.553	98	1.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 4: Subcat 4



Summary for Subcatchment 5: Subcat 5

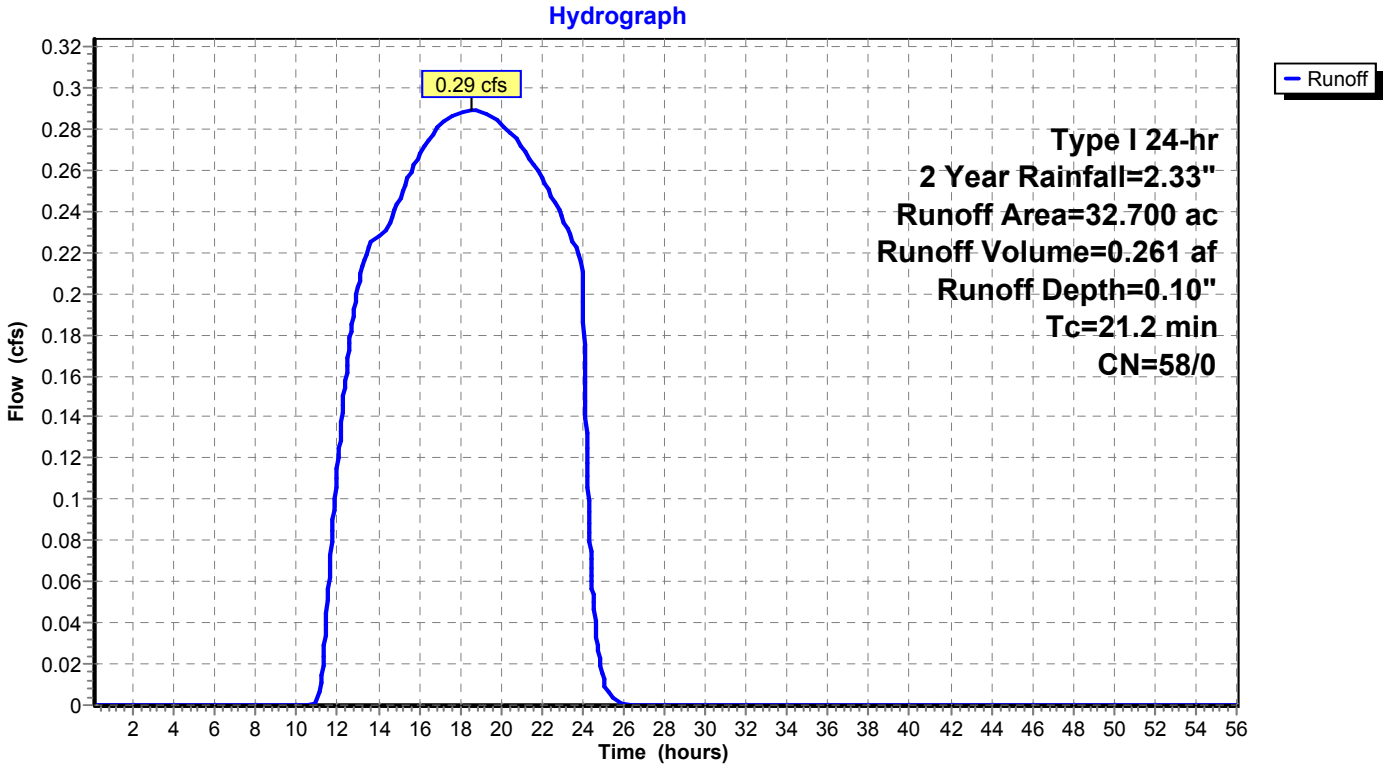
Runoff = 0.29 cfs @ 18.54 hrs, Volume= 0.261 af, Depth= 0.10"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
9.224	58	Meadow, non-grazed, HSG B
23.476	58	Meadow, non-grazed, HSG B
32.700	58	Weighted Average
32.700	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.2					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 5: Subcat 5



Summary for Subcatchment 6: Subcat 6

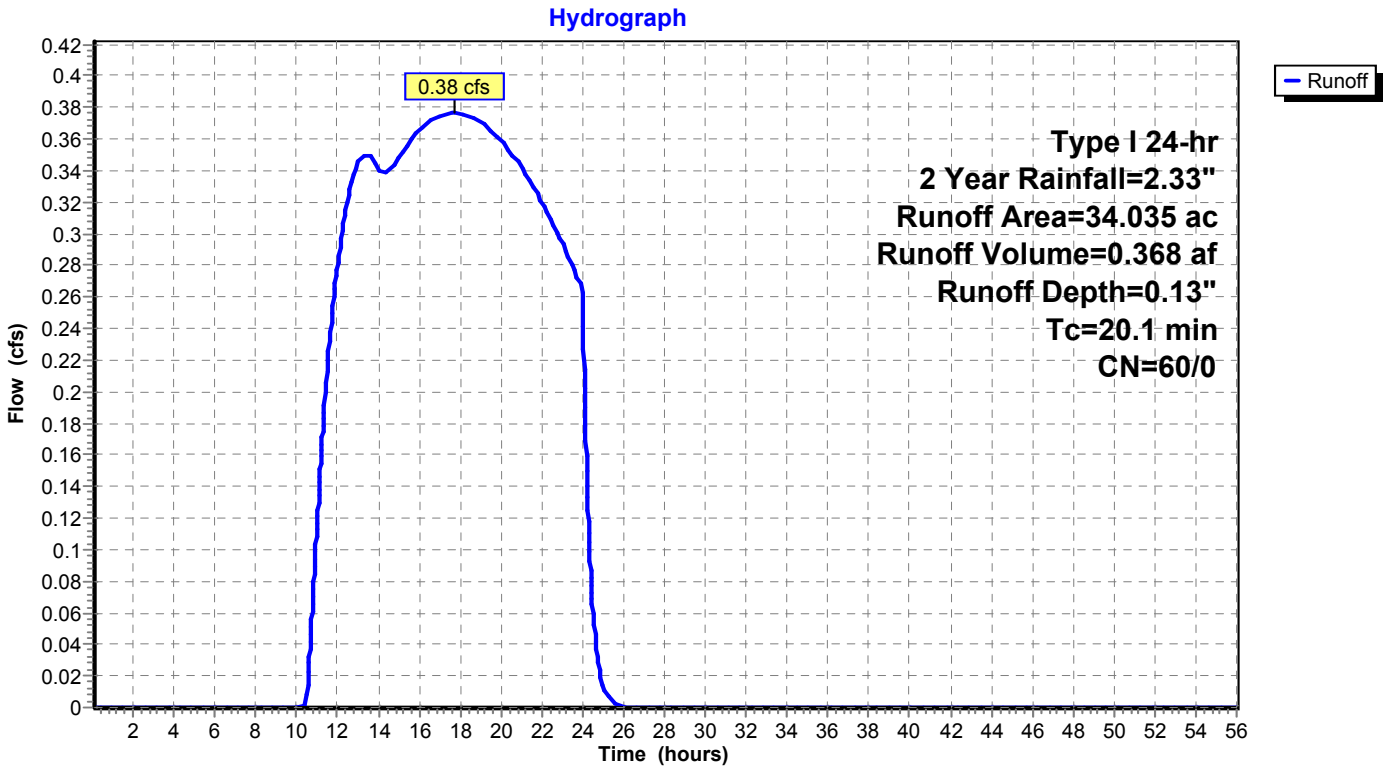
Runoff = 0.38 cfs @ 17.71 hrs, Volume= 0.368 af, Depth= 0.13"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
23.646	58	Meadow, non-grazed, HSG B
0.010	58	Meadow, non-grazed, HSG B
0.081	58	Meadow, non-grazed, HSG B
4.046	58	Meadow, non-grazed, HSG B
2.192	58	Meadow, non-grazed, HSG B
4.059	71	Meadow, non-grazed, HSG C
34.035	60	Weighted Average
34.035	60	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.1					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 6: Subcat 6



Summary for Subcatchment 7: Subcat 7

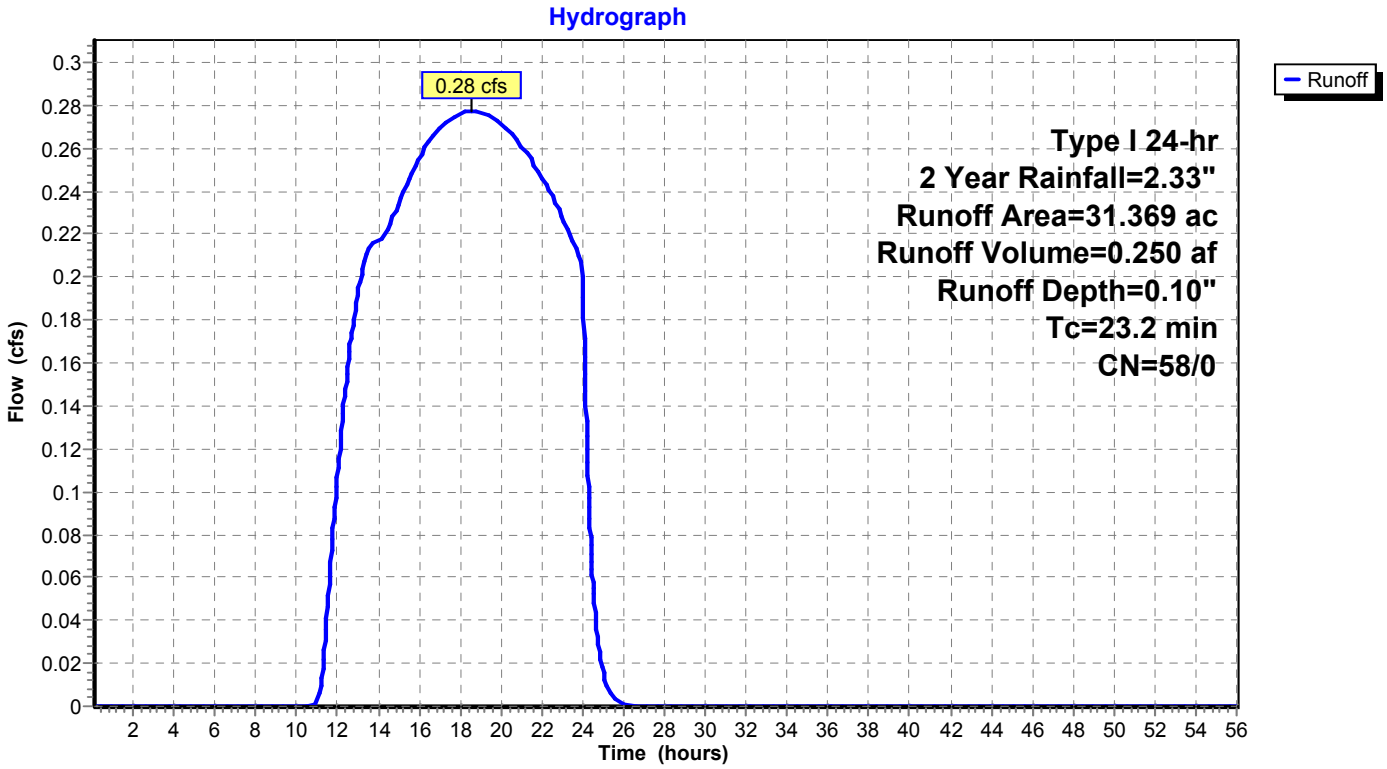
Runoff = 0.28 cfs @ 18.57 hrs, Volume= 0.250 af, Depth= 0.10"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
4.398	58	Meadow, non-grazed, HSG B
11.983	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
14.988	58	Meadow, non-grazed, HSG B
31.369	58	Weighted Average
31.369	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.2					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 7: Subcat 7



Summary for Subcatchment 8: Subcat 8

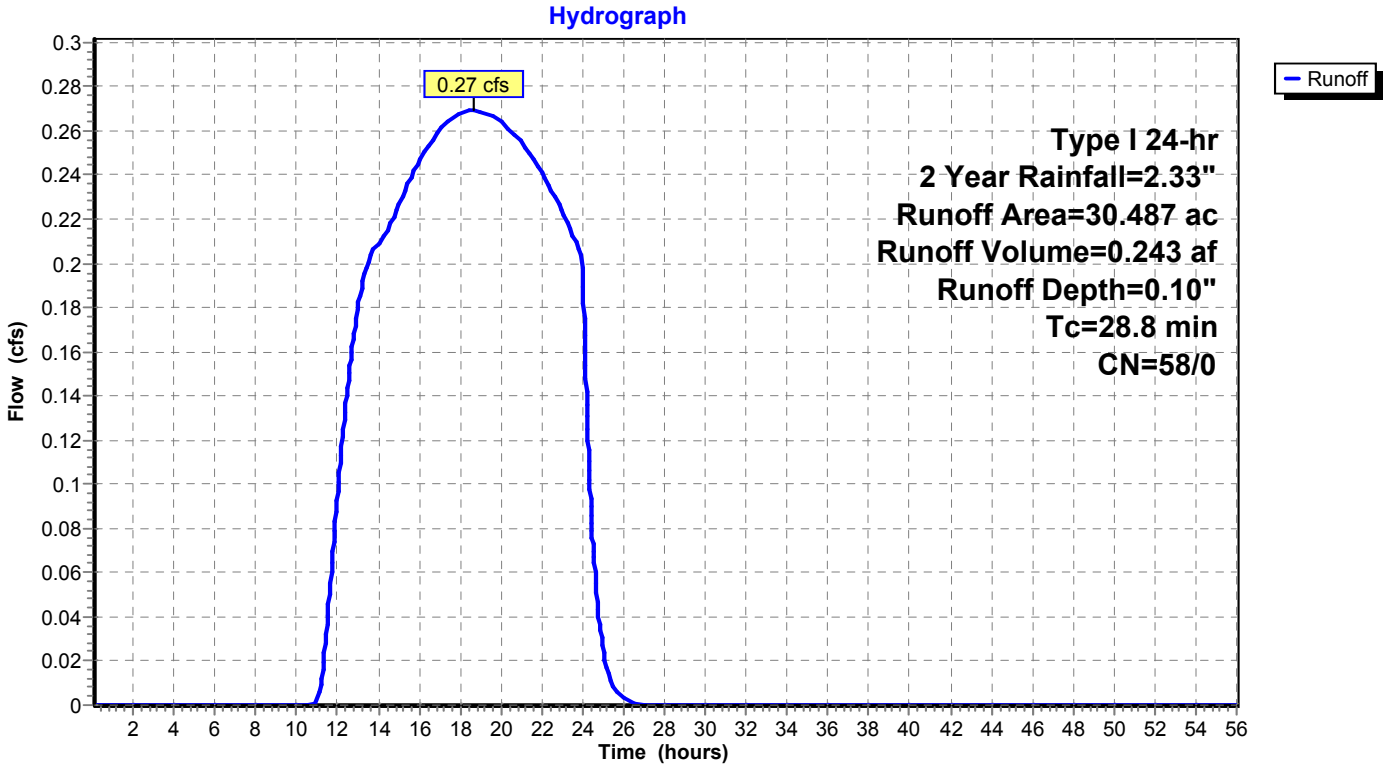
Runoff = 0.27 cfs @ 18.67 hrs, Volume= 0.243 af, Depth= 0.10"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
1.331	58	Meadow, non-grazed, HSG B
29.156	58	Meadow, non-grazed, HSG B
30.487	58	Weighted Average
30.487	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 8: Subcat 8



Summary for Subcatchment 8a-Ex: Subcat 8a-Ex

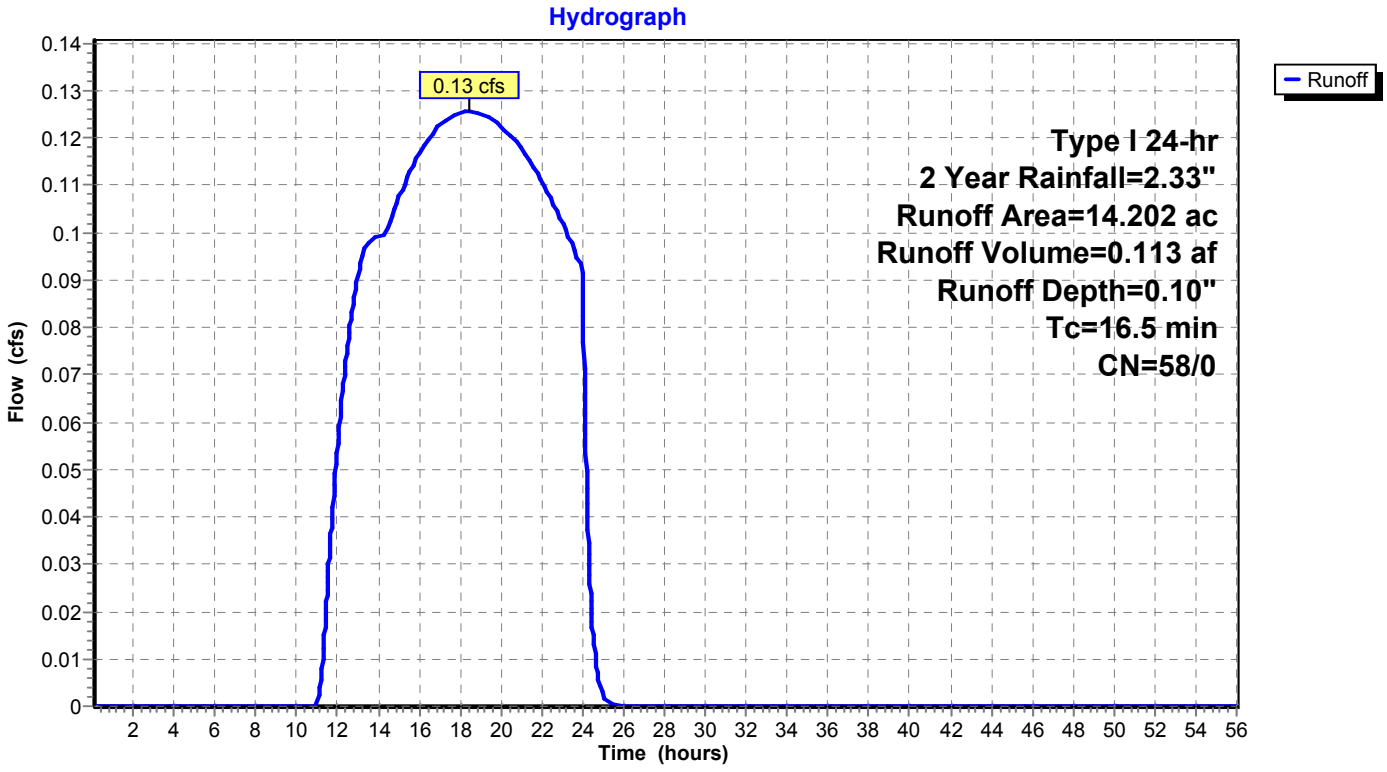
Runoff = 0.13 cfs @ 18.45 hrs, Volume= 0.113 af, Depth= 0.10"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
2.036	58	Meadow, non-grazed, HSG B
7.264	58	Meadow, non-grazed, HSG B
4.903	58	Meadow, non-grazed, HSG B
14.202	58	Weighted Average
14.202	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.5					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 8a-Ex: Subcat 8a-Ex



Summary for Subcatchment 9: Subcat 9

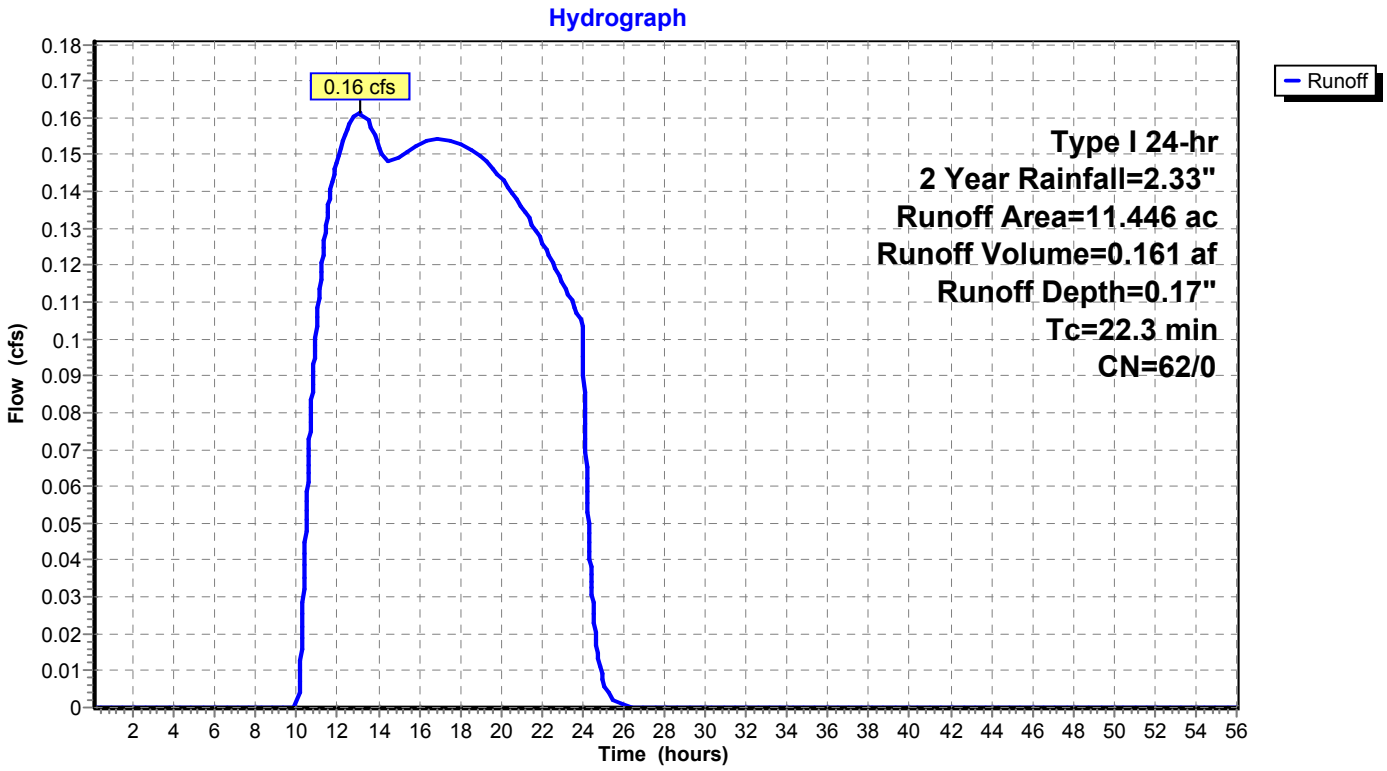
Runoff = 0.16 cfs @ 13.06 hrs, Volume= 0.161 af, Depth= 0.17"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
0.006	58	Meadow, non-grazed, HSG B
8.451	58	Meadow, non-grazed, HSG B
0.026	58	Meadow, non-grazed, HSG B
0.469	58	Meadow, non-grazed, HSG B
0.005	58	Meadow, non-grazed, HSG B
2.489	78	Meadow, non-grazed, HSG D
11.446	62	Weighted Average
11.446	62	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.3					**Direct Entry, Tc from CAD Catchments (SCS Method)**

Subcatchment 9: Subcat 9



Summary for Subcatchment 9a-Ex: Subcat 9a-Ex

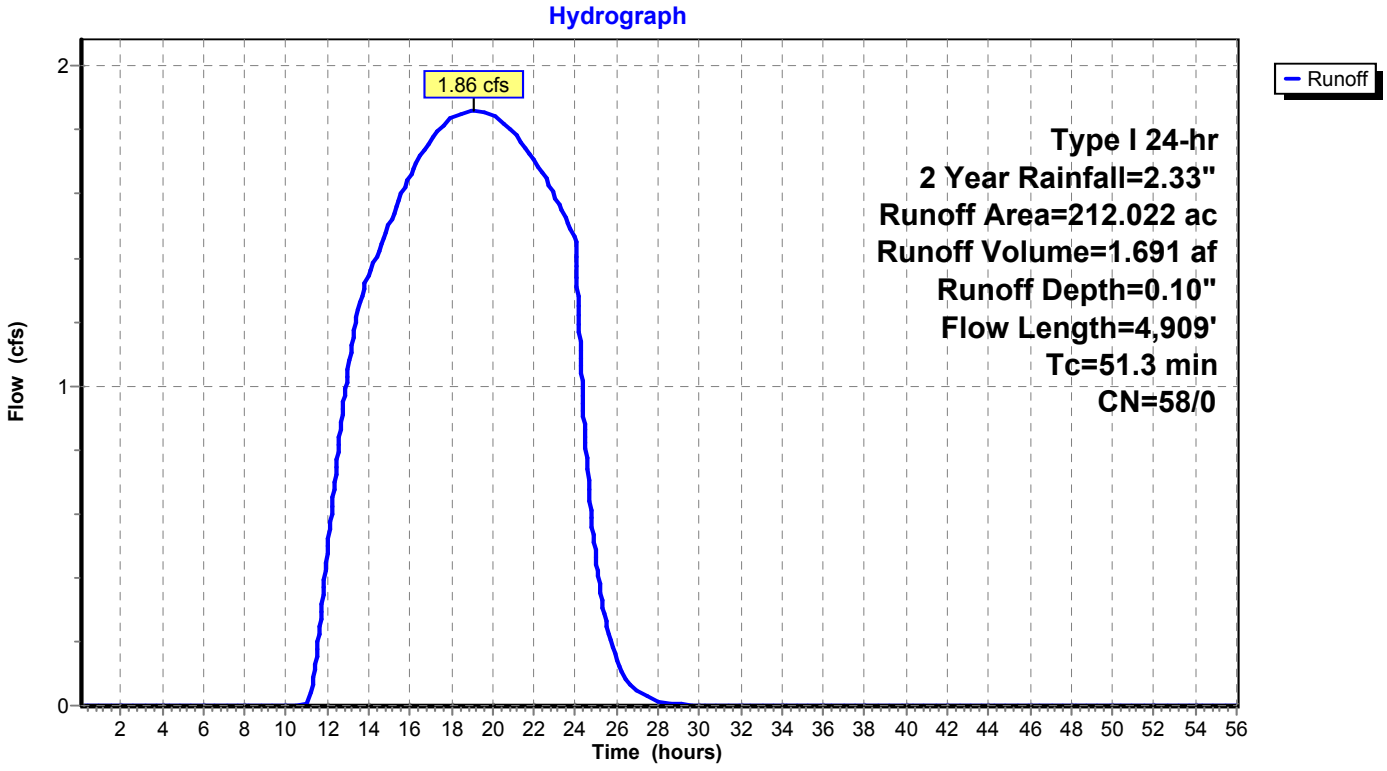
Runoff = 1.86 cfs @ 19.07 hrs, Volume= 1.691 af, Depth= 0.10"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
16.535	58	Meadow, non-grazed, HSG B
38.755	58	Meadow, non-grazed, HSG B
2.915	58	Meadow, non-grazed, HSG B
114.179	58	Meadow, non-grazed, HSG B
31.194	58	Meadow, non-grazed, HSG B
8.131	58	Meadow, non-grazed, HSG B
0.314	78	Meadow, non-grazed, HSG D
212.022	58	Weighted Average
212.022	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
51.3	4,909		1.59		**Direct Entry, SCS Method taken from Catchment in ACAD file**

Subcatchment 9a-Ex: Subcat 9a-Ex



Summary for Subcatchment 10: Subcat 10

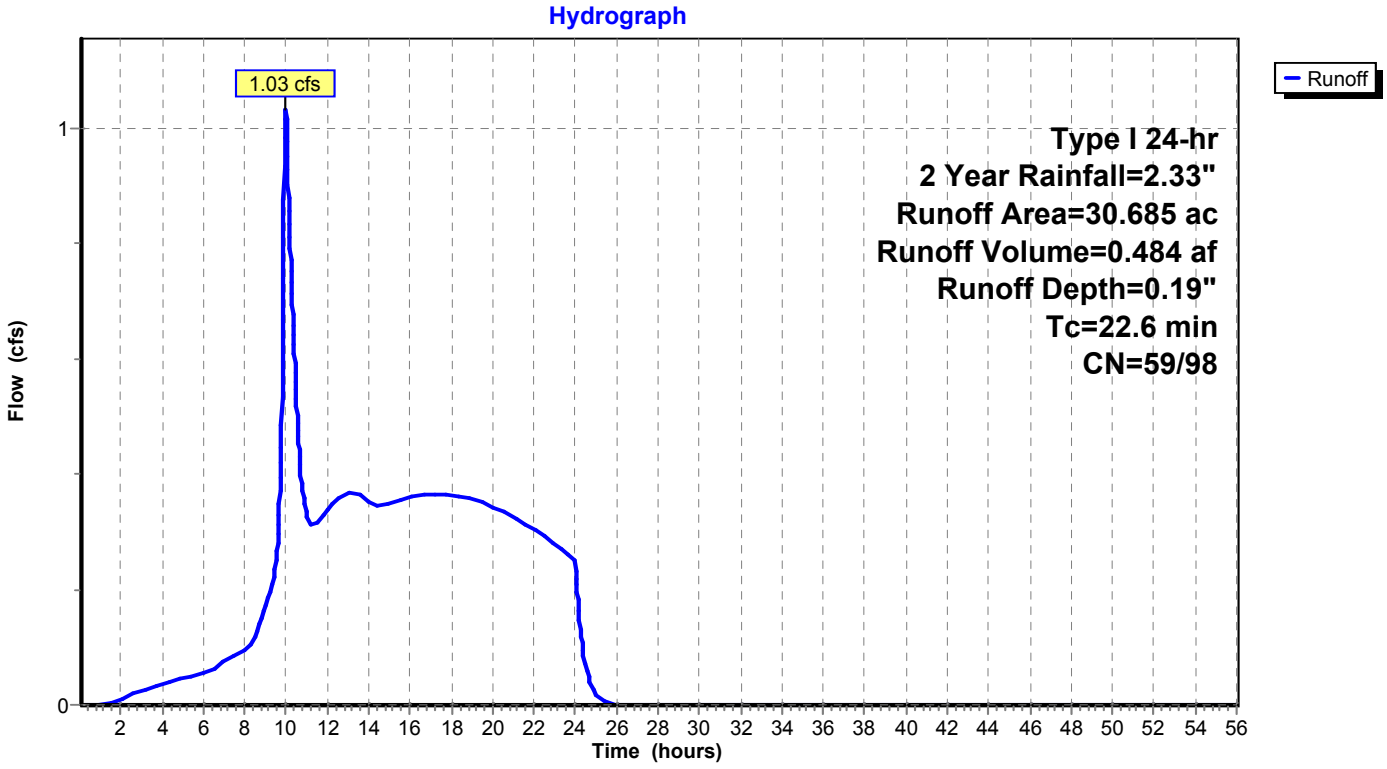
Runoff = 1.03 cfs @ 9.99 hrs, Volume= 0.484 af, Depth= 0.19"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
5.865	58	Meadow, non-grazed, HSG B
22.679	58	Meadow, non-grazed, HSG B
0.039	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.039	71	Meadow, non-grazed, HSG C
0.175	77	Natural western desert, HSG B
0.700	77	Natural western desert, HSG B
1.189	98	Paved roads w/curbs & sewers, HSG B
30.685	60	Weighted Average
29.496	59	96.12% Pervious Area
1.189	98	3.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.6					**Direct Entry, SCS Method taken from Catchment in ACAD file**

Subcatchment 10: Subcat 10



Summary for Subcatchment 10a-Ex: Subcat 10a-Ex

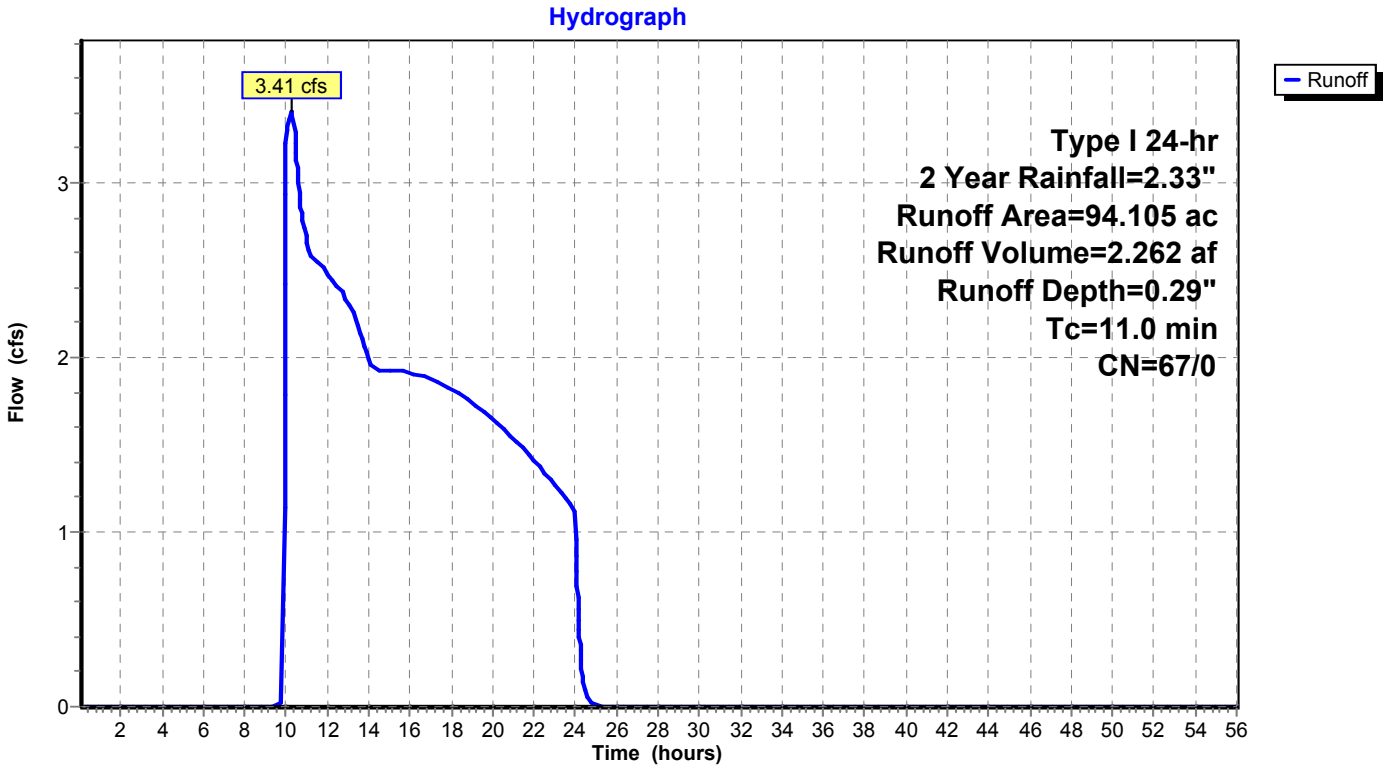
Runoff = 3.41 cfs @ 10.27 hrs, Volume= 2.262 af, Depth= 0.29"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
0.173	58	Meadow, non-grazed, HSG B
9.477	58	Meadow, non-grazed, HSG B
11.002	58	Meadow, non-grazed, HSG B
0.163	58	Meadow, non-grazed, HSG B
0.158	58	Meadow, non-grazed, HSG B
10.113	58	Meadow, non-grazed, HSG B
48.708	71	Meadow, non-grazed, HSG C
14.310	71	Meadow, non-grazed, HSG C
94.105	67	Weighted Average
94.105	67	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0					**Direct Entry, SCS Method taken from Catchment in ACAD file**

Subcatchment 10a-Ex: Subcat 10a-Ex



Summary for Subcatchment 11: Subcat 11

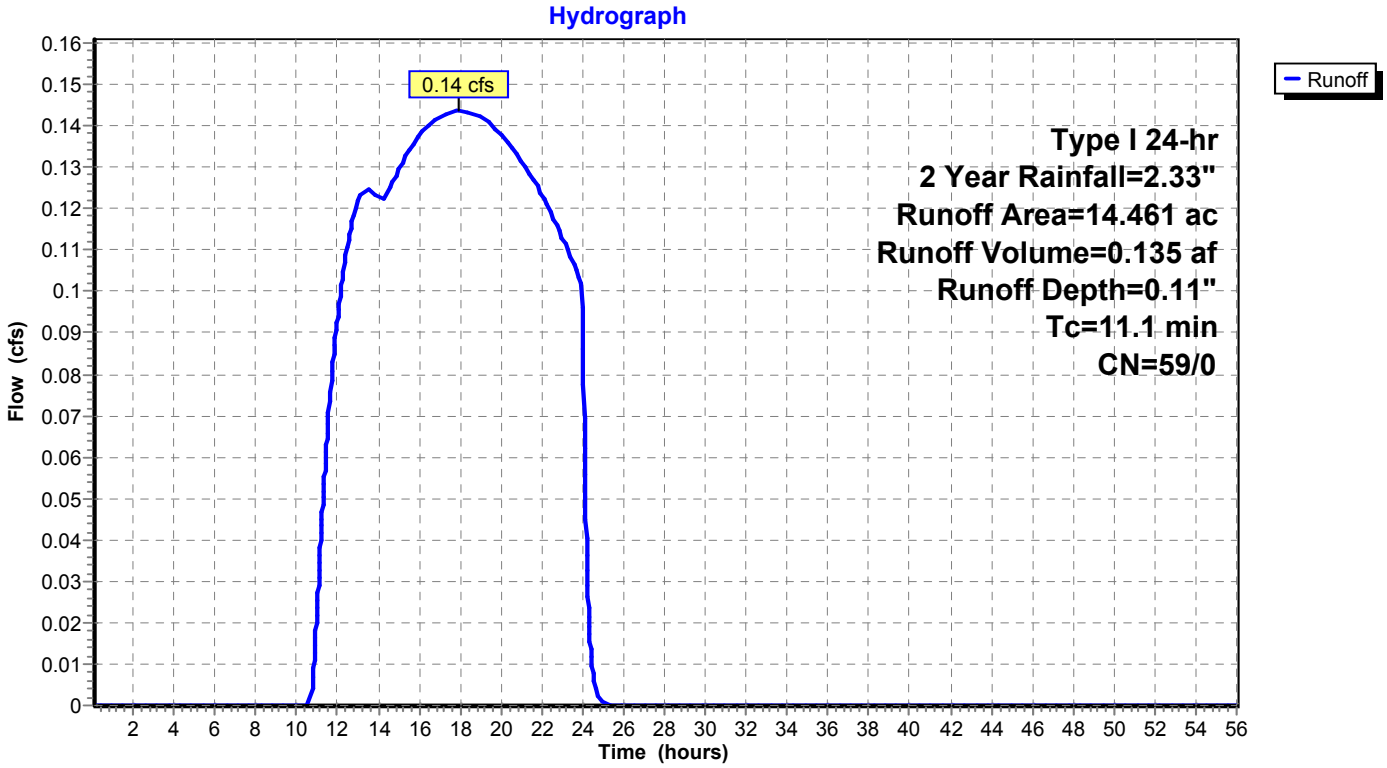
Runoff = 0.14 cfs @ 17.95 hrs, Volume= 0.135 af, Depth= 0.11"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
0.000	58	Meadow, non-grazed, HSG B
0.328	58	Meadow, non-grazed, HSG B
13.072	58	Meadow, non-grazed, HSG B
0.762	71	Meadow, non-grazed, HSG C
0.298	71	Meadow, non-grazed, HSG C
14.461	59	Weighted Average
14.461	59	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1					**Direct Entry, SCS Method taken from Catchment in ACAD file**

Subcatchment 11: Subcat 11



Summary for Subcatchment 12: Subcat 12

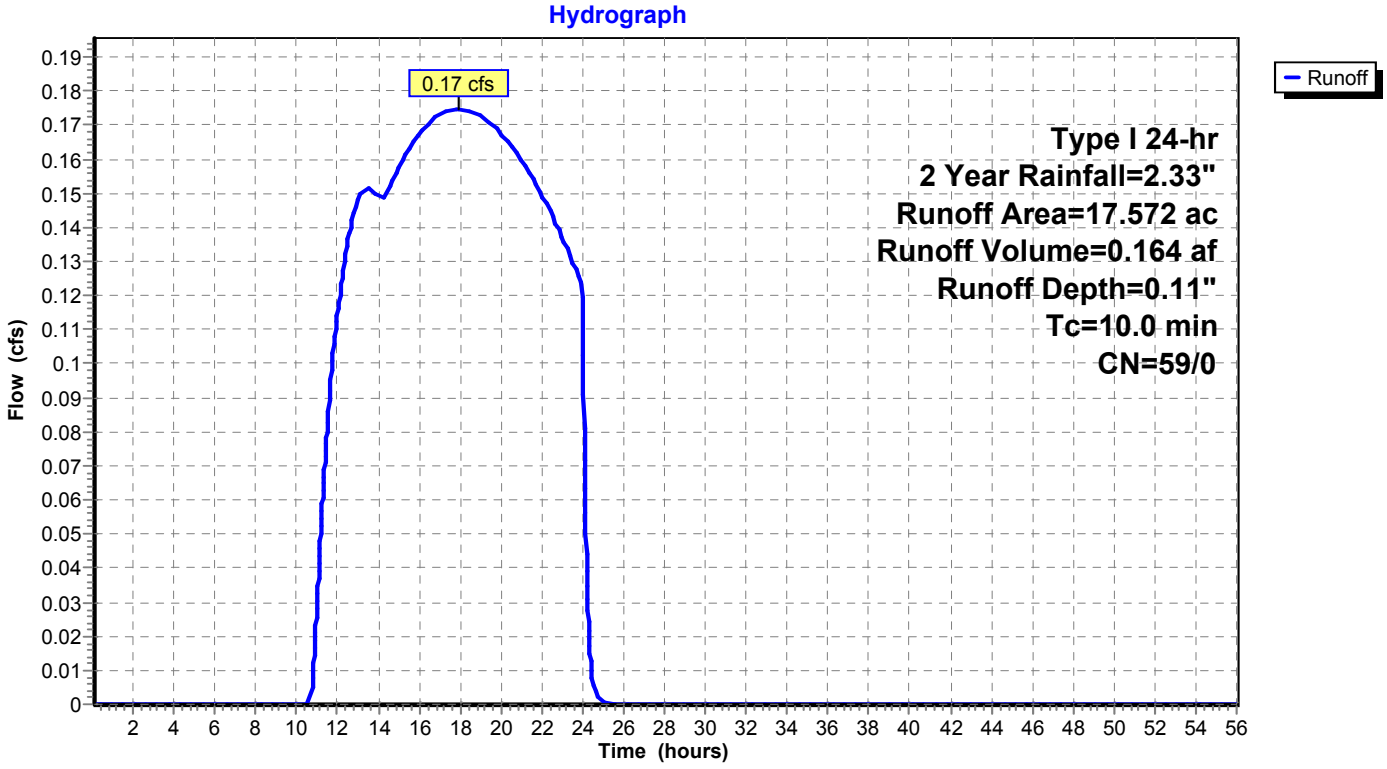
Runoff = 0.17 cfs @ 17.93 hrs, Volume= 0.164 af, Depth= 0.11"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
0.000	58	Meadow, non-grazed, HSG B
0.977	58	Meadow, non-grazed, HSG B
15.916	58	Meadow, non-grazed, HSG B
0.001	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.000	71	Meadow, non-grazed, HSG C
0.223	71	Meadow, non-grazed, HSG C
0.456	71	Meadow, non-grazed, HSG C
17.572	59	Weighted Average
17.572	59	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9					**Direct Entry, SCS Method taken from Catchment in ACAD file**
7.9	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 12: Subcat 12



Summary for Subcatchment 12a-Ex: Subcat 12a-Ex

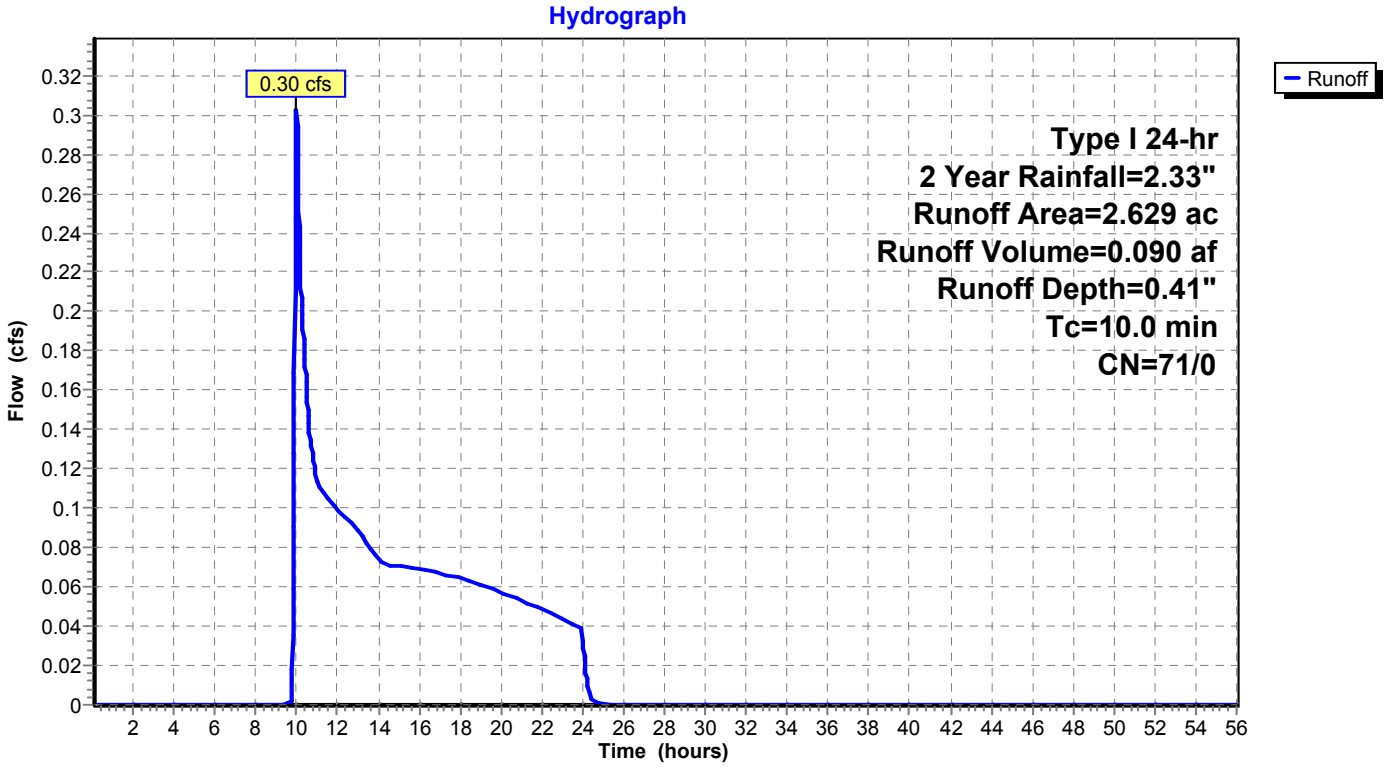
Runoff = 0.30 cfs @ 10.00 hrs, Volume= 0.090 af, Depth= 0.41"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
2.629	71	Meadow, non-grazed, HSG C
2.629	71	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9					**Direct Entry, SCS Method taken from Catchment in ACAD file**
4.9	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 12a-Ex: Subcat 12a-Ex



Summary for Subcatchment 13: Subcat 13

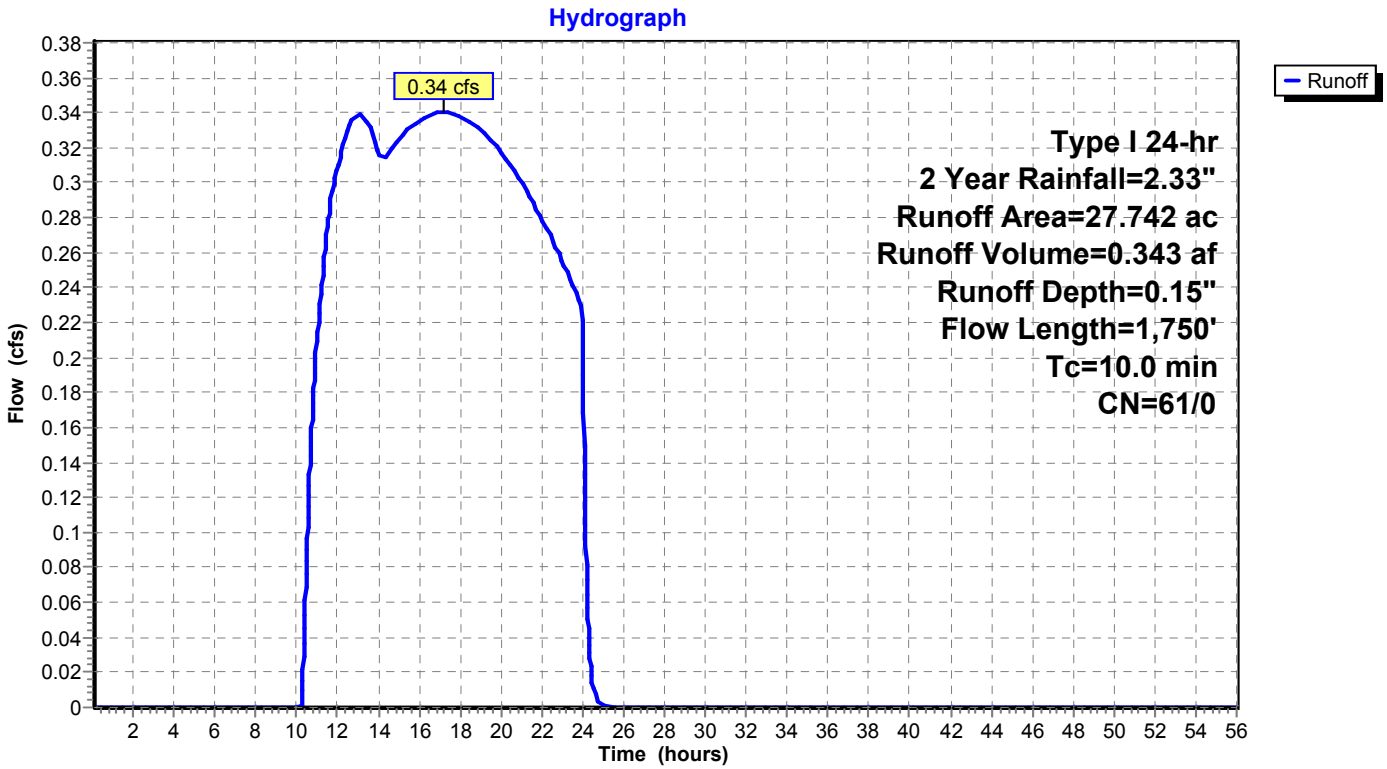
Runoff = 0.34 cfs @ 17.16 hrs, Volume= 0.343 af, Depth= 0.15"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
15.931	58	Meadow, non-grazed, HSG B
4.853	58	Meadow, non-grazed, HSG B
0.000	71	Meadow, non-grazed, HSG C
6.330	71	Meadow, non-grazed, HSG C
0.477	71	Meadow, non-grazed, HSG C
0.151	75	Row crops, SR + CR, Good, HSG B
27.742	61	Weighted Average
27.742	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	1,750		3.74		**Direct Entry, SCS Method taken from Catchment in ACAD file**
7.8	1,750	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 13: Subcat 13



Summary for Subcatchment 13a-Ex: Subcat 13a-Ex

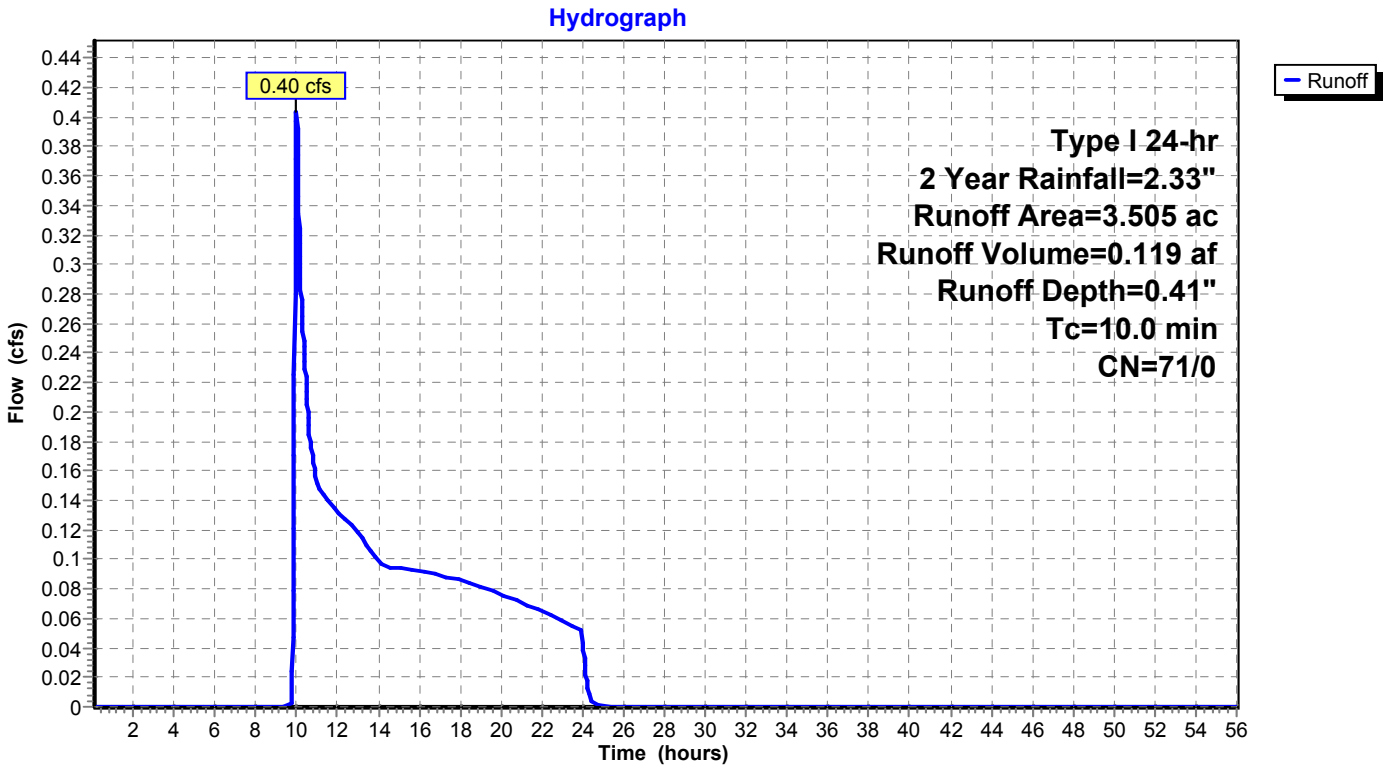
Runoff = 0.40 cfs @ 10.00 hrs, Volume= 0.119 af, Depth= 0.41"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
3.505	71	Meadow, non-grazed, HSG C
3.505	71	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9					**Direct Entry, SCS Method taken from Catchment in ACAD file**
8.9	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 13a-Ex: Subcat 13a-Ex



Summary for Subcatchment 13b-Ex: Subcat 13b-Ex

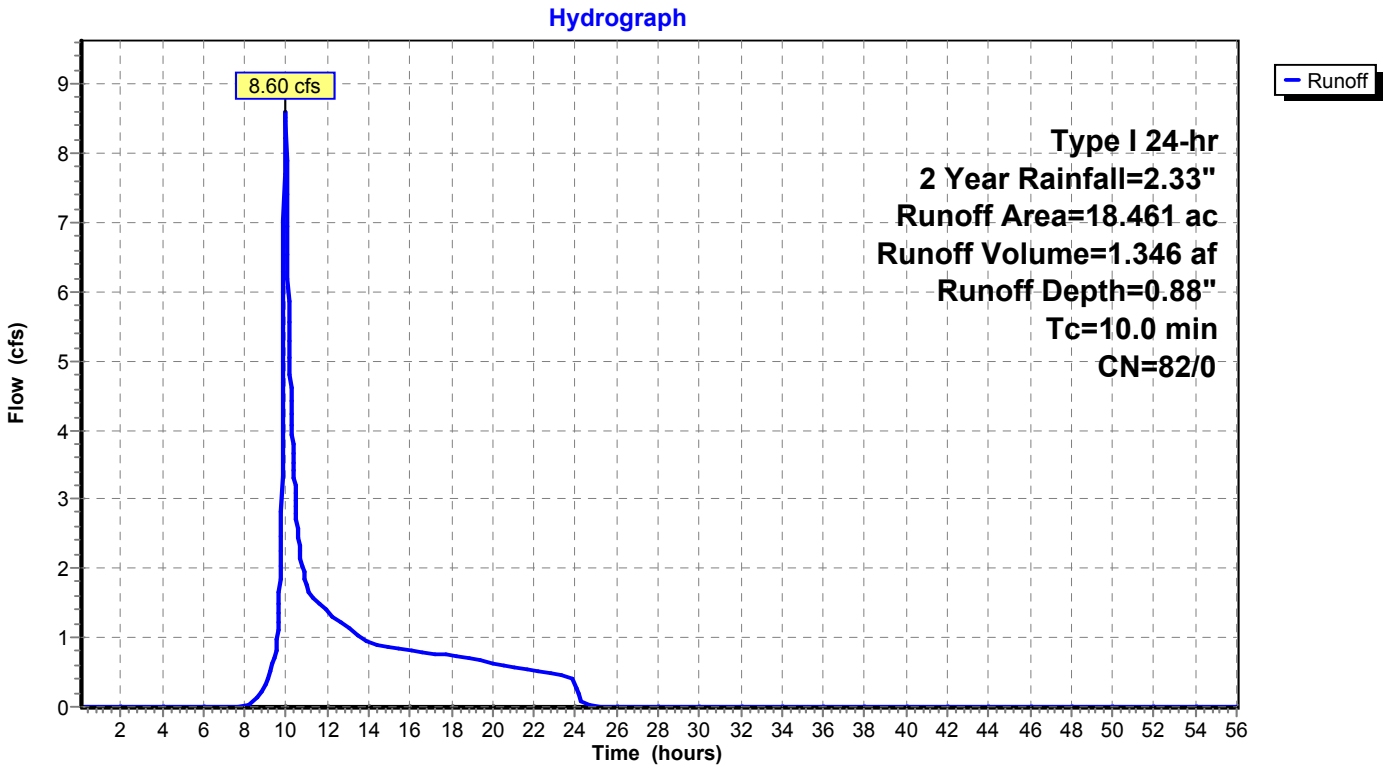
Runoff = 8.60 cfs @ 9.97 hrs, Volume= 1.346 af, Depth= 0.88"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
18.461	82	Row crops, SR + CR, Good, HSG C
18.461	82	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry, SCS Method taken from Catchment in ACAD file**
7.0	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 13b-Ex: Subcat 13b-Ex



Summary for Subcatchment 13c-Ex: Subcat 13c-Ex

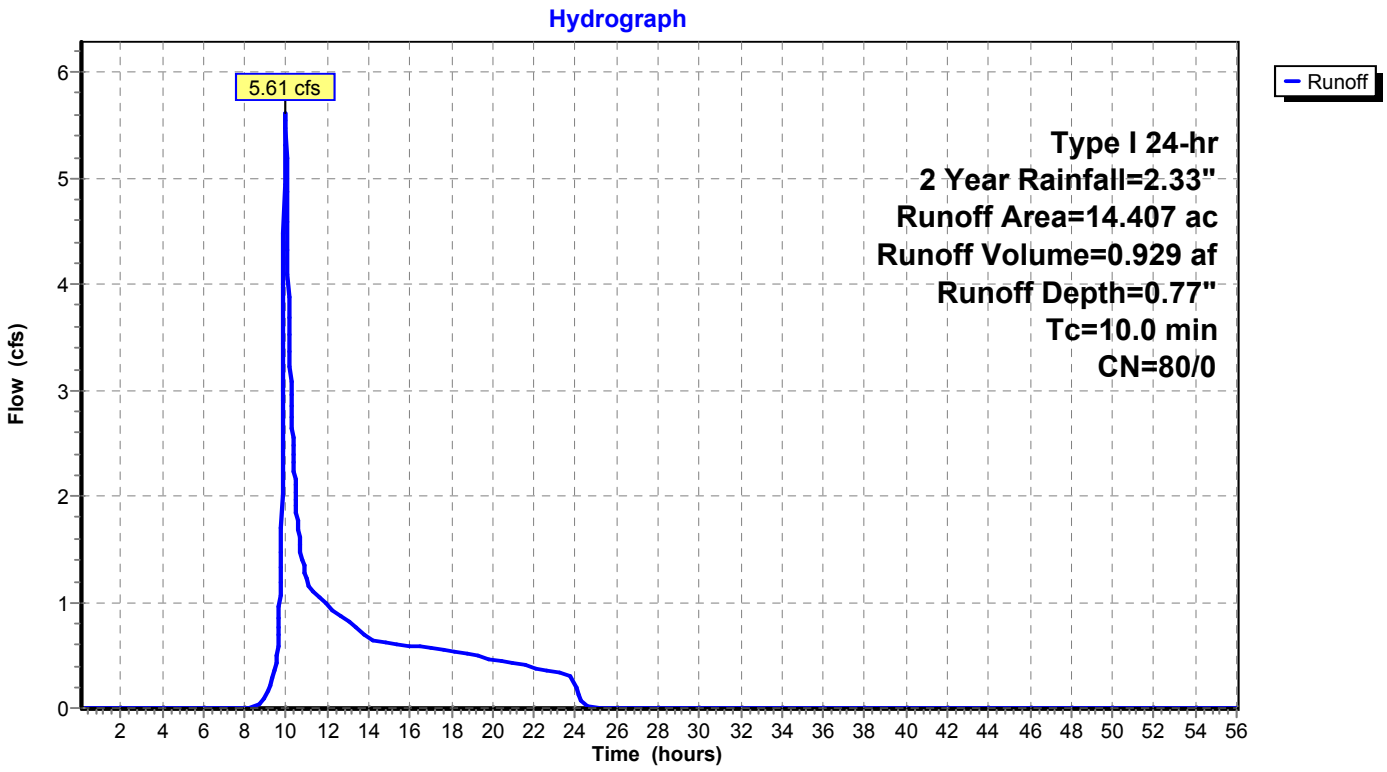
Runoff = 5.61 cfs @ 9.98 hrs, Volume= 0.929 af, Depth= 0.77"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
3.718	75	Row crops, SR + CR, Good, HSG B
10.689	82	Row crops, SR + CR, Good, HSG C
14.407	80	Weighted Average
14.407	80	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9					**Direct Entry, SCS Method taken from Catchment in ACAD file**
6.9	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 13c-Ex: Subcat 13c-Ex



Summary for Subcatchment 14: Subcat 14

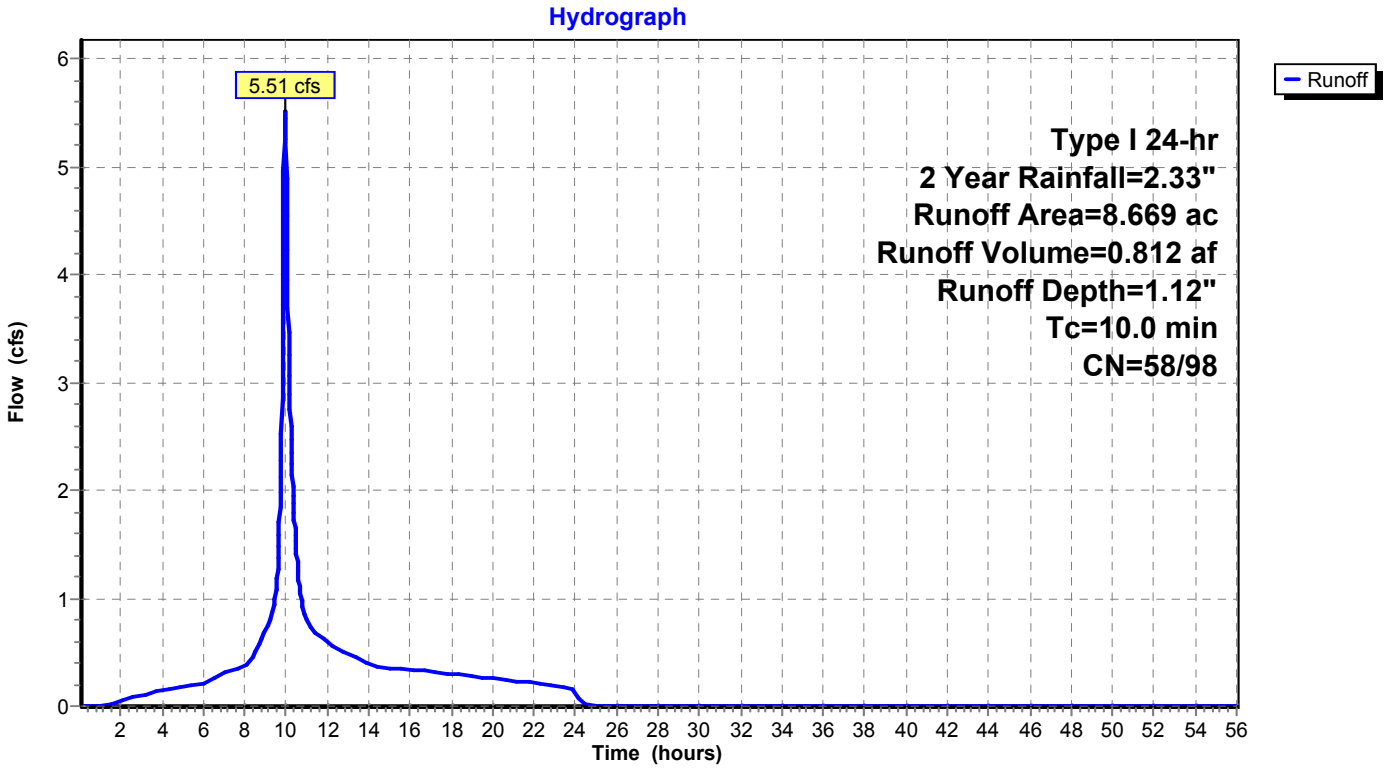
Runoff = 5.51 cfs @ 9.96 hrs, Volume= 0.812 af, Depth= 1.12"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
4.224	58	Meadow, non-grazed, HSG B
4.445	98	Paved roads w/curbs & sewers, HSG B
8.669	79	Weighted Average
4.224	58	48.73% Pervious Area
4.445	98	51.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6					**Direct Entry, SCS Method taken from Catchment in ACAD file**
8.6	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 14: Subcat 14



Summary for Subcatchment 14a{(1)}-Ex: Subcat 14a{(1)}-Ex

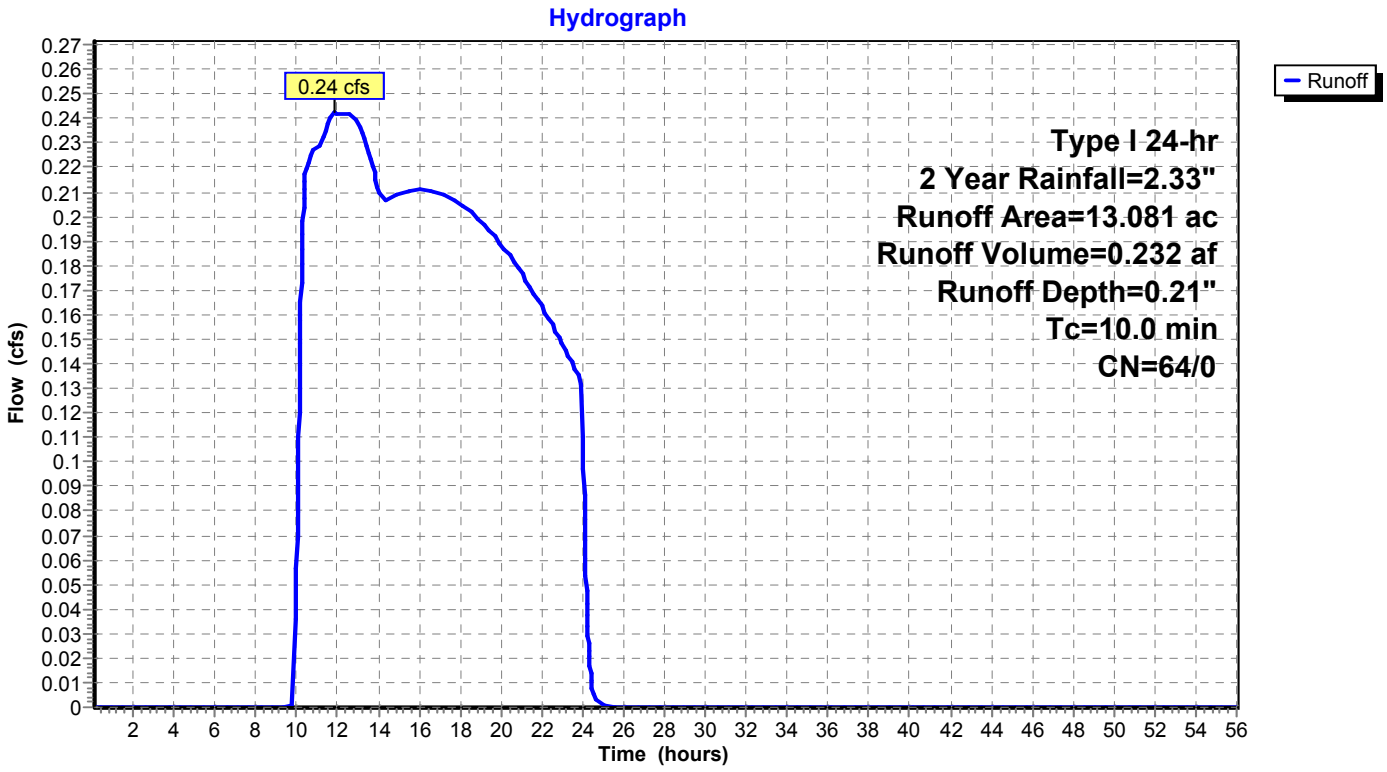
Runoff = 0.24 cfs @ 11.89 hrs, Volume= 0.232 af, Depth= 0.21"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
0.000	58	Meadow, non-grazed, HSG B
8.116	58	Meadow, non-grazed, HSG B
2.383	75	Row crops, SR + CR, Good, HSG B
0.000	75	Row crops, SR + CR, Good, HSG B
2.581	75	Row crops, SR + CR, Good, HSG B
13.081	64	Weighted Average
13.081	64	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**
8.7	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 14a{(1)}-Ex: Subcat 14a{(1)}-Ex



Summary for Subcatchment 14a{(2)}-Ex: Subcat 14a{(2)}-Ex

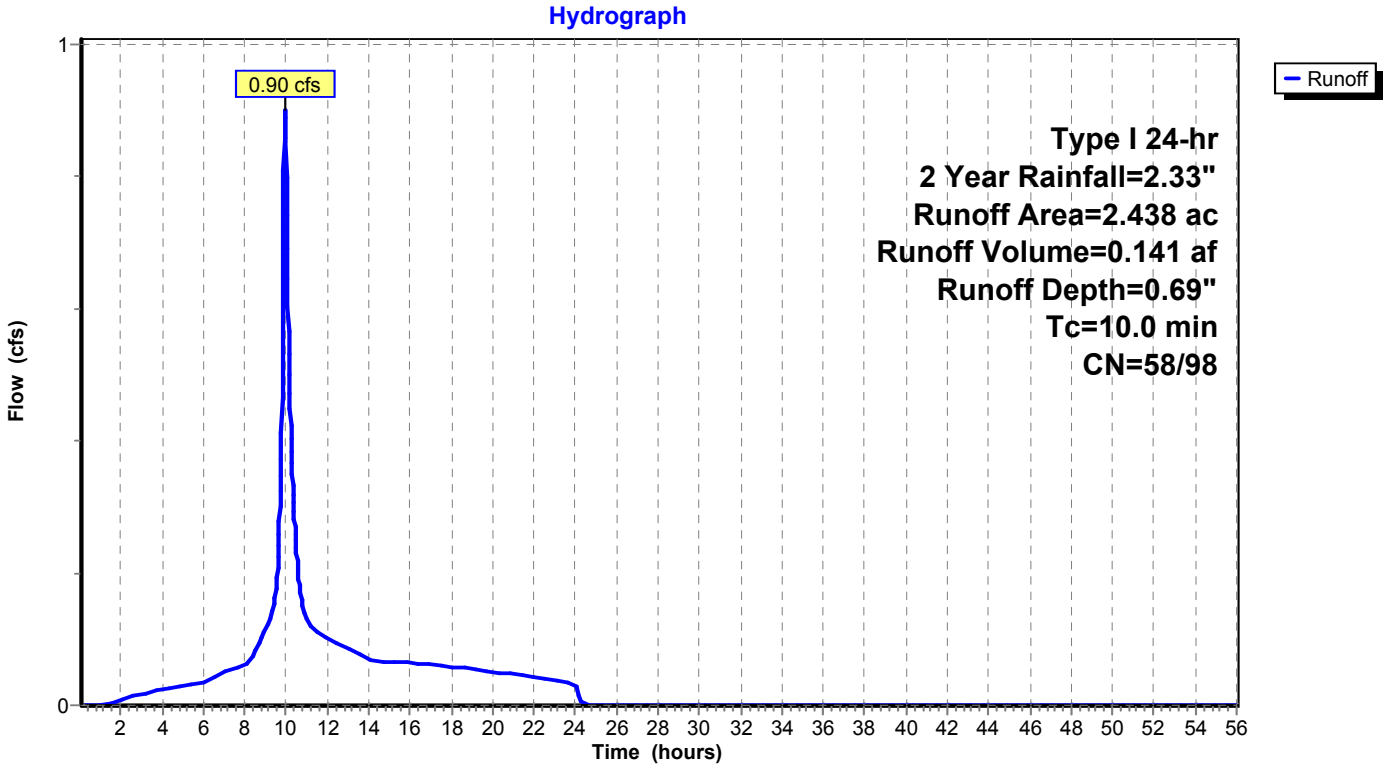
Runoff = 0.90 cfs @ 9.96 hrs, Volume= 0.141 af, Depth= 0.69"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
1.711	58	Meadow, non-grazed, HSG B
0.726	98	Paved roads w/curbs & sewers, HSG B
0.000	75	Row crops, SR + CR, Good, HSG B
0.000	75	Row crops, SR + CR, Good, HSG B
2.438	70	Weighted Average
1.711	58	70.20% Pervious Area
0.726	98	29.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**
4.9	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 14a{(2)}-Ex: Subcat 14a{(2)}-Ex



Summary for Subcatchment 14b-Ex: Subcat 14b-Ex

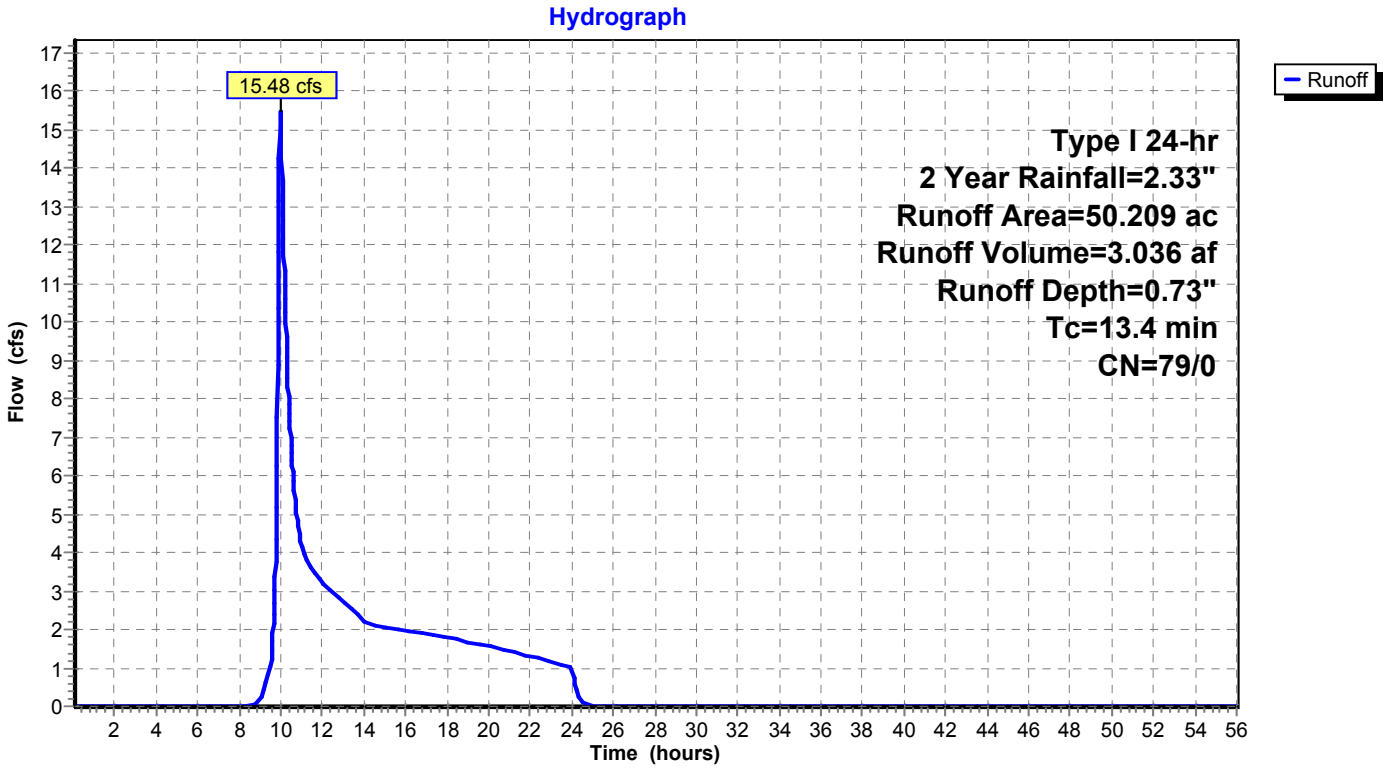
Runoff = 15.48 cfs @ 9.99 hrs, Volume= 3.036 af, Depth= 0.73"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
13.606	75	Row crops, SR + CR, Good, HSG B
8.804	75	Row crops, SR + CR, Good, HSG B
0.005	82	Row crops, SR + CR, Good, HSG C
27.793	82	Row crops, SR + CR, Good, HSG C
50.209	79	Weighted Average
50.209	79	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4					**Direct Entry, SCS Method taken from Catchment in ACAD file**

Subcatchment 14b-Ex: Subcat 14b-Ex



Summary for Subcatchment 14c{(0)}-Ex: Subcat 14c{(0)}-Ex

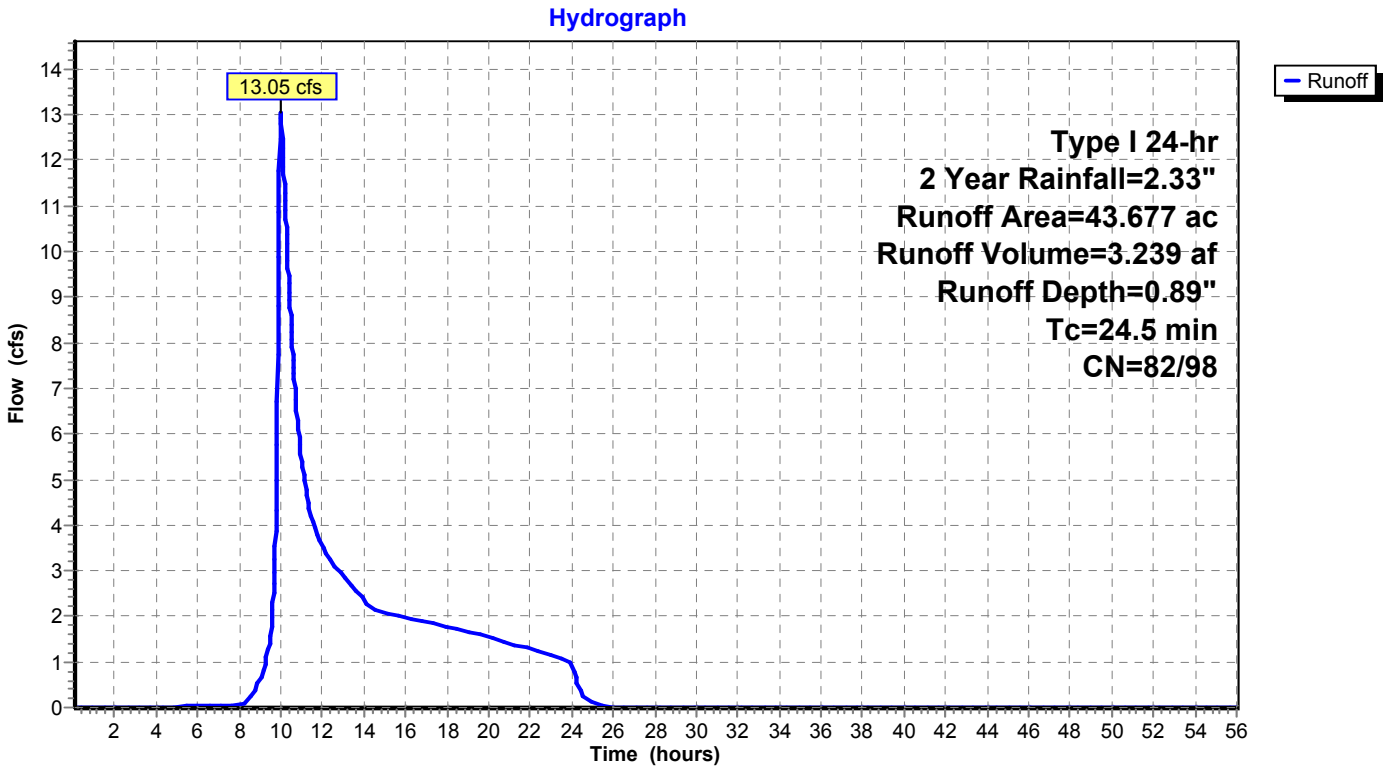
Runoff = 13.05 cfs @ 10.00 hrs, Volume= 3.239 af, Depth= 0.89"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
0.486	98	Paved roads w/curbs & sewers, HSG C
0.041	98	Paved roads w/curbs & sewers, HSG C
37.308	82	Row crops, SR + CR, Good, HSG C
0.070	82	Row crops, SR + CR, Good, HSG C
5.772	82	Row crops, SR + CR, Good, HSG C
43.677	82	Weighted Average
43.150	82	98.79% Pervious Area
0.527	98	1.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 14c{(0)}-Ex: Subcat 14c{(0)}-Ex



Summary for Subcatchment 14c{(1)}-Ex: Subcat 14c{(1)}-Ex

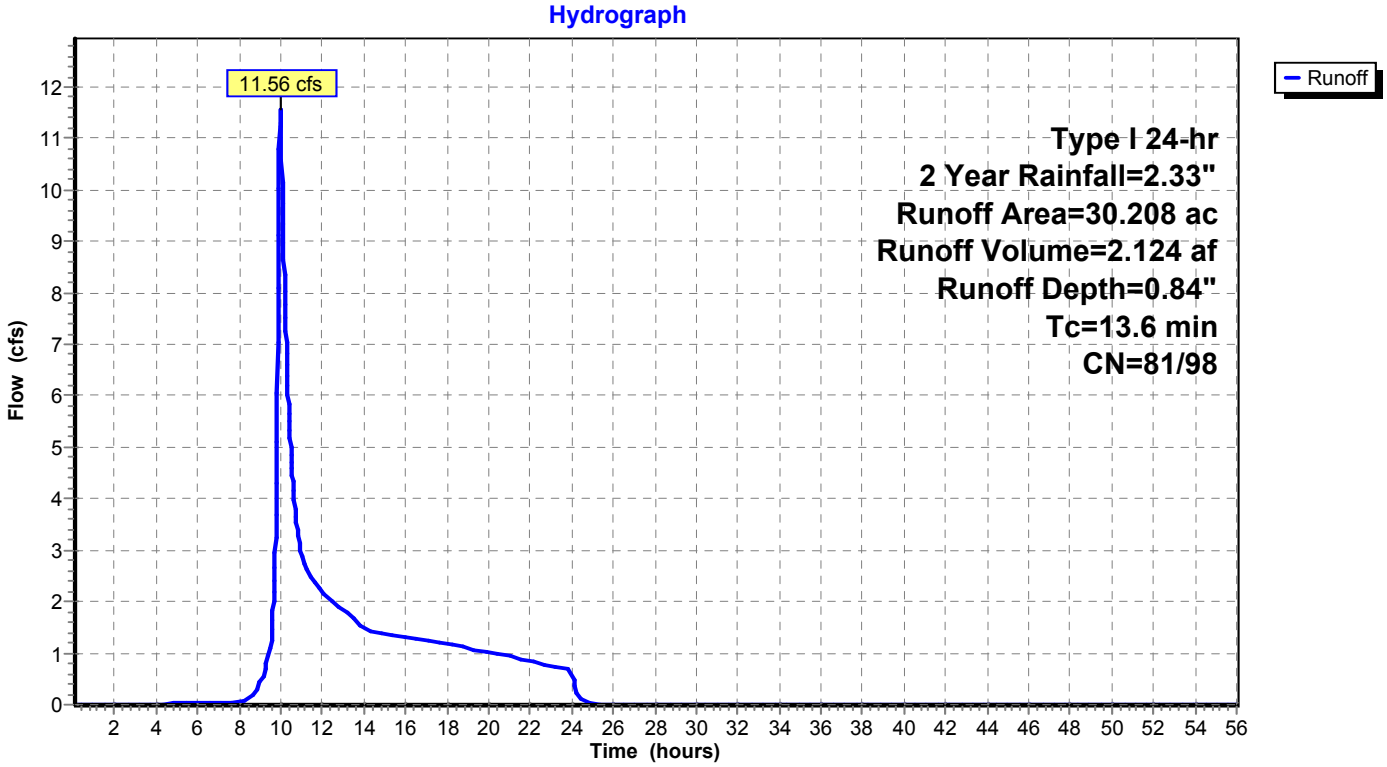
Runoff = 11.56 cfs @ 9.98 hrs, Volume= 2.124 af, Depth= 0.84"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
0.093	98	Paved roads w/curbs & sewers, HSG B
0.394	98	Paved roads w/curbs & sewers, HSG C
2.571	75	Row crops, SR + CR, Good, HSG B
2.743	75	Row crops, SR + CR, Good, HSG B
13.825	82	Row crops, SR + CR, Good, HSG C
10.454	82	Row crops, SR + CR, Good, HSG C
0.128	82	Row crops, SR + CR, Good, HSG C
30.208	81	Weighted Average
29.721	81	98.39% Pervious Area
0.486	98	1.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.6					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 14c{(1)}-Ex: Subcat 14c{(1)}-Ex



Summary for Subcatchment 14c{(2)}-Ex: Subcat 14c{(2)}-Ex

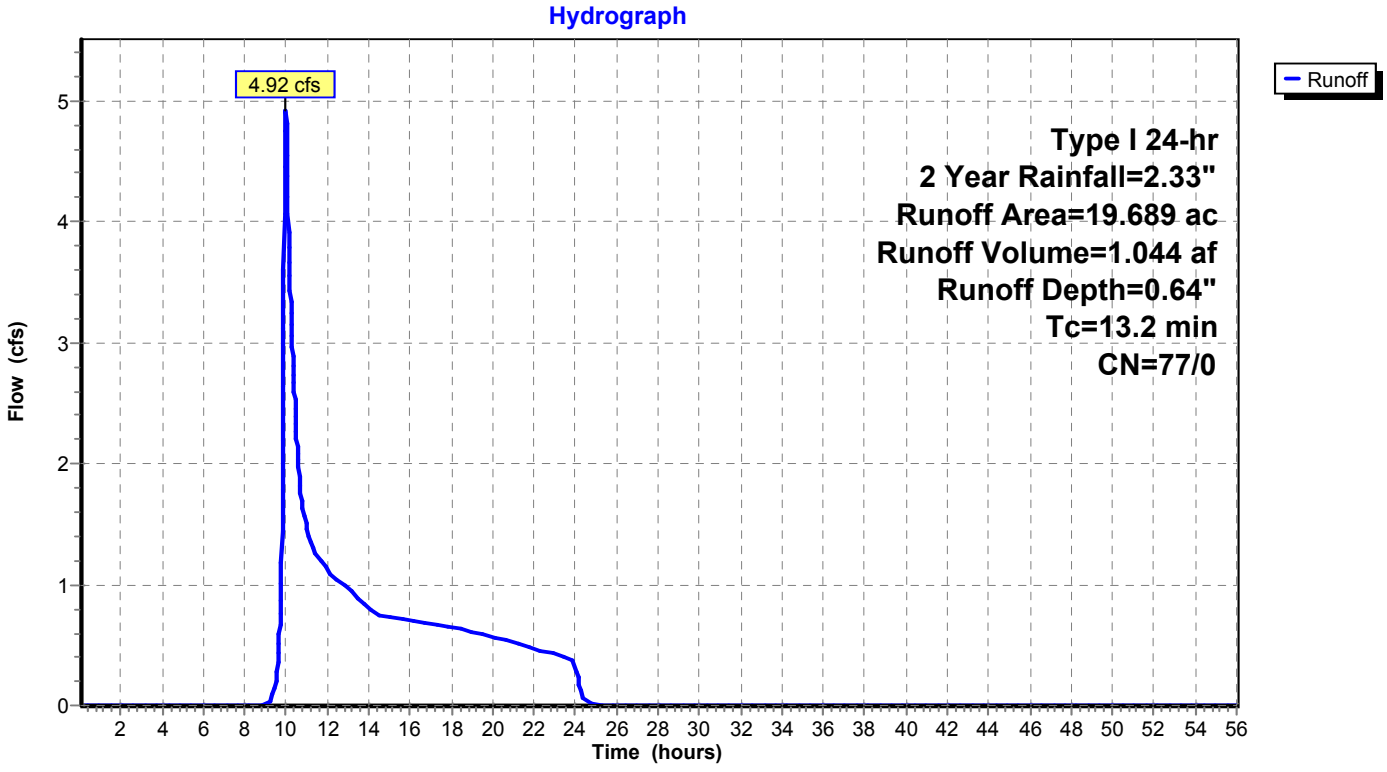
Runoff = 4.92 cfs @ 9.99 hrs, Volume= 1.044 af, Depth= 0.64"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
0.112	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
10.117	75	Row crops, SR + CR, Good, HSG B
3.200	75	Row crops, SR + CR, Good, HSG B
6.261	82	Row crops, SR + CR, Good, HSG C
19.689	77	Weighted Average
19.689	77	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 14c{(2)}-Ex: Subcat 14c{(2)}-Ex



Summary for Subcatchment 14c{(3)}-Ex: Subcat 14c{(3)}-Ex

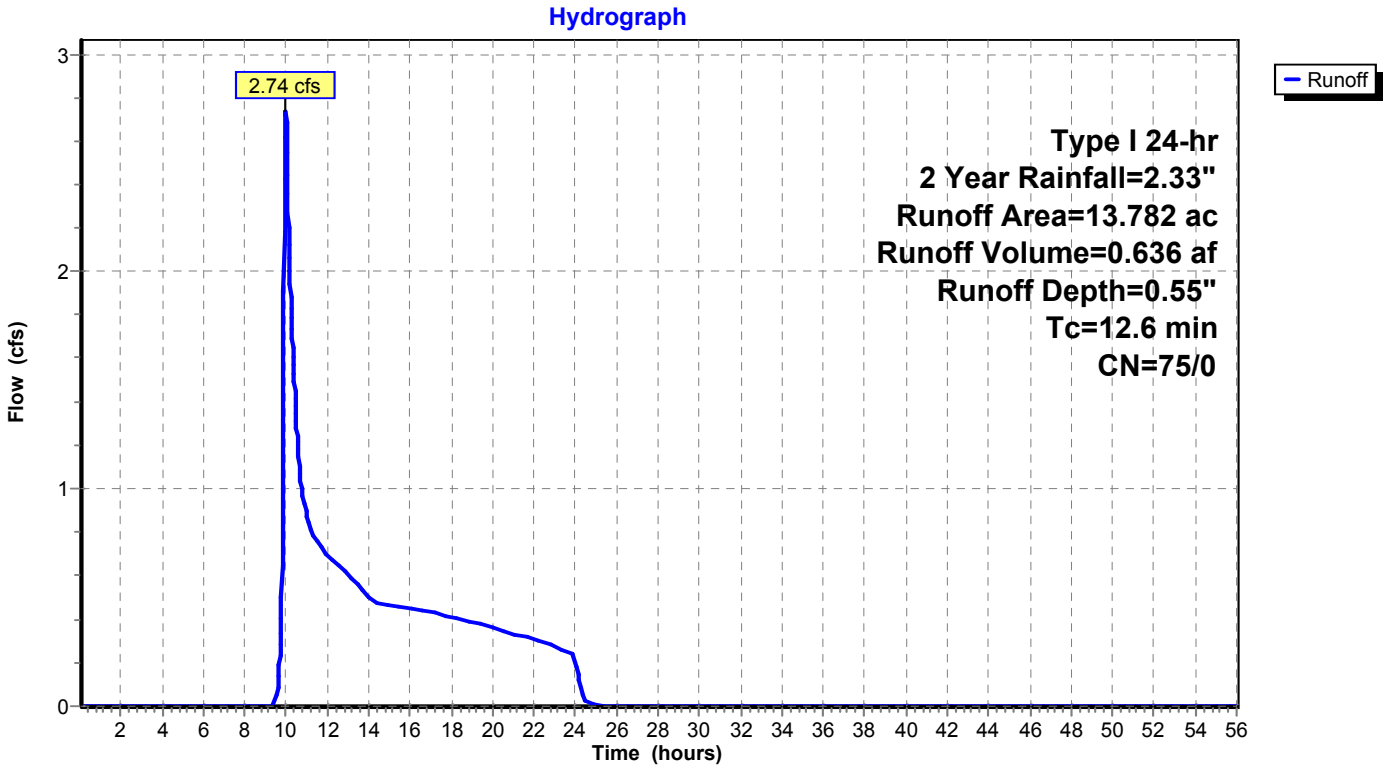
Runoff = 2.74 cfs @ 9.99 hrs, Volume= 0.636 af, Depth= 0.55"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
6.980	75	Row crops, SR + CR, Good, HSG B
0.000	75	Row crops, SR + CR, Good, HSG B
6.802	75	Row crops, SR + CR, Good, HSG B
13.782	75	Weighted Average
13.782	75	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.6					**Direct Entry, SCS Method taken from Catchment in ACAD file**

Subcatchment 14c{(3)}-Ex: Subcat 14c{(3)}-Ex



Summary for Subcatchment 14d-Ex: Subcat 14d-Ex

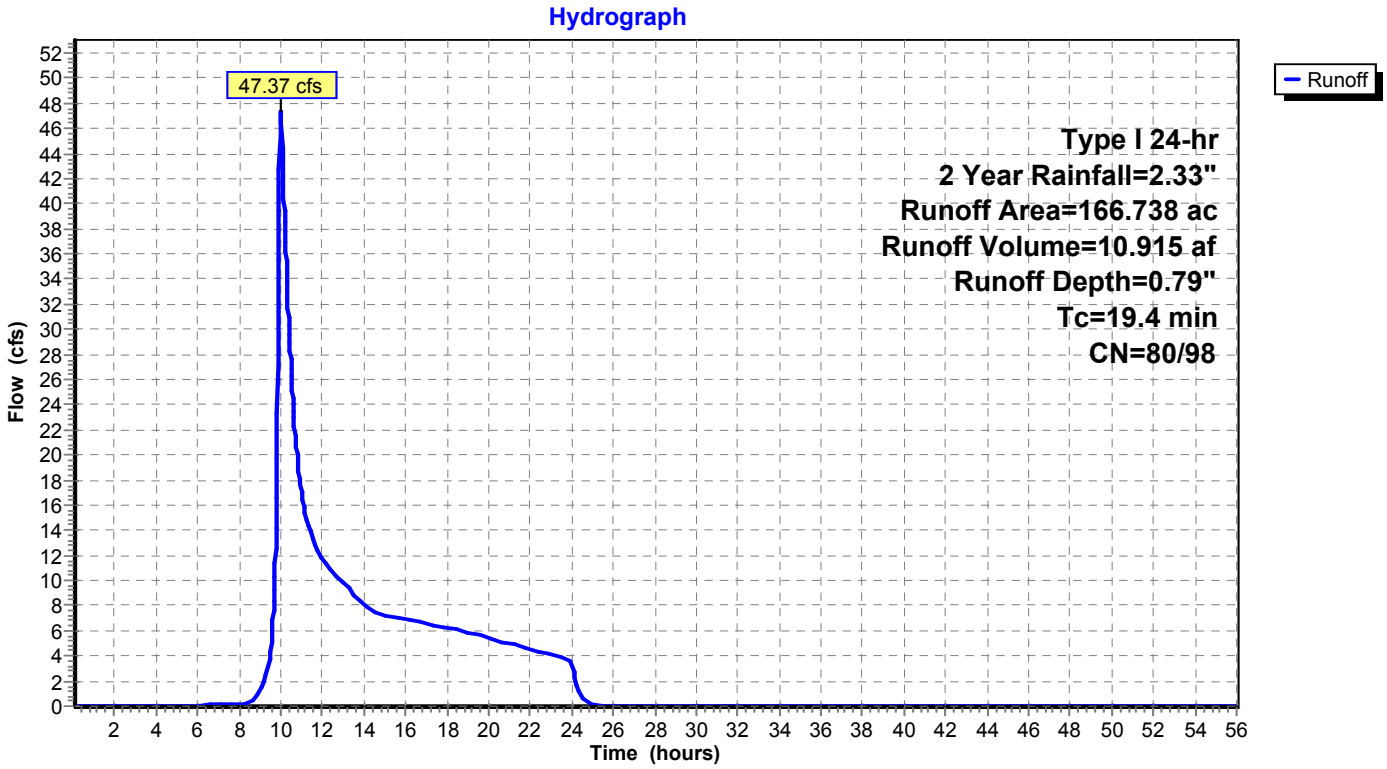
Runoff = 47.37 cfs @ 10.00 hrs, Volume= 10.915 af, Depth= 0.79"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
0.000	71	Meadow, non-grazed, HSG C
0.000	71	Meadow, non-grazed, HSG C
0.000	71	Meadow, non-grazed, HSG C
0.000	71	Meadow, non-grazed, HSG C
0.000	71	Meadow, non-grazed, HSG C
0.440	98	Paved roads w/curbs & sewers, HSG B
0.500	98	Paved roads w/curbs & sewers, HSG C
0.580	98	Paved roads w/curbs & sewers, HSG C
22.046	75	Row crops, SR + CR, Good, HSG B
2.662	75	Row crops, SR + CR, Good, HSG B
18.916	75	Row crops, SR + CR, Good, HSG B
108.025	82	Row crops, SR + CR, Good, HSG C
6.305	82	Row crops, SR + CR, Good, HSG C
7.263	82	Row crops, SR + CR, Good, HSG C
166.738	80	Weighted Average
165.218	80	99.09% Pervious Area
1.520	98	0.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.4					**Direct Entry, SCS Method taken from Catchment in ACAD file**

Subcatchment 14d-Ex: Subcat 14d-Ex



Summary for Subcatchment 14e-Ex: Subcat 14e-Ex

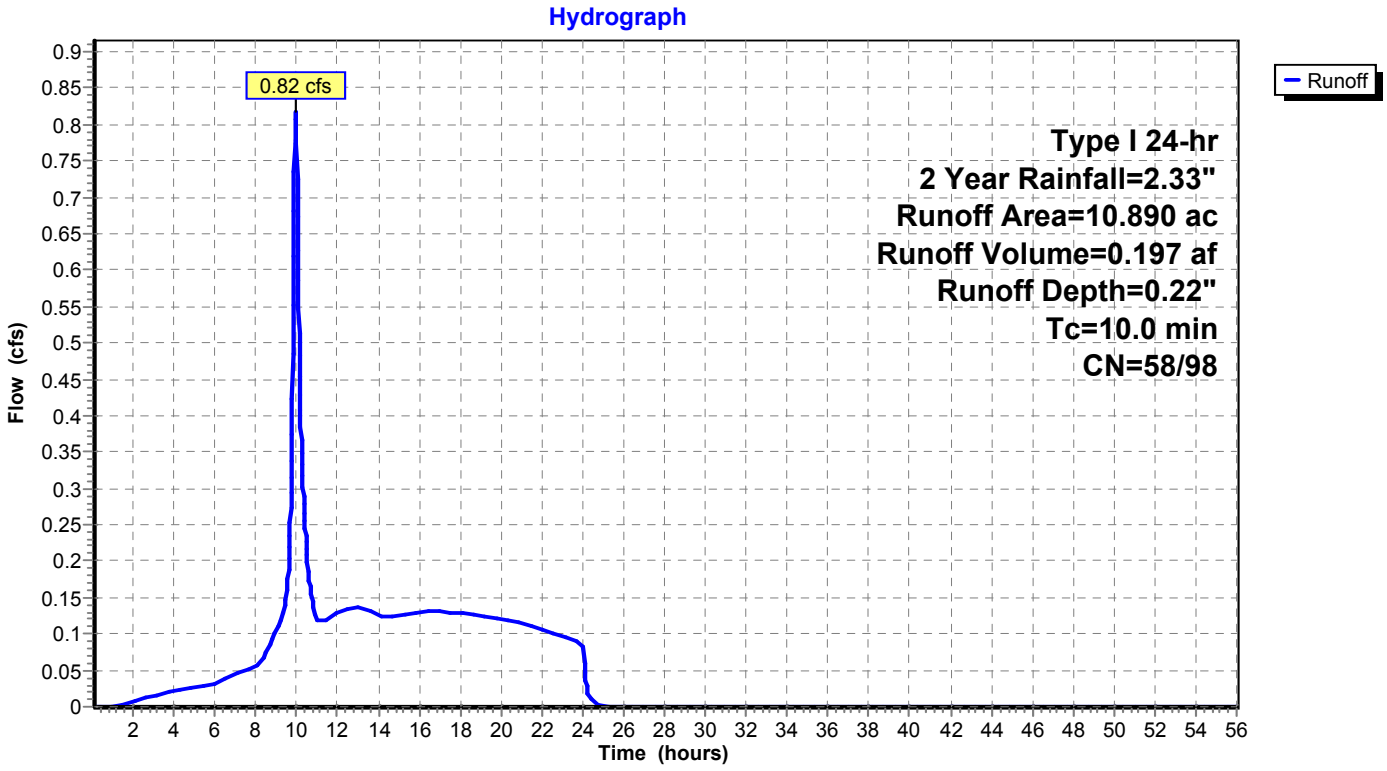
Runoff = 0.82 cfs @ 9.96 hrs, Volume= 0.197 af, Depth= 0.22"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 2 Year Rainfall=2.33"

Area (ac)	CN	Description
10.185	58	Meadow, non-grazed, HSG B
0.003	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.043	77	Natural western desert, HSG B
0.659	98	Paved roads w/curbs & sewers, HSG B
10.890	60	Weighted Average
10.231	58	93.95% Pervious Area
0.659	98	6.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4					**Direct Entry, SCS Method taken from Catchment in ACAD file**
9.4	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 14e-Ex: Subcat 14e-Ex



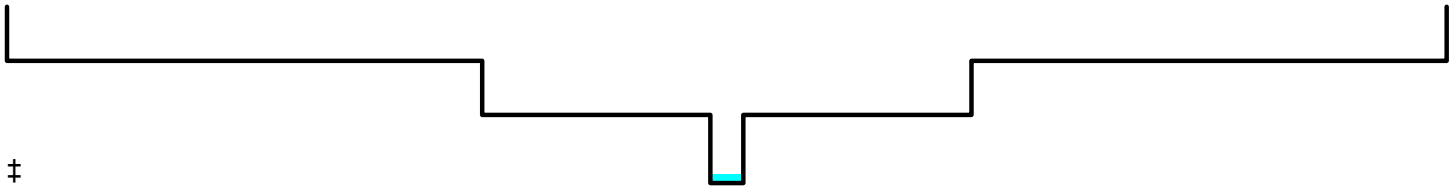
Summary for Reach 6R: Reach 1c

Inflow Area = 784.583 ac, 0.00% Impervious, Inflow Depth = 0.13" for 2 Year event
Inflow = 8.78 cfs @ 18.05 hrs, Volume= 8.692 af
Outflow = 8.78 cfs @ 18.11 hrs, Volume= 8.692 af, Atten= 0%, Lag= 3.3 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Max. Velocity= 4.26 fps, Min. Travel Time= 3.2 min
Avg. Velocity = 4.26 fps, Avg. Travel Time= 3.2 min

Peak Storage= 1,711 cf @ 18.11 hrs
Average Depth at Peak Storage= 0.33'
Bank-Full Depth= 6.52' Flow Area= 758.7 sf, Capacity= 4,878.97 cfs

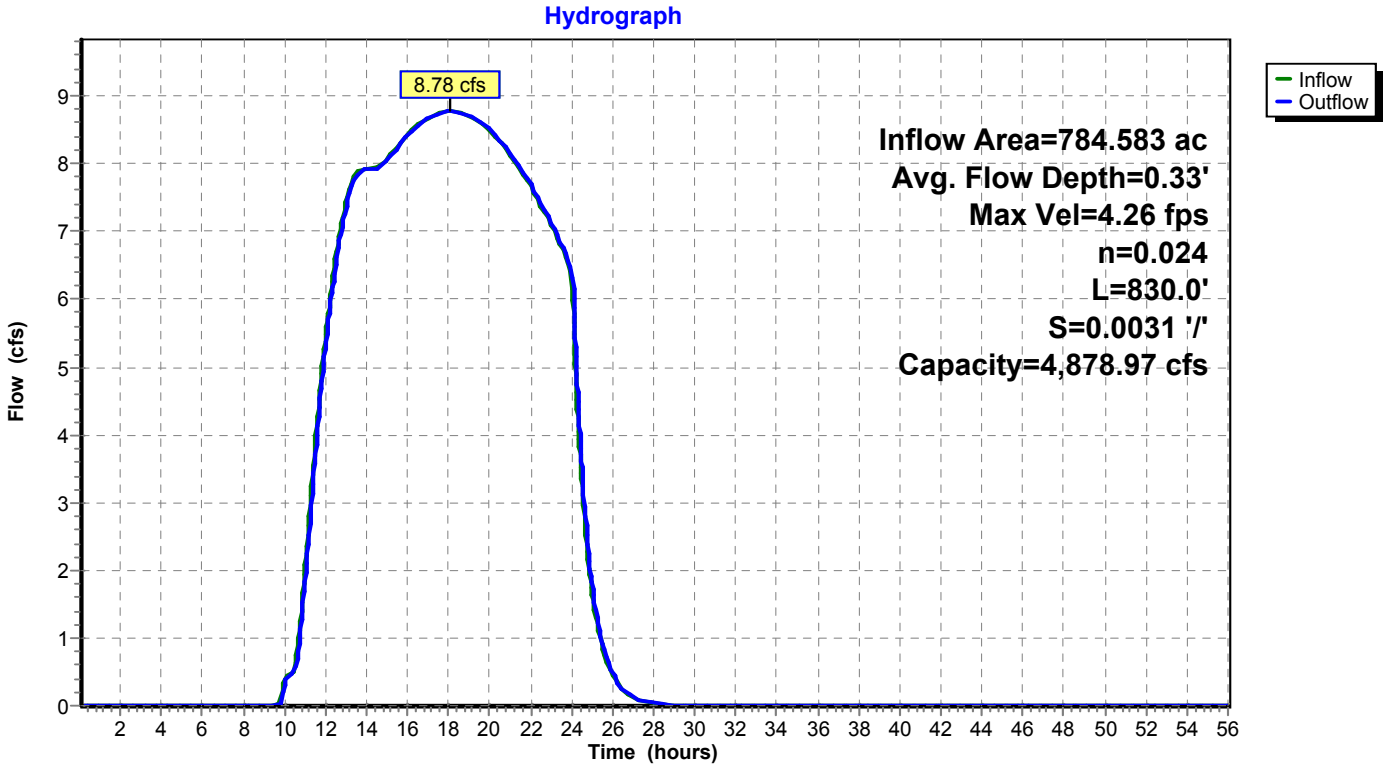
Custom stage-perimeter table, n= 0.024
102 Intermediate values determined by Multi-point interpolation
Length= 830.0' Slope= 0.0031 '/'
Inlet Invert= 841.43', Outlet Invert= 838.82'



‡

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
2.52	15.9	11.7	13,197	67.73
4.52	204.4	231.7	169,652	652.79
6.52	758.7	301.0	629,721	4,878.97

Reach 6R: Reach 1c



Summary for Reach 7R: Reach 1b

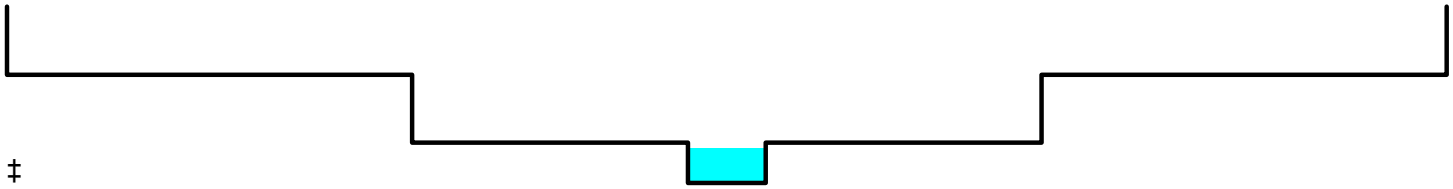
[62] Hint: Exceeded Reach 6R OUTLET depth by 0.99' @ 10.28 hrs

Inflow Area = 833.262 ac, 0.00% Impervious, Inflow Depth = 0.28" for 2 Year event
Inflow = 56.46 cfs @ 10.17 hrs, Volume= 19.384 af
Outflow = 52.49 cfs @ 10.28 hrs, Volume= 19.384 af, Atten= 7%, Lag= 6.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Max. Velocity= 3.17 fps, Min. Travel Time= 4.6 min
Avg. Velocity = 3.17 fps, Avg. Travel Time= 4.6 min

Peak Storage= 14,638 cf @ 10.28 hrs
Average Depth at Peak Storage= 1.01'
Bank-Full Depth= 5.18' Flow Area= 896.3 sf, Capacity= 8,865.90 cfs

Custom stage-perimeter table, n= 0.024
102 Intermediate values determined by Multi-point interpolation
Length= 883.0' Slope= 0.0066 '/'
Inlet Invert= 838.82', Outlet Invert= 833.00'

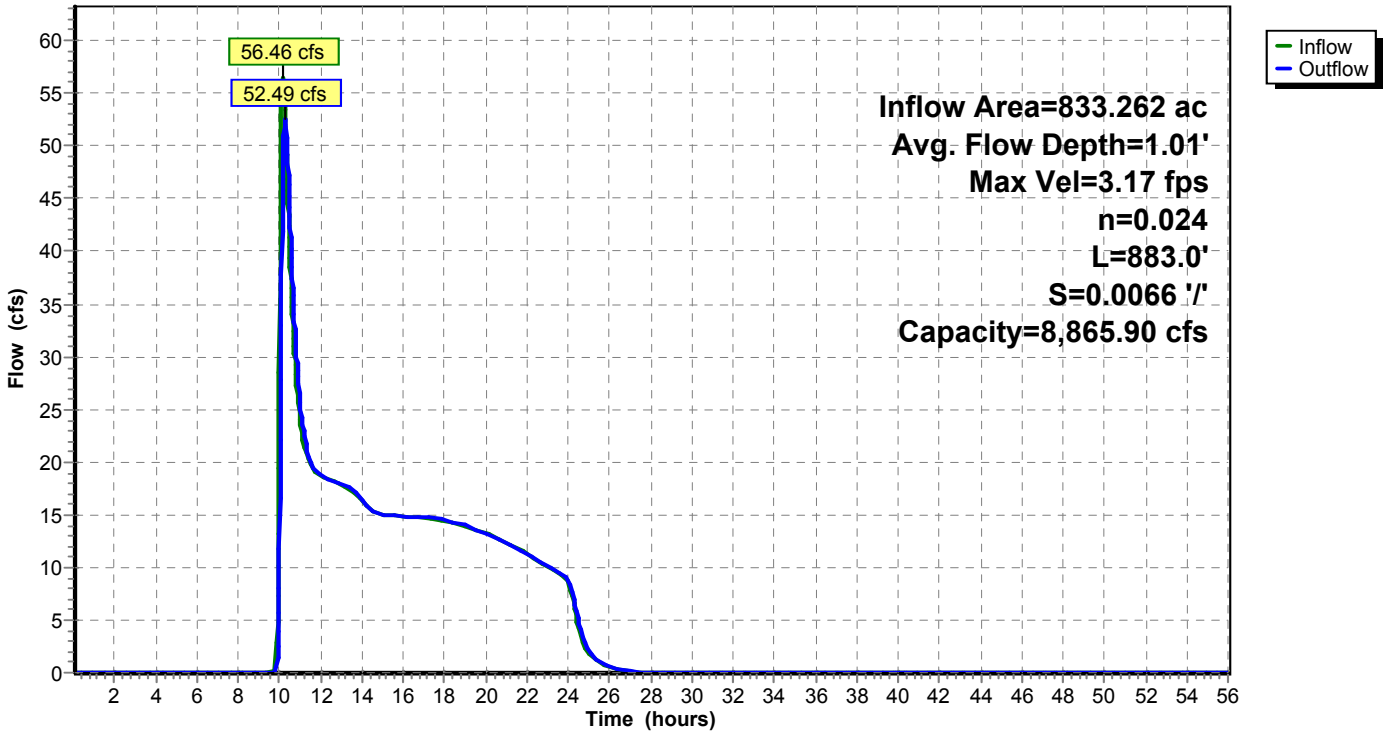


‡

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
1.18	19.4	38.8	17,130	61.43
3.18	286.2	275.2	252,715	1,476.75
5.18	896.3	324.7	791,433	8,865.90

Reach 7R: Reach 1b

Hydrograph



Summary for Reach 8R: Reach 1a

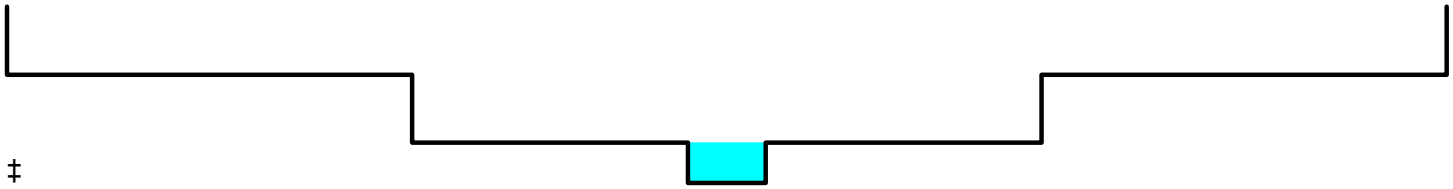
[62] Hint: Exceeded Reach 7R OUTLET depth by 0.38' @ 10.56 hrs

Inflow Area = 879.875 ac, 0.06% Impervious, Inflow Depth = 0.27" for 2 Year event
Inflow = 52.81 cfs @ 10.28 hrs, Volume= 19.883 af
Outflow = 51.34 cfs @ 10.35 hrs, Volume= 19.883 af, Atten= 3%, Lag= 4.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Max. Velocity= 2.38 fps, Min. Travel Time= 4.1 min
Avg. Velocity = 2.29 fps, Avg. Travel Time= 4.3 min

Peak Storage= 12,588 cf @ 10.35 hrs
Average Depth at Peak Storage= 1.20'
Bank-Full Depth= 5.18' Flow Area= 896.3 sf, Capacity= 6,396.21 cfs

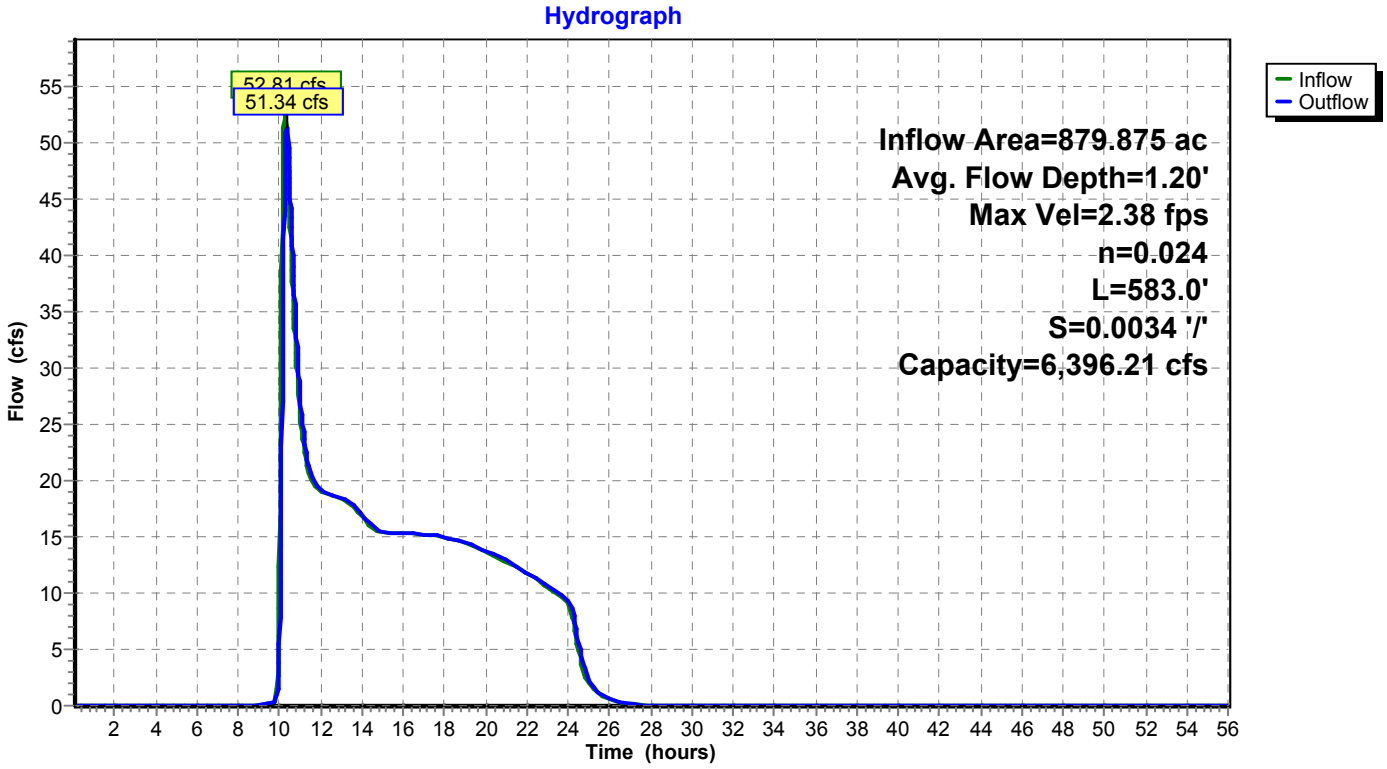
Custom stage-perimeter table, n= 0.024
102 Intermediate values determined by Multi-point interpolation
Length= 583.0' Slope= 0.0034 '/'
Inlet Invert= 833.00', Outlet Invert= 831.00'



‡

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
1.18	19.4	38.8	11,310	44.32
3.18	286.2	275.2	166,855	1,065.38
5.18	896.3	324.7	522,543	6,396.21

Reach 8R: Reach 1a



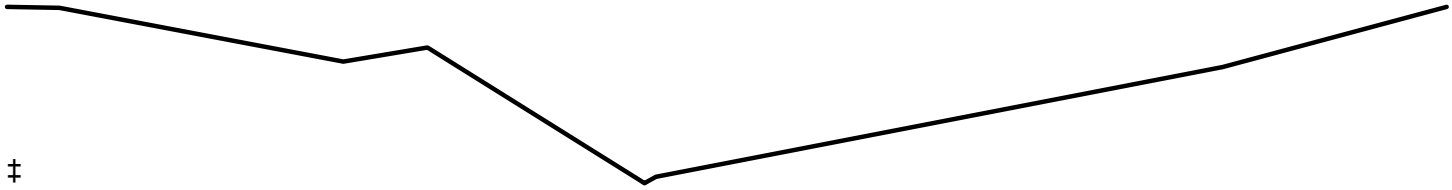
Summary for Reach 17R: Reach 1d

Inflow = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 0.10 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 1.96' Flow Area= 247.0 sf, Capacity= 1,276.84 cfs

Custom cross-section, Length= 841.0' Slope= 0.0110 '/' (102 Elevation Intervals)
Constant n= 0.027
Inlet Invert= 853.60', Outlet Invert= 844.31'

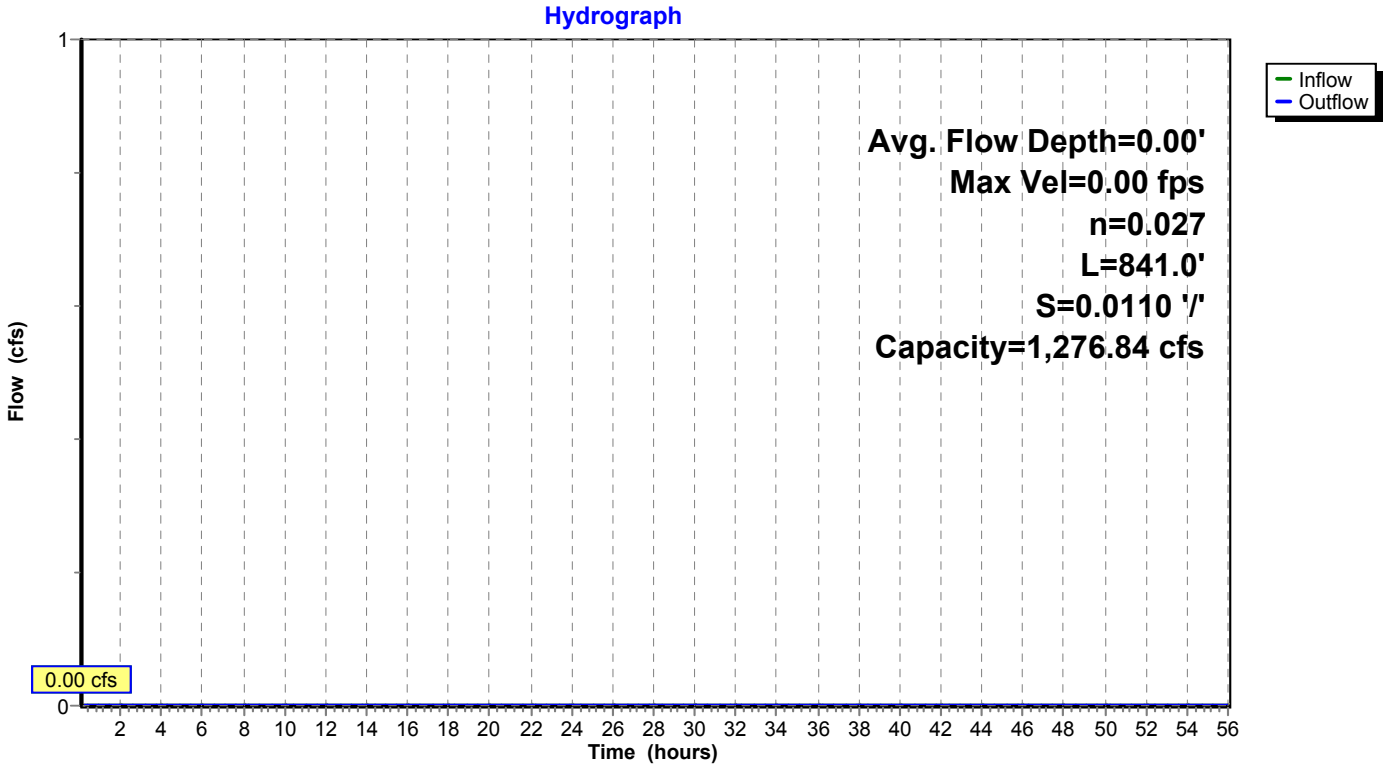


‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
8.56	851.18	0.00
19.24	851.17	0.01
76.81	850.57	0.61
93.88	850.73	0.45
136.80	849.26	1.92
137.90	849.22	1.96
140.29	849.29	1.89
255.27	850.51	0.67
300.75	851.18	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
0.04	0.0	2.5	42	0.02
0.07	0.2	4.4	128	0.09
1.29	97.3	155.0	81,870	413.13
1.35	106.8	160.8	89,836	469.56
1.51	136.4	208.8	114,697	594.12
1.95	244.1	280.9	205,277	1,285.78
1.96	247.0	292.2	207,687	1,276.84

Reach 17R: Reach 1d



Summary for Reach 18R: Linne Road Grassed Chl

Inflow Area = 276.531 ac, 1.18% Impervious, Inflow Depth = 0.34" for 2 Year event
Inflow = 12.12 cfs @ 10.20 hrs, Volume= 7.815 af
Outflow = 11.03 cfs @ 10.47 hrs, Volume= 7.815 af, Atten= 9%, Lag= 15.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Max. Velocity= 2.27 fps, Min. Travel Time= 8.7 min
Avg. Velocity = 2.27 fps, Avg. Travel Time= 8.7 min

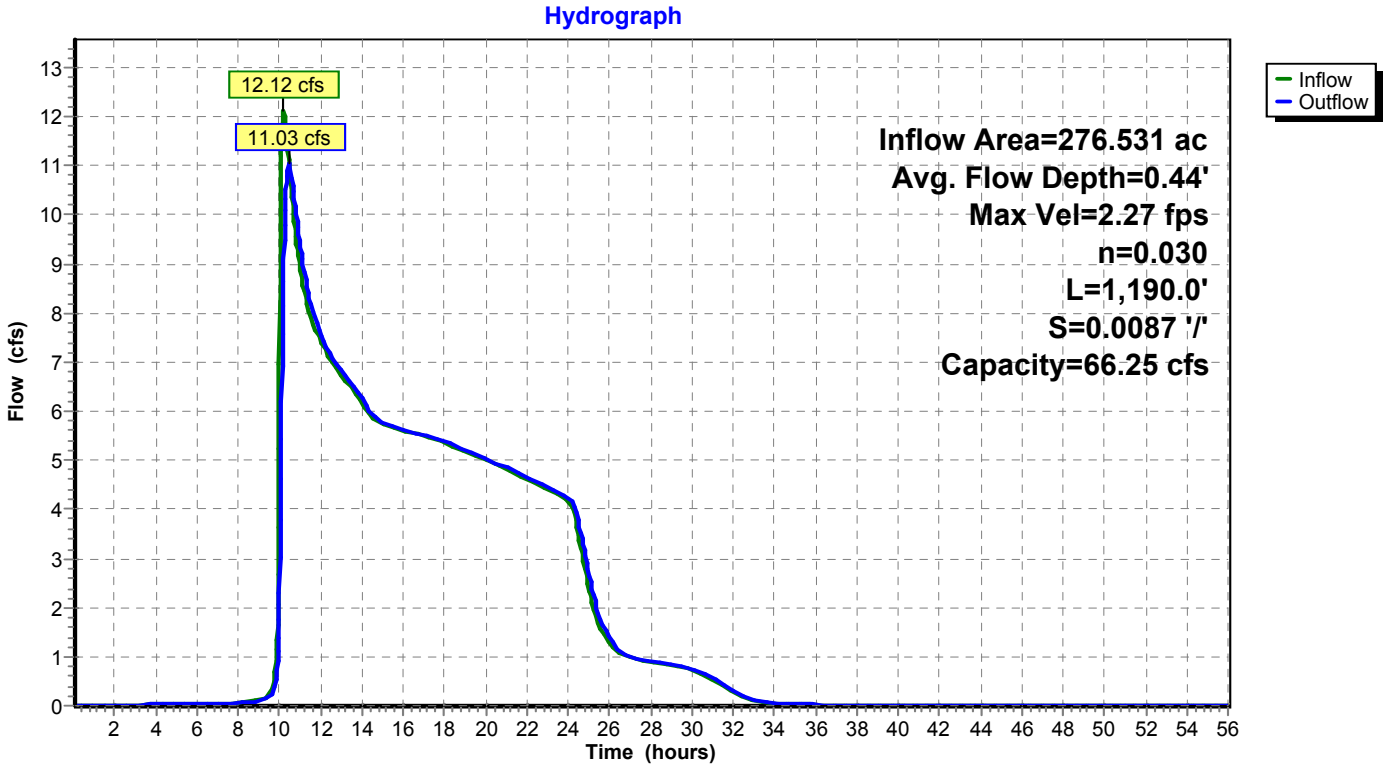
Peak Storage= 5,785 cf @ 10.47 hrs
Average Depth at Peak Storage= 0.44'
Bank-Full Depth= 1.11' Flow Area= 18.0 sf, Capacity= 66.25 cfs

Custom stage-perimeter table, n= 0.030
100 Intermediate values determined by Multi-point interpolation
Length= 1,190.0' Slope= 0.0087 '/'
Inlet Invert= 841.60', Outlet Invert= 831.20'

‡

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
0.52	5.8	16.9	6,916	13.23
0.93	13.8	22.4	16,431	46.30
1.11	18.0	25.4	21,420	66.25

Reach 18R: Linne Road Grassed Chl

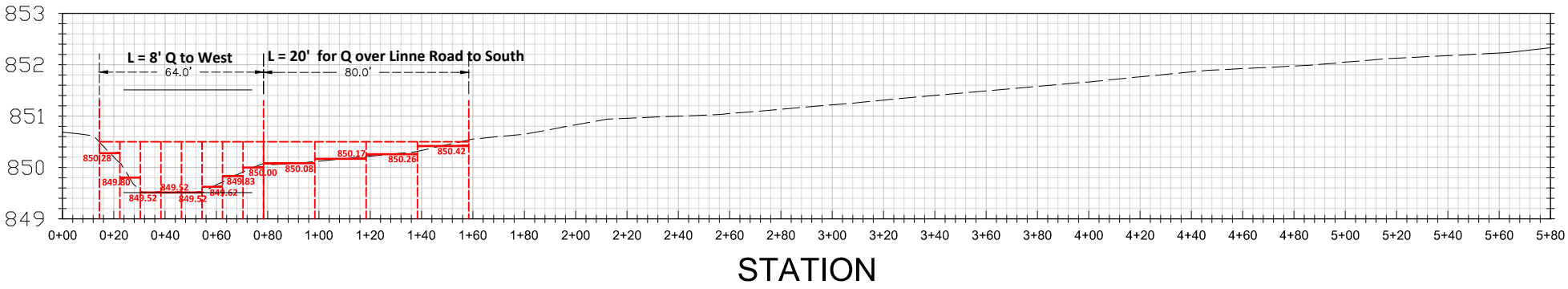


OLSEN RANCH PROJECT

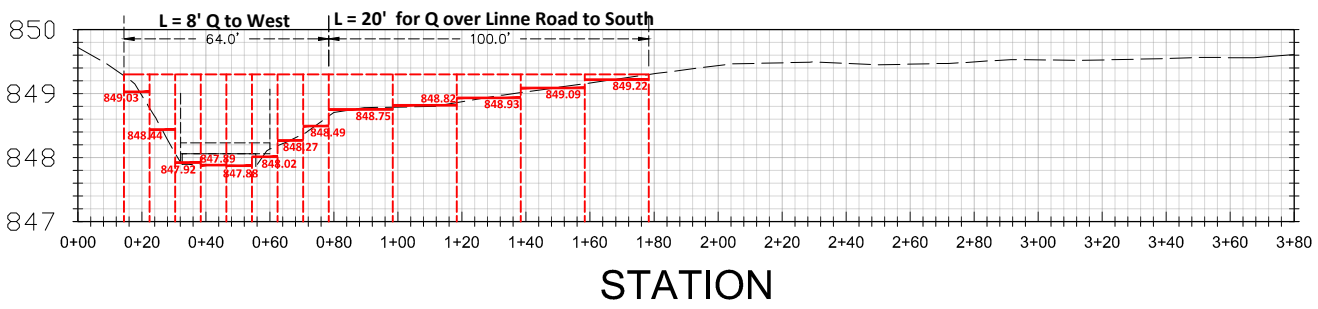
Broad Crested Weir Sizing Details

Linne Road Overtopping

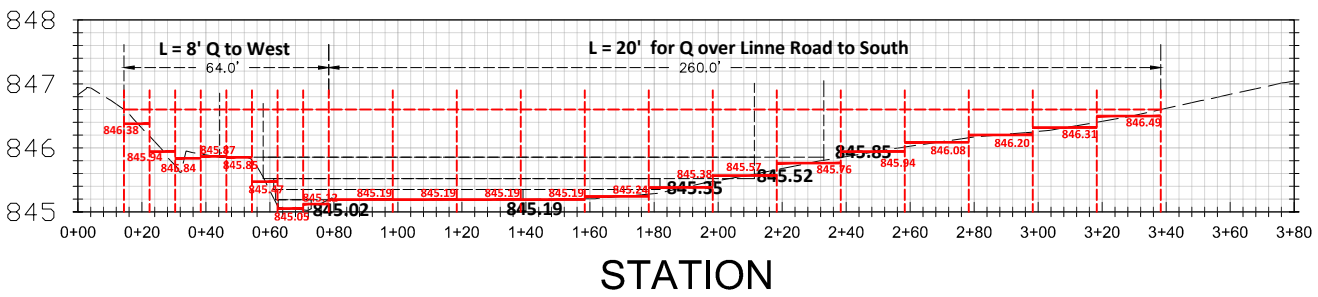
PROFILE OF CHECK DAM #1 (NORTH OF LINNE ROAD)



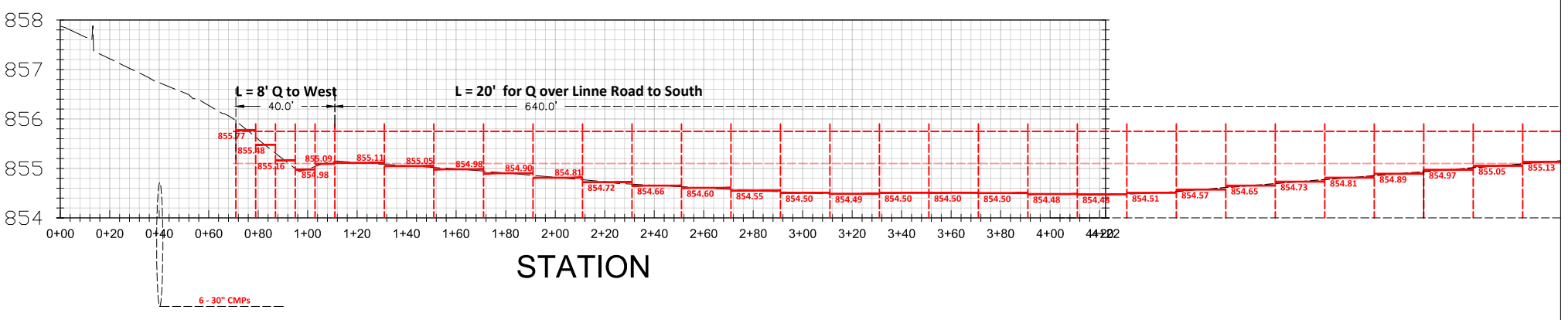
PROFILE OF CHECK DAM #2 (NORTH OF LINNE ROAD)



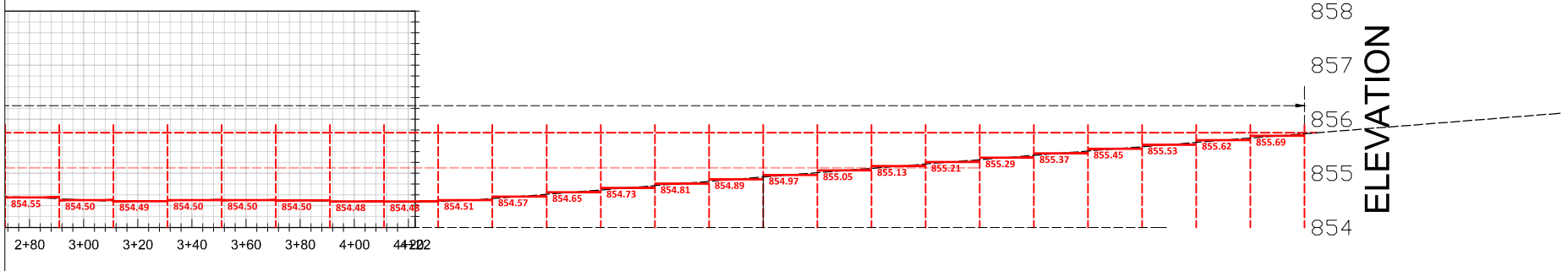
PROFILE OF CHECK DAM #3 (NORTH OF LINNE ROAD)



PROFILE OF Gran Cielo Driveway (NORTH OF LINNE ROAD)



Gran Cielo Driveway (NORTH OF LINNE ROAD)



Reso A - Exhibit C2 (EIR Technical Appendix)

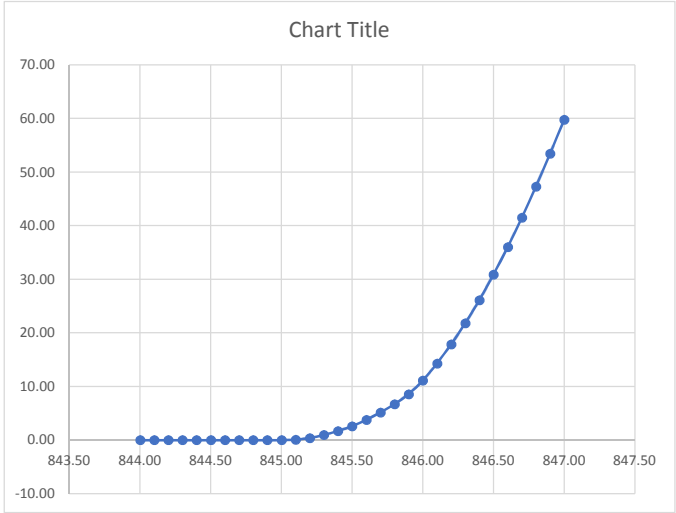
CHECK DAM CkD3 Q to West

IRREGULAR BROAD CRESTED WEIR METHOD

Q = CL(H^1.5)

C	0.60
L	8.00

0.10	W1	W2	W3	W4	W5	W6	W7	W8	W9	Total
WSE	846.38	845.94	845.84	845.87	845.85	845.47	845.05	845.12		
844.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
844.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
844.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
844.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
844.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
844.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
844.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
844.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
844.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
844.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
845.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
845.10	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00		0.05
845.20	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.11		0.39
845.30	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.37		0.97
845.40	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.71		1.71
845.50	0.00	0.00	0.00	0.00	0.00	0.02	1.45	1.12		2.60
845.60	0.00	0.00	0.00	0.00	0.00	0.22	1.96	1.60		3.78
845.70	0.00	0.00	0.00	0.00	0.00	0.53	2.52	2.12		5.17
845.80	0.00	0.00	0.00	0.00	0.00	0.91	3.12	2.69		6.72
845.90	0.00	0.00	0.07	0.02	0.05	1.35	3.76	3.31		8.57
846.00	0.00	0.07	0.31	0.22	0.28	1.85	4.44	3.96		11.14
846.10	0.00	0.31	0.64	0.53	0.60	2.40	5.16	4.66		14.29
846.20	0.00	0.64	1.04	0.91	0.99	2.99	5.92	5.39		17.88
846.30	0.00	1.04	1.50	1.35	1.45	3.63	6.71	6.15		21.83
846.40	0.01	1.50	2.01	1.85	1.96	4.30	7.53	6.95		26.12
846.50	0.20	2.01	2.57	2.40	2.52	5.02	8.38	7.78		30.88
846.60	0.50	2.57	3.18	2.99	3.12	5.77	9.26	8.64		36.03
846.70	0.87	3.18	3.83	3.63	3.76	6.55	10.17	9.53		41.52
846.80	1.31	3.83	4.51	4.30	4.44	7.36	11.11	10.45		47.33
846.90	1.80	4.51	5.24	5.02	5.16	8.21	12.08	11.40		53.42
847.00	2.34	5.24	6.00	5.77	5.92	9.08	13.07	12.37		59.79



Reso A - Exhibit C2 (EIR Technical Appendix)

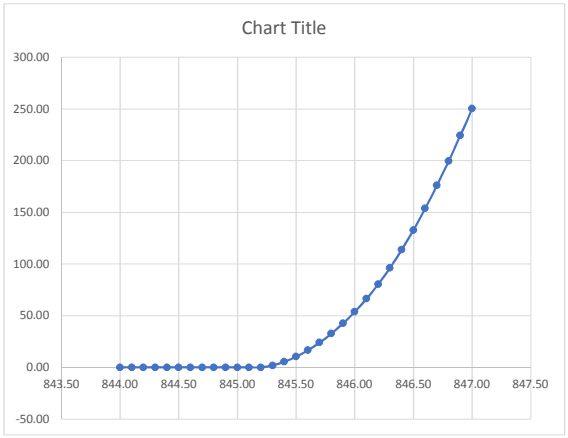
CHECK DAM CkD3 Q to South

IRREGULAR BROAD CRESTED WEIR METHOD

Q = CL(H^1.5)

C	0.60
L	20.00

0.10	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	Total
WSE	845.19	845.19	845.19	845.19	845.24	845.38	845.57	845.76	845.94	846.08	846.20	846.31	846.49	
844.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
844.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
844.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
844.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
844.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
844.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
844.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
844.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
844.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
844.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
845.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
845.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
845.20	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
845.30	0.44	0.44	0.44	0.44	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.93
845.40	1.15	1.15	1.15	1.15	0.77	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.42
845.50	2.07	2.07	2.07	2.07	1.59	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.37
845.60	3.15	3.15	3.15	3.15	2.59	1.24	0.06	0.00	0.00	0.00	0.00	0.00	0.00	16.49
845.70	4.37	4.37	4.37	4.37	3.74	2.17	0.56	0.00	0.00	0.00	0.00	0.00	0.00	23.96
845.80	5.72	5.72	5.72	5.72	5.03	3.27	1.32	0.10	0.00	0.00	0.00	0.00	0.00	32.58
845.90	7.18	7.18	7.18	7.18	6.43	4.50	2.27	0.63	0.00	0.00	0.00	0.00	0.00	42.55
846.00	8.75	8.75	8.75	8.75	7.95	5.86	3.38	1.41	0.18	0.00	0.00	0.00	0.00	53.77
846.10	10.42	10.42	10.42	10.42	9.57	7.33	4.63	2.38	0.77	0.03	0.00	0.00	0.00	66.38
846.20	12.18	12.18	12.18	12.18	11.29	8.91	6.00	3.50	1.59	0.50	0.00	0.00	0.00	80.51
846.30	14.03	14.03	14.03	14.03	13.10	10.59	7.48	4.76	2.59	1.24	0.38	0.00	0.00	96.28
846.40	15.97	15.97	15.97	15.97	14.99	12.36	9.07	6.14	3.74	2.17	1.07	0.32	0.00	113.77
846.50	17.99	17.99	17.99	17.99	16.97	14.22	10.76	7.64	5.03	3.27	1.97	0.99	0.01	132.84
846.60	20.09	20.09	20.09	20.09	19.03	16.17	12.54	9.24	6.43	4.50	3.04	1.87	0.44	153.63
846.70	22.27	22.27	22.27	22.27	21.17	18.20	14.41	10.94	7.95	5.86	4.24	2.92	1.15	175.91
846.80	24.51	24.51	24.51	24.51	23.38	20.31	16.37	12.73	9.57	7.33	5.58	4.12	2.07	199.51
846.90	26.83	26.83	26.83	26.83	25.67	22.49	18.41	14.61	11.29	8.91	7.03	5.44	3.15	224.31
847.00	29.22	29.22	29.22	29.22	28.02	24.74	20.52	16.57	13.10	10.59	8.59	6.88	4.37	250.26



Reso A - Exhibit C2 (EIR Technical Appendix)

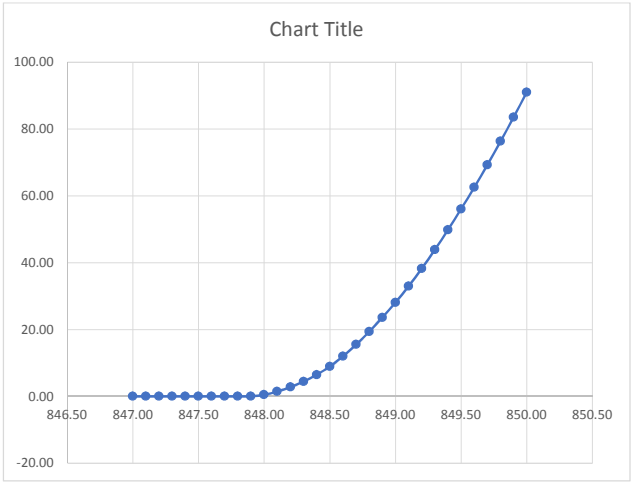
CHECK DAM CkD2 Q to West

IRREGULAR BROAD CRESTED WEIR METHOD

Q = CL(H^1.5)

C	0.60
L	8.00

0.10	W1	W2	W3	W4	W5	W6	W7	W8	W9	Total
WSE	849.03	848.44	847.92	847.89	847.88	848.02	848.27	848.49		
847.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
847.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
847.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
847.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
847.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
847.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
847.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
847.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
847.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
847.90	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00		0.02
848.00	0.00	0.00	0.11	0.18	0.20	0.00	0.00	0.00		0.48
848.10	0.00	0.00	0.37	0.46	0.50	0.11	0.00	0.00		1.43
848.20	0.00	0.00	0.71	0.83	0.87	0.37	0.00	0.00		2.78
848.30	0.00	0.00	1.12	1.26	1.31	0.71	0.02	0.00		4.43
848.40	0.00	0.00	1.60	1.75	1.80	1.12	0.22	0.00		6.49
848.50	0.00	0.07	2.12	2.29	2.34	1.60	0.53	0.00		8.95
848.60	0.00	0.31	2.69	2.87	2.93	2.12	0.91	0.18		12.01
848.70	0.00	0.64	3.31	3.50	3.56	2.69	1.35	0.46		15.51
848.80	0.00	1.04	3.96	4.17	4.24	3.31	1.85	0.83		19.39
848.90	0.00	1.50	4.66	4.87	4.94	3.96	2.40	1.26		23.59
849.00	0.00	2.01	5.39	5.61	5.69	4.66	2.99	1.75		28.10
849.10	0.09	2.57	6.15	6.39	6.47	5.39	3.63	2.29		32.98
849.20	0.34	3.18	6.95	7.20	7.28	6.15	4.30	2.87		38.27
849.30	0.67	3.83	7.78	8.04	8.12	6.95	5.02	3.50		43.91
849.40	1.08	4.51	8.64	8.91	9.00	7.78	5.77	4.17		49.85
849.50	1.55	5.24	9.53	9.81	9.90	8.64	6.55	4.87		56.08
849.60	2.07	6.00	10.45	10.73	10.83	9.53	7.36	5.61		62.58
849.70	2.63	6.79	11.40	11.69	11.79	10.45	8.21	6.39		69.34
849.80	3.24	7.61	12.37	12.67	12.77	11.40	9.08	7.20		76.35
849.90	3.90	8.47	13.37	13.68	13.78	12.37	9.99	8.04		83.59
850.00	4.59	9.35	14.40	14.71	14.82	13.37	10.92	8.91		91.07
850.10	5.31	10.27	15.45	15.77	15.88	14.40	11.88	9.81		98.76
850.20	6.07	11.21	16.53	16.85	16.96	15.45	12.87	10.73		106.67
850.30	6.87	12.18	17.62	17.96	18.07	16.53	13.88	11.69		114.80
850.40	7.70	13.17	18.75	19.09	19.20	17.62	14.92	12.67		123.12
850.50	8.55	14.19	19.89	20.24	20.36	18.75	15.98	13.68		131.64
850.60	9.44	15.24	21.06	21.41	21.53	19.89	17.07	14.71		140.36
850.70	10.36	16.31	22.25	22.61	22.73	21.06	18.18	15.77		149.27
850.80	11.30	17.40	23.46	23.83	23.95	22.25	19.32	16.85		158.36
850.90	12.27	18.52	24.69	25.07	25.19	23.46	20.47	17.96		167.64
851.00	13.27	19.66	25.95	26.33	26.45	24.69	21.65	19.09		177.09
851.10	14.30	20.82	27.22	27.61	27.73	25.95	22.85	20.24		186.72
851.20	15.34	22.01	28.51	28.91	29.04	27.22	24.07	21.41		196.52
851.30	16.42	23.22	29.83	30.23	30.36	28.51	25.32	22.61		206.48
851.40	17.51	24.44	31.16	31.56	31.70	29.83	26.58	23.83		216.62
851.50	18.63	25.69	32.51	32.92	33.06	31.16	27.86	25.07		226.91



Reso A - Exhibit C2 (EIR Technical Appendix)

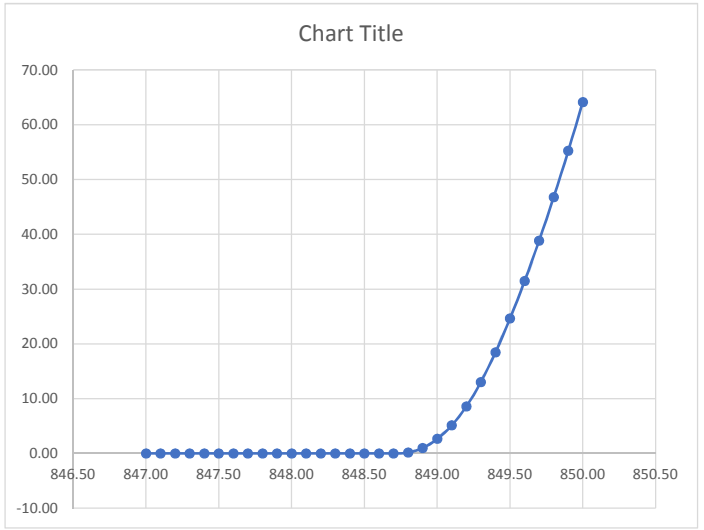
CHECK DAM CkD2 Q to South

IRREGULAR BROAD CRESTED WEIR METHOD

Q = CL(H^1.5)

C	0.60
L	20.00

0.10	W1	W2	W3	W4	W5	W6	W7	Total
WSE	848.75	848.82	848.93	849.09	849.22			
847.00	0.00	0.00	0.00	0.00	0.00			0.00
847.10	0.00	0.00	0.00	0.00	0.00			0.00
847.20	0.00	0.00	0.00	0.00	0.00			0.00
847.30	0.00	0.00	0.00	0.00	0.00			0.00
847.40	0.00	0.00	0.00	0.00	0.00			0.00
847.50	0.00	0.00	0.00	0.00	0.00			0.00
847.60	0.00	0.00	0.00	0.00	0.00			0.00
847.70	0.00	0.00	0.00	0.00	0.00			0.00
847.80	0.00	0.00	0.00	0.00	0.00			0.00
847.90	0.00	0.00	0.00	0.00	0.00			0.00
848.00	0.00	0.00	0.00	0.00	0.00			0.00
848.10	0.00	0.00	0.00	0.00	0.00			0.00
848.20	0.00	0.00	0.00	0.00	0.00			0.00
848.30	0.00	0.00	0.00	0.00	0.00			0.00
848.40	0.00	0.00	0.00	0.00	0.00			0.00
848.50	0.00	0.00	0.00	0.00	0.00			0.00
848.60	0.00	0.00	0.00	0.00	0.00			0.00
848.70	0.00	0.00	0.00	0.00	0.00			0.00
848.80	0.13	0.00	0.00	0.00	0.00			0.13
848.90	0.70	0.27	0.00	0.00	0.00			0.97
849.00	1.50	0.92	0.22	0.00	0.00			2.64
849.10	2.48	1.78	0.84	0.01	0.00			5.12
849.20	3.62	2.81	1.68	0.44	0.00			8.55
849.30	4.89	3.99	2.70	1.15	0.27			13.01
849.40	6.29	5.30	3.87	2.07	0.92			18.44
849.50	7.79	6.73	5.16	3.15	1.78			24.62
849.60	9.40	8.27	6.58	4.37	2.81			31.43
849.70	11.11	9.91	8.11	5.72	3.99			38.83
849.80	12.91	11.64	9.74	7.18	5.30			46.77
849.90	14.80	13.47	11.46	8.75	6.73			55.21
850.00	16.77	15.38	13.28	10.42	8.27			64.12



Reso A - Exhibit C2 (EIR Technical Appendix)

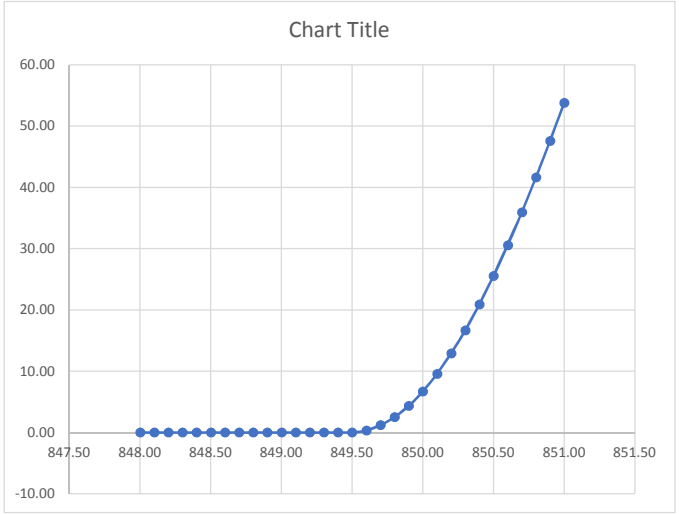
CHECK DAM CkD1 Q to West

IRREGULAR BROAD CRESTED WEIR METHOD

Q = CL(H^1.5)

C	0.60
L	8.00

0.10	W1	W2	W3	W4	W5	W6	W7	W8	W9	Total
WSE	850.28	849.80	849.52	849.52	849.52	849.62	849.83	850.00		
848.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
848.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
848.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
848.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
848.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
848.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
848.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
848.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
848.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
848.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
849.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
849.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
849.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
849.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
849.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
849.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
849.60	0.00	0.00	0.11	0.11	0.11	0.00	0.00	0.00		0.33
849.70	0.00	0.00	0.37	0.37	0.37	0.11	0.00	0.00		1.21
849.80	0.00	0.00	0.71	0.71	0.71	0.37	0.00	0.00		2.50
849.90	0.00	0.15	1.12	1.12	1.12	0.71	0.09	0.00		4.33
850.00	0.00	0.43	1.60	1.60	1.60	1.12	0.34	0.00		6.68
850.10	0.00	0.79	2.12	2.12	2.12	1.60	0.67	0.15		9.57
850.20	0.00	1.21	2.69	2.69	2.69	2.12	1.08	0.43		12.92
850.30	0.01	1.70	3.31	3.31	3.31	2.69	1.55	0.79		16.66
850.40	0.20	2.23	3.96	3.96	3.96	3.31	2.07	1.21		20.90
850.50	0.50	2.81	4.66	4.66	4.66	3.96	2.63	1.70		25.57
850.60	0.87	3.43	5.39	5.39	5.39	4.66	3.24	2.23		30.60
850.70	1.31	4.10	6.15	6.15	6.15	5.39	3.90	2.81		35.96
850.80	1.80	4.80	6.95	6.95	6.95	6.15	4.59	3.43		41.63
850.90	2.34	5.54	7.78	7.78	7.78	6.95	5.31	4.10		47.59
851.00	2.93	6.31	8.64	8.64	8.64	7.78	6.07	4.80		53.83
851.10	3.56	7.11	9.53	9.53	9.53	8.64	6.87	5.54		60.33
851.20	4.24	7.95	10.45	10.45	10.45	9.53	7.70	6.31		67.08
851.30	4.94	8.82	11.40	11.40	11.40	10.45	8.55	7.11		74.08
851.40	5.69	9.71	12.37	12.37	12.37	11.40	9.44	7.95		81.32
851.50	6.47	10.64	13.37	13.37	13.37	12.37	10.36	8.82		88.78
851.60	7.28	11.59	14.40	14.40	14.40	13.37	11.30	9.71		96.46
851.70	8.12	12.57	15.45	15.45	15.45	14.40	12.27	10.64		104.36
851.80	9.00	13.58	16.53	16.53	16.53	15.45	13.27	11.59		112.46
851.90	9.90	14.61	17.62	17.62	17.62	16.53	14.30	12.57		120.77
852.00	10.83	15.66	18.75	18.75	18.75	17.62	15.34	13.58		129.27



Reso A - Exhibit C2 (EIR Technical Appendix)

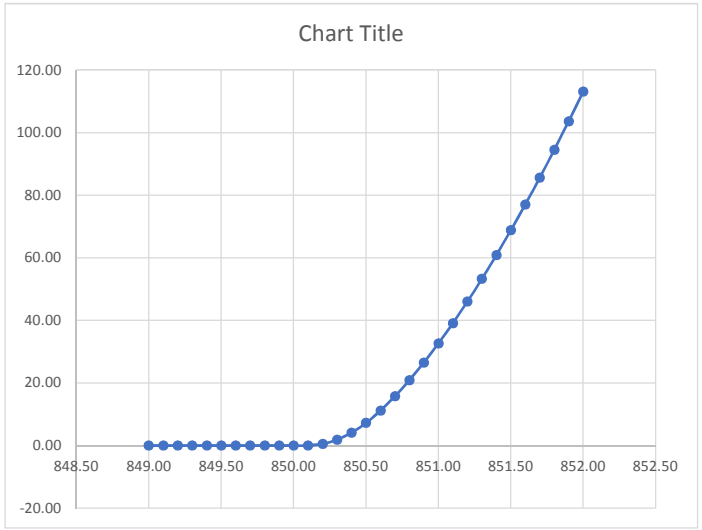
CHECK DAM CkD1 Q to South

IRREGULAR BROAD CRESTED WEIR METHOD

Q = CL(H^1.5)

C	0.60
L	20.00

0.10	W1	W2	W3	W4	W5	W6	W7	Total
WSE	850.08	850.17	850.26	850.42				
849.00	0.00	0.00	0.00	0.00				0.00
849.10	0.00	0.00	0.00	0.00				0.00
849.20	0.00	0.00	0.00	0.00				0.00
849.30	0.00	0.00	0.00	0.00				0.00
849.40	0.00	0.00	0.00	0.00				0.00
849.50	0.00	0.00	0.00	0.00				0.00
849.60	0.00	0.00	0.00	0.00				0.00
849.70	0.00	0.00	0.00	0.00				0.00
849.80	0.00	0.00	0.00	0.00				0.00
849.90	0.00	0.00	0.00	0.00				0.00
850.00	0.00	0.00	0.00	0.00				0.00
850.10	0.03	0.00	0.00	0.00				0.03
850.20	0.50	0.06	0.00	0.00				0.56
850.30	1.24	0.56	0.10	0.00				1.90
850.40	2.17	1.32	0.63	0.00				4.12
850.50	3.27	2.27	1.41	0.27				7.22
850.60	4.50	3.38	2.38	0.92				11.18
850.70	5.86	4.63	3.50	1.78				15.77
850.80	7.33	6.00	4.76	2.81				20.90
850.90	8.91	7.48	6.14	3.99				26.53
851.00	10.59	9.07	7.64	5.30				32.60
851.10	12.36	10.76	9.24	6.73				39.09
851.20	14.22	12.54	10.94	8.27				45.97
851.30	16.17	14.41	12.73	9.91				53.22
851.40	18.20	16.37	14.61	11.64				60.82
851.50	20.31	18.41	16.57	13.47				68.75
851.60	22.49	20.52	18.61	15.38				77.00
851.70	24.74	22.71	20.74	17.38				85.57
851.80	27.07	24.97	22.93	19.45				94.43
851.90	29.46	27.31	25.20	21.61				103.58
852.00	31.93	29.71	27.54	23.83				113.01



Reso A - Exhibit C2 (EIR Technical Appendix)

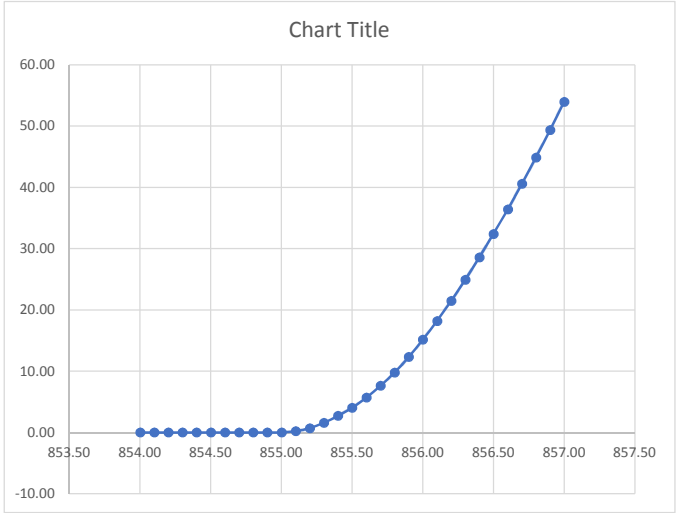
Gran Cielo Driveway GCDwy Q to West

IRREGULAR BROAD CRESTED WEIR METHOD

Q = CL(H^1.5)

C	0.60
L	8.00

0.10	W1	W2	W3	W4	W5	W6	W7	W8	W9	Total
WSE	855.77	855.48	855.16	854.98	855.09					
854.00	0.00	0.00	0.00	0.00	0.00					0.00
854.10	0.00	0.00	0.00	0.00	0.00					0.00
854.20	0.00	0.00	0.00	0.00	0.00					0.00
854.30	0.00	0.00	0.00	0.00	0.00					0.00
854.40	0.00	0.00	0.00	0.00	0.00					0.00
854.50	0.00	0.00	0.00	0.00	0.00					0.00
854.60	0.00	0.00	0.00	0.00	0.00					0.00
854.70	0.00	0.00	0.00	0.00	0.00					0.00
854.80	0.00	0.00	0.00	0.00	0.00					0.00
854.90	0.00	0.00	0.00	0.00	0.00					0.00
855.00	0.00	0.00	0.00	0.01	0.00					0.01
855.10	0.00	0.00	0.00	0.20	0.00					0.20
855.20	0.00	0.00	0.04	0.50	0.18					0.71
855.30	0.00	0.00	0.25	0.87	0.46					1.58
855.40	0.00	0.00	0.56	1.31	0.83					2.70
855.50	0.00	0.01	0.95	1.80	1.26					4.03
855.60	0.00	0.20	1.40	2.34	1.75					5.69
855.70	0.00	0.50	1.90	2.93	2.29					7.62
855.80	0.02	0.87	2.46	3.56	2.87					9.79
855.90	0.22	1.31	3.06	4.24	3.50					12.32
856.00	0.53	1.80	3.70	4.94	4.17					15.14
856.10	0.91	2.34	4.37	5.69	4.87					18.19
856.20	1.35	2.93	5.09	6.47	5.61					21.46
856.30	1.85	3.56	5.84	7.28	6.39					24.93
856.40	2.40	4.24	6.63	8.12	7.20					28.58
856.50	2.99	4.94	7.45	9.00	8.04					32.42
856.60	3.63	5.69	8.29	9.90	8.91					36.42
856.70	4.30	6.47	9.17	10.83	9.81					40.58
856.80	5.02	7.28	10.08	11.79	10.73					44.90
856.90	5.77	8.12	11.02	12.77	11.69					49.36
857.00	6.55	9.00	11.98	13.78	12.67					53.97



Reso A - Exhibit C2 (EIR Technical Appendix)

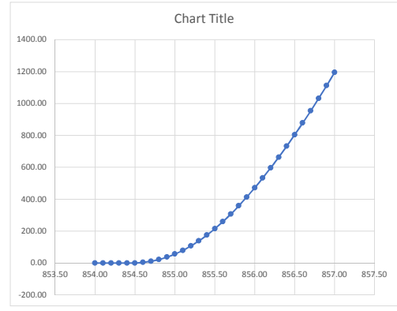
Gran Cielo Driveway GCDwy Q to South

IRREGULAR BROAD CRESTED WEIR METHOD

Q = CL(H^1.5)

C	0.60
L	20.00

0.10	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W13	W14	W15	W16	W17	W18	W19	W20	W21	W22	W23	W24	W25	W26	W27	W28	W29	W30	W31	Total
WSE	855.11	855.05	854.98	854.90	854.81	854.72	854.66	854.60	854.55	854.50	854.49	854.50	854.50	854.50	854.48	854.48	854.51	854.57	854.65	854.73	854.81	854.89	854.97	855.05	855.13	855.21	855.29	855.37	855.45	855.53	855.62	855.69	
854.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
854.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
854.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
854.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
854.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
854.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
854.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.38	0.44	0.38	0.38	0.38	0.50	0.50	0.32	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.47
854.70	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.38	0.70	1.07	1.15	1.07	1.07	1.07	1.24	1.24	0.99	0.56	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.79
854.80	0.00	0.00	0.00	0.00	0.00	0.27	0.63	1.07	1.50	1.97	2.07	1.97	1.97	1.97	2.17	2.17	1.87	1.32	0.70	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.89
854.90	0.00	0.00	0.00	0.00	0.32	0.92	1.41	1.97	2.48	3.04	3.15	3.04	3.04	3.04	3.27	3.27	2.92	2.27	1.50	0.84	0.32	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.81
855.00	0.00	0.00	0.03	0.38	0.99	1.78	2.38	3.04	3.62	4.24	4.37	4.24	4.24	4.24	4.50	4.50	4.12	3.38	2.48	1.68	0.99	0.44	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	55.72
855.10	0.00	0.13	0.50	1.07	1.87	2.81	3.50	4.24	4.89	5.58	5.72	5.58	5.58	5.58	5.86	5.86	5.44	4.63	3.62	2.70	1.87	1.15	0.56	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	78.89
855.20	0.32	0.70	1.24	1.97	2.92	3.99	4.76	5.58	6.29	7.03	7.18	7.03	7.03	7.03	7.33	7.33	6.88	6.00	4.89	3.87	2.92	2.07	1.32	0.70	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	106.60
855.30	0.99	1.50	2.17	3.04	4.12	5.30	6.14	7.03	7.79	8.59	8.75	8.59	8.59	8.59	8.91	8.91	8.43	7.48	6.29	5.16	4.12	3.15	2.27	1.50	0.84	0.32	0.01	0.00	0.00	0.00	0.00	0.00	138.58
855.40	1.87	2.48	3.27	4.24	5.44	6.73	7.64	8.59	9.40	10.25	10.42	10.25	10.25	10.25	10.59	10.59	10.08	9.07	7.79	6.58	5.44	4.37	3.38	2.48	1.68	0.99	0.44	0.06	0.00	0.00	0.00	0.00	174.62
855.50	2.92	3.62	4.50	5.58	6.88	8.27	9.24	10.25	11.11	12.00	12.18	12.00	12.00	12.00	12.36	12.36	11.82	10.76	9.40	8.11	6.88	5.72	4.63	3.62	2.70	1.87	1.15	0.56	0.13	0.00	0.00	0.00	214.63
855.60	4.12	4.89	5.86	7.03	8.43	9.91	10.94	12.00	12.91	13.84	14.03	13.84	13.84	13.84	14.22	14.22	13.66	12.54	11.11	9.74	8.43	7.18	6.00	4.89	3.87	2.92	2.07	1.32	0.70	0.22	0.00	0.00	258.59
855.70	5.44	6.29	7.33	8.59	10.08	11.64	12.73	13.84	14.80	15.77	15.97	15.77	15.77	15.77	16.17	16.17	15.58	14.41	12.91	11.46	10.08	8.75	7.48	6.29	5.16	4.12	3.15	2.27	1.50	0.84	0.27	0.01	306.44
855.80	6.88	7.79	8.91	10.25	11.82	13.47	14.61	15.77	16.77	17.79	17.99	17.79	17.79	17.79	18.20	18.20	17.58	16.37	14.80	13.28	11.82	10.42	9.07	7.79	6.58	5.44	4.37	3.38	2.48	1.68	0.92	0.44	358.24
855.90	8.43	9.40	10.59	12.00	13.66	15.38	16.57	17.79	18.82	19.88	20.09	19.88	19.88	19.88	20.31	20.31	19.67	18.41	16.77	15.19	13.66	12.18	10.76	9.40	8.11	6.88	5.72	4.63	3.62	2.70	1.78	1.15	413.47
856.00	10.08	11.11	12.36	13.84	15.58	17.38	18.61	19.88	20.95	22.05	22.27	22.05	22.05	22.05	22.49	22.49	21.83	20.52	18.82	17.17	15.58	14.03	12.54	11.11	9.74	8.43	7.18	6.00	4.89	3.87	2.81	2.07	471.81
856.10	11.82	12.91	14.22	15.77	17.58	19.45	20.74	22.05	23.16	24.29	24.51	24.29	24.29	24.29	24.74	24.74	24.06	22.71	20.95	19.24	17.58	15.97	14.41	12.91	11.46	10.08	8.75	7.48	6.29	5.16	3.99	3.15	533.06
856.20	13.66	14.80	16.17	17.79	19.67	21.61	22.93	24.29	25.43	26.60	26.83	26.60	26.60	26.60	27.07	27.07	26.36	24.97	23.16	21.39	19.67	17.99	16.37	14.80	13.28	11.82	10.42	9.07	7.79	6.58	5.30	4.37	597.05
856.30	15.58	16.77	18.20	19.88	21.83	23.83	25.20	26.60	27.78	28.98	29.22	28.98	28.98	28.98	29.46	29.46	28.74	27.31	25.43	23.61	21.83	20.09	18.41	16.77	15.19	13.66	12.18	10.76	9.40	8.11	6.73	5.72	663.65
856.40	17.58	18.82	20.31	22.05	24.06	26.13	27.54	28.98	30.20	31.43	31.68	31.43	31.43	31.43	31.93	31.93	31.18	29.71	27.78	25.90	24.06	22.27	20.52	18.82	17.17	15.58	14.03	12.54	11.11	9.74	8.27	7.18	732.76
856.50	19.67	20.95	22.49	24.29	26.36	28.50	29.95	31.43	32.68	33.94	34.20	33.94	33.94	33.94	34.45	34.45	33.69	32.17	30.20	28.26	26.36	24.51	22.71	20.95	19.24	17.58	15.97	14.41	12.91	11.46	9.91	8.75	804.27
856.60	21.83	23.16	24.74	26.60	28.74	30.93	32.43	33.94	35.22	36.52	36.78	36.52	36.52	36.52	37.04	37.04	36.26	34.71	32.68	30.69	28.74	26.83	24.97	23.16	21.39	19.67	17.99	16.37	14.80	13.28	11.64	10.42	878.10
856.70	24.06	25.43	27.07	28.98	31.18	33.43	34.96	36.52	37.83	39.16	39.42	39.16	39.16	39.16	39.69	39.69	38.89	37.30	35.22	33.18	31.18	29.22	27.31	25.43	23.61	21.83	20.09	18.41	16.77	15.19	13.47	12.18	954.18
856.80	26.36	27.78	29.46	31.43	33.69	36.00	37.57	39.16	40.50	41.86	42.13	41.86	41.86	41.86	42.40	42.40	41.58	39.96	37.83	35.74	33.69	31.68	29.71	27.78	25.90	24.06	22.27	20.52	18.82	17.17	15.38	14.03	1032.44
856.90	28.74	30.20	31.93	33.94	36.26	38.62	40.23	41.86	43.23	44.62	44.90	44.62	44.62	44.62	45.18	45.18	44.34	42.68	40.50	38.36	36.26	34.20	32.17	30.20	28.26	26.36	24.51	22.71	20.95	19.24	17.38	15.97	1112.81
857.00	31.18	32.68	34.45	36.52	38.89	41.31	42.95	44.62	46.02	47.43	47.72	47.43	47.43	47.43	48.00	48.00	47.15	45.46	43.23	41.04	38.89	36.78	34.71	32.68	30.69	28.74	26.83	24.97	23.16	21.39	19.45	17.99	1195.24



Summary for Pond 17P: Gran Cielo Dwy

Inflow Area = 166.738 ac, 0.91% Impervious, Inflow Depth = 0.79" for 2 Year event
Inflow = 47.37 cfs @ 10.00 hrs, Volume= 10.915 af
Outflow = 46.35 cfs @ 10.03 hrs, Volume= 10.915 af, Atten= 2%, Lag= 1.8 min
Primary = 46.35 cfs @ 10.03 hrs, Volume= 10.915 af
Secondary = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af
Tertiary = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Peak Elev= 854.16' @ 10.03 hrs Surf.Area= 6,316 sf Storage= 4,940 cf
Flood Elev= 854.46' Surf.Area= 6,947 sf Storage= 6,934 cf

Plug-Flow detention time= 2.2 min calculated for 10.911 af (100% of inflow)
Center-of-Mass det. time= 2.2 min (868.9 - 866.8)

Volume	Invert	Avail.Storage	Storage Description
#1	852.84'	22,270 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
852.84	0	0	0
853.14	2,586	388	388
854.14	6,275	4,431	4,818
855.14	8,376	7,326	12,144
856.14	11,876	10,126	22,270

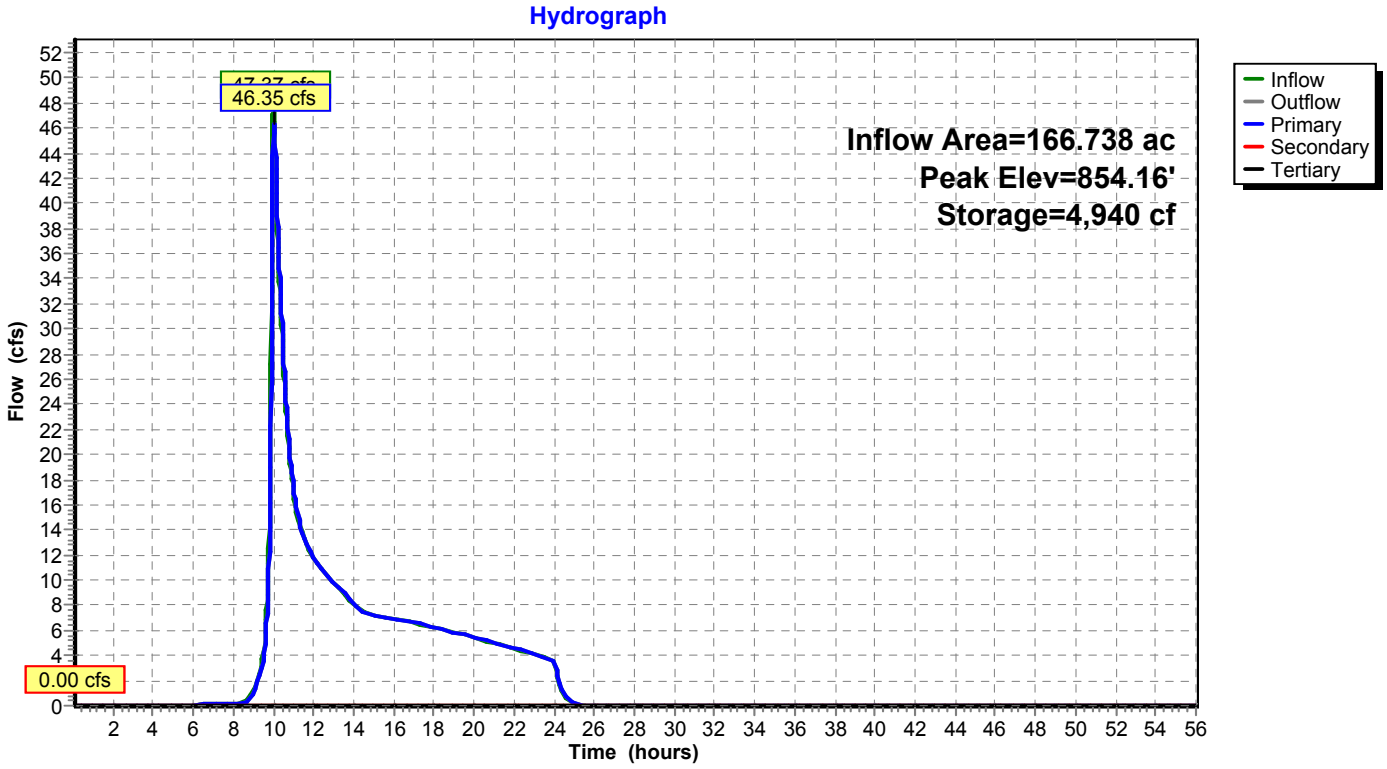
Device	Routing	Invert	Outlet Devices
#1	Primary	852.84'	**30.0" Round Culvert X 6.00** L= 77.0' CMP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 852.84' / 851.76' S= 0.0140 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 4.91 sf
#2	Secondary	854.90'	**Special & User-Defined** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 Disch. (cfs) 0.000 0.010 0.200 0.710 1.580 2.700 4.030 5.690 7.620 9.790 12.320 15.140 18.190 21.460 24.930 28.580 32.420 36.420 40.580 44.900 49.360 53.970
#3	Tertiary	854.40'	**Special & User-Defined** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 2.20 2.30 2.40 2.50 2.60 Disch. (cfs) 0.000 0.080 3.470 10.790 21.890 36.810 55.720 78.890 106.600 138.580 174.620 214.630 258.590 306.440 358.240 413.470 471.810 533.060 597.050 663.650 732.760 804.270 878.100 954.180 1,032.440 1,112.810 1,195.240

Primary OutFlow Max=46.26 cfs @ 10.03 hrs HW=854.16' TW=850.73' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 46.26 cfs @ 4.27 fps)

Secondary OutFlow Max=0.00 cfs @ 0.10 hrs HW=852.84' TW=844.56' (Dynamic Tailwater)
└**2=Special & User-Defined** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.10 hrs HW=852.84' TW=853.60' (Dynamic Tailwater)
└**3=Special & User-Defined** (Controls 0.00 cfs)

Pond 17P: Gran Cielo Dwy



Summary for Pond 18P: GC-CkD1

[58] Hint: Peaked 0.60' above defined flood level

Inflow Area = 240.622 ac, 1.05% Impervious, Inflow Depth = 0.81" for 2 Year event
Inflow = 70.33 cfs @ 10.01 hrs, Volume= 16.278 af
Outflow = 65.63 cfs @ 10.09 hrs, Volume= 16.215 af, Atten= 7%, Lag= 4.8 min
Primary = 1.14 cfs @ 9.88 hrs, Volume= 1.454 af
Secondary = 45.19 cfs @ 10.09 hrs, Volume= 13.651 af
Tertiary = 19.48 cfs @ 10.09 hrs, Volume= 1.110 af

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Peak Elev= 850.77' @ 10.09 hrs Surf.Area= 22,453 sf Storage= 36,035 cf
Flood Elev= 850.17' Surf.Area= 18,994 sf Storage= 23,481 cf

Plug-Flow detention time= 30.0 min calculated for 16.209 af (100% of inflow)
Center-of-Mass det. time= 27.9 min (892.7 - 864.8)

Volume	Invert	Avail.Storage	Storage Description
#1	844.56'	67,617 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
844.56	10	0	0
845.00	200	46	46
846.00	600	400	446
847.00	1,500	1,050	1,496
848.00	2,166	1,833	3,329
849.00	7,688	4,927	8,256
850.00	16,694	12,191	20,447
850.20	19,400	3,609	24,057
852.00	29,000	43,560	67,617

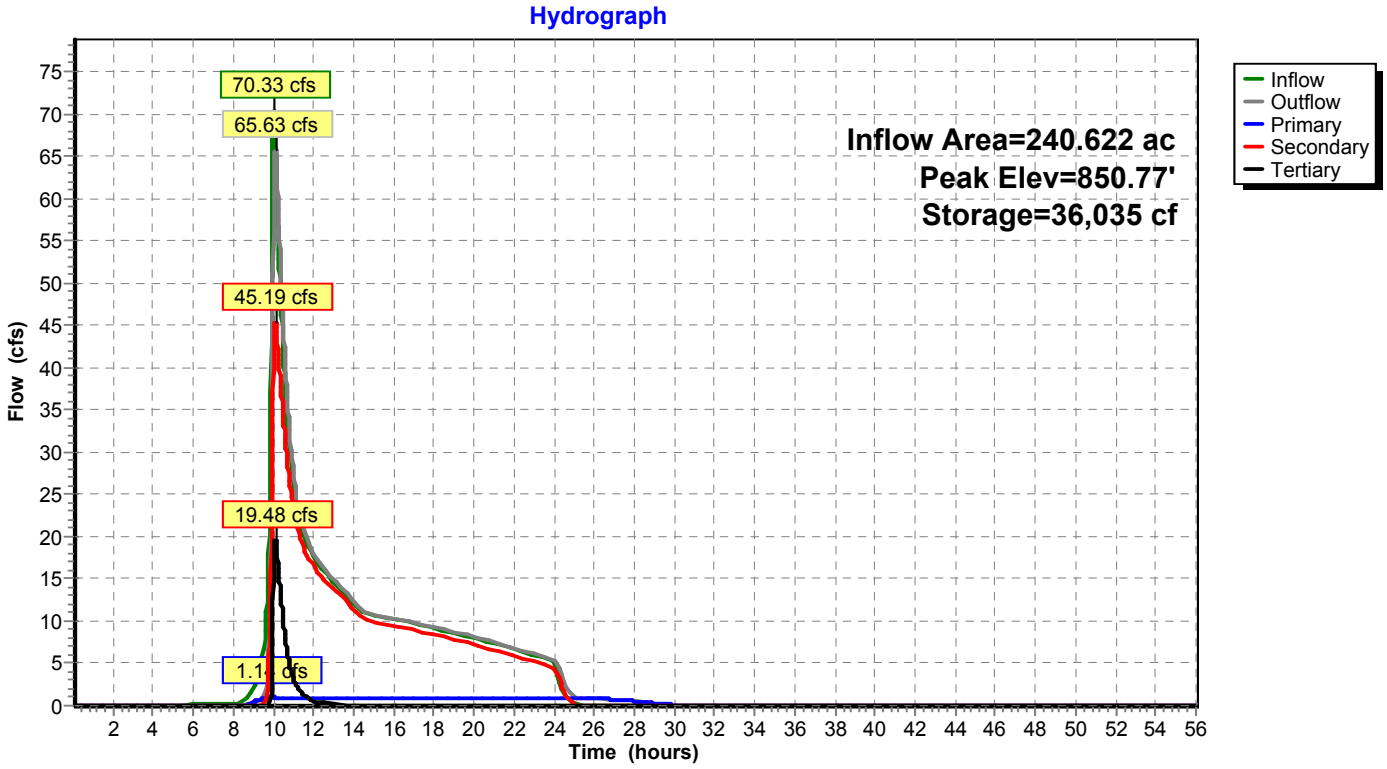
Device	Routing	Invert	Outlet Devices
#1	Primary	847.69'	**6.0" Round Culvert** L= 26.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 847.69' / 847.67' S= 0.0008 '/' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Secondary	849.50'	**9.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59
#3	Tertiary	850.00'	**Special & User-Defined (CkD1-S)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 Disch. (cfs) 0.000 0.030 0.560 1.900 4.120 7.220 11.180 15.770 20.900 26.530 32.600 39.090 45.970 53.220 60.820 68.750 77.000 85.570 94.430 103.580 113.010

Primary OutFlow Max=1.10 cfs @ 9.88 hrs HW=850.26' TW=848.09' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.10 cfs @ 5.61 fps)

Secondary OutFlow Max=45.17 cfs @ 10.09 hrs HW=850.77' TW=849.17' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 45.17 cfs @ 3.95 fps)

Tertiary OutFlow Max=19.46 cfs @ 10.09 hrs HW=850.77' TW=0.00' (Dynamic Tailwater)
└**3=Special & User-Defined (CkD1-S)** (Custom Controls 19.46 cfs)

Pond 18P: GC-CkD1



Summary for Pond 19P: GC-CkD2

[58] Hint: Peaked 0.55' above defined flood level

Inflow Area = 260.311 ac, 0.97% Impervious, Inflow Depth = 0.74" for 2 Year event
Inflow = 50.30 cfs @ 10.08 hrs, Volume= 16.149 af
Outflow = 48.22 cfs @ 10.17 hrs, Volume= 16.147 af, Atten= 4%, Lag= 5.4 min
Primary = 1.26 cfs @ 10.17 hrs, Volume= 1.832 af
Secondary = 38.35 cfs @ 10.17 hrs, Volume= 13.888 af
Tertiary = 8.61 cfs @ 10.17 hrs, Volume= 0.427 af

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Peak Elev= 849.20' @ 10.17 hrs Surf.Area= 19,195 sf Storage= 22,607 cf
Flood Elev= 848.65' Surf.Area= 11,850 sf Storage= 14,787 cf

Plug-Flow detention time= 20.8 min calculated for 16.147 af (100% of inflow)
Center-of-Mass det. time= 20.5 min (930.6 - 910.1)

Volume	Invert	Avail.Storage	Storage Description
#1	846.00'	46,430 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
846.00	267	0	0
847.00	4,055	2,161	2,161
848.00	8,178	6,117	8,278
849.00	13,828	11,003	19,281
850.00	40,470	27,149	46,430

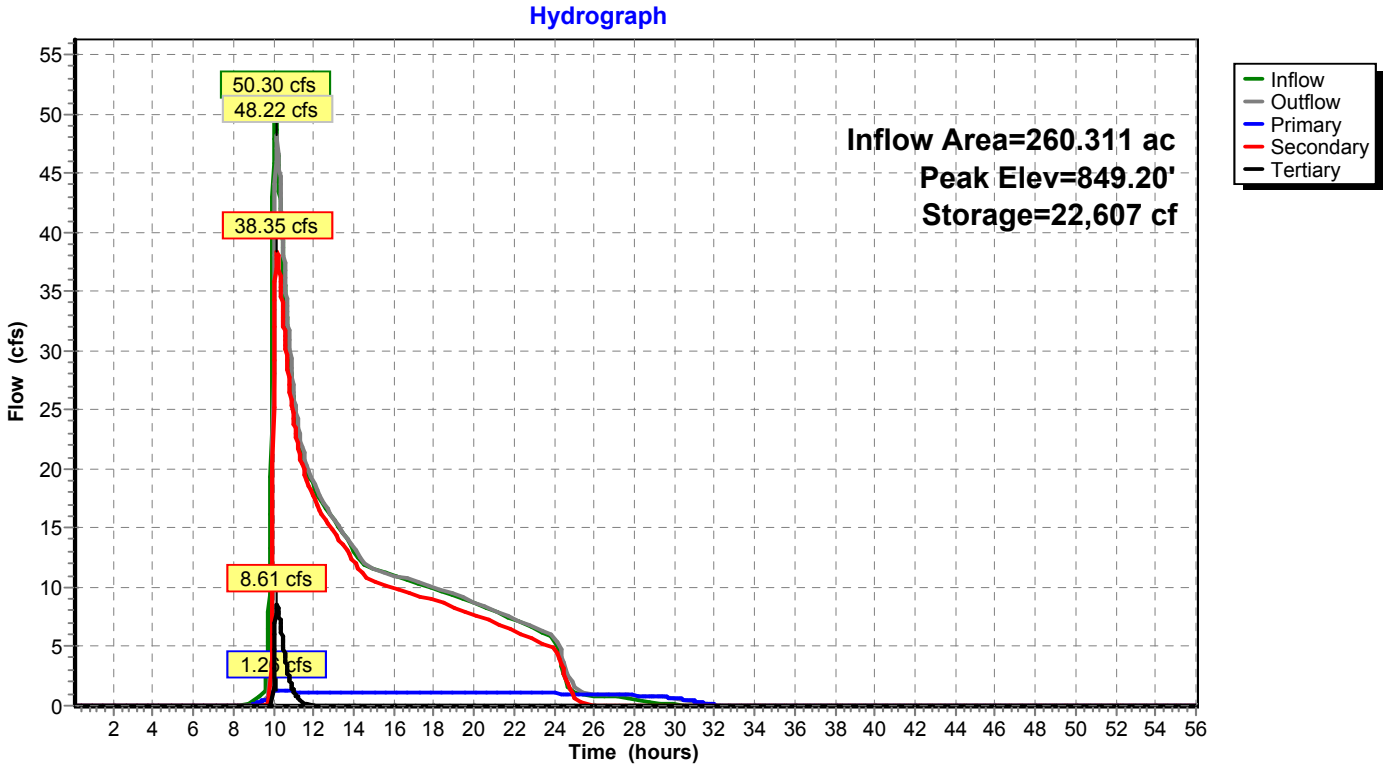
Device	Routing	Invert	Outlet Devices
#1	Primary	846.12'	**6.0" Round Culvert** L= 26.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 846.12' / 845.98' S= 0.0054 '/' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Tertiary	848.70'	**Special & User-Defined (CkD2-S)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 Disch. (cfs) 0.000 0.130 0.970 2.640 5.120 8.550 13.010 18.440 24.620 31.430 38.830 46.770 55.210 64.120
#3	Secondary	847.80'	**Special & User-Defined (CkD2-W)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 2.20 Disch. (cfs) 0.000 0.020 0.480 1.430 2.780 4.430 6.490 8.950 12.010 15.510 19.390 23.590 28.100 32.980 38.270 43.910 49.850 56.080 62.580 69.340 76.350 83.590 91.070

Primary OutFlow Max=1.26 cfs @ 10.17 hrs HW=849.20' TW=845.76' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.26 cfs @ 6.40 fps)

Secondary OutFlow Max=38.34 cfs @ 10.17 hrs HW=849.20' TW=845.76' (Dynamic Tailwater)
└**3=Special & User-Defined (CkD2-W)** (Custom Controls 38.34 cfs)

Tertiary OutFlow Max=8.60 cfs @ 10.17 hrs HW=849.20' TW=0.00' (Dynamic Tailwater)
└**2=Special & User-Defined (CkD2-S)** (Custom Controls 8.60 cfs)

Pond 19P: GC-CkD2



Summary for Pond 20P: GC-CkD3

[58] Hint: Peaked 0.75' above defined flood level

Inflow Area = 274.094 ac, 0.92% Impervious, Inflow Depth = 0.72" for 2 Year event
Inflow = 41.64 cfs @ 10.17 hrs, Volume= 16.356 af
Outflow = 41.26 cfs @ 10.22 hrs, Volume= 16.344 af, Atten= 1%, Lag= 3.0 min
Primary = 5.50 cfs @ 10.22 hrs, Volume= 5.240 af
Secondary = 6.18 cfs @ 10.22 hrs, Volume= 2.434 af
Tertiary = 29.57 cfs @ 10.22 hrs, Volume= 8.670 af

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Peak Elev= 845.77' @ 10.22 hrs Surf.Area= 13,400 sf Storage= 12,910 cf
Flood Elev= 845.02' Surf.Area= 8,229 sf Storage= 4,852 cf

Plug-Flow detention time= 12.9 min calculated for 16.339 af (100% of inflow)
Center-of-Mass det. time= 12.3 min (949.6 - 937.3)

Volume	Invert	Avail.Storage	Storage Description
#1	844.00'	24,632 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
844.00	1,288	0	0
845.00	8,090	4,689	4,689
846.50	18,500	19,943	24,632

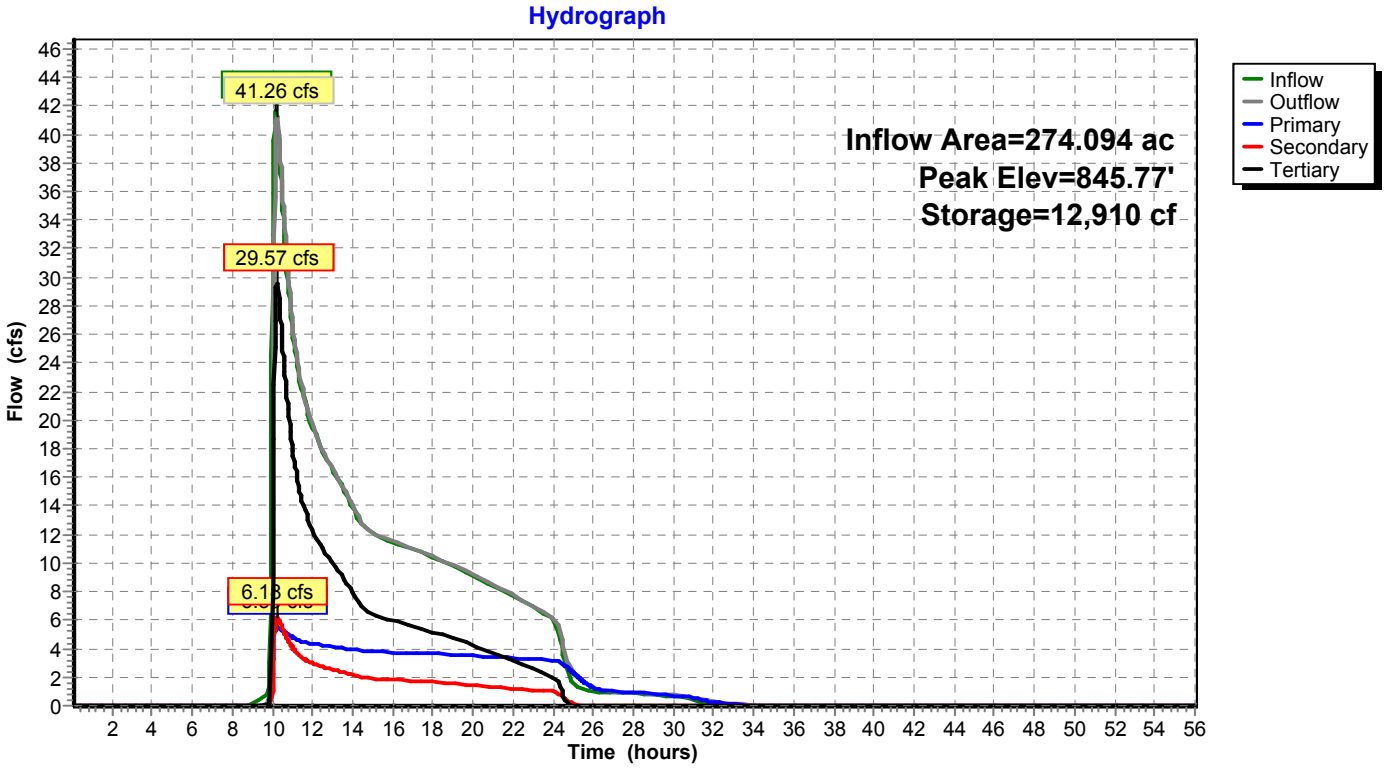
Device	Routing	Invert	Outlet Devices
#1	Primary	844.22'	**18.0" Round Culvert** L= 26.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 844.22' / 843.98' S= 0.0092 '/' Cc= 0.900 n= 0.021 Corrugated metal, Flow Area= 1.77 sf
#2	Secondary	845.00'	**Special & User-Defined (CkD3-W)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 Disch. (cfs) 0.000 0.050 0.390 0.970 1.710 2.600 3.780 5.170 6.720 8.570 11.140 14.290 17.880 21.830 26.120 30.880 36.030 41.520 47.330 53.420 59.790
#3	Tertiary	845.10'	**Special & User-Defined (CkD3-S)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 Disch. (cfs) 0.000 0.050 1.930 5.420 10.370 16.490 23.960 32.580 42.550 53.770 66.380 80.510 96.280 113.770 132.840 153.630 175.910 199.510 224.310 250.260

Primary OutFlow Max=5.50 cfs @ 10.22 hrs HW=845.77' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 5.50 cfs @ 3.76 fps)

Secondary OutFlow Max=6.18 cfs @ 10.22 hrs HW=845.77' TW=0.00' (Dynamic Tailwater)
└**2=Special & User-Defined (CkD3-W)** (Custom Controls 6.18 cfs)

Tertiary OutFlow Max=29.56 cfs @ 10.22 hrs HW=845.77' TW=0.00' (Dynamic Tailwater)
└**3=Special & User-Defined (CkD3-S)** (Custom Controls 29.56 cfs)

Pond 20P: GC-CkD3

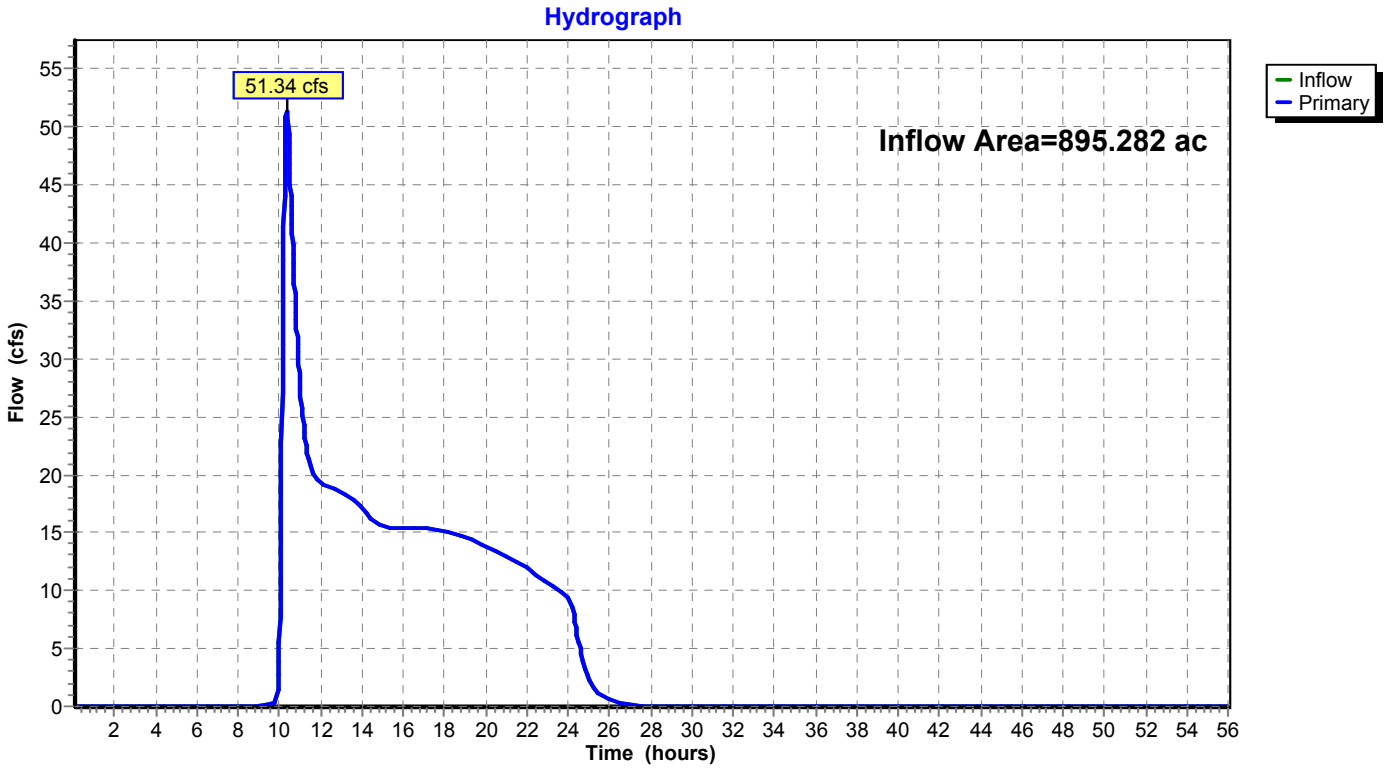


Summary for Link 3a (1,2+3)-Ex: Comb Un-dev Ck Flow

Inflow Area = 895.282 ac, 0.06% Impervious, Inflow Depth = 0.27" for 2 Year event
Inflow = 51.34 cfs @ 10.35 hrs, Volume= 20.006 af
Primary = 51.34 cfs @ 10.35 hrs, Volume= 20.006 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

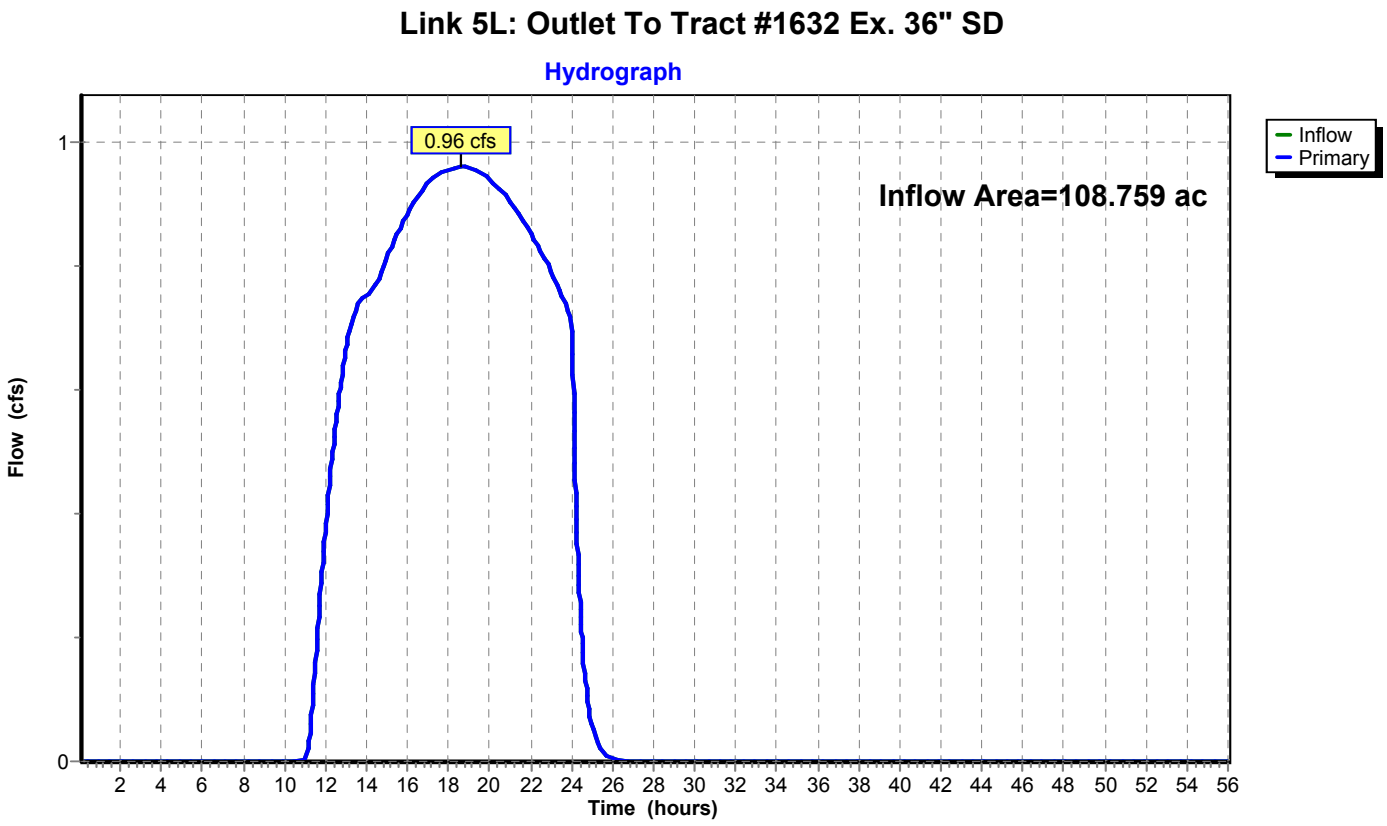
Link 3a (1,2+3)-Ex: Comb Un-dev Ck Flow



Summary for Link 5L: Outlet To Tract #1632 Ex. 36" SD

Inflow Area = 108.759 ac, 0.00% Impervious, Inflow Depth = 0.10" for 2 Year event
Inflow = 0.96 cfs @ 18.57 hrs, Volume= 0.867 af
Primary = 0.96 cfs @ 18.57 hrs, Volume= 0.867 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

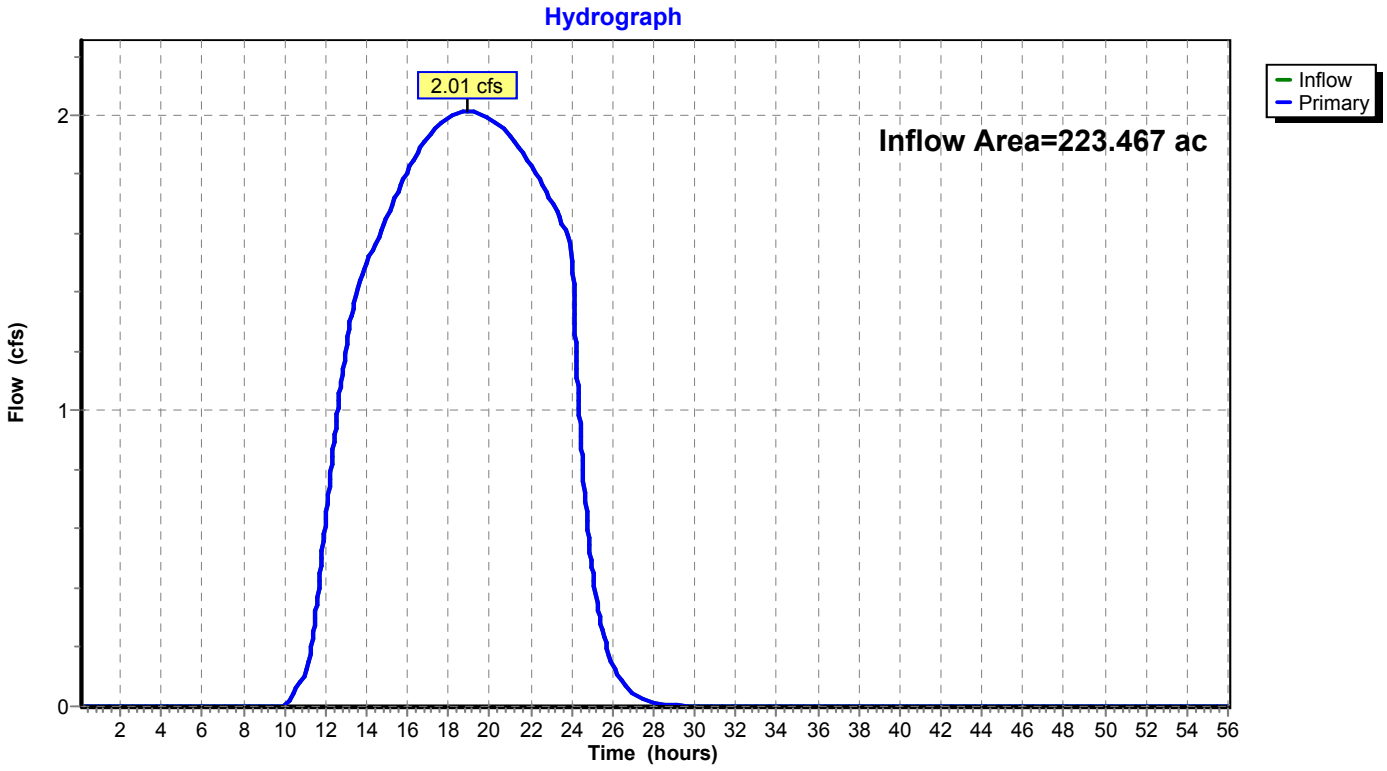


Summary for Link 6L: To Existing Meadowlark Road

Inflow Area = 223.467 ac, 0.00% Impervious, Inflow Depth = 0.10" for 2 Year event
Inflow = 2.01 cfs @ 18.95 hrs, Volume= 1.852 af
Primary = 2.01 cfs @ 18.95 hrs, Volume= 1.852 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 6L: To Existing Meadowlark Road

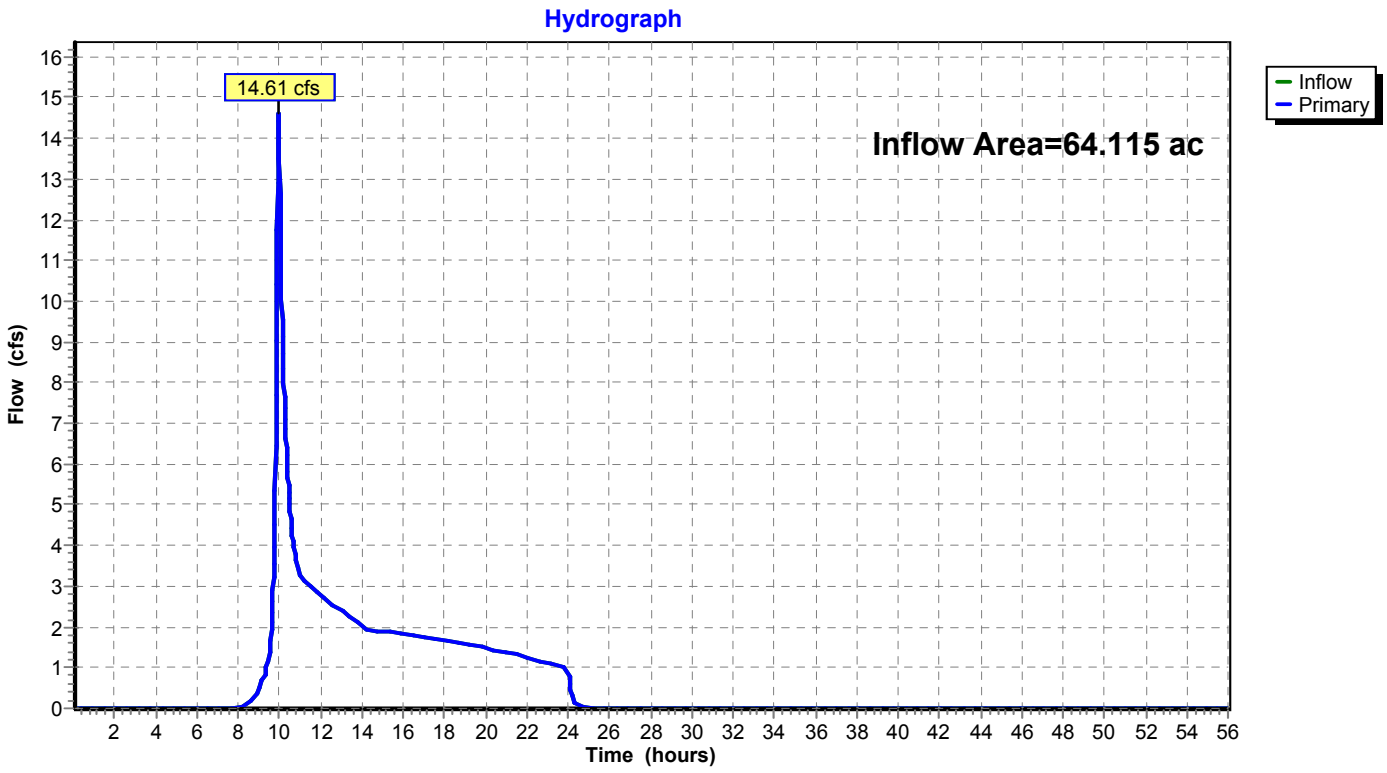


Summary for Link 7L: DMA 13

Inflow Area = 64.115 ac, 0.00% Impervious, Inflow Depth = 0.51" for 2 Year event
Inflow = 14.61 cfs @ 9.98 hrs, Volume= 2.738 af
Primary = 14.61 cfs @ 9.98 hrs, Volume= 2.738 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 7L: DMA 13

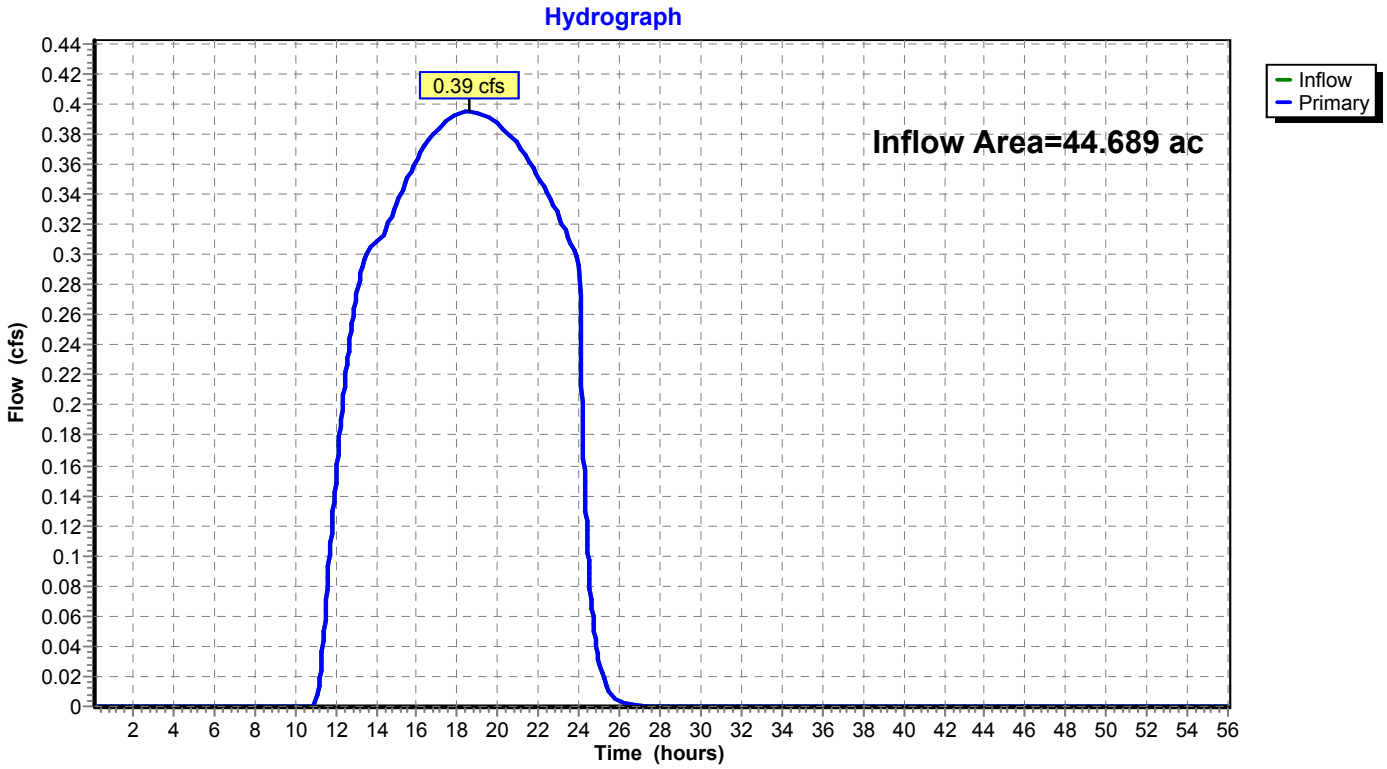


Summary for Link 8L: DMA 8

Inflow Area = 44.689 ac, 0.00% Impervious, Inflow Depth = 0.10" for 2 Year event
Inflow = 0.39 cfs @ 18.60 hrs, Volume= 0.356 af
Primary = 0.39 cfs @ 18.60 hrs, Volume= 0.356 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 8L: DMA 8

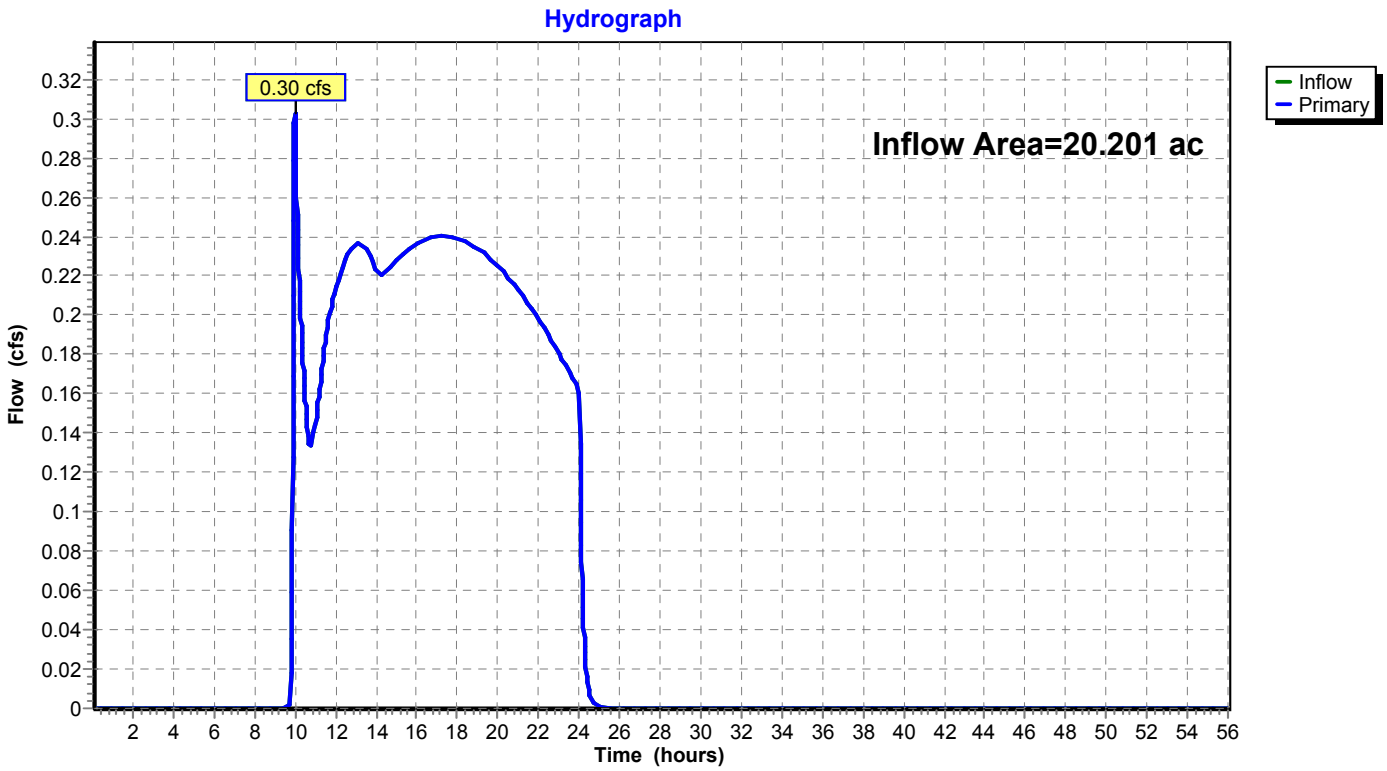


Summary for Link 9L: DMA 12

Inflow Area = 20.201 ac, 0.00% Impervious, Inflow Depth = 0.15" for 2 Year event
Inflow = 0.30 cfs @ 10.00 hrs, Volume= 0.254 af
Primary = 0.30 cfs @ 10.00 hrs, Volume= 0.254 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 9L: DMA 12

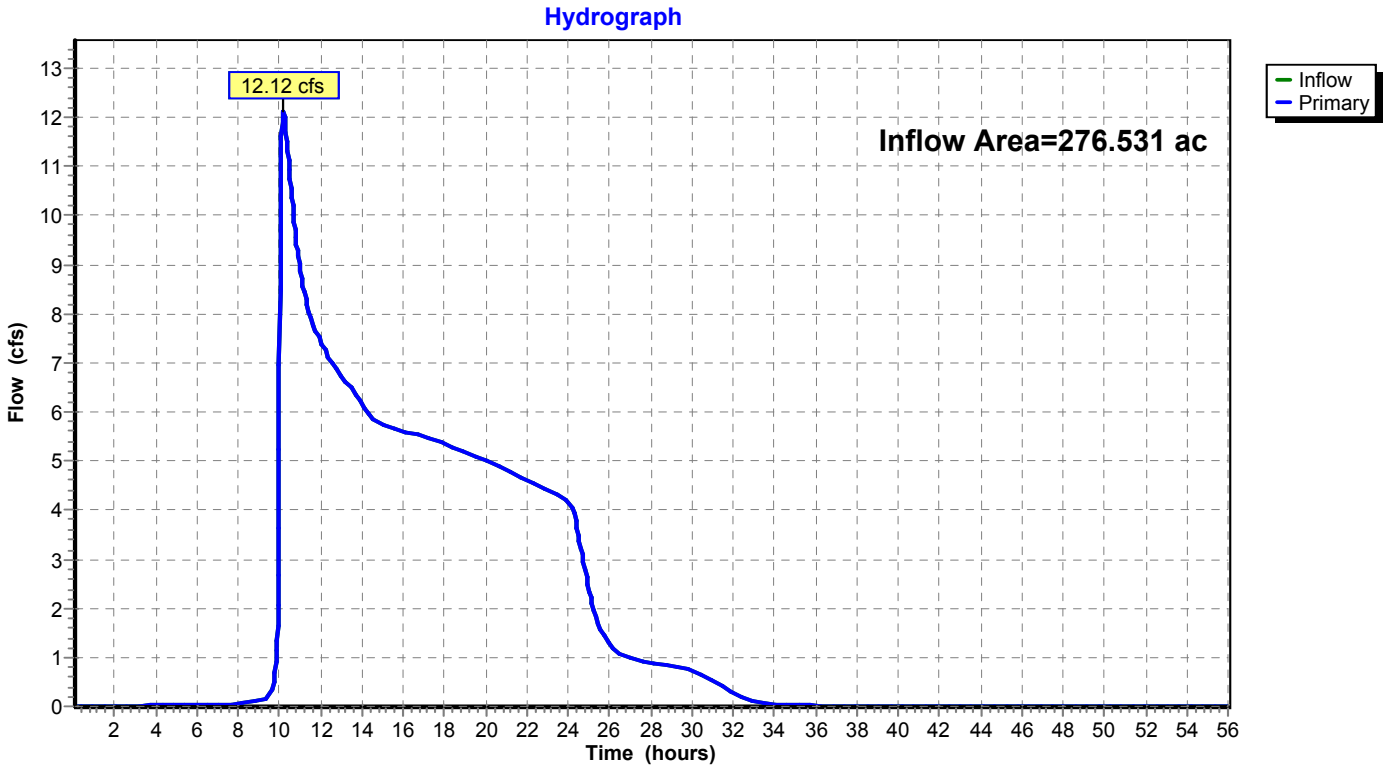


Summary for Link 10L: To Linne Road Channel

Inflow Area = 276.531 ac, 1.18% Impervious, Inflow Depth = 0.34" for 2 Year event
Inflow = 12.12 cfs @ 10.20 hrs, Volume= 7.815 af
Primary = 12.12 cfs @ 10.20 hrs, Volume= 7.815 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 10L: To Linne Road Channel

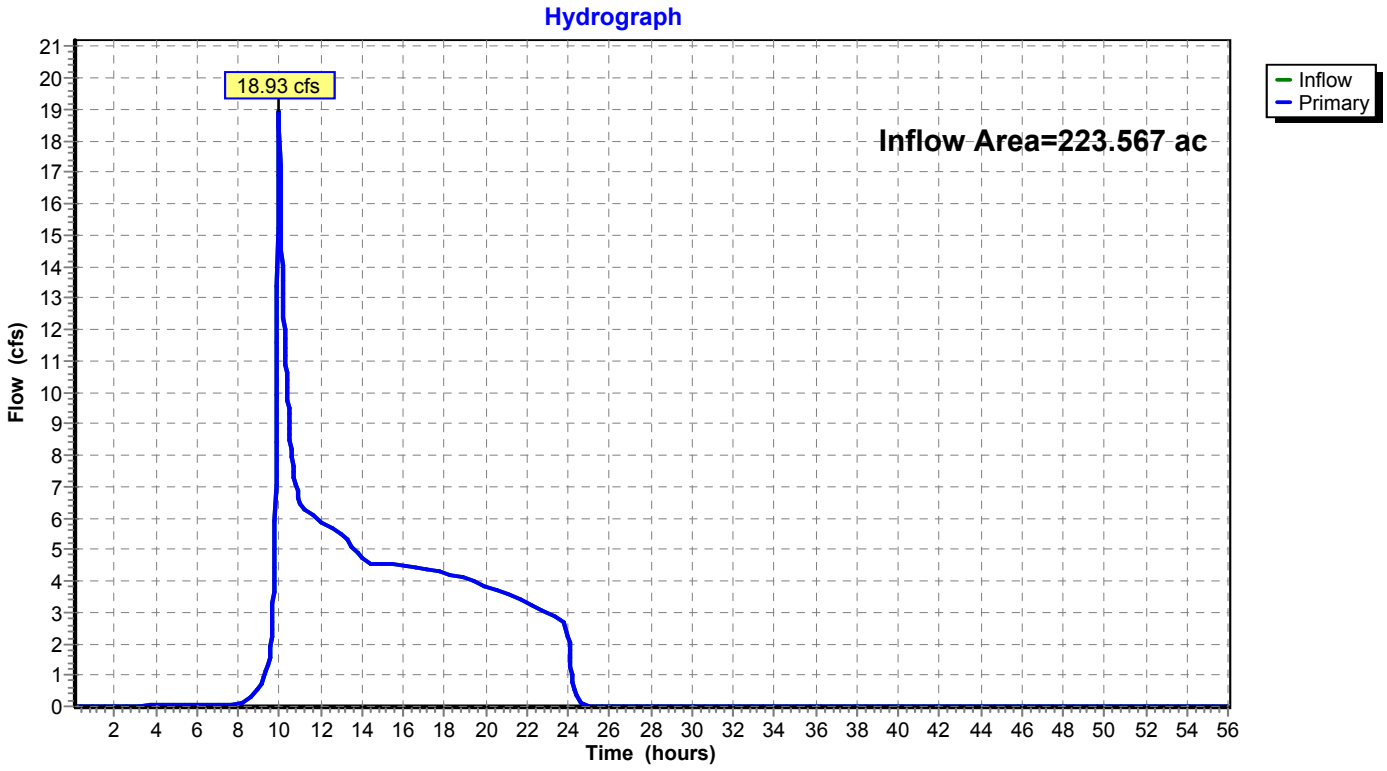


Summary for Link 11L: To Fontana Road SD

Inflow Area = 223.567 ac, 0.53% Impervious, Inflow Depth = 0.32" for 2 Year event
Inflow = 18.93 cfs @ 9.99 hrs, Volume= 5.872 af
Primary = 18.93 cfs @ 9.99 hrs, Volume= 5.872 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 11L: To Fontana Road SD

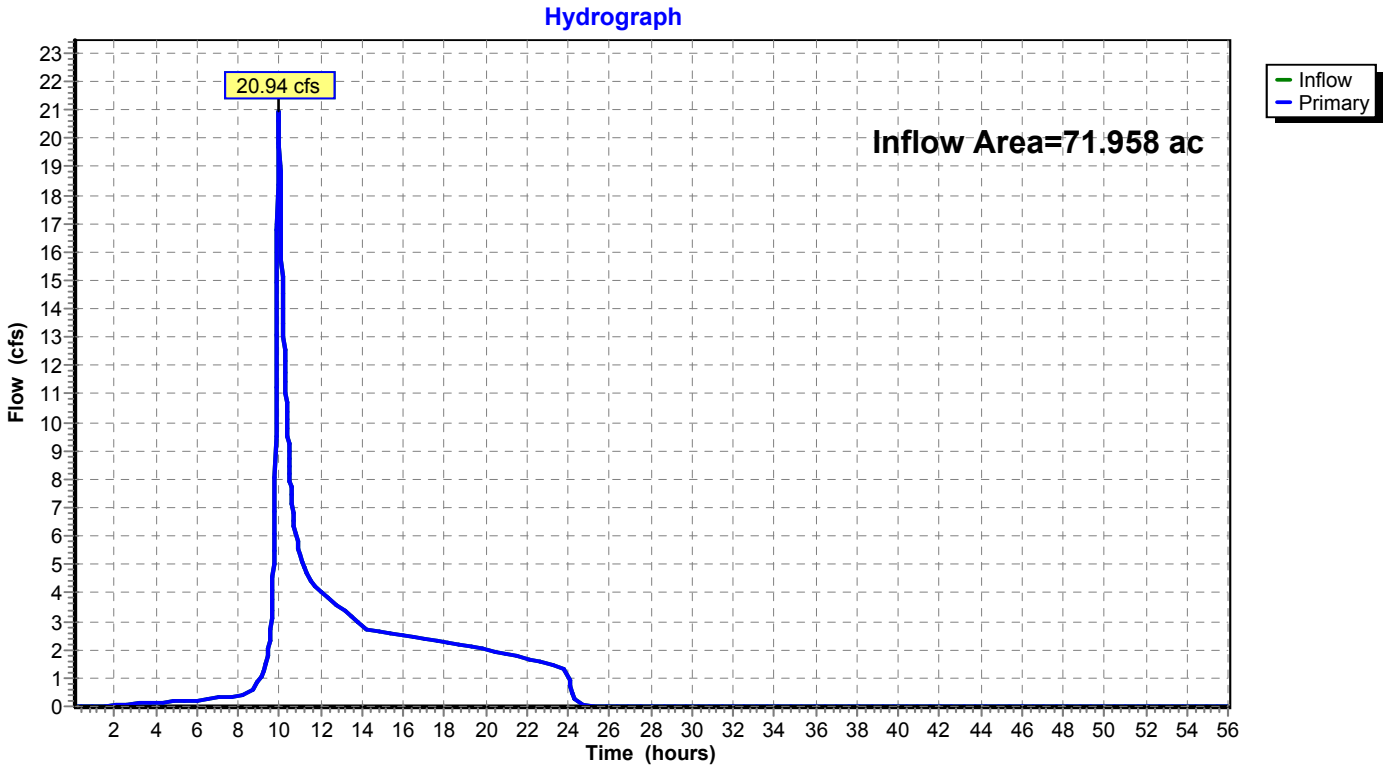


Summary for Link 15L: Sherwood/Niblick LP Xing

Inflow Area = 71.958 ac, 6.18% Impervious, Inflow Depth = 0.68" for 2 Year event
Inflow = 20.94 cfs @ 9.98 hrs, Volume= 4.080 af
Primary = 20.94 cfs @ 9.98 hrs, Volume= 4.080 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 15L: Sherwood/Niblick LP Xing

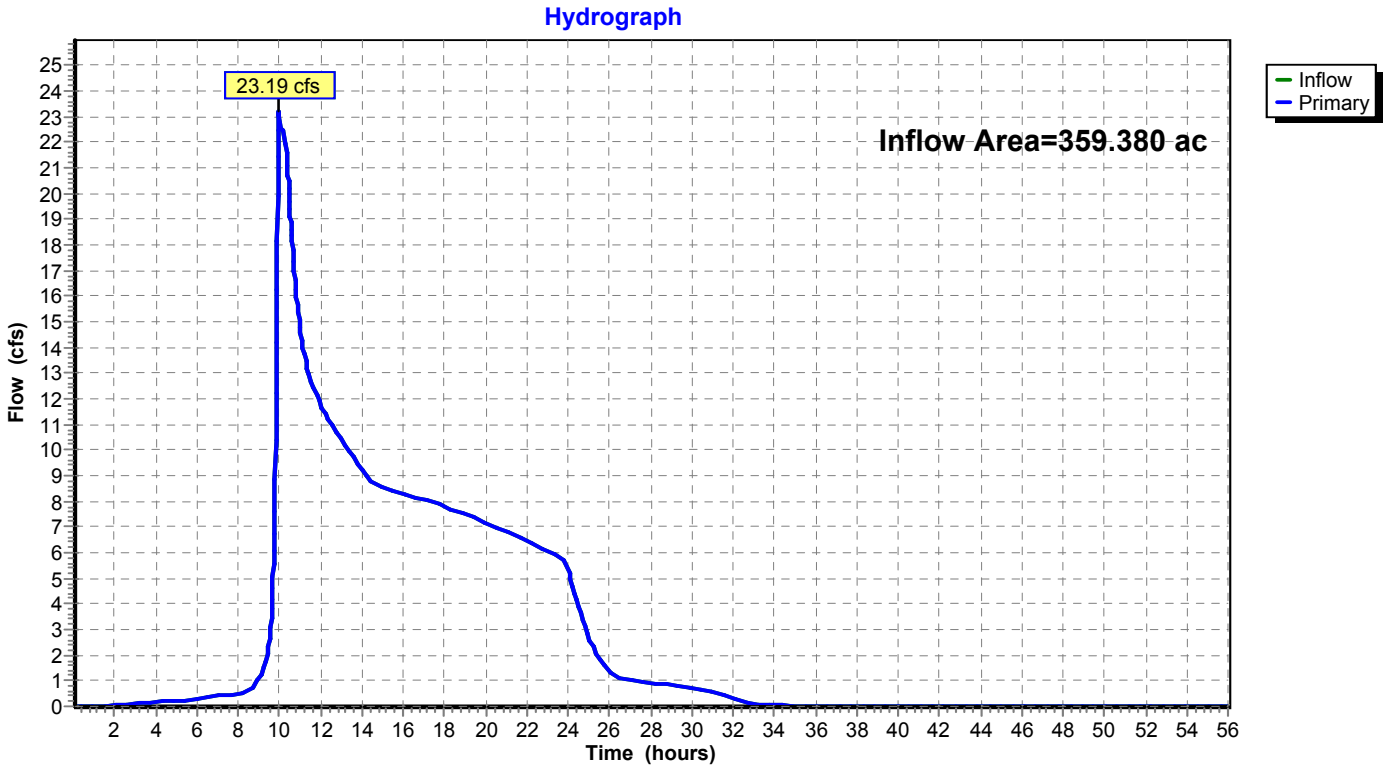


Summary for Link 16L: Airport & Linne Road SD

Inflow Area = 359.380 ac, 2.33% Impervious, Inflow Depth = 0.40" for 2 Year event
Inflow = 23.19 cfs @ 9.99 hrs, Volume= 12.092 af
Primary = 23.19 cfs @ 9.99 hrs, Volume= 12.092 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 16L: Airport & Linne Road SD



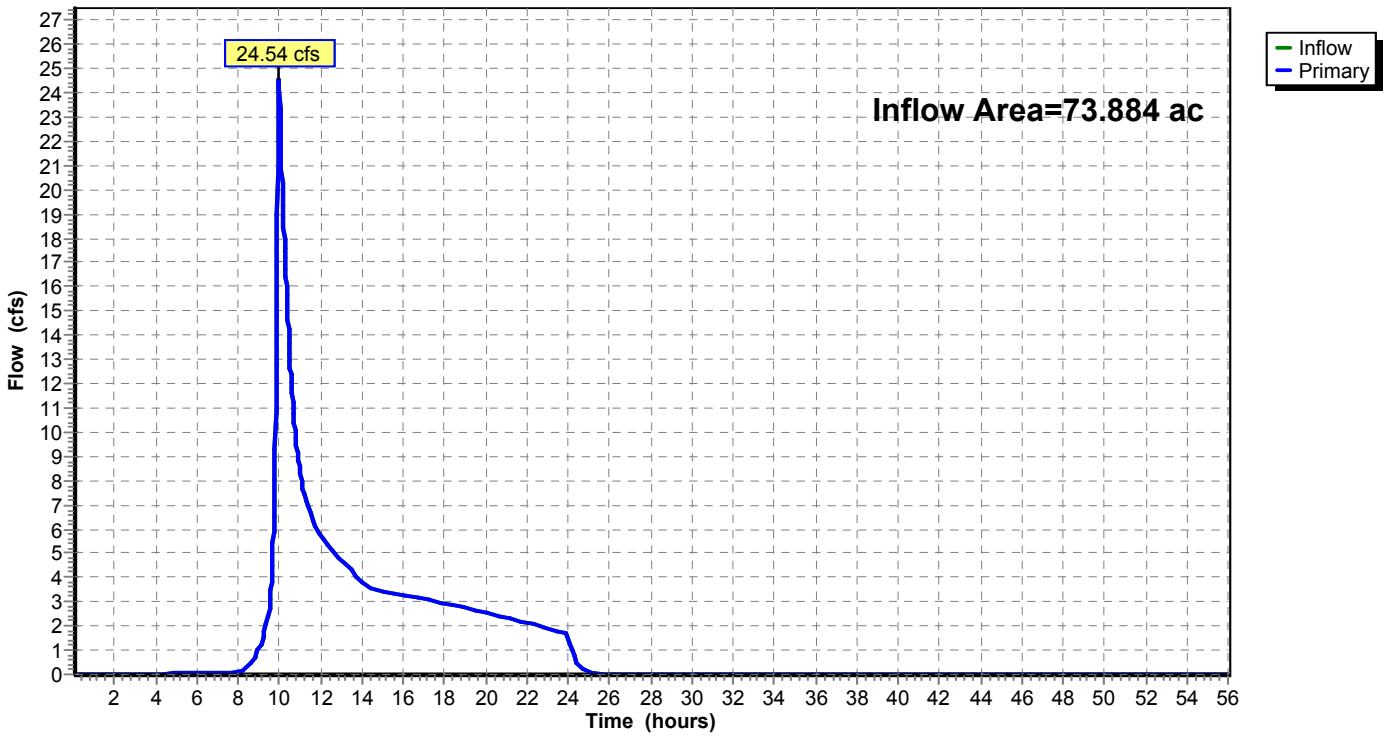
Summary for Link 19L: 14c(0+1)-Ex

Inflow Area = 73.884 ac, 1.37% Impervious, Inflow Depth = 0.87" for 2 Year event
Inflow = 24.54 cfs @ 9.99 hrs, Volume= 5.363 af
Primary = 24.54 cfs @ 9.99 hrs, Volume= 5.363 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 19L: 14c(0+1)-Ex

Hydrograph

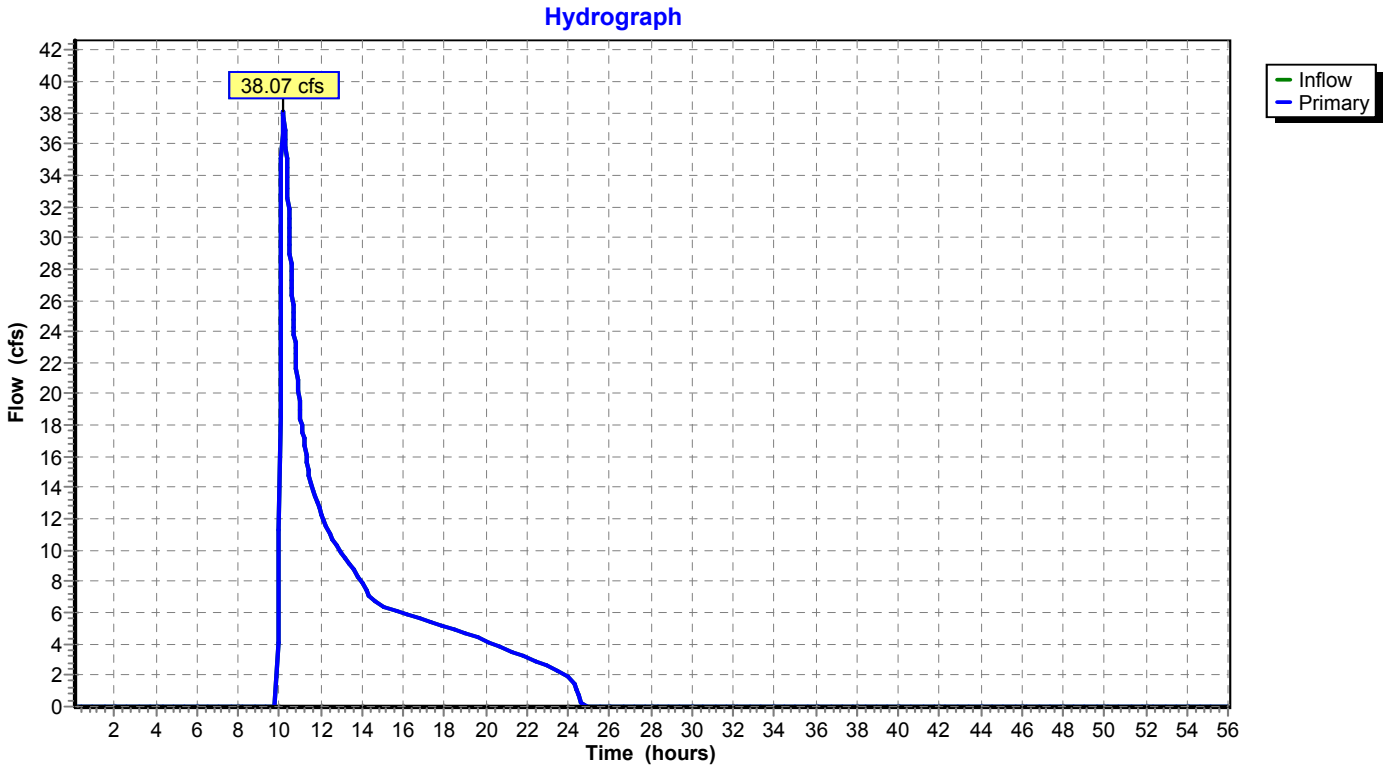


Summary for Link 22L: Linne Rd Overtopping Ex.Flow #2and#3

Inflow = 38.07 cfs @ 10.20 hrs, Volume= 9.098 af
Primary = 38.07 cfs @ 10.20 hrs, Volume= 9.098 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 22L: Linne Rd Overtopping Ex.Flow #2and#3

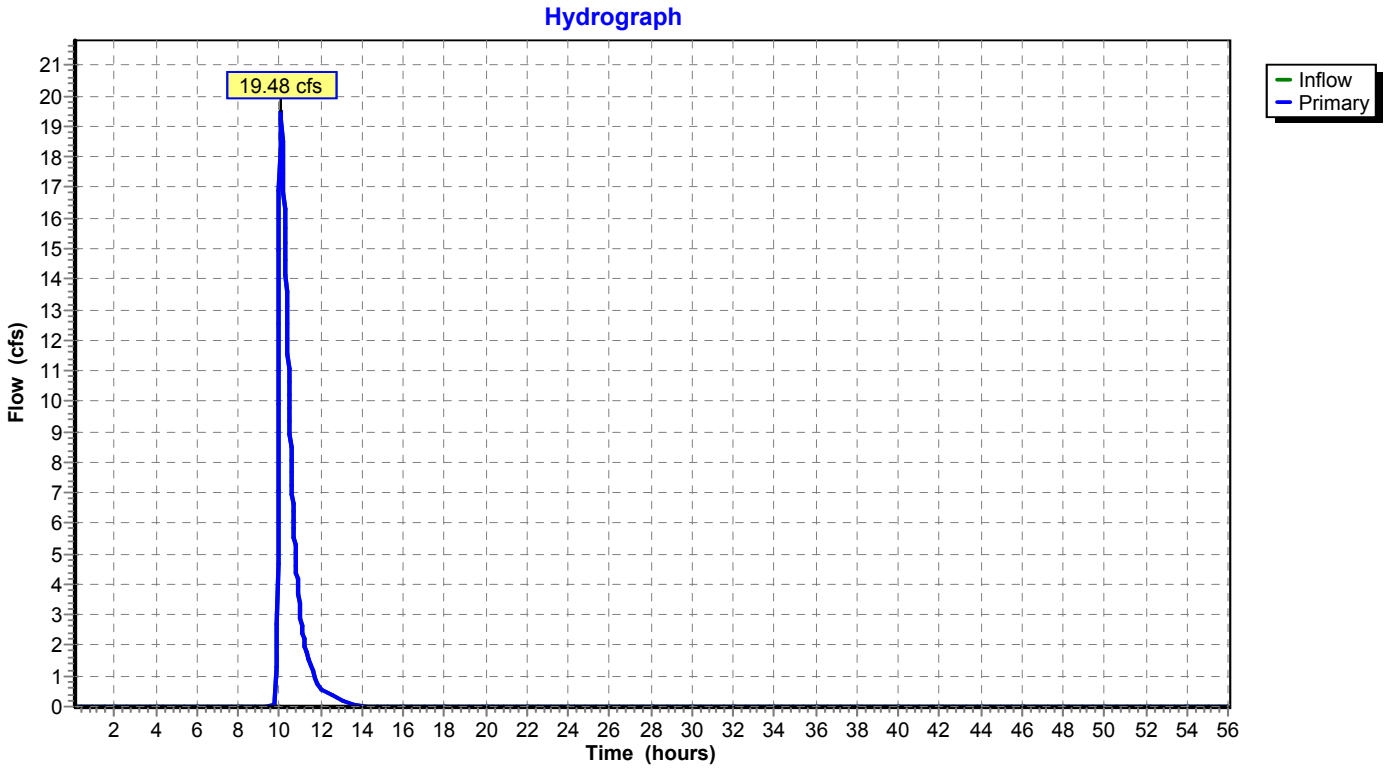


Summary for Link 23L: Linne Rd Overtop #1

Inflow = 19.48 cfs @ 10.09 hrs, Volume= 1.110 af
Primary = 19.48 cfs @ 10.09 hrs, Volume= 1.110 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 23L: Linne Rd Overtop #1



Time span=0.10-56.00 hrs, dt=0.02 hrs, 2796 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=11.244 ac 0.00% Impervious Runoff Depth=0.49"
Tc=10.0 min CN=58/0 Runoff=0.95 cfs 0.462 af

Subcatchment2: Subcat 2 Runoff Area=14.644 ac 0.00% Impervious Runoff Depth=0.49"
Tc=11.5 min CN=58/0 Runoff=1.13 cfs 0.602 af

Subcatchment3: Subcat 3 Runoff Area=21.500 ac 0.02% Impervious Runoff Depth=0.71"
Tc=16.9 min CN=63/98 Runoff=3.70 cfs 1.271 af

Subcatchment3a{(1)}-Ex: Subcat 3a{(1)}-Ex Runoff Area=4.164 ac 0.00% Impervious Runoff Depth=0.49"
Tc=10.0 min CN=58/0 Runoff=0.35 cfs 0.171 af

Subcatchment3a{(2)}-Ex: Subcat 3a{(2)}-Ex Runoff Area=7.900 ac 0.00% Impervious Runoff Depth=0.62"
Tc=10.0 min CN=61/0 Runoff=1.33 cfs 0.407 af

Subcatchment3a{(3)}-Ex: Subcat 3a{(3)}-Ex Runoff Area=6.004 ac 0.00% Impervious Runoff Depth=1.01"
Tc=10.0 min CN=69/0 Runoff=2.80 cfs 0.508 af

Subcatchment3b-Ex: Subcat 3b-Ex Runoff Area=757.079 ac 0.00% Impervious Runoff Depth=0.58"
Tc=45.5 min CN=60/98 Runoff=47.38 cfs 36.285 af

Subcatchment4: Subcat 4 Runoff Area=38.712 ac 1.43% Impervious Runoff Depth=0.53"
Tc=14.2 min CN=58/98 Runoff=3.46 cfs 1.723 af

Subcatchment5: Subcat 5 Runoff Area=32.700 ac 0.00% Impervious Runoff Depth=0.49"
Tc=21.2 min CN=58/0 Runoff=1.99 cfs 1.343 af

Subcatchment6: Subcat 6 Runoff Area=34.035 ac 0.00% Impervious Runoff Depth=0.58"
Tc=20.1 min CN=60/0 Runoff=3.02 cfs 1.631 af

Subcatchment7: Subcat 7 Runoff Area=31.369 ac 0.00% Impervious Runoff Depth=0.49"
Tc=23.2 min CN=58/0 Runoff=1.85 cfs 1.289 af

Subcatchment8: Subcat 8 Runoff Area=30.487 ac 0.00% Impervious Runoff Depth=0.49"
Tc=28.8 min CN=58/0 Runoff=1.67 cfs 1.252 af

Subcatchment8a-Ex: Subcat 8a-Ex Runoff Area=14.202 ac 0.00% Impervious Runoff Depth=0.49"
Tc=16.5 min CN=58/0 Runoff=0.93 cfs 0.583 af

Subcatchment9: Subcat 9 Runoff Area=11.446 ac 0.00% Impervious Runoff Depth=0.66"
Tc=22.3 min CN=62/0 Runoff=1.38 cfs 0.632 af

Subcatchment9a-Ex: Subcat 9a-Ex Runoff Area=212.022 ac 0.00% Impervious Runoff Depth=0.49"
Flow Length=4,909' Tc=51.3 min CN=58/0 Runoff=9.77 cfs 8.709 af

Subcatchment10: Subcat 10 Runoff Area=30.685 ac 3.88% Impervious Runoff Depth=0.64"
Tc=22.6 min CN=59/98 Runoff=3.44 cfs 1.645 af

Subcatchment10a-Ex: Subcat 10a-Ex Runoff Area=94.105 ac 0.00% Impervious Runoff Depth=0.91"
Tc=11.0 min CN=67/0 Runoff=34.57 cfs 7.111 af

Subcatchment11: Subcat 11 Runoff Area=14.461 ac 0.00% Impervious Runoff Depth=0.53"
Tc=11.1 min CN=59/0 Runoff=1.49 cfs 0.643 af

Subcatchment12: Subcat 12 Runoff Area=17.572 ac 0.00% Impervious Runoff Depth=0.53"
Tc=10.0 min CN=59/0 Runoff=1.93 cfs 0.781 af

Subcatchment12a-Ex: Subcat 12a-Ex Runoff Area=2.629 ac 0.00% Impervious Runoff Depth=1.13"
Tc=10.0 min CN=71/0 Runoff=1.45 cfs 0.247 af

Subcatchment13: Subcat 13 Runoff Area=27.742 ac 0.00% Impervious Runoff Depth=0.62"
Flow Length=1,750' Tc=10.0 min CN=61/0 Runoff=4.66 cfs 1.429 af

Subcatchment13a-Ex: Subcat 13a-Ex Runoff Area=3.505 ac 0.00% Impervious Runoff Depth=1.13"
Tc=10.0 min CN=71/0 Runoff=1.93 cfs 0.329 af

Subcatchment13b-Ex: Subcat 13b-Ex Runoff Area=18.461 ac 0.00% Impervious Runoff Depth=1.87"
Tc=10.0 min CN=82/0 Runoff=20.23 cfs 2.870 af

Subcatchment13c-Ex: Subcat 13c-Ex Runoff Area=14.407 ac 0.00% Impervious Runoff Depth=1.72"
Tc=10.0 min CN=80/0 Runoff=14.24 cfs 2.060 af

Subcatchment14: Subcat 14 Runoff Area=8.669 ac 51.27% Impervious Runoff Depth=1.97"
Tc=10.0 min CN=58/98 Runoff=8.97 cfs 1.420 af

Subcatchment14a{(1)}-Ex: Subcat 14a{(1)}-Ex Runoff Area=13.081 ac 0.00% Impervious Runoff Depth=0.76"
Tc=10.0 min CN=64/0 Runoff=3.53 cfs 0.824 af

Subcatchment14a{(2)}-Ex: Subcat 14a{(2)}-Ex Runoff Area=2.438 ac 29.80% Impervious Runoff Depth=1.35"
Tc=10.0 min CN=58/98 Runoff=1.54 cfs 0.274 af

Subcatchment14b-Ex: Subcat 14b-Ex Runoff Area=50.209 ac 0.00% Impervious Runoff Depth=1.64"
Tc=13.4 min CN=79/0 Runoff=41.39 cfs 6.879 af

Subcatchment14c{(0)}-Ex: Subcat 14c{(0)}-Ex Runoff Area=43.677 ac 1.21% Impervious Runoff Depth=1.88"
Tc=24.5 min CN=82/98 Runoff=31.22 cfs 6.856 af

Subcatchment14c{(1)}-Ex: Subcat 14c{(1)}-Ex Runoff Area=30.208 ac 1.61% Impervious Runoff Depth=1.82"
Tc=13.6 min CN=81/98 Runoff=28.00 cfs 4.570 af

Subcatchment14c{(2)}-Ex: Subcat 14c{(2)}-Ex Runoff Area=19.689 ac 0.00% Impervious Runoff Depth=1.51"
Tc=13.2 min CN=77/0 Runoff=14.53 cfs 2.470 af

Subcatchment14c{(3)}-Ex: Subcat 14c{(3)}-Ex Runoff Area=13.782 ac 0.00% Impervious Runoff Depth=1.37"
Tc=12.6 min CN=75/0 Runoff=9.15 cfs 1.577 af

Subcatchment14d-Ex: Subcat 14d-Ex Runoff Area=166.738 ac 0.91% Impervious Runoff Depth=1.73"
Tc=19.4 min CN=80/98 Runoff=121.75 cfs 24.054 af

Subcatchment14e-Ex: Subcat 14e-Ex Runoff Area=10.890 ac 6.05% Impervious Runoff Depth=0.67"
Tc=10.0 min CN=58/98 Runoff=2.09 cfs 0.605 af

Reach 6R: Reach 1c Avg. Flow Depth=2.31' Max Vel=4.26 fps Inflow=63.40 cfs 38.668 af
n=0.024 L=830.0' S=0.0031 '/' Capacity=4,878.97 cfs Outflow=62.08 cfs 38.668 af

Reach 7R: Reach 1b Avg. Flow Depth=1.40' Max Vel=4.15 fps Inflow=205.65 cfs 68.684 af
n=0.024 L=883.0' S=0.0066 '/' Capacity=8,865.90 cfs Outflow=201.96 cfs 68.684 af

Reach 8R: Reach 1a Avg. Flow Depth=1.52' Max Vel=3.17 fps Inflow=206.14 cfs 70.814 af
n=0.024 L=583.0' S=0.0034 '/' Capacity=6,396.21 cfs Outflow=203.68 cfs 70.814 af

Reach 17R: Reach 1d Avg. Flow Depth=0.43' Max Vel=1.99 fps Inflow=28.12 cfs 0.605 af
n=0.027 L=841.0' S=0.0110 '/' Capacity=1,276.84 cfs Outflow=19.66 cfs 0.605 af

Reach 18R: Linne Road Grassed Chl Avg. Flow Depth=0.59' Max Vel=2.51 fps Inflow=18.58 cfs 11.335 af
n=0.030 L=1,190.0' S=0.0087 '/' Capacity=66.25 cfs Outflow=17.83 cfs 11.335 af

Pond 17P: Gran Cielo Dwy Peak Elev=854.84' Storage=9,739 cf Inflow=121.75 cfs 24.054 af
Primary=93.28 cfs 23.449 af Secondary=0.00 cfs 0.000 af Tertiary=28.12 cfs 0.605 af Outflow=121.40 cfs 24.054 af

Pond 18P: GC-CkD1 Peak Elev=851.40' Storage=51,119 cf Inflow=152.23 cfs 34.874 af
Primary=1.04 cfs 1.606 af Secondary=84.29 cfs 27.429 af Tertiary=60.65 cfs 5.776 af Outflow=145.98 cfs 34.811 af

Pond 19P: GC-CkD2 Peak Elev=849.60' Storage=32,312 cf Inflow=98.58 cfs 31.505 af
Primary=1.34 cfs 2.070 af Secondary=62.45 cfs 26.745 af Tertiary=31.29 cfs 2.688 af Outflow=95.08 cfs 31.504 af

Pond 20P: GC-CkD3 Peak Elev=846.00' Storage=16,178 cf Inflow=71.09 cfs 30.392 af
Primary=6.49 cfs 6.543 af Secondary=11.02 cfs 4.518 af Tertiary=53.24 cfs 19.319 af Outflow=70.75 cfs 30.381 af

Link 3a (1,2+3)-Ex: Comb Un-dev Ck Flow Inflow=204.80 cfs 71.447 af
Primary=204.80 cfs 71.447 af

Link 5L: Outlet To Tract #1632 Ex. 36" SD Inflow=6.41 cfs 4.467 af
Primary=6.41 cfs 4.467 af

Link 6L: To Existing Meadowlark Road Inflow=10.54 cfs 9.341 af
Primary=10.54 cfs 9.341 af

Link 7L: DMA 13 Inflow=40.91 cfs 6.689 af
Primary=40.91 cfs 6.689 af

Link 8L: DMA 8 Inflow=2.57 cfs 1.836 af
Primary=2.57 cfs 1.836 af

Link 9L: DMA 12 Inflow=3.35 cfs 1.028 af
Primary=3.35 cfs 1.028 af

Link 10L: To Linne Road Channel Inflow=18.58 cfs 11.335 af
Primary=18.58 cfs 11.335 af

Link 11L: To Fontana Road SD Inflow=83.44 cfs 17.116 af
Primary=83.44 cfs 17.116 af

Link 15L: Sherwood/NiblickLP Xing Inflow=53.82 cfs 9.123 af
Primary=53.82 cfs 9.123 af

Link 16L: Airport & Linne Road SD Inflow=68.98 cfs 21.064 af
Primary=68.98 cfs 21.064 af

Link 19L: 14c(0+1)-Ex Inflow=59.11 cfs 11.425 af
Primary=59.11 cfs 11.425 af

Link 22L: Linne Rd OvertoppingEx.Flow #2and#3 Inflow=84.51 cfs 22.008 af
Primary=84.51 cfs 22.008 af

Link 23L: Linne Rd Overtop #1 Inflow=60.65 cfs 5.776 af
Primary=60.65 cfs 5.776 af

Total Runoff Area = 1,810.455 ac Runoff Volume = 123.511 af Average Runoff Depth = 0.82"
99.44% Pervious = 1,800.345 ac 0.56% Impervious = 10.110 ac

Summary for Subcatchment 1: Subcat 1

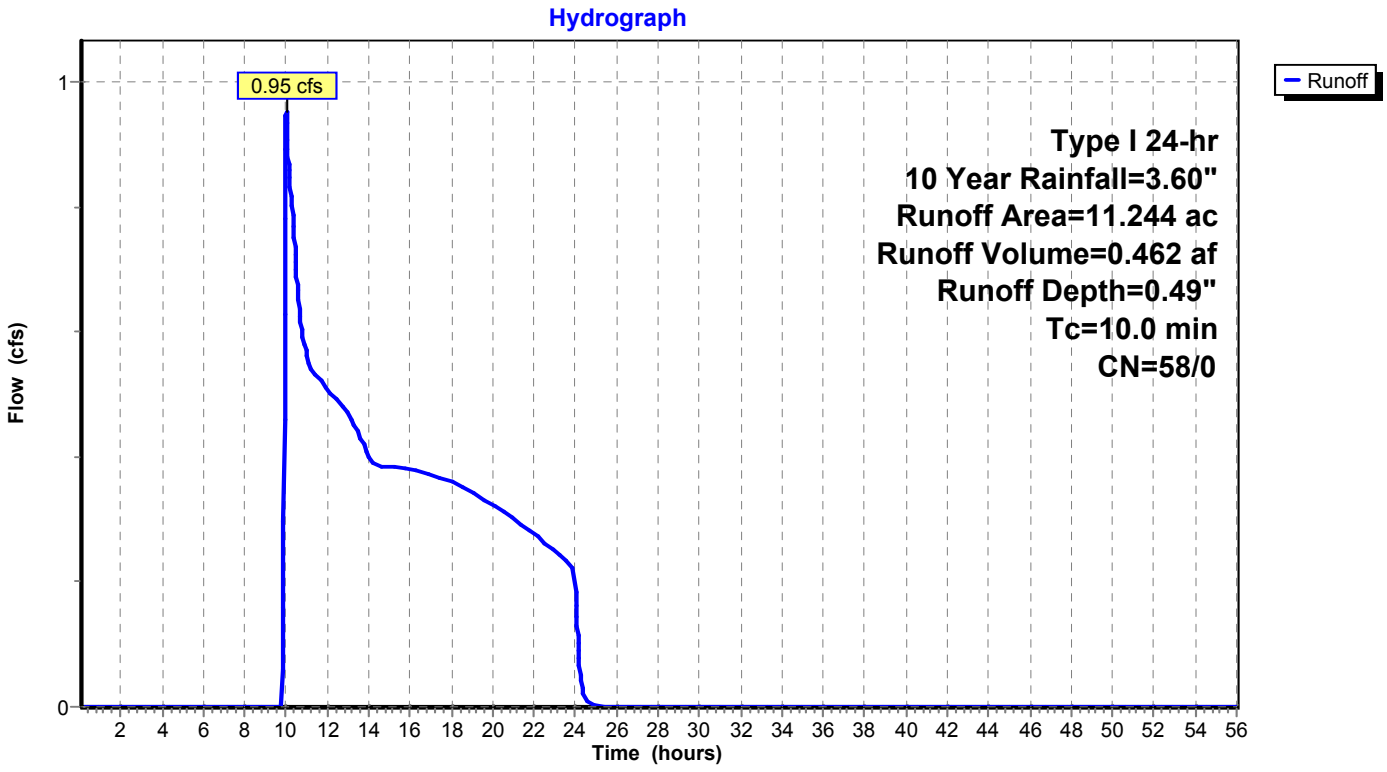
Runoff = 0.95 cfs @ 10.01 hrs, Volume= 0.462 af, Depth= 0.49"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
11.244	58	Meadow, non-grazed, HSG B
11.244	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9					**Direct Entry, SCS per Catchment Area CAD Info**
9.9	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

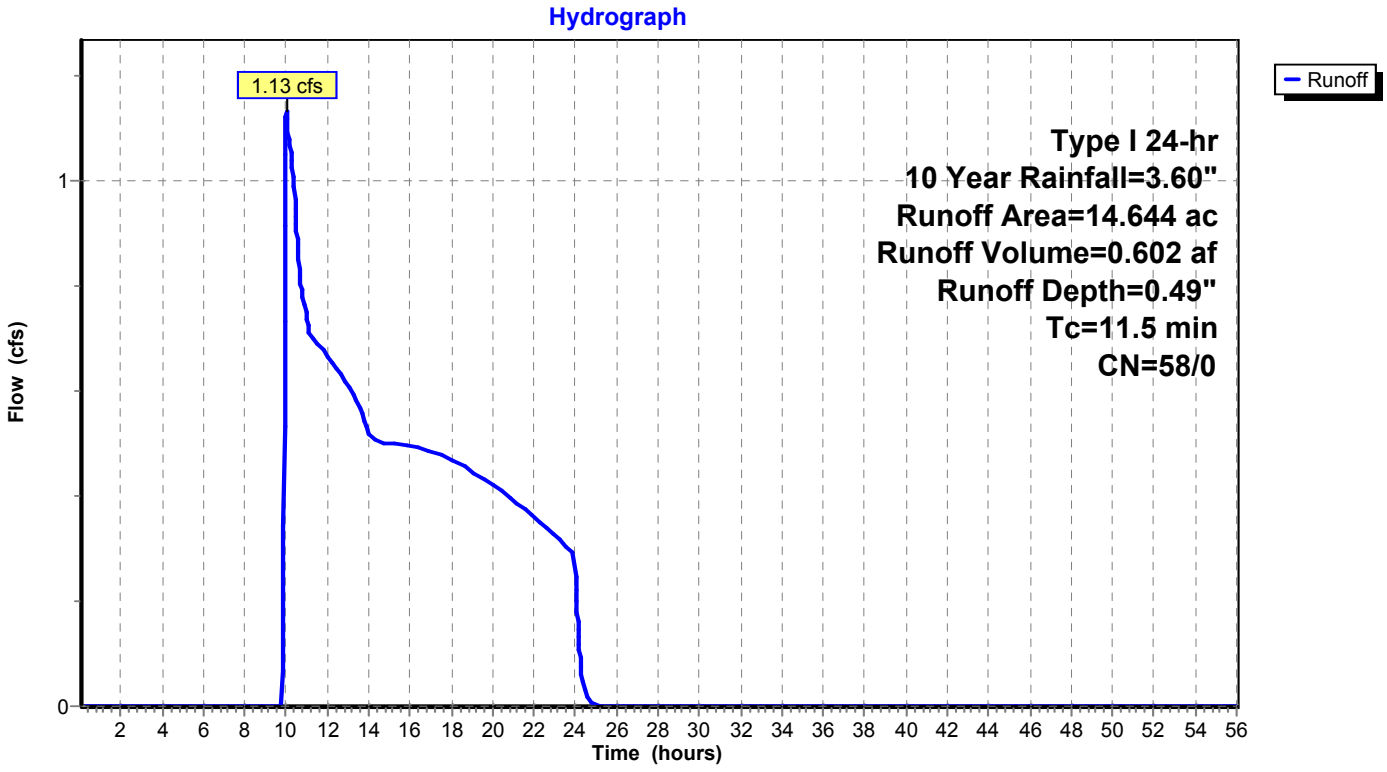
Runoff = 1.13 cfs @ 10.02 hrs, Volume= 0.602 af, Depth= 0.49"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
0.574	58	Meadow, non-grazed, HSG B
14.070	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
14.644	58	Weighted Average
14.644	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5					**Direct Entry, SCS per Catchment Area CAD Info**

Subcatchment 2: Subcat 2



Summary for Subcatchment 3: Subcat 3

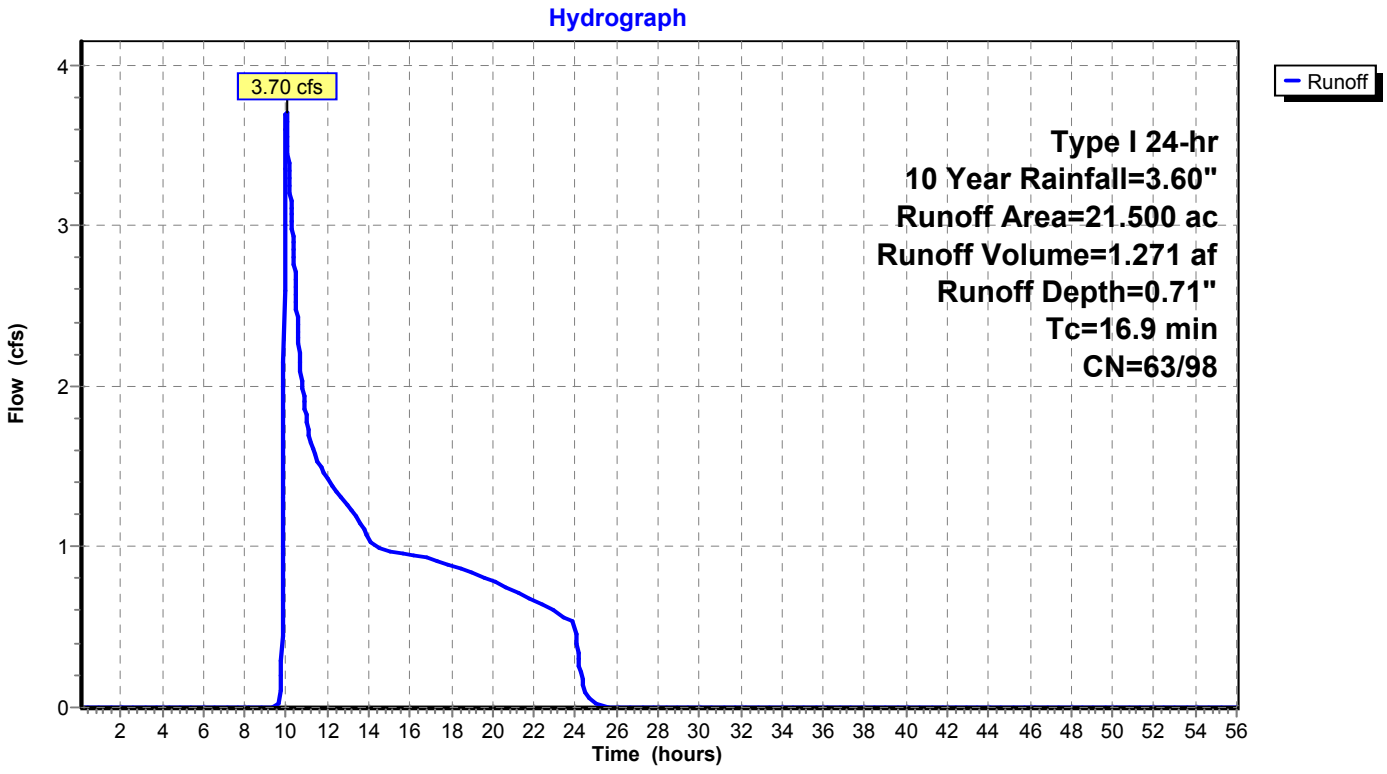
Runoff = 3.70 cfs @ 10.01 hrs, Volume= 1.271 af, Depth= 0.71"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
4.338	58	Meadow, non-grazed, HSG B
8.761	58	Meadow, non-grazed, HSG B
8.398	71	Meadow, non-grazed, HSG C
0.003	98	Paved roads w/curbs & sewers, HSG C
21.500	63	Weighted Average
21.497	63	99.98% Pervious Area
0.003	98	0.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.9					**Direct Entry, SCS per Catchment Area CAD Info**

Subcatchment 3: Subcat 3



Summary for Subcatchment 3a{(1)}-Ex: Subcat 3a{(1)}-Ex

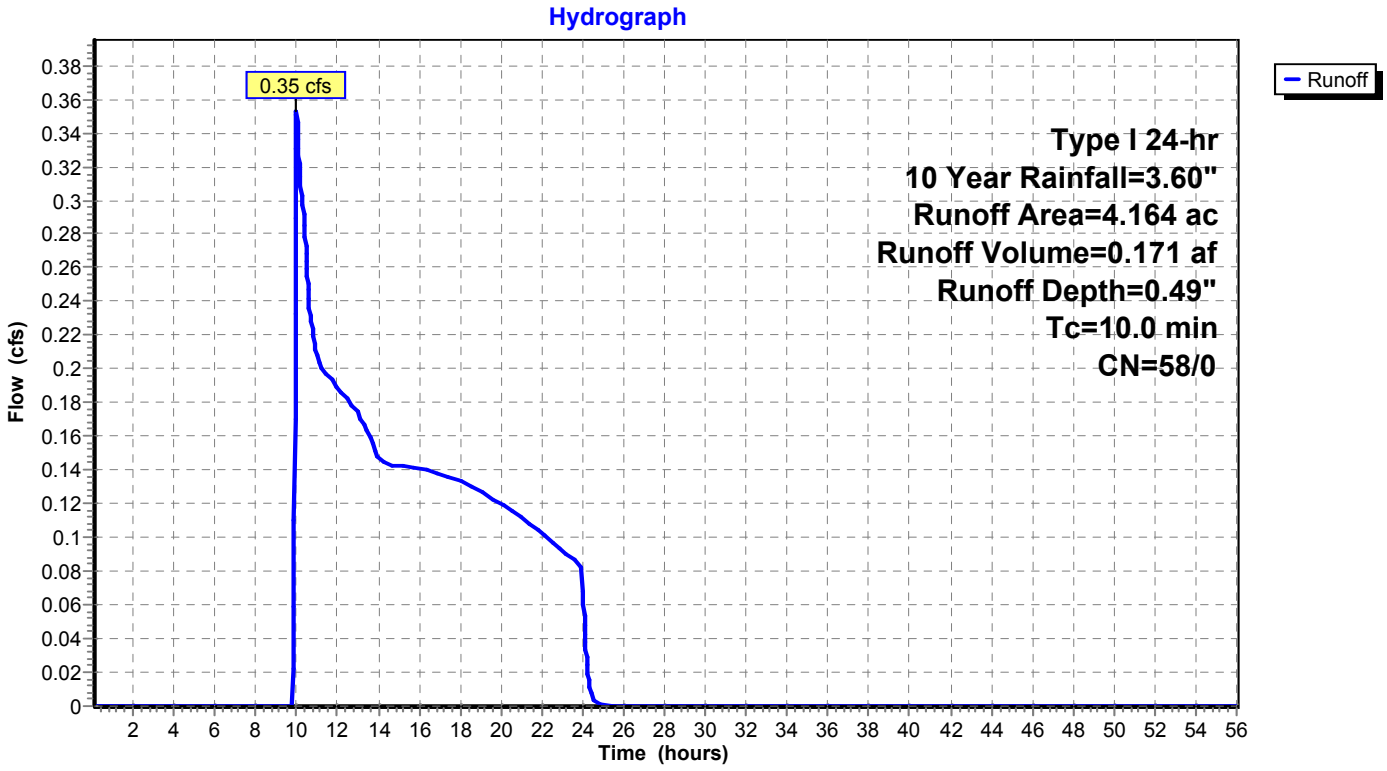
Runoff = 0.35 cfs @ 10.01 hrs, Volume= 0.171 af, Depth= 0.49"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
2.302	58	Meadow, non-grazed, HSG B
1.861	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
4.164	58	Weighted Average
4.164	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1					**Direct Entry,**
6.1	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 3a{(1)}-Ex: Subcat 3a{(1)}-Ex



Summary for Subcatchment 3a{(2)}-Ex: Subcat 3a{(2)}-Ex

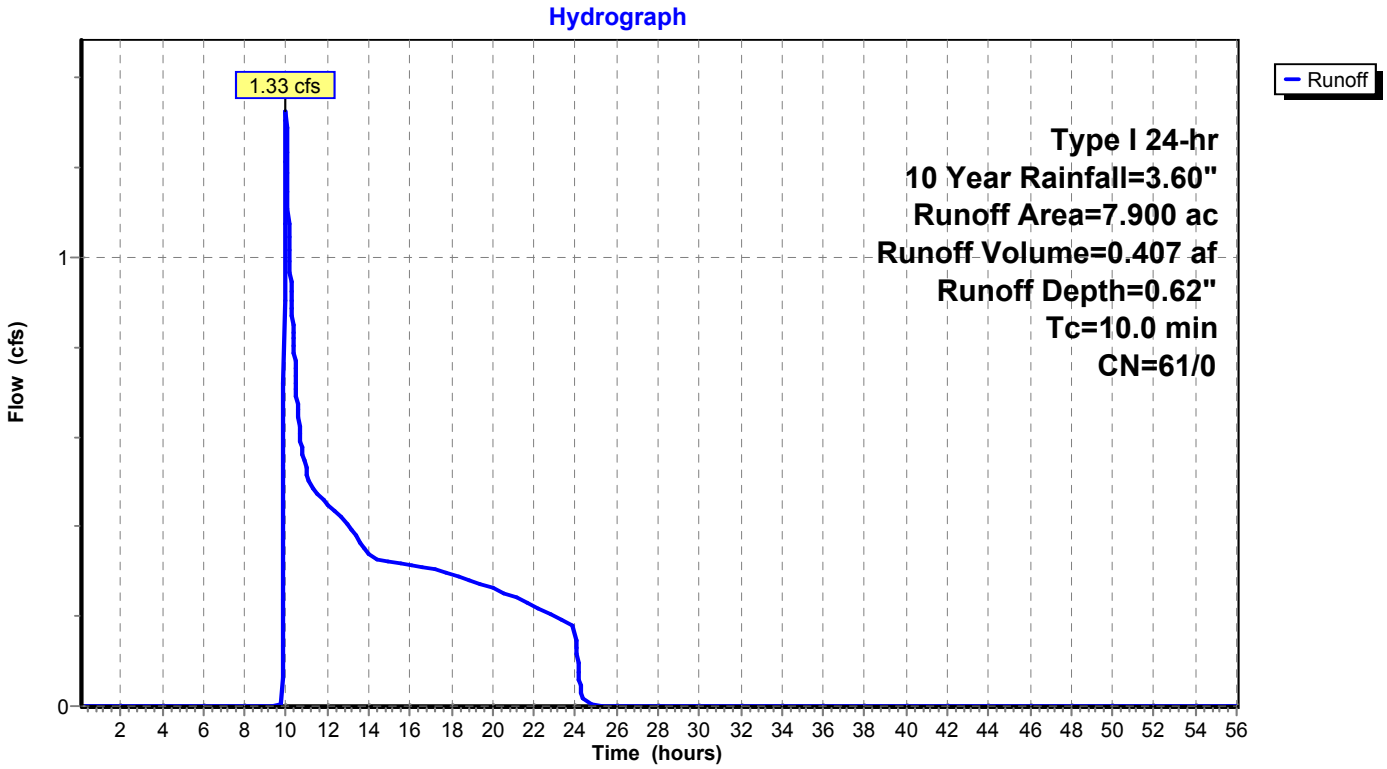
Runoff = 1.33 cfs @ 10.00 hrs, Volume= 0.407 af, Depth= 0.62"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
3.124	58	Meadow, non-grazed, HSG B
2.841	58	Meadow, non-grazed, HSG B
1.936	71	Meadow, non-grazed, HSG C
7.900	61	Weighted Average
7.900	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1					**Direct Entry,**
6.1	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 3a{(2)}-Ex: Subcat 3a{(2)}-Ex



Summary for Subcatchment 3a{(3)}-Ex: Subcat 3a{(3)}-Ex

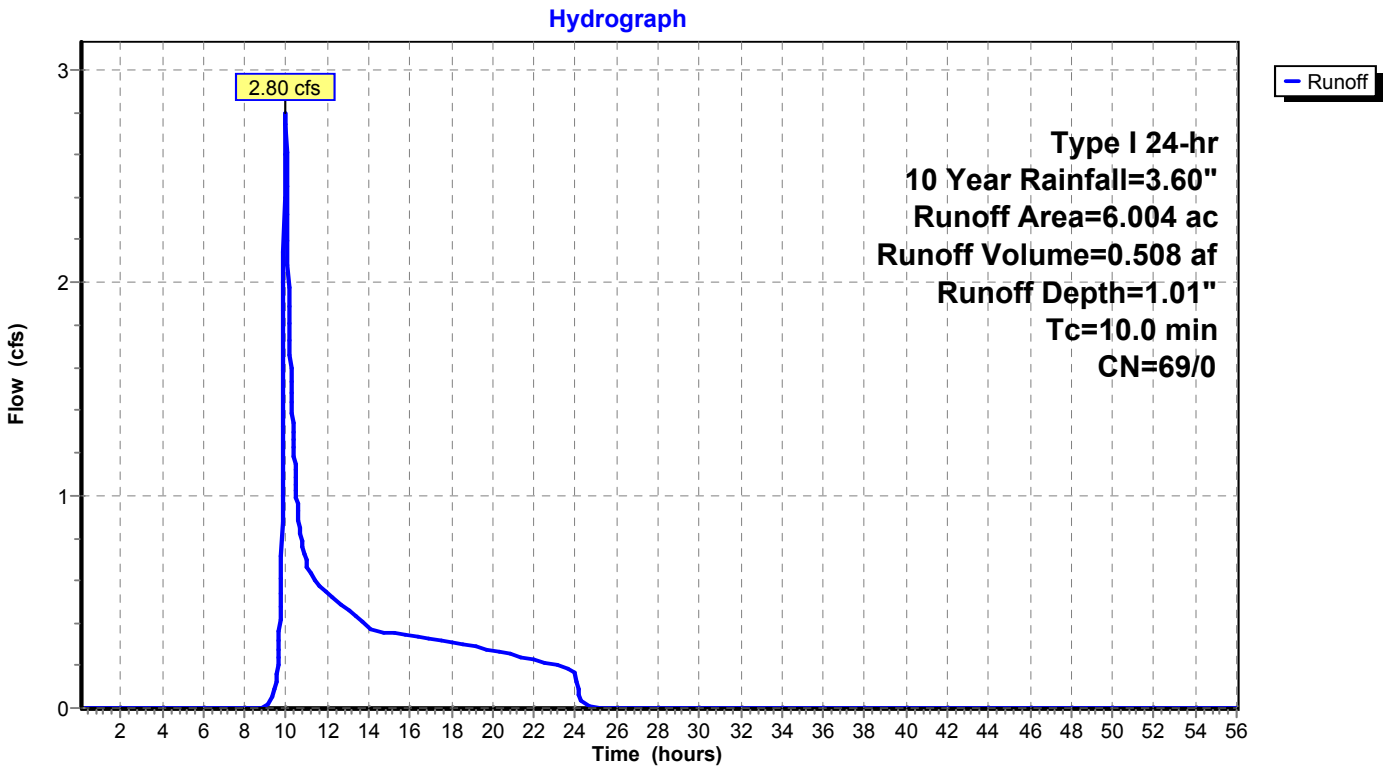
Runoff = 2.80 cfs @ 9.98 hrs, Volume= 0.508 af, Depth= 1.01"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
1.129	58	Meadow, non-grazed, HSG B
4.876	71	Meadow, non-grazed, HSG C
6.004	69	Weighted Average
6.004	69	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1					**Direct Entry, 14c{(2)}-Ex**
6.1	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 3a{(3)}-Ex: Subcat 3a{(3)}-Ex



Summary for Subcatchment 3b-Ex: Subcat 3b-Ex

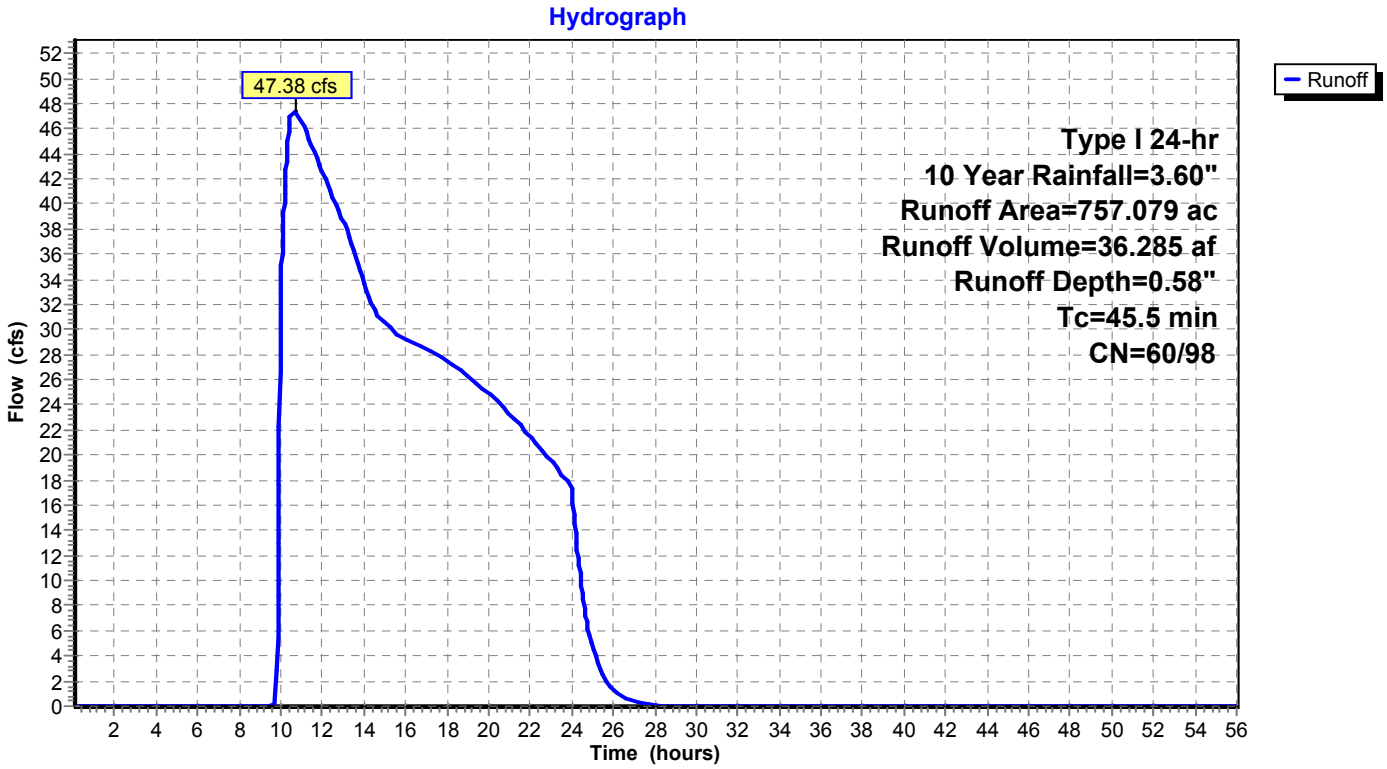
Runoff = 47.38 cfs @ 10.69 hrs, Volume= 36.285 af, Depth= 0.58"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
234.658	58	Meadow, non-grazed, HSG B
36.169	58	Meadow, non-grazed, HSG B
0.022	58	Meadow, non-grazed, HSG B
51.779	58	Meadow, non-grazed, HSG B
10.304	58	Meadow, non-grazed, HSG B
28.620	58	Meadow, non-grazed, HSG B
28.650	58	Meadow, non-grazed, HSG B
67.424	58	Meadow, non-grazed, HSG B
203.020	58	Meadow, non-grazed, HSG B
26.053	71	Meadow, non-grazed, HSG C
12.803	71	Meadow, non-grazed, HSG C
44.268	71	Meadow, non-grazed, HSG C
13.308	71	Meadow, non-grazed, HSG C
0.001	98	Paved roads w/curbs & sewers, HSG C
757.079	60	Weighted Average
757.078	60	100.00% Pervious Area
0.001	98	0.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
45.5					**Direct Entry, SCS Method taken from Catchment in ACAD file**

Subcatchment 3b-Ex: Subcat 3b-Ex



Summary for Subcatchment 4: Subcat 4

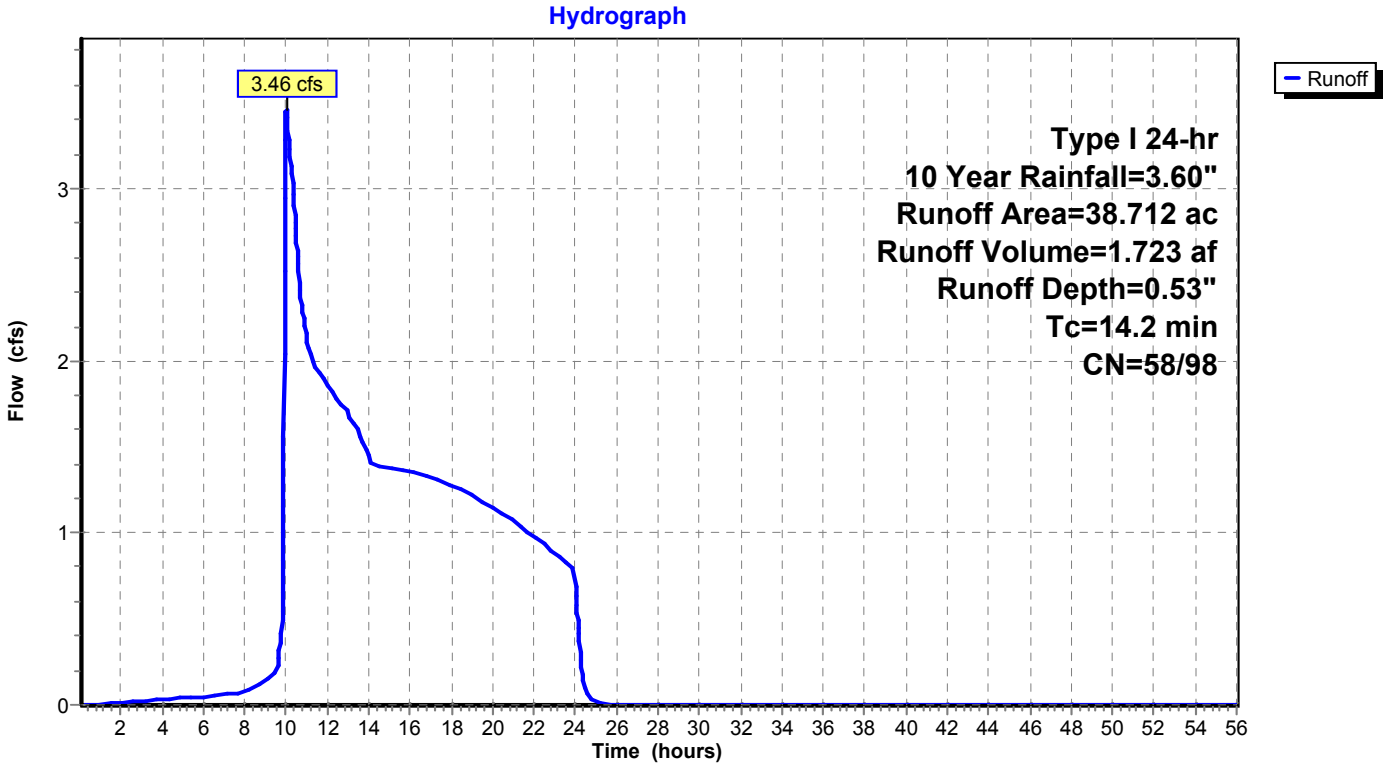
Runoff = 3.46 cfs @ 10.01 hrs, Volume= 1.723 af, Depth= 0.53"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
2.765	68	1 acre lots, 20% imp, HSG B
0.000	58	Meadow, non-grazed, HSG B
7.644	58	Meadow, non-grazed, HSG B
0.126	58	Meadow, non-grazed, HSG B
5.342	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
20.803	58	Meadow, non-grazed, HSG B
0.971	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
1.061	58	Meadow, non-grazed, HSG B
38.712	59	Weighted Average
38.159	58	98.57% Pervious Area
0.553	98	1.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 4: Subcat 4



Summary for Subcatchment 5: Subcat 5

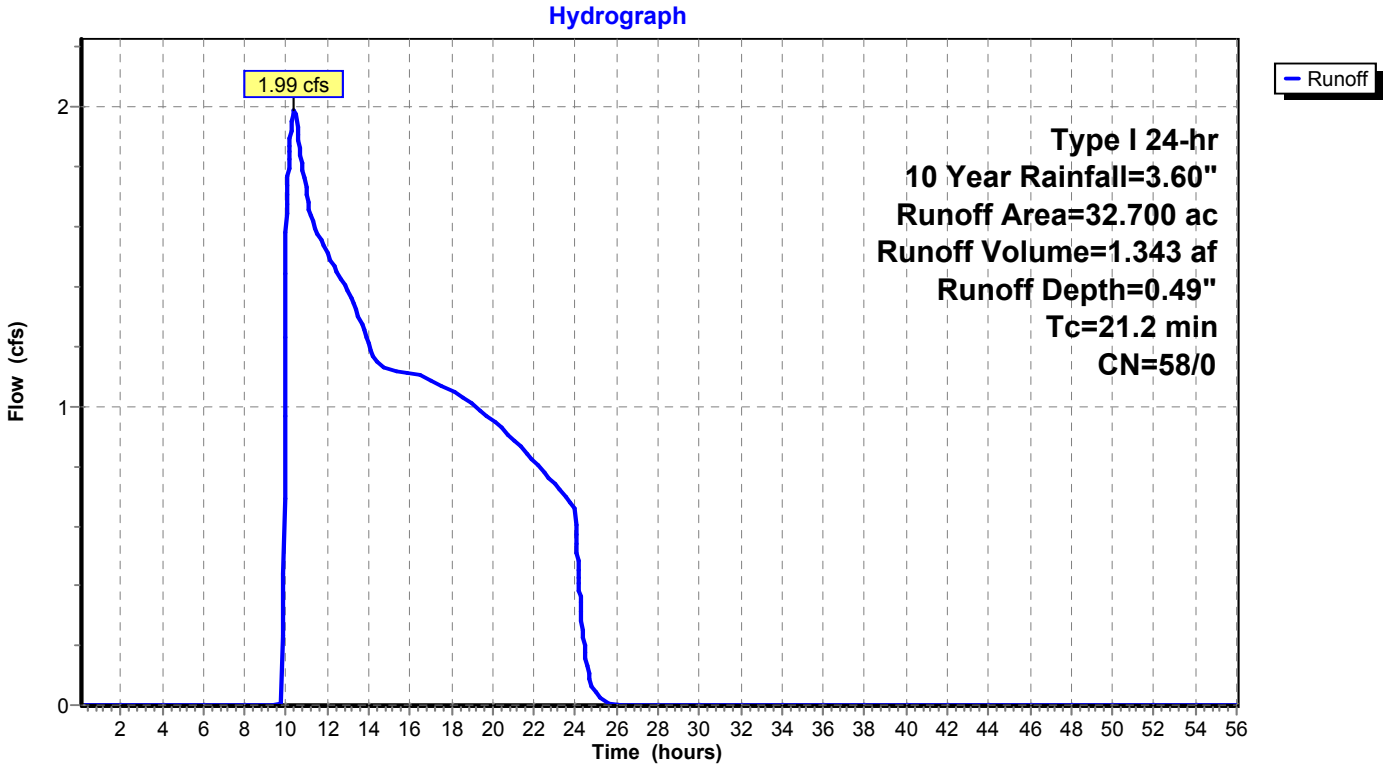
Runoff = 1.99 cfs @ 10.39 hrs, Volume= 1.343 af, Depth= 0.49"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
9.224	58	Meadow, non-grazed, HSG B
23.476	58	Meadow, non-grazed, HSG B
32.700	58	Weighted Average
32.700	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.2					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 5: Subcat 5



Summary for Subcatchment 6: Subcat 6

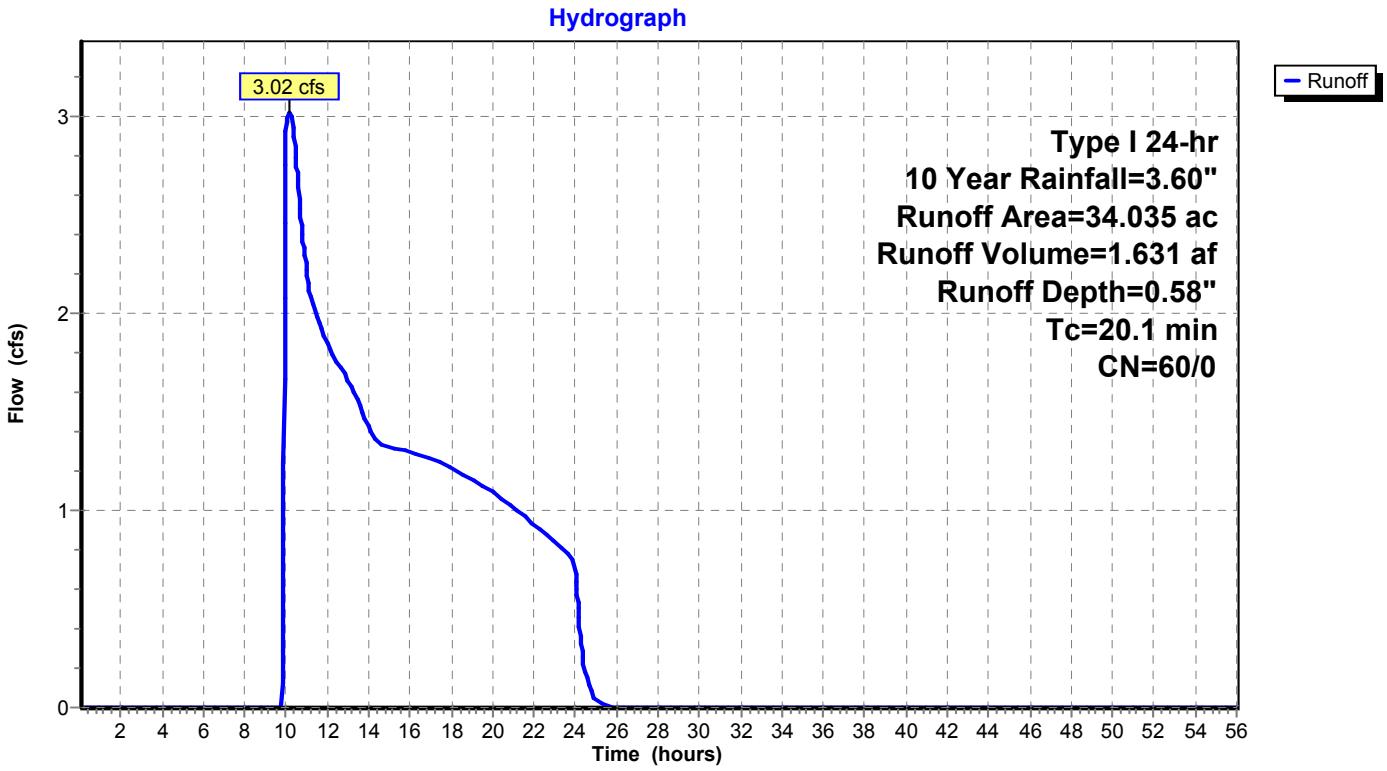
Runoff = 3.02 cfs @ 10.19 hrs, Volume= 1.631 af, Depth= 0.58"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
23.646	58	Meadow, non-grazed, HSG B
0.010	58	Meadow, non-grazed, HSG B
0.081	58	Meadow, non-grazed, HSG B
4.046	58	Meadow, non-grazed, HSG B
2.192	58	Meadow, non-grazed, HSG B
4.059	71	Meadow, non-grazed, HSG C
34.035	60	Weighted Average
34.035	60	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.1					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 6: Subcat 6



Summary for Subcatchment 7: Subcat 7

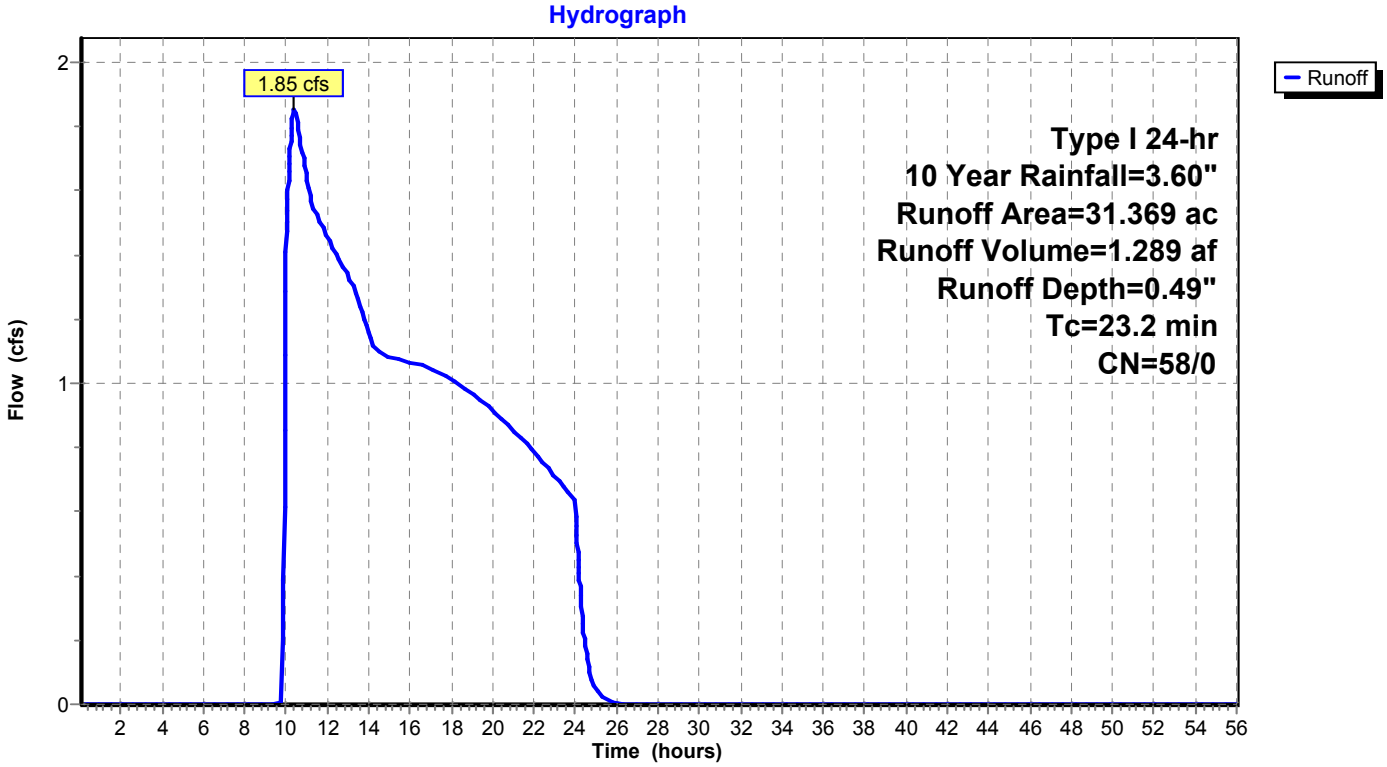
Runoff = 1.85 cfs @ 10.42 hrs, Volume= 1.289 af, Depth= 0.49"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
4.398	58	Meadow, non-grazed, HSG B
11.983	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
14.988	58	Meadow, non-grazed, HSG B
31.369	58	Weighted Average
31.369	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.2					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 7: Subcat 7



Summary for Subcatchment 8: Subcat 8

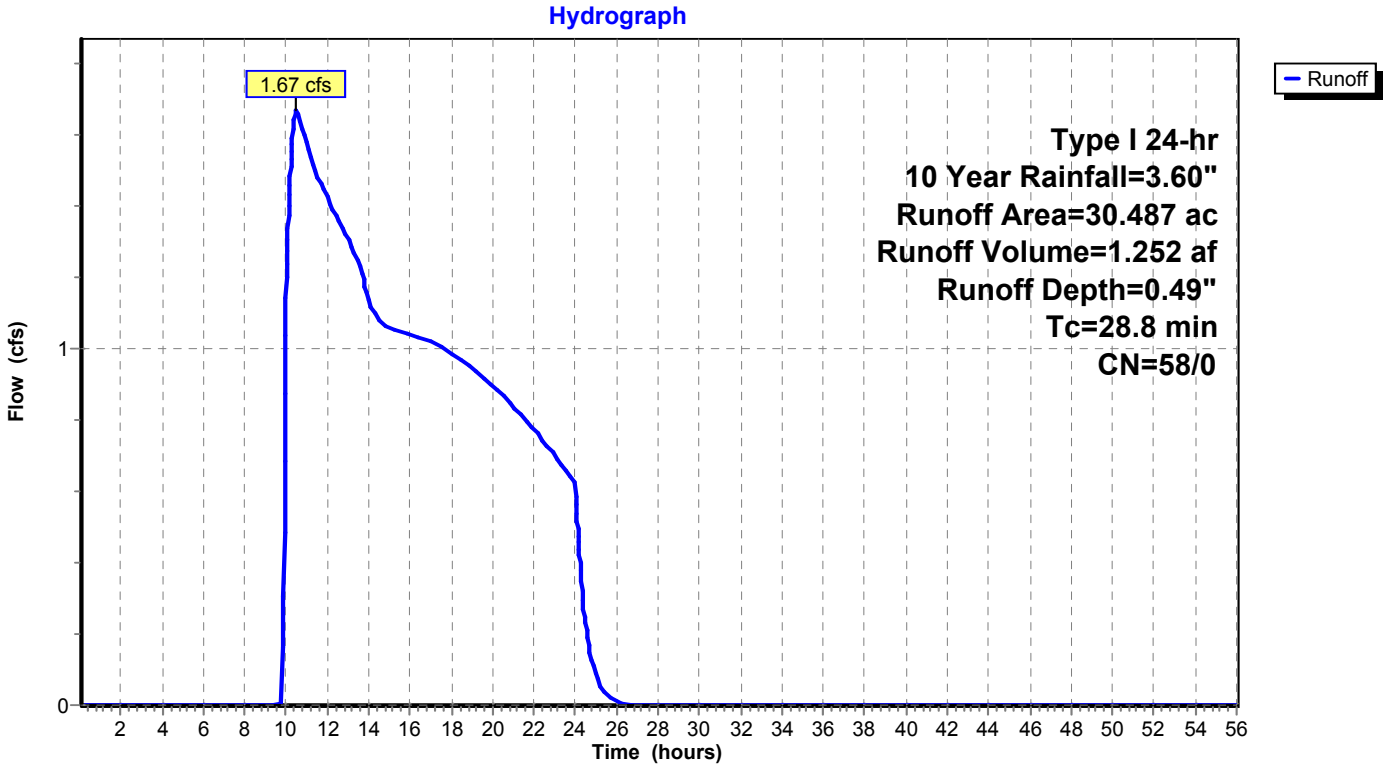
Runoff = 1.67 cfs @ 10.48 hrs, Volume= 1.252 af, Depth= 0.49"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
1.331	58	Meadow, non-grazed, HSG B
29.156	58	Meadow, non-grazed, HSG B
30.487	58	Weighted Average
30.487	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 8: Subcat 8



Summary for Subcatchment 8a-Ex: Subcat 8a-Ex

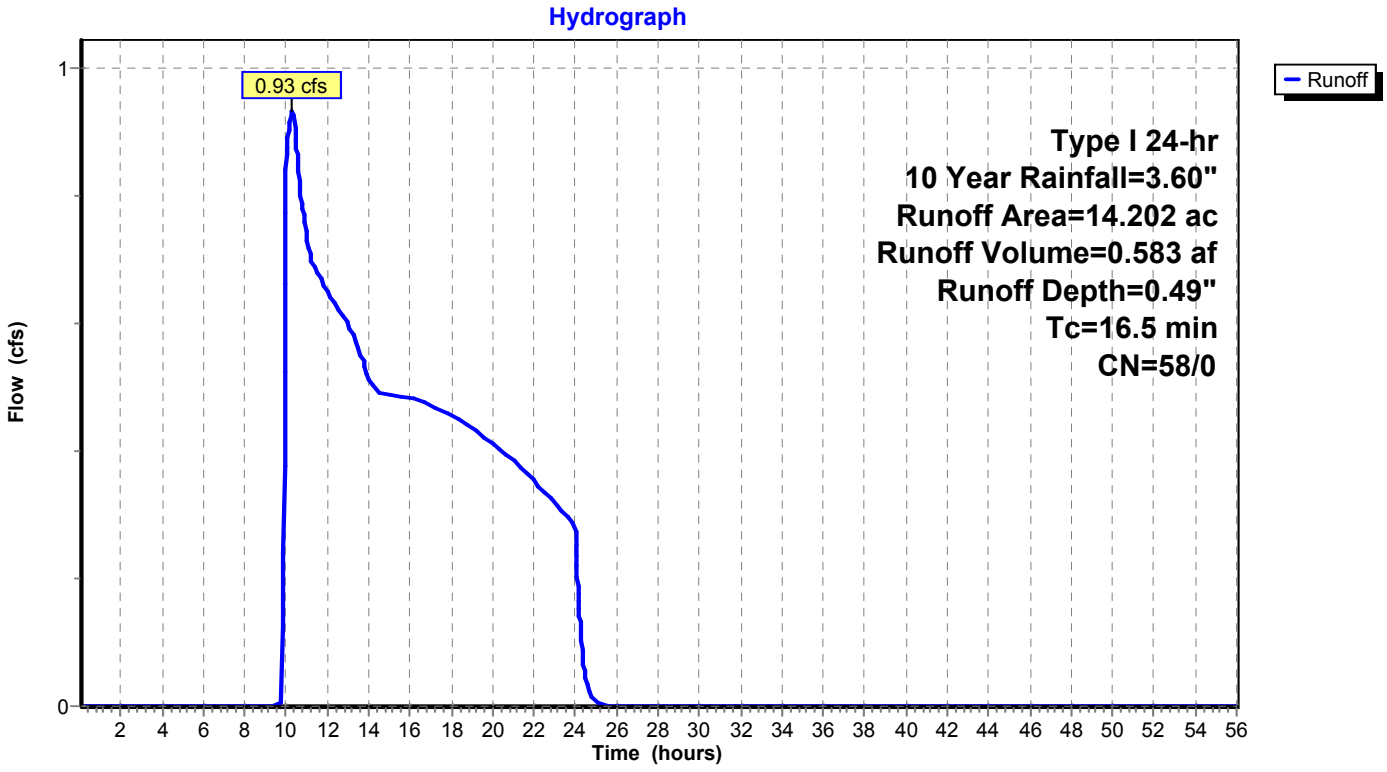
Runoff = 0.93 cfs @ 10.30 hrs, Volume= 0.583 af, Depth= 0.49"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
2.036	58	Meadow, non-grazed, HSG B
7.264	58	Meadow, non-grazed, HSG B
4.903	58	Meadow, non-grazed, HSG B
14.202	58	Weighted Average
14.202	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.5					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 8a-Ex: Subcat 8a-Ex



Summary for Subcatchment 9: Subcat 9

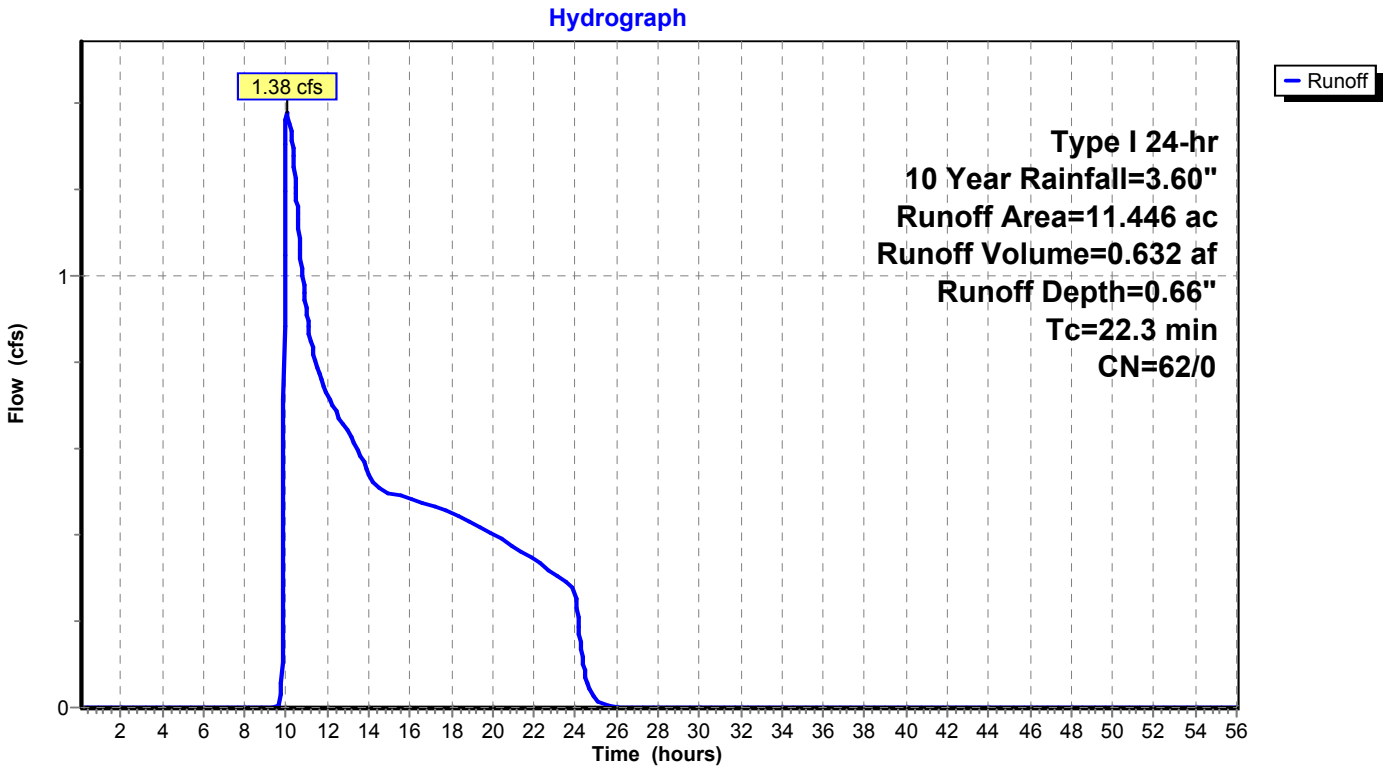
Runoff = 1.38 cfs @ 10.03 hrs, Volume= 0.632 af, Depth= 0.66"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
0.006	58	Meadow, non-grazed, HSG B
8.451	58	Meadow, non-grazed, HSG B
0.026	58	Meadow, non-grazed, HSG B
0.469	58	Meadow, non-grazed, HSG B
0.005	58	Meadow, non-grazed, HSG B
2.489	78	Meadow, non-grazed, HSG D
11.446	62	Weighted Average
11.446	62	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.3					**Direct Entry, Tc from CAD Catchments (SCS Method)**

Subcatchment 9: Subcat 9



Summary for Subcatchment 9a-Ex: Subcat 9a-Ex

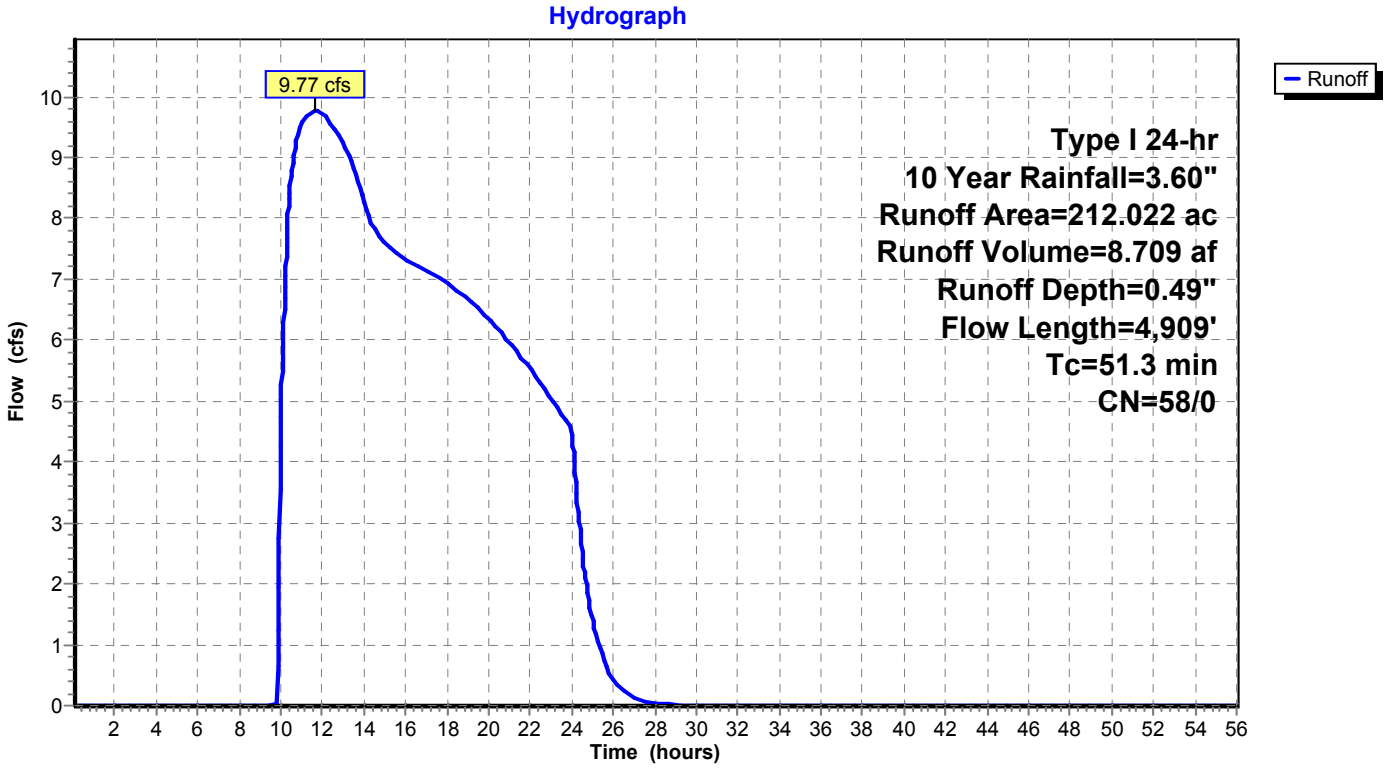
Runoff = 9.77 cfs @ 11.69 hrs, Volume= 8.709 af, Depth= 0.49"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
16.535	58	Meadow, non-grazed, HSG B
38.755	58	Meadow, non-grazed, HSG B
2.915	58	Meadow, non-grazed, HSG B
114.179	58	Meadow, non-grazed, HSG B
31.194	58	Meadow, non-grazed, HSG B
8.131	58	Meadow, non-grazed, HSG B
0.314	78	Meadow, non-grazed, HSG D
212.022	58	Weighted Average
212.022	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
51.3	4,909		1.59		**Direct Entry, SCS Method taken from Catchment in ACAD file**

Subcatchment 9a-Ex: Subcat 9a-Ex



Summary for Subcatchment 10: Subcat 10

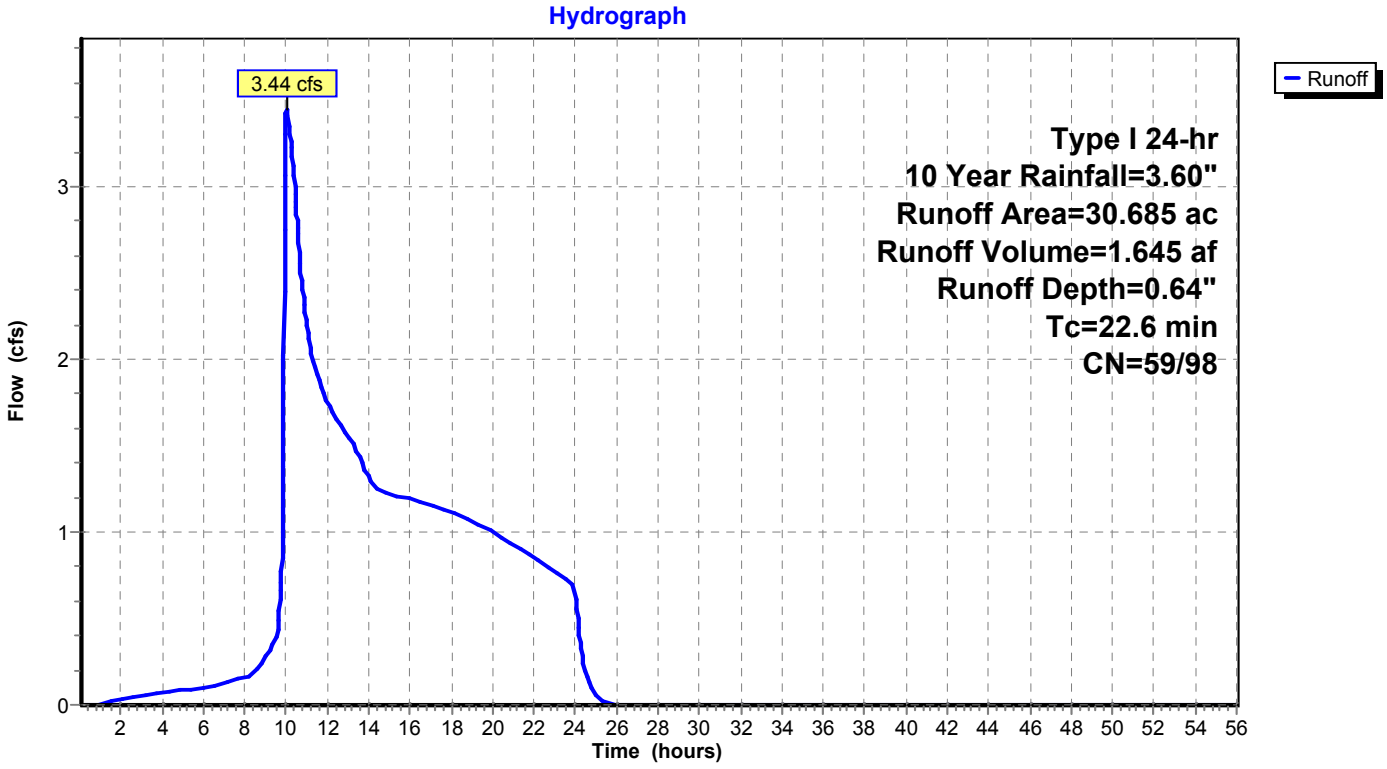
Runoff = 3.44 cfs @ 10.02 hrs, Volume= 1.645 af, Depth= 0.64"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
5.865	58	Meadow, non-grazed, HSG B
22.679	58	Meadow, non-grazed, HSG B
0.039	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.039	71	Meadow, non-grazed, HSG C
0.175	77	Natural western desert, HSG B
0.700	77	Natural western desert, HSG B
1.189	98	Paved roads w/curbs & sewers, HSG B
30.685	60	Weighted Average
29.496	59	96.12% Pervious Area
1.189	98	3.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.6					**Direct Entry, SCS Method taken from Catchment in ACAD file**

Subcatchment 10: Subcat 10



Summary for Subcatchment 10a-Ex: Subcat 10a-Ex

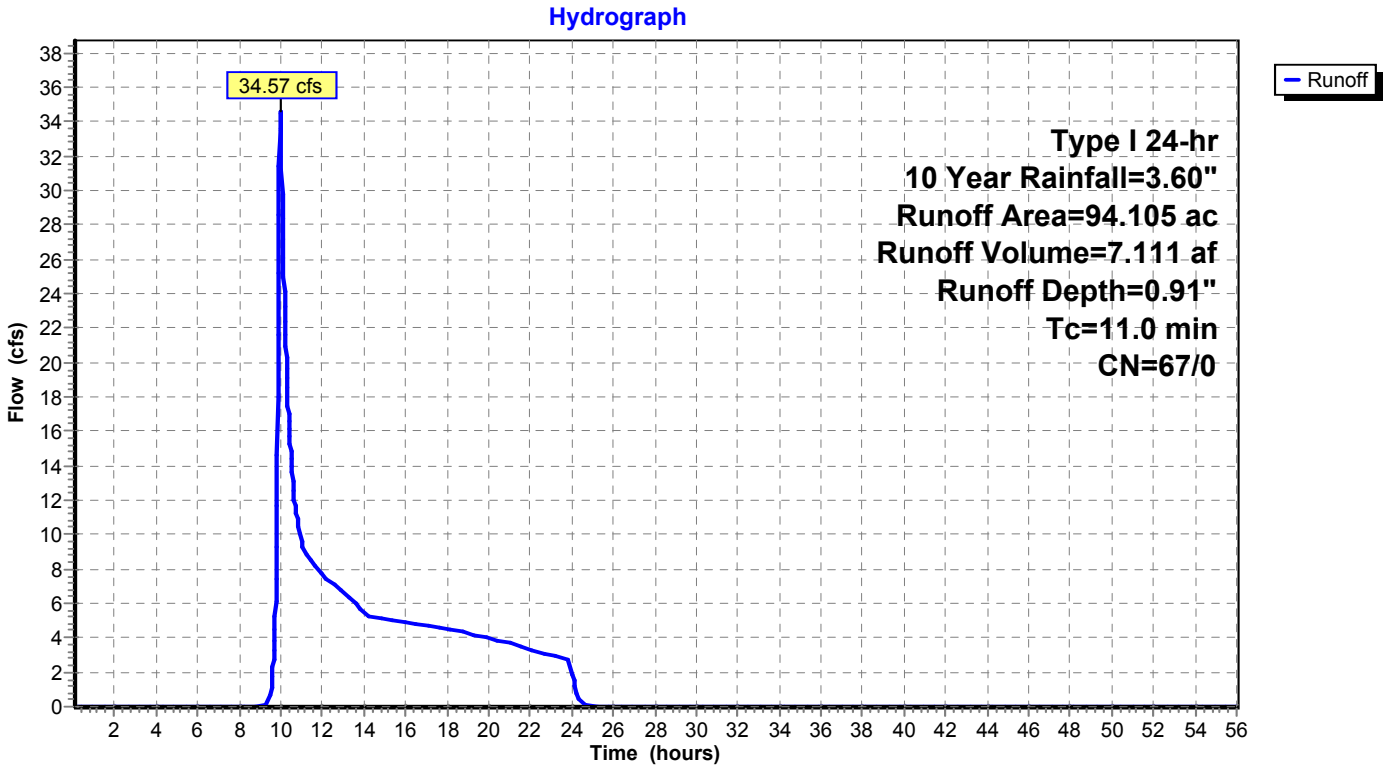
Runoff = 34.57 cfs @ 9.99 hrs, Volume= 7.111 af, Depth= 0.91"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
0.173	58	Meadow, non-grazed, HSG B
9.477	58	Meadow, non-grazed, HSG B
11.002	58	Meadow, non-grazed, HSG B
0.163	58	Meadow, non-grazed, HSG B
0.158	58	Meadow, non-grazed, HSG B
10.113	58	Meadow, non-grazed, HSG B
48.708	71	Meadow, non-grazed, HSG C
14.310	71	Meadow, non-grazed, HSG C
94.105	67	Weighted Average
94.105	67	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0					**Direct Entry, SCS Method taken from Catchment in ACAD file**

Subcatchment 10a-Ex: Subcat 10a-Ex



Summary for Subcatchment 11: Subcat 11

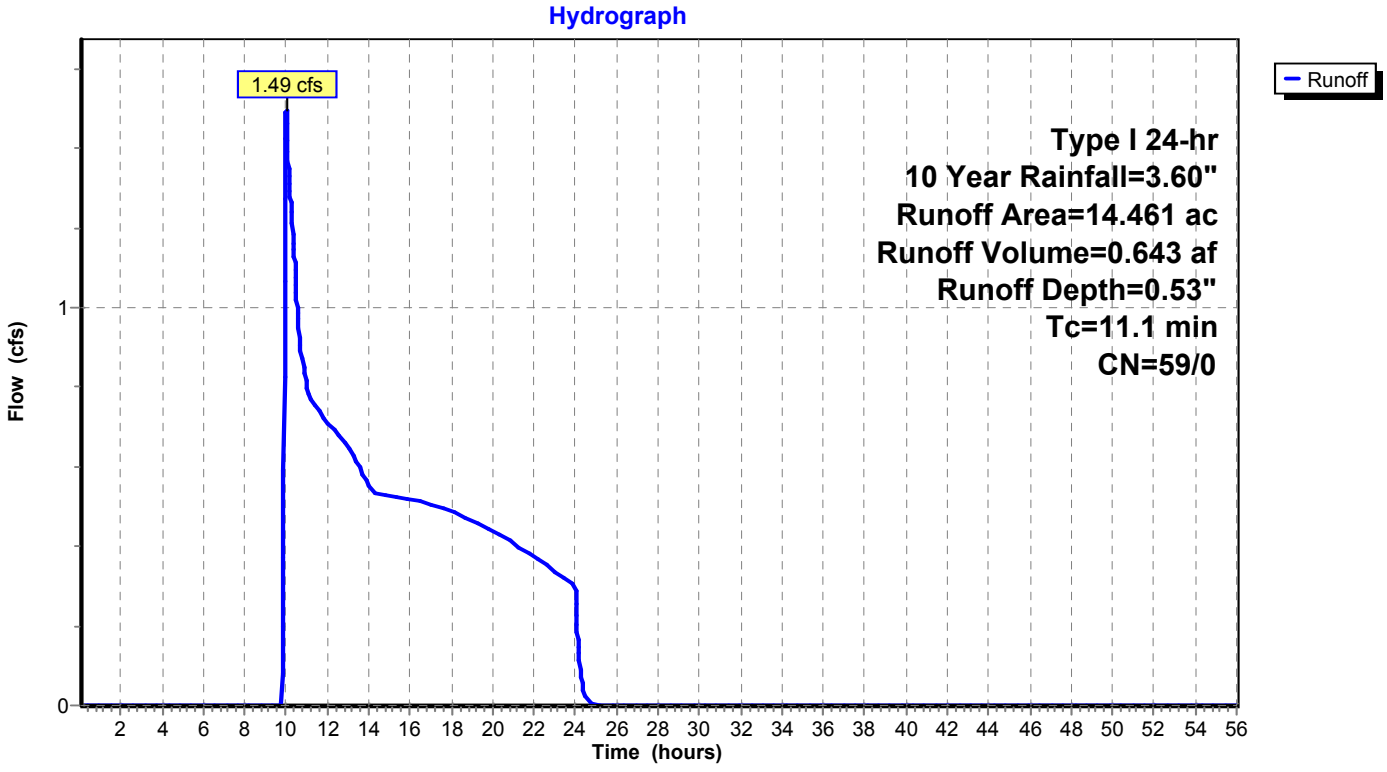
Runoff = 1.49 cfs @ 10.01 hrs, Volume= 0.643 af, Depth= 0.53"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
0.000	58	Meadow, non-grazed, HSG B
0.328	58	Meadow, non-grazed, HSG B
13.072	58	Meadow, non-grazed, HSG B
0.762	71	Meadow, non-grazed, HSG C
0.298	71	Meadow, non-grazed, HSG C
14.461	59	Weighted Average
14.461	59	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1					**Direct Entry, SCS Method taken from Catchment in ACAD file**

Subcatchment 11: Subcat 11



Summary for Subcatchment 12: Subcat 12

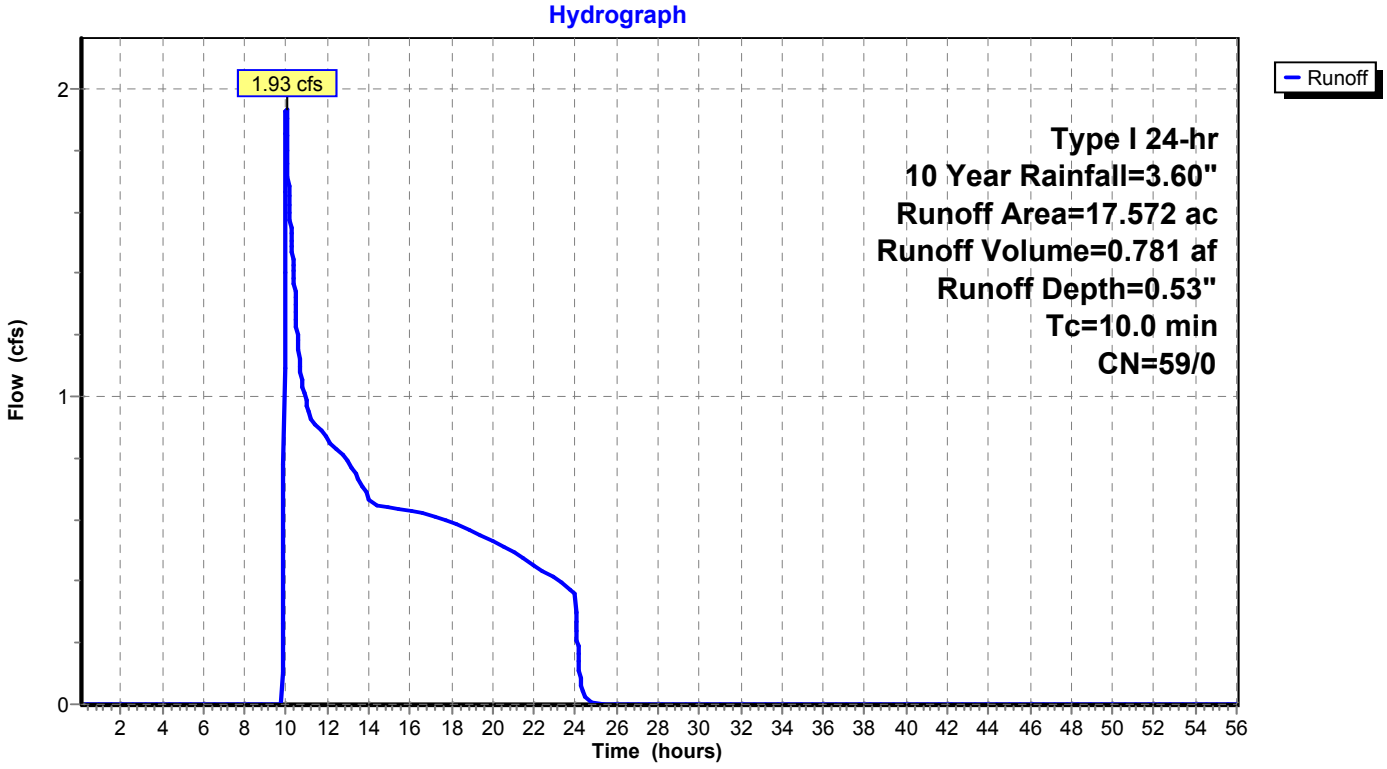
Runoff = 1.93 cfs @ 10.01 hrs, Volume= 0.781 af, Depth= 0.53"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
0.000	58	Meadow, non-grazed, HSG B
0.977	58	Meadow, non-grazed, HSG B
15.916	58	Meadow, non-grazed, HSG B
0.001	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.000	71	Meadow, non-grazed, HSG C
0.223	71	Meadow, non-grazed, HSG C
0.456	71	Meadow, non-grazed, HSG C
17.572	59	Weighted Average
17.572	59	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9					**Direct Entry, SCS Method taken from Catchment in ACAD file**
7.9	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 12: Subcat 12



Summary for Subcatchment 12a-Ex: Subcat 12a-Ex

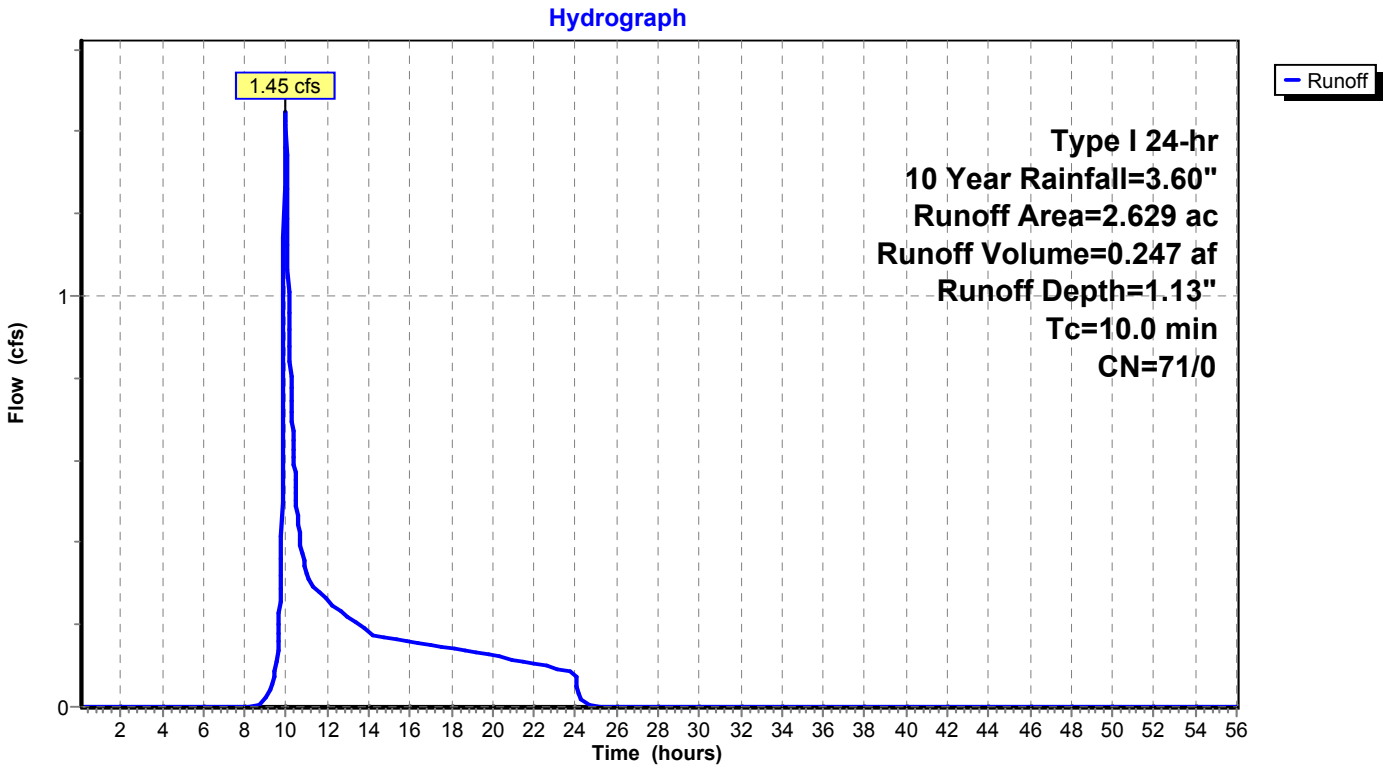
Runoff = 1.45 cfs @ 9.98 hrs, Volume= 0.247 af, Depth= 1.13"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
2.629	71	Meadow, non-grazed, HSG C
2.629	71	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9					**Direct Entry, SCS Method taken from Catchment in ACAD file**
4.9	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 12a-Ex: Subcat 12a-Ex



Summary for Subcatchment 13: Subcat 13

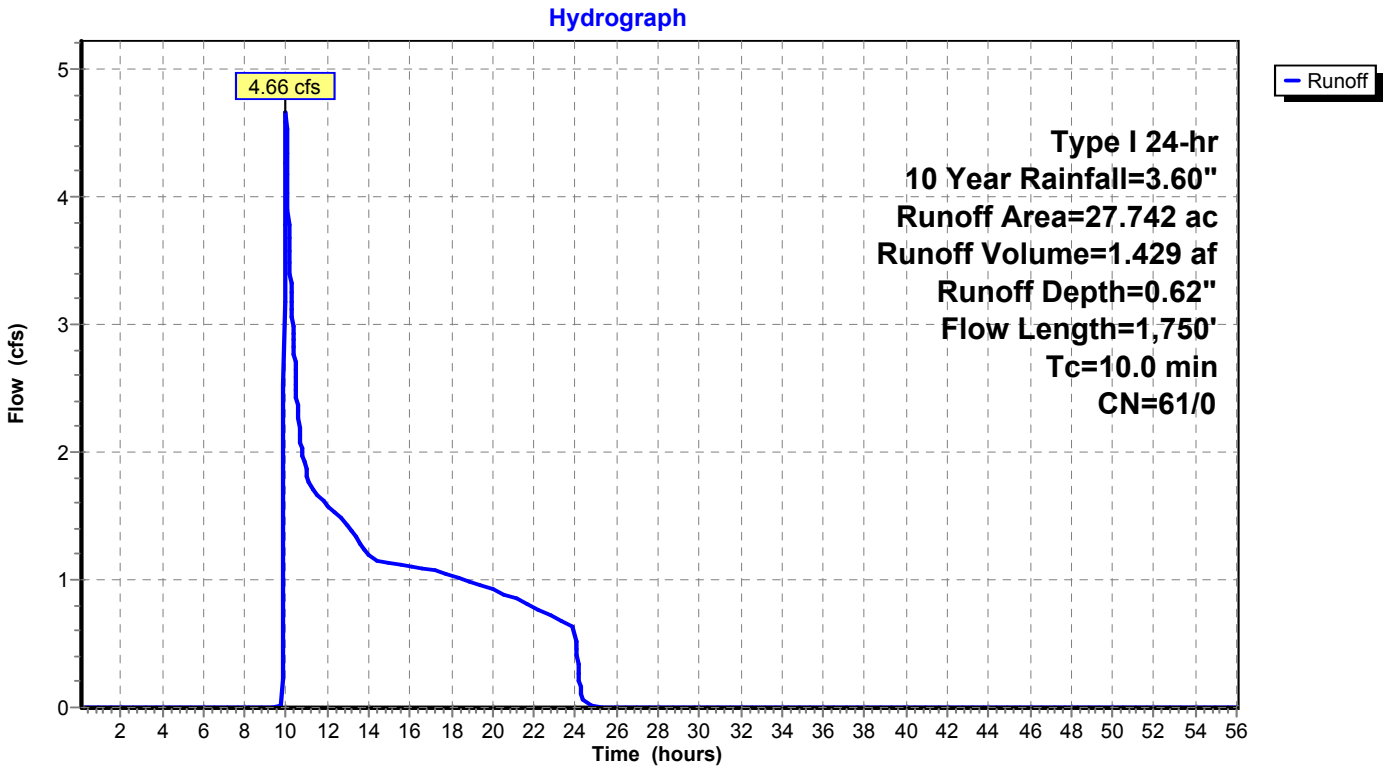
Runoff = 4.66 cfs @ 10.00 hrs, Volume= 1.429 af, Depth= 0.62"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
15.931	58	Meadow, non-grazed, HSG B
4.853	58	Meadow, non-grazed, HSG B
0.000	71	Meadow, non-grazed, HSG C
6.330	71	Meadow, non-grazed, HSG C
0.477	71	Meadow, non-grazed, HSG C
0.151	75	Row crops, SR + CR, Good, HSG B
27.742	61	Weighted Average
27.742	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	1,750		3.74		**Direct Entry, SCS Method taken from Catchment in ACAD file**
7.8	1,750	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 13: Subcat 13



Summary for Subcatchment 13a-Ex: Subcat 13a-Ex

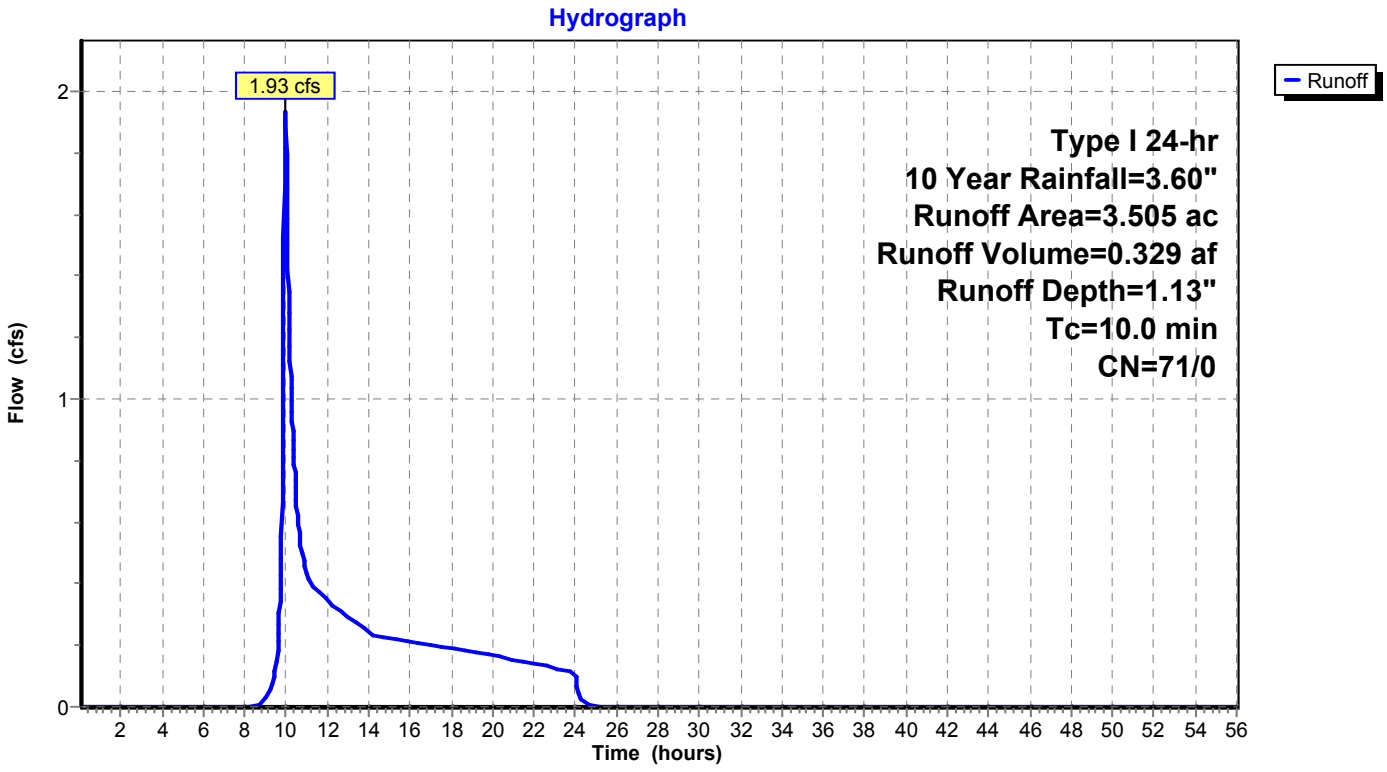
Runoff = 1.93 cfs @ 9.98 hrs, Volume= 0.329 af, Depth= 1.13"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
3.505	71	Meadow, non-grazed, HSG C
3.505	71	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9					**Direct Entry, SCS Method taken from Catchment in ACAD file**
8.9	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 13a-Ex: Subcat 13a-Ex



Summary for Subcatchment 13b-Ex: Subcat 13b-Ex

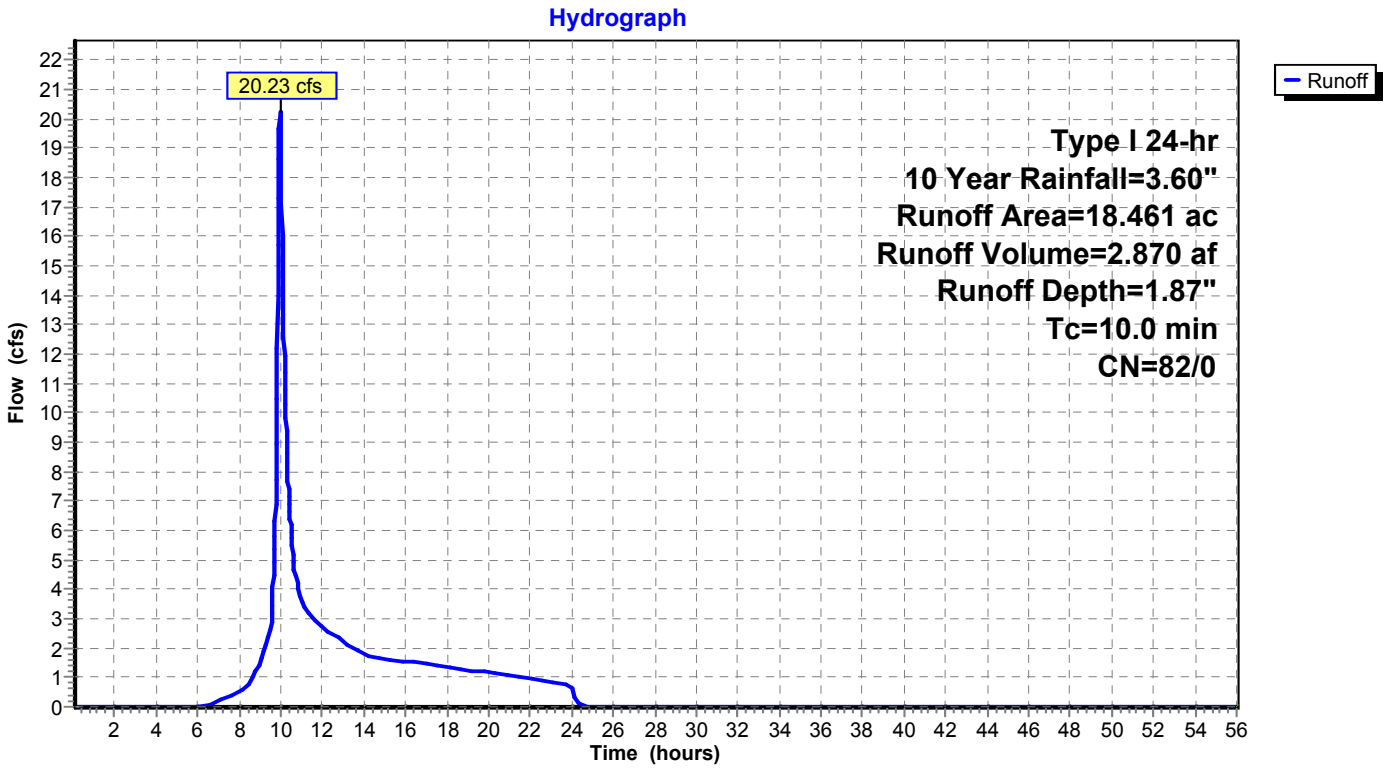
Runoff = 20.23 cfs @ 9.97 hrs, Volume= 2.870 af, Depth= 1.87"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
18.461	82	Row crops, SR + CR, Good, HSG C
18.461	82	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry, SCS Method taken from Catchment in ACAD file**
7.0	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 13b-Ex: Subcat 13b-Ex



Summary for Subcatchment 13c-Ex: Subcat 13c-Ex

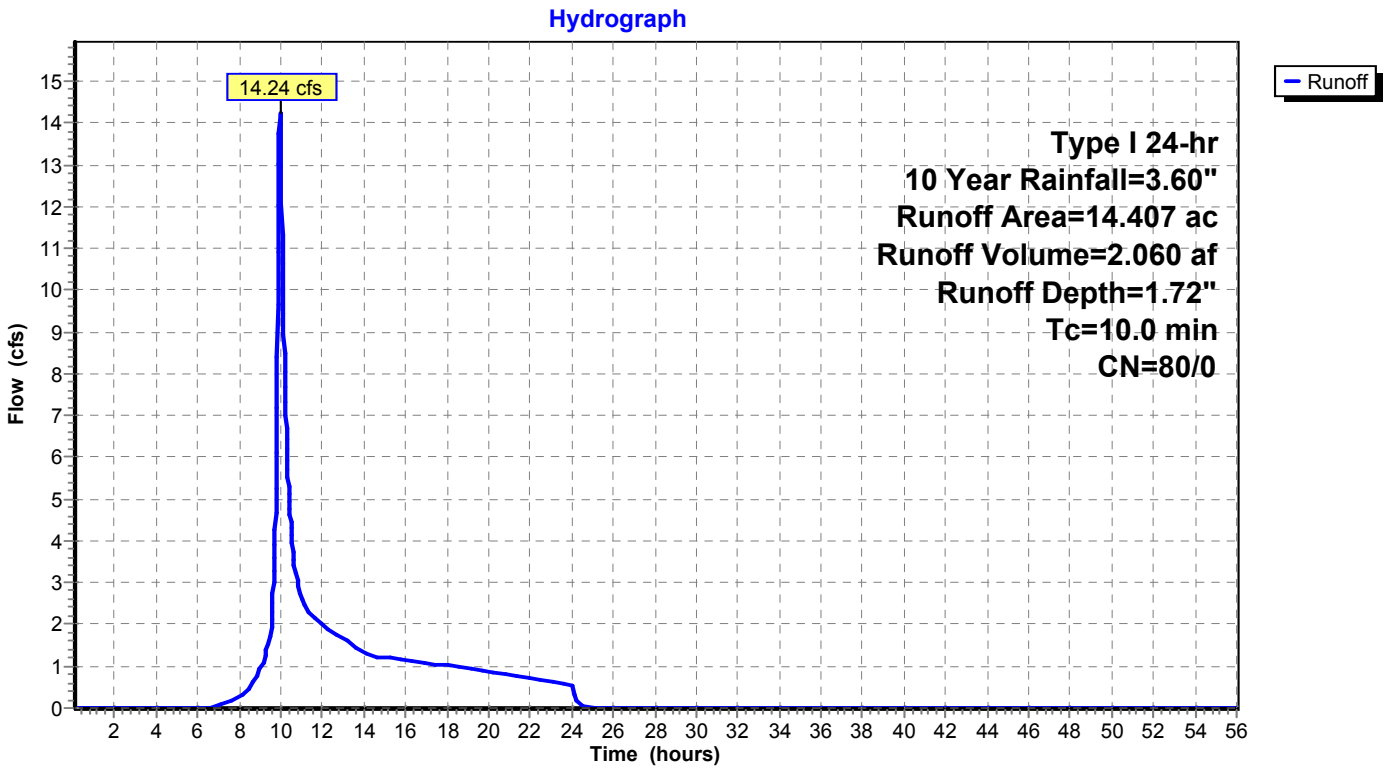
Runoff = 14.24 cfs @ 9.97 hrs, Volume= 2.060 af, Depth= 1.72"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
3.718	75	Row crops, SR + CR, Good, HSG B
10.689	82	Row crops, SR + CR, Good, HSG C
14.407	80	Weighted Average
14.407	80	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9					**Direct Entry, SCS Method taken from Catchment in ACAD file**
6.9	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 13c-Ex: Subcat 13c-Ex



Summary for Subcatchment 14: Subcat 14

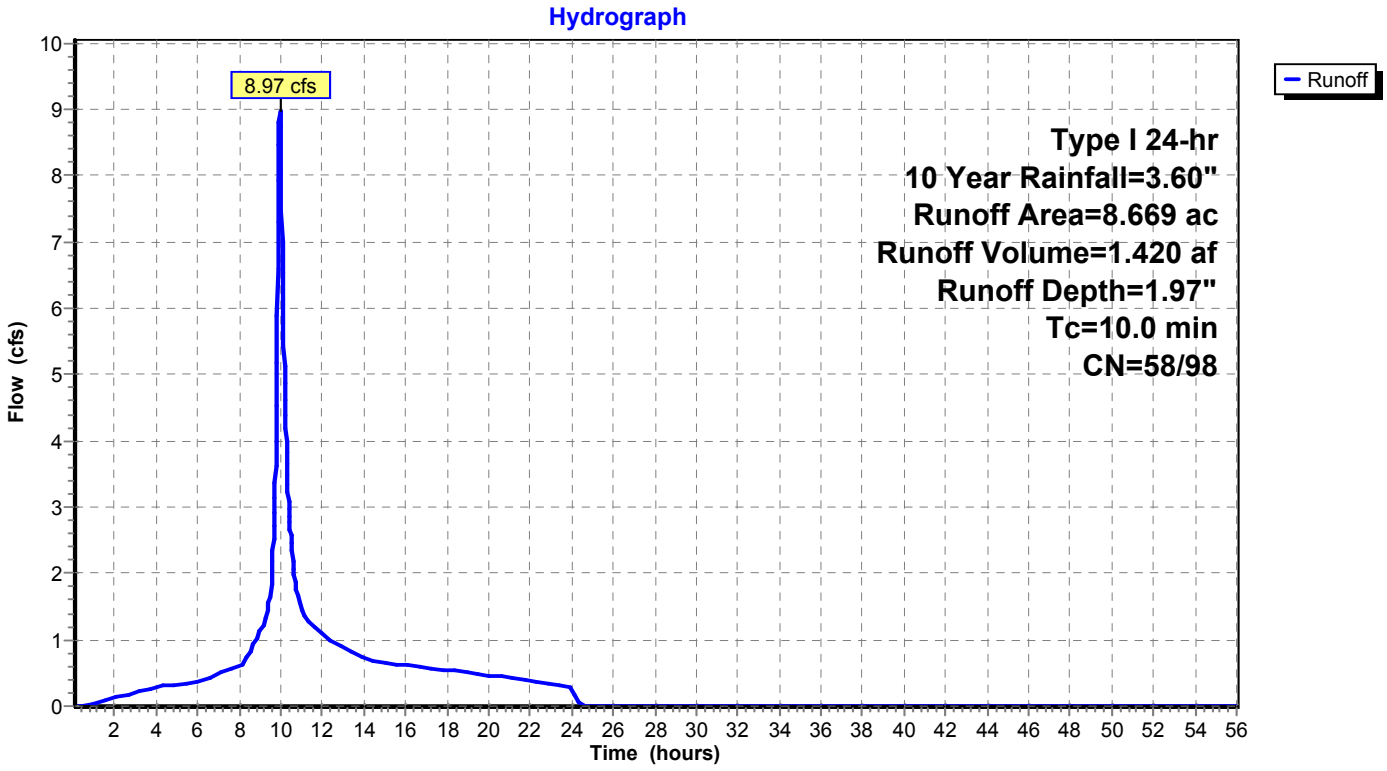
Runoff = 8.97 cfs @ 9.96 hrs, Volume= 1.420 af, Depth= 1.97"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
4.224	58	Meadow, non-grazed, HSG B
4.445	98	Paved roads w/curbs & sewers, HSG B
8.669	79	Weighted Average
4.224	58	48.73% Pervious Area
4.445	98	51.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6					**Direct Entry, SCS Method taken from Catchment in ACAD file**
8.6	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 14: Subcat 14



Summary for Subcatchment 14a{(1)}-Ex: Subcat 14a{(1)}-Ex

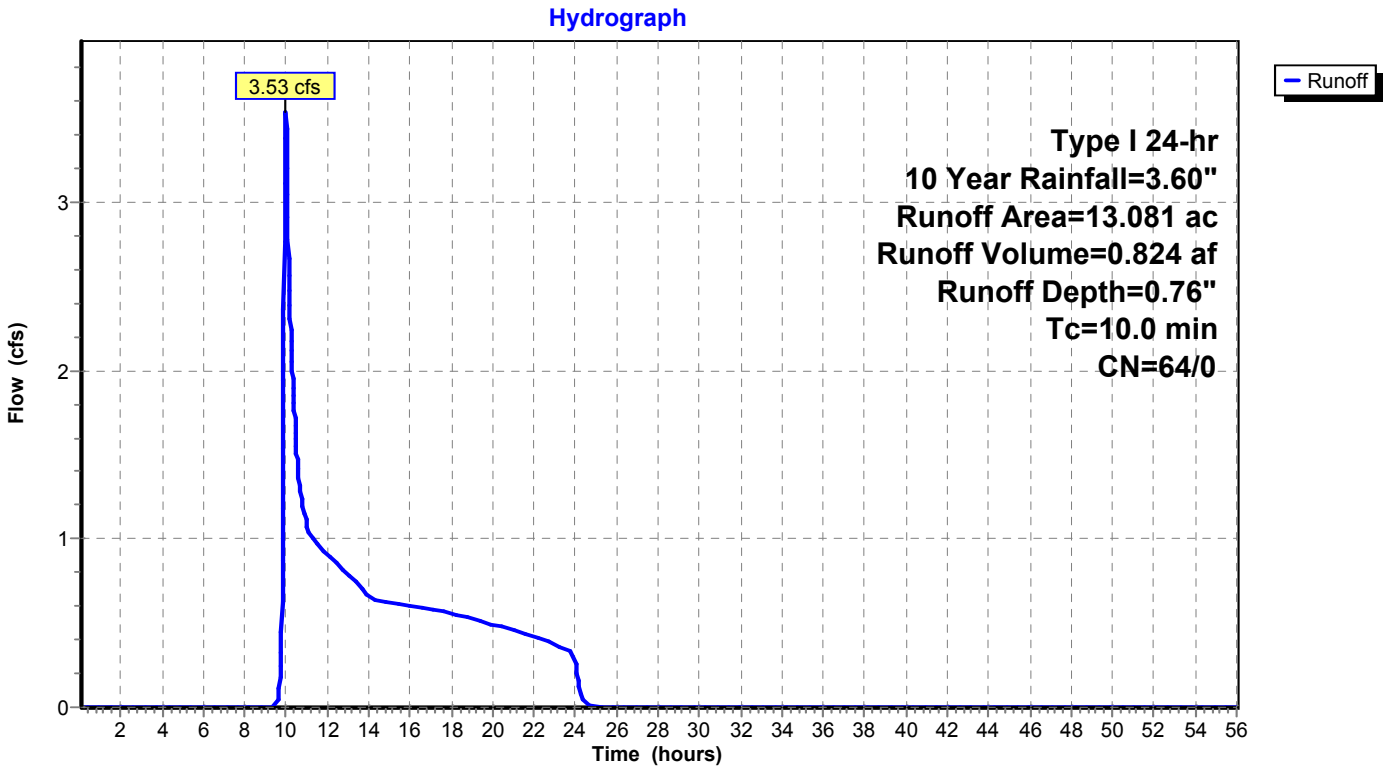
Runoff = 3.53 cfs @ 9.99 hrs, Volume= 0.824 af, Depth= 0.76"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
0.000	58	Meadow, non-grazed, HSG B
8.116	58	Meadow, non-grazed, HSG B
2.383	75	Row crops, SR + CR, Good, HSG B
0.000	75	Row crops, SR + CR, Good, HSG B
2.581	75	Row crops, SR + CR, Good, HSG B
13.081	64	Weighted Average
13.081	64	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**
8.7	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 14a{(1)}-Ex: Subcat 14a{(1)}-Ex



Summary for Subcatchment 14a{(2)}-Ex: Subcat 14a{(2)}-Ex

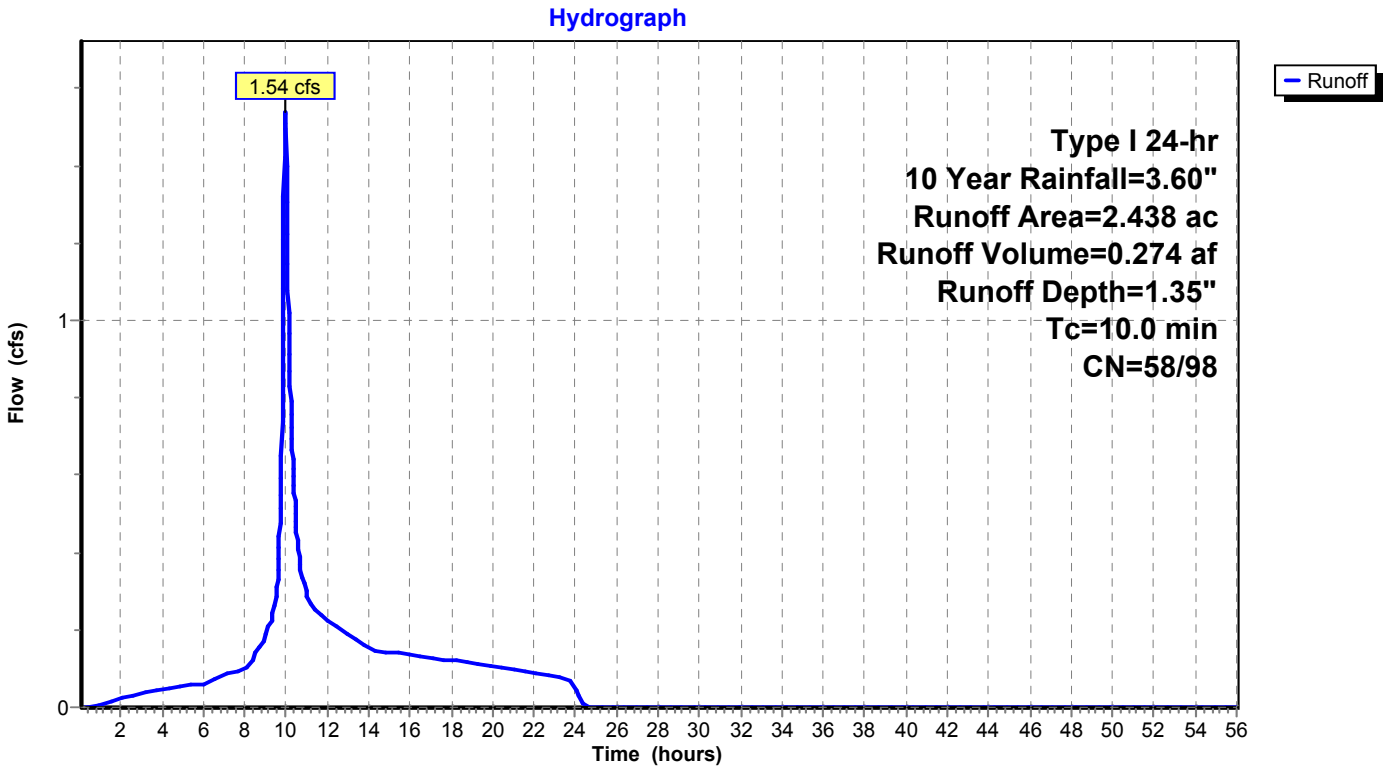
Runoff = 1.54 cfs @ 9.97 hrs, Volume= 0.274 af, Depth= 1.35"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
1.711	58	Meadow, non-grazed, HSG B
0.726	98	Paved roads w/curbs & sewers, HSG B
0.000	75	Row crops, SR + CR, Good, HSG B
0.000	75	Row crops, SR + CR, Good, HSG B
2.438	70	Weighted Average
1.711	58	70.20% Pervious Area
0.726	98	29.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**
4.9	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 14a{(2)}-Ex: Subcat 14a{(2)}-Ex



Summary for Subcatchment 14b-Ex: Subcat 14b-Ex

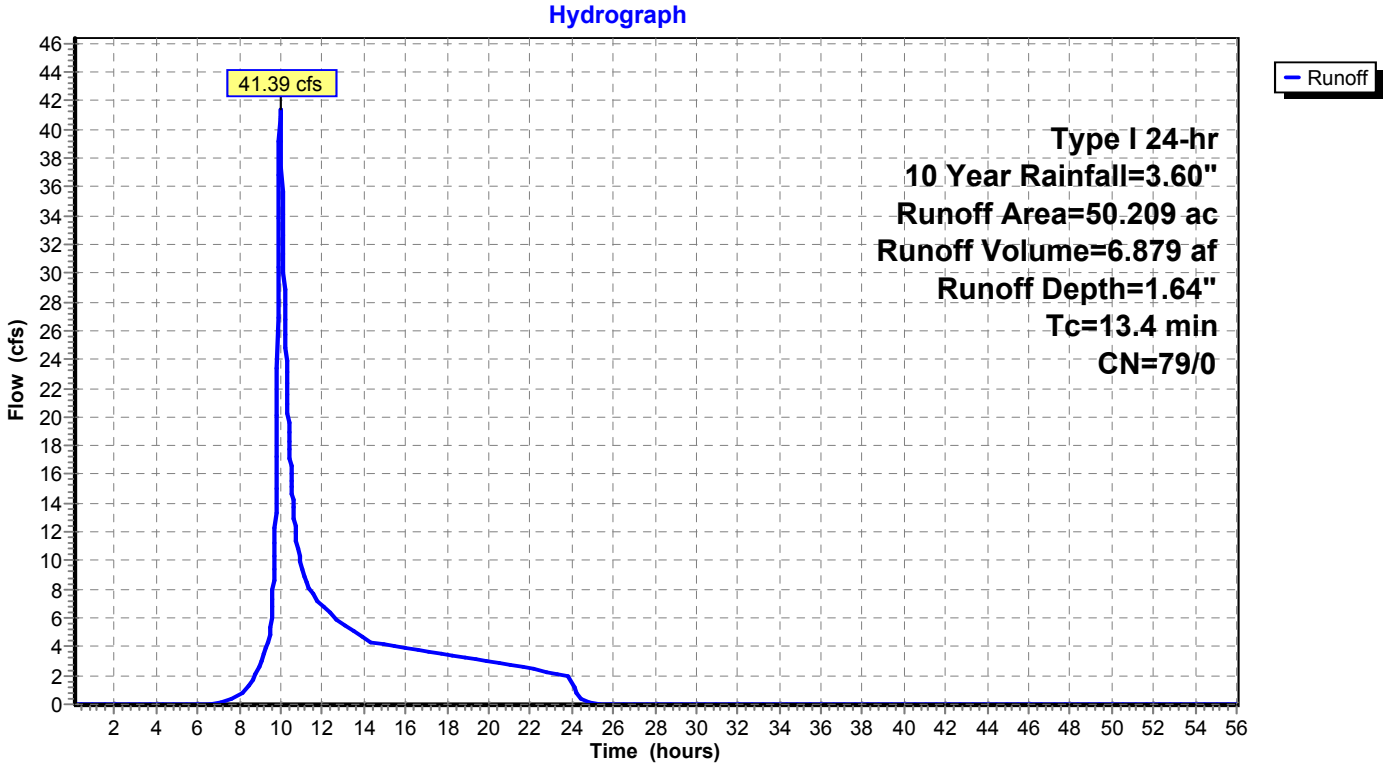
Runoff = 41.39 cfs @ 9.98 hrs, Volume= 6.879 af, Depth= 1.64"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
13.606	75	Row crops, SR + CR, Good, HSG B
8.804	75	Row crops, SR + CR, Good, HSG B
0.005	82	Row crops, SR + CR, Good, HSG C
27.793	82	Row crops, SR + CR, Good, HSG C
50.209	79	Weighted Average
50.209	79	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4					**Direct Entry, SCS Method taken from Catchment in ACAD file**

Subcatchment 14b-Ex: Subcat 14b-Ex



Summary for Subcatchment 14c{(0)}-Ex: Subcat 14c{(0)}-Ex

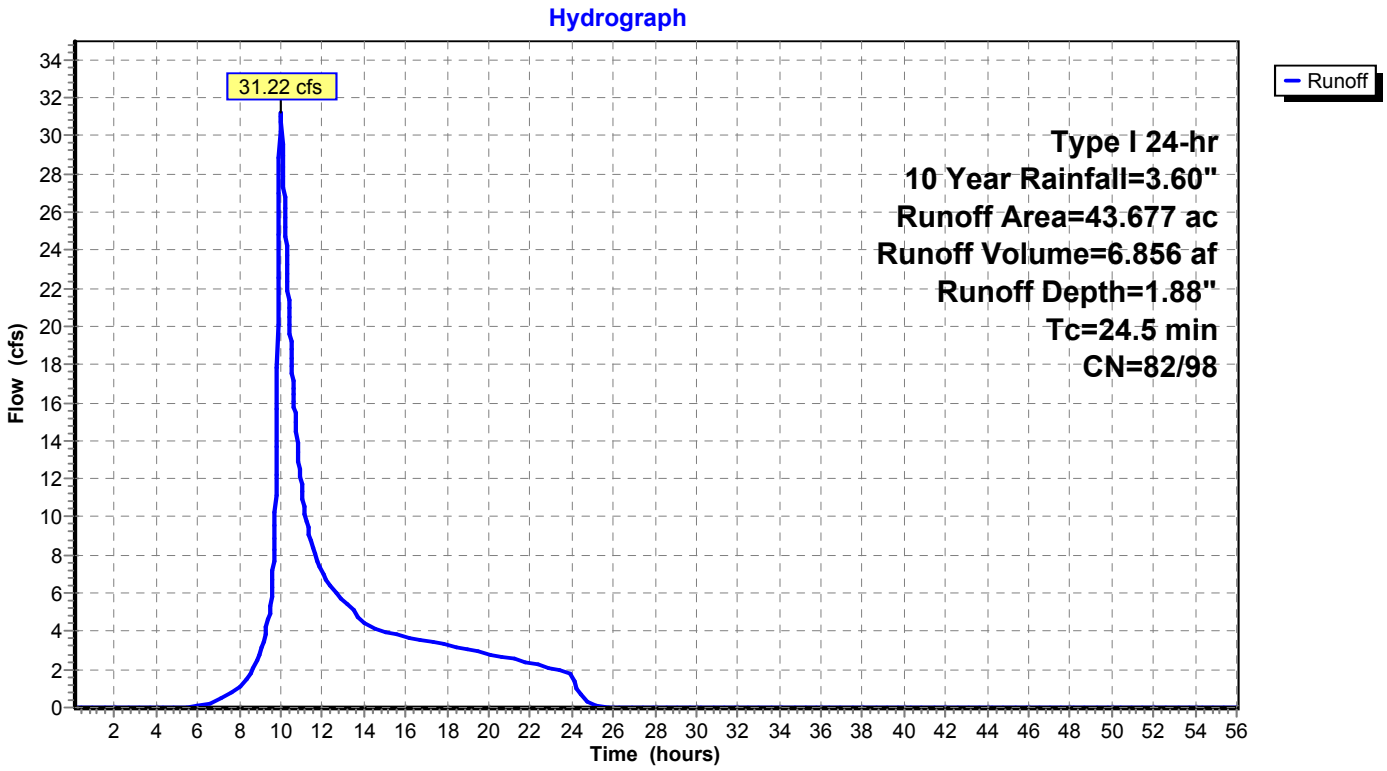
Runoff = 31.22 cfs @ 10.00 hrs, Volume= 6.856 af, Depth= 1.88"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
0.486	98	Paved roads w/curbs & sewers, HSG C
0.041	98	Paved roads w/curbs & sewers, HSG C
37.308	82	Row crops, SR + CR, Good, HSG C
0.070	82	Row crops, SR + CR, Good, HSG C
5.772	82	Row crops, SR + CR, Good, HSG C
43.677	82	Weighted Average
43.150	82	98.79% Pervious Area
0.527	98	1.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 14c{(0)}-Ex: Subcat 14c{(0)}-Ex



Summary for Subcatchment 14c{(1)}-Ex: Subcat 14c{(1)}-Ex

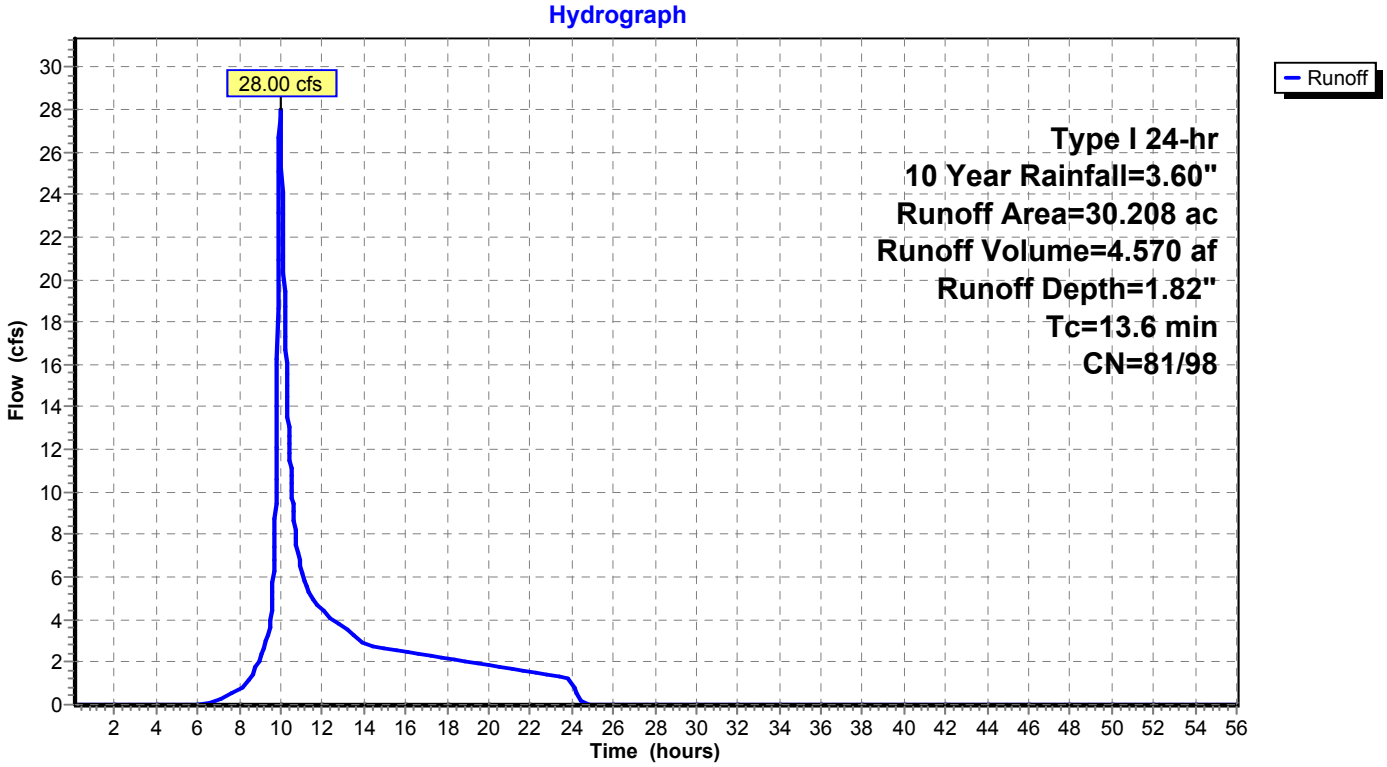
Runoff = 28.00 cfs @ 9.98 hrs, Volume= 4.570 af, Depth= 1.82"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
0.093	98	Paved roads w/curbs & sewers, HSG B
0.394	98	Paved roads w/curbs & sewers, HSG C
2.571	75	Row crops, SR + CR, Good, HSG B
2.743	75	Row crops, SR + CR, Good, HSG B
13.825	82	Row crops, SR + CR, Good, HSG C
10.454	82	Row crops, SR + CR, Good, HSG C
0.128	82	Row crops, SR + CR, Good, HSG C
30.208	81	Weighted Average
29.721	81	98.39% Pervious Area
0.486	98	1.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.6					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 14c{(1)}-Ex: Subcat 14c{(1)}-Ex



Summary for Subcatchment 14c{(2)}-Ex: Subcat 14c{(2)}-Ex

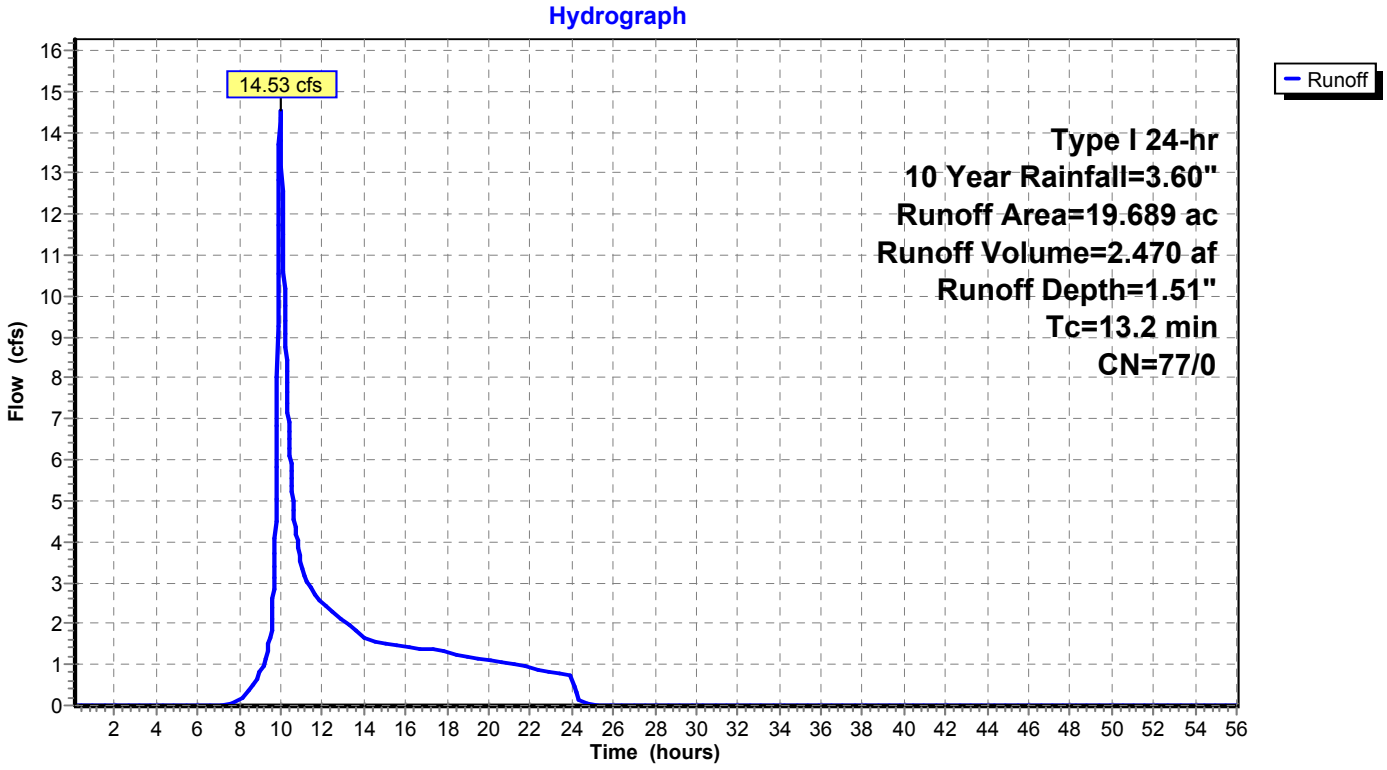
Runoff = 14.53 cfs @ 9.98 hrs, Volume= 2.470 af, Depth= 1.51"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
0.112	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
10.117	75	Row crops, SR + CR, Good, HSG B
3.200	75	Row crops, SR + CR, Good, HSG B
6.261	82	Row crops, SR + CR, Good, HSG C
19.689	77	Weighted Average
19.689	77	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 14c{(2)}-Ex: Subcat 14c{(2)}-Ex



Summary for Subcatchment 14c{(3)}-Ex: Subcat 14c{(3)}-Ex

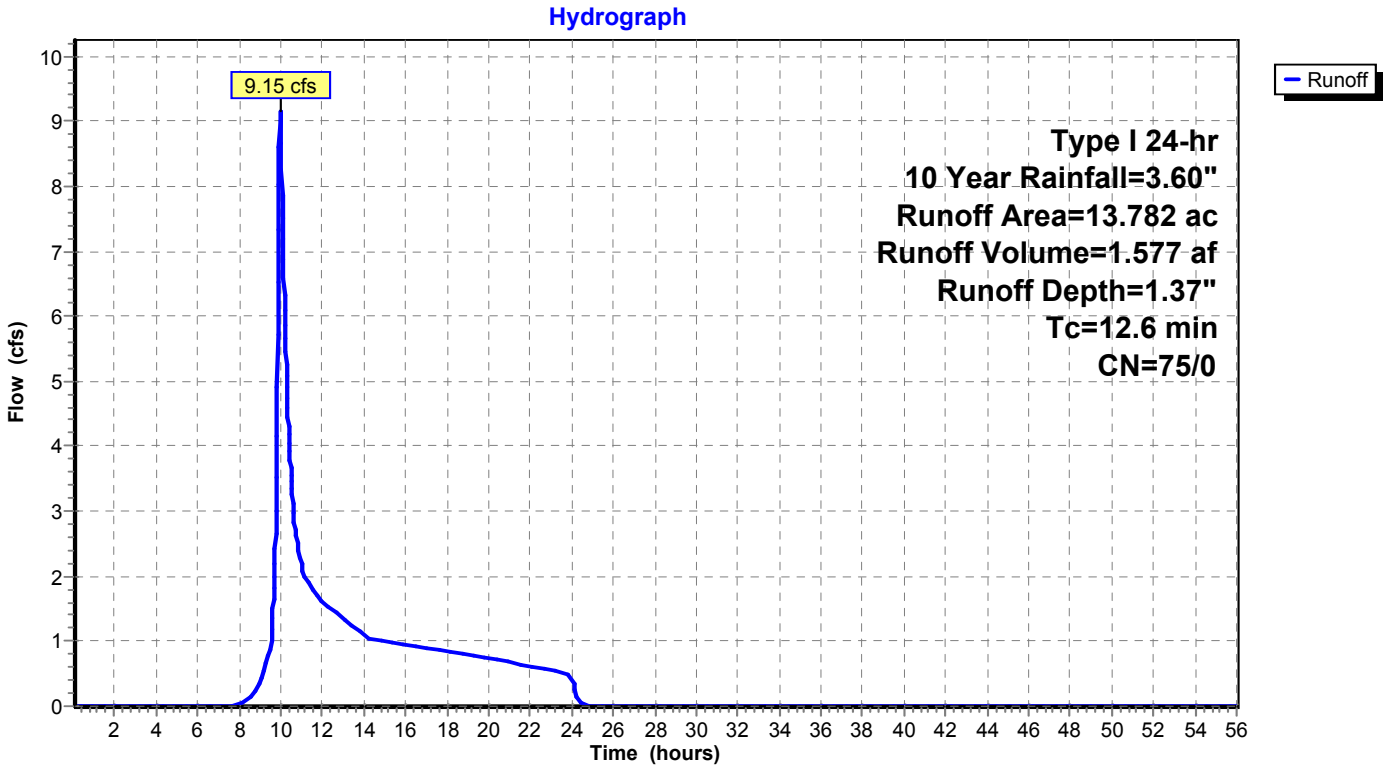
Runoff = 9.15 cfs @ 9.98 hrs, Volume= 1.577 af, Depth= 1.37"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
6.980	75	Row crops, SR + CR, Good, HSG B
0.000	75	Row crops, SR + CR, Good, HSG B
6.802	75	Row crops, SR + CR, Good, HSG B
13.782	75	Weighted Average
13.782	75	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.6					**Direct Entry, SCS Method taken from Catchment in ACAD file**

Subcatchment 14c{(3)}-Ex: Subcat 14c{(3)}-Ex



Summary for Subcatchment 14d-Ex: Subcat 14d-Ex

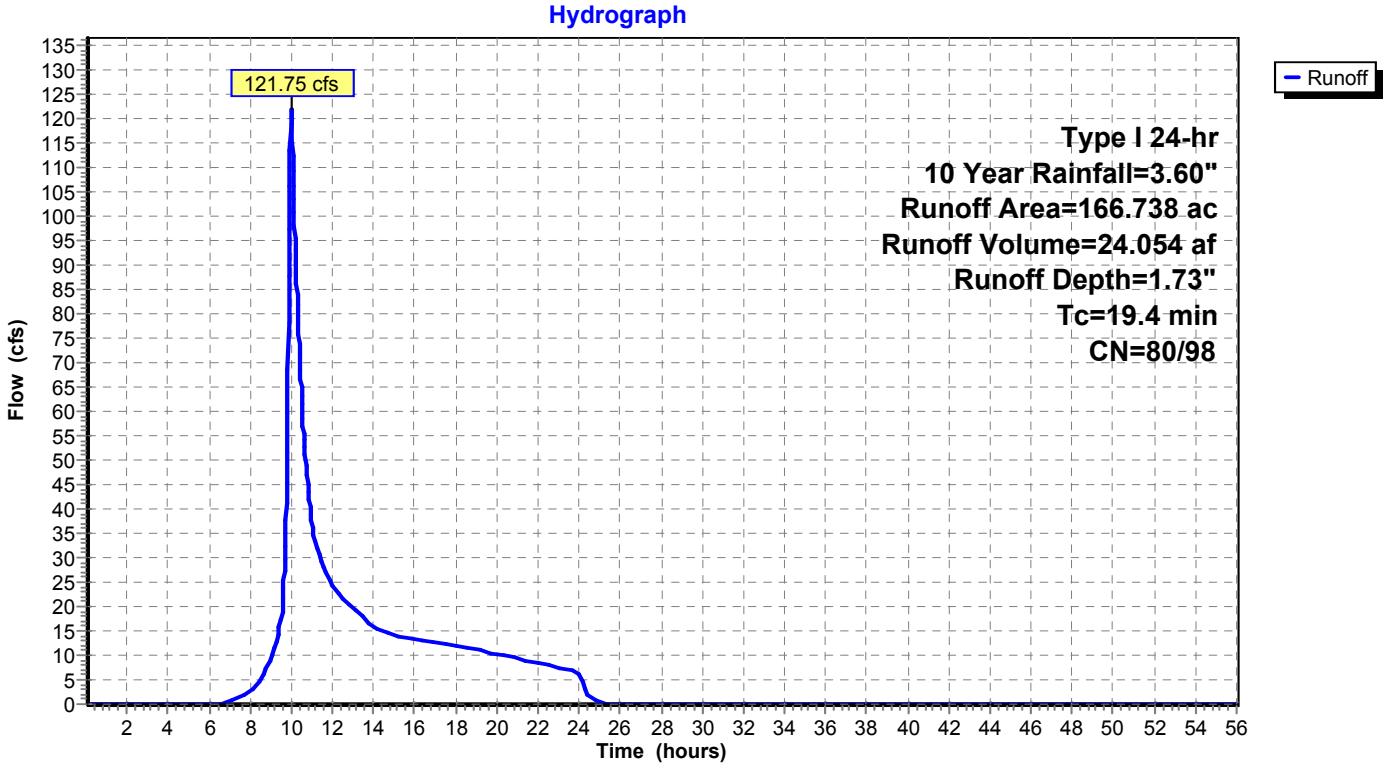
Runoff = 121.75 cfs @ 9.99 hrs, Volume= 24.054 af, Depth= 1.73"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
0.000	71	Meadow, non-grazed, HSG C
0.000	71	Meadow, non-grazed, HSG C
0.000	71	Meadow, non-grazed, HSG C
0.000	71	Meadow, non-grazed, HSG C
0.000	71	Meadow, non-grazed, HSG C
0.440	98	Paved roads w/curbs & sewers, HSG B
0.500	98	Paved roads w/curbs & sewers, HSG C
0.580	98	Paved roads w/curbs & sewers, HSG C
22.046	75	Row crops, SR + CR, Good, HSG B
2.662	75	Row crops, SR + CR, Good, HSG B
18.916	75	Row crops, SR + CR, Good, HSG B
108.025	82	Row crops, SR + CR, Good, HSG C
6.305	82	Row crops, SR + CR, Good, HSG C
7.263	82	Row crops, SR + CR, Good, HSG C
166.738	80	Weighted Average
165.218	80	99.09% Pervious Area
1.520	98	0.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.4					**Direct Entry, SCS Method taken from Catchment in ACAD file**

Subcatchment 14d-Ex: Subcat 14d-Ex



Summary for Subcatchment 14e-Ex: Subcat 14e-Ex

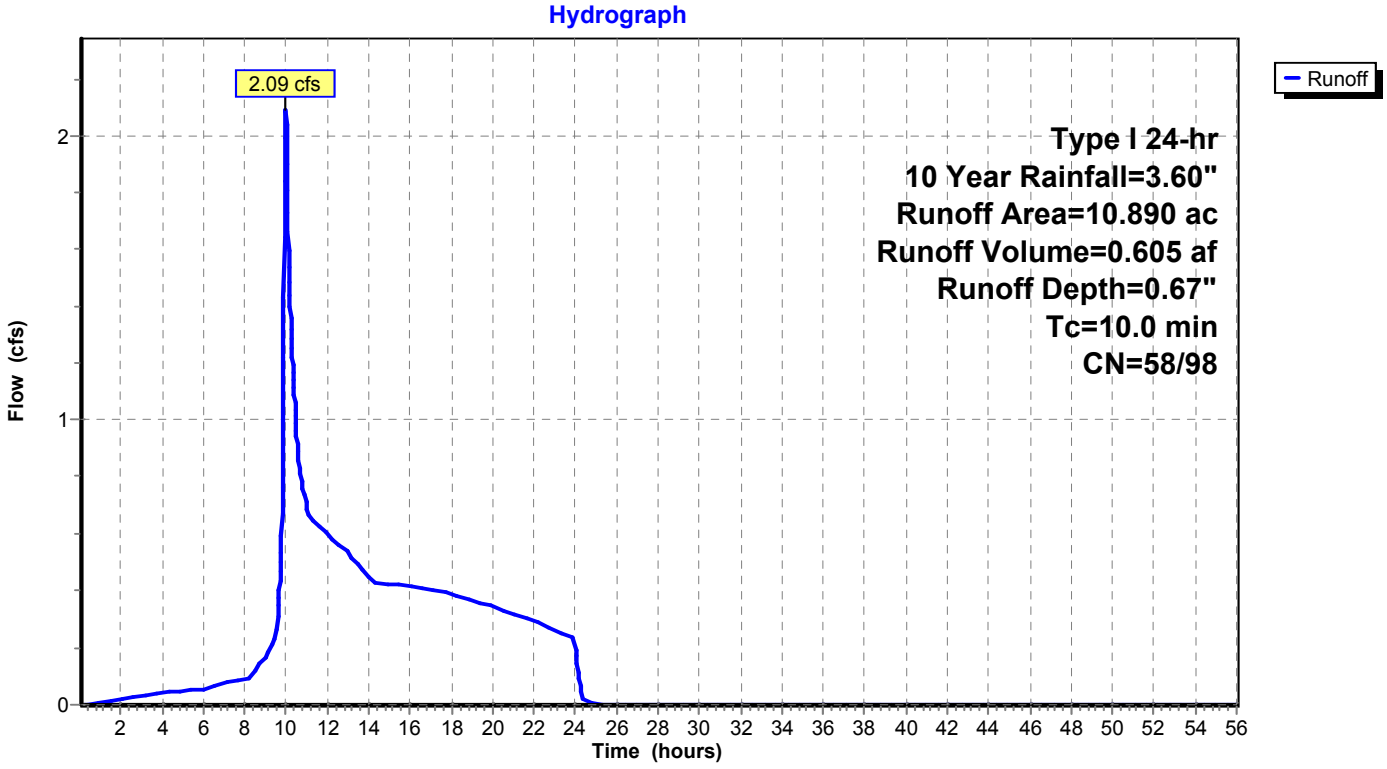
Runoff = 2.09 cfs @ 9.99 hrs, Volume= 0.605 af, Depth= 0.67"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 10 Year Rainfall=3.60"

Area (ac)	CN	Description
10.185	58	Meadow, non-grazed, HSG B
0.003	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.043	77	Natural western desert, HSG B
0.659	98	Paved roads w/curbs & sewers, HSG B
10.890	60	Weighted Average
10.231	58	93.95% Pervious Area
0.659	98	6.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4					**Direct Entry, SCS Method taken from Catchment in ACAD file**
9.4	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 14e-Ex: Subcat 14e-Ex



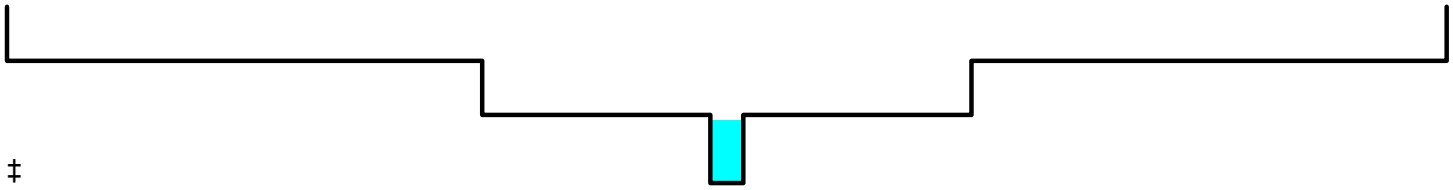
Summary for Reach 6R: Reach 1c

Inflow Area = 784.583 ac, 0.00% Impervious, Inflow Depth = 0.59" for 10 Year event
Inflow = 63.40 cfs @ 10.14 hrs, Volume= 38.668 af
Outflow = 62.08 cfs @ 10.22 hrs, Volume= 38.668 af, Atten= 2%, Lag= 4.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Max. Velocity= 4.26 fps, Min. Travel Time= 3.2 min
Avg. Velocity = 4.26 fps, Avg. Travel Time= 3.2 min

Peak Storage= 12,095 cf @ 10.22 hrs
Average Depth at Peak Storage= 2.31'
Bank-Full Depth= 6.52' Flow Area= 758.7 sf, Capacity= 4,878.97 cfs

Custom stage-perimeter table, n= 0.024
102 Intermediate values determined by Multi-point interpolation
Length= 830.0' Slope= 0.0031 '/'
Inlet Invert= 841.43', Outlet Invert= 838.82'



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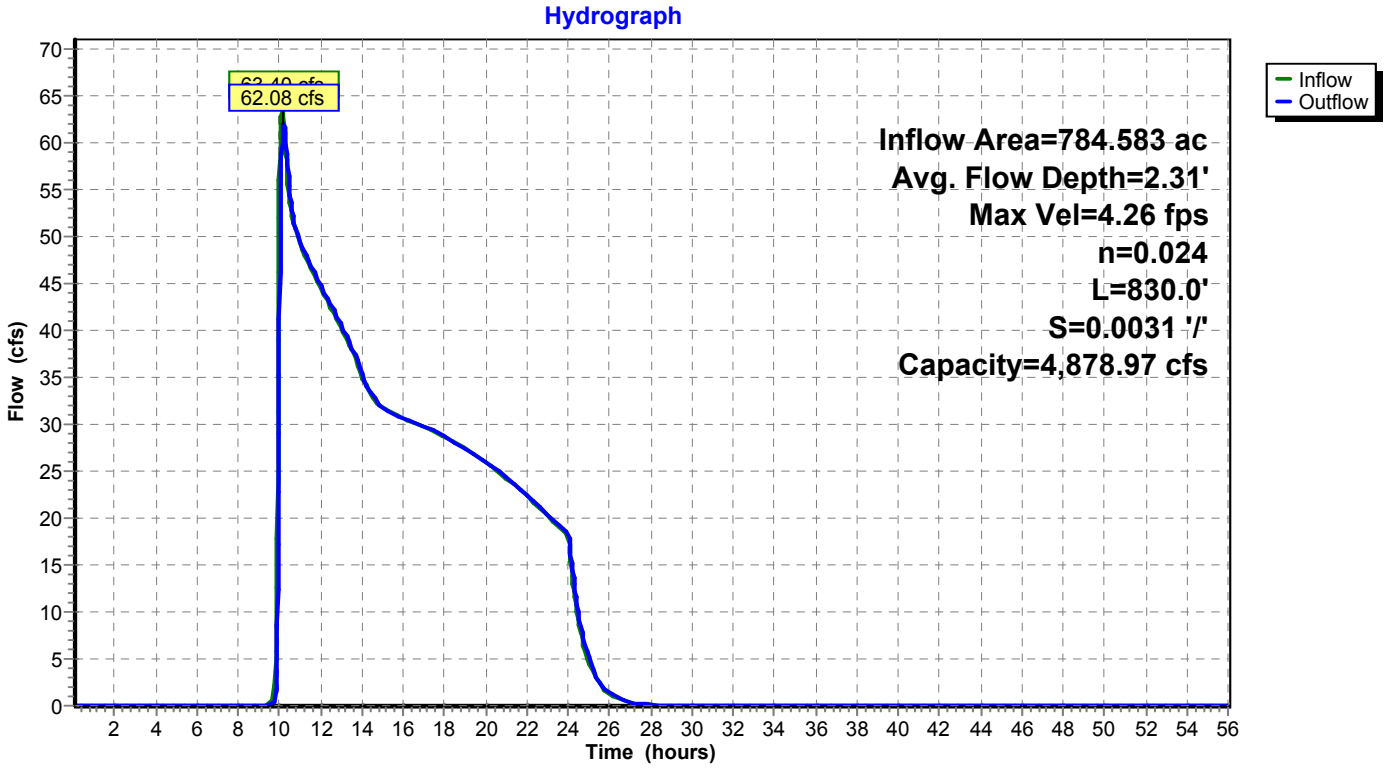
Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
2.52	15.9	11.7	13,197	67.73
4.52	204.4	231.7	169,652	652.79
6.52	758.7	301.0	629,721	4,878.97

Reach 6R: Reach 1c



Summary for Reach 7R: Reach 1b

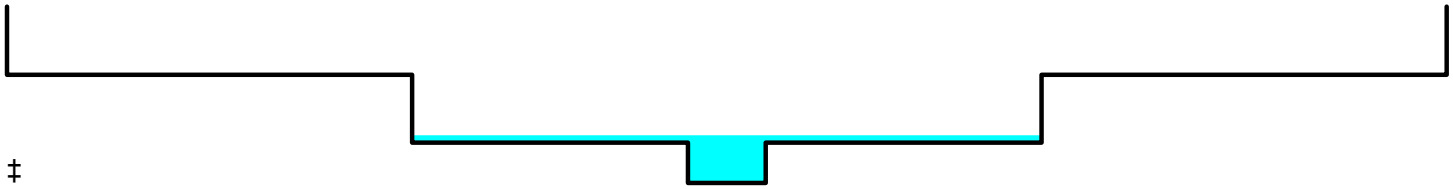
[62] Hint: Exceeded Reach 6R OUTLET depth by 0.82' @ 9.90 hrs

Inflow Area = 833.262 ac, 0.00% Impervious, Inflow Depth = 0.99" for 10 Year event
Inflow = 205.65 cfs @ 10.13 hrs, Volume= 68.684 af
Outflow = 201.96 cfs @ 10.19 hrs, Volume= 68.684 af, Atten= 2%, Lag= 3.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Max. Velocity= 4.15 fps, Min. Travel Time= 3.5 min
Avg. Velocity = 3.22 fps, Avg. Travel Time= 4.6 min

Peak Storage= 42,919 cf @ 10.19 hrs
Average Depth at Peak Storage= 1.40'
Bank-Full Depth= 5.18' Flow Area= 896.3 sf, Capacity= 8,865.90 cfs

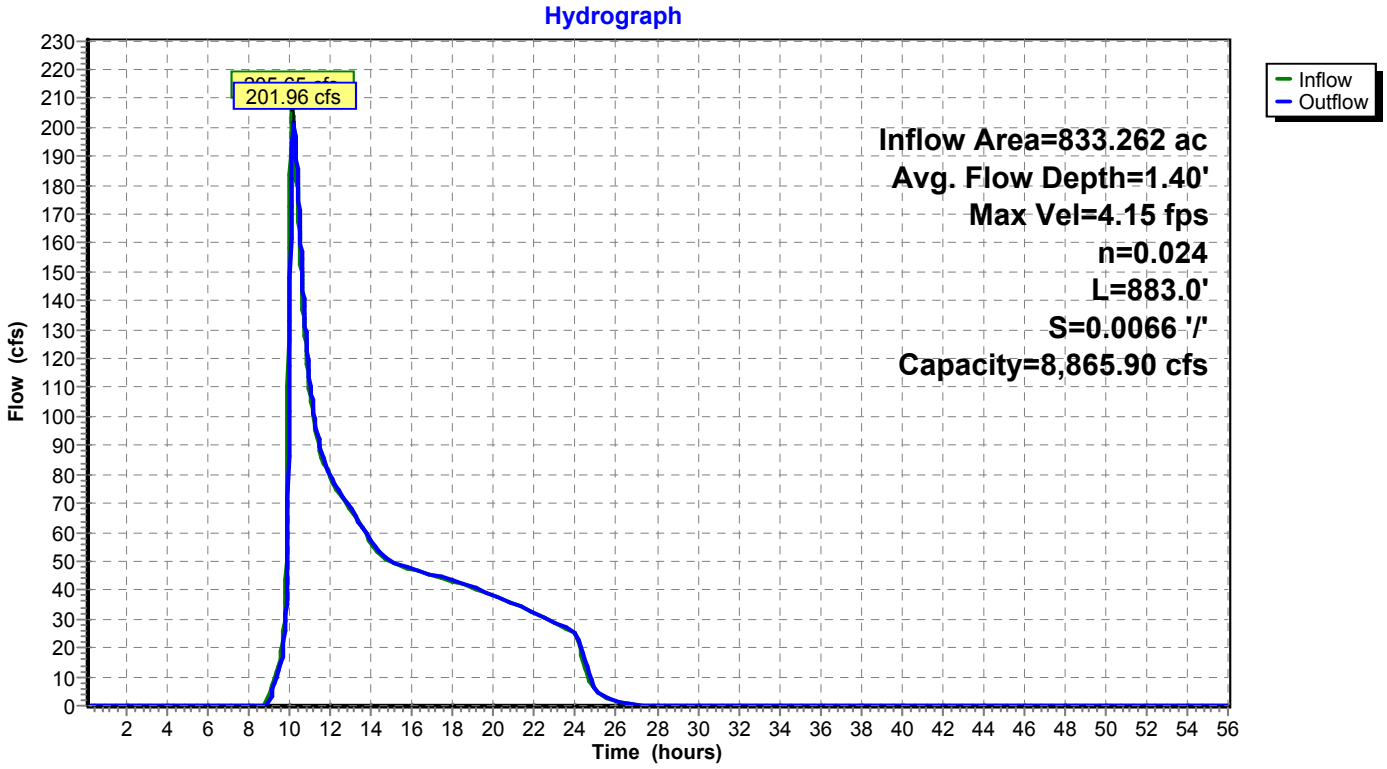
Custom stage-perimeter table, n= 0.024
102 Intermediate values determined by Multi-point interpolation
Length= 883.0' Slope= 0.0066 '/'
Inlet Invert= 838.82', Outlet Invert= 833.00'



‡

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
1.18	19.4	38.8	17,130	61.43
3.18	286.2	275.2	252,715	1,476.75
5.18	896.3	324.7	791,433	8,865.90

Reach 7R: Reach 1b



Summary for Reach 8R: Reach 1a

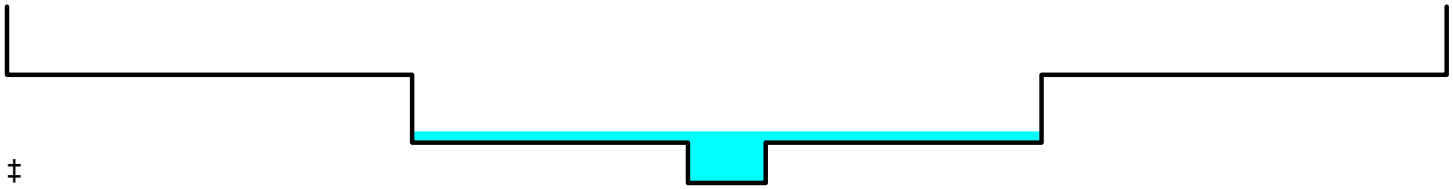
[62] Hint: Exceeded Reach 7R OUTLET depth by 0.36' @ 18.26 hrs

Inflow Area = 879.875 ac, 0.06% Impervious, Inflow Depth = 0.97" for 10 Year event
Inflow = 206.14 cfs @ 10.19 hrs, Volume= 70.814 af
Outflow = 203.68 cfs @ 10.25 hrs, Volume= 70.814 af, Atten= 1%, Lag= 3.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Max. Velocity= 3.17 fps, Min. Travel Time= 3.1 min
Avg. Velocity = 2.35 fps, Avg. Travel Time= 4.1 min

Peak Storage= 37,435 cf @ 10.25 hrs
Average Depth at Peak Storage= 1.52'
Bank-Full Depth= 5.18' Flow Area= 896.3 sf, Capacity= 6,396.21 cfs

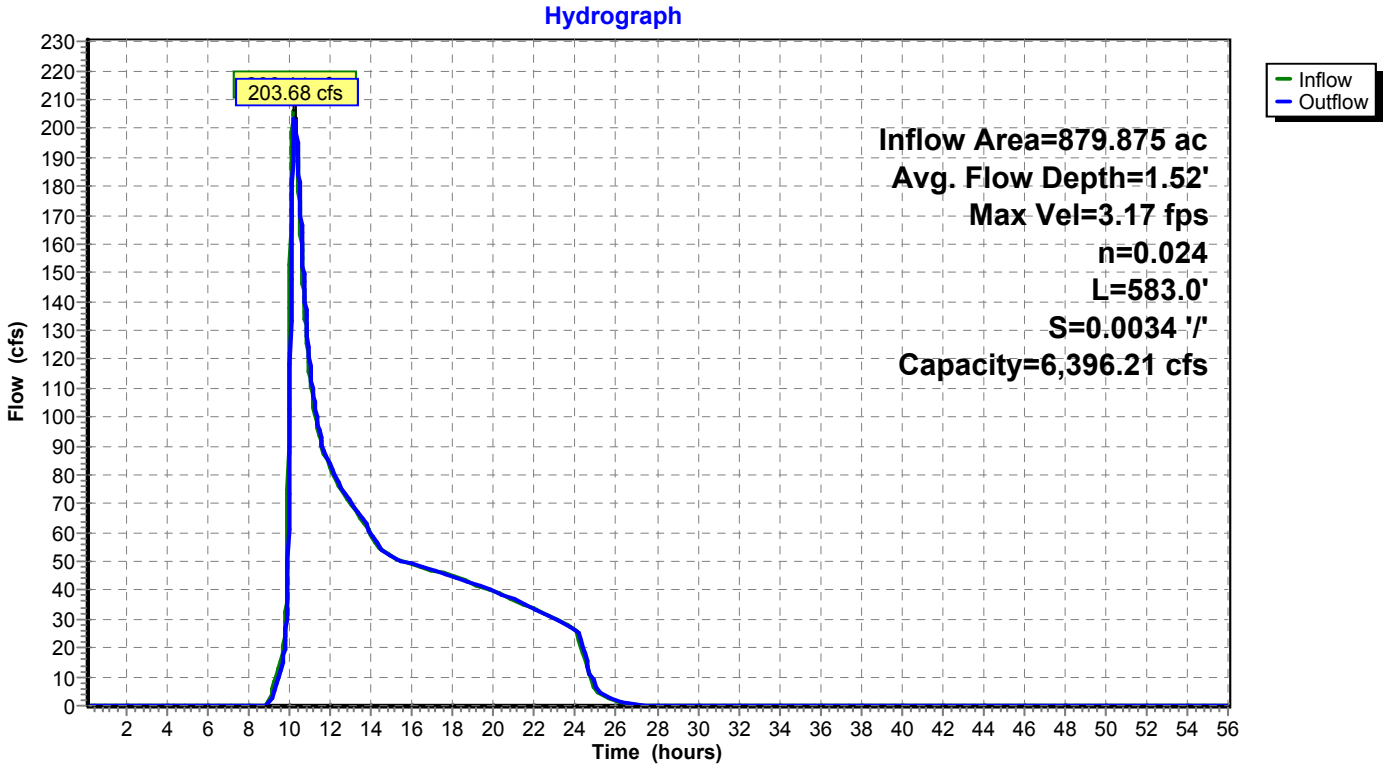
Custom stage-perimeter table, n= 0.024
102 Intermediate values determined by Multi-point interpolation
Length= 583.0' Slope= 0.0034 '/'
Inlet Invert= 833.00', Outlet Invert= 831.00'



‡

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
1.18	19.4	38.8	11,310	44.32
3.18	286.2	275.2	166,855	1,065.38
5.18	896.3	324.7	522,543	6,396.21

Reach 8R: Reach 1a



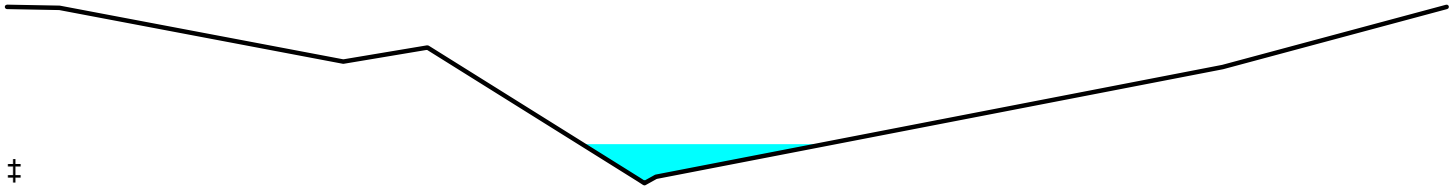
Summary for Reach 17R: Reach 1d

Inflow = 28.12 cfs @ 10.00 hrs, Volume= 0.605 af
Outflow = 19.66 cfs @ 10.10 hrs, Volume= 0.605 af, Atten= 30%, Lag= 5.8 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Max. Velocity= 1.99 fps, Min. Travel Time= 7.1 min
Avg. Velocity = 0.48 fps, Avg. Travel Time= 29.4 min

Peak Storage= 8,327 cf @ 10.10 hrs
Average Depth at Peak Storage= 0.43'
Bank-Full Depth= 1.96' Flow Area= 247.0 sf, Capacity= 1,276.84 cfs

Custom cross-section, Length= 841.0' Slope= 0.0110 '/' (102 Elevation Intervals)
Constant n= 0.027
Inlet Invert= 853.60', Outlet Invert= 844.31'



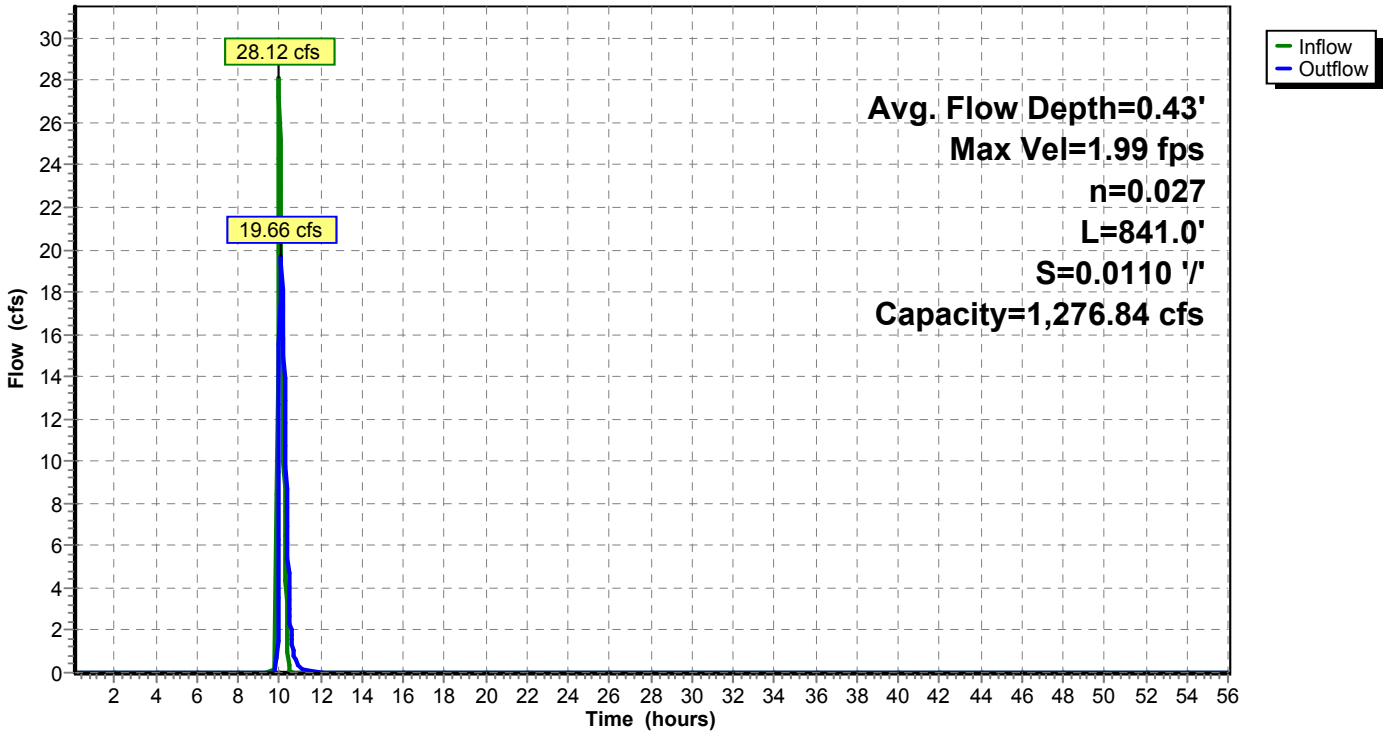
‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
8.56	851.18	0.00
19.24	851.17	0.01
76.81	850.57	0.61
93.88	850.73	0.45
136.80	849.26	1.92
137.90	849.22	1.96
140.29	849.29	1.89
255.27	850.51	0.67
300.75	851.18	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
0.04	0.0	2.5	42	0.02
0.07	0.2	4.4	128	0.09
1.29	97.3	155.0	81,870	413.13
1.35	106.8	160.8	89,836	469.56
1.51	136.4	208.8	114,697	594.12
1.95	244.1	280.9	205,277	1,285.78
1.96	247.0	292.2	207,687	1,276.84

Reach 17R: Reach 1d

Hydrograph



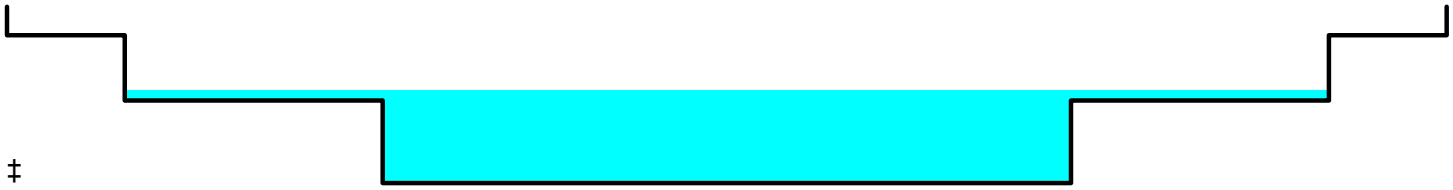
Summary for Reach 18R: Linne Road Grassed Chl

Inflow Area = 276.531 ac, 1.18% Impervious, Inflow Depth = 0.49" for 10 Year event
Inflow = 18.58 cfs @ 10.09 hrs, Volume= 11.335 af
Outflow = 17.83 cfs @ 10.22 hrs, Volume= 11.335 af, Atten= 4%, Lag= 7.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Max. Velocity= 2.51 fps, Min. Travel Time= 7.9 min
Avg. Velocity = 2.27 fps, Avg. Travel Time= 8.7 min

Peak Storage= 8,452 cf @ 10.22 hrs
Average Depth at Peak Storage= 0.59'
Bank-Full Depth= 1.11' Flow Area= 18.0 sf, Capacity= 66.25 cfs

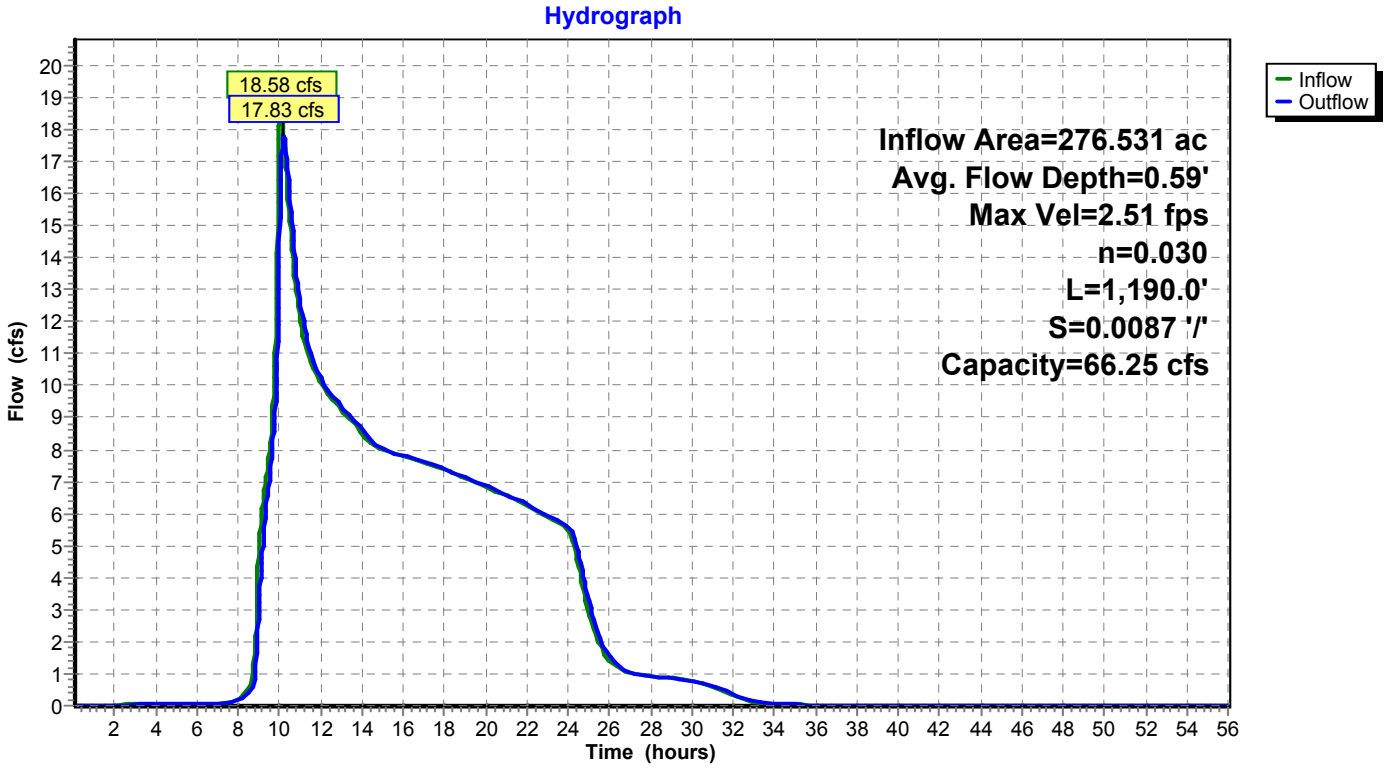
Custom stage-perimeter table, n= 0.030
100 Intermediate values determined by Multi-point interpolation
Length= 1,190.0' Slope= 0.0087 '/'
Inlet Invert= 841.60', Outlet Invert= 831.20'



‡

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
0.52	5.8	16.9	6,916	13.23
0.93	13.8	22.4	16,431	46.30
1.11	18.0	25.4	21,420	66.25

Reach 18R: Linne Road Grassed Chl



Summary for Pond 17P: Gran Cielo Dwy

[58] Hint: Peaked 0.38' above defined flood level

Inflow Area = 166.738 ac, 0.91% Impervious, Inflow Depth = 1.73" for 10 Year event
Inflow = 121.75 cfs @ 9.99 hrs, Volume= 24.054 af
Outflow = 121.40 cfs @ 10.00 hrs, Volume= 24.054 af, Atten= 0%, Lag= 0.6 min
Primary = 93.28 cfs @ 10.00 hrs, Volume= 23.449 af
Secondary = 0.00 cfs @ 0.10 hrs, Volume= 0.000 af
Tertiary = 28.12 cfs @ 10.00 hrs, Volume= 0.605 af

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Peak Elev= 854.84' @ 10.00 hrs Surf.Area= 7,749 sf Storage= 9,739 cf
Flood Elev= 854.46' Surf.Area= 6,947 sf Storage= 6,934 cf

Plug-Flow detention time= 1.9 min calculated for 24.045 af (100% of inflow)
Center-of-Mass det. time= 1.9 min (831.7 - 829.8)

Volume	Invert	Avail.Storage	Storage Description
#1	852.84'	22,270 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
852.84	0	0	0
853.14	2,586	388	388
854.14	6,275	4,431	4,818
855.14	8,376	7,326	12,144
856.14	11,876	10,126	22,270

Device	Routing	Invert	Outlet Devices
#1	Primary	852.84'	**30.0" Round Culvert X 6.00** L= 77.0' CMP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 852.84' / 851.76' S= 0.0140 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 4.91 sf
#2	Secondary	854.90'	**Special & User-Defined** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 Disch. (cfs) 0.000 0.010 0.200 0.710 1.580 2.700 4.030 5.690 7.620 9.790 12.320 15.140 18.190 21.460 24.930 28.580 32.420 36.420 40.580 44.900 49.360 53.970
#3	Tertiary	854.40'	**Special & User-Defined** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 2.20 2.30 2.40 2.50 2.60 Disch. (cfs) 0.000 0.080 3.470 10.790 21.890 36.810 55.720 78.890 106.600 138.580 174.620 214.630 258.590 306.440 358.240 413.470 471.810 533.060 597.050 663.650 732.760 804.270 878.100 954.180 1,032.440 1,112.810 1,195.240

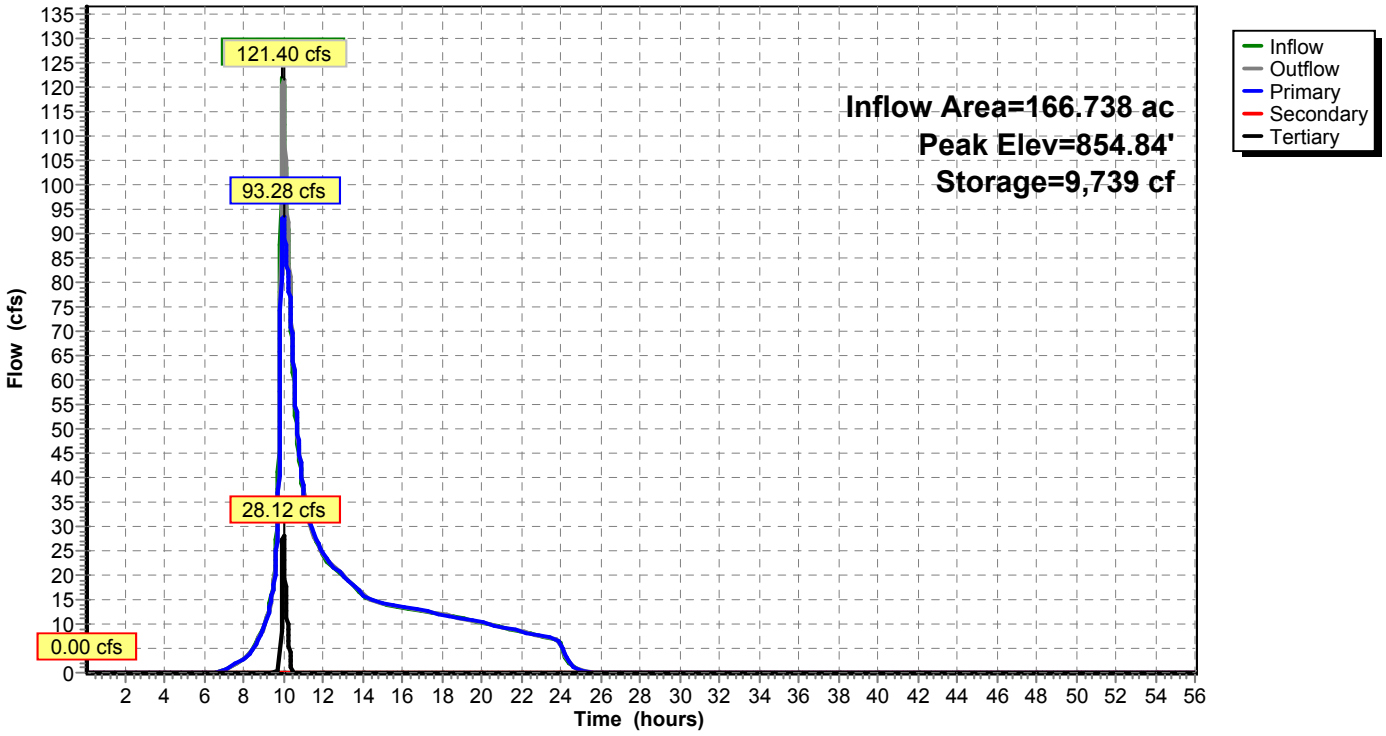
Primary OutFlow Max=93.28 cfs @ 10.00 hrs HW=854.84' TW=851.36' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 93.28 cfs @ 5.05 fps)

Secondary OutFlow Max=0.00 cfs @ 0.10 hrs HW=852.84' TW=844.56' (Dynamic Tailwater)
└**2=Special & User-Defined** (Controls 0.00 cfs)

Tertiary OutFlow Max=28.11 cfs @ 10.00 hrs HW=854.84' TW=853.97' (Dynamic Tailwater)
└**3=Special & User-Defined** (Custom Controls 28.11 cfs)

Pond 17P: Gran Cielo Dwy

Hydrograph



Summary for Pond 18P: GC-CkD1

[58] Hint: Peaked 1.23' above defined flood level

Inflow Area = 240.622 ac, 1.05% Impervious, Inflow Depth = 1.74" for 10 Year event
Inflow = 152.23 cfs @ 9.99 hrs, Volume= 34.874 af
Outflow = 145.98 cfs @ 10.05 hrs, Volume= 34.811 af, Atten= 4%, Lag= 3.5 min
Primary = 1.04 cfs @ 8.63 hrs, Volume= 1.606 af
Secondary = 84.29 cfs @ 10.05 hrs, Volume= 27.429 af
Tertiary = 60.65 cfs @ 10.05 hrs, Volume= 5.776 af

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Peak Elev= 851.40' @ 10.05 hrs Surf.Area= 25,788 sf Storage= 51,119 cf
Flood Elev= 850.17' Surf.Area= 18,994 sf Storage= 23,481 cf

Plug-Flow detention time= 18.6 min calculated for 34.811 af (100% of inflow)
Center-of-Mass det. time= 17.2 min (849.7 - 832.5)

Volume	Invert	Avail.Storage	Storage Description
#1	844.56'	67,617 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
844.56	10	0	0
845.00	200	46	46
846.00	600	400	446
847.00	1,500	1,050	1,496
848.00	2,166	1,833	3,329
849.00	7,688	4,927	8,256
850.00	16,694	12,191	20,447
850.20	19,400	3,609	24,057
852.00	29,000	43,560	67,617

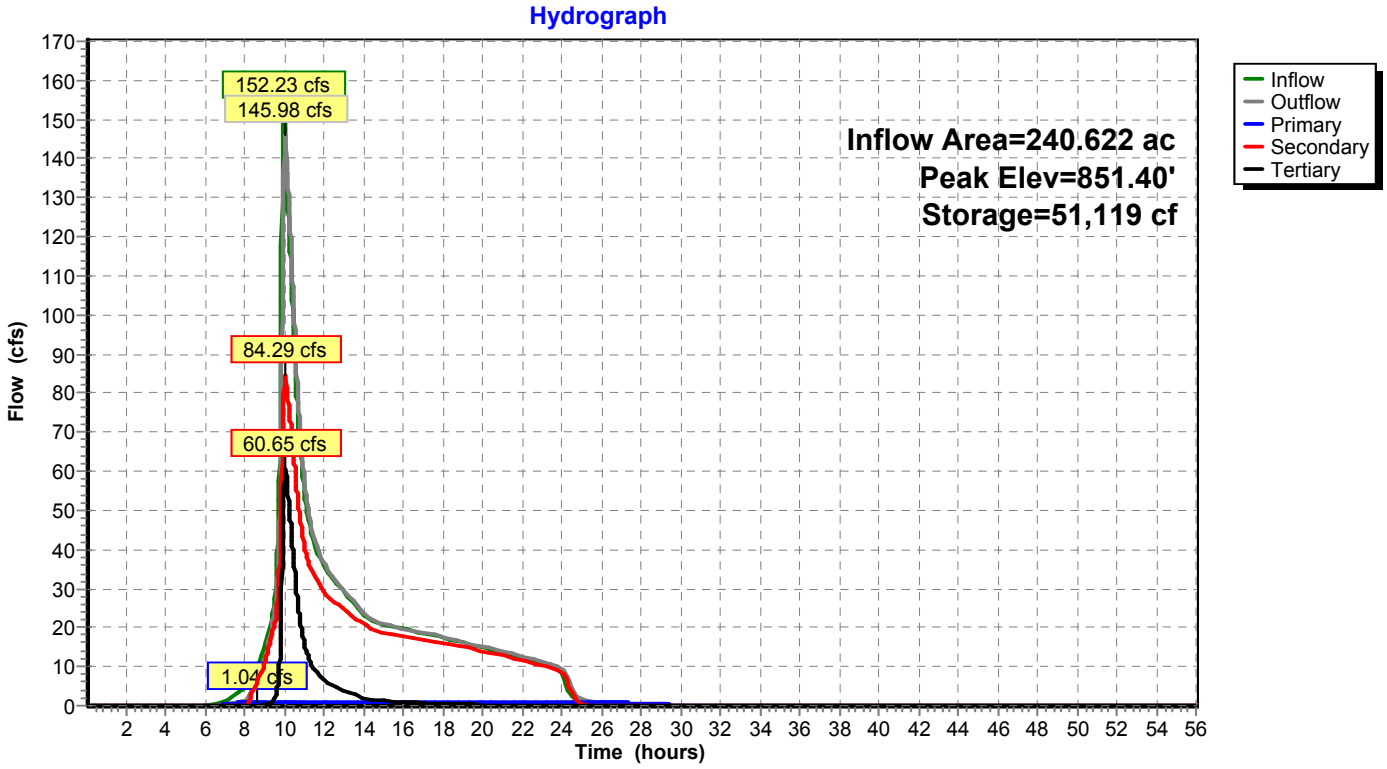
Device	Routing	Invert	Outlet Devices
#1	Primary	847.69'	**6.0" Round Culvert** L= 26.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 847.69' / 847.67' S= 0.0008 '/' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Secondary	849.50'	**9.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59
#3	Tertiary	850.00'	**Special & User-Defined (CkD1-S)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 Disch. (cfs) 0.000 0.030 0.560 1.900 4.120 7.220 11.180 15.770 20.900 26.530 32.600 39.090 45.970 53.220 60.820 68.750 77.000 85.570 94.430 103.580 113.010

Primary OutFlow Max=1.03 cfs @ 8.63 hrs HW=849.88' TW=847.98' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 1.03 cfs @ 5.24 fps)

Secondary OutFlow Max=84.14 cfs @ 10.05 hrs HW=851.40' TW=849.58' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 84.14 cfs @ 4.93 fps)

Tertiary OutFlow Max=60.59 cfs @ 10.05 hrs HW=851.40' TW=0.00' (Dynamic Tailwater)
↑—**3=Special & User-Defined (CkD1-S)** (Custom Controls 60.59 cfs)

Pond 18P: GC-CkD1



Summary for Pond 19P: GC-CkD2

[58] Hint: Peaked 0.95' above defined flood level

Inflow Area = 260.311 ac, 0.97% Impervious, Inflow Depth = 1.45" for 10 Year event
Inflow = 98.58 cfs @ 10.03 hrs, Volume= 31.505 af
Outflow = 95.08 cfs @ 10.11 hrs, Volume= 31.504 af, Atten= 4%, Lag= 4.7 min
Primary = 1.34 cfs @ 10.11 hrs, Volume= 2.070 af
Secondary = 62.45 cfs @ 10.11 hrs, Volume= 26.745 af
Tertiary = 31.29 cfs @ 10.11 hrs, Volume= 2.688 af

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Peak Elev= 849.60' @ 10.11 hrs Surf.Area= 29,759 sf Storage= 32,312 cf
Flood Elev= 848.65' Surf.Area= 11,850 sf Storage= 14,787 cf

Plug-Flow detention time= 13.6 min calculated for 31.492 af (100% of inflow)
Center-of-Mass det. time= 13.6 min (895.2 - 881.6)

Volume	Invert	Avail.Storage	Storage Description
#1	846.00'	46,430 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
846.00	267	0	0
847.00	4,055	2,161	2,161
848.00	8,178	6,117	8,278
849.00	13,828	11,003	19,281
850.00	40,470	27,149	46,430

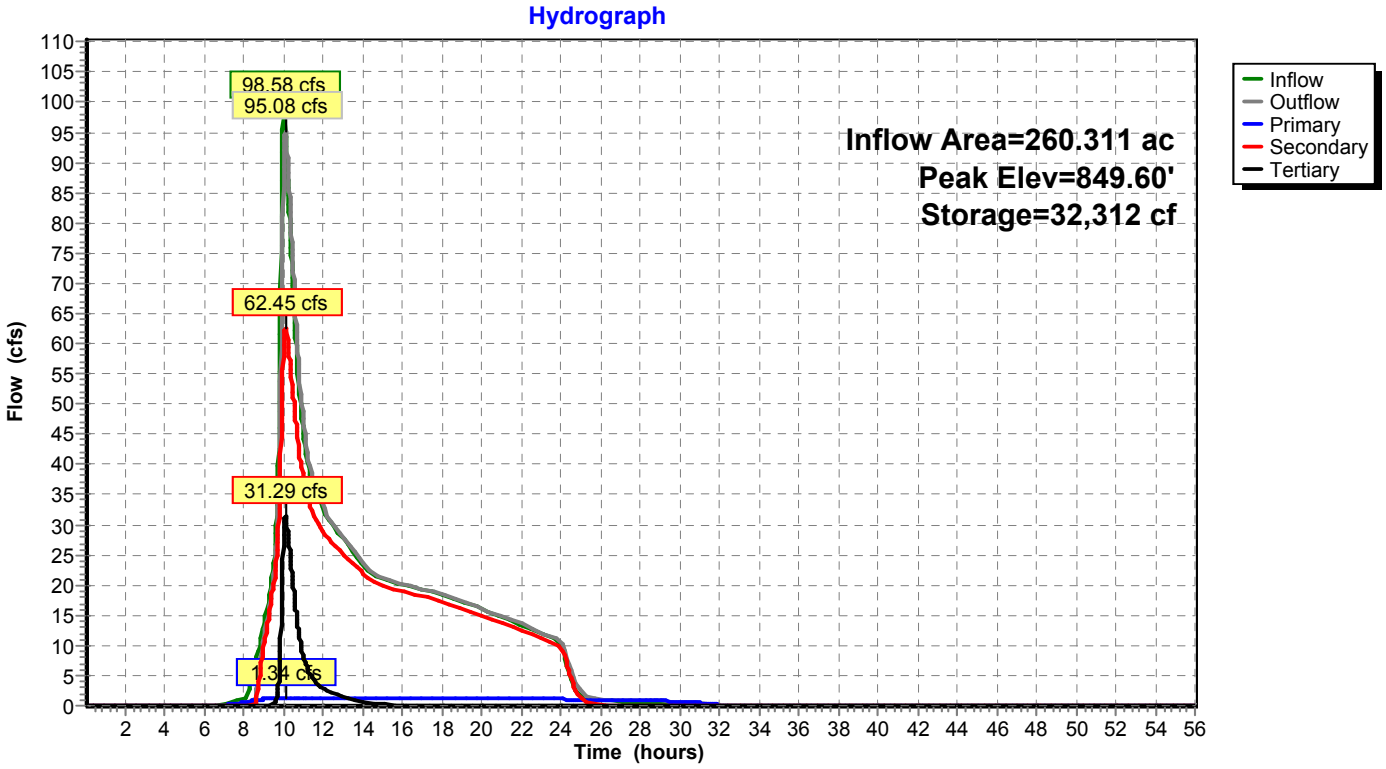
Device	Routing	Invert	Outlet Devices
#1	Primary	846.12'	**6.0" Round Culvert** L= 26.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 846.12' / 845.98' S= 0.0054 '/' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Tertiary	848.70'	**Special & User-Defined (CkD2-S)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 Disch. (cfs) 0.000 0.130 0.970 2.640 5.120 8.550 13.010 18.440 24.620 31.430 38.830 46.770 55.210 64.120
#3	Secondary	847.80'	**Special & User-Defined (CkD2-W)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 2.20 Disch. (cfs) 0.000 0.020 0.480 1.430 2.780 4.430 6.490 8.950 12.010 15.510 19.390 23.590 28.100 32.980 38.270 43.910 49.850 56.080 62.580 69.340 76.350 83.590 91.070

Primary OutFlow Max=1.34 cfs @ 10.11 hrs HW=849.60' TW=845.99' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.34 cfs @ 6.83 fps)

Secondary OutFlow Max=62.42 cfs @ 10.11 hrs HW=849.60' TW=845.99' (Dynamic Tailwater)
└**3=Special & User-Defined (CkD2-W)** (Custom Controls 62.42 cfs)

Tertiary OutFlow Max=31.26 cfs @ 10.11 hrs HW=849.60' TW=0.00' (Dynamic Tailwater)
└**2=Special & User-Defined (CkD2-S)** (Custom Controls 31.26 cfs)

Pond 19P: GC-CkD2



Summary for Pond 20P: GC-CkD3

[58] Hint: Peaked 0.98' above defined flood level

Inflow Area = 274.094 ac, 0.92% Impervious, Inflow Depth = 1.33" for 10 Year event
Inflow = 71.09 cfs @ 10.08 hrs, Volume= 30.392 af
Outflow = 70.75 cfs @ 10.11 hrs, Volume= 30.381 af, Atten= 0%, Lag= 2.1 min
Primary = 6.49 cfs @ 10.11 hrs, Volume= 6.543 af
Secondary = 11.02 cfs @ 10.11 hrs, Volume= 4.518 af
Tertiary = 53.24 cfs @ 10.11 hrs, Volume= 19.319 af

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Peak Elev= 846.00' @ 10.11 hrs Surf.Area= 14,997 sf Storage= 16,178 cf
Flood Elev= 845.02' Surf.Area= 8,229 sf Storage= 4,852 cf

Plug-Flow detention time= 8.9 min calculated for 30.381 af (100% of inflow)
Center-of-Mass det. time= 8.3 min (922.7 - 914.4)

Volume	Invert	Avail.Storage	Storage Description
#1	844.00'	24,632 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
844.00	1,288	0	0
845.00	8,090	4,689	4,689
846.50	18,500	19,943	24,632

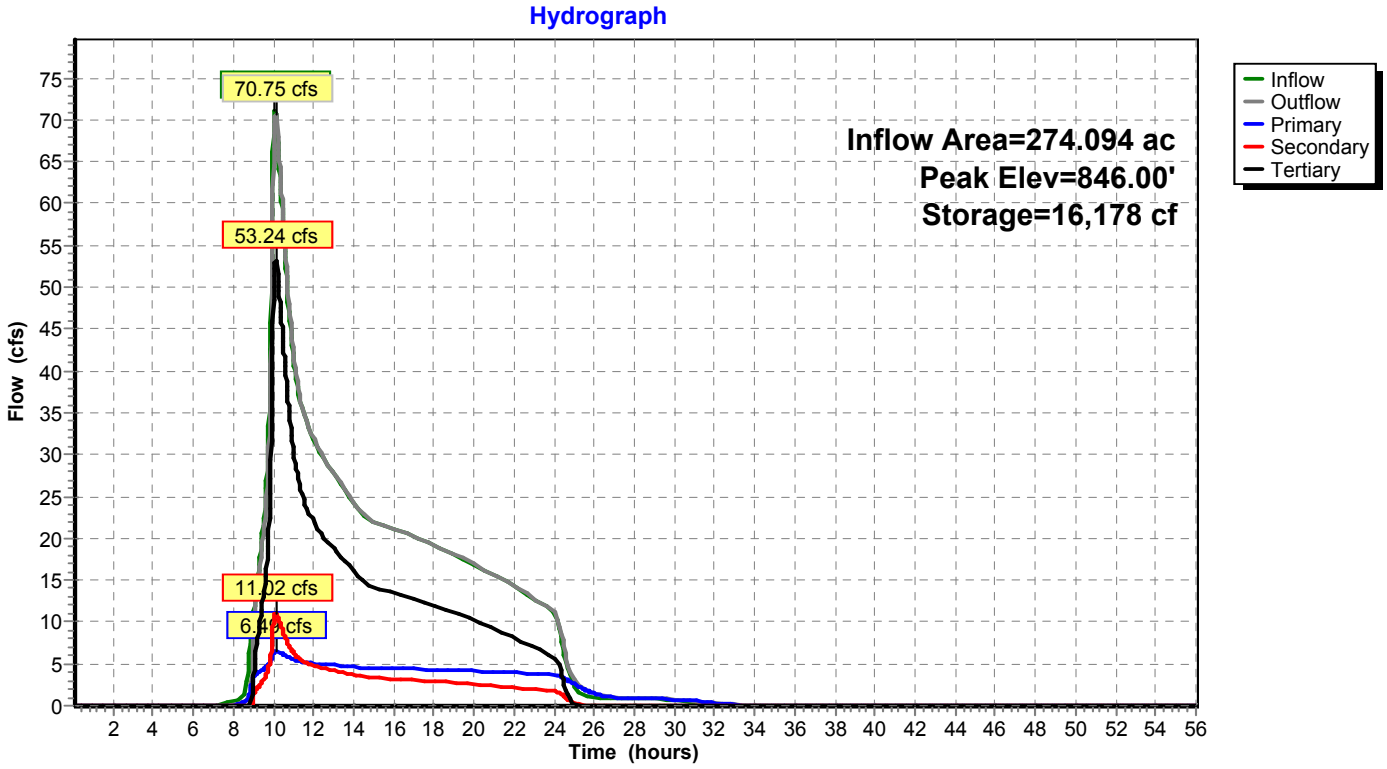
Device	Routing	Invert	Outlet Devices
#1	Primary	844.22'	**18.0" Round Culvert** L= 26.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 844.22' / 843.98' S= 0.0092 '/' Cc= 0.900 n= 0.021 Corrugated metal, Flow Area= 1.77 sf
#2	Secondary	845.00'	**Special & User-Defined (CkD3-W)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 Disch. (cfs) 0.000 0.050 0.390 0.970 1.710 2.600 3.780 5.170 6.720 8.570 11.140 14.290 17.880 21.830 26.120 30.880 36.030 41.520 47.330 53.420 59.790
#3	Tertiary	845.10'	**Special & User-Defined (CkD3-S)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 Disch. (cfs) 0.000 0.050 1.930 5.420 10.370 16.490 23.960 32.580 42.550 53.770 66.380 80.510 96.280 113.770 132.840 153.630 175.910 199.510 224.310 250.260

Primary OutFlow Max=6.49 cfs @ 10.11 hrs HW=846.00' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 6.49 cfs @ 3.91 fps)

Secondary OutFlow Max=11.01 cfs @ 10.11 hrs HW=846.00' TW=0.00' (Dynamic Tailwater)
↑—**2=Special & User-Defined (CkD3-W)** (Custom Controls 11.01 cfs)

Tertiary OutFlow Max=53.22 cfs @ 10.11 hrs HW=846.00' TW=0.00' (Dynamic Tailwater)
↑—**3=Special & User-Defined (CkD3-S)** (Custom Controls 53.22 cfs)

Pond 20P: GC-CkD3

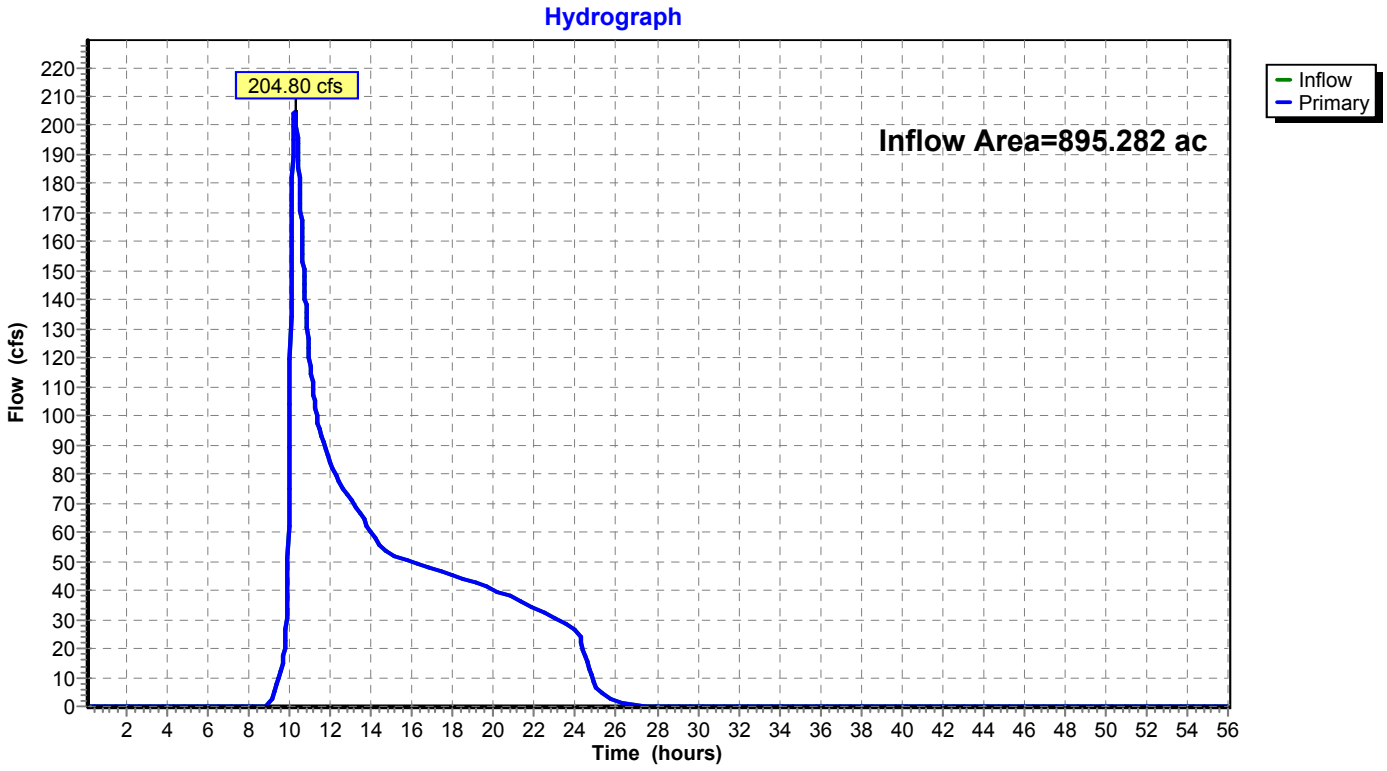


Summary for Link 3a (1,2+3)-Ex: Comb Un-dev Ck Flow

Inflow Area = 895.282 ac, 0.06% Impervious, Inflow Depth = 0.96" for 10 Year event
Inflow = 204.80 cfs @ 10.25 hrs, Volume= 71.447 af
Primary = 204.80 cfs @ 10.25 hrs, Volume= 71.447 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 3a (1,2+3)-Ex: Comb Un-dev Ck Flow

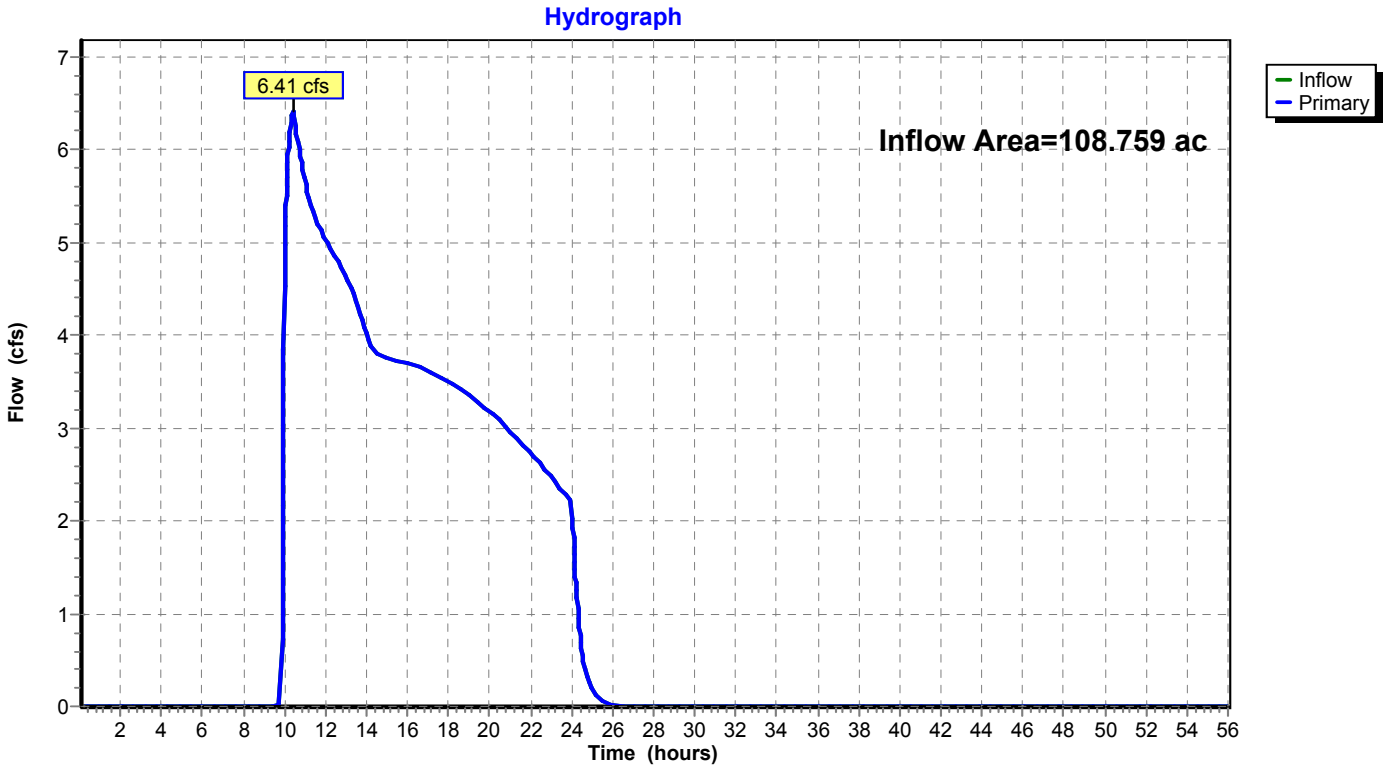


Summary for Link 5L: Outlet To Tract #1632 Ex. 36" SD

Inflow Area = 108.759 ac, 0.00% Impervious, Inflow Depth = 0.49" for 10 Year event
Inflow = 6.41 cfs @ 10.41 hrs, Volume= 4.467 af
Primary = 6.41 cfs @ 10.41 hrs, Volume= 4.467 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 5L: Outlet To Tract #1632 Ex. 36" SD

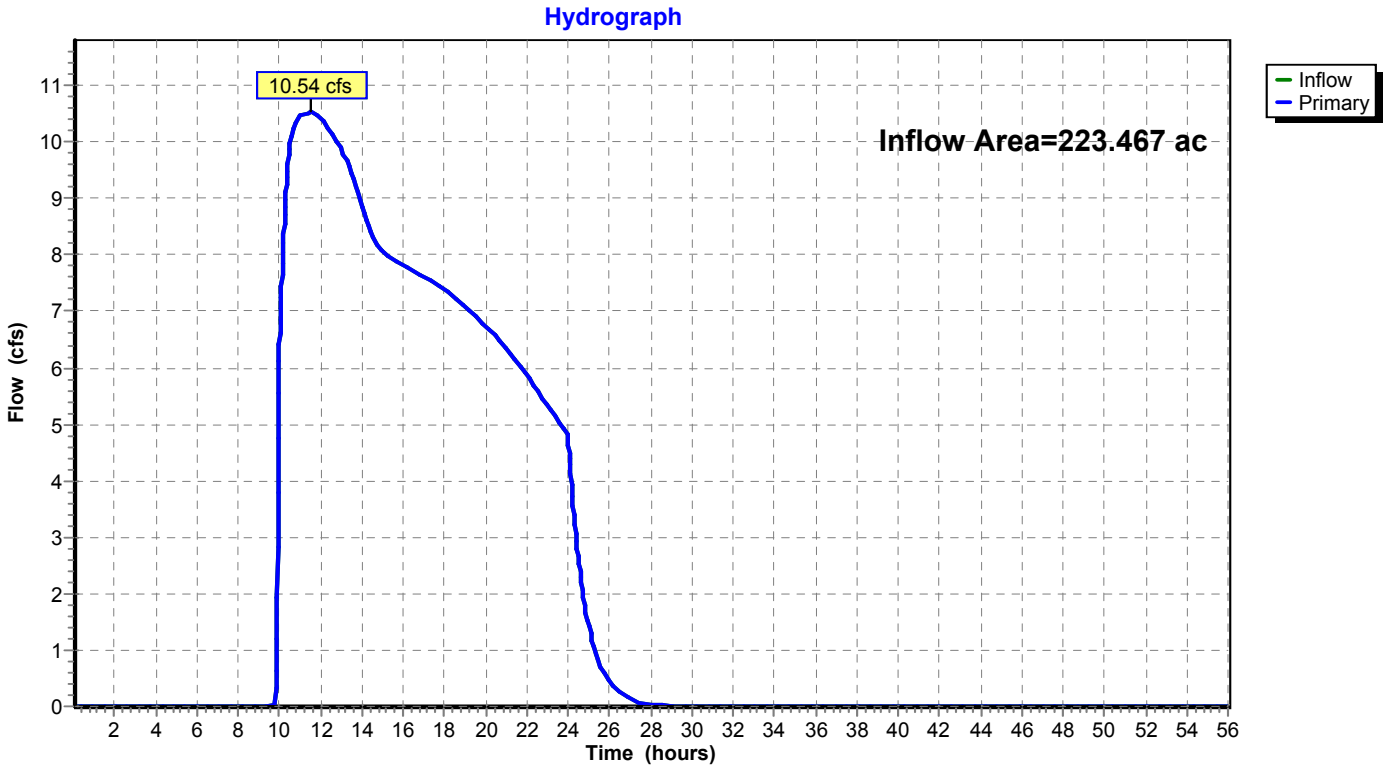


Summary for Link 6L: To Existing Meadowlark Road

Inflow Area = 223.467 ac, 0.00% Impervious, Inflow Depth = 0.50" for 10 Year event
Inflow = 10.54 cfs @ 11.55 hrs, Volume= 9.341 af
Primary = 10.54 cfs @ 11.55 hrs, Volume= 9.341 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 6L: To Existing Meadowlark Road

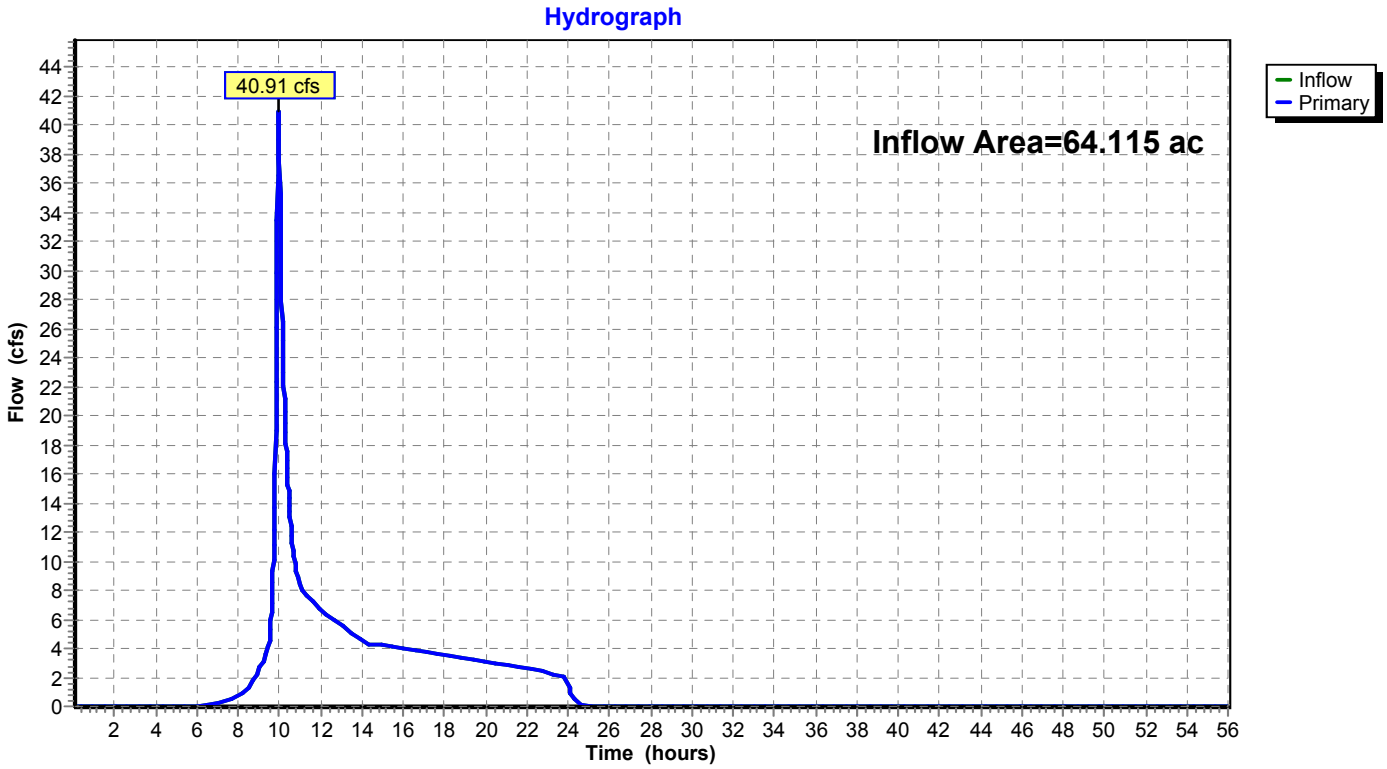


Summary for Link 7L: DMA 13

Inflow Area = 64.115 ac, 0.00% Impervious, Inflow Depth = 1.25" for 10 Year event
Inflow = 40.91 cfs @ 9.97 hrs, Volume= 6.689 af
Primary = 40.91 cfs @ 9.97 hrs, Volume= 6.689 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 7L: DMA 13

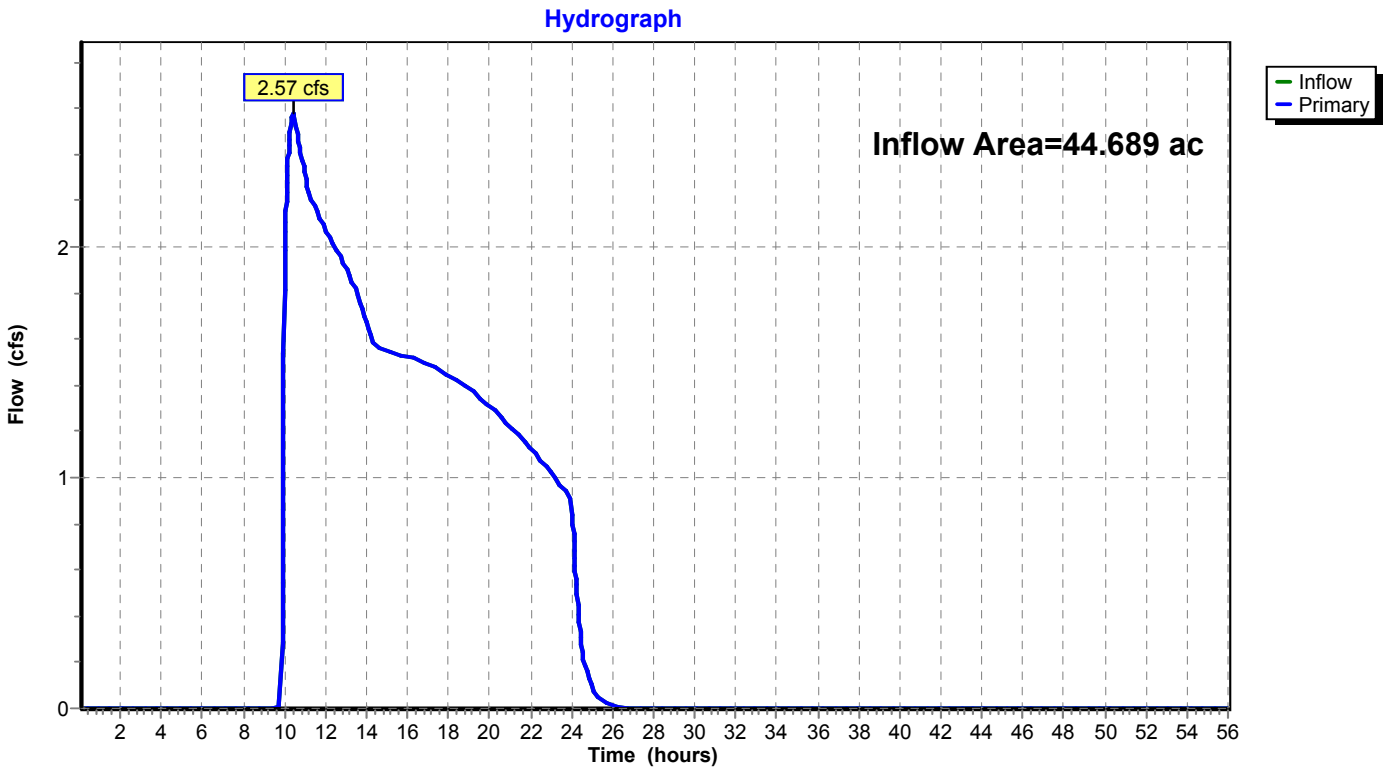


Summary for Link 8L: DMA 8

Inflow Area = 44.689 ac, 0.00% Impervious, Inflow Depth = 0.49" for 10 Year event
Inflow = 2.57 cfs @ 10.42 hrs, Volume= 1.836 af
Primary = 2.57 cfs @ 10.42 hrs, Volume= 1.836 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 8L: DMA 8

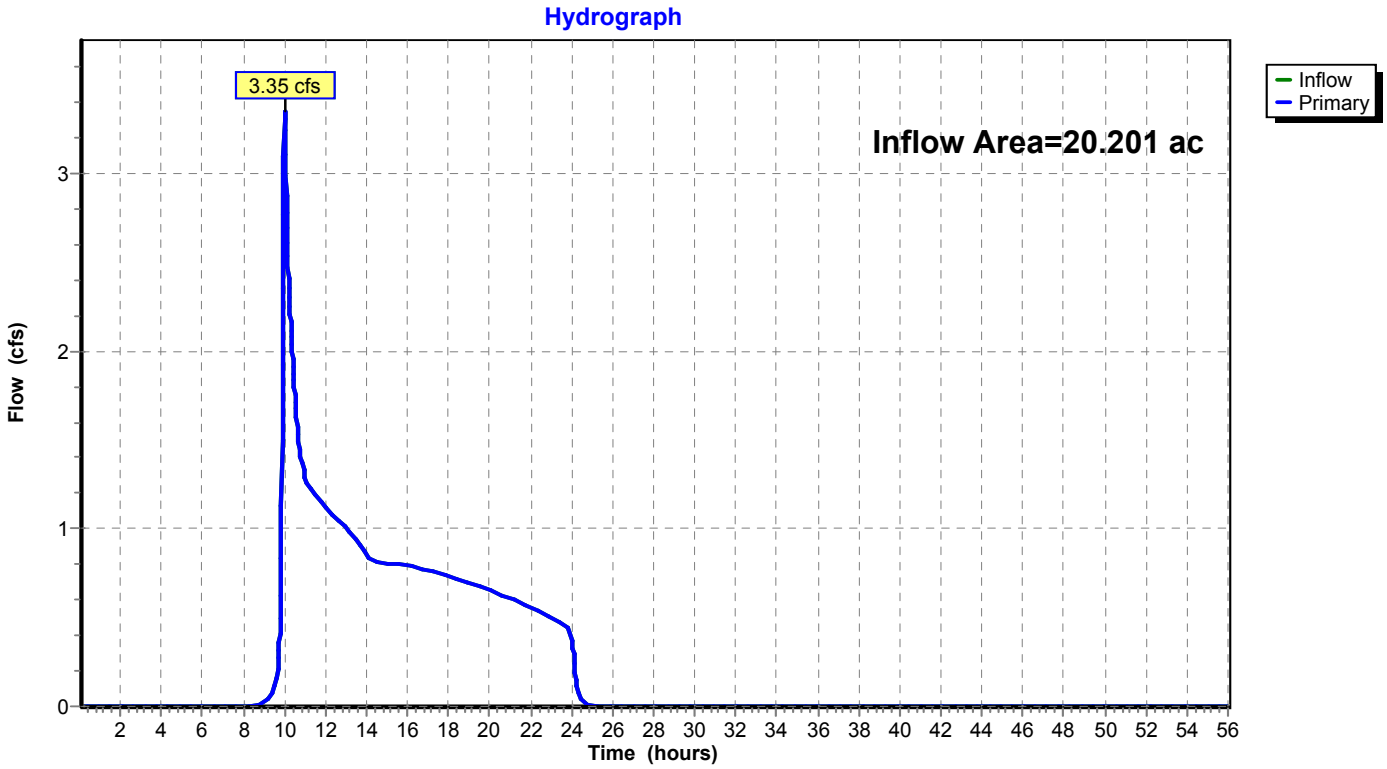


Summary for Link 9L: DMA 12

Inflow Area = 20.201 ac, 0.00% Impervious, Inflow Depth = 0.61" for 10 Year event
Inflow = 3.35 cfs @ 10.00 hrs, Volume= 1.028 af
Primary = 3.35 cfs @ 10.00 hrs, Volume= 1.028 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 9L: DMA 12

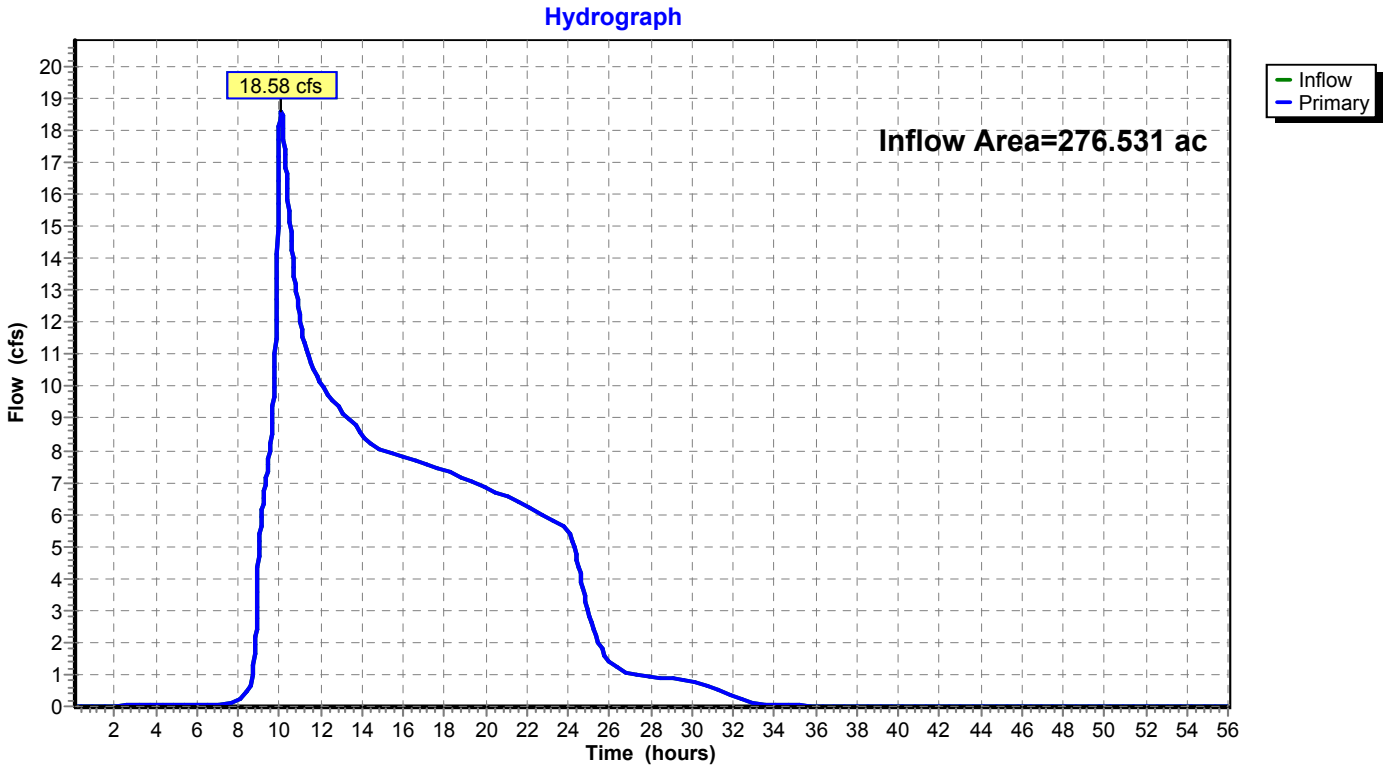


Summary for Link 10L: To Linne Road Channel

Inflow Area = 276.531 ac, 1.18% Impervious, Inflow Depth = 0.49" for 10 Year event
Inflow = 18.58 cfs @ 10.09 hrs, Volume= 11.335 af
Primary = 18.58 cfs @ 10.09 hrs, Volume= 11.335 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 10L: To Linne Road Channel

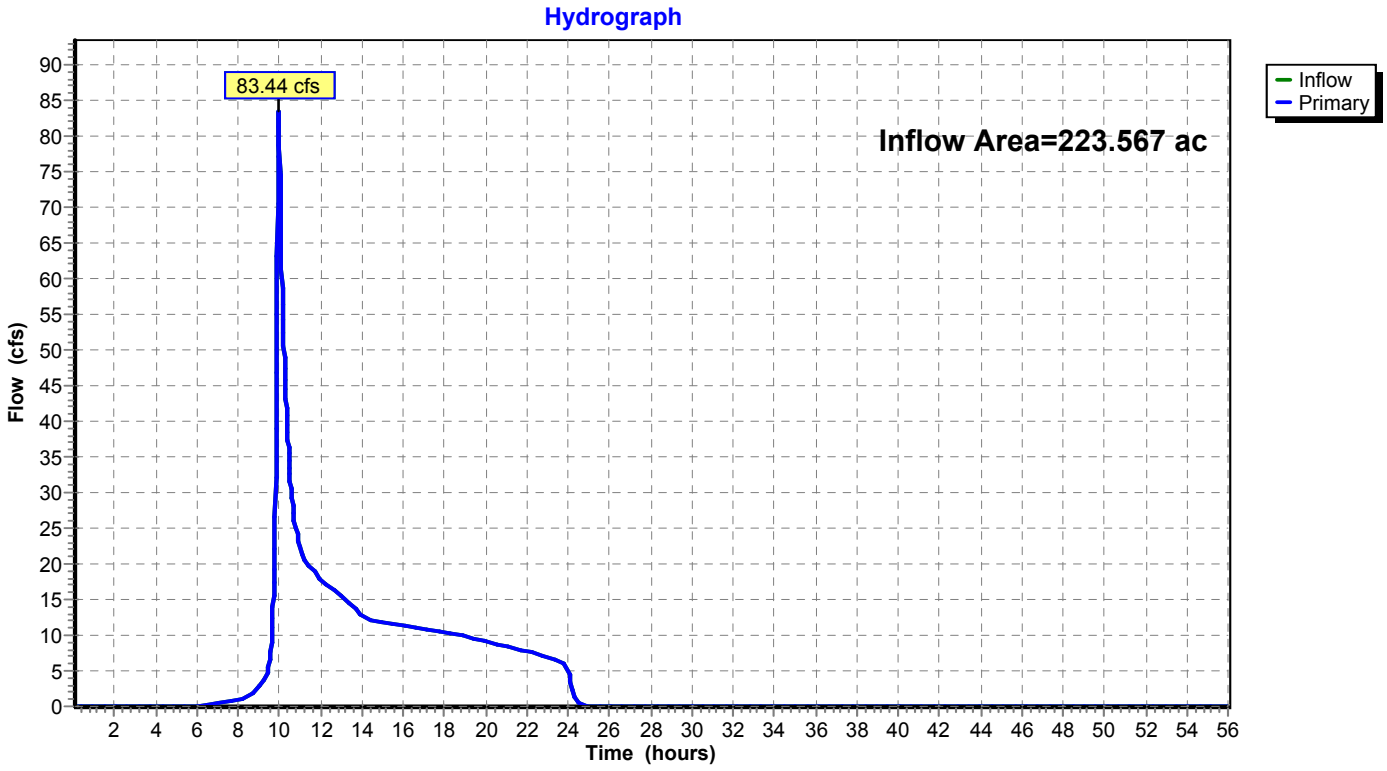


Summary for Link 11L: To Fontana Road SD

Inflow Area = 223.567 ac, 0.53% Impervious, Inflow Depth = 0.92" for 10 Year event
Inflow = 83.44 cfs @ 9.98 hrs, Volume= 17.116 af
Primary = 83.44 cfs @ 9.98 hrs, Volume= 17.116 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 11L: To Fontana Road SD

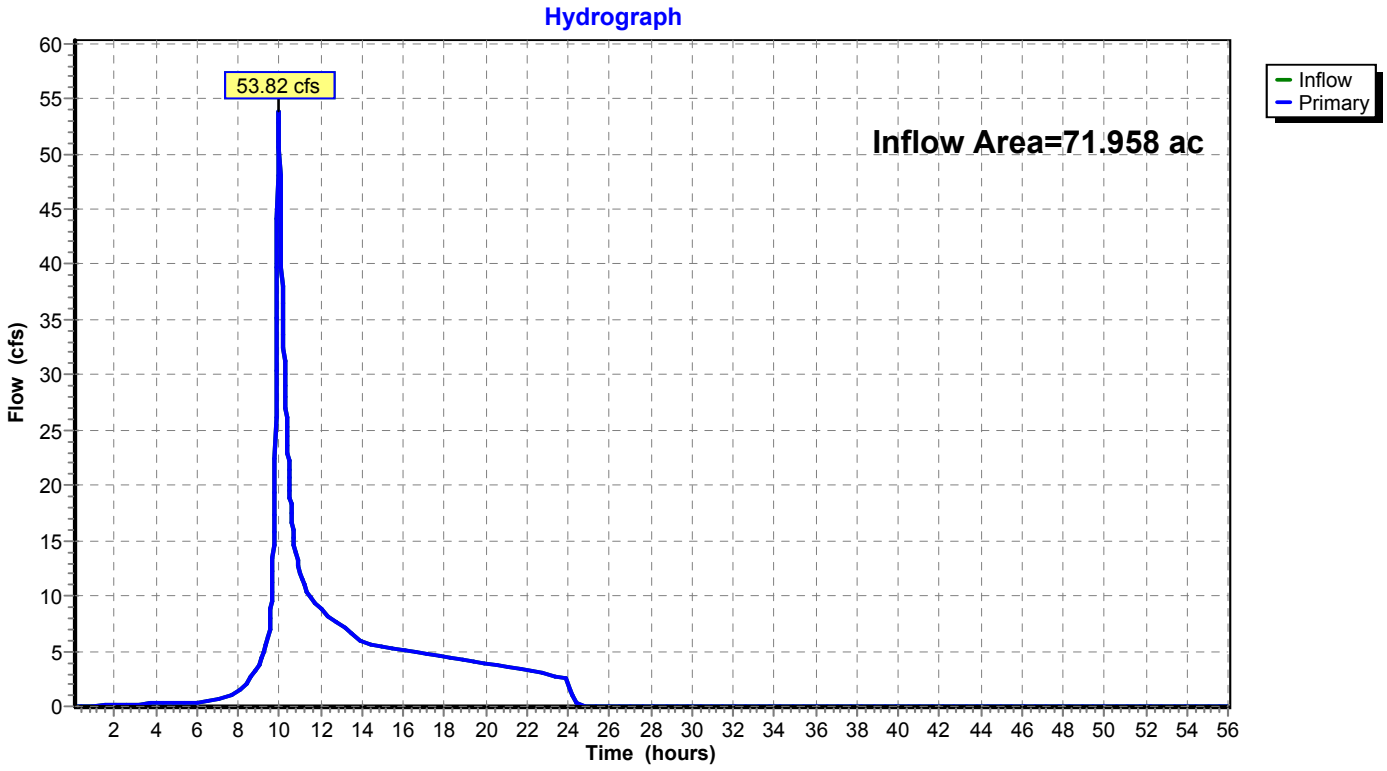


Summary for Link 15L: Sherwood/Niblick LP Xing

Inflow Area = 71.958 ac, 6.18% Impervious, Inflow Depth = 1.52" for 10 Year event
Inflow = 53.82 cfs @ 9.98 hrs, Volume= 9.123 af
Primary = 53.82 cfs @ 9.98 hrs, Volume= 9.123 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 15L: Sherwood/Niblick LP Xing

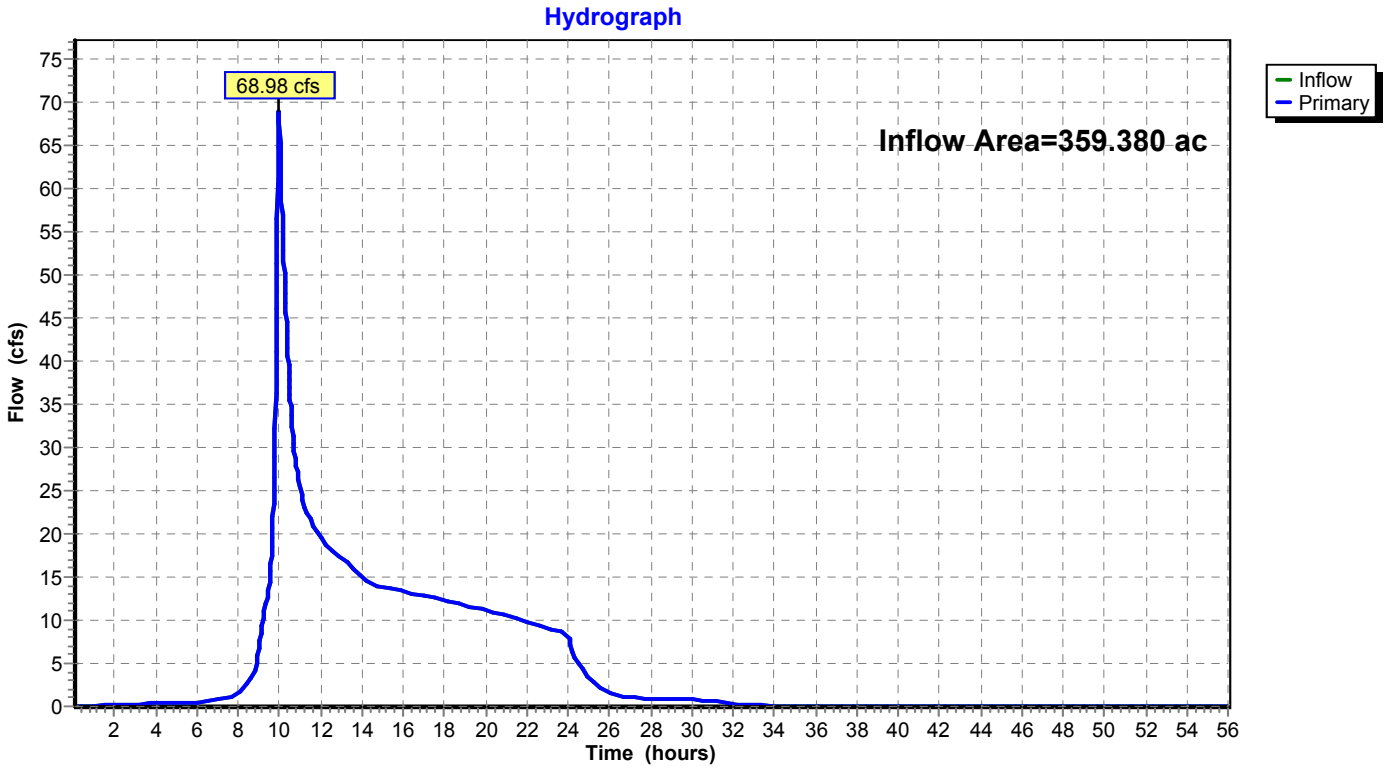


Summary for Link 16L: Airport & Linne Road SD

Inflow Area = 359.380 ac, 2.33% Impervious, Inflow Depth = 0.70" for 10 Year event
Inflow = 68.98 cfs @ 9.99 hrs, Volume= 21.064 af
Primary = 68.98 cfs @ 9.99 hrs, Volume= 21.064 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 16L: Airport & Linne Road SD



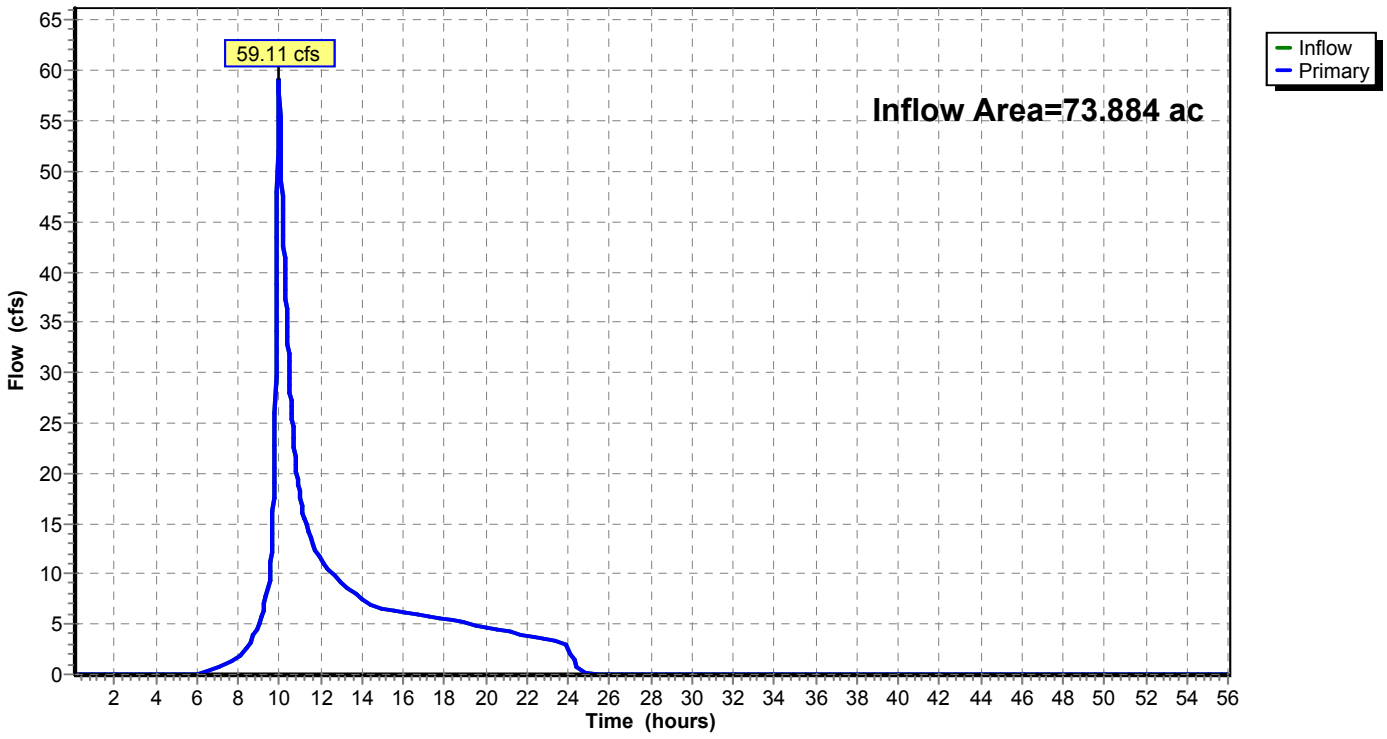
Summary for Link 19L: 14c(0+1)-Ex

Inflow Area = 73.884 ac, 1.37% Impervious, Inflow Depth = 1.86" for 10 Year event
Inflow = 59.11 cfs @ 9.99 hrs, Volume= 11.425 af
Primary = 59.11 cfs @ 9.99 hrs, Volume= 11.425 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 19L: 14c(0+1)-Ex

Hydrograph

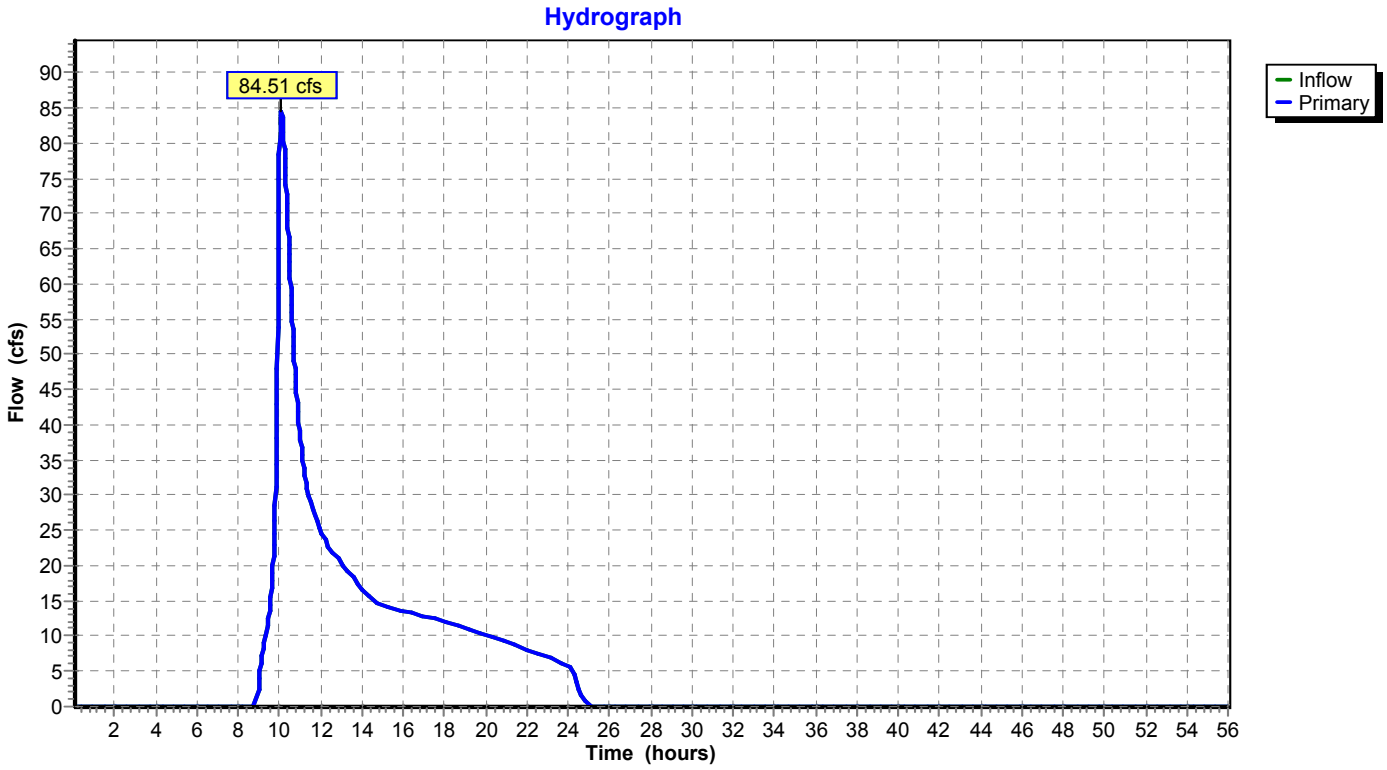


Summary for Link 22L: Linne Rd Overtopping Ex.Flow #2and#3

Inflow = 84.51 cfs @ 10.11 hrs, Volume= 22.008 af
Primary = 84.51 cfs @ 10.11 hrs, Volume= 22.008 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 22L: Linne Rd Overtopping Ex.Flow #2and#3

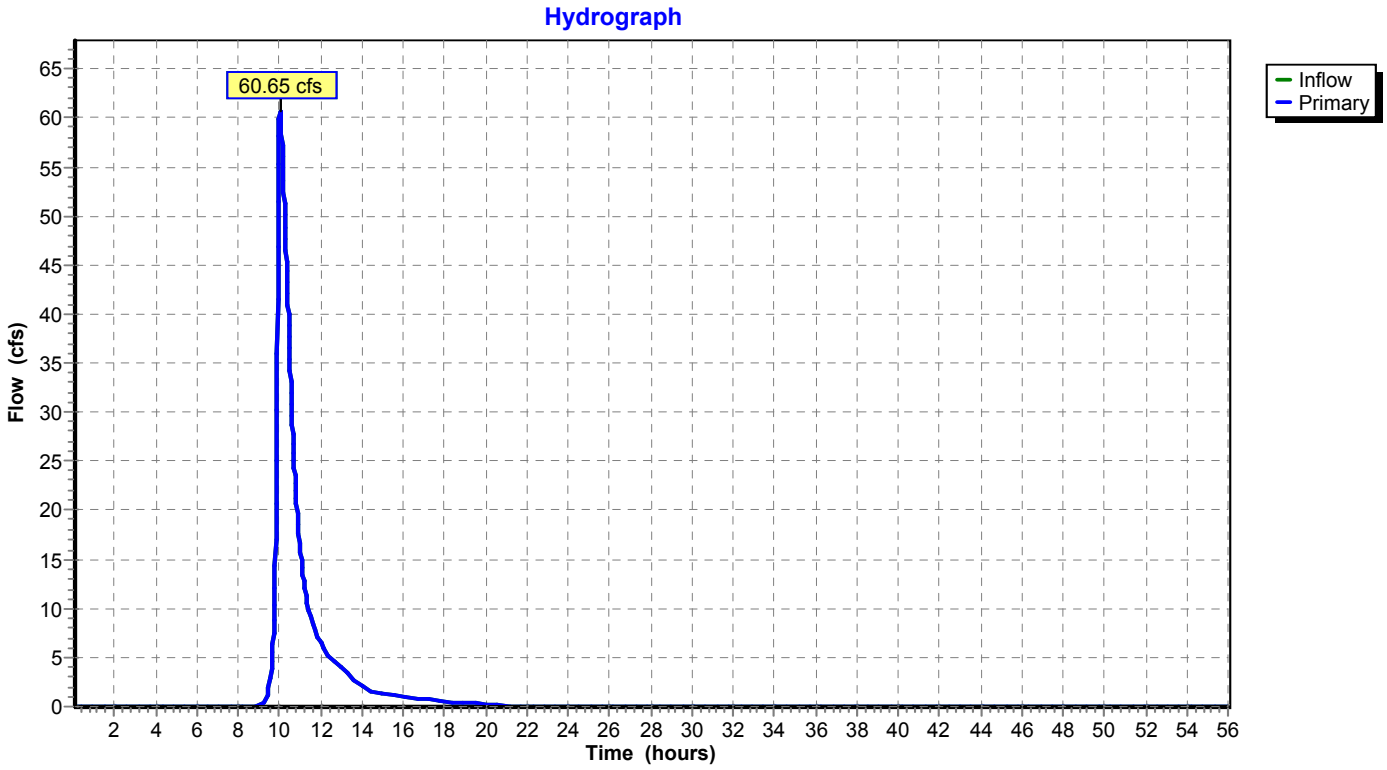


Summary for Link 23L: Linne Rd Overtop #1

Inflow = 60.65 cfs @ 10.05 hrs, Volume= 5.776 af
Primary = 60.65 cfs @ 10.05 hrs, Volume= 5.776 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 23L: Linne Rd Overtop #1



Time span=0.10-56.00 hrs, dt=0.02 hrs, 2796 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=11.244 ac 0.00% Impervious Runoff Depth=0.76"
Tc=10.0 min CN=58/0 Runoff=2.50 cfs 0.710 af

Subcatchment2: Subcat 2 Runoff Area=14.644 ac 0.00% Impervious Runoff Depth=0.76"
Tc=11.5 min CN=58/0 Runoff=3.01 cfs 0.925 af

Subcatchment3: Subcat 3 Runoff Area=21.500 ac 0.02% Impervious Runoff Depth=1.03"
Tc=16.9 min CN=63/98 Runoff=6.90 cfs 1.844 af

Subcatchment3a{(1)}-Ex: Subcat 3a{(1)}-Ex Runoff Area=4.164 ac 0.00% Impervious Runoff Depth=0.76"
Tc=10.0 min CN=58/0 Runoff=0.93 cfs 0.263 af

Subcatchment3a{(2)}-Ex: Subcat 3a{(2)}-Ex Runoff Area=7.900 ac 0.00% Impervious Runoff Depth=0.92"
Tc=10.0 min CN=61/0 Runoff=2.69 cfs 0.603 af

Subcatchment3a{(3)}-Ex: Subcat 3a{(3)}-Ex Runoff Area=6.004 ac 0.00% Impervious Runoff Depth=1.40"
Tc=10.0 min CN=69/0 Runoff=4.24 cfs 0.700 af

Subcatchment3b-Ex: Subcat 3b-Ex Runoff Area=757.079 ac 0.00% Impervious Runoff Depth=0.86"
Tc=45.5 min CN=60/98 Runoff=90.76 cfs 54.384 af

Subcatchment4: Subcat 4 Runoff Area=38.712 ac 1.43% Impervious Runoff Depth=0.80"
Tc=14.2 min CN=58/98 Runoff=7.97 cfs 2.592 af

Subcatchment5: Subcat 5 Runoff Area=32.700 ac 0.00% Impervious Runoff Depth=0.76"
Tc=21.2 min CN=58/0 Runoff=4.51 cfs 2.065 af

Subcatchment6: Subcat 6 Runoff Area=34.035 ac 0.00% Impervious Runoff Depth=0.86"
Tc=20.1 min CN=60/0 Runoff=6.69 cfs 2.445 af

Subcatchment7: Subcat 7 Runoff Area=31.369 ac 0.00% Impervious Runoff Depth=0.76"
Tc=23.2 min CN=58/0 Runoff=4.06 cfs 1.981 af

Subcatchment8: Subcat 8 Runoff Area=30.487 ac 0.00% Impervious Runoff Depth=0.76"
Tc=28.8 min CN=58/0 Runoff=3.54 cfs 1.925 af

Subcatchment8a-Ex: Subcat 8a-Ex Runoff Area=14.202 ac 0.00% Impervious Runoff Depth=0.76"
Tc=16.5 min CN=58/0 Runoff=2.33 cfs 0.897 af

Subcatchment9: Subcat 9 Runoff Area=11.446 ac 0.00% Impervious Runoff Depth=0.97"
Tc=22.3 min CN=62/0 Runoff=2.73 cfs 0.927 af

Subcatchment9a-Ex: Subcat 9a-Ex Runoff Area=212.022 ac 0.00% Impervious Runoff Depth=0.76"
Flow Length=4,909' Tc=51.3 min CN=58/0 Runoff=18.56 cfs 13.388 af

Subcatchment10: Subcat 10 Runoff Area=30.685 ac 3.88% Impervious Runoff Depth=0.93"
Tc=22.6 min CN=59/98 Runoff=6.47 cfs 2.382 af

Subcatchment10a-Ex: Subcat 10a-Ex Runoff Area=94.105 ac 0.00% Impervious Runoff Depth=1.27"
Tc=11.0 min CN=67/0 Runoff=54.90 cfs 9.957 af

Subcatchment11: Subcat 11 Runoff Area=14.461 ac 0.00% Impervious Runoff Depth=0.81"
Tc=11.1 min CN=59/0 Runoff=3.56 cfs 0.975 af

Subcatchment12: Subcat 12 Runoff Area=17.572 ac 0.00% Impervious Runoff Depth=0.81"
Tc=10.0 min CN=59/0 Runoff=4.57 cfs 1.185 af

Subcatchment12a-Ex: Subcat 12a-Ex Runoff Area=2.629 ac 0.00% Impervious Runoff Depth=1.53"
Tc=10.0 min CN=71/0 Runoff=2.12 cfs 0.336 af

Subcatchment13: Subcat 13 Runoff Area=27.742 ac 0.00% Impervious Runoff Depth=0.92"
Flow Length=1,750' Tc=10.0 min CN=61/0 Runoff=9.46 cfs 2.118 af

Subcatchment13a-Ex: Subcat 13a-Ex Runoff Area=3.505 ac 0.00% Impervious Runoff Depth=1.53"
Tc=10.0 min CN=71/0 Runoff=2.83 cfs 0.448 af

Subcatchment13b-Ex: Subcat 13b-Ex Runoff Area=18.461 ac 0.00% Impervious Runoff Depth=2.37"
Tc=10.0 min CN=82/0 Runoff=26.22 cfs 3.654 af

Subcatchment13c-Ex: Subcat 13c-Ex Runoff Area=14.407 ac 0.00% Impervious Runoff Depth=2.21"
Tc=10.0 min CN=80/0 Runoff=18.75 cfs 2.651 af

Subcatchment14: Subcat 14 Runoff Area=8.669 ac 51.27% Impervious Runoff Depth=2.40"
Tc=10.0 min CN=58/98 Runoff=11.03 cfs 1.735 af

Subcatchment14a{(1)}-Ex: Subcat 14a{(1)}-Ex Runoff Area=13.081 ac 0.00% Impervious Runoff Depth=1.09"
Tc=10.0 min CN=64/0 Runoff=6.16 cfs 1.185 af

Subcatchment14a{(2)}-Ex: Subcat 14a{(2)}-Ex Runoff Area=2.438 ac 29.80% Impervious Runoff Depth=1.71"
Tc=10.0 min CN=58/98 Runoff=2.02 cfs 0.348 af

Subcatchment14b-Ex: Subcat 14b-Ex Runoff Area=50.209 ac 0.00% Impervious Runoff Depth=2.13"
Tc=13.4 min CN=79/0 Runoff=55.16 cfs 8.900 af

Subcatchment14c{(0)}-Ex: Subcat 14c{(0)}-Ex Runoff Area=43.677 ac 1.21% Impervious Runoff Depth=2.39"
Tc=24.5 min CN=82/98 Runoff=40.63 cfs 8.714 af

Subcatchment14c{(1)}-Ex: Subcat 14c{(1)}-Ex Runoff Area=30.208 ac 1.61% Impervious Runoff Depth=2.32"
Tc=13.6 min CN=81/98 Runoff=36.54 cfs 5.834 af

Subcatchment14c{(2)}-Ex: Subcat 14c{(2)}-Ex Runoff Area=19.689 ac 0.00% Impervious Runoff Depth=1.97"
Tc=13.2 min CN=77/0 Runoff=19.74 cfs 3.232 af

Subcatchment14c{(3)}-Ex: Subcat 14c{(3)}-Ex Runoff Area=13.782 ac 0.00% Impervious Runoff Depth=1.82"
Tc=12.6 min CN=75/0 Runoff=12.70 cfs 2.088 af

Subcatchment14d-Ex: Subcat 14d-Ex Runoff Area=166.738 ac 0.91% Impervious Runoff Depth=2.22"
Tc=19.4 min CN=80/98 Runoff=160.94 cfs 30.903 af

Subcatchment14e-Ex: Subcat 14e-Ex Runoff Area=10.890 ac 6.05% Impervious Runoff Depth=0.95"
Tc=10.0 min CN=58/98 Runoff=3.74 cfs 0.864 af

Reach 6R: Reach 1c Avg. Flow Depth=2.75' Max Vel=4.26 fps Inflow=137.65 cfs 58.525 af
n=0.024 L=830.0' S=0.0031 '/' Capacity=4,878.97 cfs Outflow=131.50 cfs 58.525 af

Reach 7R: Reach 1b Avg. Flow Depth=1.55' Max Vel=4.45 fps Inflow=309.45 cfs 98.507 af
n=0.024 L=883.0' S=0.0066 '/' Capacity=8,865.90 cfs Outflow=304.94 cfs 98.507 af

Reach 8R: Reach 1a Avg. Flow Depth=1.73' Max Vel=3.36 fps Inflow=313.21 cfs 101.702 af
n=0.024 L=583.0' S=0.0034 '/' Capacity=6,396.21 cfs Outflow=310.01 cfs 101.702 af

Reach 17R: Reach 1d Avg. Flow Depth=0.58' Max Vel=2.44 fps Inflow=55.87 cfs 1.597 af
n=0.027 L=841.0' S=0.0110 '/' Capacity=1,276.84 cfs Outflow=45.04 cfs 1.597 af

Reach 18R: Linne Road Grassed Chl Avg. Flow Depth=0.62' Max Vel=2.63 fps Inflow=21.44 cfs 12.833 af
n=0.030 L=1,190.0' S=0.0087 '/' Capacity=66.25 cfs Outflow=20.56 cfs 12.833 af

Pond 17P: Gran Cielo Dwy Peak Elev=855.00' Storage=10,997 cf Inflow=160.94 cfs 30.903 af
Primary=104.69 cfs 29.306 af Secondary=0.01 cfs 0.000 af Tertiary=55.87 cfs 1.597 af Outflow=160.58 cfs 30.903 af

Pond 18P: GC-CkD1 Peak Elev=851.60' Storage=56,309 cf Inflow=181.62 cfs 43.854 af
Primary=1.04 cfs 1.666 af Secondary=96.98 cfs 33.439 af Tertiary=76.59 cfs 8.686 af Outflow=174.59 cfs 43.791 af

Pond 19P: GC-CkD2 Peak Elev=849.72' Storage=36,034 cf Inflow=116.37 cfs 38.336 af
Primary=1.37 cfs 2.166 af Secondary=70.51 cfs 32.030 af Tertiary=40.16 cfs 4.140 af Outflow=112.03 cfs 38.335 af

Pond 20P: GC-CkD3 Peak Elev=846.07' Storage=17,246 cf Inflow=82.30 cfs 36.283 af
Primary=6.72 cfs 7.070 af Secondary=13.20 cfs 5.415 af Tertiary=62.01 cfs 23.787 af Outflow=81.94 cfs 36.272 af

Link 3a (1,2+3)-Ex: Comb Un-dev Ck Flow Inflow=312.31 cfs 102.675 af
Primary=312.31 cfs 102.675 af

Link 5L: Outlet To Tract #1632 Ex. 36" SD Inflow=14.23 cfs 6.867 af
Primary=14.23 cfs 6.867 af

Link 6L: To Existing Meadowlark Road Inflow=20.59 cfs 14.315 af
Primary=20.59 cfs 14.315 af

Link 7L: DMA 13 Inflow=57.14 cfs 8.870 af
Primary=57.14 cfs 8.870 af

Link 8L: DMA 8 Inflow=5.66 cfs 2.822 af
Primary=5.66 cfs 2.822 af

Link 9L: DMA 12 Inflow=6.67 cfs 1.521 af
Primary=6.67 cfs 1.521 af

Link 10L: To Linne Road Channel Inflow=21.44 cfs 12.833 af
Primary=21.44 cfs 12.833 af

Link 11L: To Fontana Road SD Inflow=128.36 cfs 23.705 af
Primary=128.36 cfs 23.705 af

Link 15L: Sherwood/NiblickLP Xing Inflow=72.28 cfs 11.820 af
Primary=72.28 cfs 11.820 af

Link 16L: Airport & Linne Road SD Inflow=92.25 cfs 25.516 af
Primary=92.25 cfs 25.516 af

Link 19L: 14c(0+1)-Ex Inflow=77.03 cfs 14.548 af
Primary=77.03 cfs 14.548 af

Link 22L: Linne Rd OvertoppingEx.Flow #2and#3 Inflow=102.17 cfs 27.926 af
Primary=102.17 cfs 27.926 af

Link 23L: Linne Rd Overtop #1 Inflow=76.59 cfs 8.686 af
Primary=76.59 cfs 8.686 af

Total Runoff Area = 1,810.455 ac Runoff Volume = 173.154 af Average Runoff Depth = 1.15"
99.44% Pervious = 1,800.345 ac 0.56% Impervious = 10.110 ac

Summary for Subcatchment 1: Subcat 1

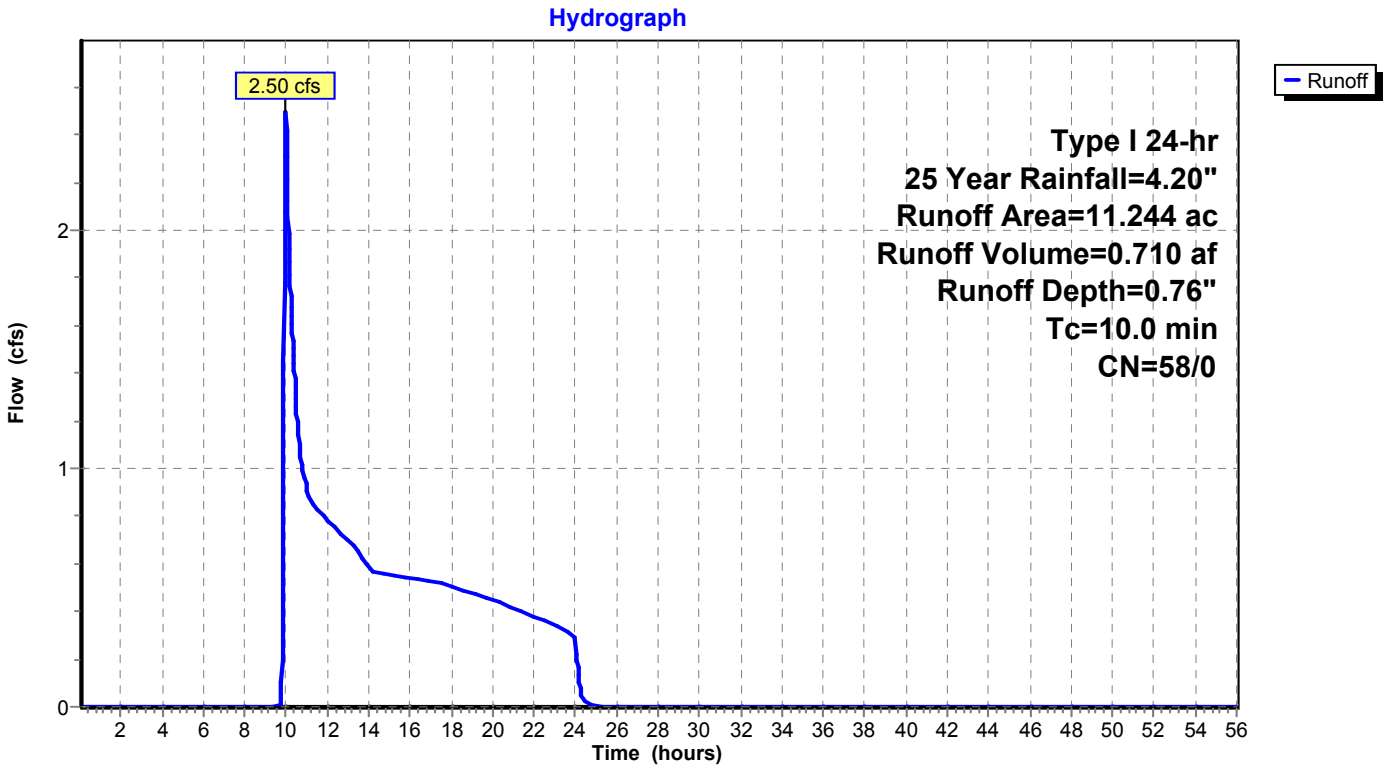
Runoff = 2.50 cfs @ 10.00 hrs, Volume= 0.710 af, Depth= 0.76"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
11.244	58	Meadow, non-grazed, HSG B
11.244	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9					**Direct Entry, SCS per Catchment Area CAD Info**
9.9	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

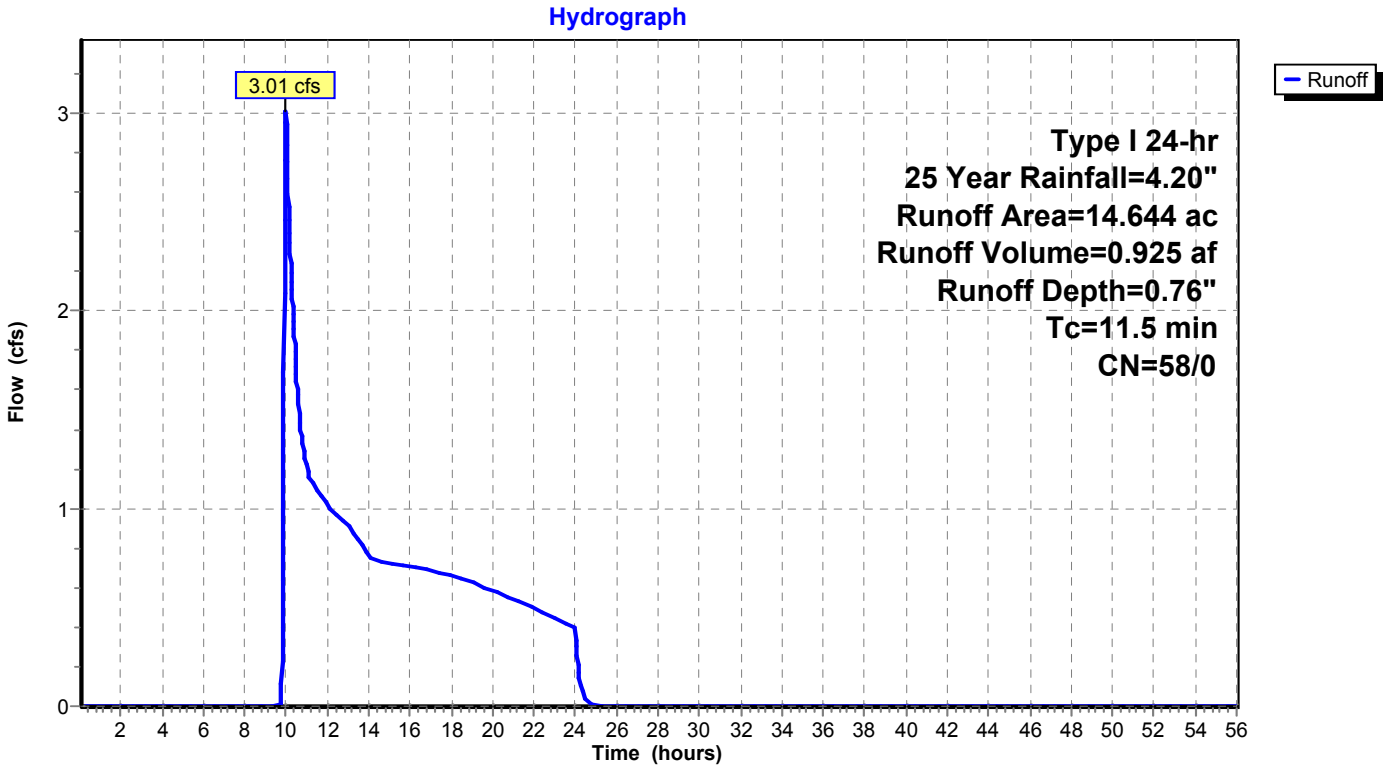
Runoff = 3.01 cfs @ 10.00 hrs, Volume= 0.925 af, Depth= 0.76"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
0.574	58	Meadow, non-grazed, HSG B
14.070	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
14.644	58	Weighted Average
14.644	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5					**Direct Entry, SCS per Catchment Area CAD Info**

Subcatchment 2: Subcat 2



Summary for Subcatchment 3: Subcat 3

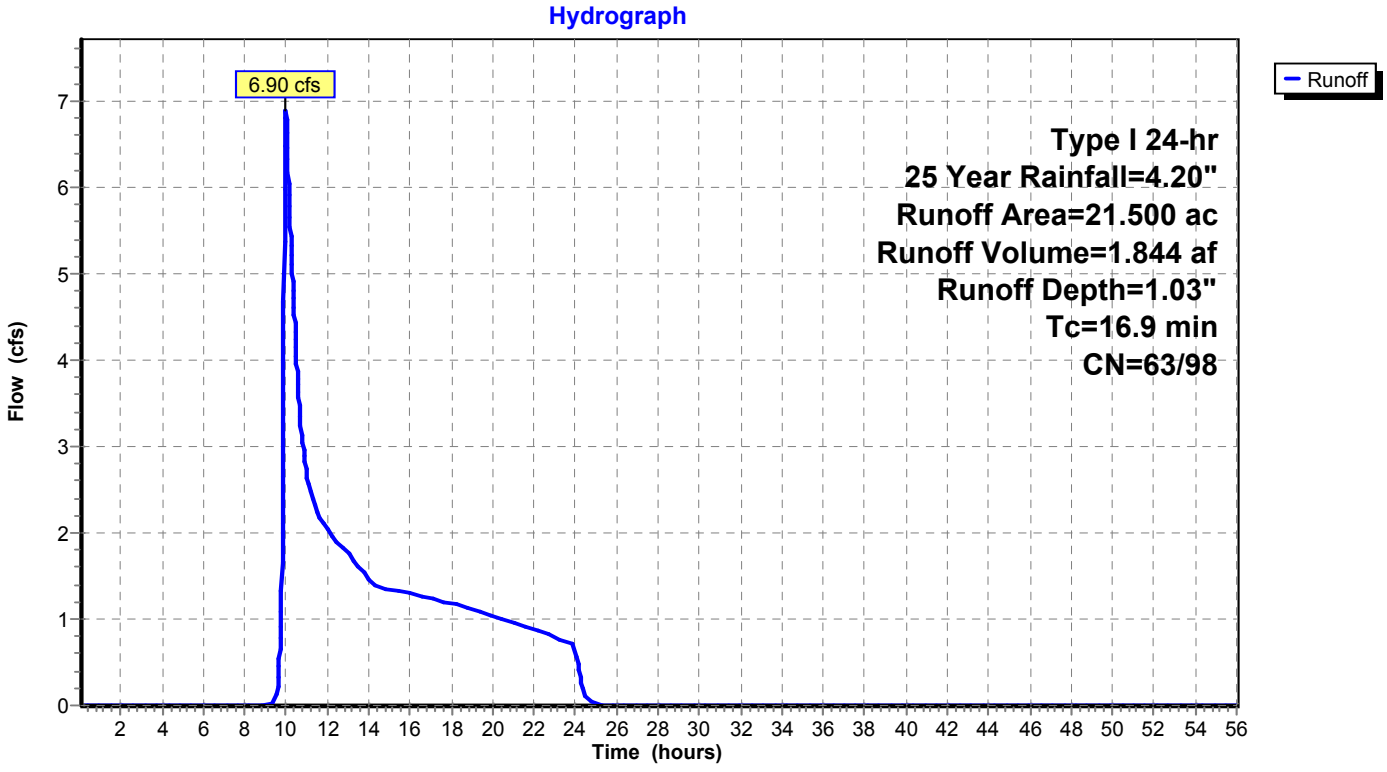
Runoff = 6.90 cfs @ 10.00 hrs, Volume= 1.844 af, Depth= 1.03"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
4.338	58	Meadow, non-grazed, HSG B
8.761	58	Meadow, non-grazed, HSG B
8.398	71	Meadow, non-grazed, HSG C
0.003	98	Paved roads w/curbs & sewers, HSG C
21.500	63	Weighted Average
21.497	63	99.98% Pervious Area
0.003	98	0.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.9					**Direct Entry, SCS per Catchment Area CAD Info**

Subcatchment 3: Subcat 3



Summary for Subcatchment 3a{(1)}-Ex: Subcat 3a{(1)}-Ex

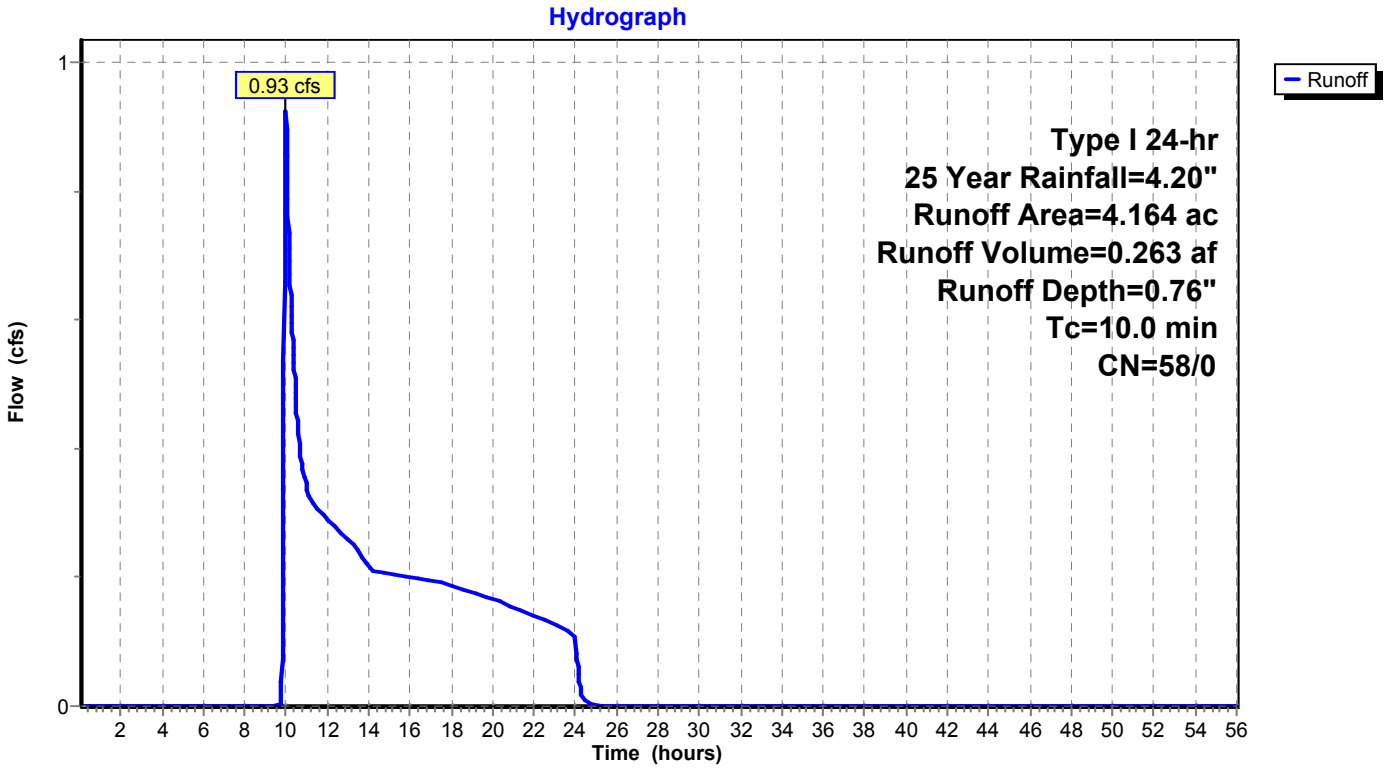
Runoff = 0.93 cfs @ 10.00 hrs, Volume= 0.263 af, Depth= 0.76"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
2.302	58	Meadow, non-grazed, HSG B
1.861	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
4.164	58	Weighted Average
4.164	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1					**Direct Entry,**
6.1	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 3a{(1)}-Ex: Subcat 3a{(1)}-Ex



Summary for Subcatchment 3a{(2)}-Ex: Subcat 3a{(2)}-Ex

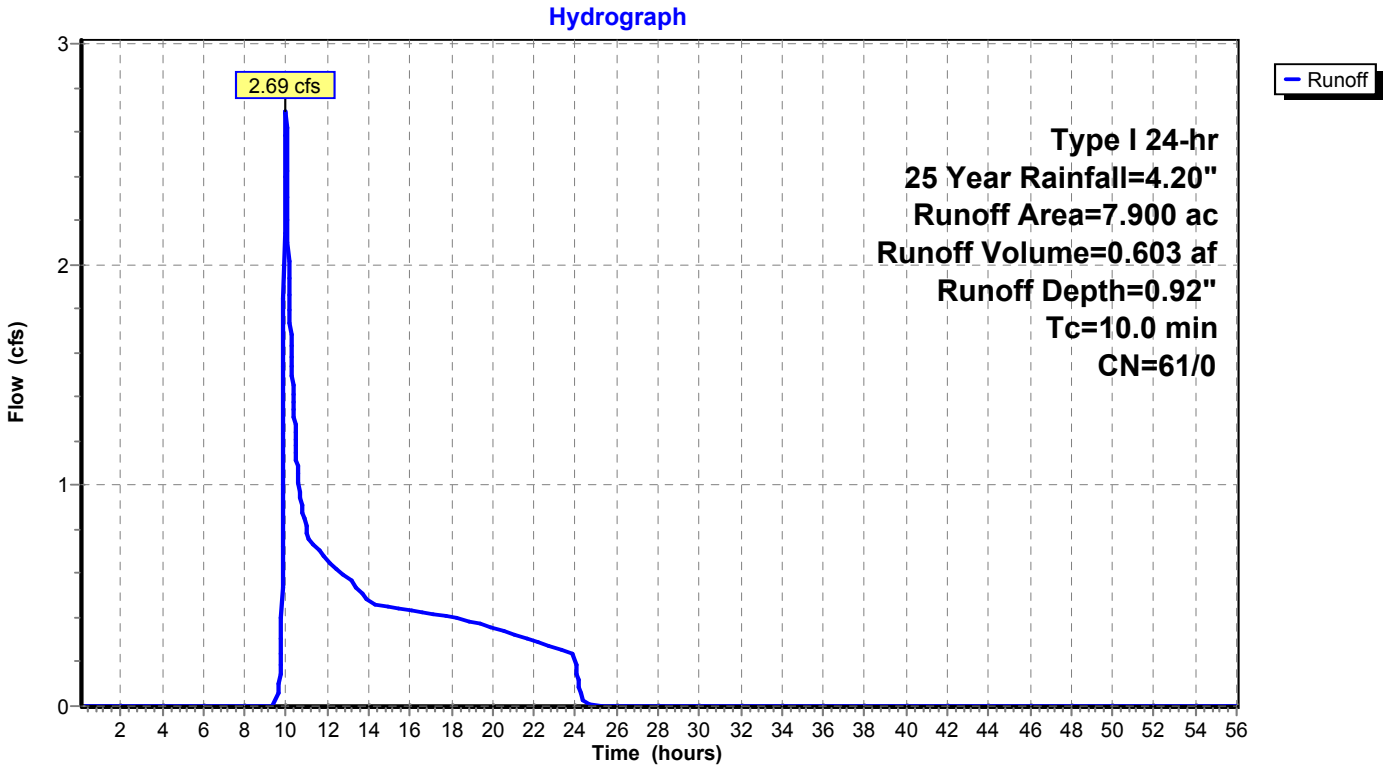
Runoff = 2.69 cfs @ 9.99 hrs, Volume= 0.603 af, Depth= 0.92"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
3.124	58	Meadow, non-grazed, HSG B
2.841	58	Meadow, non-grazed, HSG B
1.936	71	Meadow, non-grazed, HSG C
7.900	61	Weighted Average
7.900	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1					**Direct Entry,**
6.1	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 3a{(2)}-Ex: Subcat 3a{(2)}-Ex



Summary for Subcatchment 3a{(3)}-Ex: Subcat 3a{(3)}-Ex

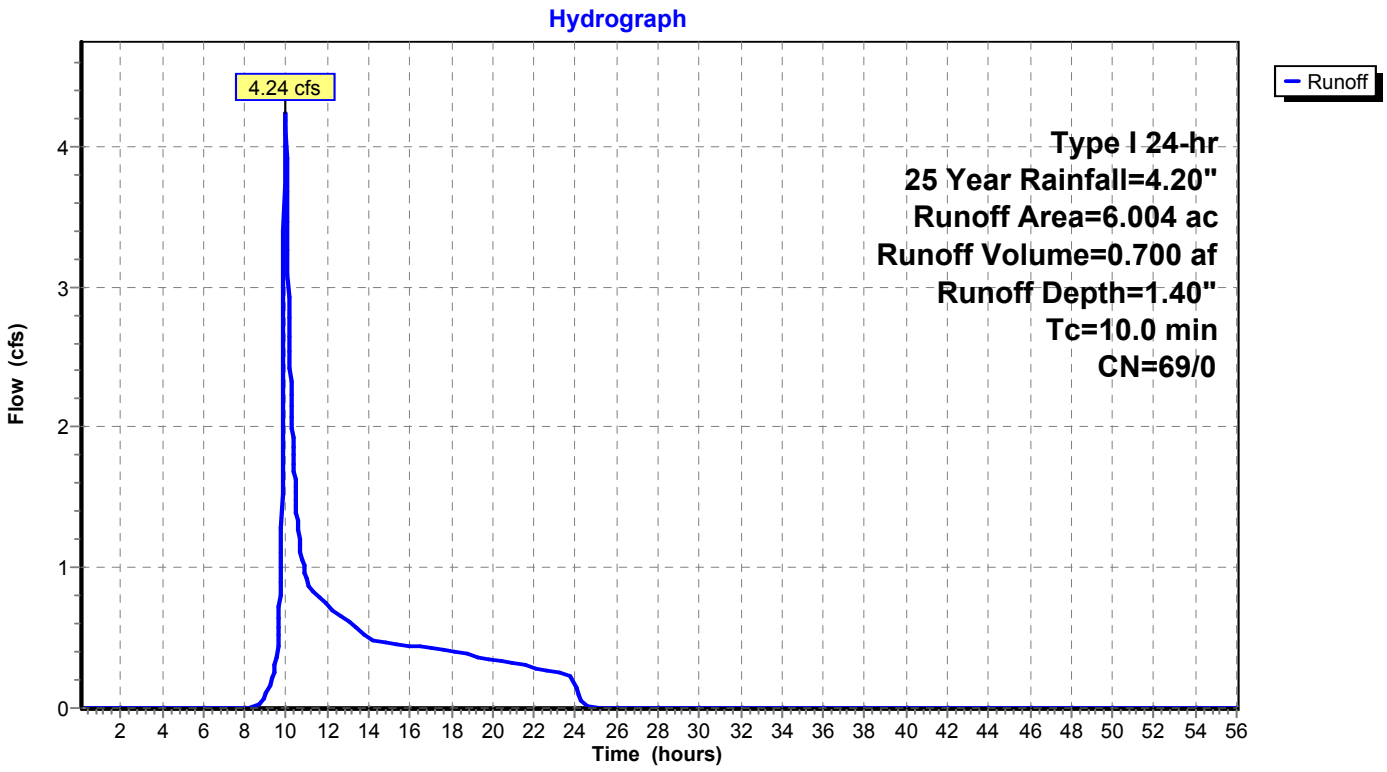
Runoff = 4.24 cfs @ 9.98 hrs, Volume= 0.700 af, Depth= 1.40"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
1.129	58	Meadow, non-grazed, HSG B
4.876	71	Meadow, non-grazed, HSG C
6.004	69	Weighted Average
6.004	69	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1					**Direct Entry, 14c{(2)}-Ex**
6.1	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 3a{(3)}-Ex: Subcat 3a{(3)}-Ex



Summary for Subcatchment 3b-Ex: Subcat 3b-Ex

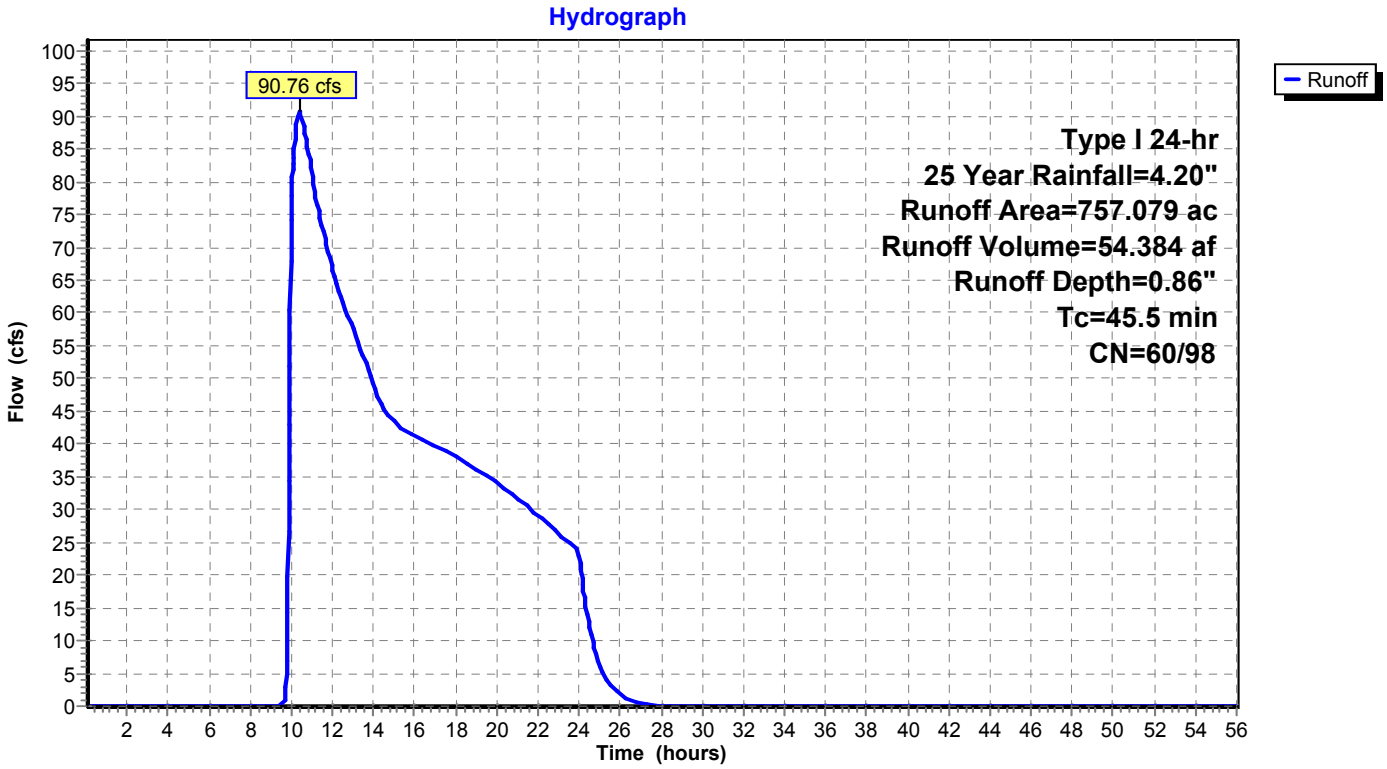
Runoff = 90.76 cfs @ 10.41 hrs, Volume= 54.384 af, Depth= 0.86"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
234.658	58	Meadow, non-grazed, HSG B
36.169	58	Meadow, non-grazed, HSG B
0.022	58	Meadow, non-grazed, HSG B
51.779	58	Meadow, non-grazed, HSG B
10.304	58	Meadow, non-grazed, HSG B
28.620	58	Meadow, non-grazed, HSG B
28.650	58	Meadow, non-grazed, HSG B
67.424	58	Meadow, non-grazed, HSG B
203.020	58	Meadow, non-grazed, HSG B
26.053	71	Meadow, non-grazed, HSG C
12.803	71	Meadow, non-grazed, HSG C
44.268	71	Meadow, non-grazed, HSG C
13.308	71	Meadow, non-grazed, HSG C
0.001	98	Paved roads w/curbs & sewers, HSG C
757.079	60	Weighted Average
757.078	60	100.00% Pervious Area
0.001	98	0.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
45.5					**Direct Entry, SCS Method taken from Catchment in ACAD file**

Subcatchment 3b-Ex: Subcat 3b-Ex



Summary for Subcatchment 4: Subcat 4

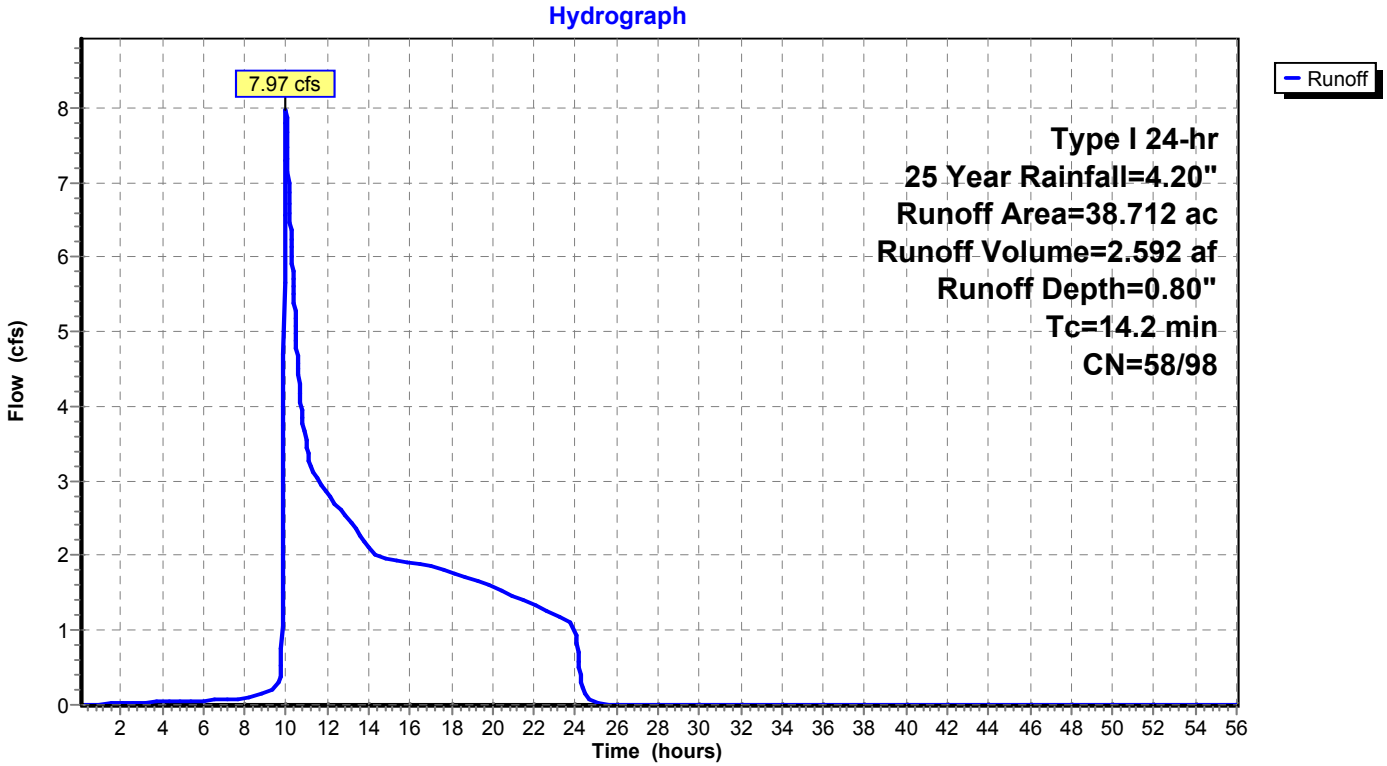
Runoff = 7.97 cfs @ 10.00 hrs, Volume= 2.592 af, Depth= 0.80"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
2.765	68	1 acre lots, 20% imp, HSG B
0.000	58	Meadow, non-grazed, HSG B
7.644	58	Meadow, non-grazed, HSG B
0.126	58	Meadow, non-grazed, HSG B
5.342	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
20.803	58	Meadow, non-grazed, HSG B
0.971	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
1.061	58	Meadow, non-grazed, HSG B
38.712	59	Weighted Average
38.159	58	98.57% Pervious Area
0.553	98	1.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 4: Subcat 4



Summary for Subcatchment 5: Subcat 5

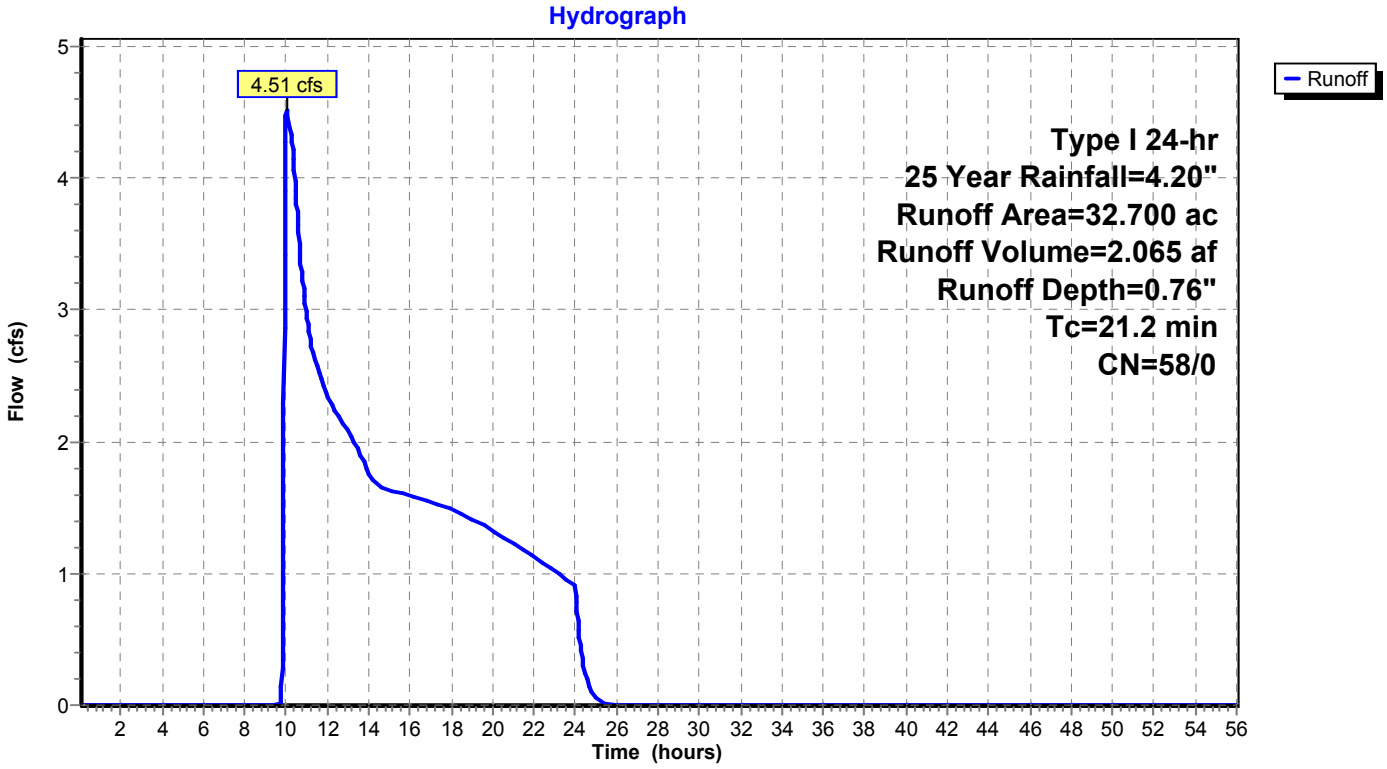
Runoff = 4.51 cfs @ 10.03 hrs, Volume= 2.065 af, Depth= 0.76"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
9.224	58	Meadow, non-grazed, HSG B
23.476	58	Meadow, non-grazed, HSG B
32.700	58	Weighted Average
32.700	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.2					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 5: Subcat 5



Summary for Subcatchment 6: Subcat 6

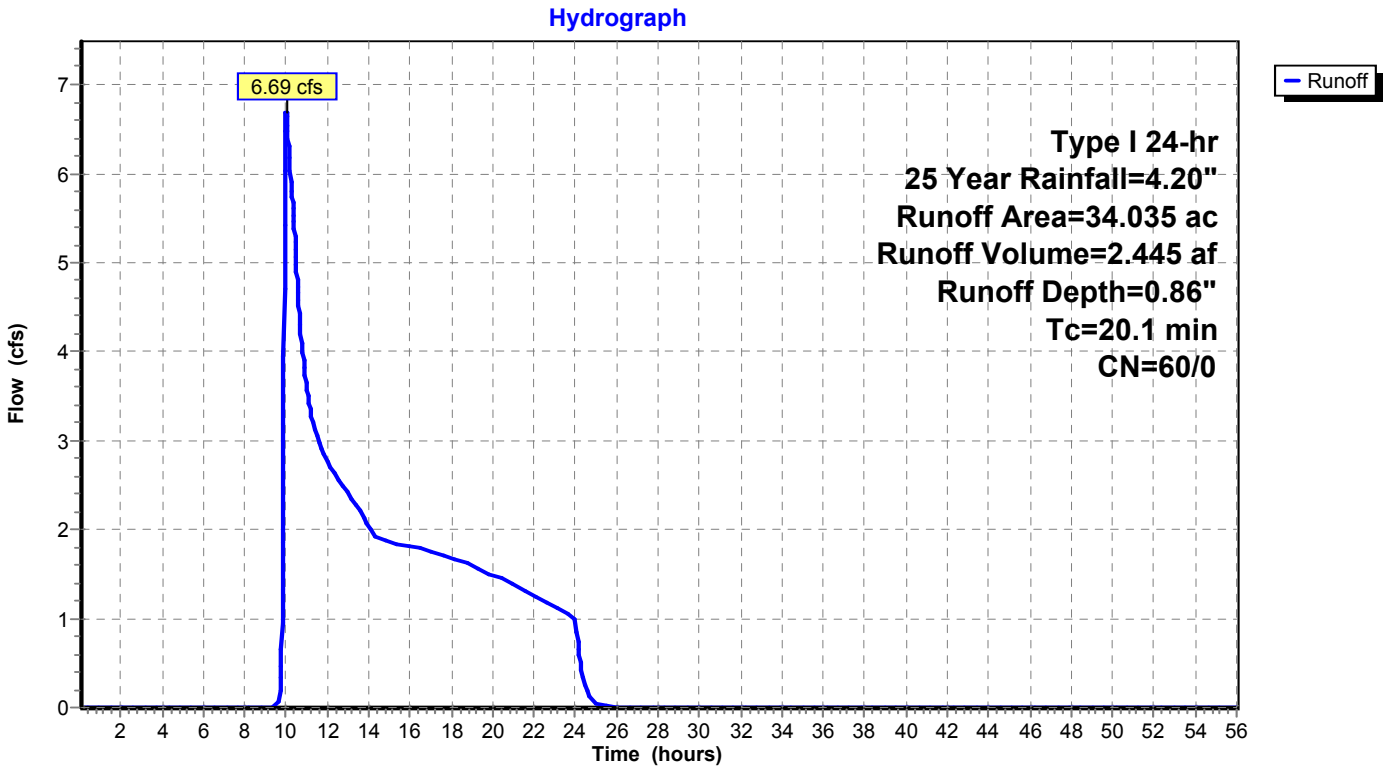
Runoff = 6.69 cfs @ 10.01 hrs, Volume= 2.445 af, Depth= 0.86"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
23.646	58	Meadow, non-grazed, HSG B
0.010	58	Meadow, non-grazed, HSG B
0.081	58	Meadow, non-grazed, HSG B
4.046	58	Meadow, non-grazed, HSG B
2.192	58	Meadow, non-grazed, HSG B
4.059	71	Meadow, non-grazed, HSG C
34.035	60	Weighted Average
34.035	60	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.1					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 6: Subcat 6



Summary for Subcatchment 7: Subcat 7

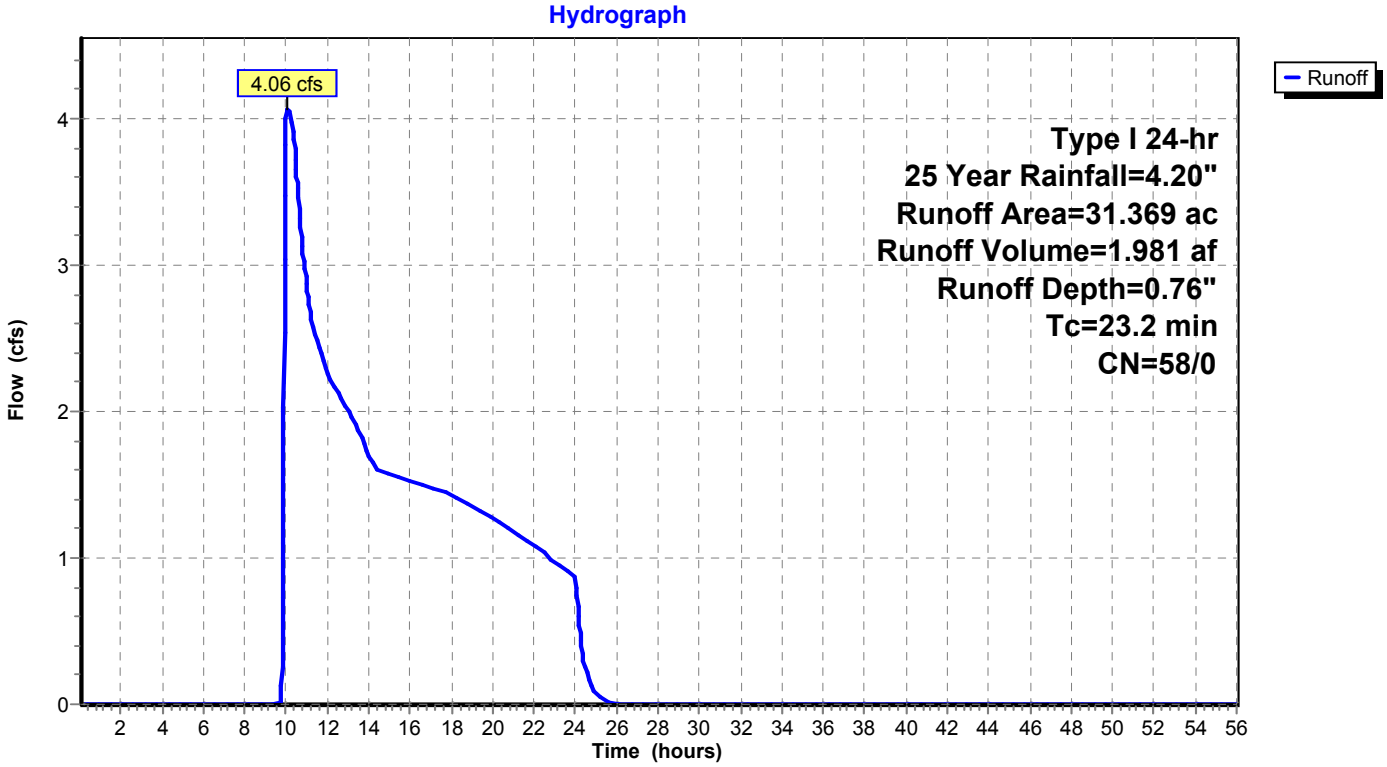
Runoff = 4.06 cfs @ 10.09 hrs, Volume= 1.981 af, Depth= 0.76"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
4.398	58	Meadow, non-grazed, HSG B
11.983	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
14.988	58	Meadow, non-grazed, HSG B
31.369	58	Weighted Average
31.369	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.2					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 7: Subcat 7



Summary for Subcatchment 8: Subcat 8

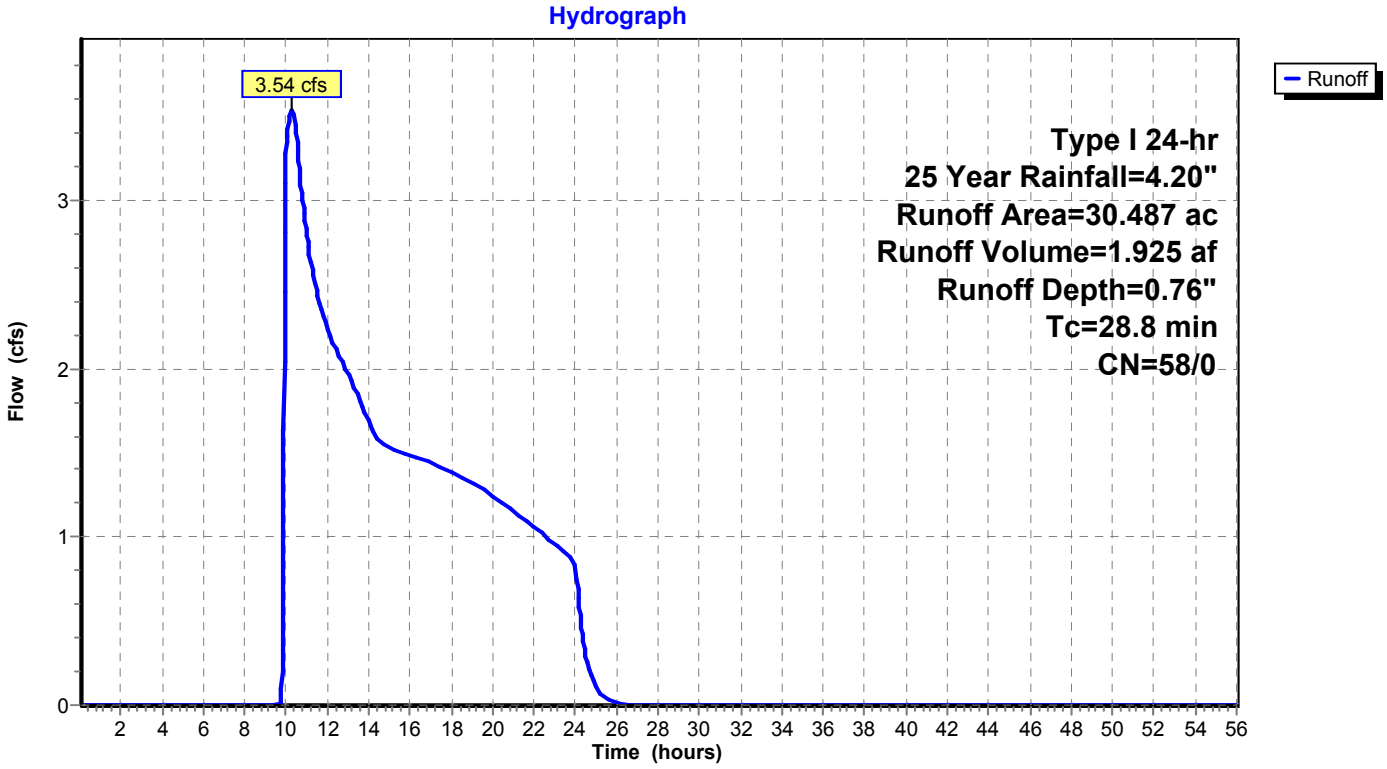
Runoff = 3.54 cfs @ 10.28 hrs, Volume= 1.925 af, Depth= 0.76"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
1.331	58	Meadow, non-grazed, HSG B
29.156	58	Meadow, non-grazed, HSG B
30.487	58	Weighted Average
30.487	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 8: Subcat 8



Summary for Subcatchment 8a-Ex: Subcat 8a-Ex

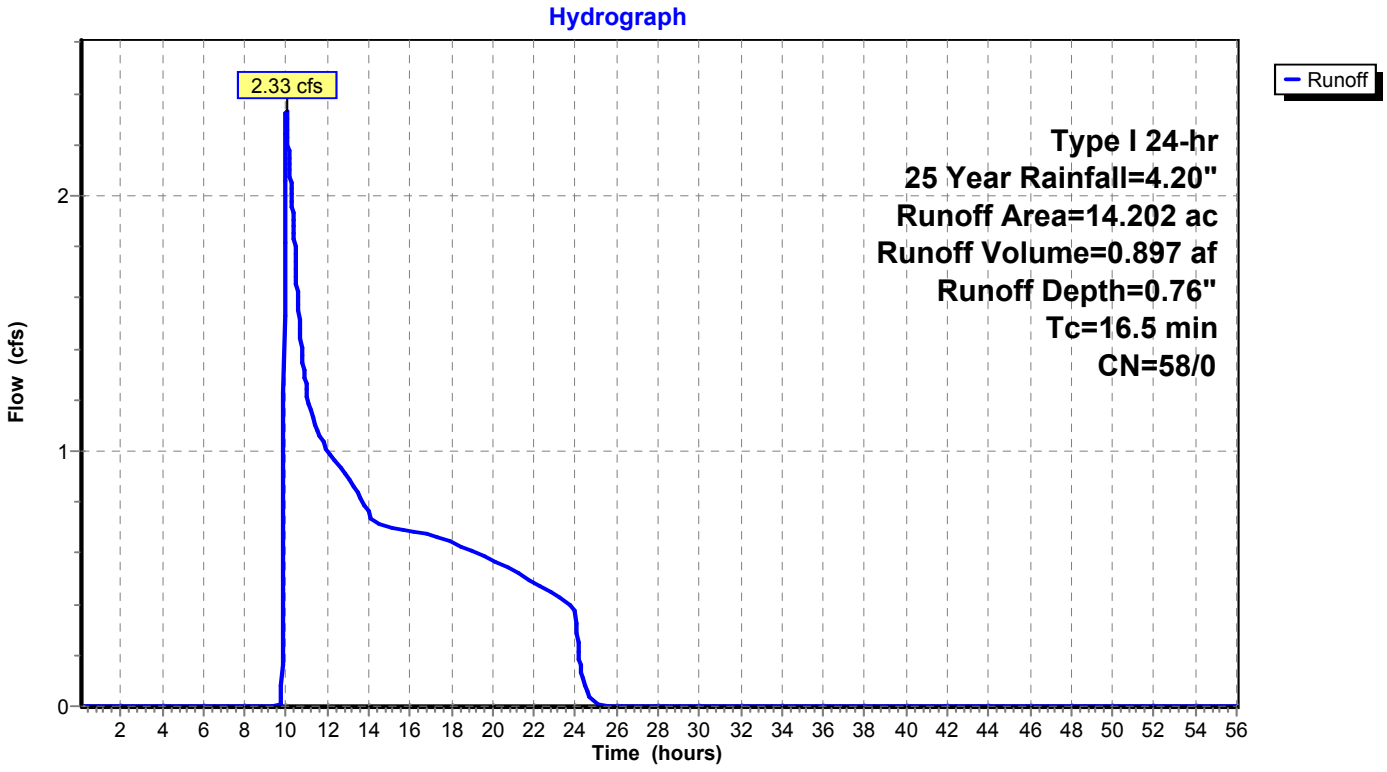
Runoff = 2.33 cfs @ 10.01 hrs, Volume= 0.897 af, Depth= 0.76"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
2.036	58	Meadow, non-grazed, HSG B
7.264	58	Meadow, non-grazed, HSG B
4.903	58	Meadow, non-grazed, HSG B
14.202	58	Weighted Average
14.202	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.5					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 8a-Ex: Subcat 8a-Ex



Summary for Subcatchment 9: Subcat 9

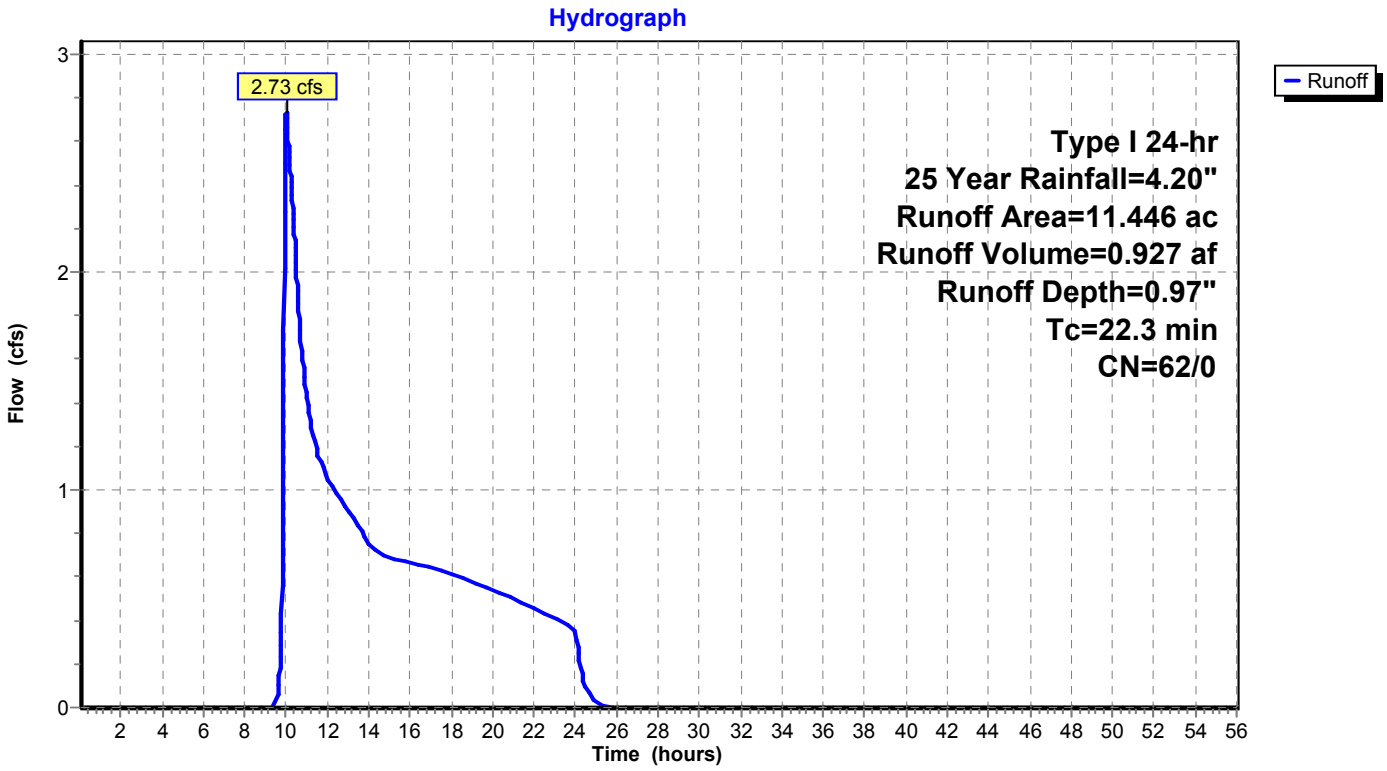
Runoff = 2.73 cfs @ 10.01 hrs, Volume= 0.927 af, Depth= 0.97"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
0.006	58	Meadow, non-grazed, HSG B
8.451	58	Meadow, non-grazed, HSG B
0.026	58	Meadow, non-grazed, HSG B
0.469	58	Meadow, non-grazed, HSG B
0.005	58	Meadow, non-grazed, HSG B
2.489	78	Meadow, non-grazed, HSG D
11.446	62	Weighted Average
11.446	62	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.3					**Direct Entry, Tc from CAD Catchments (SCS Method)**

Subcatchment 9: Subcat 9



Summary for Subcatchment 9a-Ex: Subcat 9a-Ex

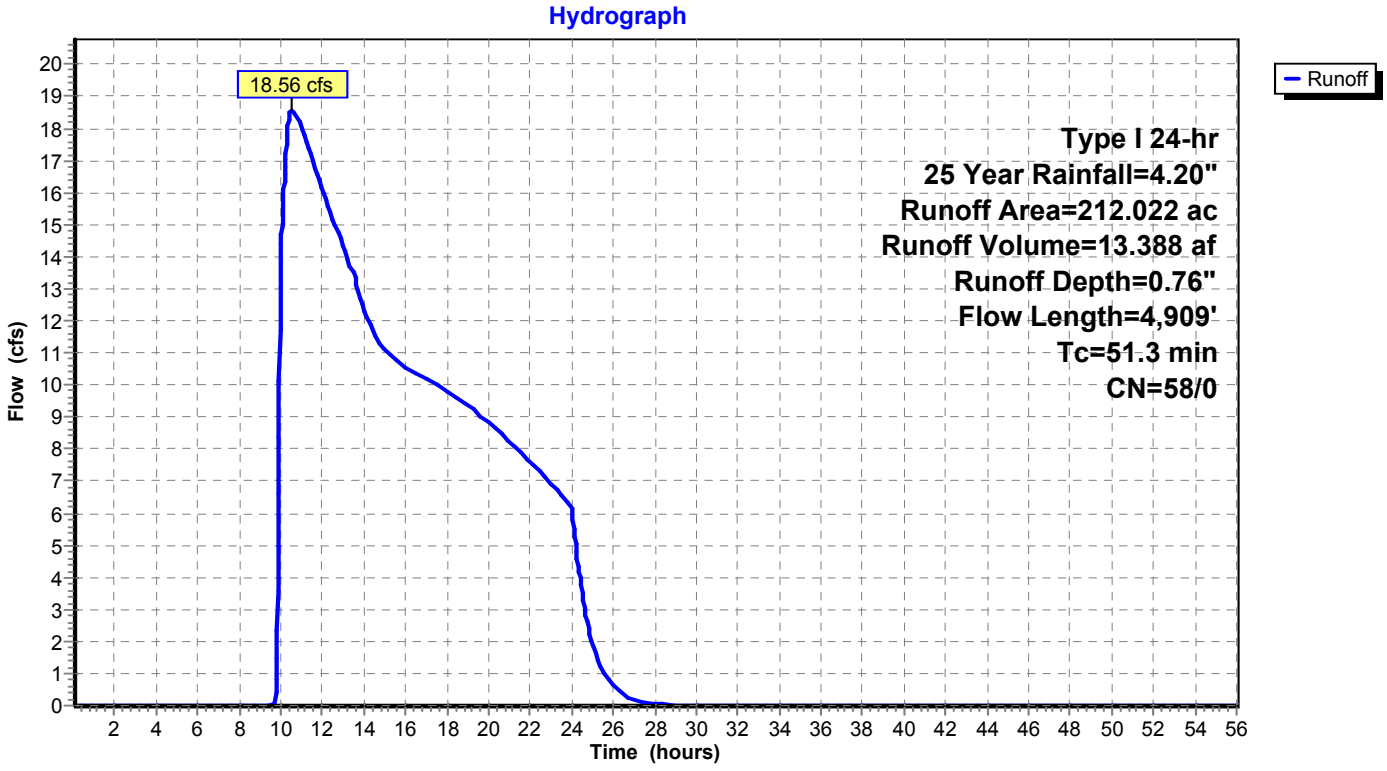
Runoff = 18.56 cfs @ 10.53 hrs, Volume= 13.388 af, Depth= 0.76"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
16.535	58	Meadow, non-grazed, HSG B
38.755	58	Meadow, non-grazed, HSG B
2.915	58	Meadow, non-grazed, HSG B
114.179	58	Meadow, non-grazed, HSG B
31.194	58	Meadow, non-grazed, HSG B
8.131	58	Meadow, non-grazed, HSG B
0.314	78	Meadow, non-grazed, HSG D
212.022	58	Weighted Average
212.022	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
51.3	4,909		1.59		**Direct Entry, SCS Method taken from Catchment in ACAD file**

Subcatchment 9a-Ex: Subcat 9a-Ex



Summary for Subcatchment 10: Subcat 10

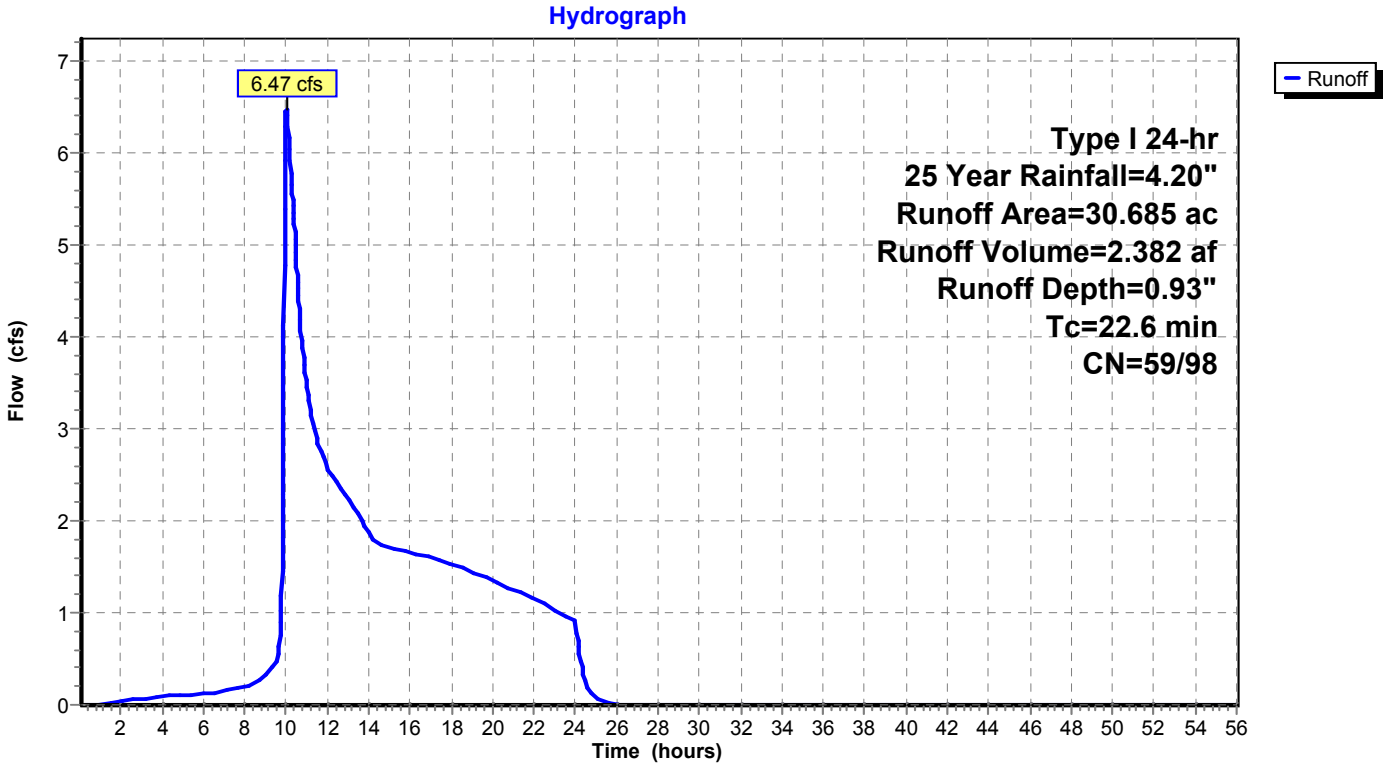
Runoff = 6.47 cfs @ 10.01 hrs, Volume= 2.382 af, Depth= 0.93"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
5.865	58	Meadow, non-grazed, HSG B
22.679	58	Meadow, non-grazed, HSG B
0.039	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.039	71	Meadow, non-grazed, HSG C
0.175	77	Natural western desert, HSG B
0.700	77	Natural western desert, HSG B
1.189	98	Paved roads w/curbs & sewers, HSG B
30.685	60	Weighted Average
29.496	59	96.12% Pervious Area
1.189	98	3.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.6					**Direct Entry, SCS Method taken from Catchment in ACAD file**

Subcatchment 10: Subcat 10



Summary for Subcatchment 10a-Ex: Subcat 10a-Ex

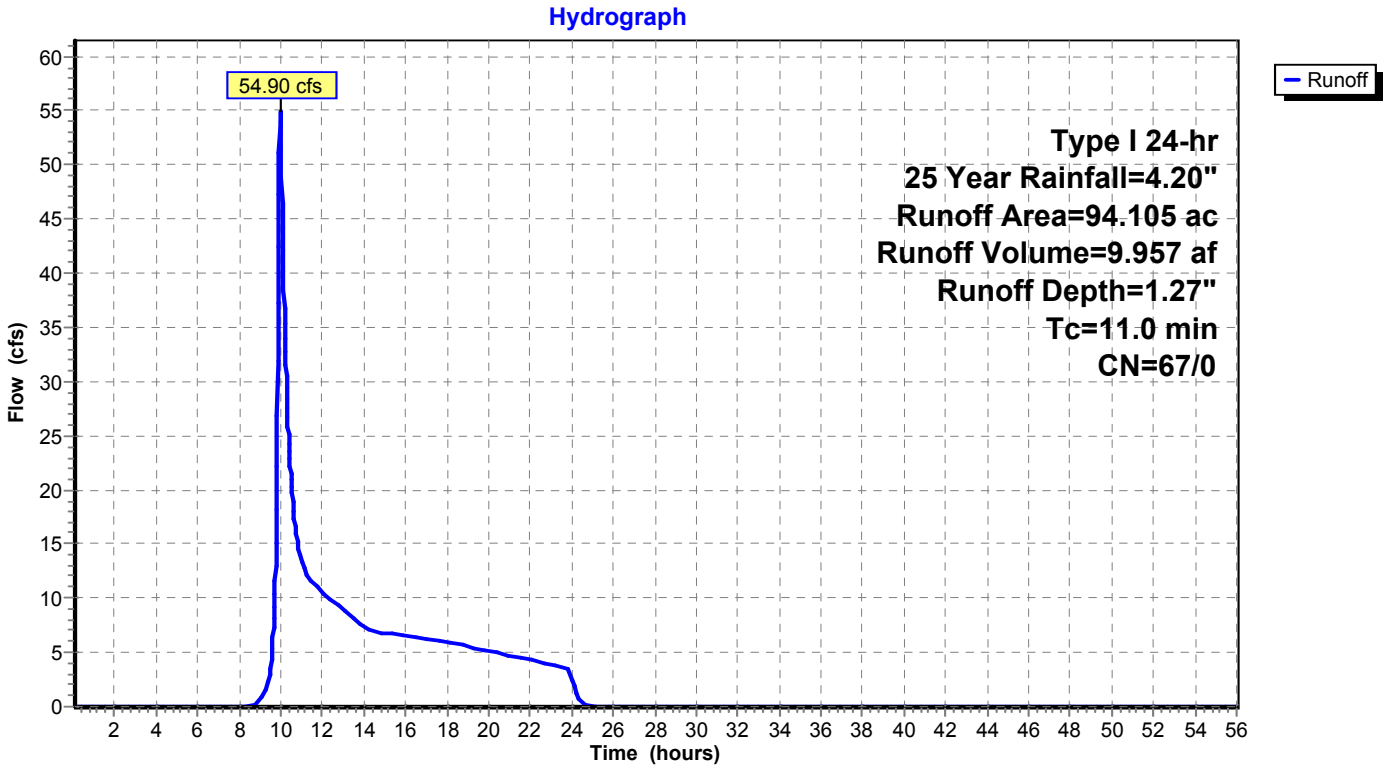
Runoff = 54.90 cfs @ 9.98 hrs, Volume= 9.957 af, Depth= 1.27"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
0.173	58	Meadow, non-grazed, HSG B
9.477	58	Meadow, non-grazed, HSG B
11.002	58	Meadow, non-grazed, HSG B
0.163	58	Meadow, non-grazed, HSG B
0.158	58	Meadow, non-grazed, HSG B
10.113	58	Meadow, non-grazed, HSG B
48.708	71	Meadow, non-grazed, HSG C
14.310	71	Meadow, non-grazed, HSG C
94.105	67	Weighted Average
94.105	67	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0					**Direct Entry, SCS Method taken from Catchment in ACAD file**

Subcatchment 10a-Ex: Subcat 10a-Ex



Summary for Subcatchment 11: Subcat 11

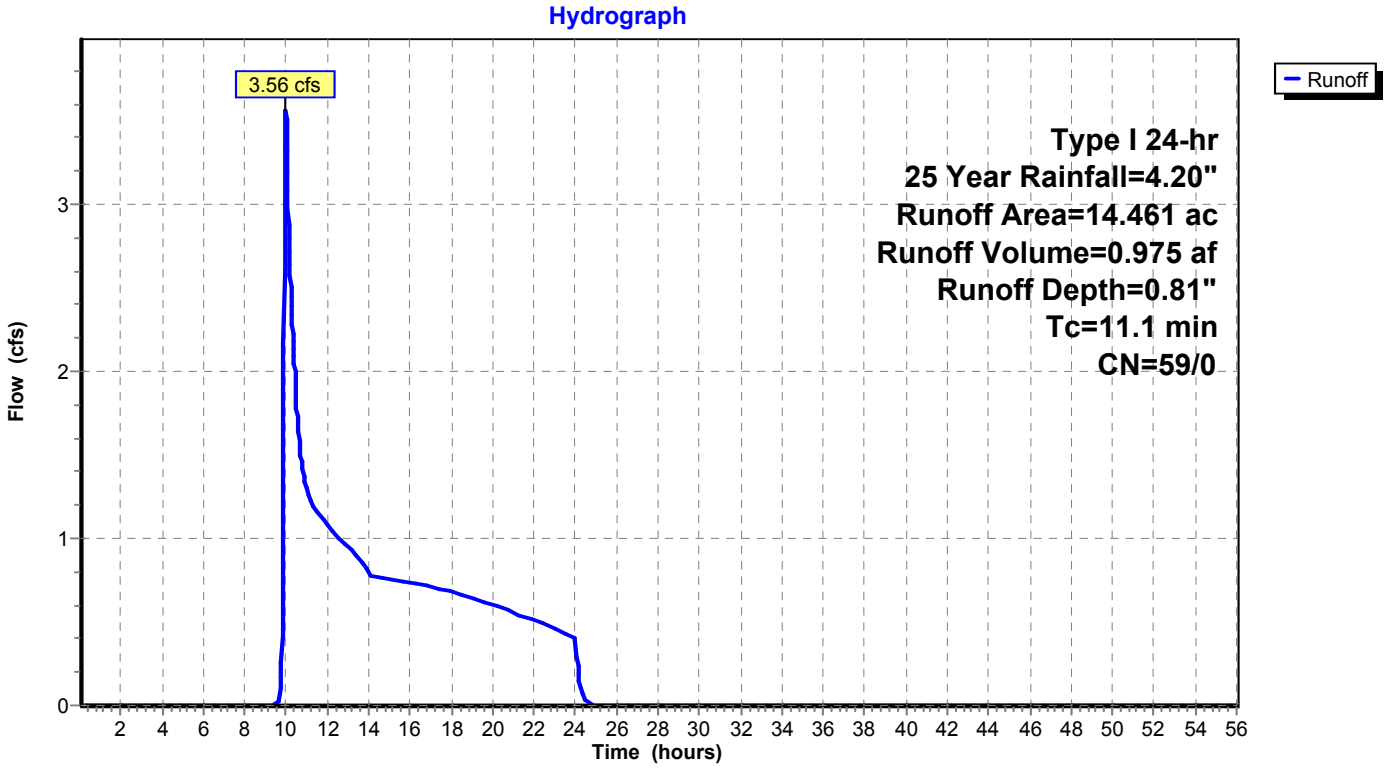
Runoff = 3.56 cfs @ 10.00 hrs, Volume= 0.975 af, Depth= 0.81"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
0.000	58	Meadow, non-grazed, HSG B
0.328	58	Meadow, non-grazed, HSG B
13.072	58	Meadow, non-grazed, HSG B
0.762	71	Meadow, non-grazed, HSG C
0.298	71	Meadow, non-grazed, HSG C
14.461	59	Weighted Average
14.461	59	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1					**Direct Entry, SCS Method taken from Catchment in ACAD file**

Subcatchment 11: Subcat 11



Summary for Subcatchment 12: Subcat 12

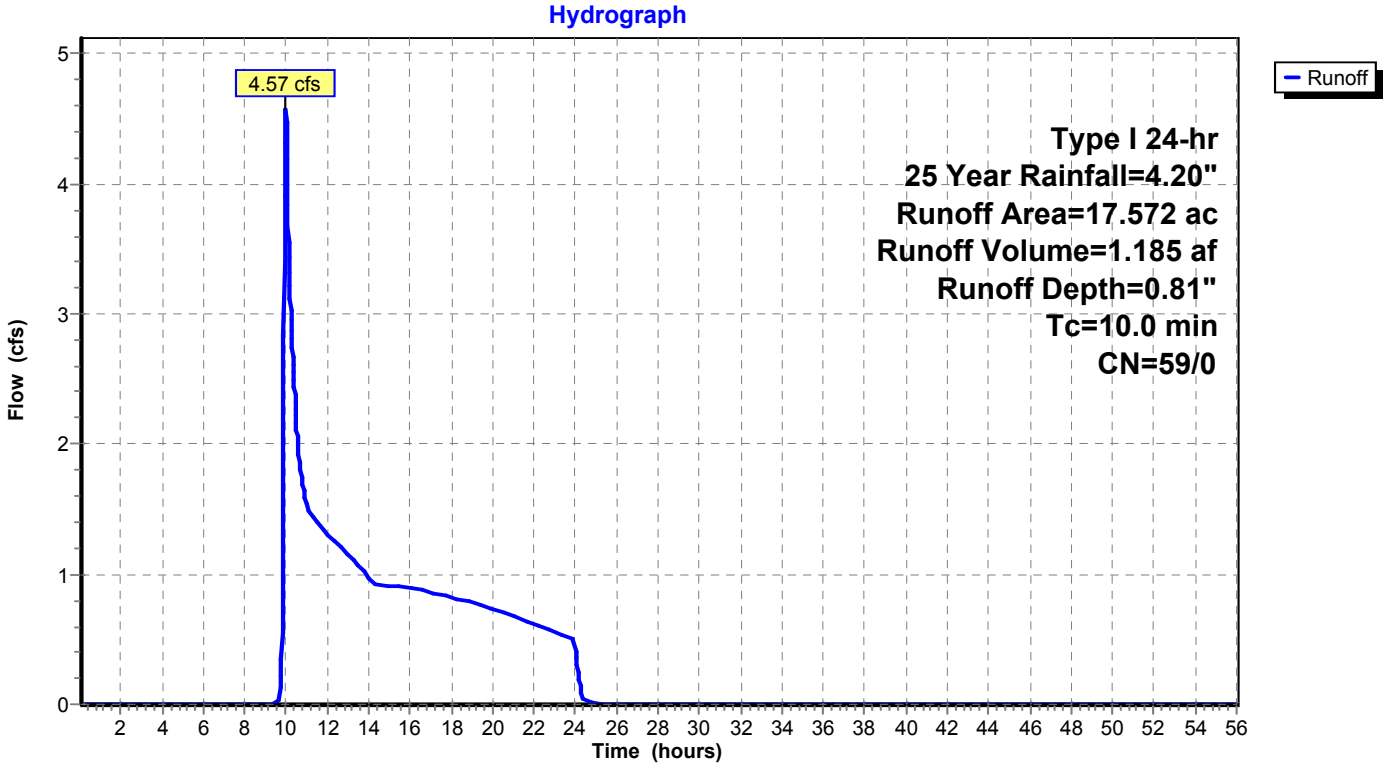
Runoff = 4.57 cfs @ 9.99 hrs, Volume= 1.185 af, Depth= 0.81"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
0.000	58	Meadow, non-grazed, HSG B
0.977	58	Meadow, non-grazed, HSG B
15.916	58	Meadow, non-grazed, HSG B
0.001	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.000	71	Meadow, non-grazed, HSG C
0.223	71	Meadow, non-grazed, HSG C
0.456	71	Meadow, non-grazed, HSG C
17.572	59	Weighted Average
17.572	59	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9					**Direct Entry, SCS Method taken from Catchment in ACAD file**
7.9	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 12: Subcat 12



Summary for Subcatchment 12a-Ex: Subcat 12a-Ex

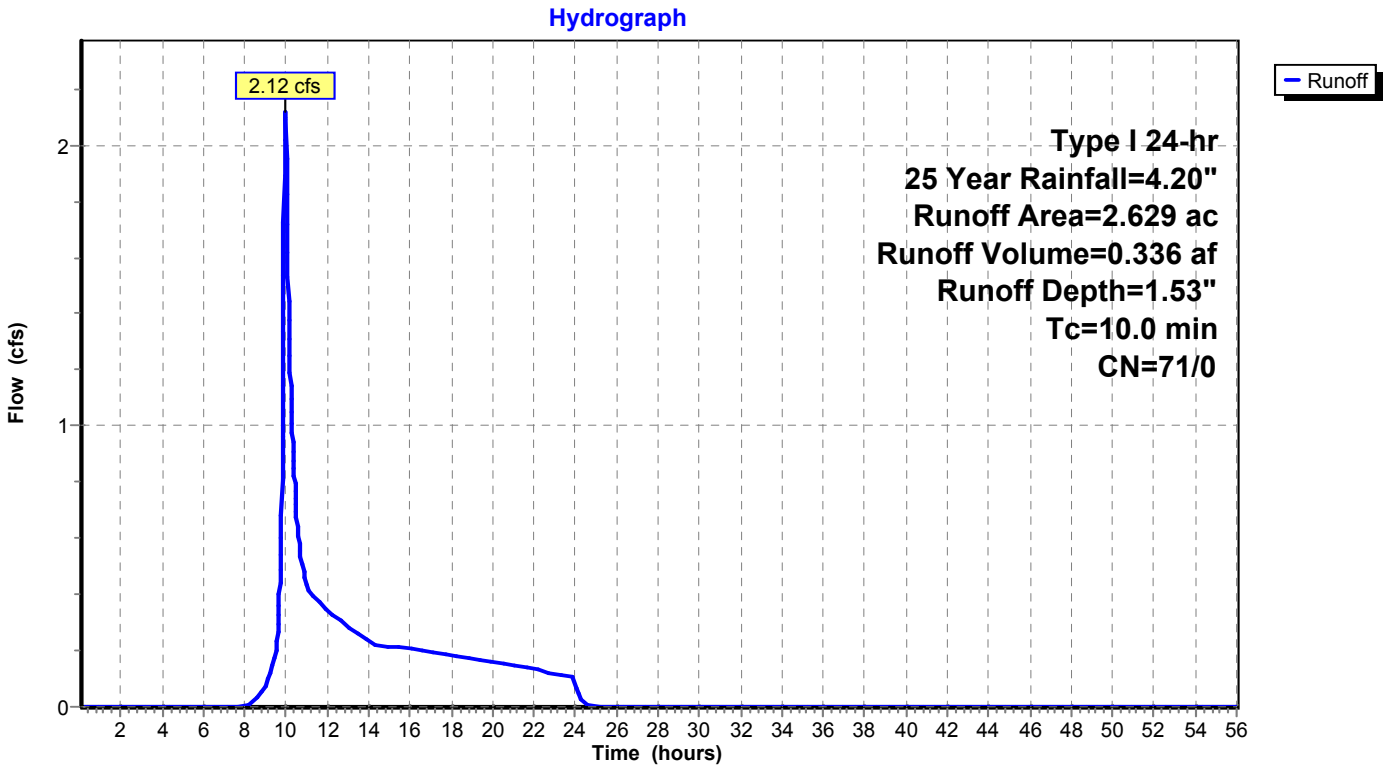
Runoff = 2.12 cfs @ 9.97 hrs, Volume= 0.336 af, Depth= 1.53"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
2.629	71	Meadow, non-grazed, HSG C
2.629	71	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9					**Direct Entry, SCS Method taken from Catchment in ACAD file**
4.9	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 12a-Ex: Subcat 12a-Ex



Summary for Subcatchment 13: Subcat 13

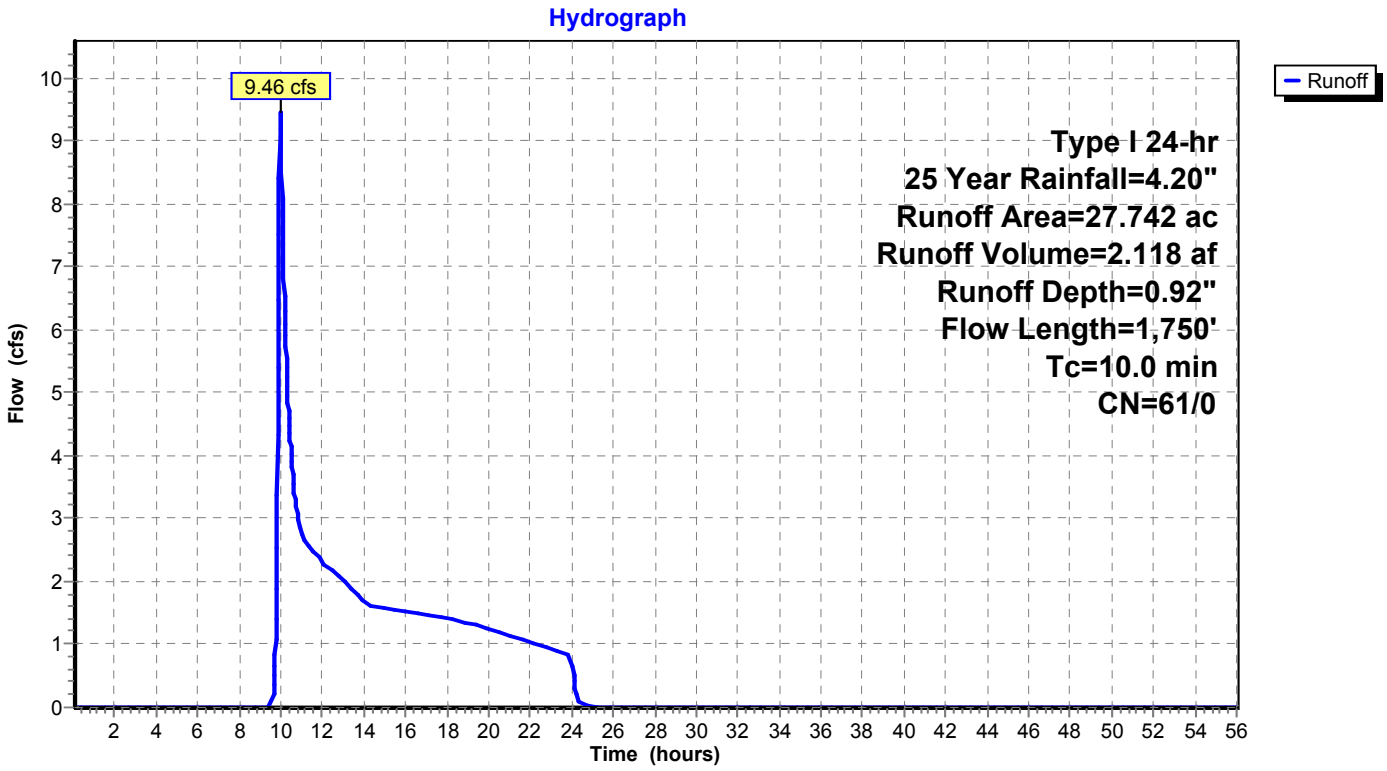
Runoff = 9.46 cfs @ 9.99 hrs, Volume= 2.118 af, Depth= 0.92"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
15.931	58	Meadow, non-grazed, HSG B
4.853	58	Meadow, non-grazed, HSG B
0.000	71	Meadow, non-grazed, HSG C
6.330	71	Meadow, non-grazed, HSG C
0.477	71	Meadow, non-grazed, HSG C
0.151	75	Row crops, SR + CR, Good, HSG B
27.742	61	Weighted Average
27.742	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	1,750		3.74		**Direct Entry, SCS Method taken from Catchment in ACAD file**
7.8	1,750	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 13: Subcat 13



Summary for Subcatchment 13a-Ex: Subcat 13a-Ex

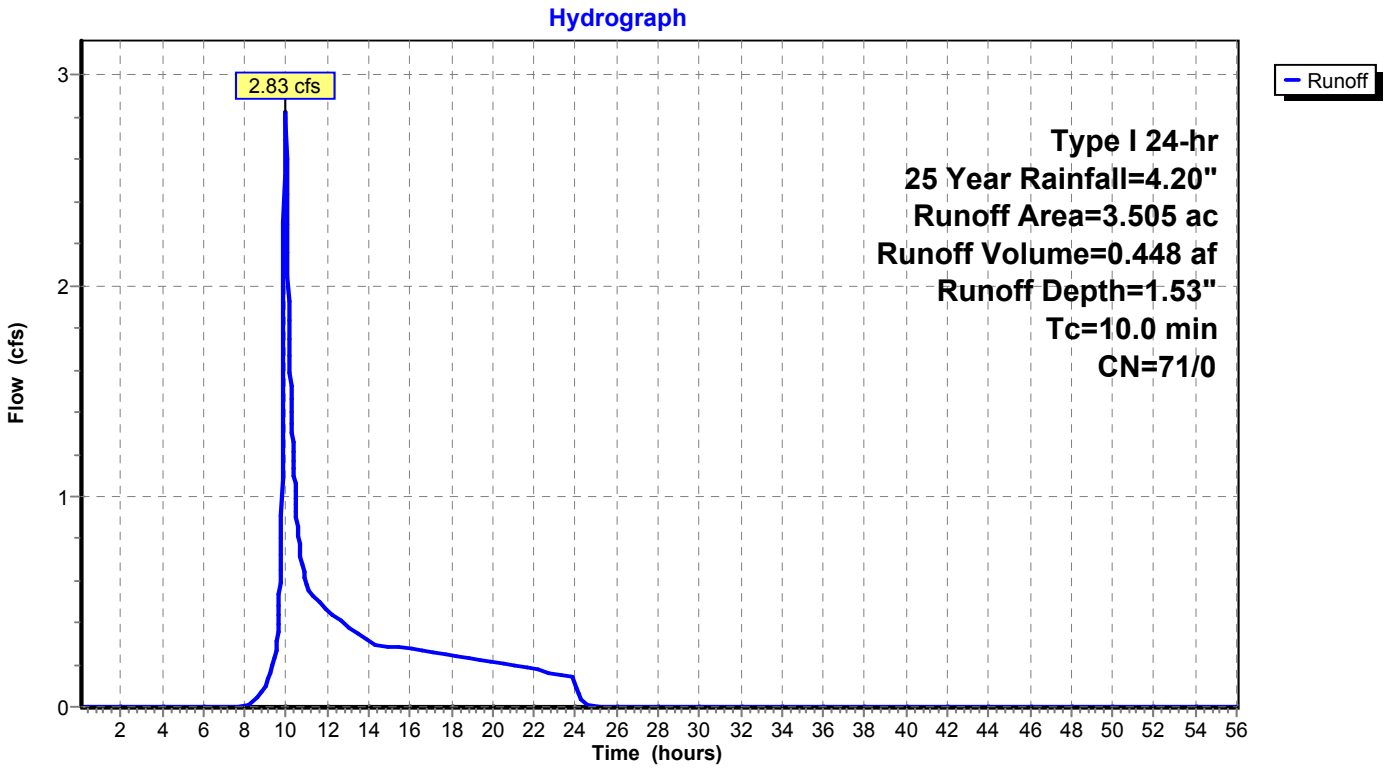
Runoff = 2.83 cfs @ 9.97 hrs, Volume= 0.448 af, Depth= 1.53"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
3.505	71	Meadow, non-grazed, HSG C
3.505	71	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9					**Direct Entry, SCS Method taken from Catchment in ACAD file**
8.9	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 13a-Ex: Subcat 13a-Ex



Summary for Subcatchment 13b-Ex: Subcat 13b-Ex

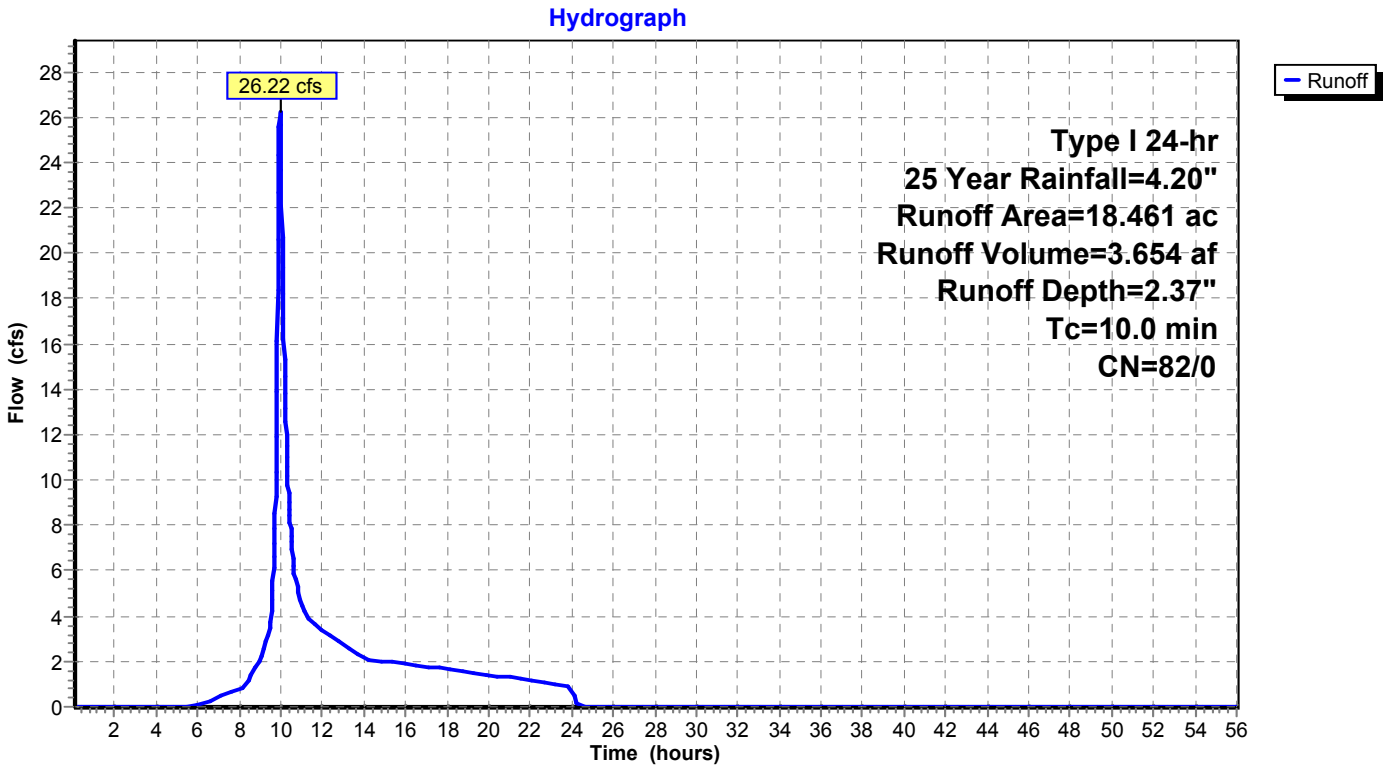
Runoff = 26.22 cfs @ 9.97 hrs, Volume= 3.654 af, Depth= 2.37"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
18.461	82	Row crops, SR + CR, Good, HSG C
18.461	82	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry, SCS Method taken from Catchment in ACAD file**
7.0	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 13b-Ex: Subcat 13b-Ex



Summary for Subcatchment 13c-Ex: Subcat 13c-Ex

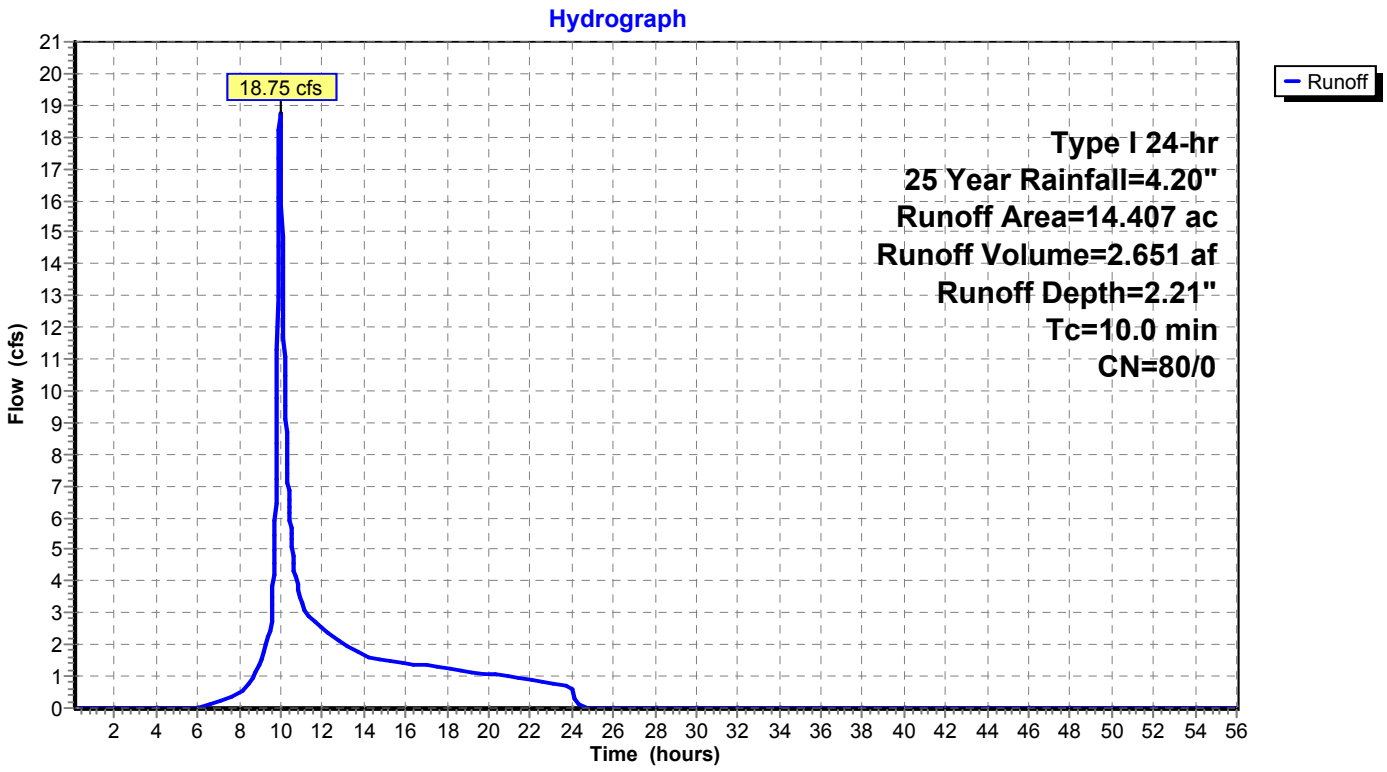
Runoff = 18.75 cfs @ 9.97 hrs, Volume= 2.651 af, Depth= 2.21"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
3.718	75	Row crops, SR + CR, Good, HSG B
10.689	82	Row crops, SR + CR, Good, HSG C
14.407	80	Weighted Average
14.407	80	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9					**Direct Entry, SCS Method taken from Catchment in ACAD file**
6.9	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 13c-Ex: Subcat 13c-Ex



Summary for Subcatchment 14: Subcat 14

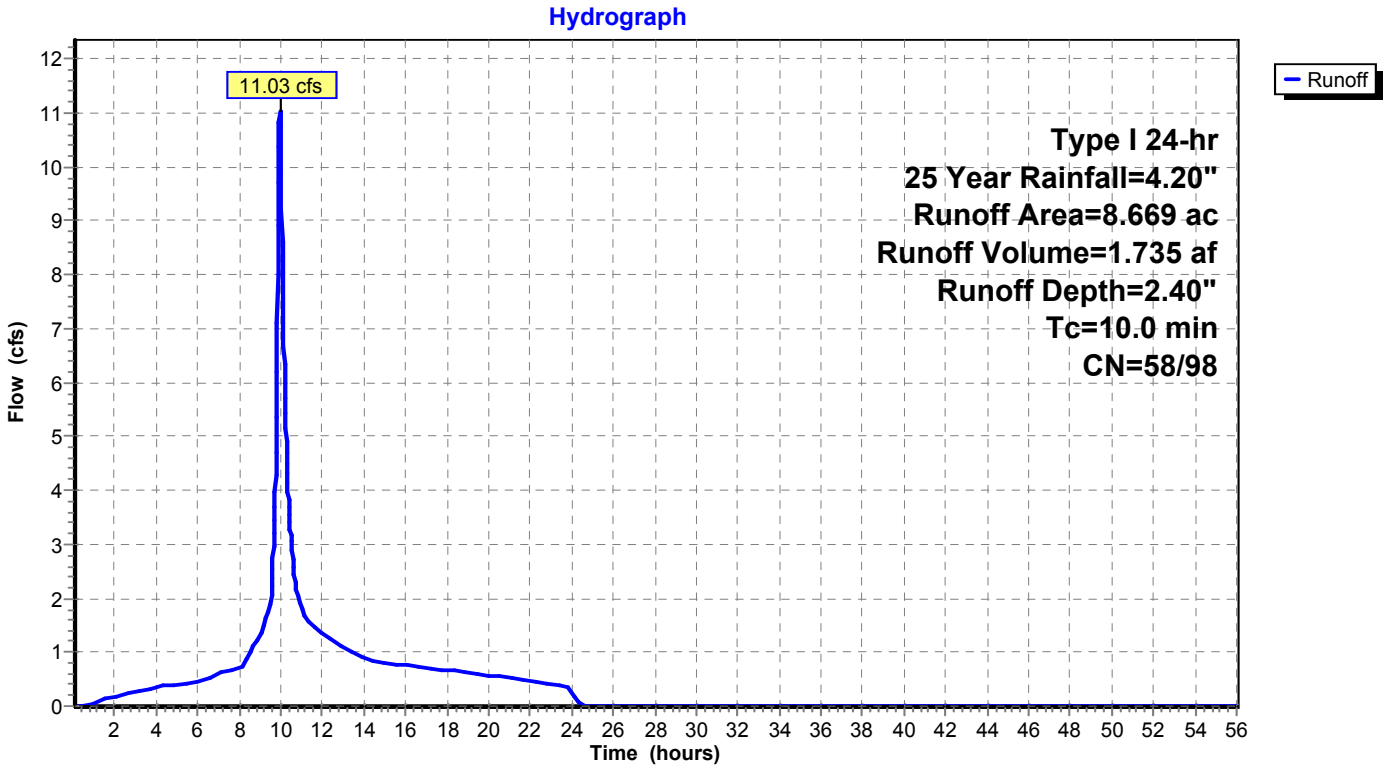
Runoff = 11.03 cfs @ 9.96 hrs, Volume= 1.735 af, Depth= 2.40"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
4.224	58	Meadow, non-grazed, HSG B
4.445	98	Paved roads w/curbs & sewers, HSG B
8.669	79	Weighted Average
4.224	58	48.73% Pervious Area
4.445	98	51.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6					**Direct Entry, SCS Method taken from Catchment in ACAD file**
8.6	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 14: Subcat 14



Summary for Subcatchment 14a{(1)}-Ex: Subcat 14a{(1)}-Ex

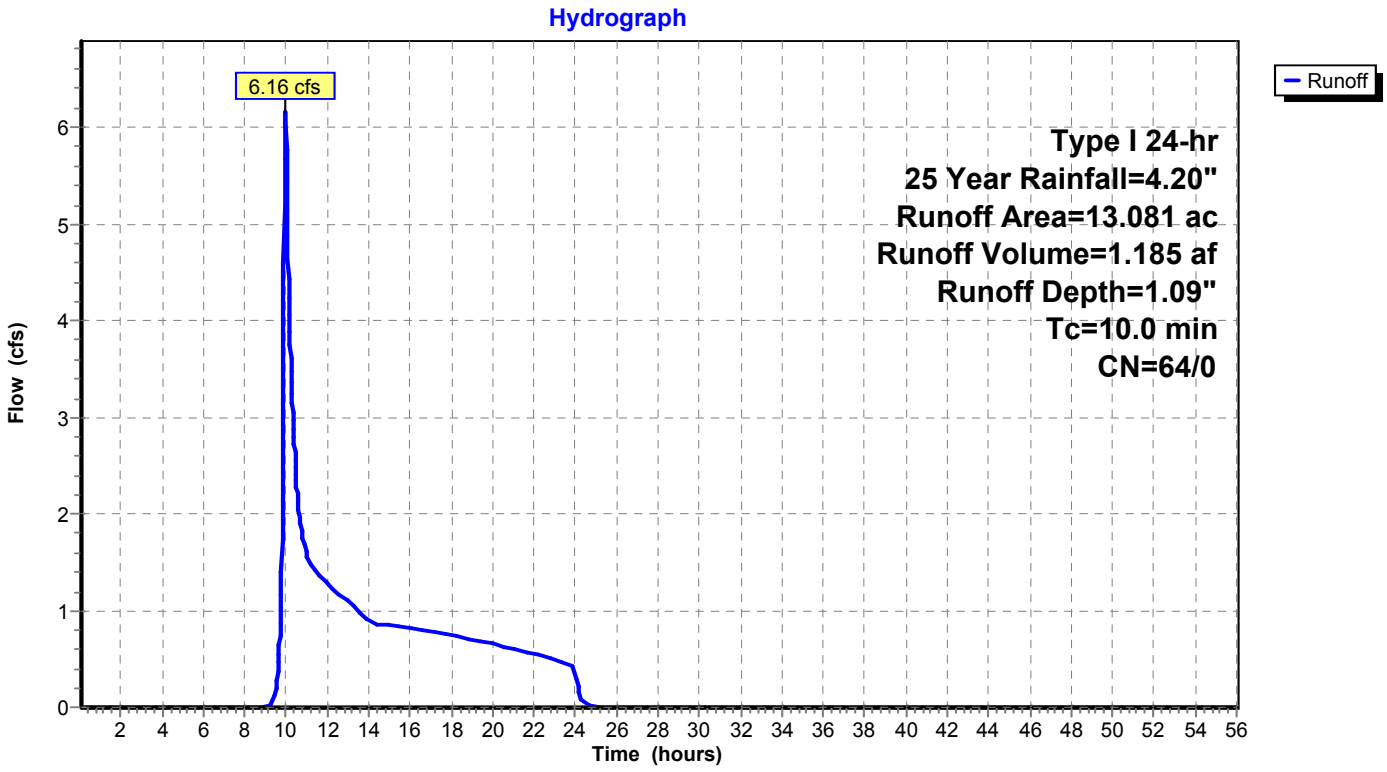
Runoff = 6.16 cfs @ 9.98 hrs, Volume= 1.185 af, Depth= 1.09"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
0.000	58	Meadow, non-grazed, HSG B
8.116	58	Meadow, non-grazed, HSG B
2.383	75	Row crops, SR + CR, Good, HSG B
0.000	75	Row crops, SR + CR, Good, HSG B
2.581	75	Row crops, SR + CR, Good, HSG B
13.081	64	Weighted Average
13.081	64	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**
8.7	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 14a{(1)}-Ex: Subcat 14a{(1)}-Ex



Summary for Subcatchment 14a{(2)}-Ex: Subcat 14a{(2)}-Ex

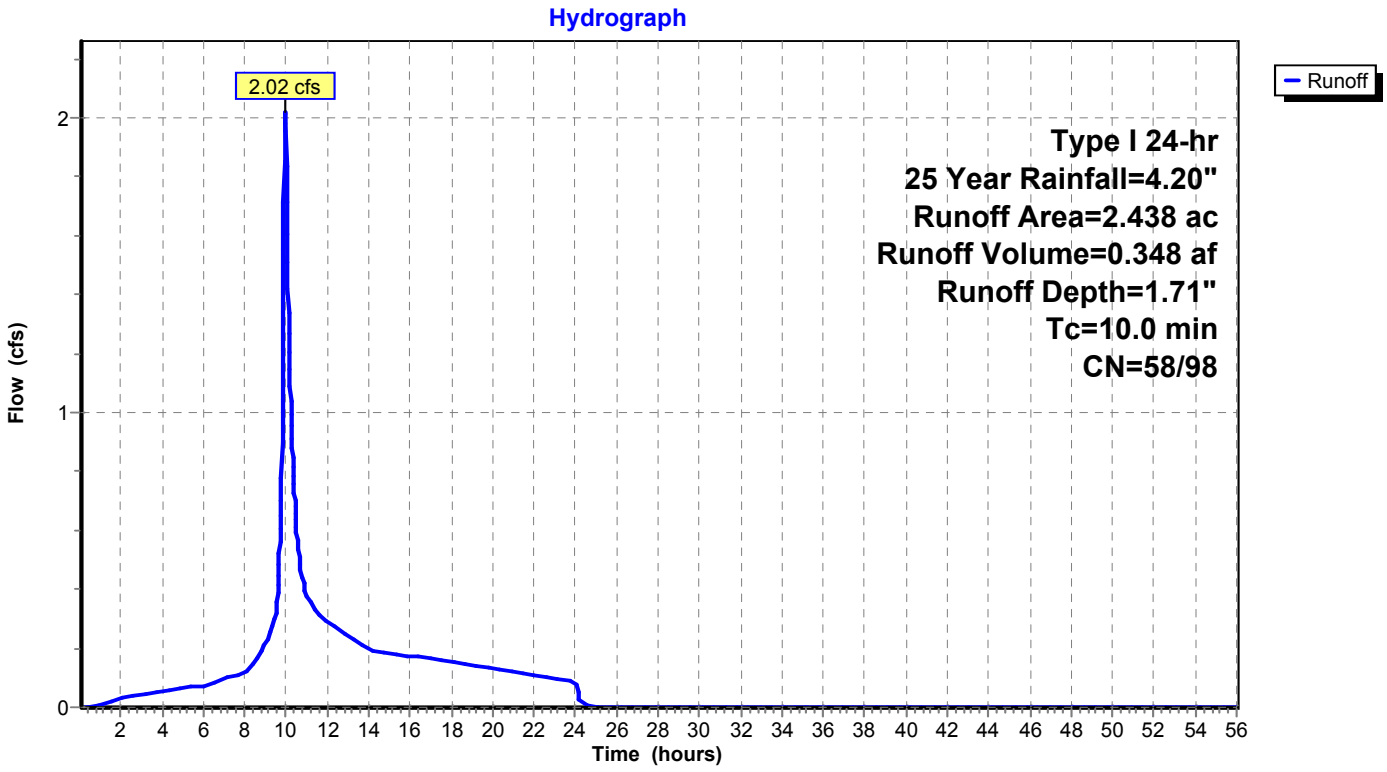
Runoff = 2.02 cfs @ 9.97 hrs, Volume= 0.348 af, Depth= 1.71"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
1.711	58	Meadow, non-grazed, HSG B
0.726	98	Paved roads w/curbs & sewers, HSG B
0.000	75	Row crops, SR + CR, Good, HSG B
0.000	75	Row crops, SR + CR, Good, HSG B
2.438	70	Weighted Average
1.711	58	70.20% Pervious Area
0.726	98	29.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**
4.9	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 14a{(2)}-Ex: Subcat 14a{(2)}-Ex



Summary for Subcatchment 14b-Ex: Subcat 14b-Ex

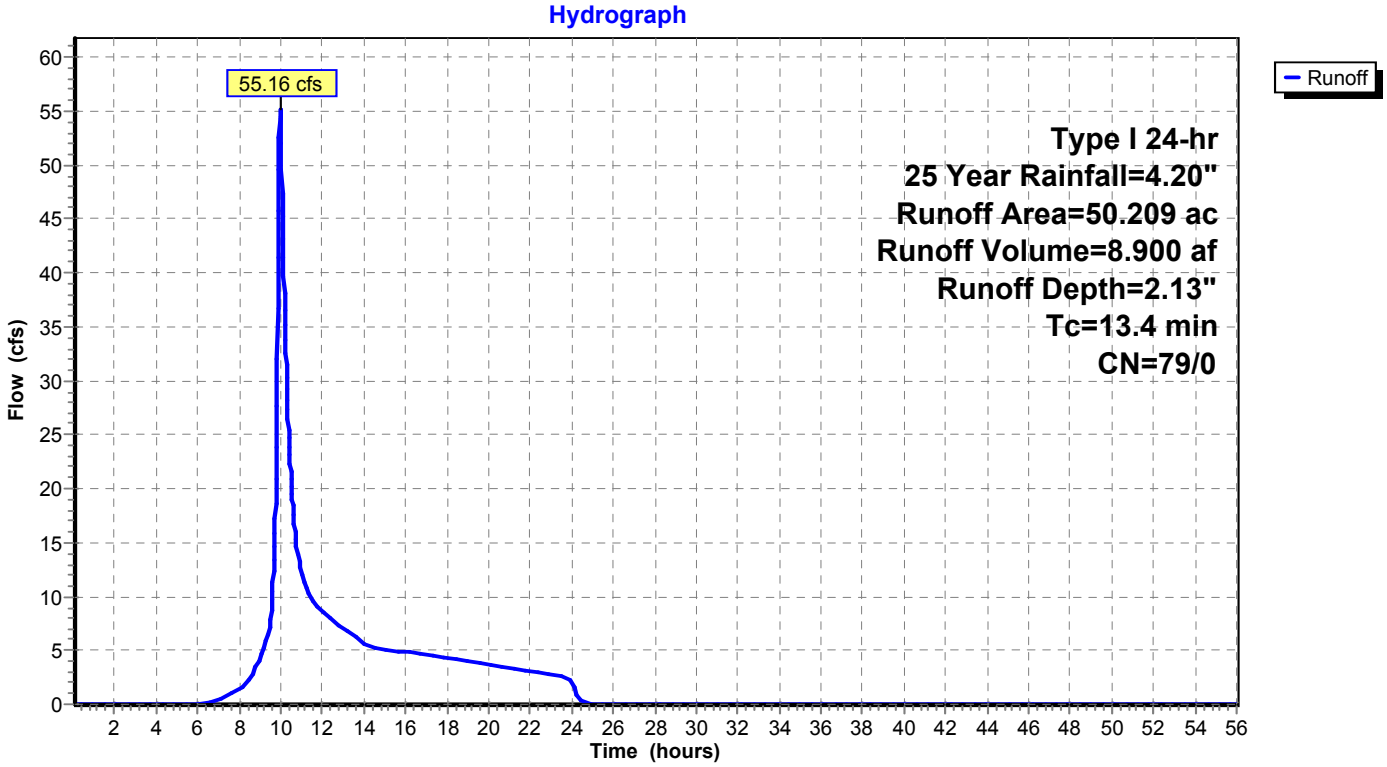
Runoff = 55.16 cfs @ 9.98 hrs, Volume= 8.900 af, Depth= 2.13"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
13.606	75	Row crops, SR + CR, Good, HSG B
8.804	75	Row crops, SR + CR, Good, HSG B
0.005	82	Row crops, SR + CR, Good, HSG C
27.793	82	Row crops, SR + CR, Good, HSG C
50.209	79	Weighted Average
50.209	79	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4					**Direct Entry, SCS Method taken from Catchment in ACAD file**

Subcatchment 14b-Ex: Subcat 14b-Ex



Summary for Subcatchment 14c{(0)}-Ex: Subcat 14c{(0)}-Ex

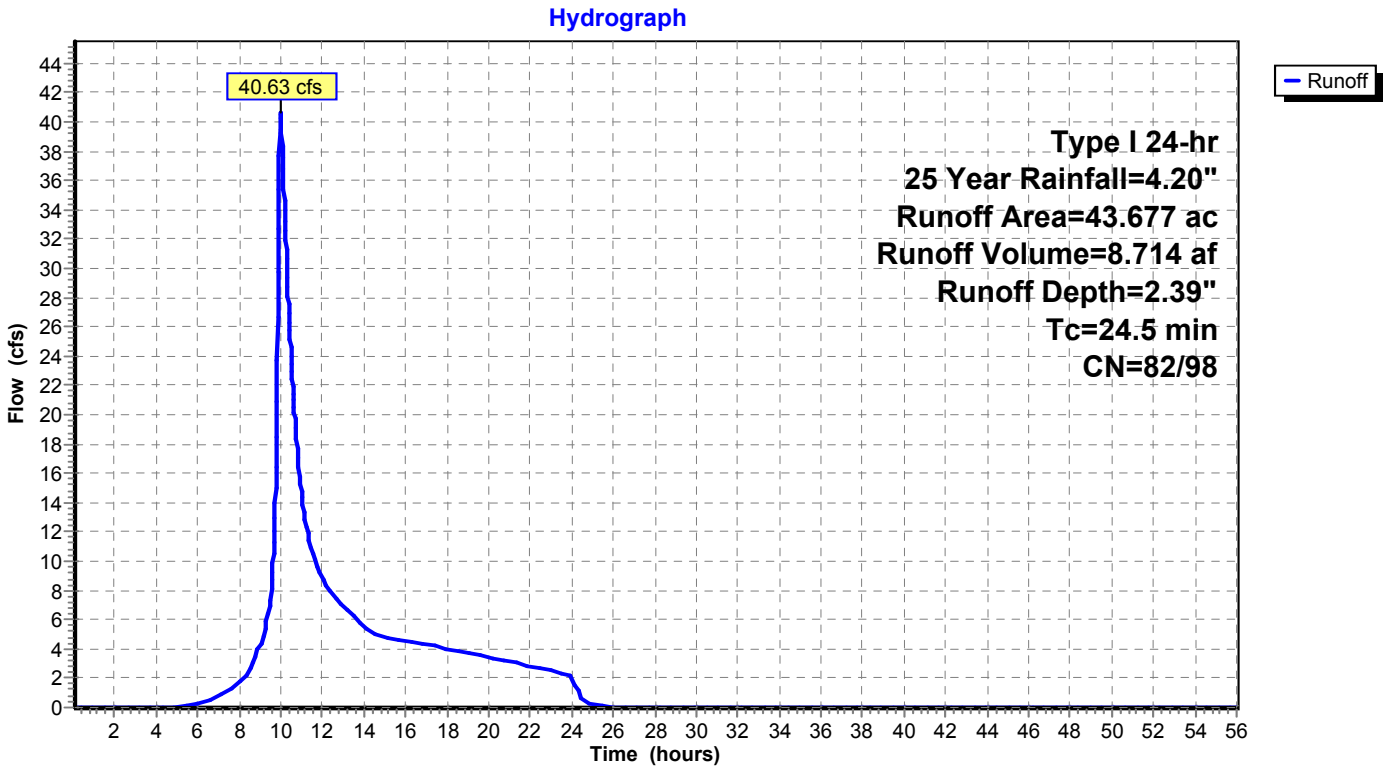
Runoff = 40.63 cfs @ 9.99 hrs, Volume= 8.714 af, Depth= 2.39"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
0.486	98	Paved roads w/curbs & sewers, HSG C
0.041	98	Paved roads w/curbs & sewers, HSG C
37.308	82	Row crops, SR + CR, Good, HSG C
0.070	82	Row crops, SR + CR, Good, HSG C
5.772	82	Row crops, SR + CR, Good, HSG C
43.677	82	Weighted Average
43.150	82	98.79% Pervious Area
0.527	98	1.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 14c{(0)}-Ex: Subcat 14c{(0)}-Ex



Summary for Subcatchment 14c{(1)}-Ex: Subcat 14c{(1)}-Ex

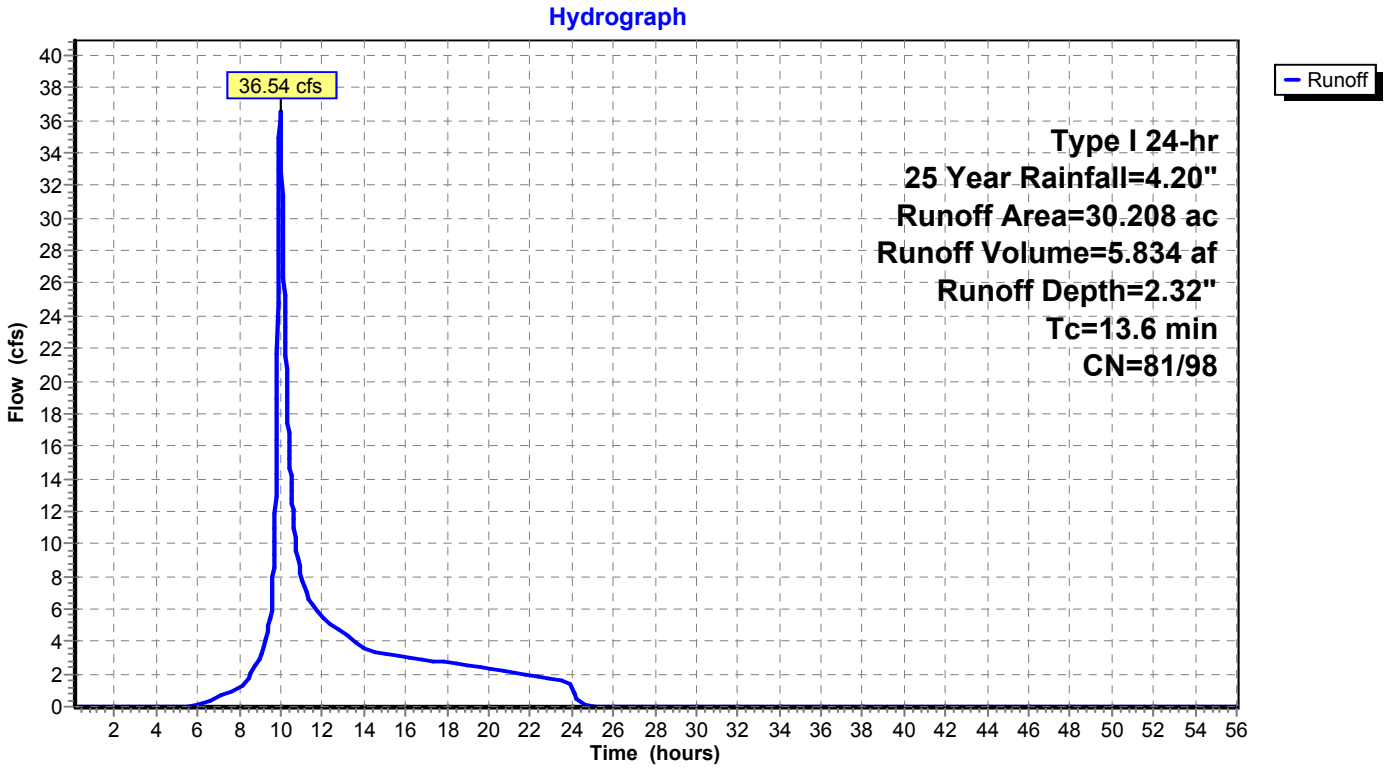
Runoff = 36.54 cfs @ 9.98 hrs, Volume= 5.834 af, Depth= 2.32"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
0.093	98	Paved roads w/curbs & sewers, HSG B
0.394	98	Paved roads w/curbs & sewers, HSG C
2.571	75	Row crops, SR + CR, Good, HSG B
2.743	75	Row crops, SR + CR, Good, HSG B
13.825	82	Row crops, SR + CR, Good, HSG C
10.454	82	Row crops, SR + CR, Good, HSG C
0.128	82	Row crops, SR + CR, Good, HSG C
30.208	81	Weighted Average
29.721	81	98.39% Pervious Area
0.486	98	1.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.6					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 14c{(1)}-Ex: Subcat 14c{(1)}-Ex



Summary for Subcatchment 14c{(2)}-Ex: Subcat 14c{(2)}-Ex

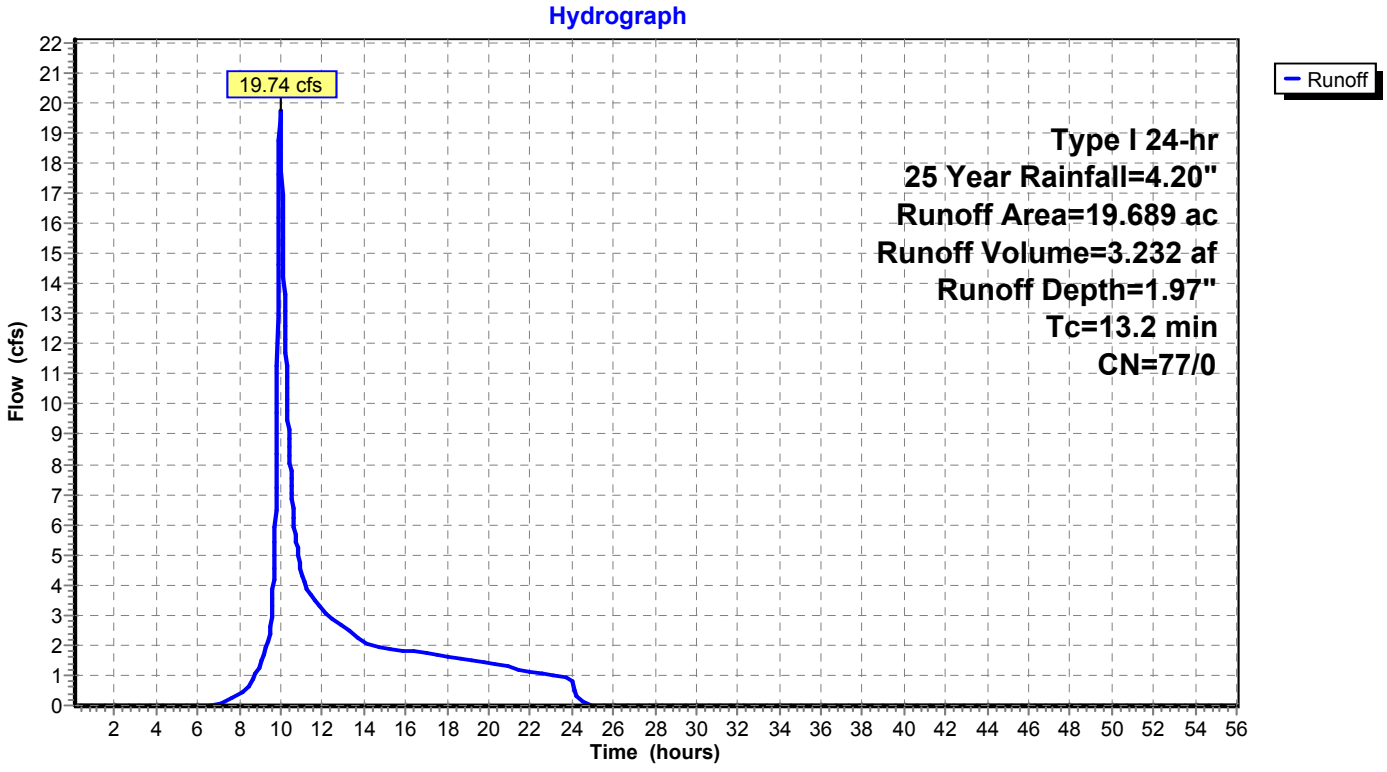
Runoff = 19.74 cfs @ 9.98 hrs, Volume= 3.232 af, Depth= 1.97"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
0.112	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
10.117	75	Row crops, SR + CR, Good, HSG B
3.200	75	Row crops, SR + CR, Good, HSG B
6.261	82	Row crops, SR + CR, Good, HSG C
19.689	77	Weighted Average
19.689	77	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 14c{(2)}-Ex: Subcat 14c{(2)}-Ex



Summary for Subcatchment 14c{(3)}-Ex: Subcat 14c{(3)}-Ex

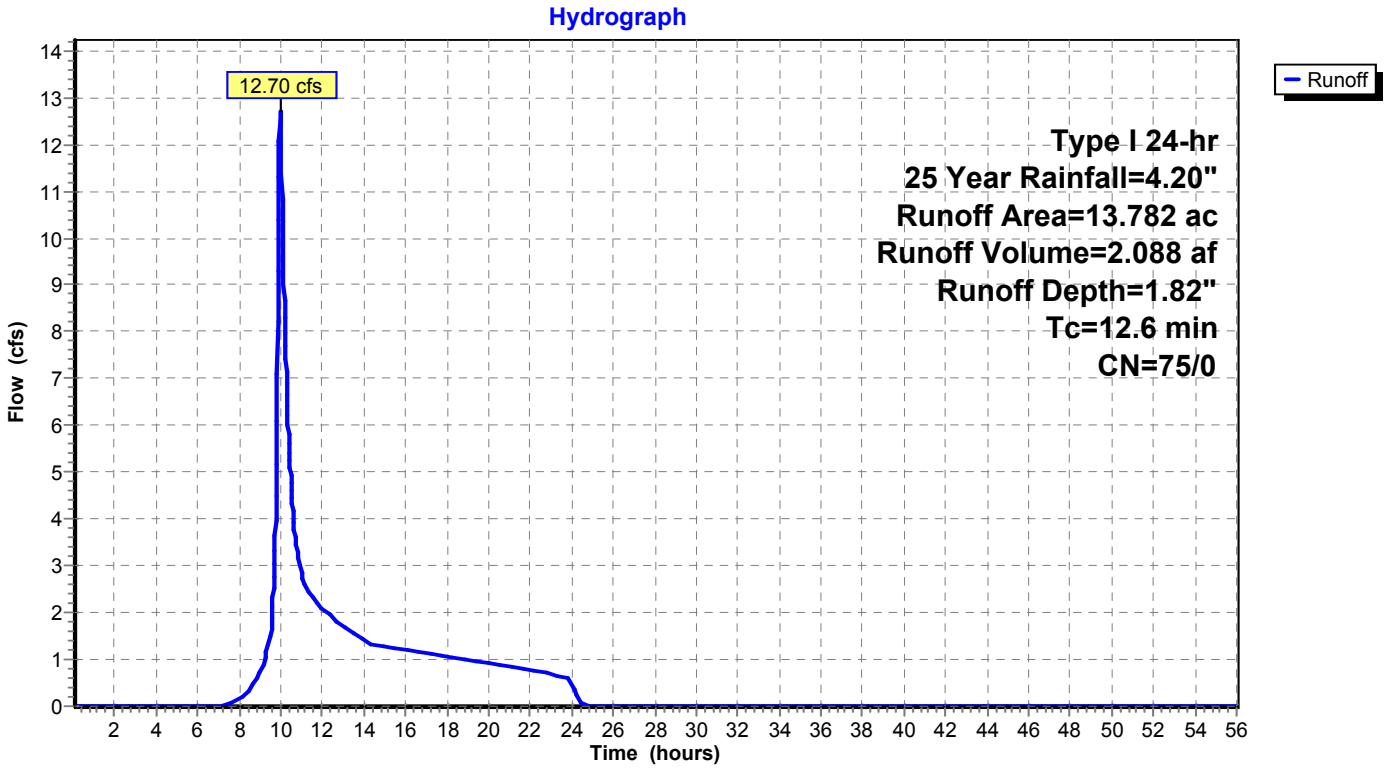
Runoff = 12.70 cfs @ 9.98 hrs, Volume= 2.088 af, Depth= 1.82"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
6.980	75	Row crops, SR + CR, Good, HSG B
0.000	75	Row crops, SR + CR, Good, HSG B
6.802	75	Row crops, SR + CR, Good, HSG B
13.782	75	Weighted Average
13.782	75	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.6					**Direct Entry, SCS Method taken from Catchment in ACAD file**

Subcatchment 14c{(3)}-Ex: Subcat 14c{(3)}-Ex



Summary for Subcatchment 14d-Ex: Subcat 14d-Ex

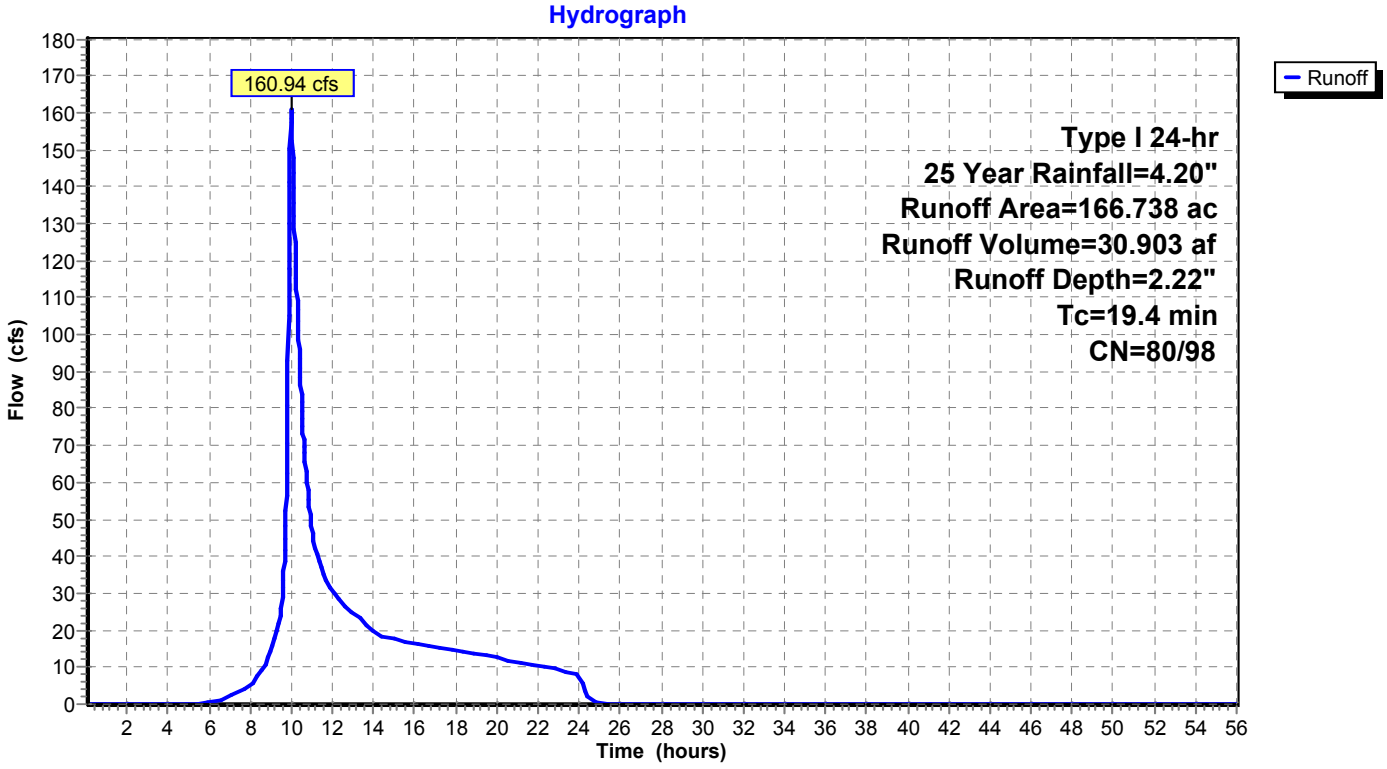
Runoff = 160.94 cfs @ 9.99 hrs, Volume= 30.903 af, Depth= 2.22"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
0.000	71	Meadow, non-grazed, HSG C
0.000	71	Meadow, non-grazed, HSG C
0.000	71	Meadow, non-grazed, HSG C
0.000	71	Meadow, non-grazed, HSG C
0.000	71	Meadow, non-grazed, HSG C
0.440	98	Paved roads w/curbs & sewers, HSG B
0.500	98	Paved roads w/curbs & sewers, HSG C
0.580	98	Paved roads w/curbs & sewers, HSG C
22.046	75	Row crops, SR + CR, Good, HSG B
2.662	75	Row crops, SR + CR, Good, HSG B
18.916	75	Row crops, SR + CR, Good, HSG B
108.025	82	Row crops, SR + CR, Good, HSG C
6.305	82	Row crops, SR + CR, Good, HSG C
7.263	82	Row crops, SR + CR, Good, HSG C
166.738	80	Weighted Average
165.218	80	99.09% Pervious Area
1.520	98	0.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.4					**Direct Entry, SCS Method taken from Catchment in ACAD file**

Subcatchment 14d-Ex: Subcat 14d-Ex



Summary for Subcatchment 14e-Ex: Subcat 14e-Ex

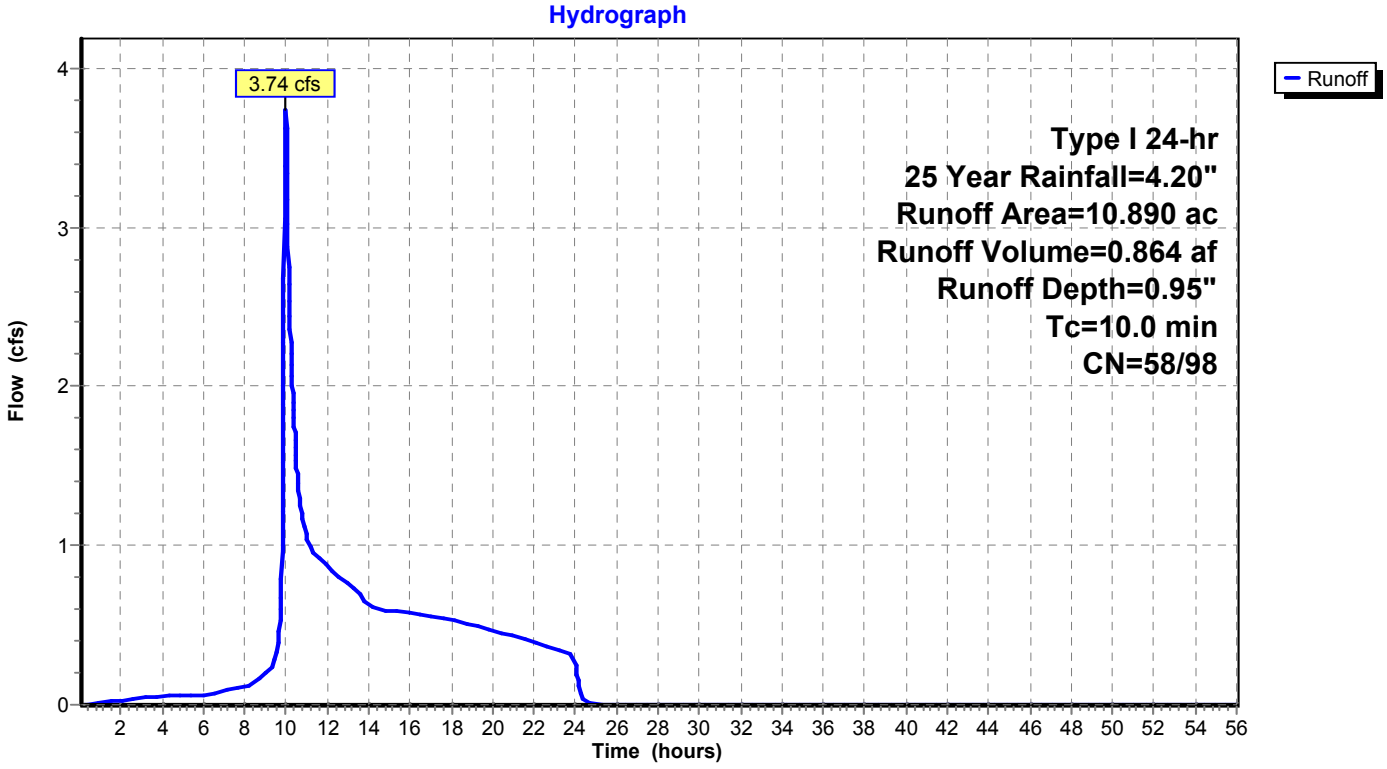
Runoff = 3.74 cfs @ 9.99 hrs, Volume= 0.864 af, Depth= 0.95"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 25 Year Rainfall=4.20"

Area (ac)	CN	Description
10.185	58	Meadow, non-grazed, HSG B
0.003	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.043	77	Natural western desert, HSG B
0.659	98	Paved roads w/curbs & sewers, HSG B
10.890	60	Weighted Average
10.231	58	93.95% Pervious Area
0.659	98	6.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4					**Direct Entry, SCS Method taken from Catchment in ACAD file**
9.4	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 14e-Ex: Subcat 14e-Ex



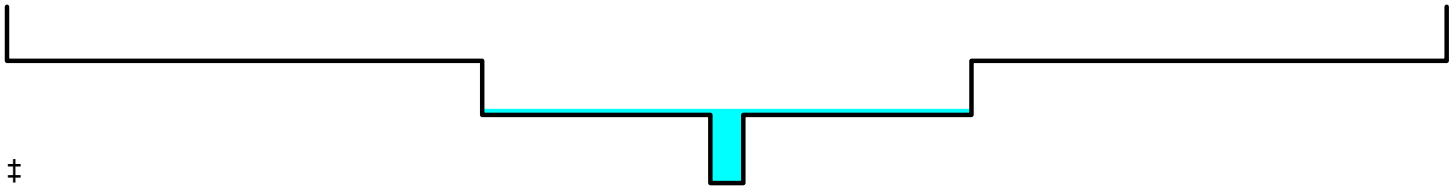
Summary for Reach 6R: Reach 1c

Inflow Area = 784.583 ac, 0.00% Impervious, Inflow Depth = 0.90" for 25 Year event
Inflow = 137.65 cfs @ 10.10 hrs, Volume= 58.525 af
Outflow = 131.50 cfs @ 10.21 hrs, Volume= 58.525 af, Atten= 4%, Lag= 6.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Max. Velocity= 4.26 fps, Min. Travel Time= 3.2 min
Avg. Velocity = 4.22 fps, Avg. Travel Time= 3.3 min

Peak Storage= 31,100 cf @ 10.21 hrs
Average Depth at Peak Storage= 2.75'
Bank-Full Depth= 6.52' Flow Area= 758.7 sf, Capacity= 4,878.97 cfs

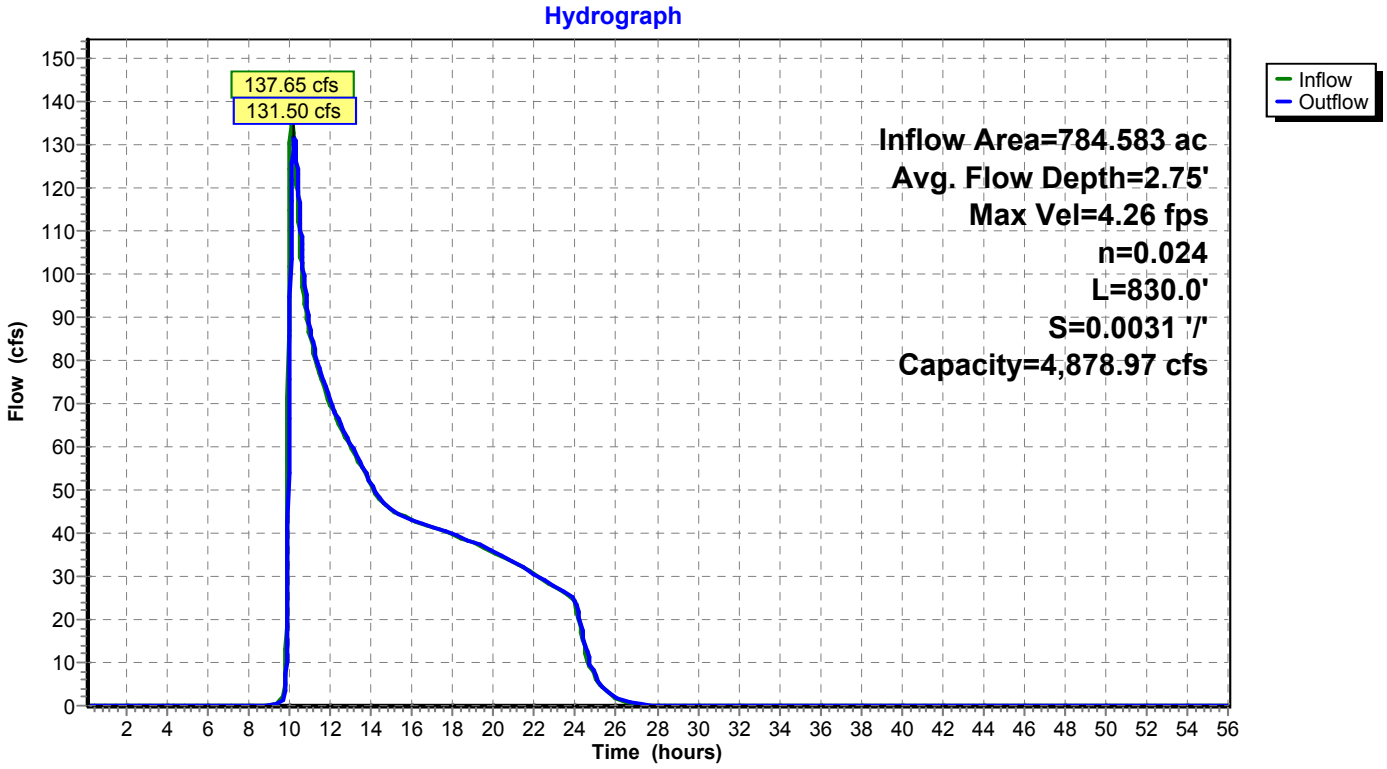
Custom stage-perimeter table, n= 0.024
102 Intermediate values determined by Multi-point interpolation
Length= 830.0' Slope= 0.0031 '/'
Inlet Invert= 841.43', Outlet Invert= 838.82'



‡

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
2.52	15.9	11.7	13,197	67.73
4.52	204.4	231.7	169,652	652.79
6.52	758.7	301.0	629,721	4,878.97

Reach 6R: Reach 1c



Summary for Reach 7R: Reach 1b

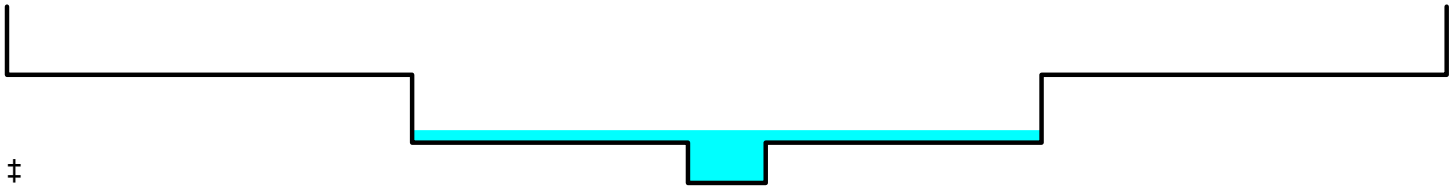
[62] Hint: Exceeded Reach 6R OUTLET depth by 0.77' @ 9.82 hrs

Inflow Area = 833.262 ac, 0.00% Impervious, Inflow Depth = 1.42" for 25 Year event
Inflow = 309.45 cfs @ 10.13 hrs, Volume= 98.507 af
Outflow = 304.94 cfs @ 10.19 hrs, Volume= 98.507 af, Atten= 1%, Lag= 3.6 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Max. Velocity= 4.45 fps, Min. Travel Time= 3.3 min
Avg. Velocity = 3.27 fps, Avg. Travel Time= 4.5 min

Peak Storage= 60,531 cf @ 10.19 hrs
Average Depth at Peak Storage= 1.55'
Bank-Full Depth= 5.18' Flow Area= 896.3 sf, Capacity= 8,865.90 cfs

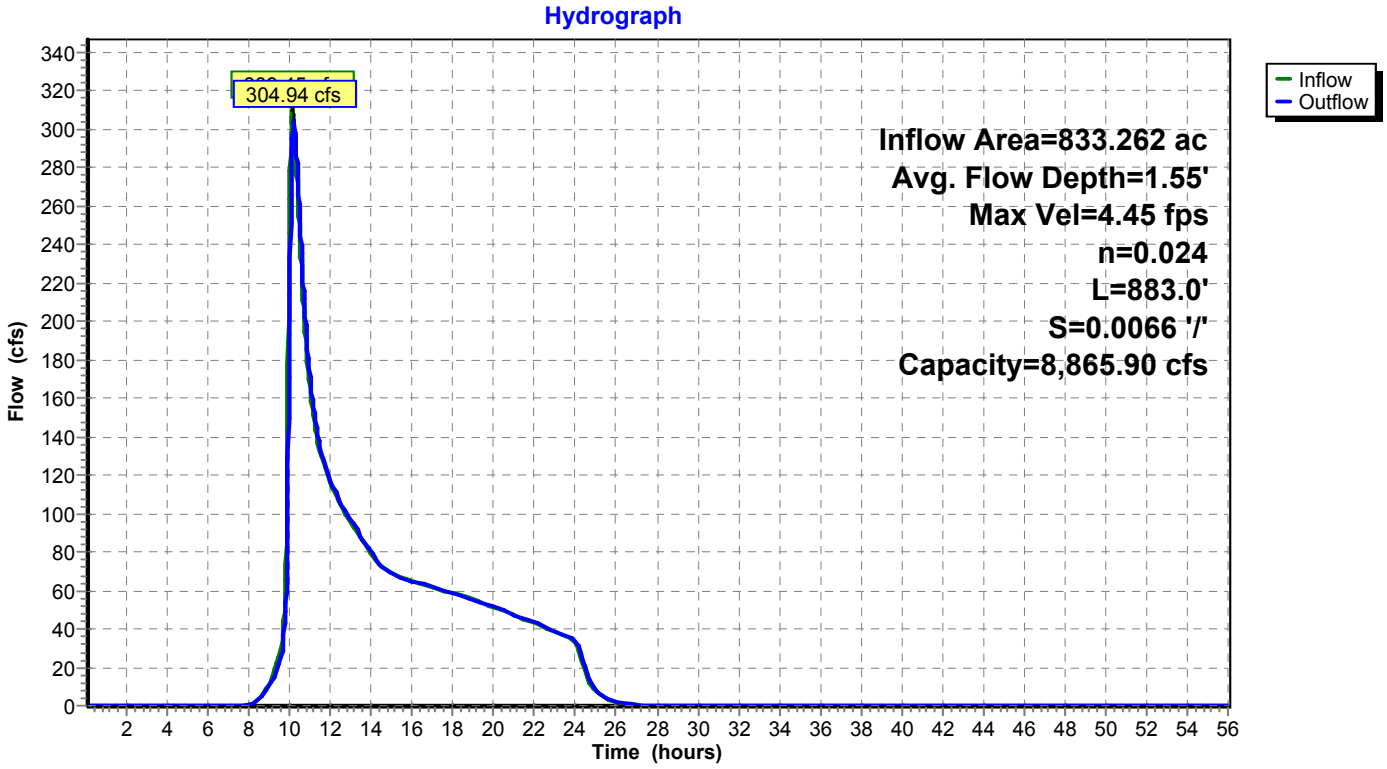
Custom stage-perimeter table, n= 0.024
102 Intermediate values determined by Multi-point interpolation
Length= 883.0' Slope= 0.0066 '/'
Inlet Invert= 838.82', Outlet Invert= 833.00'



‡

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
1.18	19.4	38.8	17,130	61.43
3.18	286.2	275.2	252,715	1,476.75
5.18	896.3	324.7	791,433	8,865.90

Reach 7R: Reach 1b



Summary for Reach 8R: Reach 1a

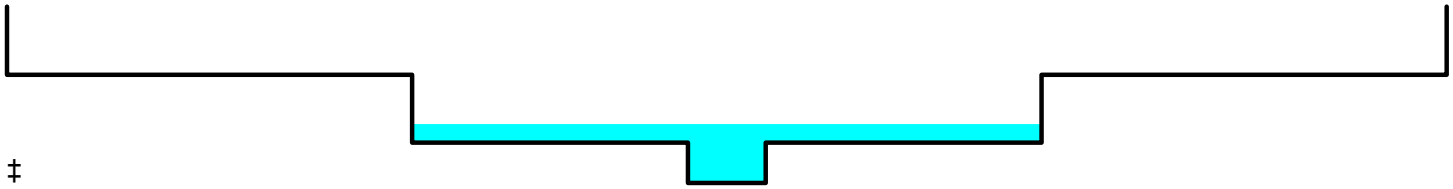
[62] Hint: Exceeded Reach 7R OUTLET depth by 0.36' @ 22.18 hrs

Inflow Area = 879.875 ac, 0.06% Impervious, Inflow Depth = 1.39" for 25 Year event
Inflow = 313.21 cfs @ 10.19 hrs, Volume= 101.702 af
Outflow = 310.01 cfs @ 10.24 hrs, Volume= 101.702 af, Atten= 1%, Lag= 3.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Max. Velocity= 3.36 fps, Min. Travel Time= 2.9 min
Avg. Velocity = 2.42 fps, Avg. Travel Time= 4.0 min

Peak Storage= 53,760 cf @ 10.24 hrs
Average Depth at Peak Storage= 1.73'
Bank-Full Depth= 5.18' Flow Area= 896.3 sf, Capacity= 6,396.21 cfs

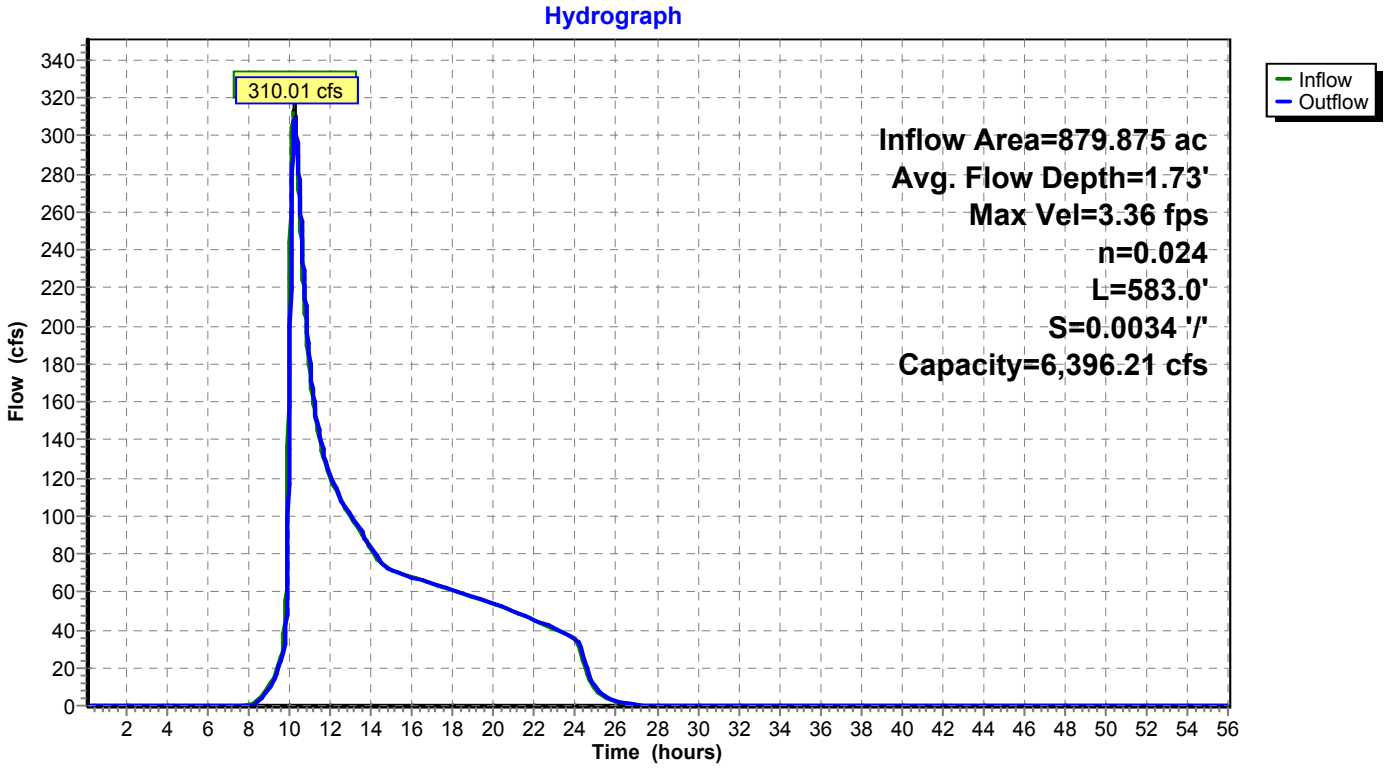
Custom stage-perimeter table, n= 0.024
102 Intermediate values determined by Multi-point interpolation
Length= 583.0' Slope= 0.0034 '/'
Inlet Invert= 833.00', Outlet Invert= 831.00'



‡

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
1.18	19.4	38.8	11,310	44.32
3.18	286.2	275.2	166,855	1,065.38
5.18	896.3	324.7	522,543	6,396.21

Reach 8R: Reach 1a



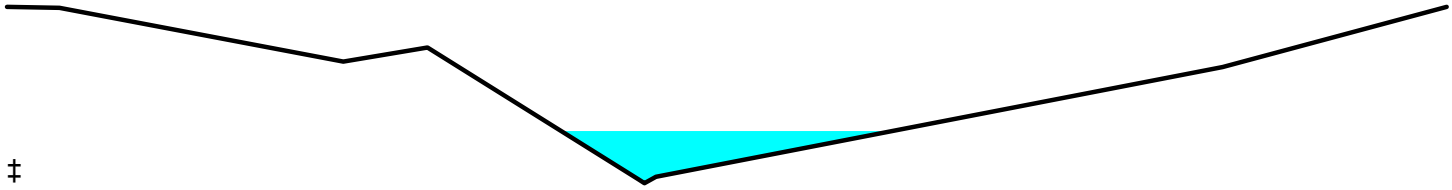
Summary for Reach 17R: Reach 1d

Inflow = 55.87 cfs @ 10.00 hrs, Volume= 1.597 af
Outflow = 45.04 cfs @ 10.08 hrs, Volume= 1.597 af, Atten= 19%, Lag= 5.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Max. Velocity= 2.44 fps, Min. Travel Time= 5.7 min
Avg. Velocity = 0.55 fps, Avg. Travel Time= 25.6 min

Peak Storage= 15,520 cf @ 10.08 hrs
Average Depth at Peak Storage= 0.58'
Bank-Full Depth= 1.96' Flow Area= 247.0 sf, Capacity= 1,276.84 cfs

Custom cross-section, Length= 841.0' Slope= 0.0110 '/' (102 Elevation Intervals)
Constant n= 0.027
Inlet Invert= 853.60', Outlet Invert= 844.31'



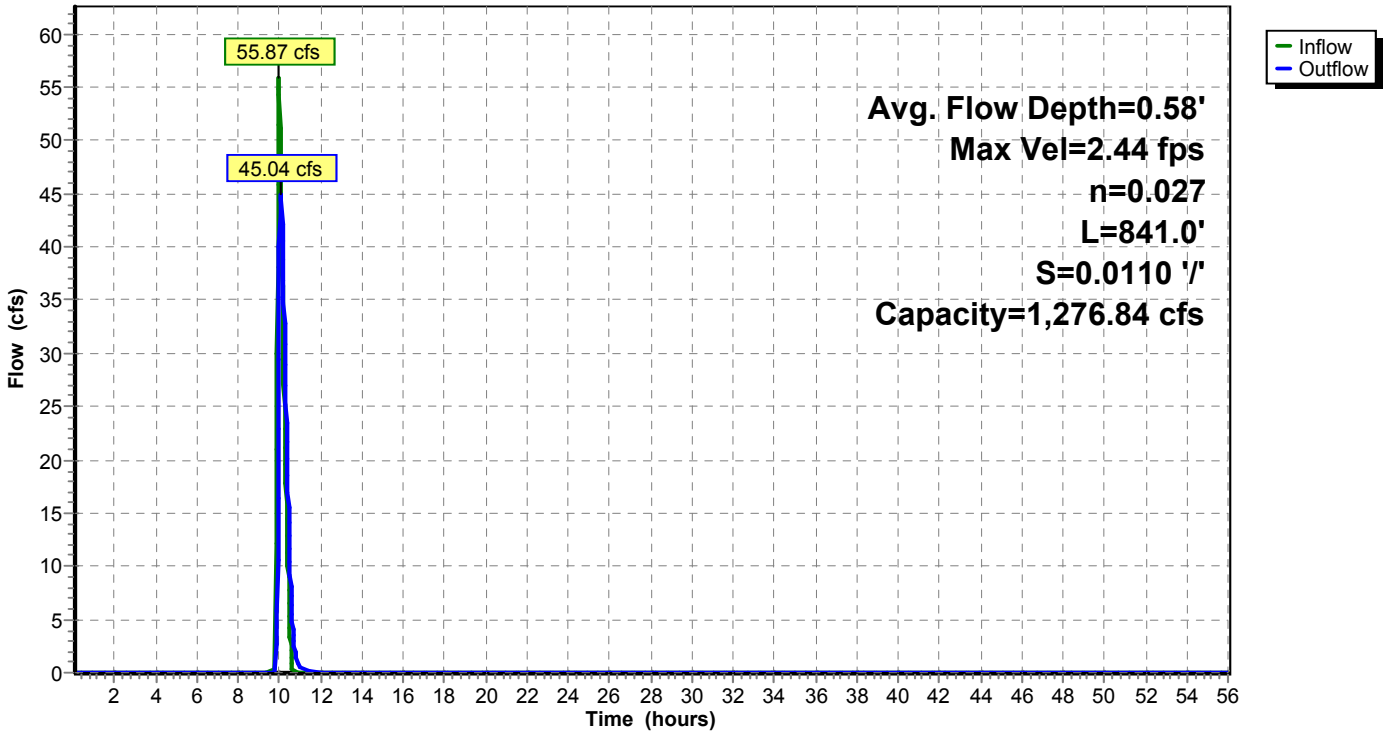
‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
8.56	851.18	0.00
19.24	851.17	0.01
76.81	850.57	0.61
93.88	850.73	0.45
136.80	849.26	1.92
137.90	849.22	1.96
140.29	849.29	1.89
255.27	850.51	0.67
300.75	851.18	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
0.04	0.0	2.5	42	0.02
0.07	0.2	4.4	128	0.09
1.29	97.3	155.0	81,870	413.13
1.35	106.8	160.8	89,836	469.56
1.51	136.4	208.8	114,697	594.12
1.95	244.1	280.9	205,277	1,285.78
1.96	247.0	292.2	207,687	1,276.84

Reach 17R: Reach 1d

Hydrograph



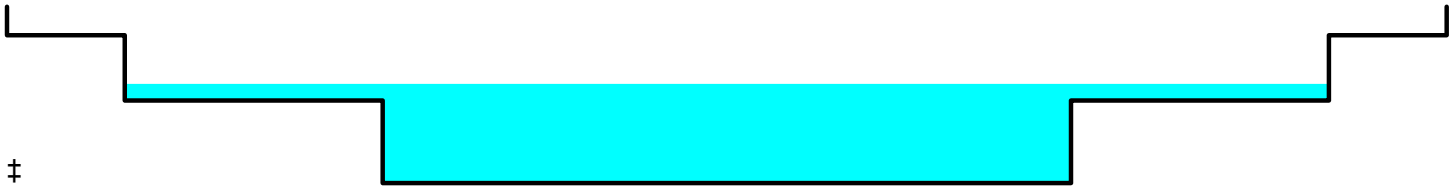
Summary for Reach 18R: Linne Road Grassed Chl

Inflow Area = 276.531 ac, 1.18% Impervious, Inflow Depth = 0.56" for 25 Year event
Inflow = 21.44 cfs @ 10.07 hrs, Volume= 12.833 af
Outflow = 20.56 cfs @ 10.18 hrs, Volume= 12.833 af, Atten= 4%, Lag= 6.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Max. Velocity= 2.63 fps, Min. Travel Time= 7.5 min
Avg. Velocity = 2.27 fps, Avg. Travel Time= 8.7 min

Peak Storage= 9,309 cf @ 10.18 hrs
Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 1.11' Flow Area= 18.0 sf, Capacity= 66.25 cfs

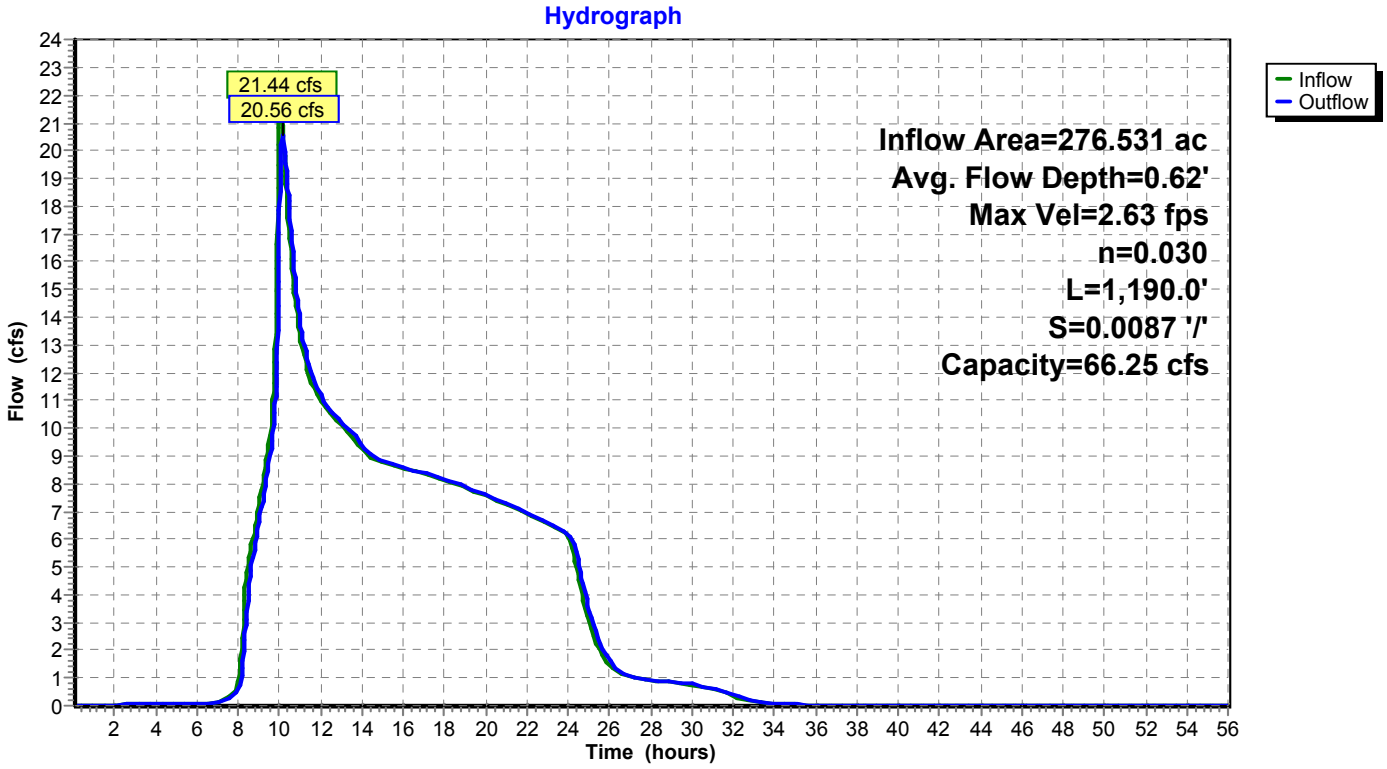
Custom stage-perimeter table, n= 0.030
100 Intermediate values determined by Multi-point interpolation
Length= 1,190.0' Slope= 0.0087 '/'
Inlet Invert= 841.60', Outlet Invert= 831.20'



‡

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
0.52	5.8	16.9	6,916	13.23
0.93	13.8	22.4	16,431	46.30
1.11	18.0	25.4	21,420	66.25

Reach 18R: Linne Road Grassed Chl



Summary for Pond 17P: Gran Cielo Dwy

[58] Hint: Peaked 0.54' above defined flood level

Inflow Area = 166.738 ac, 0.91% Impervious, Inflow Depth = 2.22" for 25 Year event
Inflow = 160.94 cfs @ 9.99 hrs, Volume= 30.903 af
Outflow = 160.58 cfs @ 10.00 hrs, Volume= 30.903 af, Atten= 0%, Lag= 0.6 min
Primary = 104.69 cfs @ 10.00 hrs, Volume= 29.306 af
Secondary = 0.01 cfs @ 10.00 hrs, Volume= 0.000 af
Tertiary = 55.87 cfs @ 10.00 hrs, Volume= 1.597 af

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Peak Elev= 855.00' @ 10.00 hrs Surf.Area= 8,083 sf Storage= 10,997 cf
Flood Elev= 854.46' Surf.Area= 6,947 sf Storage= 6,934 cf

Plug-Flow detention time= 1.8 min calculated for 30.892 af (100% of inflow)
Center-of-Mass det. time= 1.8 min (820.4 - 818.5)

Volume	Invert	Avail.Storage	Storage Description
#1	852.84'	22,270 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
852.84	0	0	0
853.14	2,586	388	388
854.14	6,275	4,431	4,818
855.14	8,376	7,326	12,144
856.14	11,876	10,126	22,270

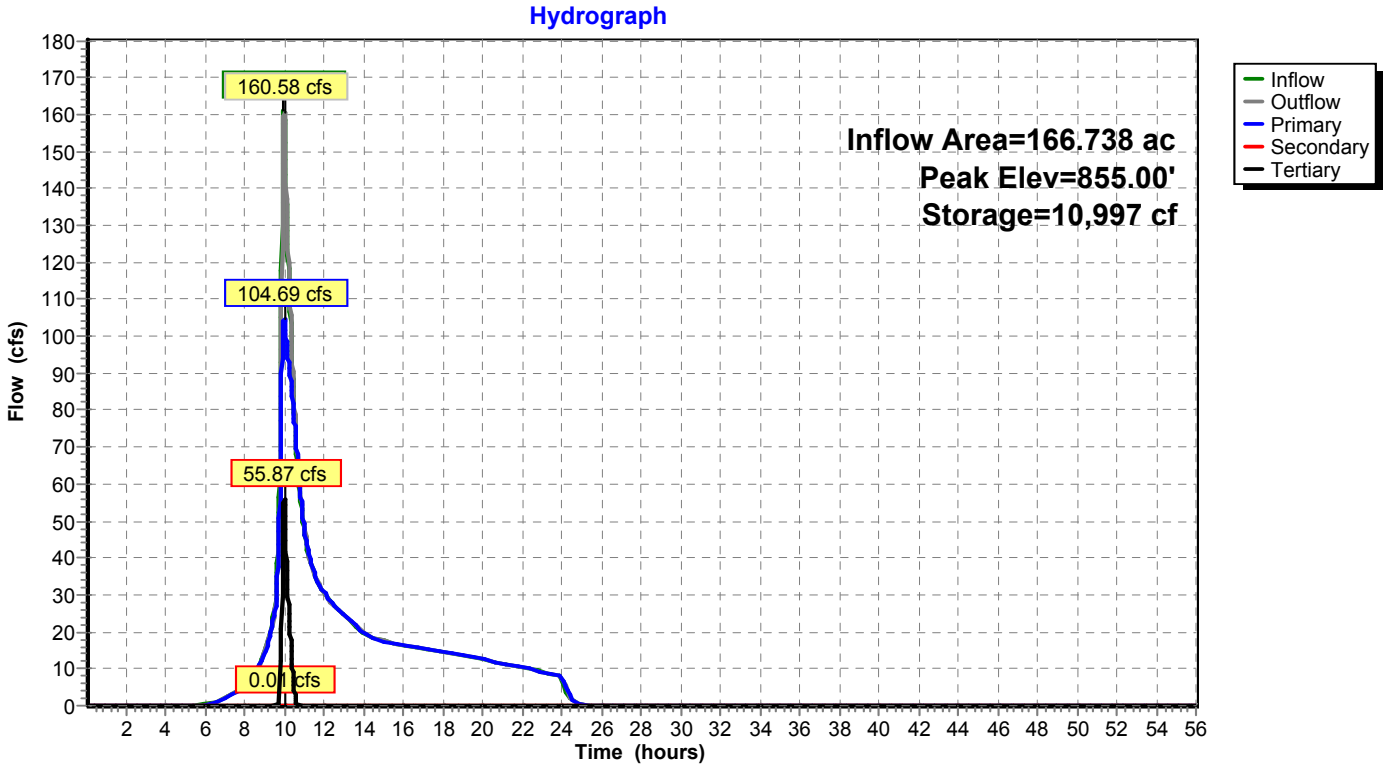
Device	Routing	Invert	Outlet Devices
#1	Primary	852.84'	**30.0" Round Culvert X 6.00** L= 77.0' CMP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 852.84' / 851.76' S= 0.0140 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 4.91 sf
#2	Secondary	854.90'	**Special & User-Defined** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 Disch. (cfs) 0.000 0.010 0.200 0.710 1.580 2.700 4.030 5.690 7.620 9.790 12.320 15.140 18.190 21.460 24.930 28.580 32.420 36.420 40.580 44.900 49.360 53.970
#3	Tertiary	854.40'	**Special & User-Defined** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 2.20 2.30 2.40 2.50 2.60 Disch. (cfs) 0.000 0.080 3.470 10.790 21.890 36.810 55.720 78.890 106.600 138.580 174.620 214.630 258.590 306.440 358.240 413.470 471.810 533.060 597.050 663.650 732.760 804.270 878.100 954.180 1,032.440 1,112.810 1,195.240

Primary OutFlow Max=104.64 cfs @ 10.00 hrs HW=855.00' TW=851.56' (Dynamic Tailwater)
1=Culvert (Barrel Controls 104.64 cfs @ 5.18 fps)

Secondary OutFlow Max=0.01 cfs @ 10.00 hrs HW=855.00' TW=851.57' (Dynamic Tailwater)
2=Special & User-Defined (Custom Controls 0.01 cfs)

Tertiary OutFlow Max=55.70 cfs @ 10.00 hrs HW=855.00' TW=854.13' (Dynamic Tailwater)
3=Special & User-Defined (Custom Controls 55.70 cfs)

Pond 17P: Gran Cielo Dwy



Summary for Pond 18P: GC-CkD1

[58] Hint: Peaked 1.43' above defined flood level

Inflow Area = 240.622 ac, 1.05% Impervious, Inflow Depth = 2.19" for 25 Year event
Inflow = 181.62 cfs @ 9.99 hrs, Volume= 43.854 af
Outflow = 174.59 cfs @ 10.04 hrs, Volume= 43.791 af, Atten= 4%, Lag= 3.2 min
Primary = 1.04 cfs @ 9.98 hrs, Volume= 1.666 af
Secondary = 96.98 cfs @ 10.04 hrs, Volume= 33.439 af
Tertiary = 76.59 cfs @ 10.04 hrs, Volume= 8.686 af

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Peak Elev= 851.60' @ 10.04 hrs Surf.Area= 26,840 sf Storage= 56,309 cf
Flood Elev= 850.17' Surf.Area= 18,994 sf Storage= 23,481 cf

Plug-Flow detention time= 16.2 min calculated for 43.791 af (100% of inflow)
Center-of-Mass det. time= 15.1 min (840.3 - 825.2)

Volume	Invert	Avail.Storage	Storage Description
#1	844.56'	67,617 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
844.56	10	0	0
845.00	200	46	46
846.00	600	400	446
847.00	1,500	1,050	1,496
848.00	2,166	1,833	3,329
849.00	7,688	4,927	8,256
850.00	16,694	12,191	20,447
850.20	19,400	3,609	24,057
852.00	29,000	43,560	67,617

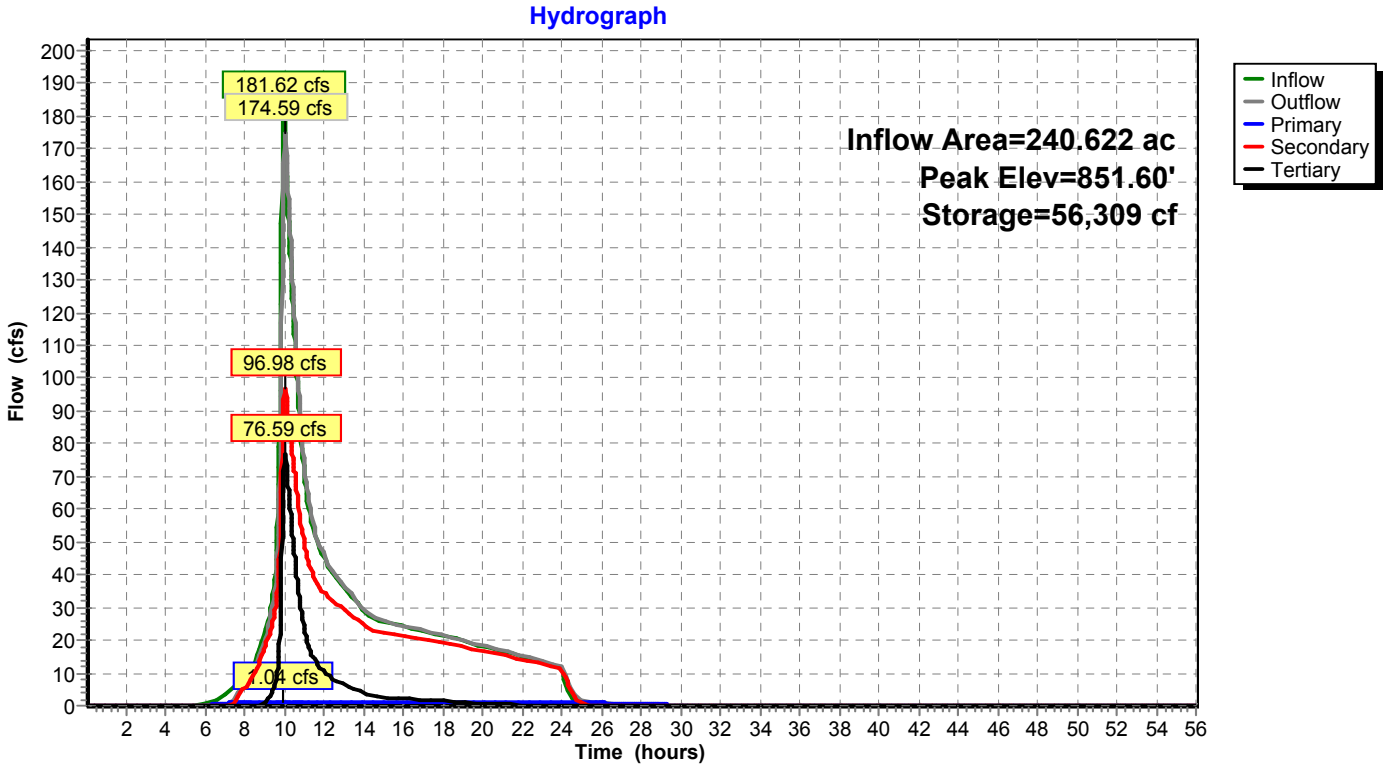
Device	Routing	Invert	Outlet Devices
#1	Primary	847.69'	**6.0" Round Culvert** L= 26.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 847.69' / 847.67' S= 0.0008 '/' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Secondary	849.50'	**9.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59
#3	Tertiary	850.00'	**Special & User-Defined (CkD1-S)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 Disch. (cfs) 0.000 0.030 0.560 1.900 4.120 7.220 11.180 15.770 20.900 26.530 32.600 39.090 45.970 53.220 60.820 68.750 77.000 85.570 94.430 103.580 113.010

Primary OutFlow Max=1.03 cfs @ 9.98 hrs HW=851.54' TW=849.63' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.03 cfs @ 5.25 fps)

Secondary OutFlow Max=96.82 cfs @ 10.04 hrs HW=851.59' TW=849.70' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 96.82 cfs @ 5.14 fps)

Tertiary OutFlow Max=76.52 cfs @ 10.04 hrs HW=851.59' TW=0.00' (Dynamic Tailwater)
└**3=Special & User-Defined (CkD1-S)** (Custom Controls 76.52 cfs)

Pond 18P: GC-CkD1



Summary for Pond 19P: GC-CkD2

[58] Hint: Peaked 1.07' above defined flood level

Inflow Area = 260.311 ac, 0.97% Impervious, Inflow Depth = 1.77" for 25 Year event
Inflow = 116.37 cfs @ 10.02 hrs, Volume= 38.336 af
Outflow = 112.03 cfs @ 10.09 hrs, Volume= 38.335 af, Atten= 4%, Lag= 4.5 min
Primary = 1.37 cfs @ 10.09 hrs, Volume= 2.166 af
Secondary = 70.51 cfs @ 10.09 hrs, Volume= 32.030 af
Tertiary = 40.16 cfs @ 10.09 hrs, Volume= 4.140 af

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Peak Elev= 849.72' @ 10.09 hrs Surf.Area= 32,923 sf Storage= 36,034 cf
Flood Elev= 848.65' Surf.Area= 11,850 sf Storage= 14,787 cf

Plug-Flow detention time= 12.2 min calculated for 38.321 af (100% of inflow)
Center-of-Mass det. time= 12.2 min (885.1 - 872.9)

Volume	Invert	Avail.Storage	Storage Description
#1	846.00'	46,430 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
846.00	267	0	0
847.00	4,055	2,161	2,161
848.00	8,178	6,117	8,278
849.00	13,828	11,003	19,281
850.00	40,470	27,149	46,430

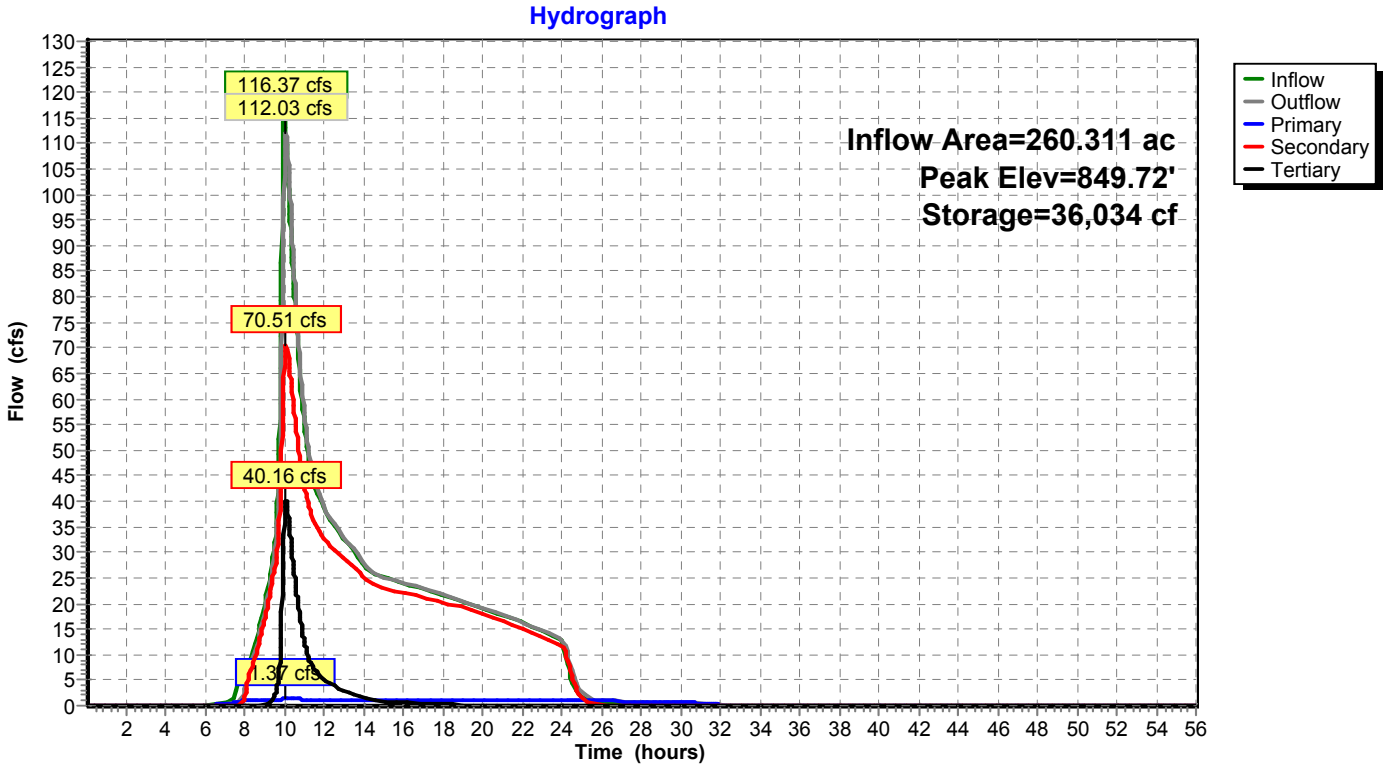
Device	Routing	Invert	Outlet Devices
#1	Primary	846.12'	**6.0" Round Culvert** L= 26.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 846.12' / 845.98' S= 0.0054 '/' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Tertiary	848.70'	**Special & User-Defined (CkD2-S)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 Disch. (cfs) 0.000 0.130 0.970 2.640 5.120 8.550 13.010 18.440 24.620 31.430 38.830 46.770 55.210 64.120
#3	Secondary	847.80'	**Special & User-Defined (CkD2-W)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 2.20 Disch. (cfs) 0.000 0.020 0.480 1.430 2.780 4.430 6.490 8.950 12.010 15.510 19.390 23.590 28.100 32.980 38.270 43.910 49.850 56.080 62.580 69.340 76.350 83.590 91.070

Primary OutFlow Max=1.37 cfs @ 10.09 hrs HW=849.72' TW=846.07' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.37 cfs @ 6.95 fps)

Secondary OutFlow Max=70.49 cfs @ 10.09 hrs HW=849.72' TW=846.07' (Dynamic Tailwater)
└**3=Special & User-Defined (CkD2-W)** (Custom Controls 70.49 cfs)

Tertiary OutFlow Max=40.13 cfs @ 10.09 hrs HW=849.72' TW=0.00' (Dynamic Tailwater)
└**2=Special & User-Defined (CkD2-S)** (Custom Controls 40.13 cfs)

Pond 19P: GC-CkD2



Summary for Pond 20P: GC-CkD3

[58] Hint: Peaked 1.05' above defined flood level

Inflow Area = 274.094 ac, 0.92% Impervious, Inflow Depth = 1.59" for 25 Year event
Inflow = 82.30 cfs @ 10.06 hrs, Volume= 36.283 af
Outflow = 81.94 cfs @ 10.09 hrs, Volume= 36.272 af, Atten= 0%, Lag= 1.8 min
Primary = 6.72 cfs @ 10.09 hrs, Volume= 7.070 af
Secondary = 13.20 cfs @ 10.09 hrs, Volume= 5.415 af
Tertiary = 62.01 cfs @ 10.09 hrs, Volume= 23.787 af

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Peak Elev= 846.07' @ 10.09 hrs Surf.Area= 15,484 sf Storage= 17,246 cf
Flood Elev= 845.02' Surf.Area= 8,229 sf Storage= 4,852 cf

Plug-Flow detention time= 8.1 min calculated for 36.272 af (100% of inflow)
Center-of-Mass det. time= 7.5 min (914.4 - 906.8)

Volume	Invert	Avail.Storage	Storage Description
#1	844.00'	24,632 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
844.00	1,288	0	0
845.00	8,090	4,689	4,689
846.50	18,500	19,943	24,632

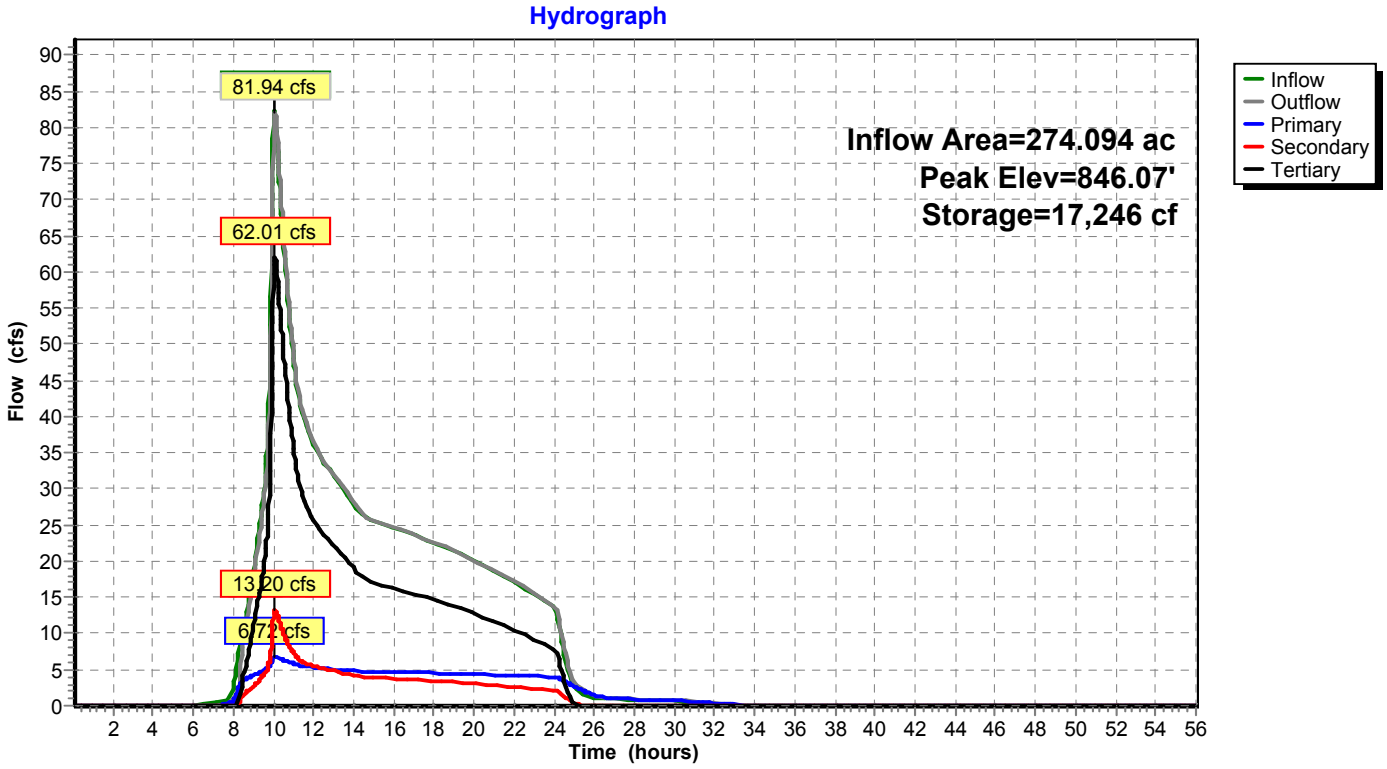
Device	Routing	Invert	Outlet Devices
#1	Primary	844.22'	**18.0" Round Culvert** L= 26.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 844.22' / 843.98' S= 0.0092 '/' Cc= 0.900 n= 0.021 Corrugated metal, Flow Area= 1.77 sf
#2	Secondary	845.00'	**Special & User-Defined (CkD3-W)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 Disch. (cfs) 0.000 0.050 0.390 0.970 1.710 2.600 3.780 5.170 6.720 8.570 11.140 14.290 17.880 21.830 26.120 30.880 36.030 41.520 47.330 53.420 59.790
#3	Tertiary	845.10'	**Special & User-Defined (CkD3-S)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 Disch. (cfs) 0.000 0.050 1.930 5.420 10.370 16.490 23.960 32.580 42.550 53.770 66.380 80.510 96.280 113.770 132.840 153.630 175.910 199.510 224.310 250.260

Primary OutFlow Max=6.72 cfs @ 10.09 hrs HW=846.07' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 6.72 cfs @ 3.95 fps)

Secondary OutFlow Max=13.19 cfs @ 10.09 hrs HW=846.07' TW=0.00' (Dynamic Tailwater)
↑—**2=Special & User-Defined (CkD3-W)** (Custom Controls 13.19 cfs)

Tertiary OutFlow Max=61.98 cfs @ 10.09 hrs HW=846.07' TW=0.00' (Dynamic Tailwater)
↑—**3=Special & User-Defined (CkD3-S)** (Custom Controls 61.98 cfs)

Pond 20P: GC-CkD3

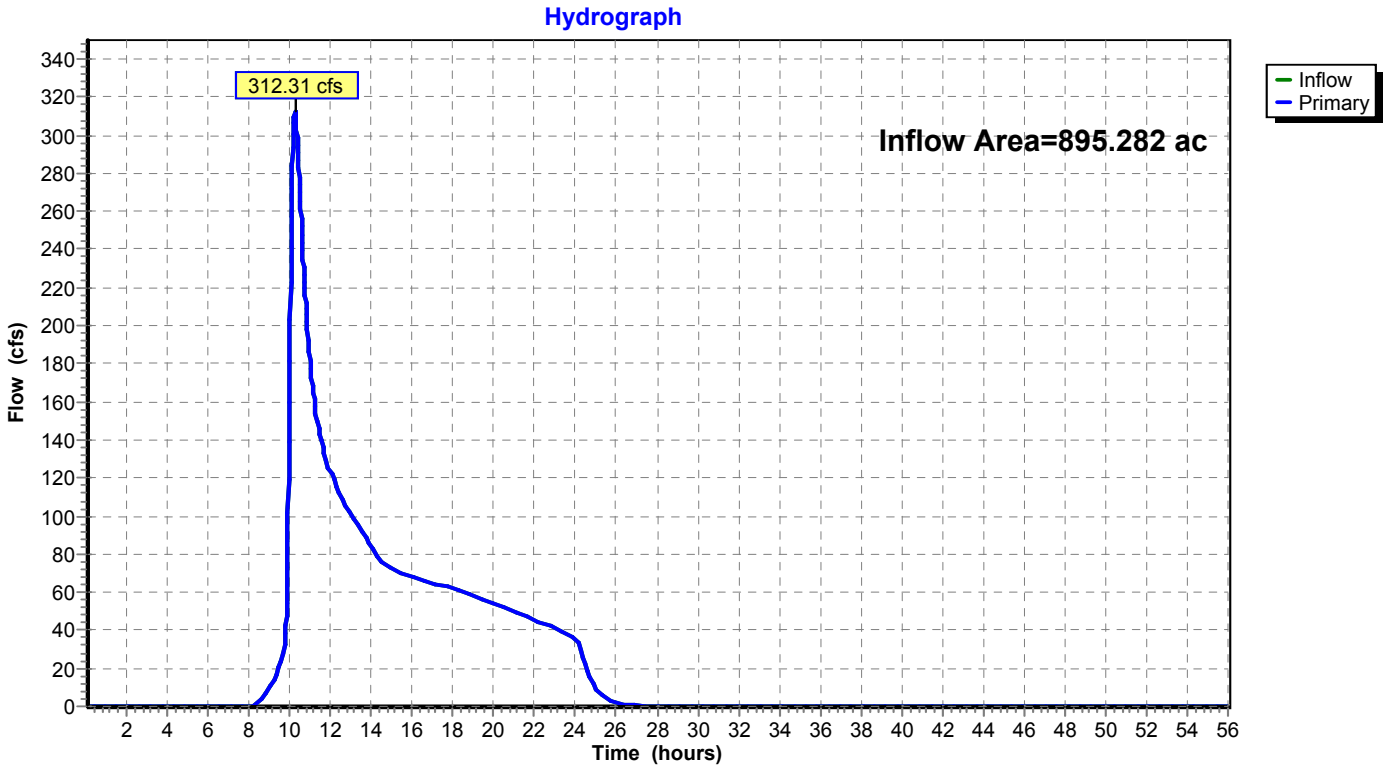


Summary for Link 3a (1,2+3)-Ex: Comb Un-dev Ck Flow

Inflow Area = 895.282 ac, 0.06% Impervious, Inflow Depth = 1.38" for 25 Year event
Inflow = 312.31 cfs @ 10.24 hrs, Volume= 102.675 af
Primary = 312.31 cfs @ 10.24 hrs, Volume= 102.675 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 3a (1,2+3)-Ex: Comb Un-dev Ck Flow

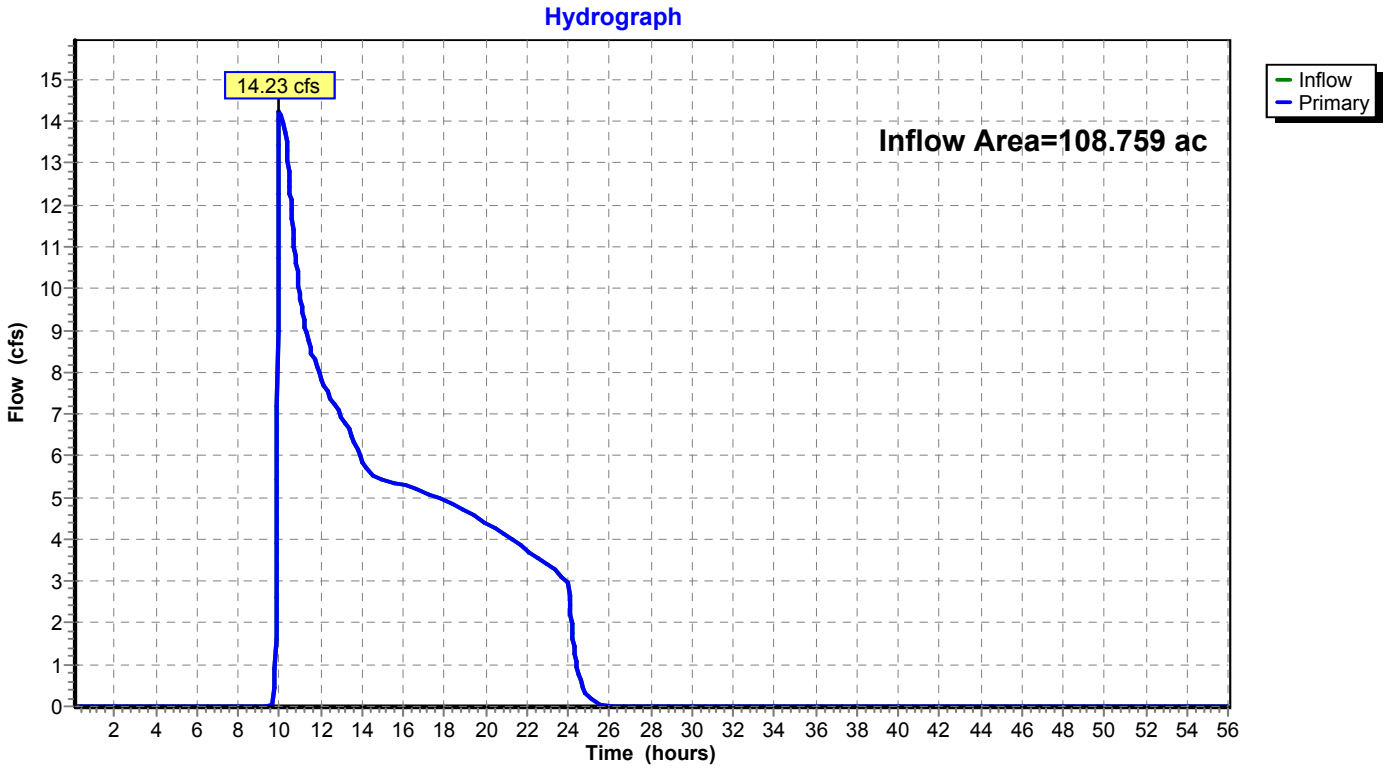


Summary for Link 5L: Outlet To Tract #1632 Ex. 36" SD

Inflow Area = 108.759 ac, 0.00% Impervious, Inflow Depth = 0.76" for 25 Year event
Inflow = 14.23 cfs @ 10.02 hrs, Volume= 6.867 af
Primary = 14.23 cfs @ 10.02 hrs, Volume= 6.867 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 5L: Outlet To Tract #1632 Ex. 36" SD

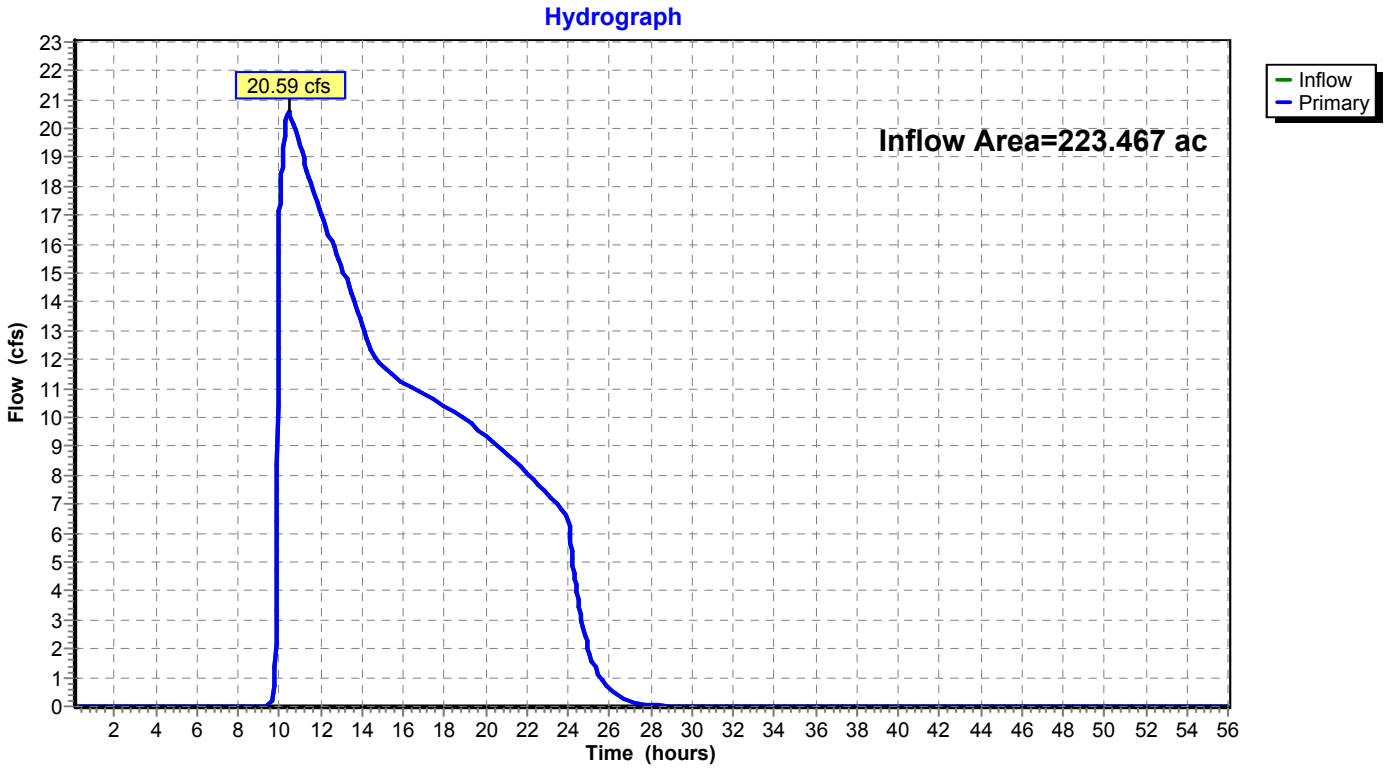


Summary for Link 6L: To Existing Meadowlark Road

Inflow Area = 223.467 ac, 0.00% Impervious, Inflow Depth = 0.77" for 25 Year event
Inflow = 20.59 cfs @ 10.47 hrs, Volume= 14.315 af
Primary = 20.59 cfs @ 10.47 hrs, Volume= 14.315 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 6L: To Existing Meadowlark Road

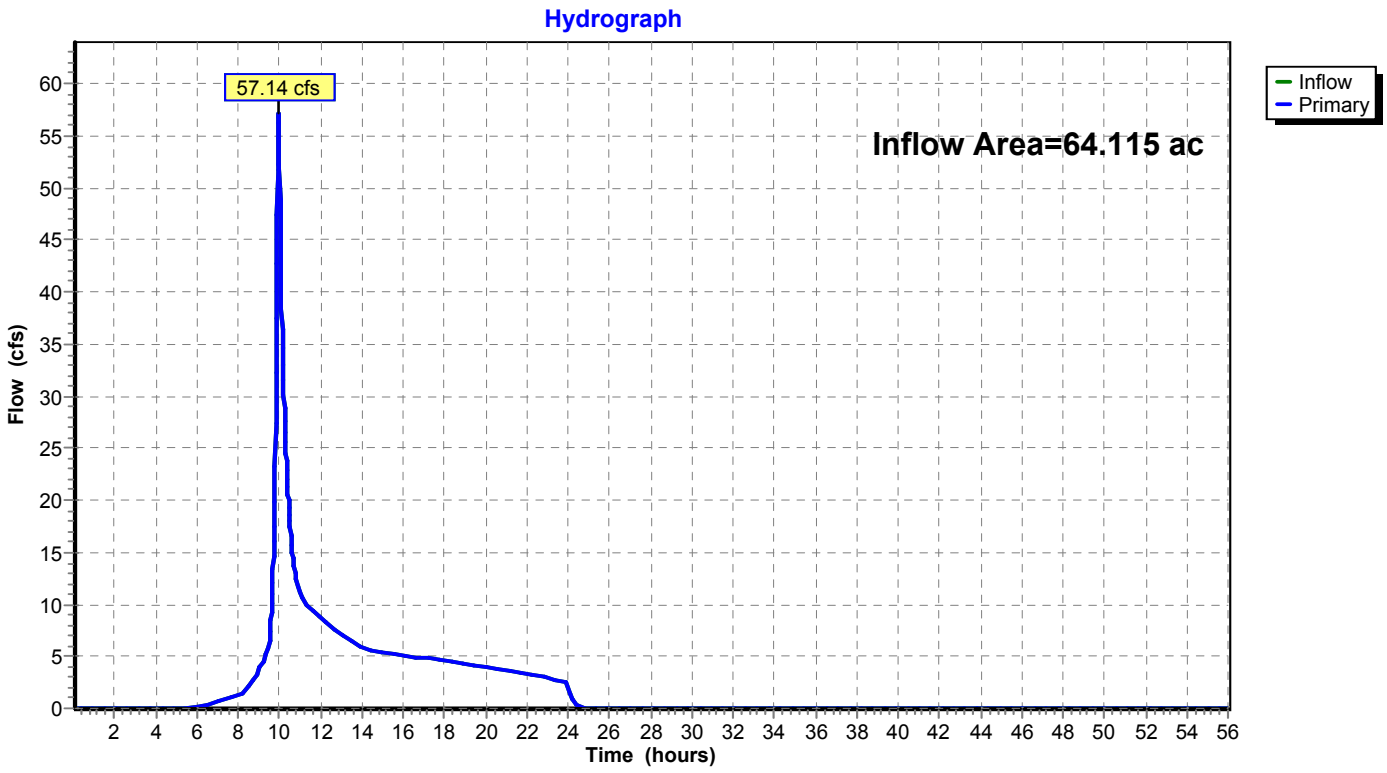


Summary for Link 7L: DMA 13

Inflow Area = 64.115 ac, 0.00% Impervious, Inflow Depth = 1.66" for 25 Year event
Inflow = 57.14 cfs @ 9.97 hrs, Volume= 8.870 af
Primary = 57.14 cfs @ 9.97 hrs, Volume= 8.870 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 7L: DMA 13

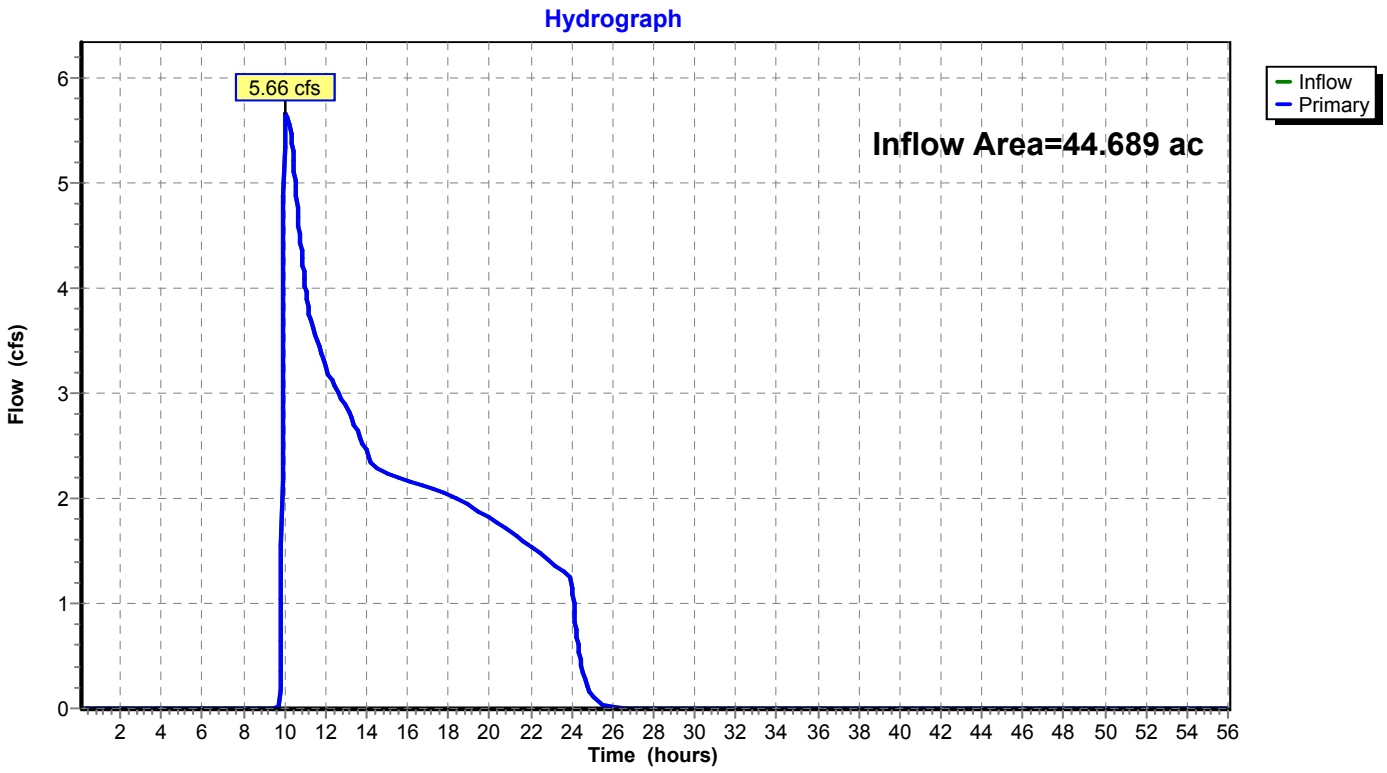


Summary for Link 8L: DMA 8

Inflow Area = 44.689 ac, 0.00% Impervious, Inflow Depth = 0.76" for 25 Year event
Inflow = 5.66 cfs @ 10.02 hrs, Volume= 2.822 af
Primary = 5.66 cfs @ 10.02 hrs, Volume= 2.822 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 8L: DMA 8

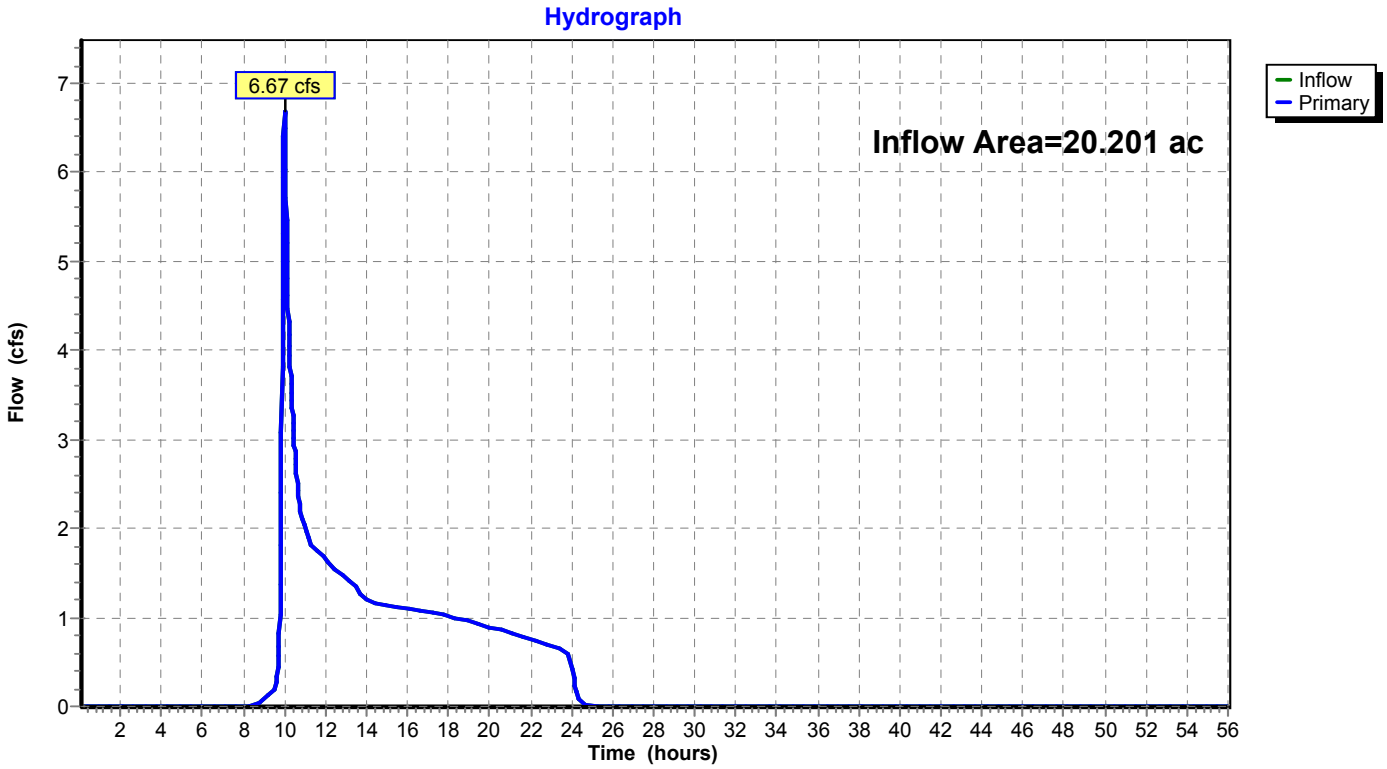


Summary for Link 9L: DMA 12

Inflow Area = 20.201 ac, 0.00% Impervious, Inflow Depth = 0.90" for 25 Year event
Inflow = 6.67 cfs @ 9.99 hrs, Volume= 1.521 af
Primary = 6.67 cfs @ 9.99 hrs, Volume= 1.521 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 9L: DMA 12

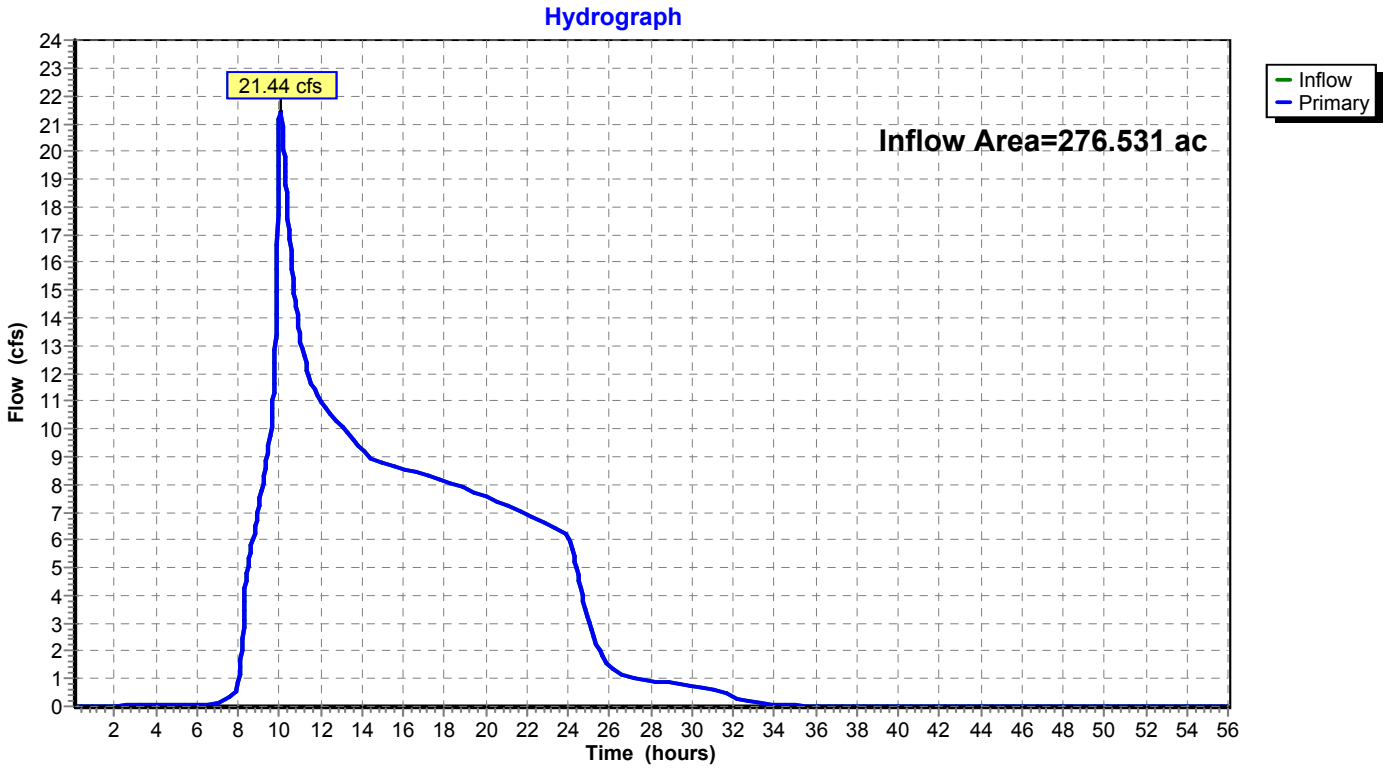


Summary for Link 10L: To Linne Road Channel

Inflow Area = 276.531 ac, 1.18% Impervious, Inflow Depth = 0.56" for 25 Year event
Inflow = 21.44 cfs @ 10.07 hrs, Volume= 12.833 af
Primary = 21.44 cfs @ 10.07 hrs, Volume= 12.833 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 10L: To Linne Road Channel

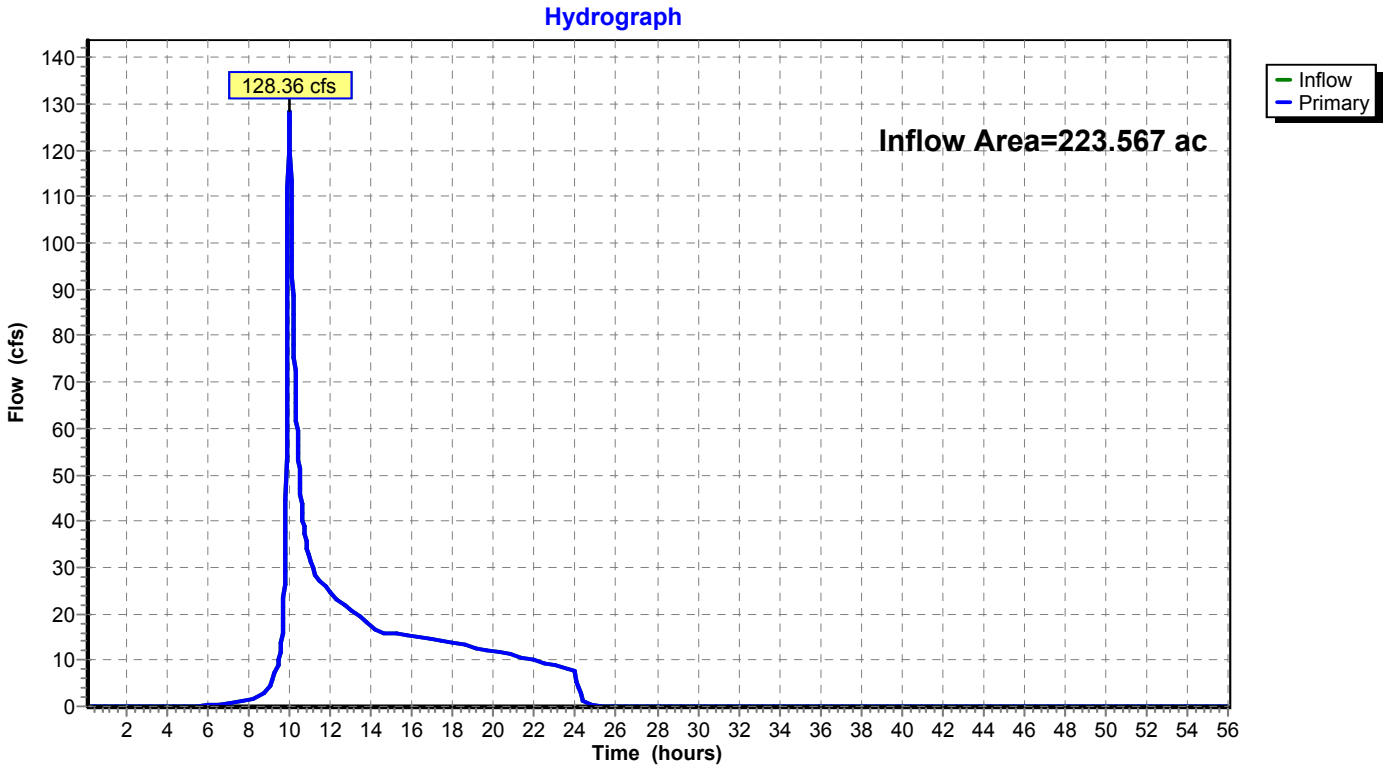


Summary for Link 11L: To Fontana Road SD

Inflow Area = 223.567 ac, 0.53% Impervious, Inflow Depth = 1.27" for 25 Year event
Inflow = 128.36 cfs @ 9.98 hrs, Volume= 23.705 af
Primary = 128.36 cfs @ 9.98 hrs, Volume= 23.705 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 11L: To Fontana Road SD

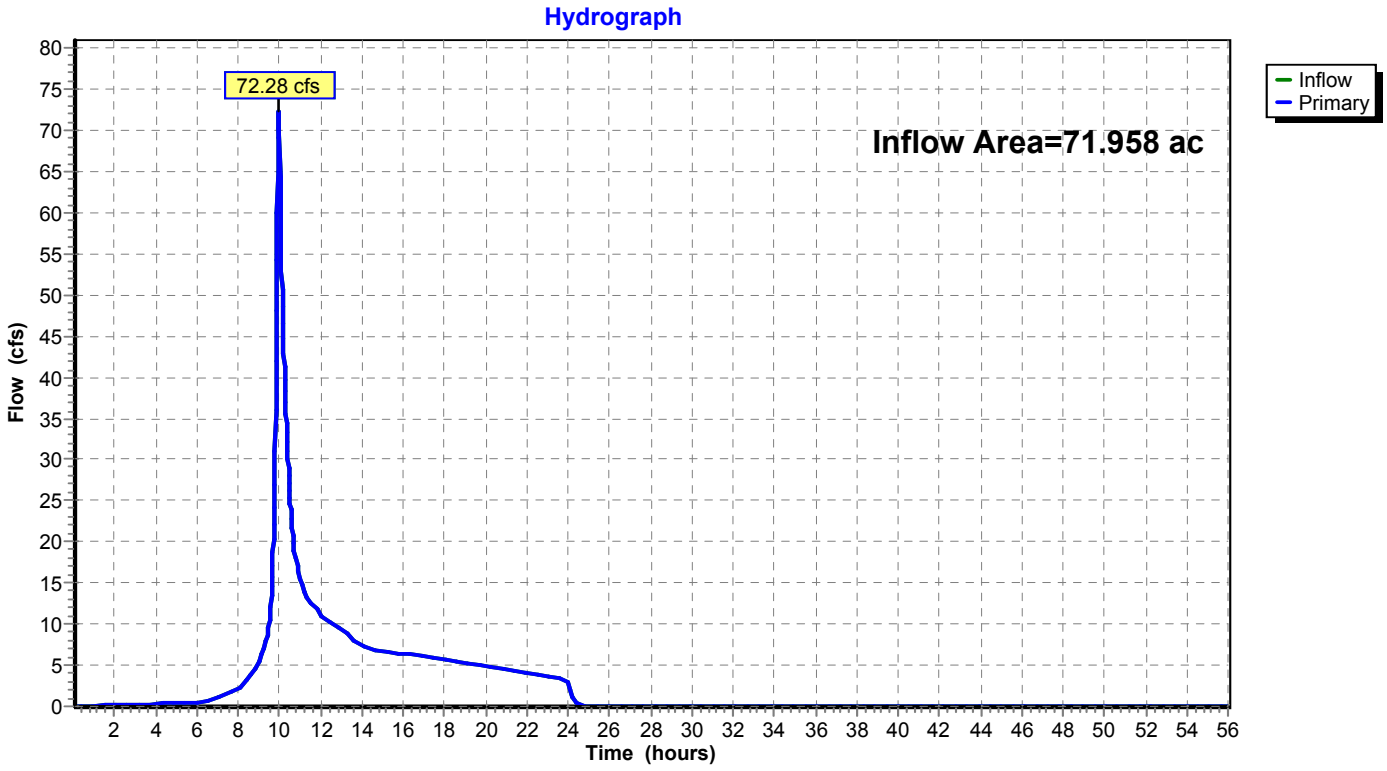


Summary for Link 15L: Sherwood/Niblick LP Xing

Inflow Area = 71.958 ac, 6.18% Impervious, Inflow Depth = 1.97" for 25 Year event
Inflow = 72.28 cfs @ 9.98 hrs, Volume= 11.820 af
Primary = 72.28 cfs @ 9.98 hrs, Volume= 11.820 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 15L: Sherwood/Niblick LP Xing

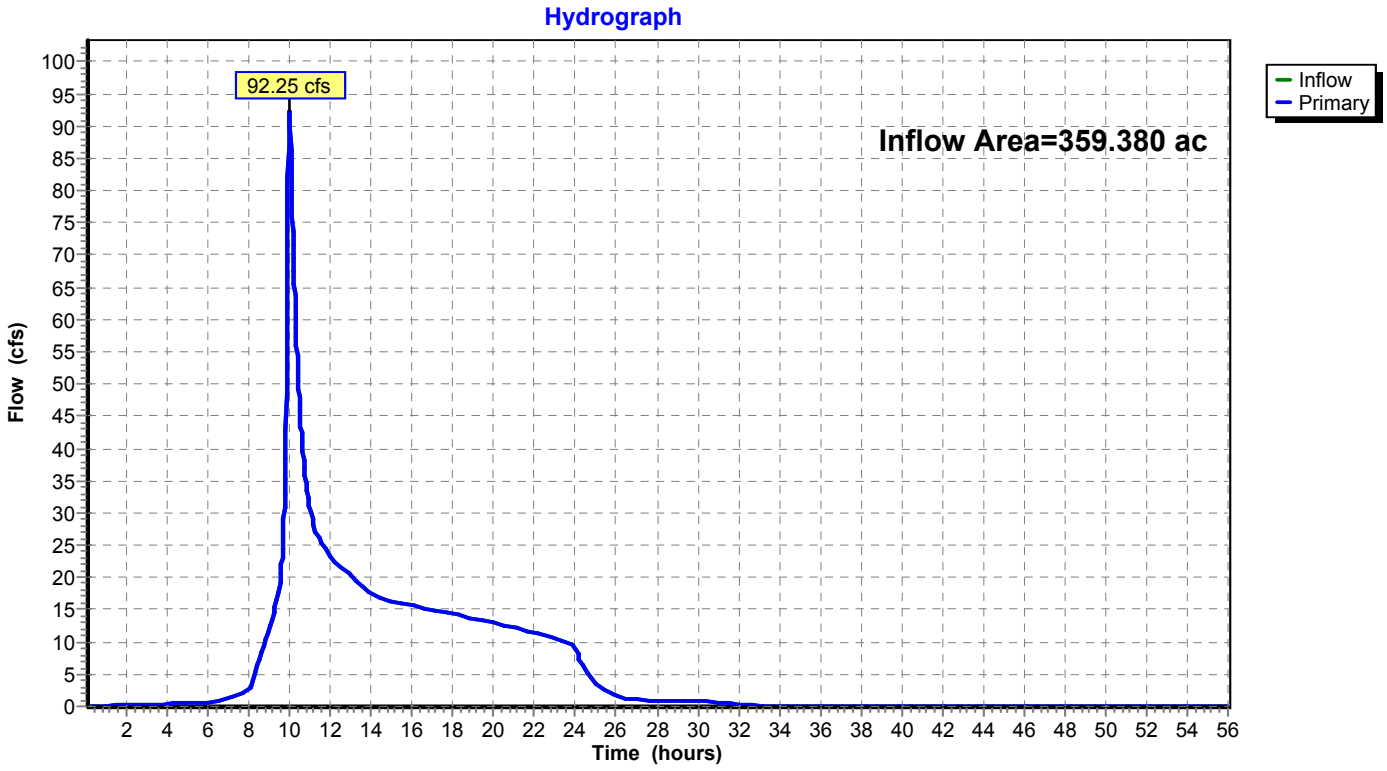


Summary for Link 16L: Airport & Linne Road SD

Inflow Area = 359.380 ac, 2.33% Impervious, Inflow Depth = 0.85" for 25 Year event
Inflow = 92.25 cfs @ 9.98 hrs, Volume= 25.516 af
Primary = 92.25 cfs @ 9.98 hrs, Volume= 25.516 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 16L: Airport & Linne Road SD

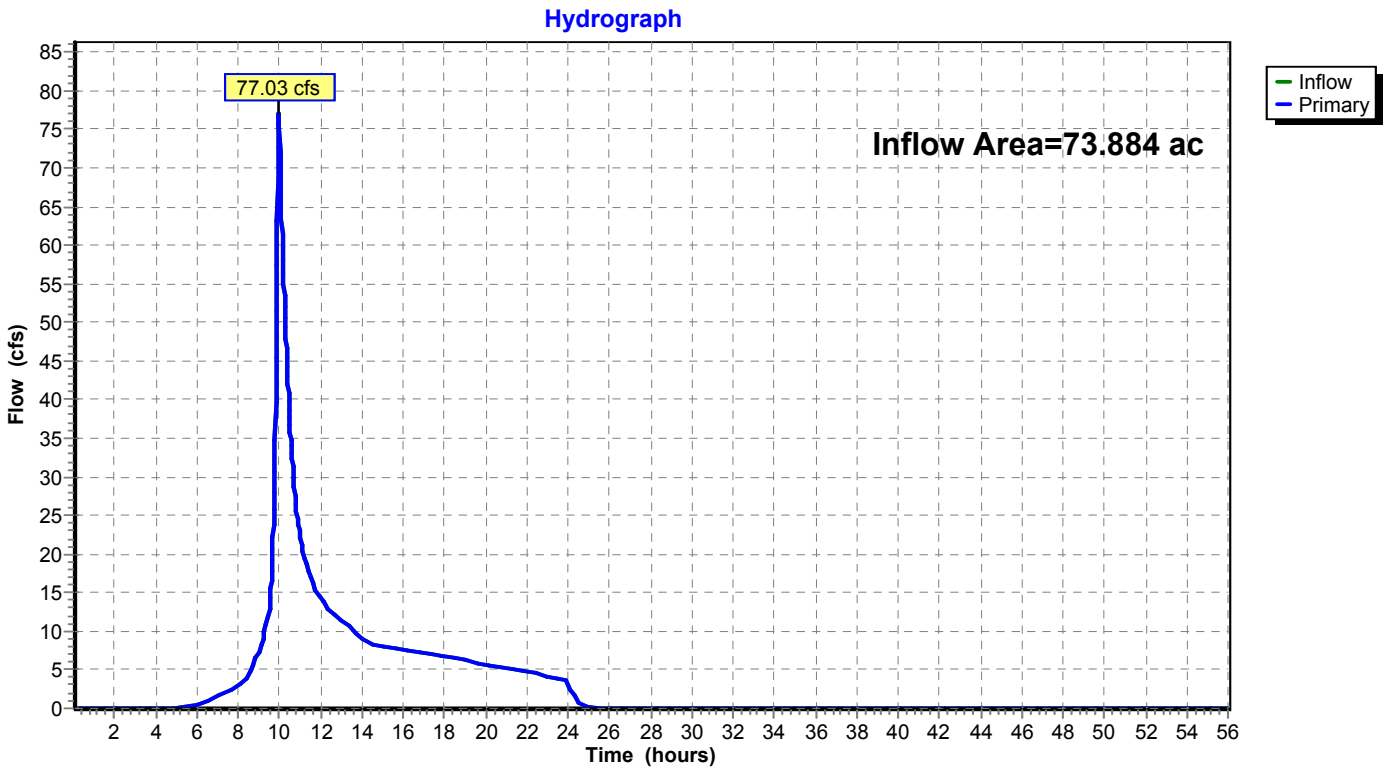


Summary for Link 19L: 14c(0+1)-Ex

Inflow Area = 73.884 ac, 1.37% Impervious, Inflow Depth = 2.36" for 25 Year event
Inflow = 77.03 cfs @ 9.98 hrs, Volume= 14.548 af
Primary = 77.03 cfs @ 9.98 hrs, Volume= 14.548 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 19L: 14c(0+1)-Ex

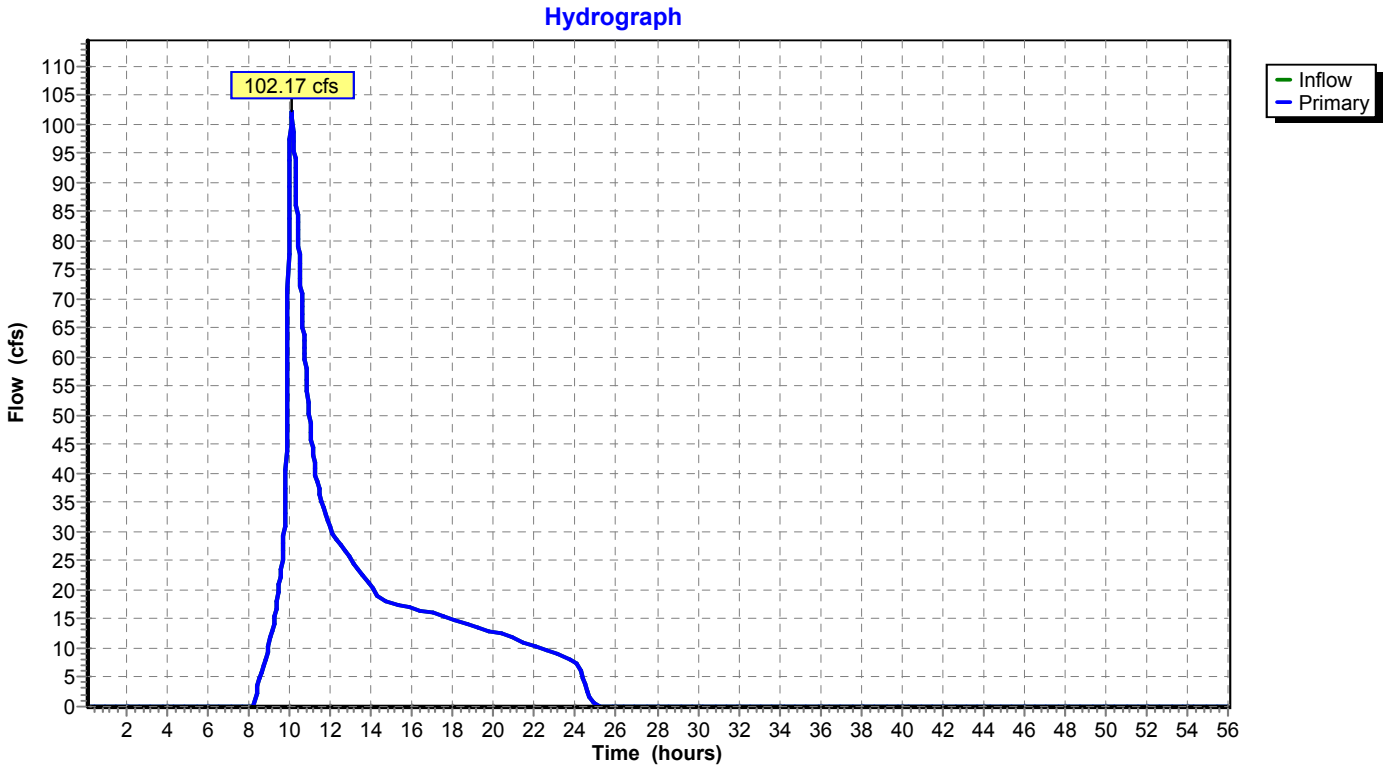


Summary for Link 22L: Linne Rd Overtopping Ex.Flow #2and#3

Inflow = 102.17 cfs @ 10.09 hrs, Volume= 27.926 af
Primary = 102.17 cfs @ 10.09 hrs, Volume= 27.926 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 22L: Linne Rd Overtopping Ex.Flow #2and#3

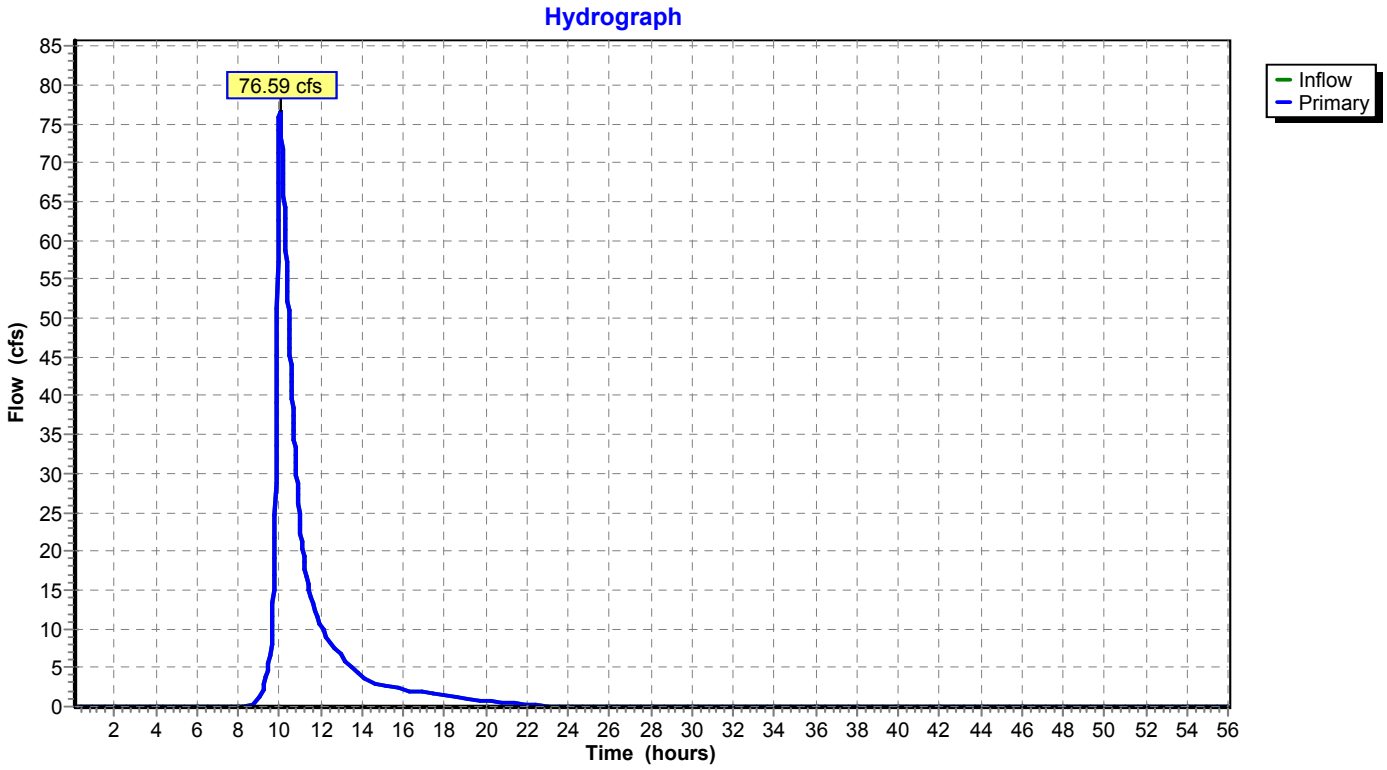


Summary for Link 23L: Linne Rd Overtop #1

Inflow = 76.59 cfs @ 10.04 hrs, Volume= 8.686 af
Primary = 76.59 cfs @ 10.04 hrs, Volume= 8.686 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 23L: Linne Rd Overtop #1



Time span=0.10-56.00 hrs, dt=0.02 hrs, 2796 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=11.244 ac 0.00% Impervious Runoff Depth=1.22"
Tc=10.0 min CN=58/0 Runoff=5.61 cfs 1.147 af

Subcatchment2: Subcat 2 Runoff Area=14.644 ac 0.00% Impervious Runoff Depth=1.22"
Tc=11.5 min CN=58/0 Runoff=6.82 cfs 1.494 af

Subcatchment3: Subcat 3 Runoff Area=21.500 ac 0.02% Impervious Runoff Depth=1.57"
Tc=16.9 min CN=63/98 Runoff=12.60 cfs 2.819 af

Subcatchment3a{(1)}-Ex: Subcat 3a{(1)}-Ex Runoff Area=4.164 ac 0.00% Impervious Runoff Depth=1.22"
Tc=10.0 min CN=58/0 Runoff=2.08 cfs 0.425 af

Subcatchment3a{(2)}-Ex: Subcat 3a{(2)}-Ex Runoff Area=7.900 ac 0.00% Impervious Runoff Depth=1.43"
Tc=10.0 min CN=61/0 Runoff=5.17 cfs 0.941 af

Subcatchment3a{(3)}-Ex: Subcat 3a{(3)}-Ex Runoff Area=6.004 ac 0.00% Impervious Runoff Depth=2.03"
Tc=10.0 min CN=69/0 Runoff=6.63 cfs 1.016 af

Subcatchment3b-Ex: Subcat 3b-Ex Runoff Area=757.079 ac 0.00% Impervious Runoff Depth=1.36"
Tc=45.5 min CN=60/98 Runoff=178.43 cfs 85.793 af

Subcatchment4: Subcat 4 Runoff Area=38.712 ac 1.43% Impervious Runoff Depth=1.28"
Tc=14.2 min CN=58/98 Runoff=17.15 cfs 4.117 af

Subcatchment5: Subcat 5 Runoff Area=32.700 ac 0.00% Impervious Runoff Depth=1.22"
Tc=21.2 min CN=58/0 Runoff=10.59 cfs 3.336 af

Subcatchment6: Subcat 6 Runoff Area=34.035 ac 0.00% Impervious Runoff Depth=1.36"
Tc=20.1 min CN=60/0 Runoff=13.97 cfs 3.857 af

Subcatchment7: Subcat 7 Runoff Area=31.369 ac 0.00% Impervious Runoff Depth=1.22"
Tc=23.2 min CN=58/0 Runoff=9.56 cfs 3.200 af

Subcatchment8: Subcat 8 Runoff Area=30.487 ac 0.00% Impervious Runoff Depth=1.22"
Tc=28.8 min CN=58/0 Runoff=7.96 cfs 3.110 af

Subcatchment8a-Ex: Subcat 8a-Ex Runoff Area=14.202 ac 0.00% Impervious Runoff Depth=1.22"
Tc=16.5 min CN=58/0 Runoff=5.39 cfs 1.449 af

Subcatchment9: Subcat 9 Runoff Area=11.446 ac 0.00% Impervious Runoff Depth=1.50"
Tc=22.3 min CN=62/0 Runoff=5.24 cfs 1.431 af

Subcatchment9a-Ex: Subcat 9a-Ex Runoff Area=212.022 ac 0.00% Impervious Runoff Depth=1.22"
Flow Length=4,909' Tc=51.3 min CN=58/0 Runoff=38.64 cfs 21.629 af

Subcatchment10: Subcat 10 Runoff Area=30.685 ac 3.88% Impervious Runoff Depth=1.43"
Tc=22.6 min CN=59/98 Runoff=12.48 cfs 3.656 af

Subcatchment10a-Ex: Subcat 10a-Ex Runoff Area=94.105 ac 0.00% Impervious Runoff Depth=1.87"
Tc=11.0 min CN=67/0 Runoff=89.24 cfs 14.688 af

Subcatchment11: Subcat 11 Runoff Area=14.461 ac 0.00% Impervious Runoff Depth=1.29"
Tc=11.1 min CN=59/0 Runoff=7.56 cfs 1.556 af

Subcatchment12: Subcat 12 Runoff Area=17.572 ac 0.00% Impervious Runoff Depth=1.29"
Tc=10.0 min CN=59/0 Runoff=9.66 cfs 1.891 af

Subcatchment12a-Ex: Subcat 12a-Ex Runoff Area=2.629 ac 0.00% Impervious Runoff Depth=2.19"
Tc=10.0 min CN=71/0 Runoff=3.22 cfs 0.480 af

Subcatchment13: Subcat 13 Runoff Area=27.742 ac 0.00% Impervious Runoff Depth=1.43"
Flow Length=1,750' Tc=10.0 min CN=61/0 Runoff=18.16 cfs 3.305 af

Subcatchment13a-Ex: Subcat 13a-Ex Runoff Area=3.505 ac 0.00% Impervious Runoff Depth=2.19"
Tc=10.0 min CN=71/0 Runoff=4.29 cfs 0.640 af

Subcatchment13b-Ex: Subcat 13b-Ex Runoff Area=18.461 ac 0.00% Impervious Runoff Depth=3.17"
Tc=10.0 min CN=82/0 Runoff=35.51 cfs 4.875 af

Subcatchment13c-Ex: Subcat 13c-Ex Runoff Area=14.407 ac 0.00% Impervious Runoff Depth=2.98"
Tc=10.0 min CN=80/0 Runoff=25.83 cfs 3.578 af

Subcatchment14: Subcat 14 Runoff Area=8.669 ac 51.27% Impervious Runoff Depth=3.09"
Tc=10.0 min CN=58/98 Runoff=14.43 cfs 2.232 af

Subcatchment14a{(1)}-Ex: Subcat 14a{(1)}-Ex Runoff Area=13.081 ac 0.00% Impervious Runoff Depth=1.65"
Tc=10.0 min CN=64/0 Runoff=10.70 cfs 1.794 af

Subcatchment14a{(2)}-Ex: Subcat 14a{(2)}-Ex Runoff Area=2.438 ac 29.80% Impervious Runoff Depth=2.31"
Tc=10.0 min CN=58/98 Runoff=2.86 cfs 0.469 af

Subcatchment14b-Ex: Subcat 14b-Ex Runoff Area=50.209 ac 0.00% Impervious Runoff Depth=2.89"
Tc=13.4 min CN=79/0 Runoff=76.84 cfs 12.083 af

Subcatchment14c{(0)}-Ex: Subcat 14c{(0)}-Ex Runoff Area=43.677 ac 1.21% Impervious Runoff Depth=3.19"
Tc=24.5 min CN=82/98 Runoff=55.26 cfs 11.607 af

Subcatchment14c{(1)}-Ex: Subcat 14c{(1)}-Ex Runoff Area=30.208 ac 1.61% Impervious Runoff Depth=3.10"
Tc=13.6 min CN=81/98 Runoff=49.85 cfs 7.810 af

Subcatchment14c{(2)}-Ex: Subcat 14c{(2)}-Ex Runoff Area=19.689 ac 0.00% Impervious Runoff Depth=2.71"
Tc=13.2 min CN=77/0 Runoff=28.04 cfs 4.441 af

Subcatchment14c{(3)}-Ex: Subcat 14c{(3)}-Ex Runoff Area=13.782 ac 0.00% Impervious Runoff Depth=2.53"
Tc=12.6 min CN=75/0 Runoff=18.42 cfs 2.906 af

Subcatchment14d-Ex: Subcat 14d-Ex Runoff Area=166.738 ac 0.91% Impervious Runoff Depth=3.00"
Tc=19.4 min CN=80/98 Runoff=222.44 cfs 41.649 af

Subcatchment14e-Ex: Subcat 14e-Ex Runoff Area=10.890 ac 6.05% Impervious Runoff Depth=1.44"
Tc=10.0 min CN=58/98 Runoff=6.91 cfs 1.311 af

Reach 6R: Reach 1c Avg. Flow Depth=3.21' Max Vel=4.26 fps Inflow=281.87 cfs 93.331 af
n=0.024 L=830.0' S=0.0031 '/' Capacity=4,878.97 cfs Outflow=267.92 cfs 93.331 af

Reach 7R: Reach 1b Avg. Flow Depth=1.82' Max Vel=4.74 fps Inflow=501.58 cfs 148.911 af
n=0.024 L=883.0' S=0.0066 '/' Capacity=8,865.90 cfs Outflow=494.14 cfs 148.911 af

Reach 8R: Reach 1a Avg. Flow Depth=2.10' Max Vel=3.54 fps Inflow=510.36 cfs 153.969 af
n=0.024 L=583.0' S=0.0034 '/' Capacity=6,396.21 cfs Outflow=504.95 cfs 153.969 af

Reach 17R: Reach 1d Avg. Flow Depth=0.74' Max Vel=2.90 fps Inflow=103.48 cfs 3.704 af
n=0.027 L=841.0' S=0.0110 '/' Capacity=1,276.84 cfs Outflow=90.29 cfs 3.704 af

Reach 18R: Linne Road Grassed Chl Avg. Flow Depth=0.68' Max Vel=2.78 fps Inflow=25.65 cfs 14.875 af
n=0.030 L=1,190.0' S=0.0087 '/' Capacity=66.25 cfs Outflow=24.58 cfs 14.875 af

Pond 17P: Gran Cielo Dwy Peak Elev=855.19' Storage=12,556 cf Inflow=222.44 cfs 41.649 af
Primary=117.95 cfs 37.936 af Secondary=0.65 cfs 0.009 af Tertiary=103.48 cfs 3.704 af Outflow=222.08 cfs 41.649 af

Pond 18P: GC-CkD1 Peak Elev=851.86' Storage=63,522 cf Inflow=223.44 cfs 57.363 af
Primary=1.07 cfs 1.743 af Secondary=114.40 cfs 41.965 af Tertiary=99.64 cfs 13.592 af Outflow=215.08 cfs 57.300 af

Pond 19P: GC-CkD2 Peak Elev=849.87' Storage=41,536 cf Inflow=141.95 cfs 48.150 af
Primary=1.40 cfs 2.285 af Secondary=81.70 cfs 39.175 af Tertiary=53.00 cfs 6.687 af Outflow=136.09 cfs 48.148 af

Pond 20P: GC-CkD3 Peak Elev=846.16' Storage=18,734 cf Inflow=98.57 cfs 44.367 af
Primary=6.94 cfs 7.743 af Secondary=16.42 cfs 6.664 af Tertiary=74.78 cfs 29.949 af Outflow=98.14 cfs 44.355 af

Link 3a (1,2+3)-Ex: Comb Un-dev Ck Flow Inflow=509.50 cfs 155.541 af
Primary=509.50 cfs 155.541 af

Link 5L: Outlet To Tract #1632 Ex. 36" SD Inflow=33.49 cfs 11.095 af
Primary=33.49 cfs 11.095 af

Link 6L: To Existing Meadowlark Road Inflow=42.63 cfs 23.060 af
Primary=42.63 cfs 23.060 af

Link 7L: DMA 13 Inflow=83.70 cfs 12.398 af
Primary=83.70 cfs 12.398 af

Link 8L: DMA 8 Inflow=13.34 cfs 4.559 af
Primary=13.34 cfs 4.559 af

Link 9L: DMA 12 Inflow=12.87 cfs 2.371 af
Primary=12.87 cfs 2.371 af

Link 10L: To Linne Road Channel Inflow=25.65 cfs 14.875 af
Primary=25.65 cfs 14.875 af

Link 11L: To Fontana Road SD Inflow=205.41 cfs 34.670 af
Primary=205.41 cfs 34.670 af

Link 15L: Sherwood/NiblickLP Xing Inflow=101.91 cfs 16.110 af
Primary=101.91 cfs 16.110 af

Link 16L: Airport & Linne Road SD Inflow=129.17 cfs 32.296 af
Primary=129.17 cfs 32.296 af

Link 19L: 14c(0+1)-Ex Inflow=104.93 cfs 19.418 af
Primary=104.93 cfs 19.418 af

Link 22L: Linne Rd OvertoppingEx.Flow #2and#3 Inflow=127.75 cfs 36.636 af
Primary=127.75 cfs 36.636 af

Link 23L: Linne Rd Overtop #1 Inflow=99.64 cfs 13.592 af
Primary=99.64 cfs 13.592 af

Total Runoff Area = 1,810.455 ac Runoff Volume = 256.738 af Average Runoff Depth = 1.70"
99.44% Pervious = 1,800.345 ac 0.56% Impervious = 10.110 ac

Summary for Subcatchment 1: Subcat 1

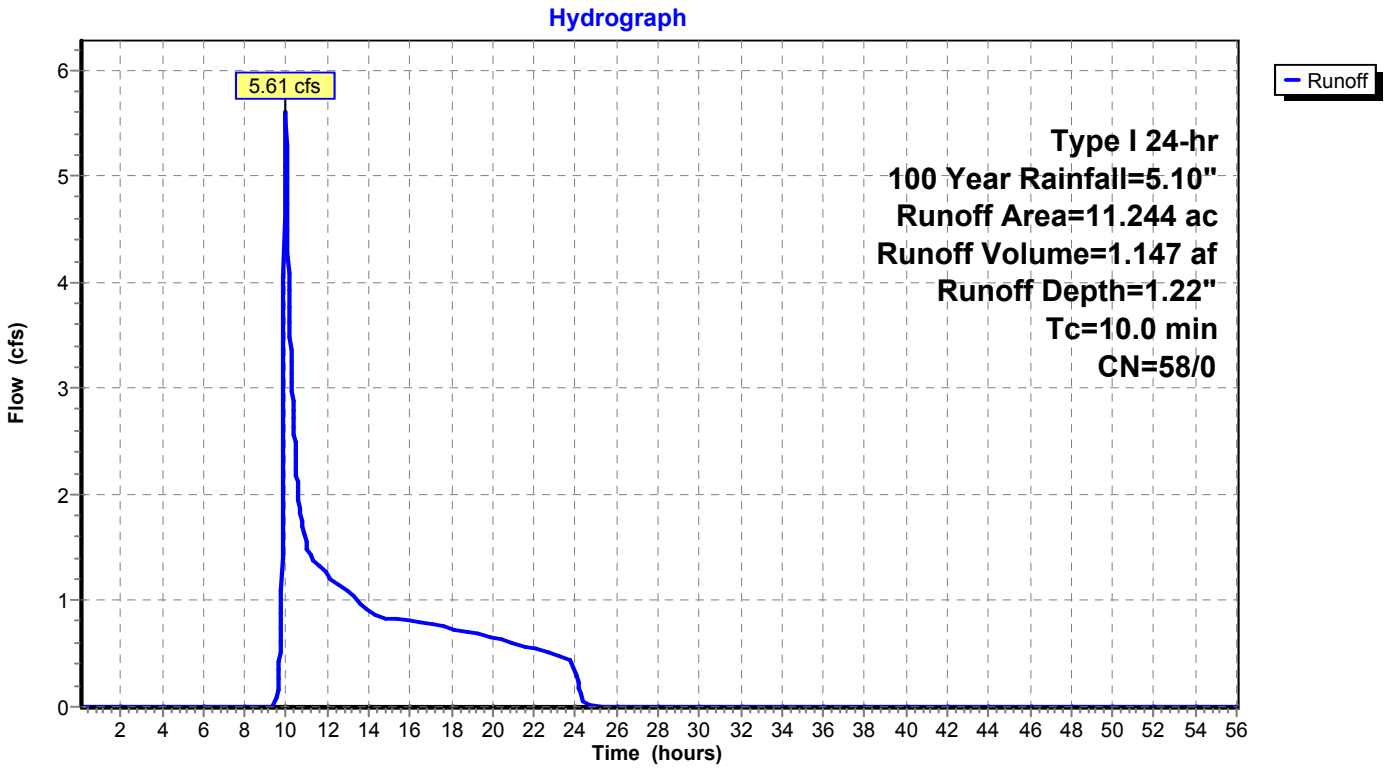
Runoff = 5.61 cfs @ 9.98 hrs, Volume= 1.147 af, Depth= 1.22"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
11.244	58	Meadow, non-grazed, HSG B
11.244	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.9					**Direct Entry, SCS per Catchment Area CAD Info**
9.9	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 1: Subcat 1



Summary for Subcatchment 2: Subcat 2

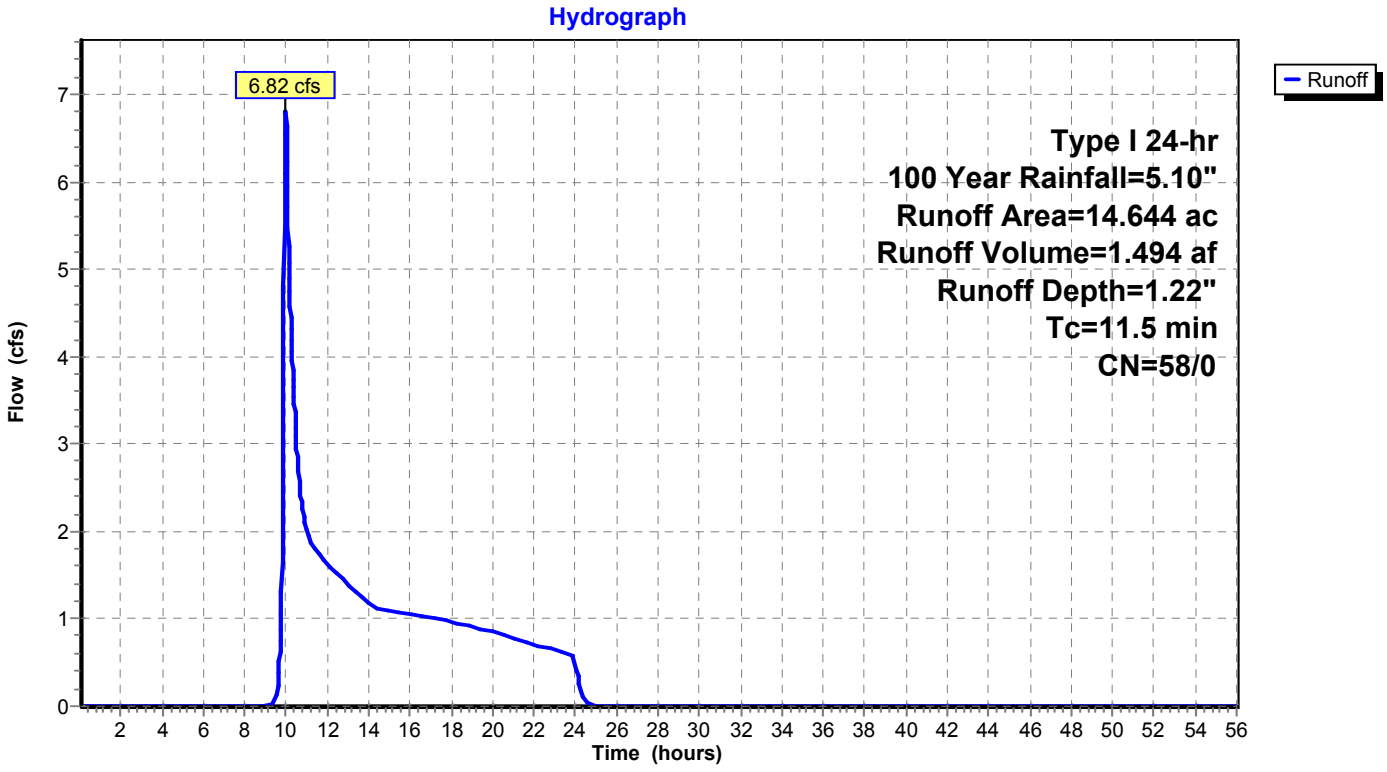
Runoff = 6.82 cfs @ 9.99 hrs, Volume= 1.494 af, Depth= 1.22"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
0.574	58	Meadow, non-grazed, HSG B
14.070	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
14.644	58	Weighted Average
14.644	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.5					**Direct Entry, SCS per Catchment Area CAD Info**

Subcatchment 2: Subcat 2



Summary for Subcatchment 3: Subcat 3

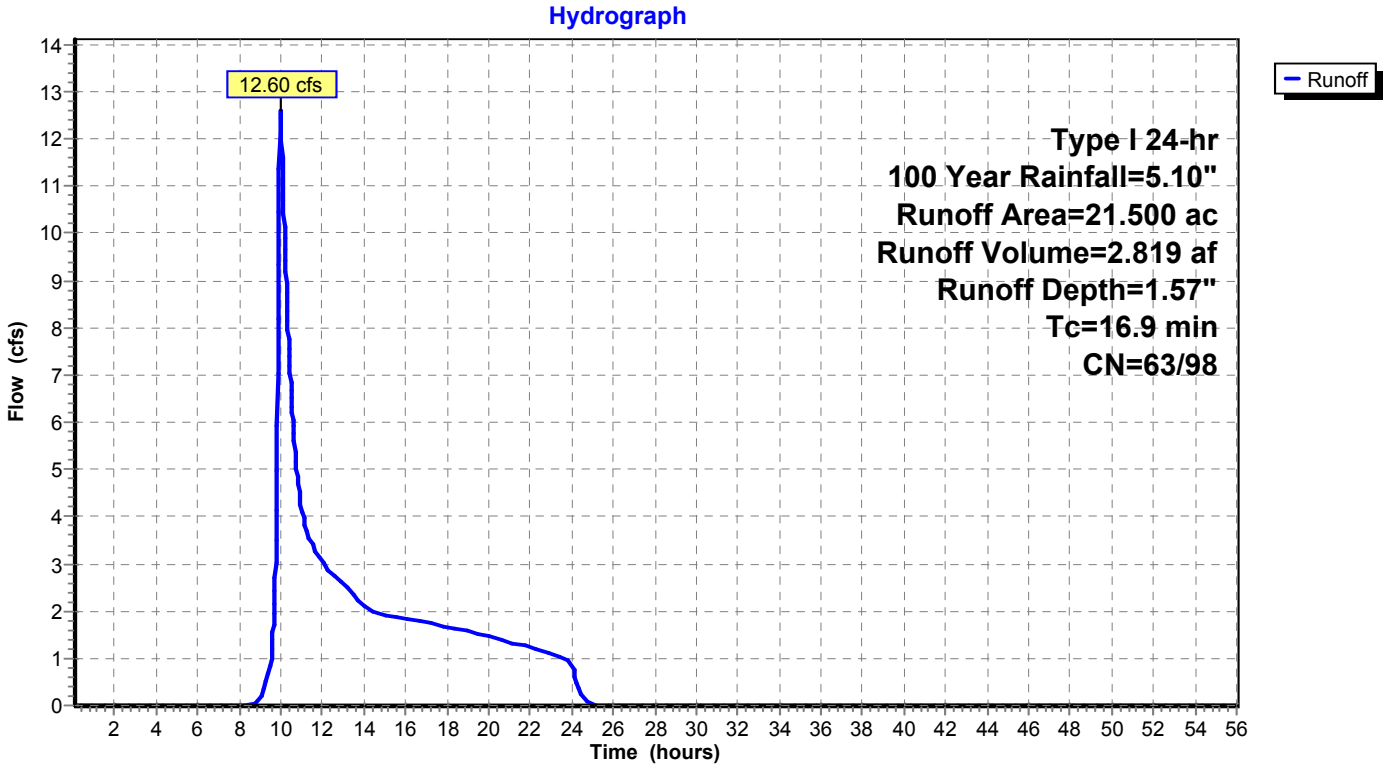
Runoff = 12.60 cfs @ 9.99 hrs, Volume= 2.819 af, Depth= 1.57"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
4.338	58	Meadow, non-grazed, HSG B
8.761	58	Meadow, non-grazed, HSG B
8.398	71	Meadow, non-grazed, HSG C
0.003	98	Paved roads w/curbs & sewers, HSG C
21.500	63	Weighted Average
21.497	63	99.98% Pervious Area
0.003	98	0.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.9					**Direct Entry, SCS per Catchment Area CAD Info**

Subcatchment 3: Subcat 3



Summary for Subcatchment 3a{(1)}-Ex: Subcat 3a{(1)}-Ex

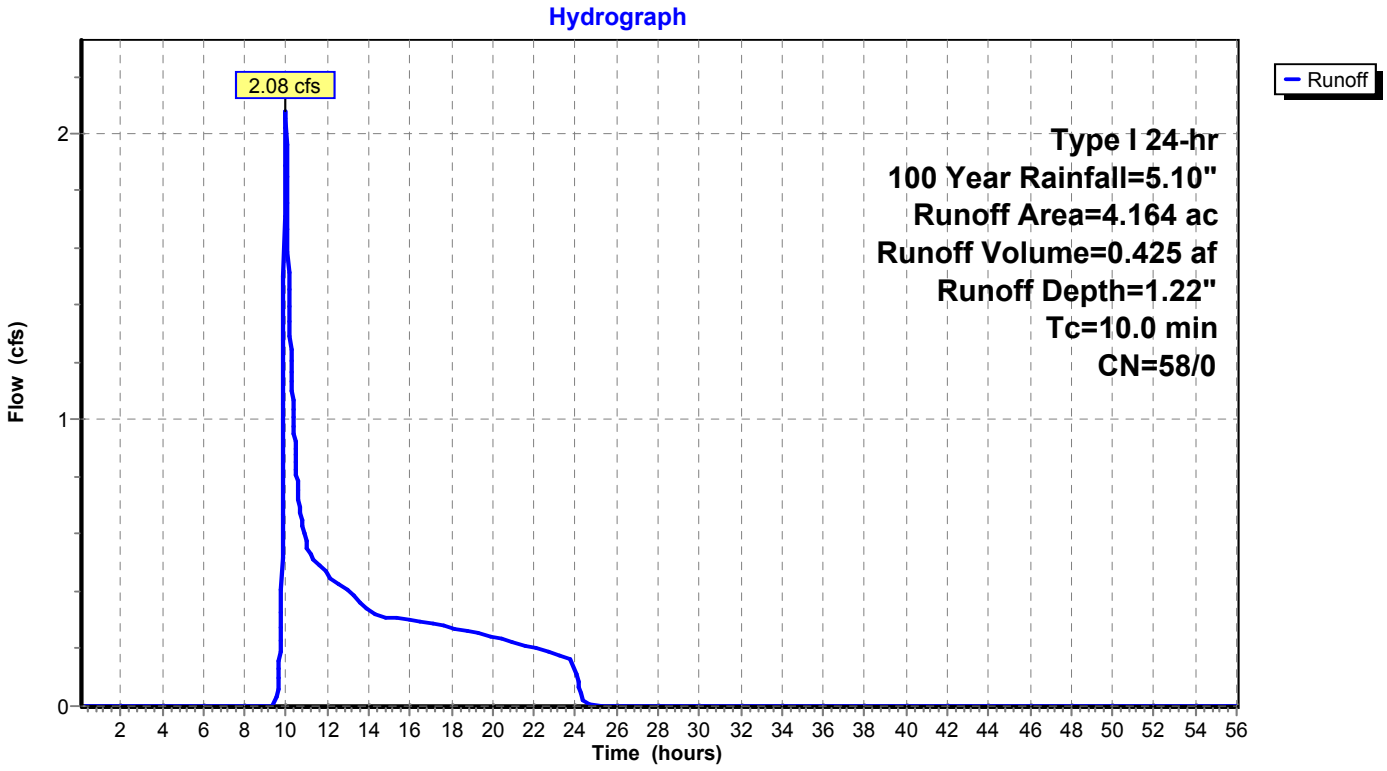
Runoff = 2.08 cfs @ 9.98 hrs, Volume= 0.425 af, Depth= 1.22"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
2.302	58	Meadow, non-grazed, HSG B
1.861	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
4.164	58	Weighted Average
4.164	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1					**Direct Entry,**
6.1	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 3a{(1)}-Ex: Subcat 3a{(1)}-Ex



Summary for Subcatchment 3a{(2)}-Ex: Subcat 3a{(2)}-Ex

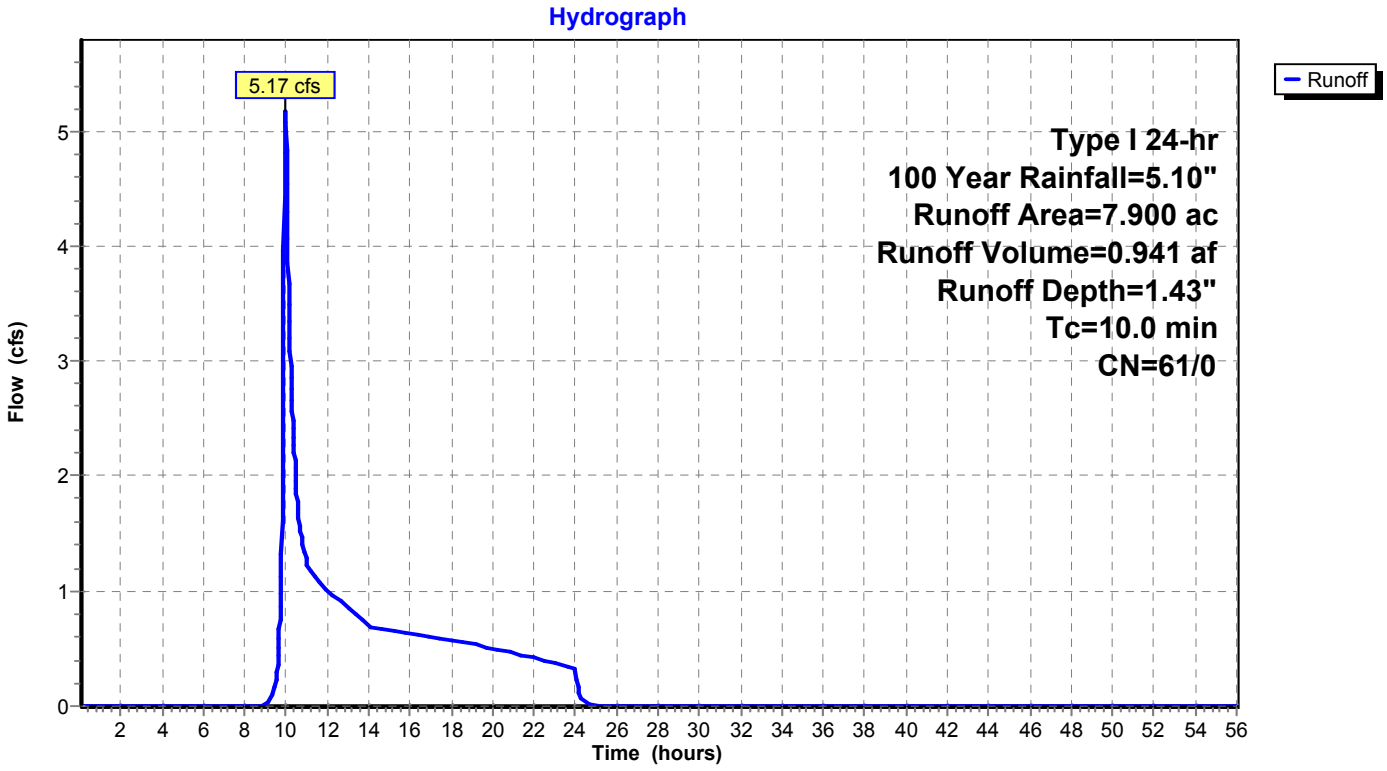
Runoff = 5.17 cfs @ 9.98 hrs, Volume= 0.941 af, Depth= 1.43"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
3.124	58	Meadow, non-grazed, HSG B
2.841	58	Meadow, non-grazed, HSG B
1.936	71	Meadow, non-grazed, HSG C
7.900	61	Weighted Average
7.900	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1					**Direct Entry,**
6.1	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 3a{(2)}-Ex: Subcat 3a{(2)}-Ex



Summary for Subcatchment 3a{(3)}-Ex: Subcat 3a{(3)}-Ex

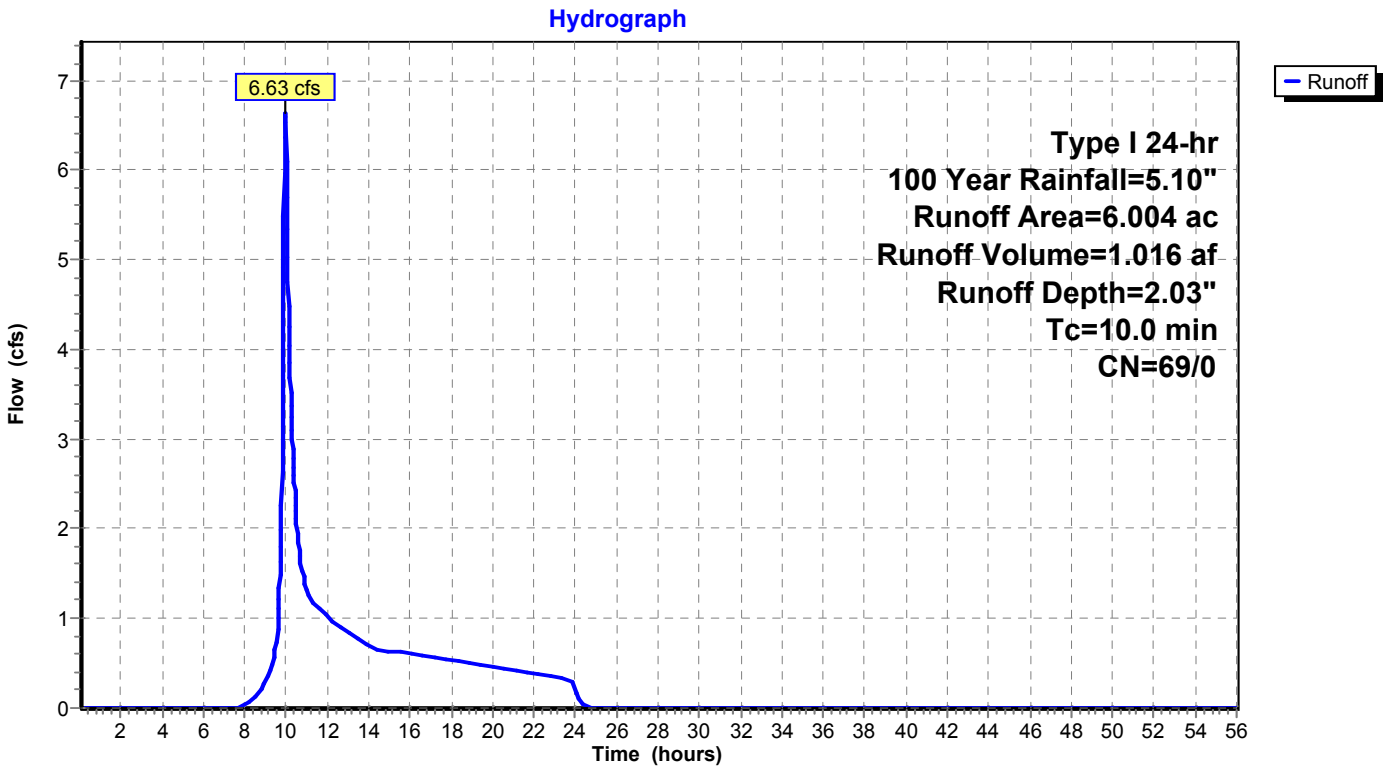
Runoff = 6.63 cfs @ 9.97 hrs, Volume= 1.016 af, Depth= 2.03"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
1.129	58	Meadow, non-grazed, HSG B
4.876	71	Meadow, non-grazed, HSG C
6.004	69	Weighted Average
6.004	69	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.1					**Direct Entry, 14c{(2)}-Ex**
6.1	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 3a{(3)}-Ex: Subcat 3a{(3)}-Ex



Summary for Subcatchment 3b-Ex: Subcat 3b-Ex

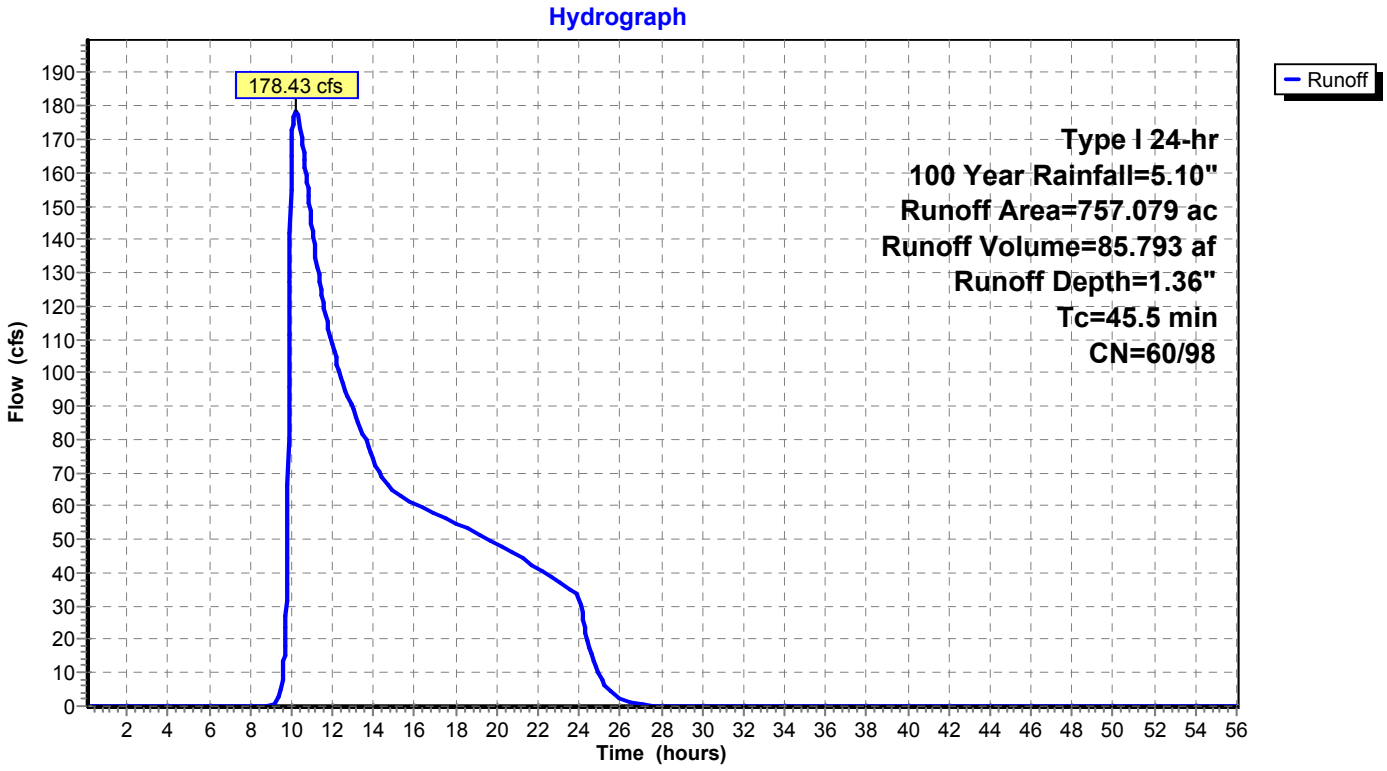
Runoff = 178.43 cfs @ 10.25 hrs, Volume= 85.793 af, Depth= 1.36"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
234.658	58	Meadow, non-grazed, HSG B
36.169	58	Meadow, non-grazed, HSG B
0.022	58	Meadow, non-grazed, HSG B
51.779	58	Meadow, non-grazed, HSG B
10.304	58	Meadow, non-grazed, HSG B
28.620	58	Meadow, non-grazed, HSG B
28.650	58	Meadow, non-grazed, HSG B
67.424	58	Meadow, non-grazed, HSG B
203.020	58	Meadow, non-grazed, HSG B
26.053	71	Meadow, non-grazed, HSG C
12.803	71	Meadow, non-grazed, HSG C
44.268	71	Meadow, non-grazed, HSG C
13.308	71	Meadow, non-grazed, HSG C
0.001	98	Paved roads w/curbs & sewers, HSG C
757.079	60	Weighted Average
757.078	60	100.00% Pervious Area
0.001	98	0.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
45.5					**Direct Entry, SCS Method taken from Catchment in ACAD file**

Subcatchment 3b-Ex: Subcat 3b-Ex



Summary for Subcatchment 4: Subcat 4

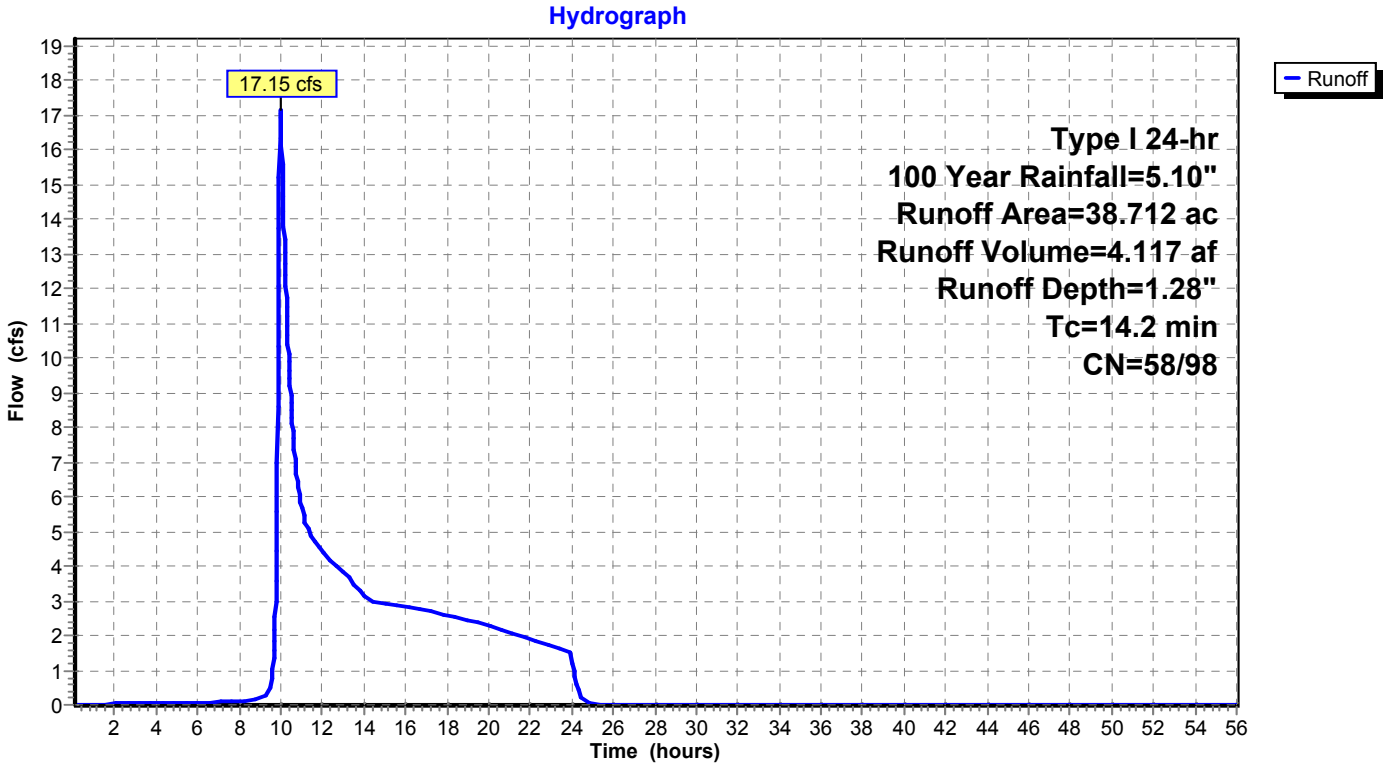
Runoff = 17.15 cfs @ 9.99 hrs, Volume= 4.117 af, Depth= 1.28"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
2.765	68	1 acre lots, 20% imp, HSG B
0.000	58	Meadow, non-grazed, HSG B
7.644	58	Meadow, non-grazed, HSG B
0.126	58	Meadow, non-grazed, HSG B
5.342	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
20.803	58	Meadow, non-grazed, HSG B
0.971	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
1.061	58	Meadow, non-grazed, HSG B
38.712	59	Weighted Average
38.159	58	98.57% Pervious Area
0.553	98	1.43% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.2					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 4: Subcat 4



Summary for Subcatchment 5: Subcat 5

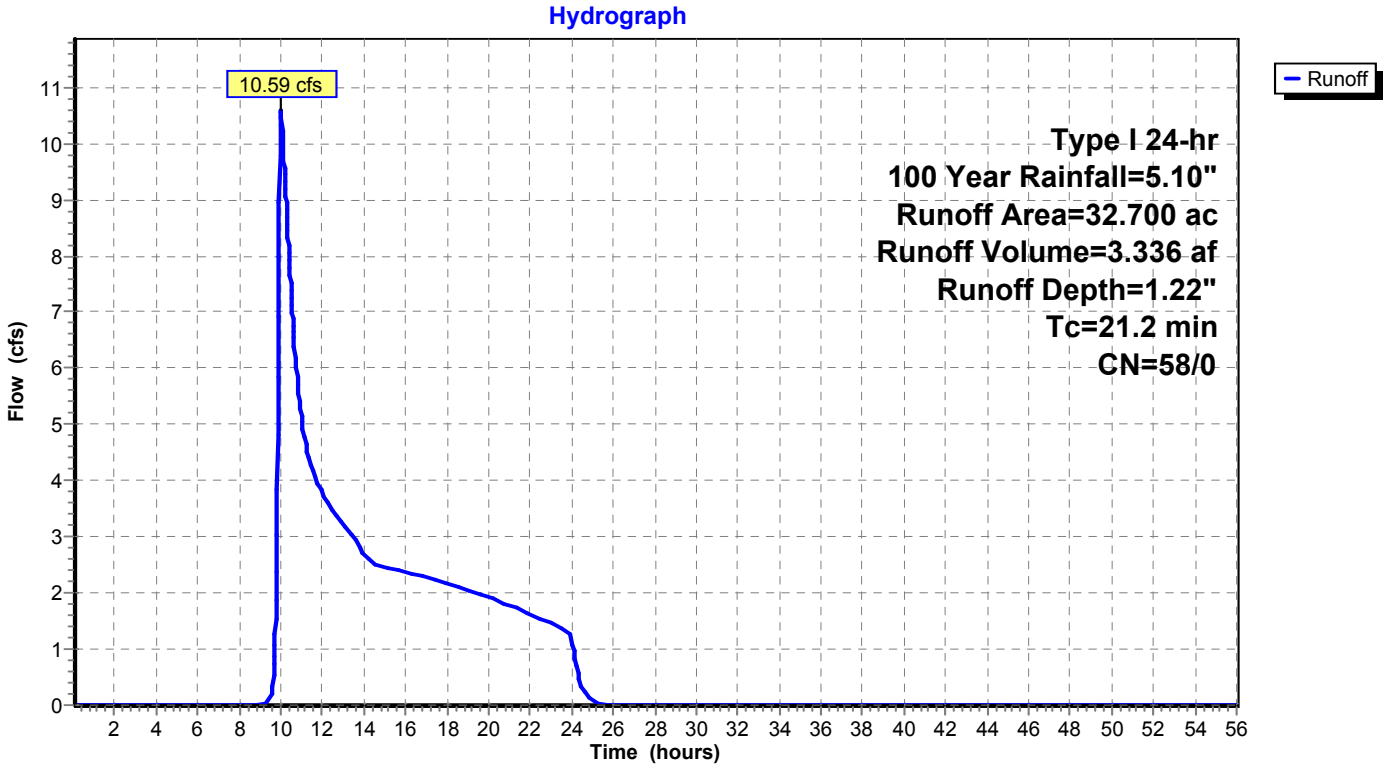
Runoff = 10.59 cfs @ 10.01 hrs, Volume= 3.336 af, Depth= 1.22"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
9.224	58	Meadow, non-grazed, HSG B
23.476	58	Meadow, non-grazed, HSG B
32.700	58	Weighted Average
32.700	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.2					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 5: Subcat 5



Summary for Subcatchment 6: Subcat 6

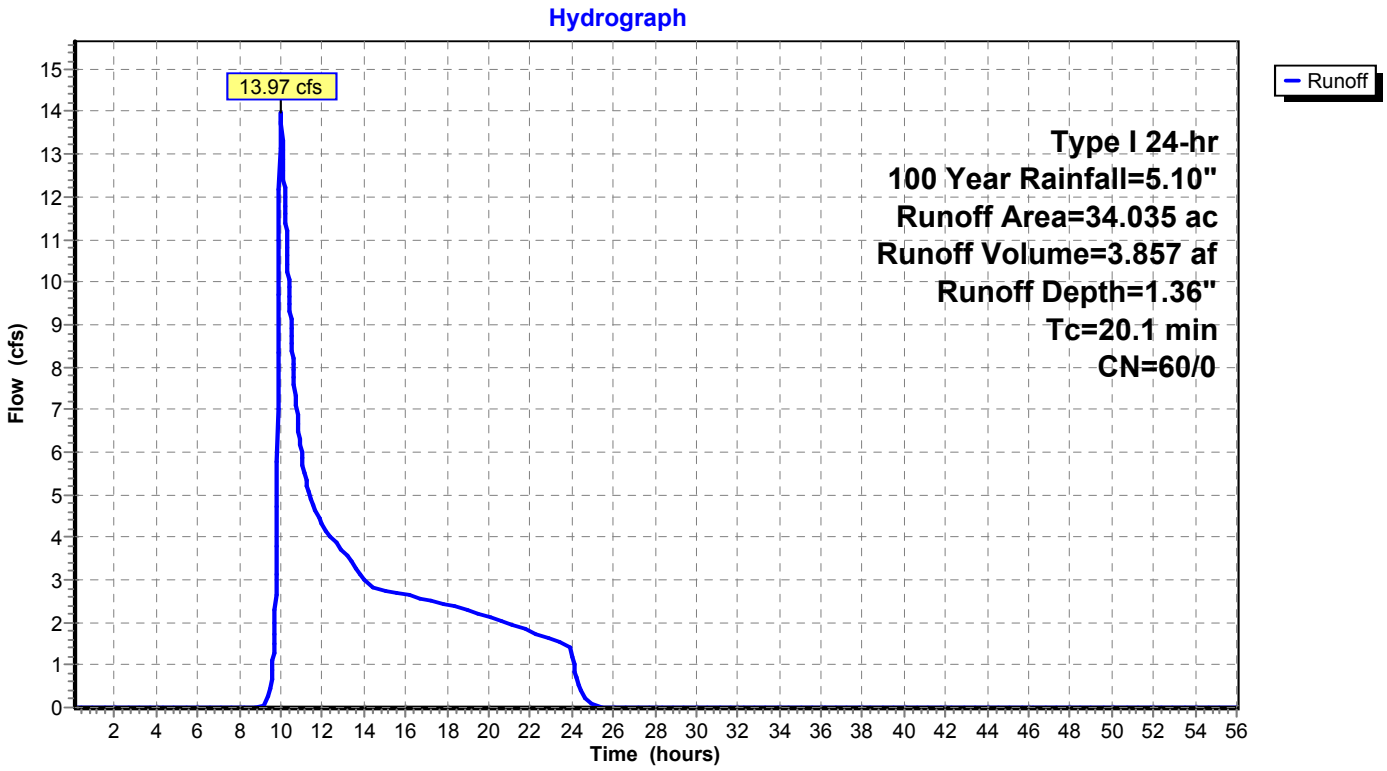
Runoff = 13.97 cfs @ 10.00 hrs, Volume= 3.857 af, Depth= 1.36"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
23.646	58	Meadow, non-grazed, HSG B
0.010	58	Meadow, non-grazed, HSG B
0.081	58	Meadow, non-grazed, HSG B
4.046	58	Meadow, non-grazed, HSG B
2.192	58	Meadow, non-grazed, HSG B
4.059	71	Meadow, non-grazed, HSG C
34.035	60	Weighted Average
34.035	60	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.1					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 6: Subcat 6



Summary for Subcatchment 7: Subcat 7

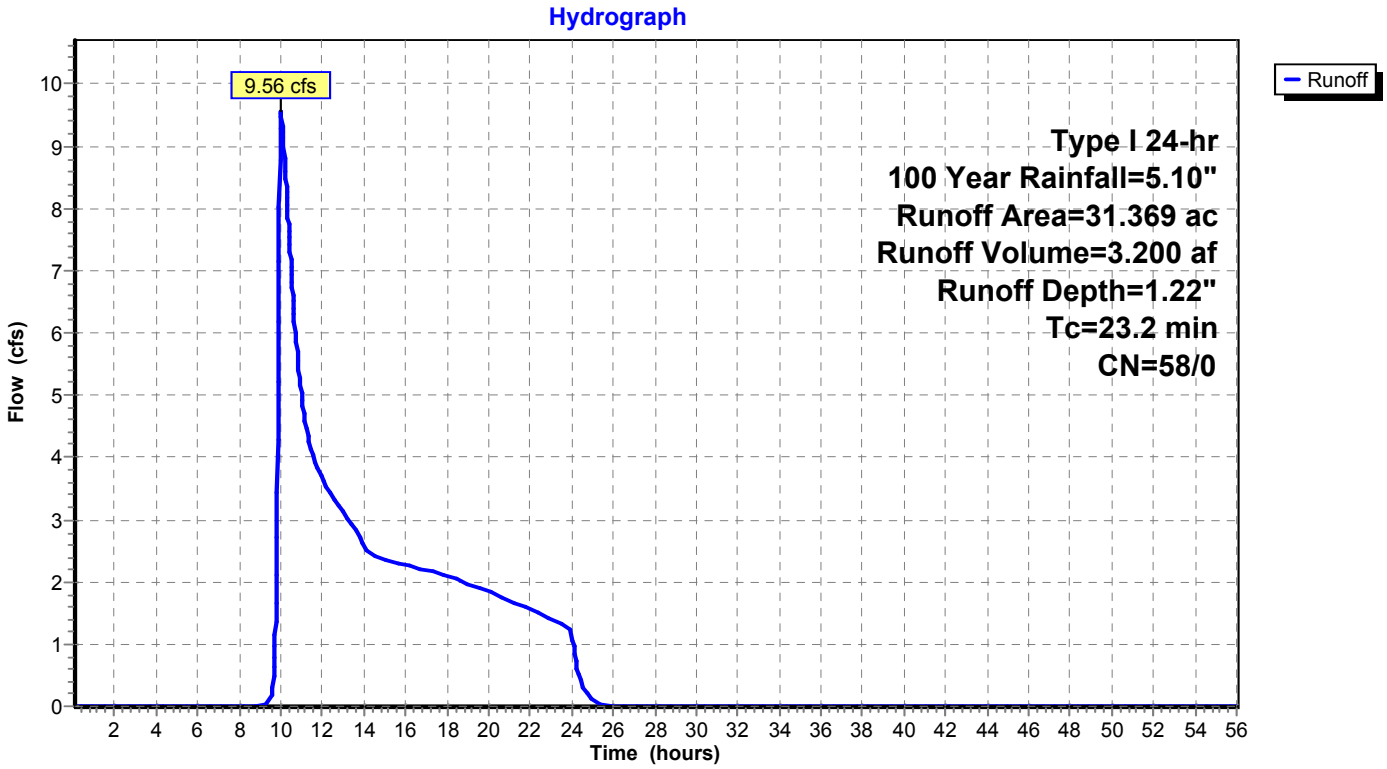
Runoff = 9.56 cfs @ 10.01 hrs, Volume= 3.200 af, Depth= 1.22"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
4.398	58	Meadow, non-grazed, HSG B
11.983	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
14.988	58	Meadow, non-grazed, HSG B
31.369	58	Weighted Average
31.369	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.2					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 7: Subcat 7



Summary for Subcatchment 8: Subcat 8

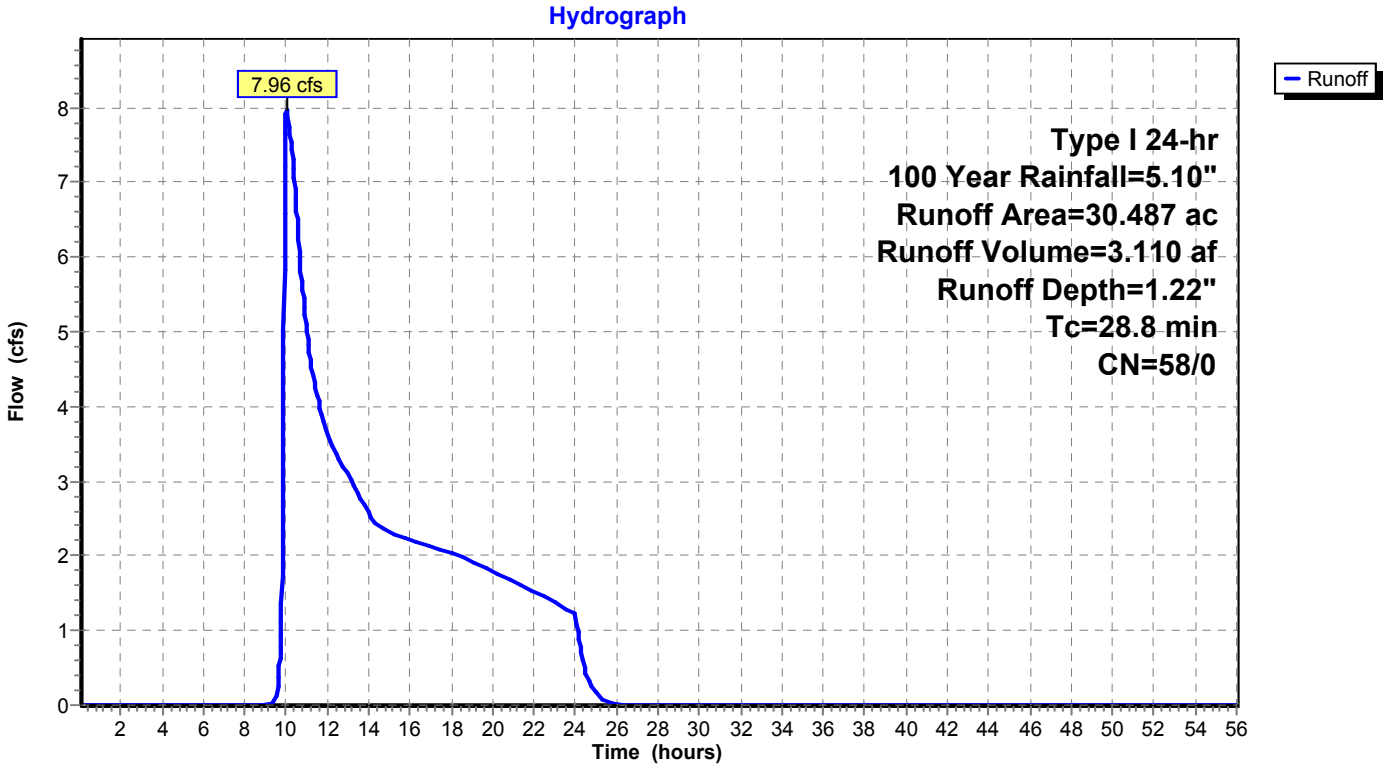
Runoff = 7.96 cfs @ 10.02 hrs, Volume= 3.110 af, Depth= 1.22"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
1.331	58	Meadow, non-grazed, HSG B
29.156	58	Meadow, non-grazed, HSG B
30.487	58	Weighted Average
30.487	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
28.8					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 8: Subcat 8



Summary for Subcatchment 8a-Ex: Subcat 8a-Ex

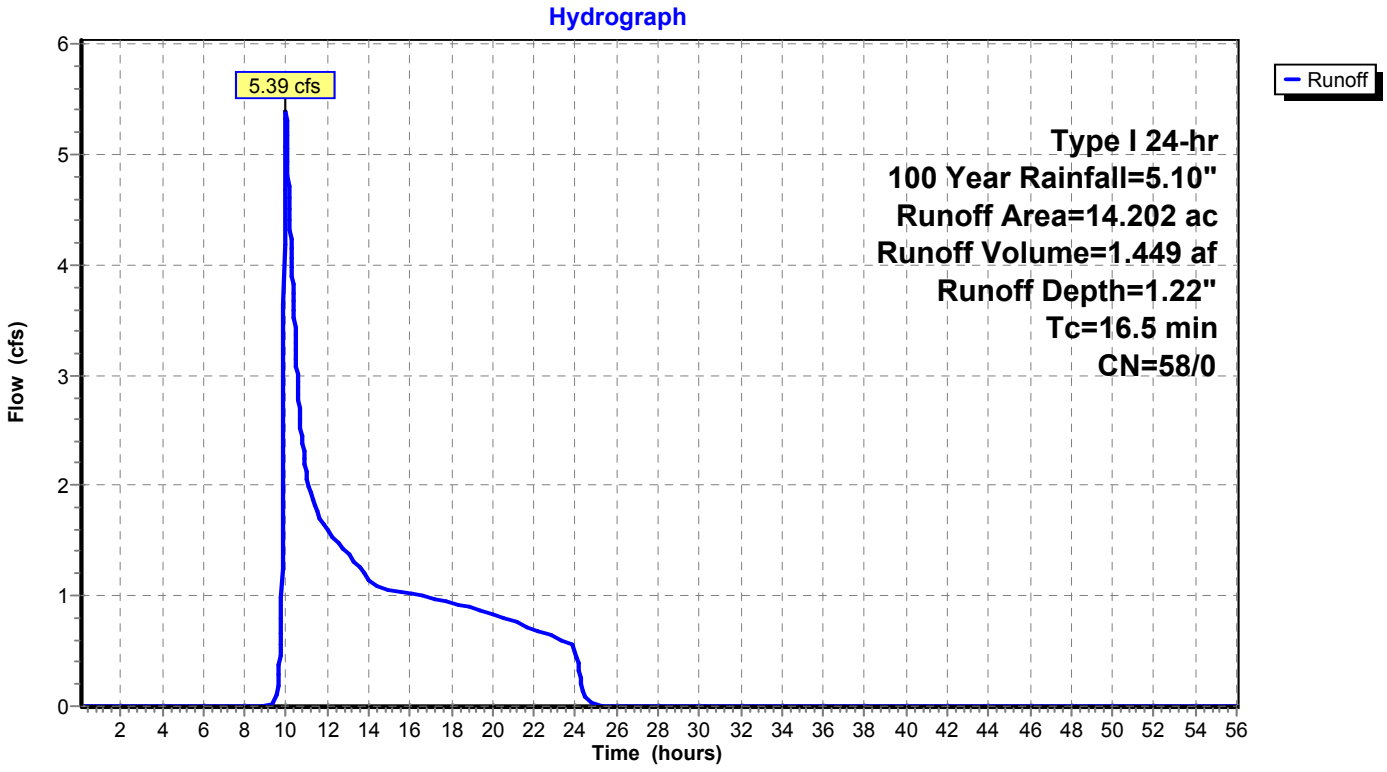
Runoff = 5.39 cfs @ 10.00 hrs, Volume= 1.449 af, Depth= 1.22"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
2.036	58	Meadow, non-grazed, HSG B
7.264	58	Meadow, non-grazed, HSG B
4.903	58	Meadow, non-grazed, HSG B
14.202	58	Weighted Average
14.202	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.5					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 8a-Ex: Subcat 8a-Ex



Summary for Subcatchment 9: Subcat 9

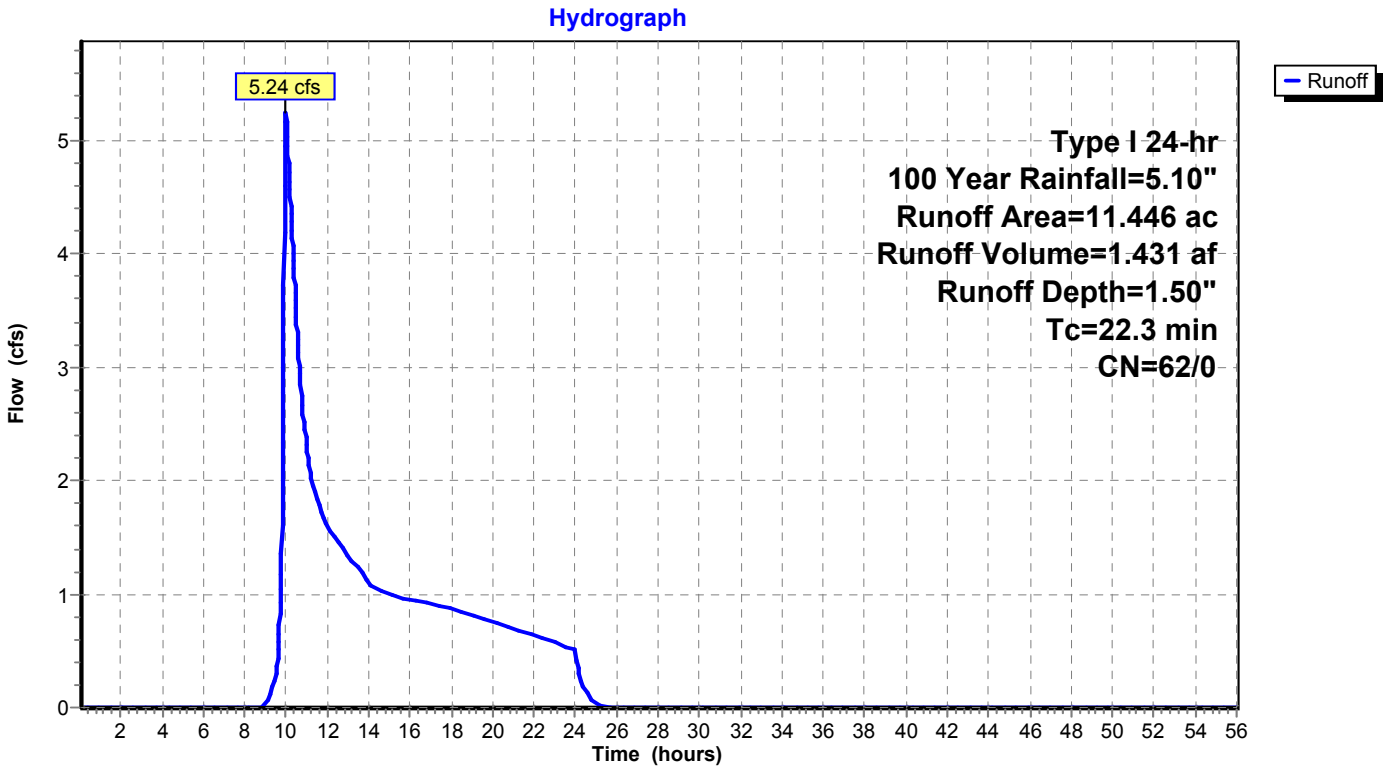
Runoff = 5.24 cfs @ 10.00 hrs, Volume= 1.431 af, Depth= 1.50"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
0.006	58	Meadow, non-grazed, HSG B
8.451	58	Meadow, non-grazed, HSG B
0.026	58	Meadow, non-grazed, HSG B
0.469	58	Meadow, non-grazed, HSG B
0.005	58	Meadow, non-grazed, HSG B
2.489	78	Meadow, non-grazed, HSG D
11.446	62	Weighted Average
11.446	62	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.3					**Direct Entry, Tc from CAD Catchments (SCS Method)**

Subcatchment 9: Subcat 9



Summary for Subcatchment 9a-Ex: Subcat 9a-Ex

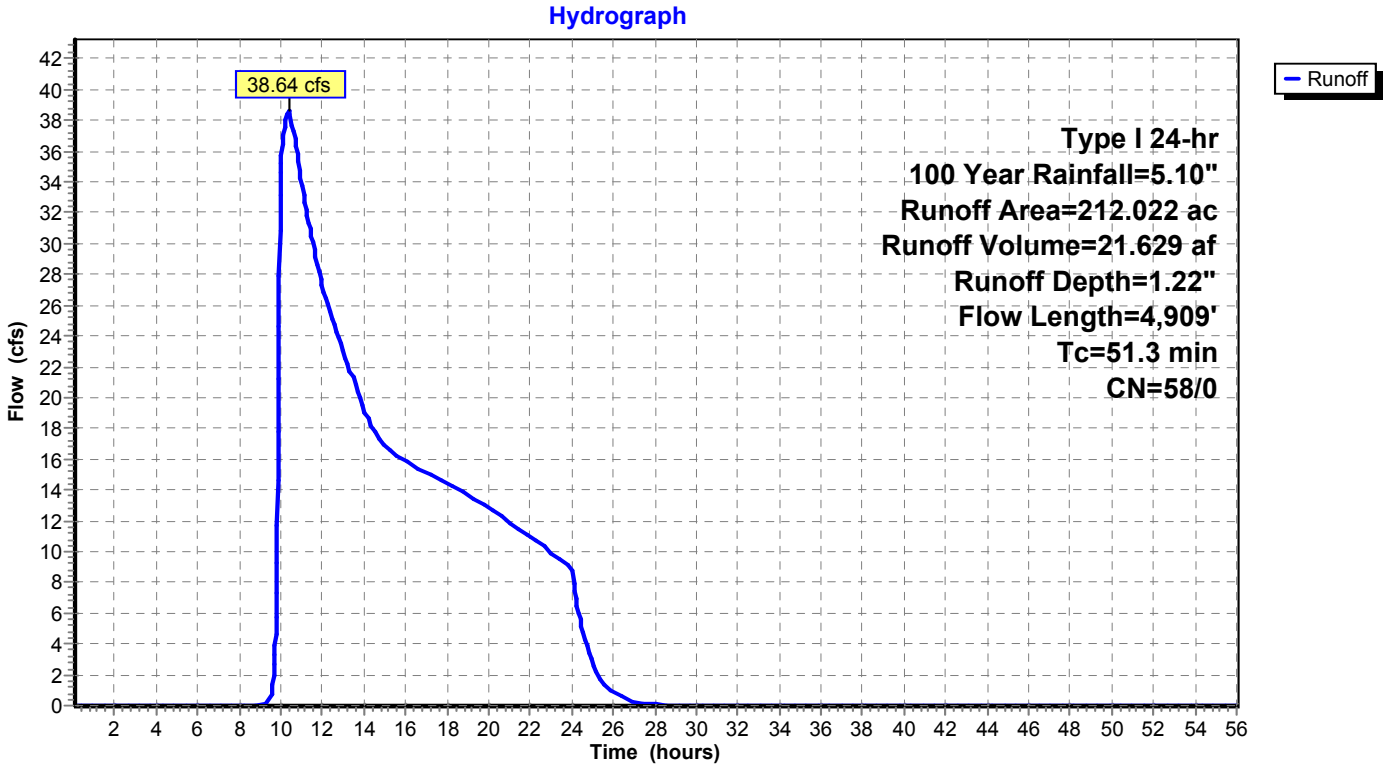
Runoff = 38.64 cfs @ 10.37 hrs, Volume= 21.629 af, Depth= 1.22"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
16.535	58	Meadow, non-grazed, HSG B
38.755	58	Meadow, non-grazed, HSG B
2.915	58	Meadow, non-grazed, HSG B
114.179	58	Meadow, non-grazed, HSG B
31.194	58	Meadow, non-grazed, HSG B
8.131	58	Meadow, non-grazed, HSG B
0.314	78	Meadow, non-grazed, HSG D
212.022	58	Weighted Average
212.022	58	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
51.3	4,909		1.59		**Direct Entry, SCS Method taken from Catchment in ACAD file**

Subcatchment 9a-Ex: Subcat 9a-Ex



Summary for Subcatchment 10: Subcat 10

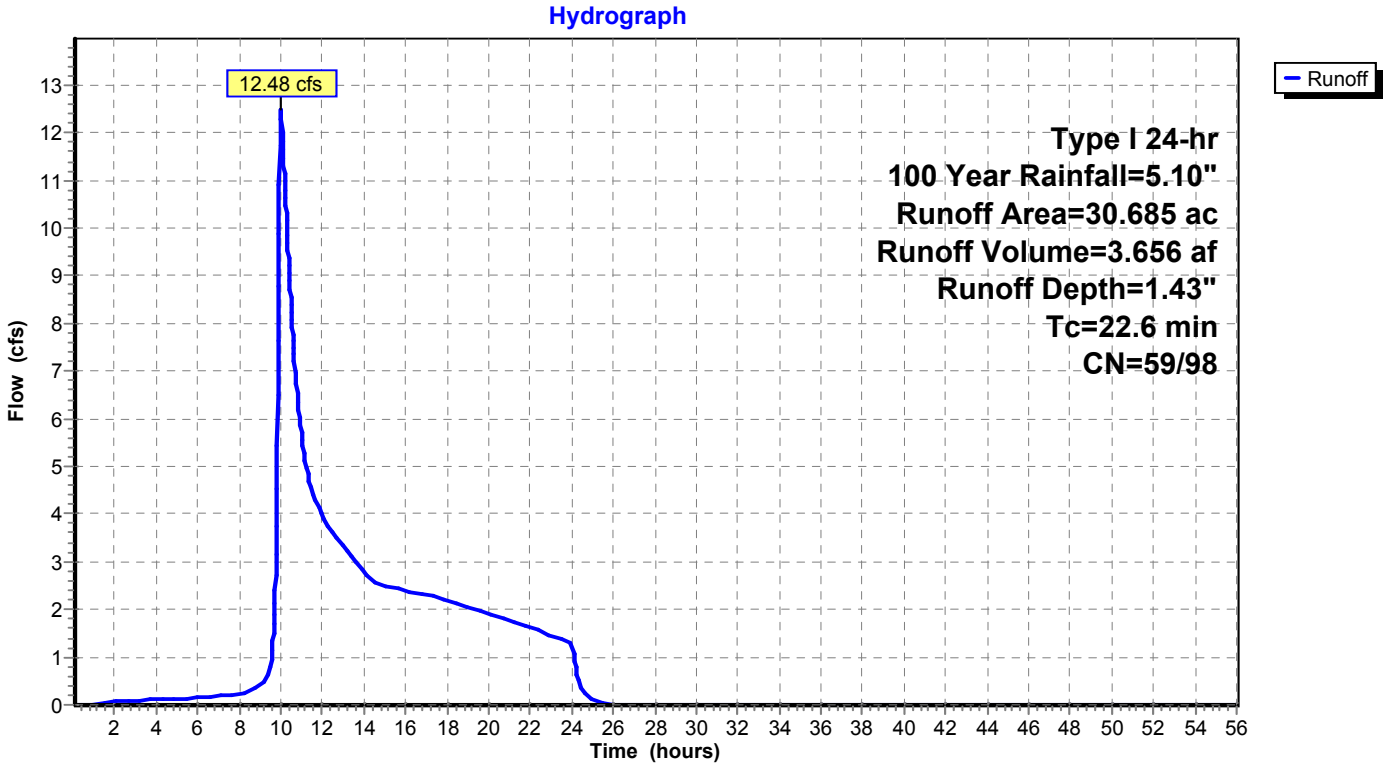
Runoff = 12.48 cfs @ 10.00 hrs, Volume= 3.656 af, Depth= 1.43"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
5.865	58	Meadow, non-grazed, HSG B
22.679	58	Meadow, non-grazed, HSG B
0.039	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.039	71	Meadow, non-grazed, HSG C
0.175	77	Natural western desert, HSG B
0.700	77	Natural western desert, HSG B
1.189	98	Paved roads w/curbs & sewers, HSG B
30.685	60	Weighted Average
29.496	59	96.12% Pervious Area
1.189	98	3.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.6					**Direct Entry, SCS Method taken from Catchment in ACAD file**

Subcatchment 10: Subcat 10



Summary for Subcatchment 10a-Ex: Subcat 10a-Ex

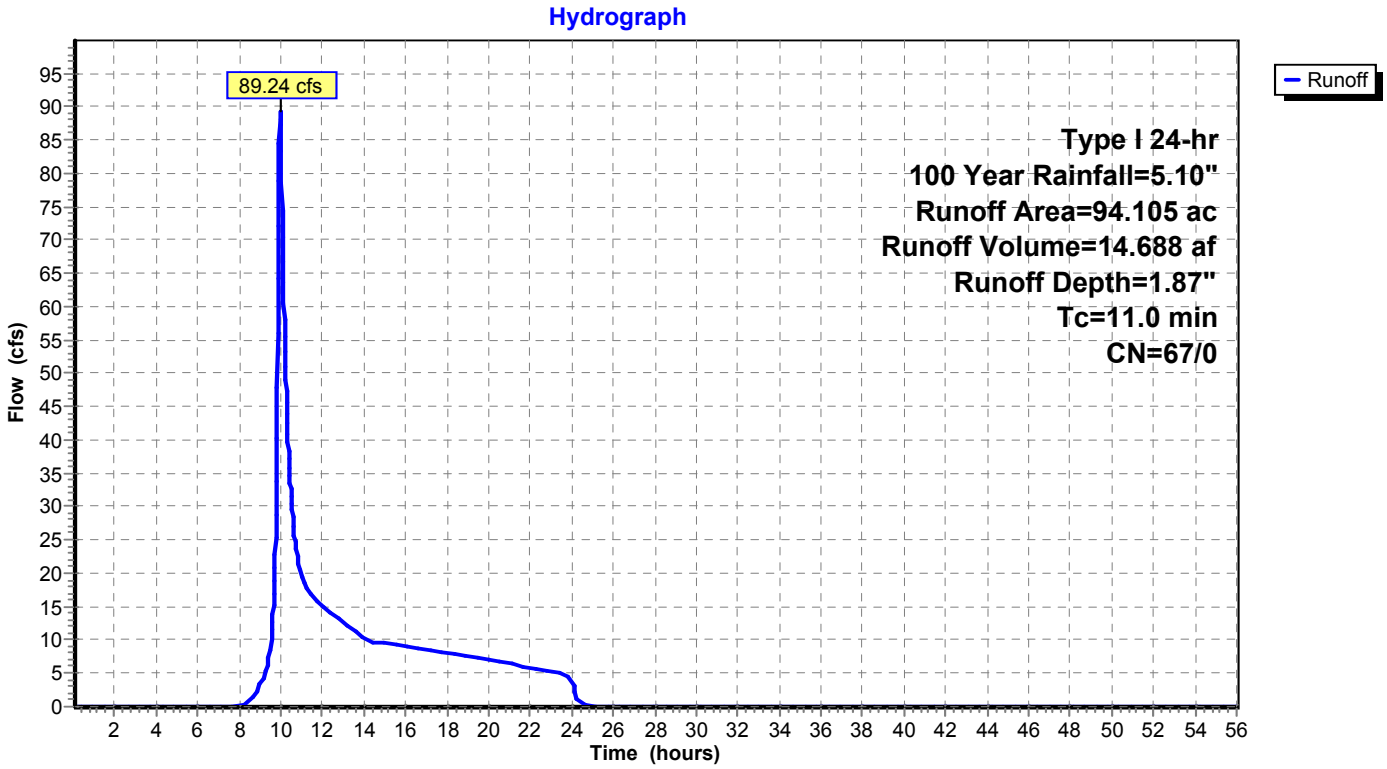
Runoff = 89.24 cfs @ 9.98 hrs, Volume= 14.688 af, Depth= 1.87"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
0.173	58	Meadow, non-grazed, HSG B
9.477	58	Meadow, non-grazed, HSG B
11.002	58	Meadow, non-grazed, HSG B
0.163	58	Meadow, non-grazed, HSG B
0.158	58	Meadow, non-grazed, HSG B
10.113	58	Meadow, non-grazed, HSG B
48.708	71	Meadow, non-grazed, HSG C
14.310	71	Meadow, non-grazed, HSG C
94.105	67	Weighted Average
94.105	67	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.0					**Direct Entry, SCS Method taken from Catchment in ACAD file**

Subcatchment 10a-Ex: Subcat 10a-Ex



Summary for Subcatchment 11: Subcat 11

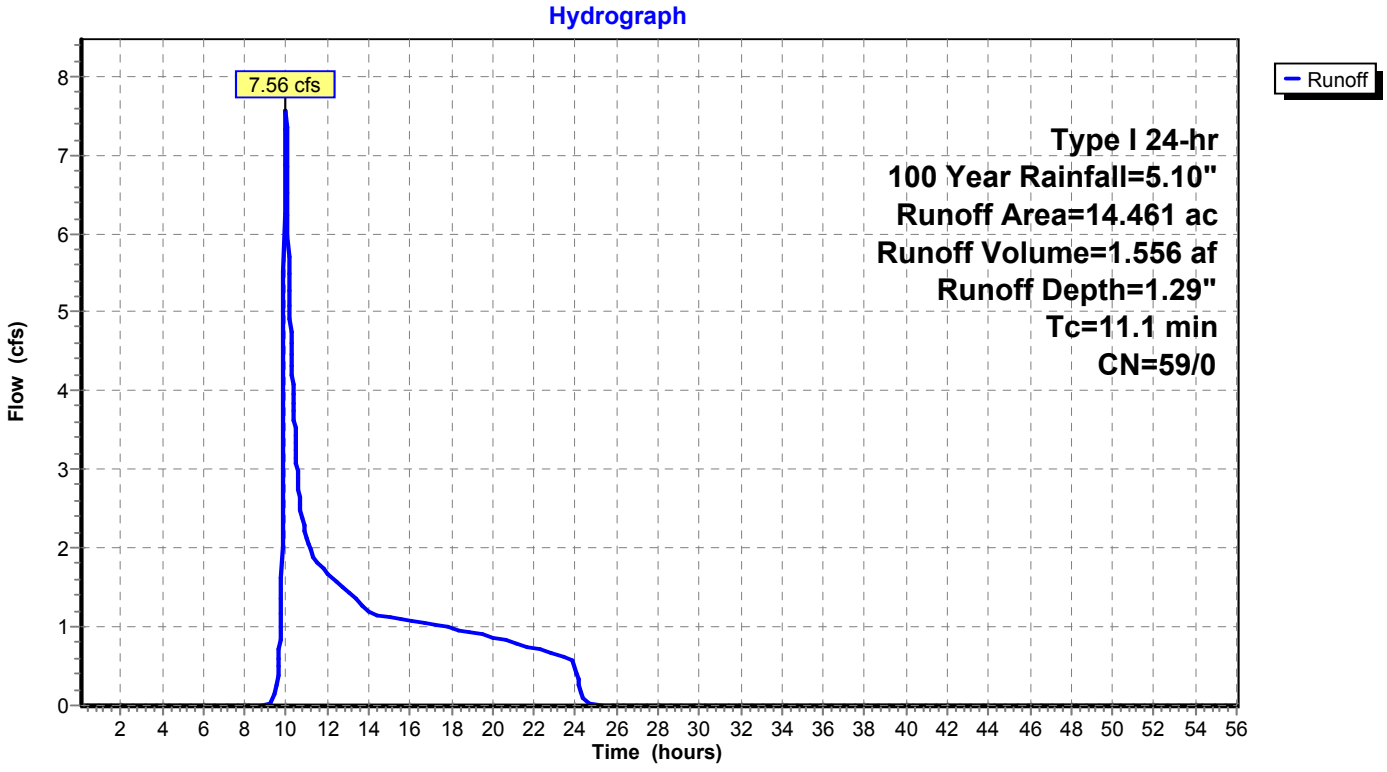
Runoff = 7.56 cfs @ 9.99 hrs, Volume= 1.556 af, Depth= 1.29"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
0.000	58	Meadow, non-grazed, HSG B
0.328	58	Meadow, non-grazed, HSG B
13.072	58	Meadow, non-grazed, HSG B
0.762	71	Meadow, non-grazed, HSG C
0.298	71	Meadow, non-grazed, HSG C
14.461	59	Weighted Average
14.461	59	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
11.1					**Direct Entry, SCS Method taken from Catchment in ACAD file**

Subcatchment 11: Subcat 11



Summary for Subcatchment 12: Subcat 12

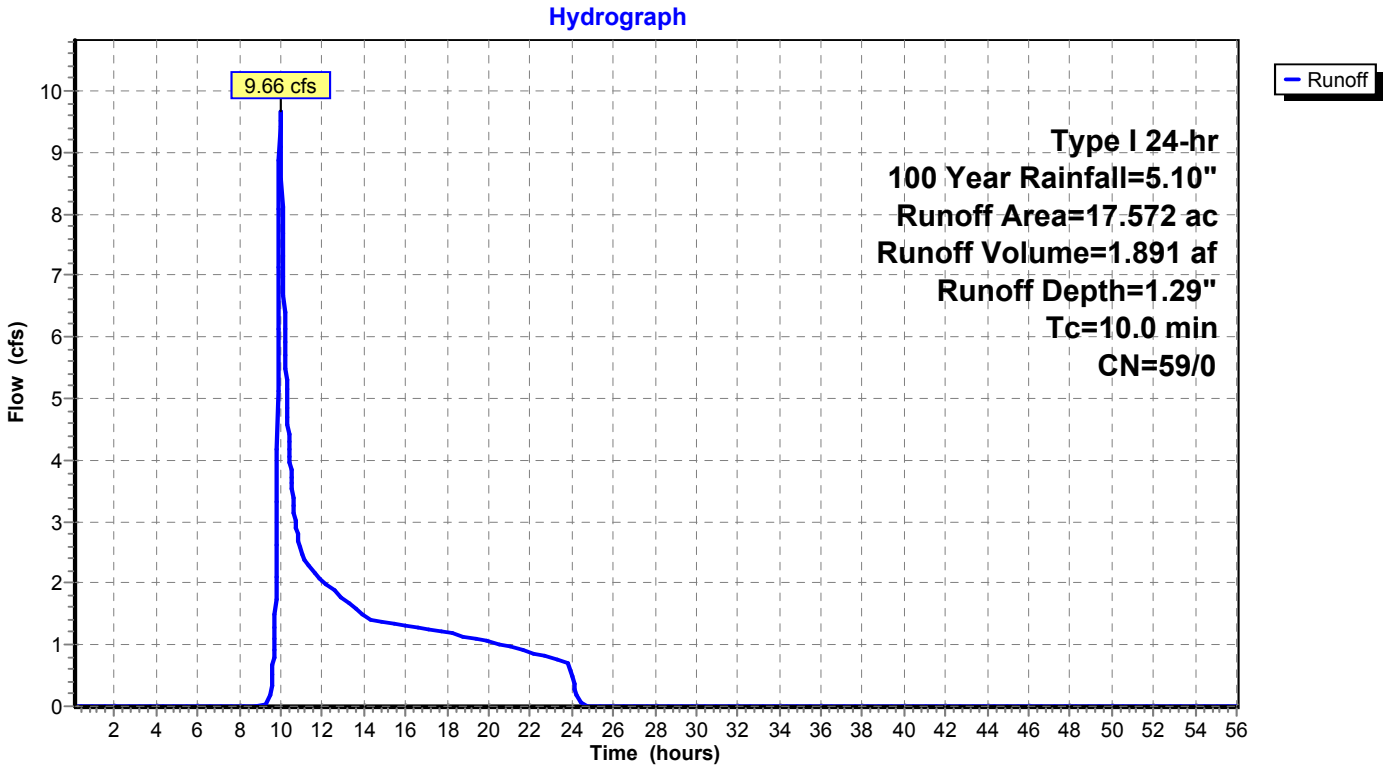
Runoff = 9.66 cfs @ 9.98 hrs, Volume= 1.891 af, Depth= 1.29"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
0.000	58	Meadow, non-grazed, HSG B
0.977	58	Meadow, non-grazed, HSG B
15.916	58	Meadow, non-grazed, HSG B
0.001	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.000	71	Meadow, non-grazed, HSG C
0.223	71	Meadow, non-grazed, HSG C
0.456	71	Meadow, non-grazed, HSG C
17.572	59	Weighted Average
17.572	59	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.9					**Direct Entry, SCS Method taken from Catchment in ACAD file**
7.9	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 12: Subcat 12



Summary for Subcatchment 12a-Ex: Subcat 12a-Ex

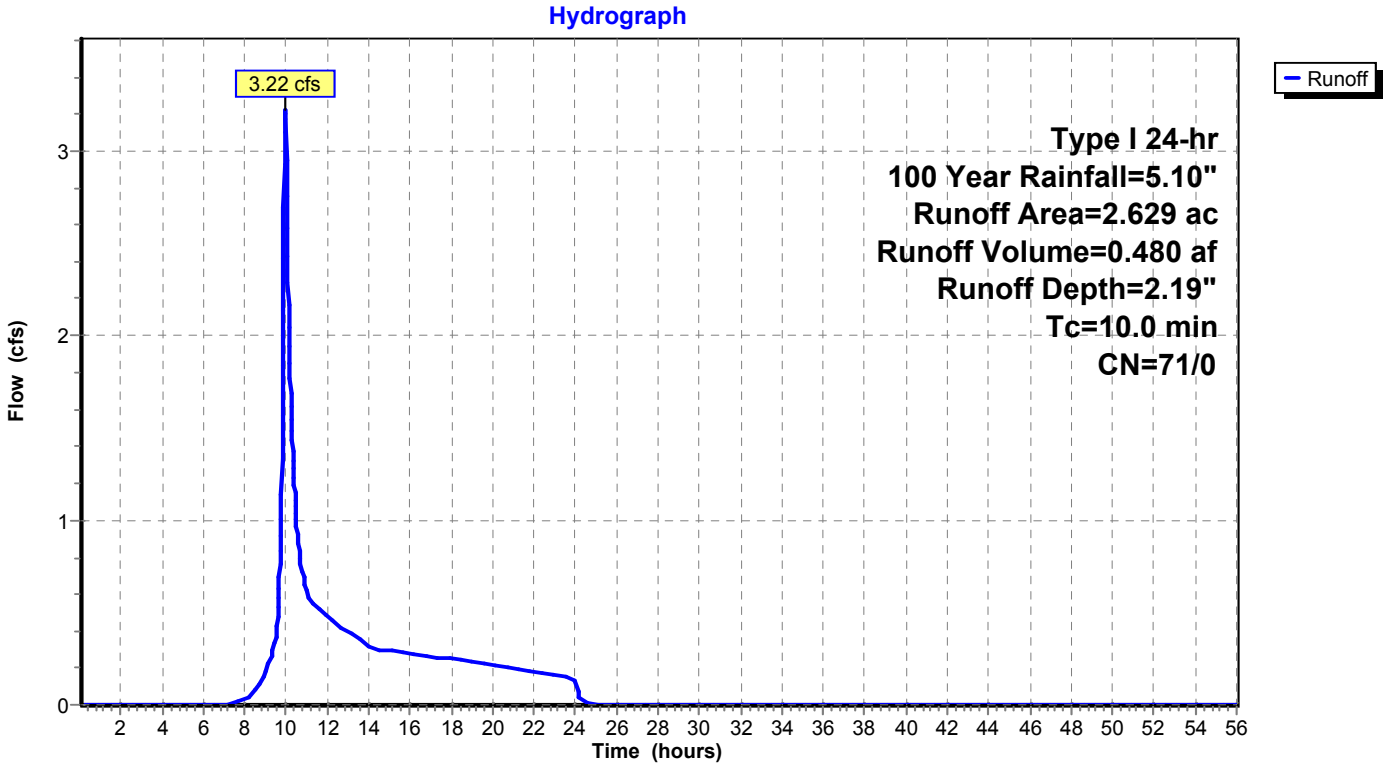
Runoff = 3.22 cfs @ 9.97 hrs, Volume= 0.480 af, Depth= 2.19"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
2.629	71	Meadow, non-grazed, HSG C
2.629	71	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9					**Direct Entry, SCS Method taken from Catchment in ACAD file**
4.9	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 12a-Ex: Subcat 12a-Ex



Summary for Subcatchment 13: Subcat 13

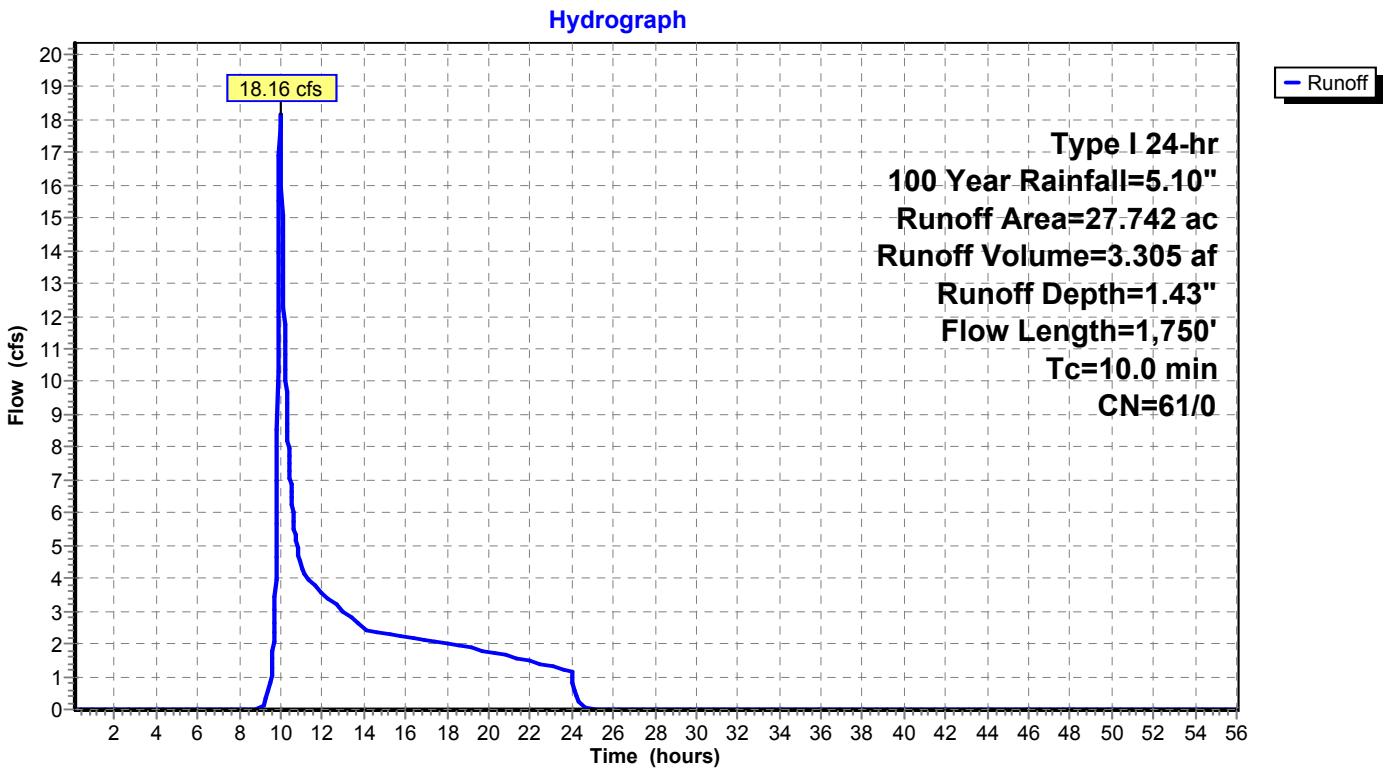
Runoff = 18.16 cfs @ 9.98 hrs, Volume= 3.305 af, Depth= 1.43"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
15.931	58	Meadow, non-grazed, HSG B
4.853	58	Meadow, non-grazed, HSG B
0.000	71	Meadow, non-grazed, HSG C
6.330	71	Meadow, non-grazed, HSG C
0.477	71	Meadow, non-grazed, HSG C
0.151	75	Row crops, SR + CR, Good, HSG B
27.742	61	Weighted Average
27.742	61	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	1,750		3.74		**Direct Entry, SCS Method taken from Catchment in ACAD file**
7.8	1,750	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 13: Subcat 13



Summary for Subcatchment 13a-Ex: Subcat 13a-Ex

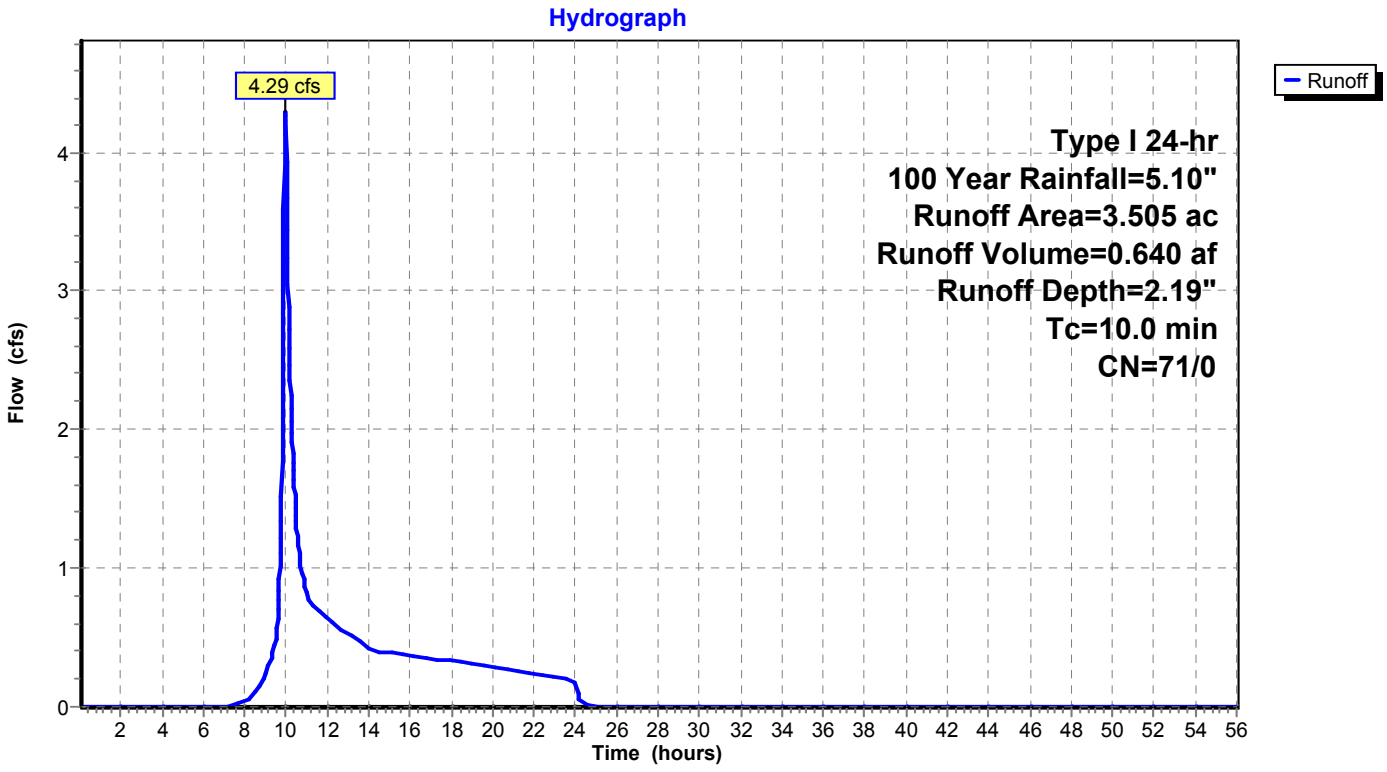
Runoff = 4.29 cfs @ 9.97 hrs, Volume= 0.640 af, Depth= 2.19"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
3.505	71	Meadow, non-grazed, HSG C
3.505	71	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9					**Direct Entry, SCS Method taken from Catchment in ACAD file**
8.9	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 13a-Ex: Subcat 13a-Ex



Summary for Subcatchment 13b-Ex: Subcat 13b-Ex

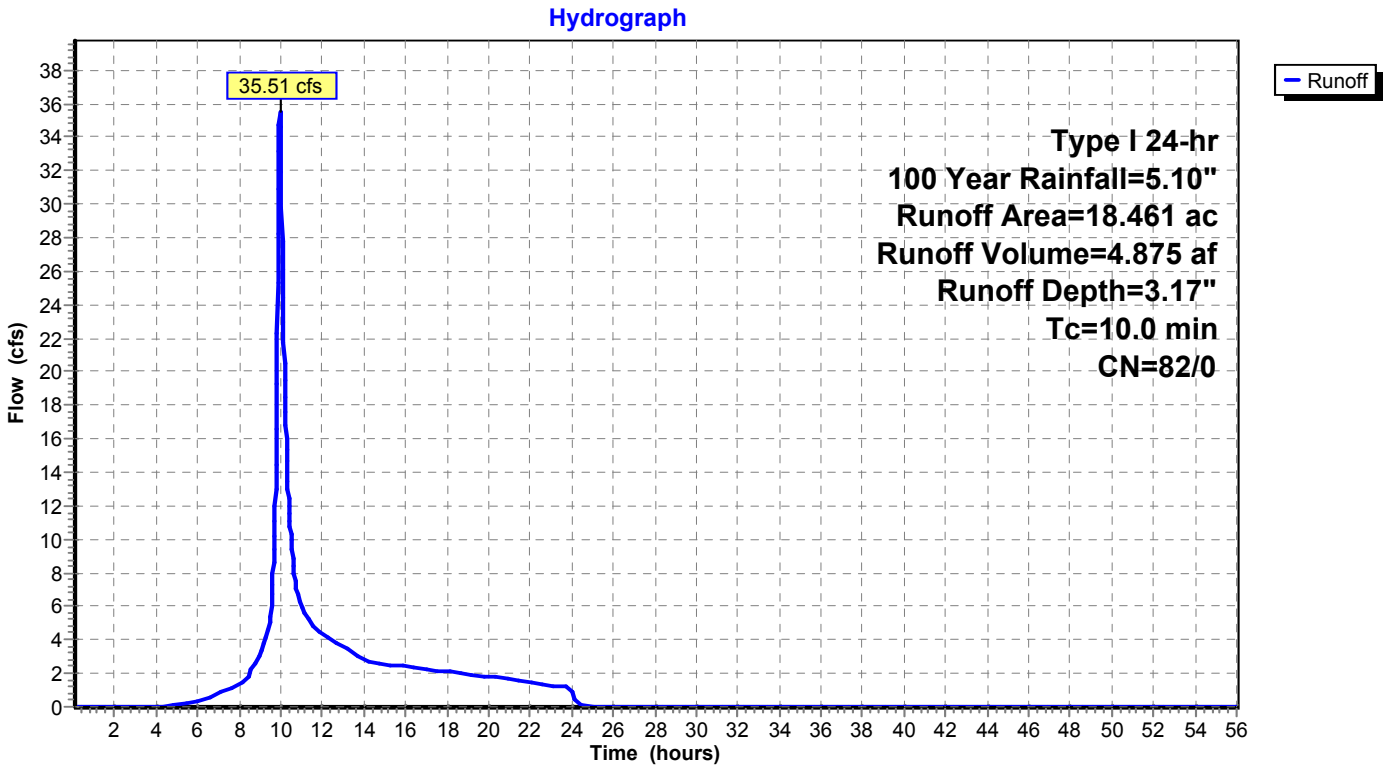
Runoff = 35.51 cfs @ 9.97 hrs, Volume= 4.875 af, Depth= 3.17"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
18.461	82	Row crops, SR + CR, Good, HSG C
18.461	82	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.0					**Direct Entry, SCS Method taken from Catchment in ACAD file**
7.0	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 13b-Ex: Subcat 13b-Ex



Summary for Subcatchment 13c-Ex: Subcat 13c-Ex

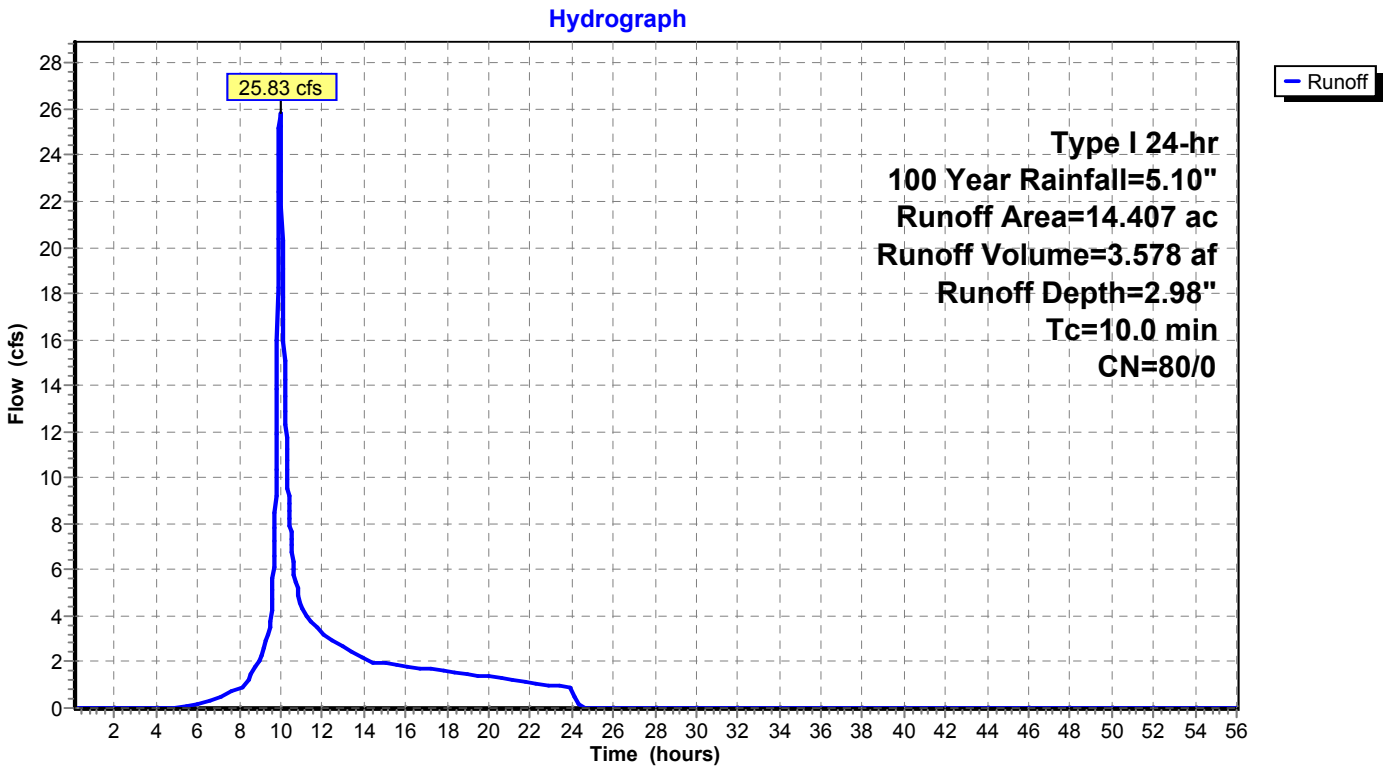
Runoff = 25.83 cfs @ 9.97 hrs, Volume= 3.578 af, Depth= 2.98"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
3.718	75	Row crops, SR + CR, Good, HSG B
10.689	82	Row crops, SR + CR, Good, HSG C
14.407	80	Weighted Average
14.407	80	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.9					**Direct Entry, SCS Method taken from Catchment in ACAD file**
6.9	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 13c-Ex: Subcat 13c-Ex



Summary for Subcatchment 14: Subcat 14

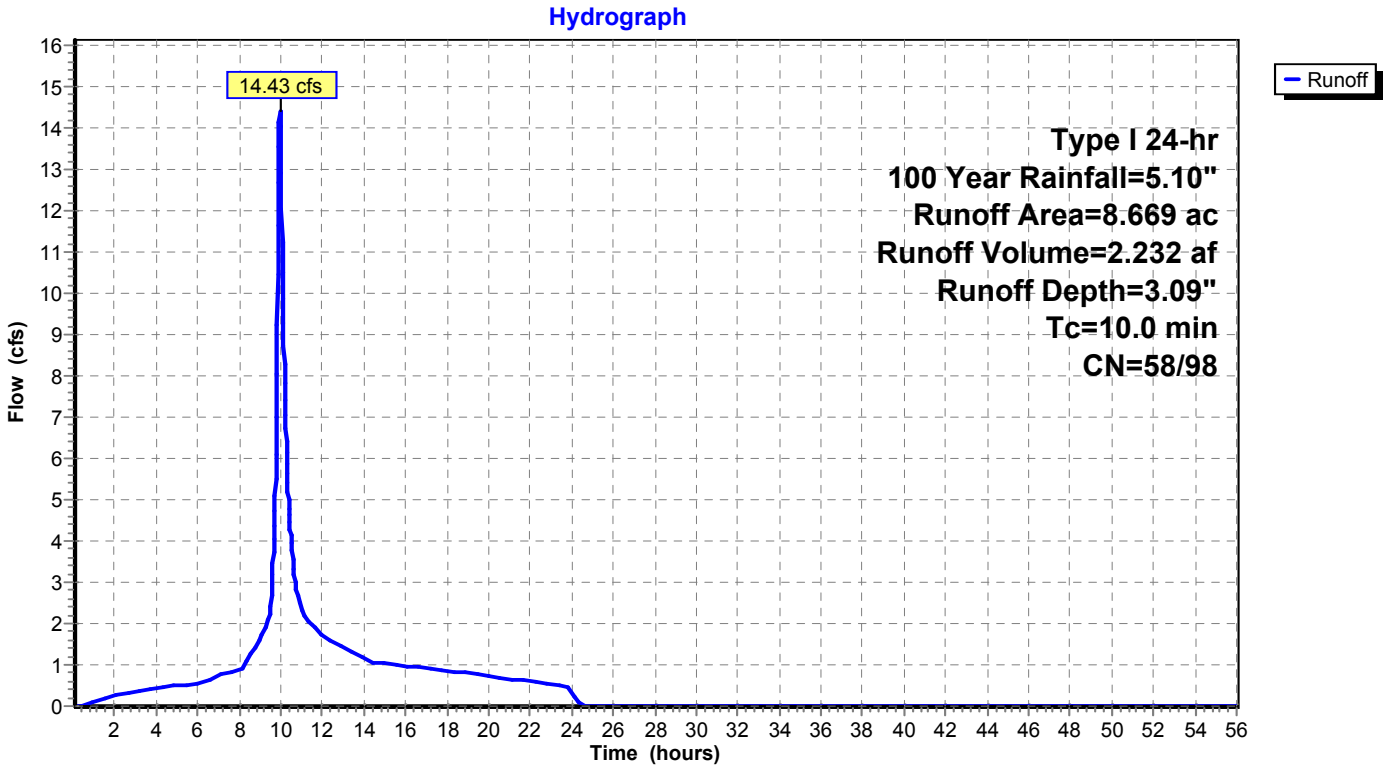
Runoff = 14.43 cfs @ 9.96 hrs, Volume= 2.232 af, Depth= 3.09"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
4.224	58	Meadow, non-grazed, HSG B
4.445	98	Paved roads w/curbs & sewers, HSG B
8.669	79	Weighted Average
4.224	58	48.73% Pervious Area
4.445	98	51.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.6					**Direct Entry, SCS Method taken from Catchment in ACAD file**
8.6	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 14: Subcat 14



Summary for Subcatchment 14a{(1)}-Ex: Subcat 14a{(1)}-Ex

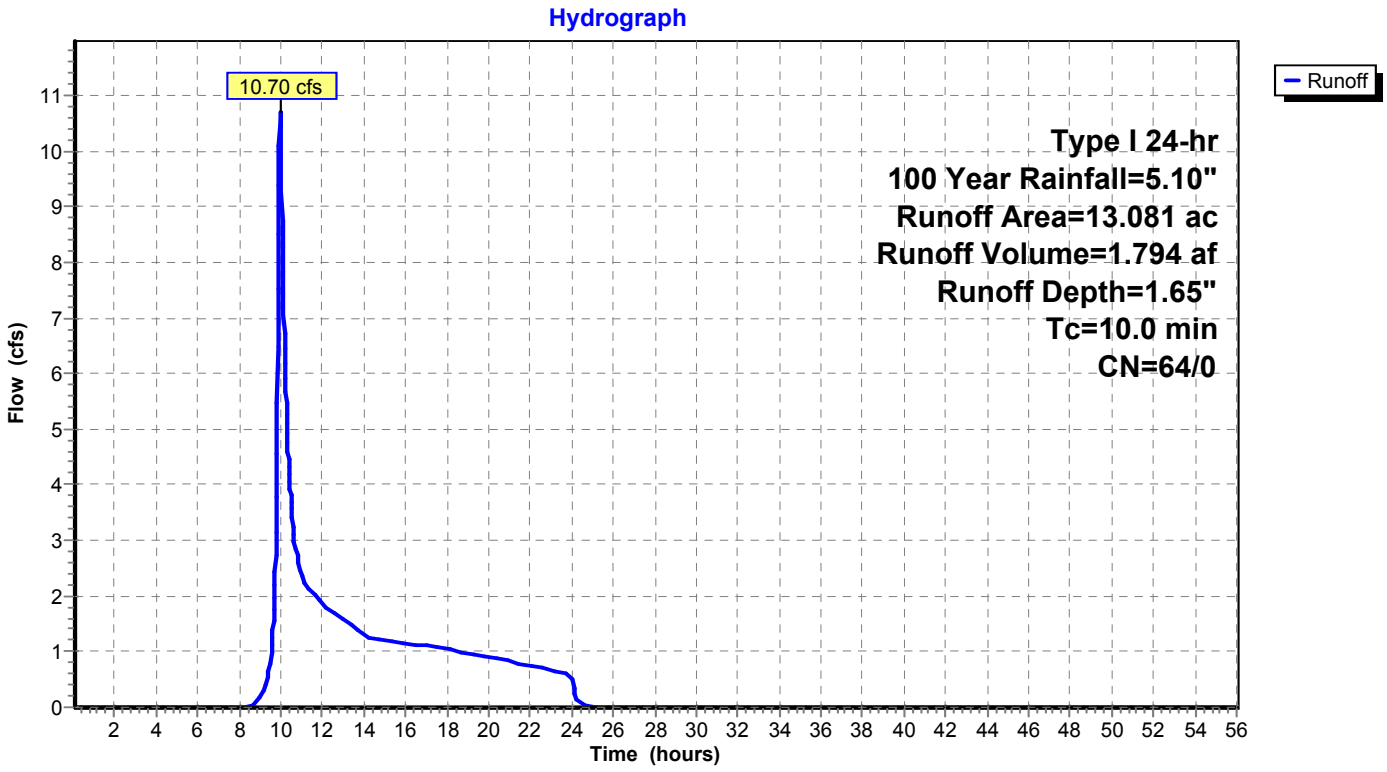
Runoff = 10.70 cfs @ 9.98 hrs, Volume= 1.794 af, Depth= 1.65"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
0.000	58	Meadow, non-grazed, HSG B
8.116	58	Meadow, non-grazed, HSG B
2.383	75	Row crops, SR + CR, Good, HSG B
0.000	75	Row crops, SR + CR, Good, HSG B
2.581	75	Row crops, SR + CR, Good, HSG B
13.081	64	Weighted Average
13.081	64	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**
8.7	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 14a{(1)}-Ex: Subcat 14a{(1)}-Ex



Summary for Subcatchment 14a{(2)}-Ex: Subcat 14a{(2)}-Ex

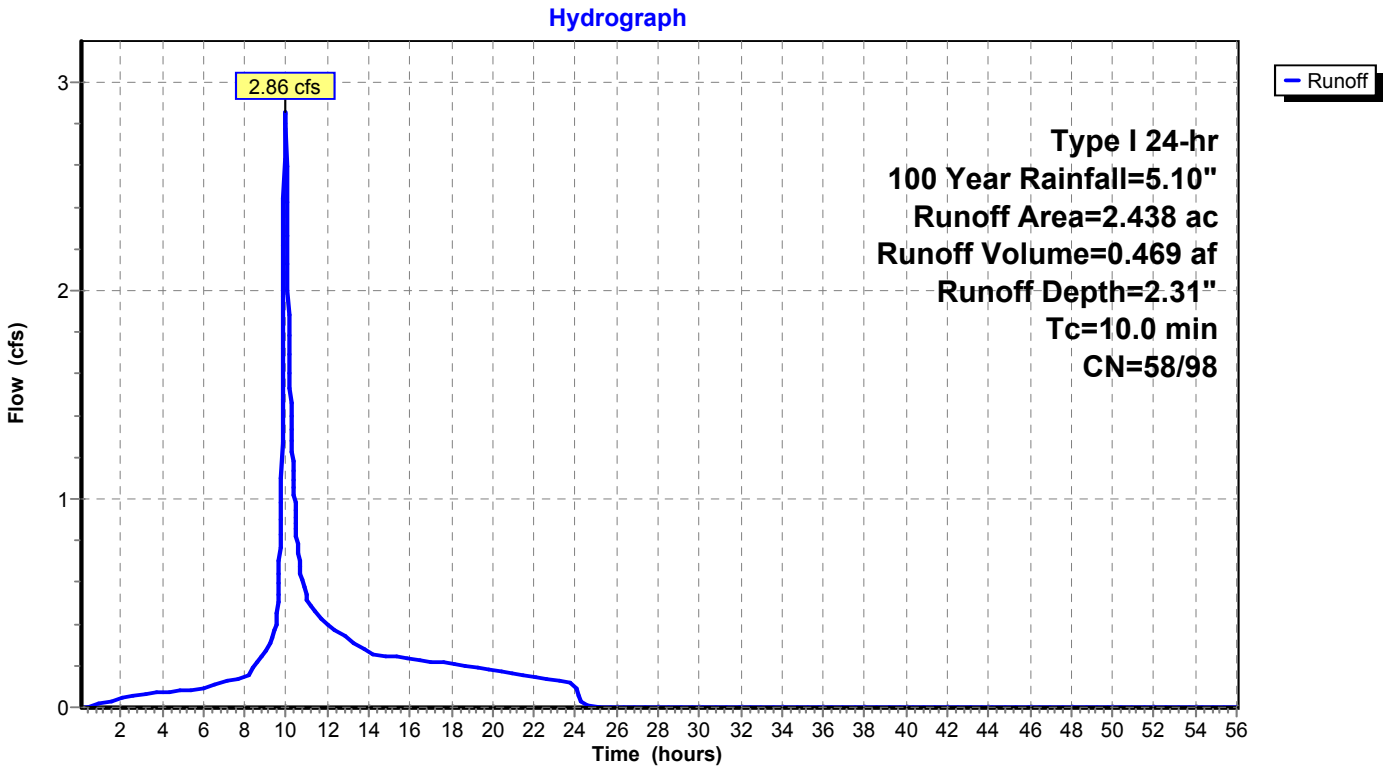
Runoff = 2.86 cfs @ 9.97 hrs, Volume= 0.469 af, Depth= 2.31"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
1.711	58	Meadow, non-grazed, HSG B
0.726	98	Paved roads w/curbs & sewers, HSG B
0.000	75	Row crops, SR + CR, Good, HSG B
0.000	75	Row crops, SR + CR, Good, HSG B
2.438	70	Weighted Average
1.711	58	70.20% Pervious Area
0.726	98	29.80% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**
4.9	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 14a{(2)}-Ex: Subcat 14a{(2)}-Ex



Summary for Subcatchment 14b-Ex: Subcat 14b-Ex

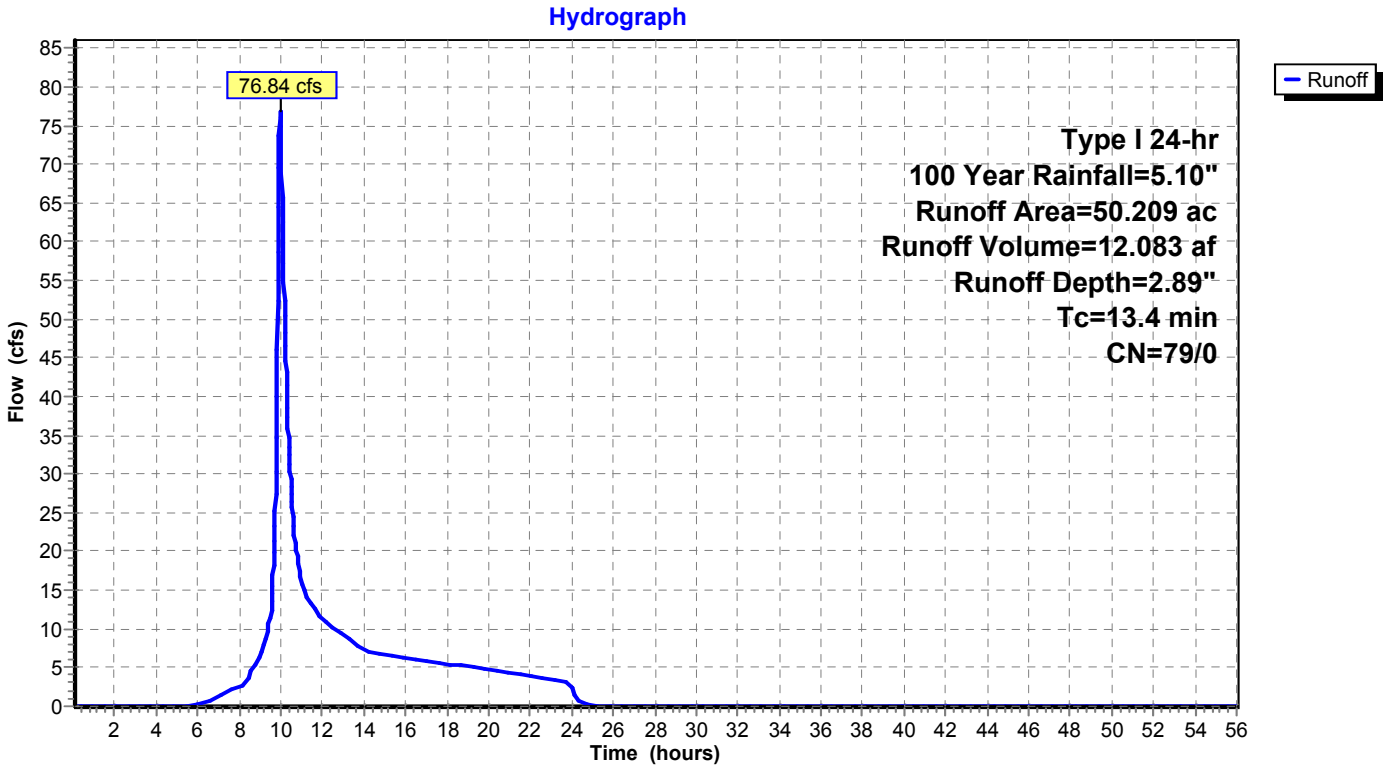
Runoff = 76.84 cfs @ 9.98 hrs, Volume= 12.083 af, Depth= 2.89"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
13.606	75	Row crops, SR + CR, Good, HSG B
8.804	75	Row crops, SR + CR, Good, HSG B
0.005	82	Row crops, SR + CR, Good, HSG C
27.793	82	Row crops, SR + CR, Good, HSG C
50.209	79	Weighted Average
50.209	79	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.4					**Direct Entry, SCS Method taken from Catchment in ACAD file**

Subcatchment 14b-Ex: Subcat 14b-Ex



Summary for Subcatchment 14c{(0)}-Ex: Subcat 14c{(0)}-Ex

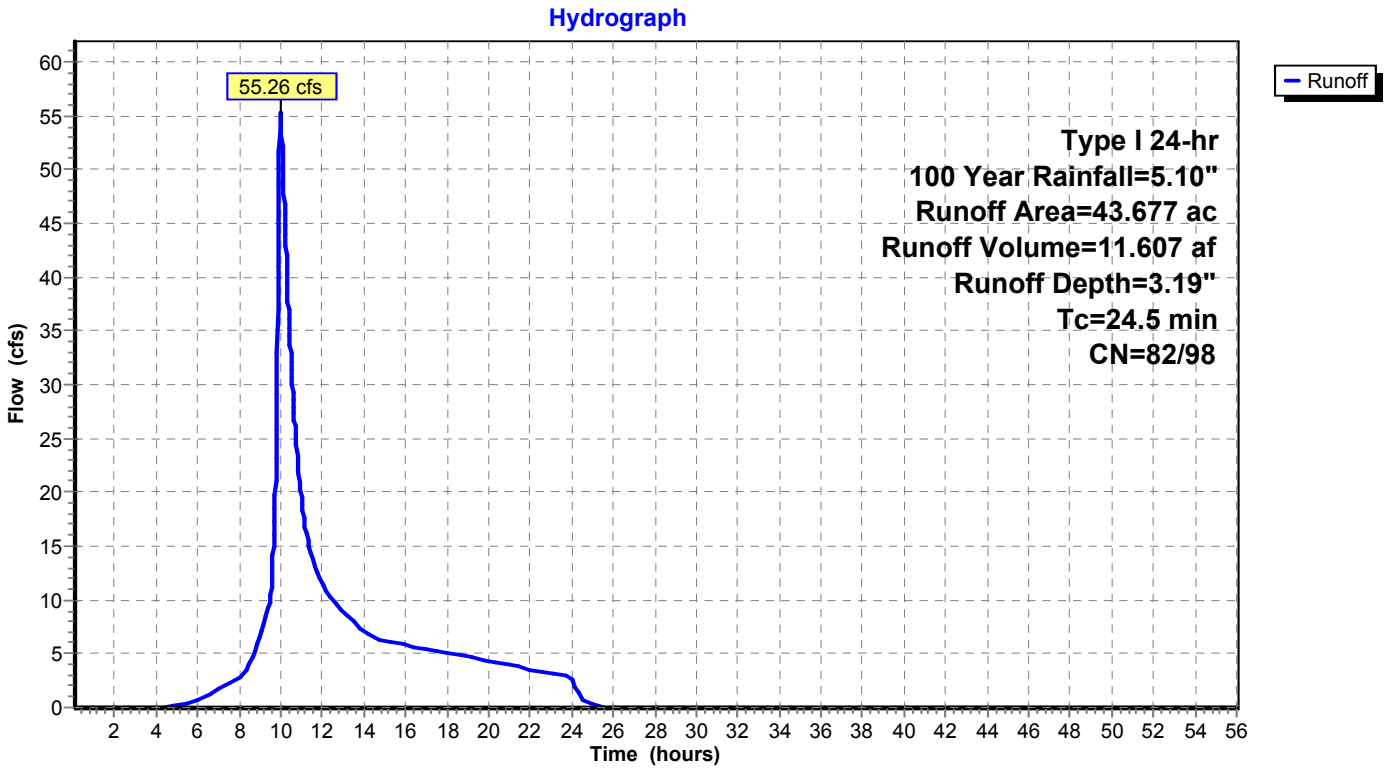
Runoff = 55.26 cfs @ 9.99 hrs, Volume= 11.607 af, Depth= 3.19"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
0.486	98	Paved roads w/curbs & sewers, HSG C
0.041	98	Paved roads w/curbs & sewers, HSG C
37.308	82	Row crops, SR + CR, Good, HSG C
0.070	82	Row crops, SR + CR, Good, HSG C
5.772	82	Row crops, SR + CR, Good, HSG C
43.677	82	Weighted Average
43.150	82	98.79% Pervious Area
0.527	98	1.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 14c{(0)}-Ex: Subcat 14c{(0)}-Ex



Summary for Subcatchment 14c{(1)}-Ex: Subcat 14c{(1)}-Ex

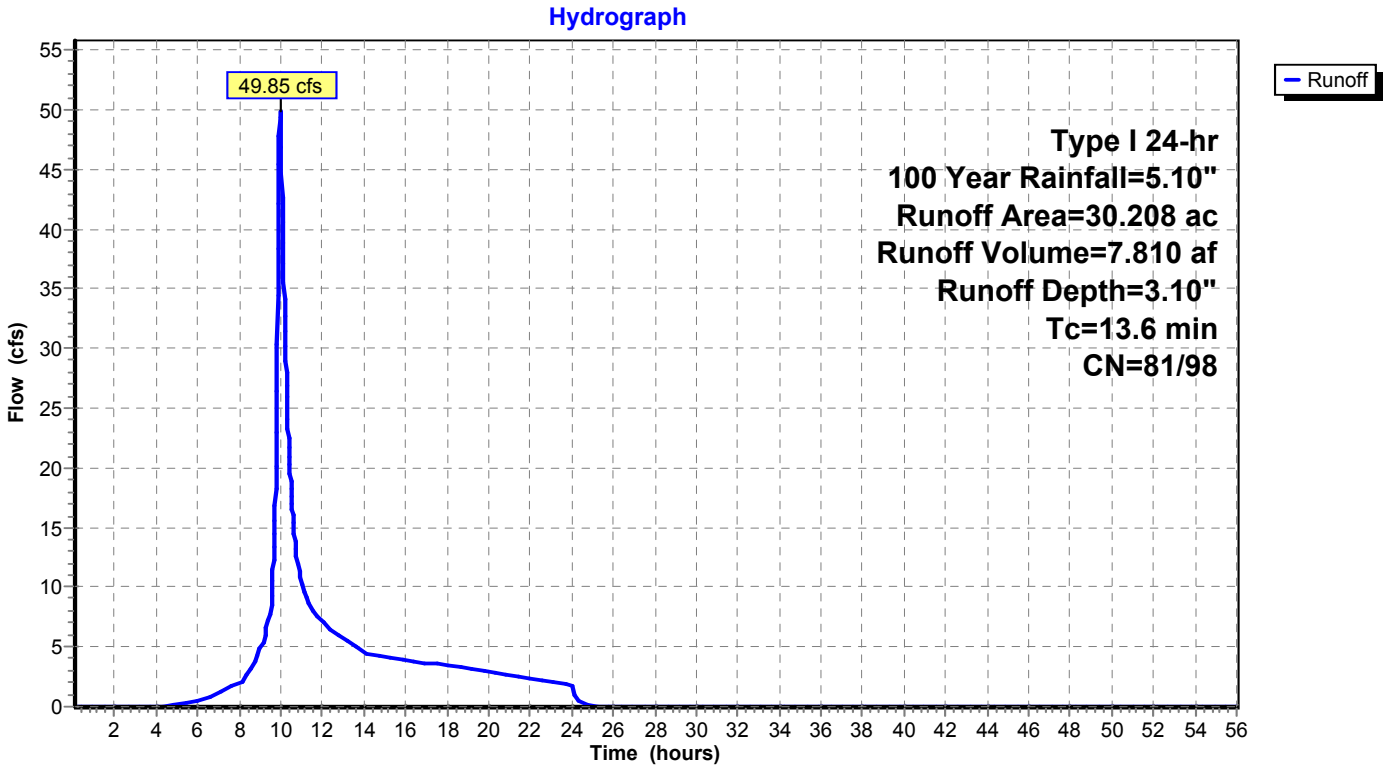
Runoff = 49.85 cfs @ 9.98 hrs, Volume= 7.810 af, Depth= 3.10"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
0.093	98	Paved roads w/curbs & sewers, HSG B
0.394	98	Paved roads w/curbs & sewers, HSG C
2.571	75	Row crops, SR + CR, Good, HSG B
2.743	75	Row crops, SR + CR, Good, HSG B
13.825	82	Row crops, SR + CR, Good, HSG C
10.454	82	Row crops, SR + CR, Good, HSG C
0.128	82	Row crops, SR + CR, Good, HSG C
30.208	81	Weighted Average
29.721	81	98.39% Pervious Area
0.486	98	1.61% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.6					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 14c{(1)}-Ex: Subcat 14c{(1)}-Ex



Summary for Subcatchment 14c{(2)}-Ex: Subcat 14c{(2)}-Ex

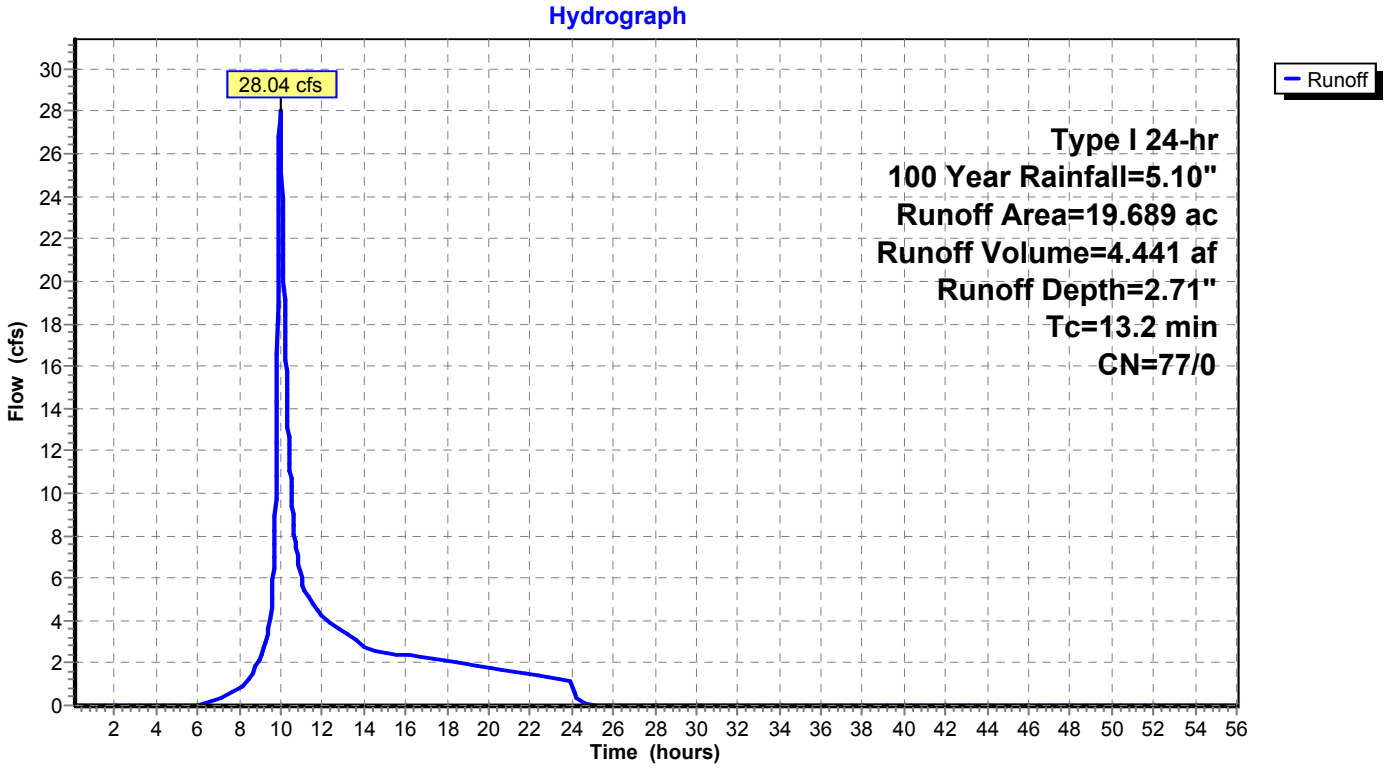
Runoff = 28.04 cfs @ 9.98 hrs, Volume= 4.441 af, Depth= 2.71"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
0.112	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
10.117	75	Row crops, SR + CR, Good, HSG B
3.200	75	Row crops, SR + CR, Good, HSG B
6.261	82	Row crops, SR + CR, Good, HSG C
19.689	77	Weighted Average
19.689	77	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.2					**Direct Entry, Tc from CAD Catchment Data (SCS Method)**

Subcatchment 14c{(2)}-Ex: Subcat 14c{(2)}-Ex



Summary for Subcatchment 14c{(3)}-Ex: Subcat 14c{(3)}-Ex

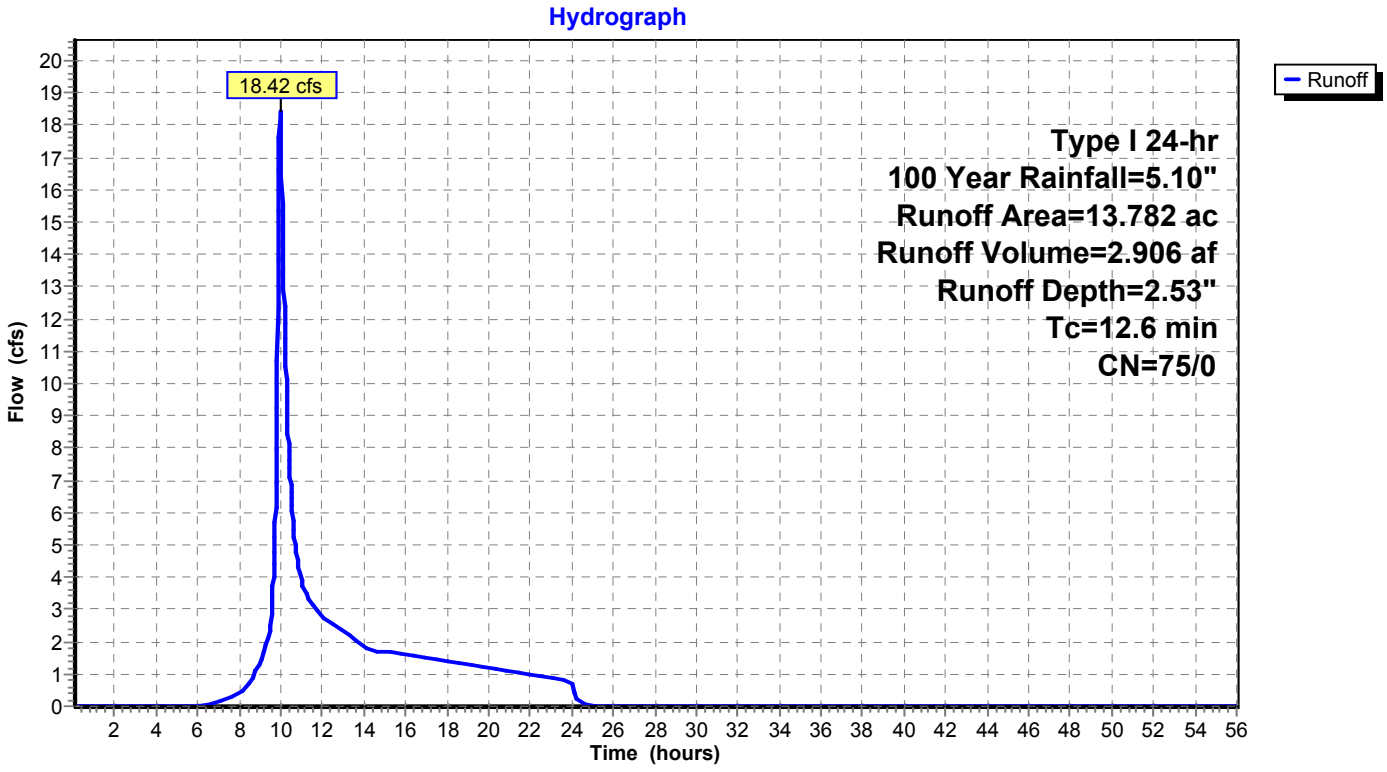
Runoff = 18.42 cfs @ 9.98 hrs, Volume= 2.906 af, Depth= 2.53"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
6.980	75	Row crops, SR + CR, Good, HSG B
0.000	75	Row crops, SR + CR, Good, HSG B
6.802	75	Row crops, SR + CR, Good, HSG B
13.782	75	Weighted Average
13.782	75	100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.6					**Direct Entry, SCS Method taken from Catchment in ACAD file**

Subcatchment 14c{(3)}-Ex: Subcat 14c{(3)}-Ex



Summary for Subcatchment 14d-Ex: Subcat 14d-Ex

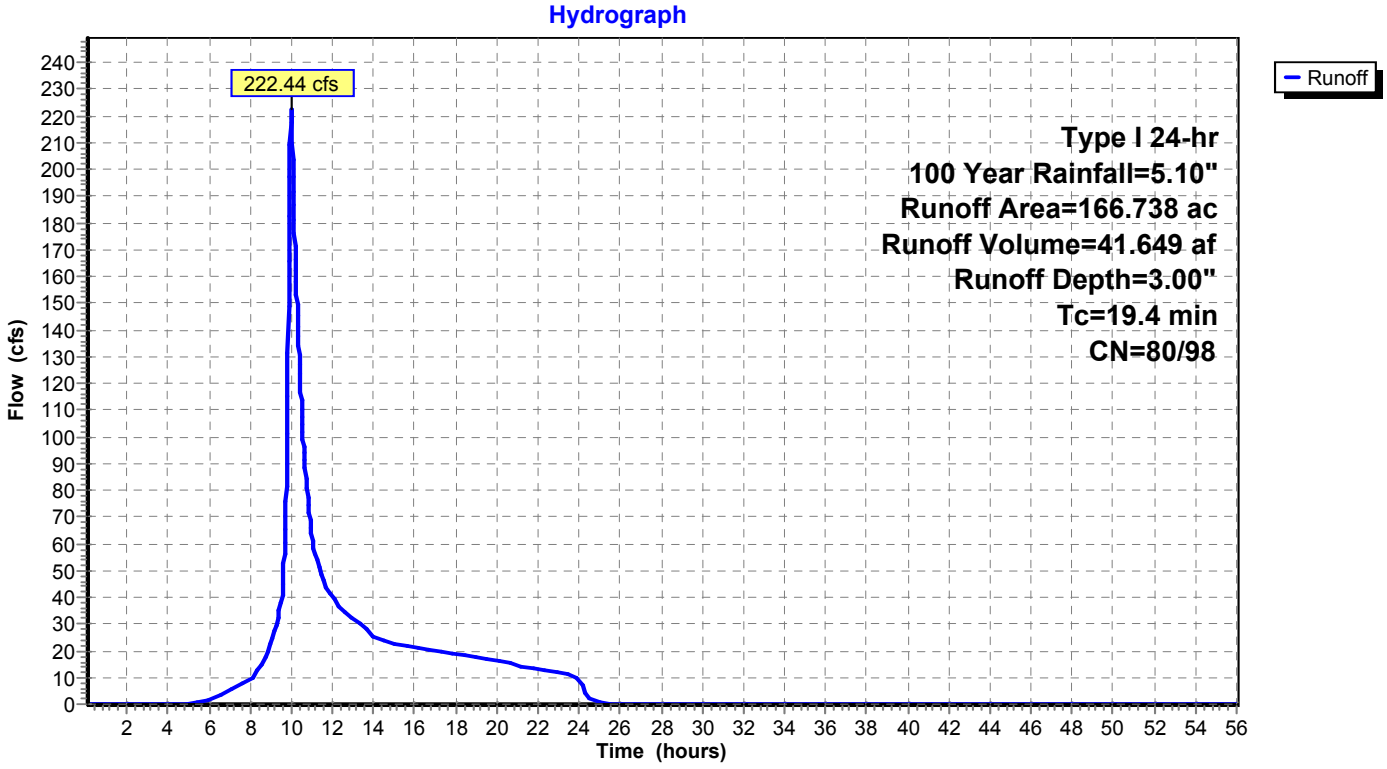
Runoff = 222.44 cfs @ 9.99 hrs, Volume= 41.649 af, Depth= 3.00"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
0.000	71	Meadow, non-grazed, HSG C
0.000	71	Meadow, non-grazed, HSG C
0.000	71	Meadow, non-grazed, HSG C
0.000	71	Meadow, non-grazed, HSG C
0.000	71	Meadow, non-grazed, HSG C
0.440	98	Paved roads w/curbs & sewers, HSG B
0.500	98	Paved roads w/curbs & sewers, HSG C
0.580	98	Paved roads w/curbs & sewers, HSG C
22.046	75	Row crops, SR + CR, Good, HSG B
2.662	75	Row crops, SR + CR, Good, HSG B
18.916	75	Row crops, SR + CR, Good, HSG B
108.025	82	Row crops, SR + CR, Good, HSG C
6.305	82	Row crops, SR + CR, Good, HSG C
7.263	82	Row crops, SR + CR, Good, HSG C
166.738	80	Weighted Average
165.218	80	99.09% Pervious Area
1.520	98	0.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.4					**Direct Entry, SCS Method taken from Catchment in ACAD file**

Subcatchment 14d-Ex: Subcat 14d-Ex



Summary for Subcatchment 14e-Ex: Subcat 14e-Ex

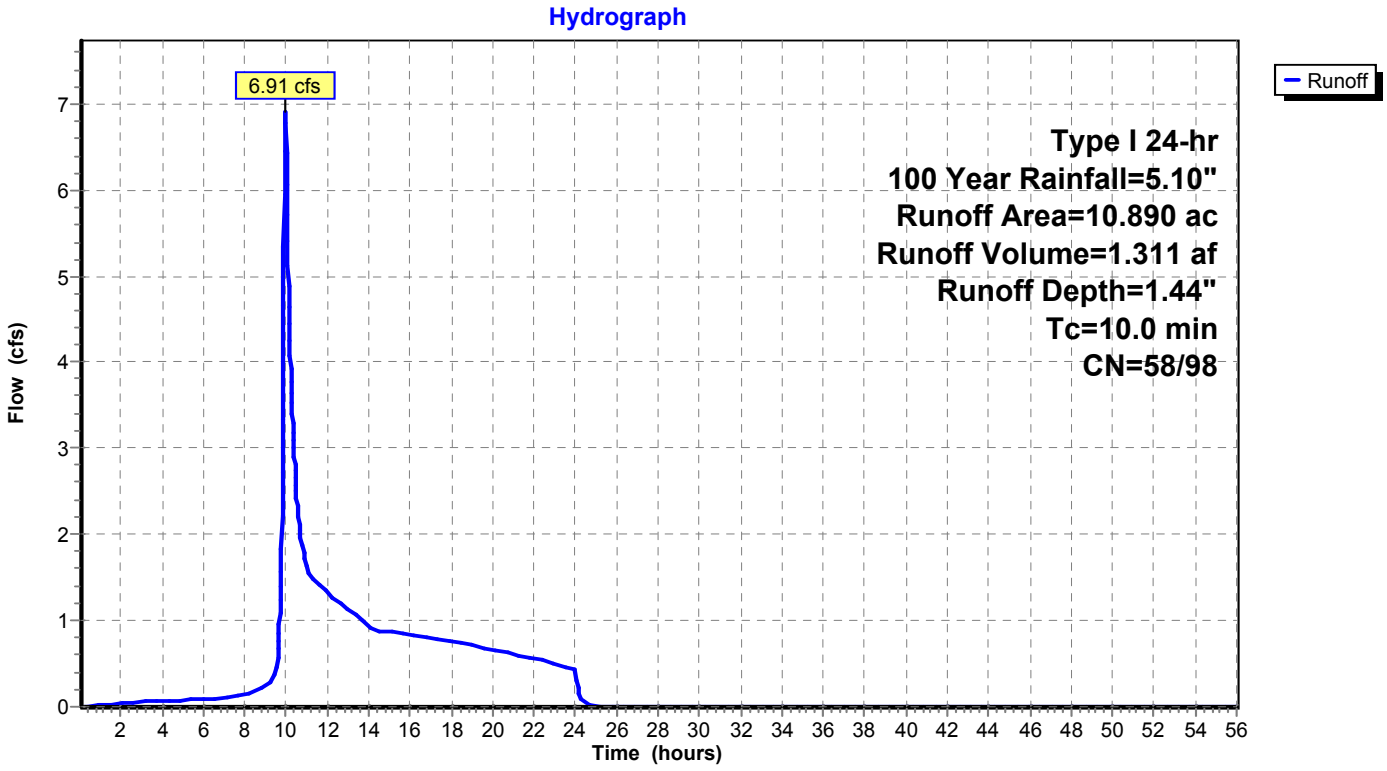
Runoff = 6.91 cfs @ 9.98 hrs, Volume= 1.311 af, Depth= 1.44"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Type I 24-hr 100 Year Rainfall=5.10"

Area (ac)	CN	Description
10.185	58	Meadow, non-grazed, HSG B
0.003	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.000	58	Meadow, non-grazed, HSG B
0.043	77	Natural western desert, HSG B
0.659	98	Paved roads w/curbs & sewers, HSG B
10.890	60	Weighted Average
10.231	58	93.95% Pervious Area
0.659	98	6.05% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.4					**Direct Entry, SCS Method taken from Catchment in ACAD file**
9.4	0	Total, Increased to minimum Tc = 10.0 min			

Subcatchment 14e-Ex: Subcat 14e-Ex



Summary for Reach 6R: Reach 1c

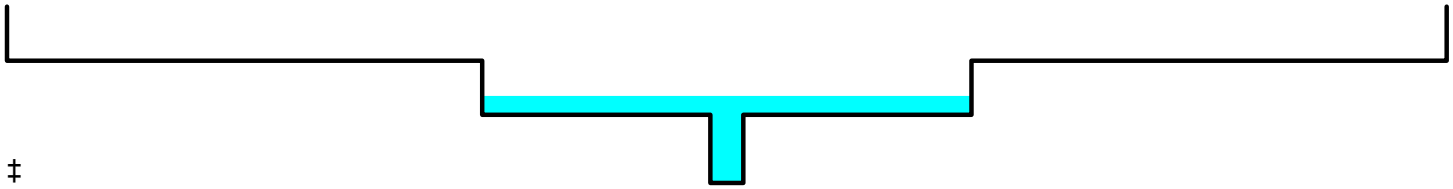
[61] Hint: Exceeded Reach 17R outlet invert by 0.33' @ 10.18 hrs

Inflow Area = 784.583 ac, 0.00% Impervious, Inflow Depth = 1.43" for 100 Year event
Inflow = 281.87 cfs @ 10.06 hrs, Volume= 93.331 af
Outflow = 267.92 cfs @ 10.18 hrs, Volume= 93.331 af, Atten= 5%, Lag= 6.9 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Max. Velocity= 4.26 fps, Min. Travel Time= 3.2 min
Avg. Velocity = 4.16 fps, Avg. Travel Time= 3.3 min

Peak Storage= 67,536 cf @ 10.18 hrs
Average Depth at Peak Storage= 3.21'
Bank-Full Depth= 6.52' Flow Area= 758.7 sf, Capacity= 4,878.97 cfs

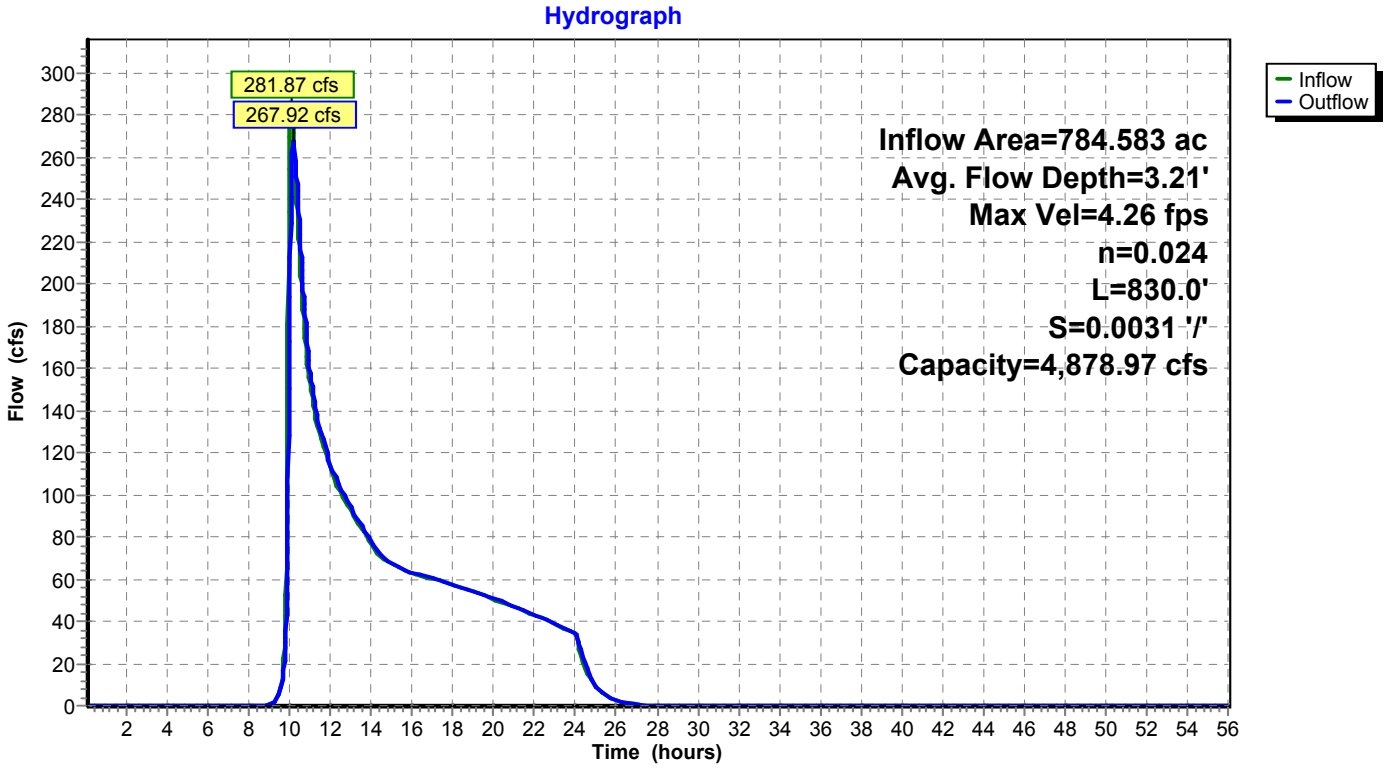
Custom stage-perimeter table, n= 0.024
102 Intermediate values determined by Multi-point interpolation
Length= 830.0' Slope= 0.0031 '/'
Inlet Invert= 841.43', Outlet Invert= 838.82'



‡

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
2.52	15.9	11.7	13,197	67.73
4.52	204.4	231.7	169,652	652.79
6.52	758.7	301.0	629,721	4,878.97

Reach 6R: Reach 1c



Summary for Reach 7R: Reach 1b

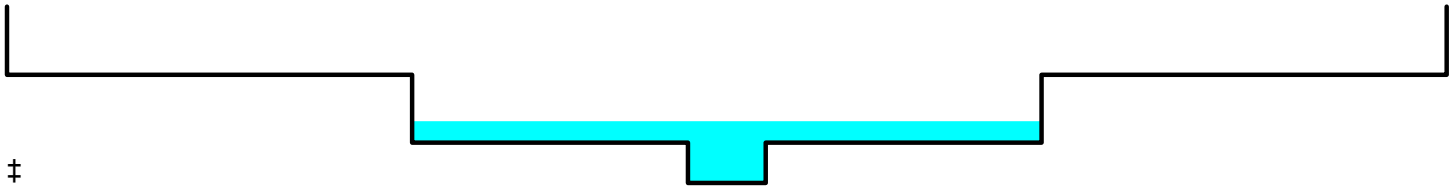
[62] Hint: Exceeded Reach 6R OUTLET depth by 0.69' @ 9.62 hrs

Inflow Area = 833.262 ac, 0.00% Impervious, Inflow Depth = 2.14" for 100 Year event
Inflow = 501.58 cfs @ 10.13 hrs, Volume= 148.911 af
Outflow = 494.14 cfs @ 10.18 hrs, Volume= 148.911 af, Atten= 1%, Lag= 3.5 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Max. Velocity= 4.74 fps, Min. Travel Time= 3.1 min
Avg. Velocity = 3.37 fps, Avg. Travel Time= 4.4 min

Peak Storage= 92,114 cf @ 10.18 hrs
Average Depth at Peak Storage= 1.82'
Bank-Full Depth= 5.18' Flow Area= 896.3 sf, Capacity= 8,865.90 cfs

Custom stage-perimeter table, n= 0.024
102 Intermediate values determined by Multi-point interpolation
Length= 883.0' Slope= 0.0066 '/'
Inlet Invert= 838.82', Outlet Invert= 833.00'

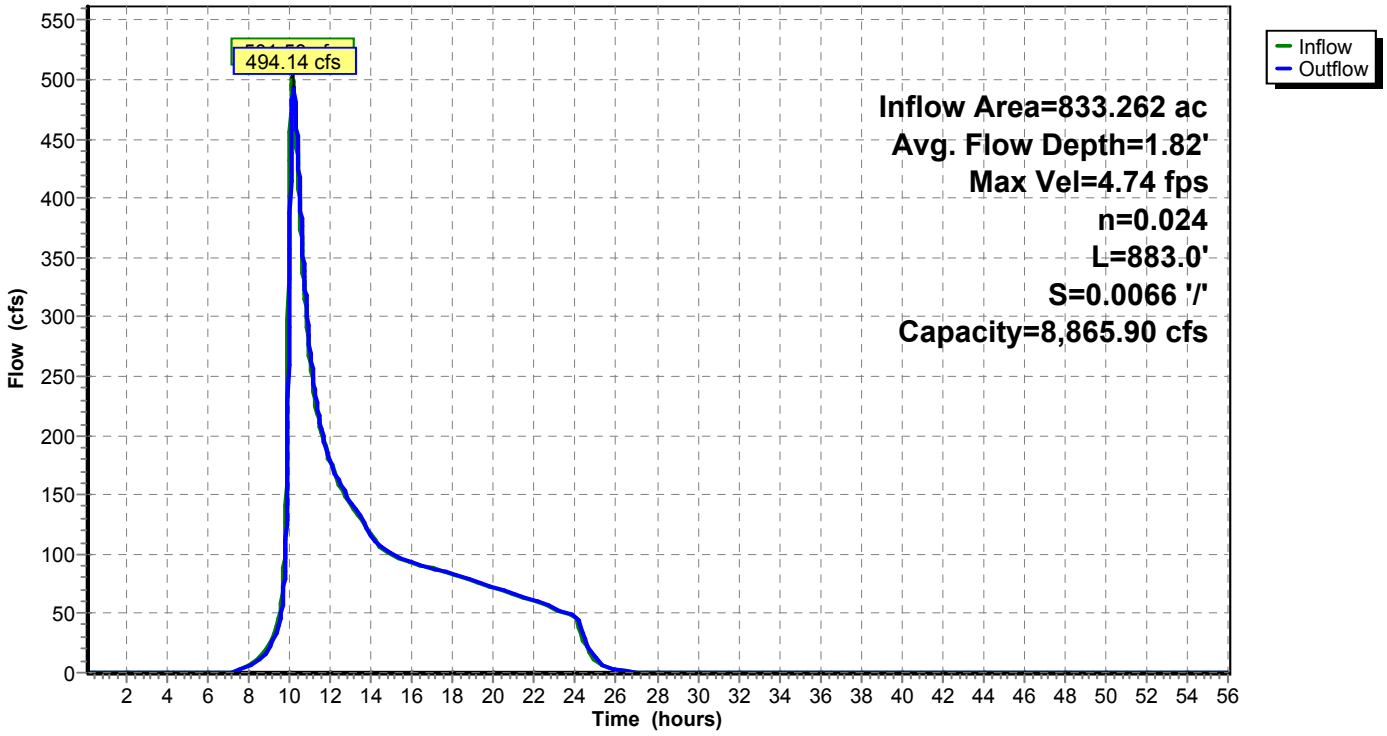


‡

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
1.18	19.4	38.8	17,130	61.43
3.18	286.2	275.2	252,715	1,476.75
5.18	896.3	324.7	791,433	8,865.90

Reach 7R: Reach 1b

Hydrograph



Summary for Reach 8R: Reach 1a

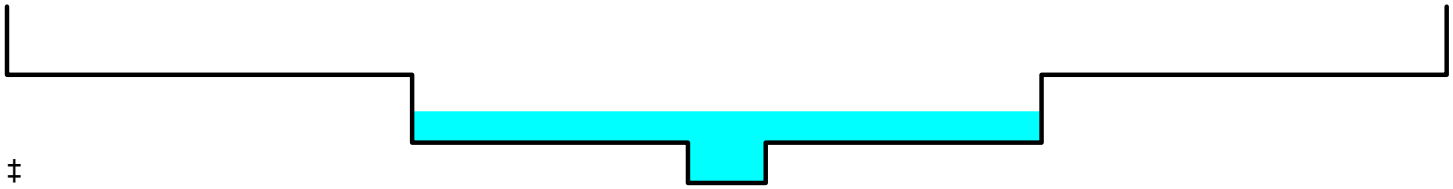
[62] Hint: Exceeded Reach 7R OUTLET depth by 0.39' @ 24.24 hrs

Inflow Area = 879.875 ac, 0.06% Impervious, Inflow Depth = 2.10" for 100 Year event
Inflow = 510.36 cfs @ 10.18 hrs, Volume= 153.969 af
Outflow = 504.95 cfs @ 10.23 hrs, Volume= 153.969 af, Atten= 1%, Lag= 3.0 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Max. Velocity= 3.54 fps, Min. Travel Time= 2.7 min
Avg. Velocity = 2.51 fps, Avg. Travel Time= 3.9 min

Peak Storage= 83,193 cf @ 10.23 hrs
Average Depth at Peak Storage= 2.10'
Bank-Full Depth= 5.18' Flow Area= 896.3 sf, Capacity= 6,396.21 cfs

Custom stage-perimeter table, n= 0.024
102 Intermediate values determined by Multi-point interpolation
Length= 583.0' Slope= 0.0034 '/'
Inlet Invert= 833.00', Outlet Invert= 831.00'



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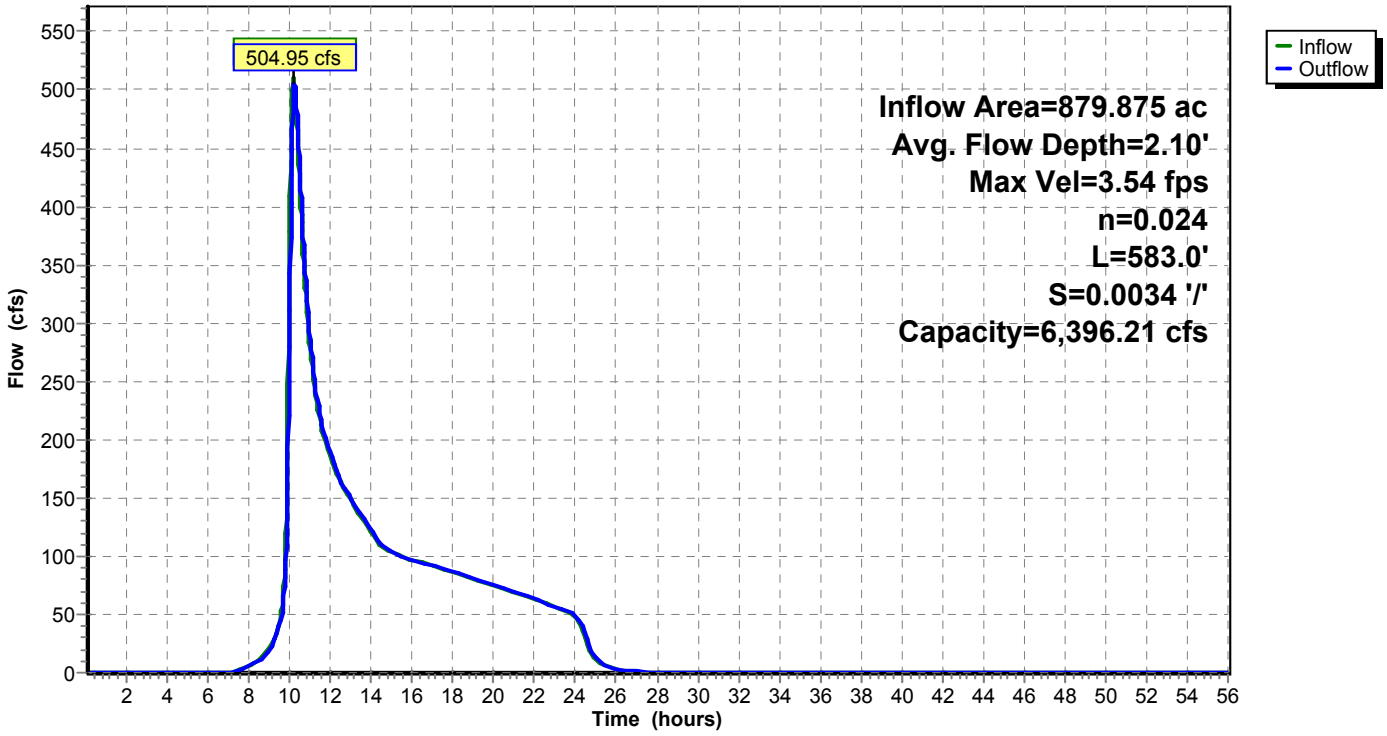
Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
1.18	19.4	38.8	11,310	44.32
3.18	286.2	275.2	166,855	1,065.38
5.18	896.3	324.7	522,543	6,396.21

Reach 8R: Reach 1a

Hydrograph



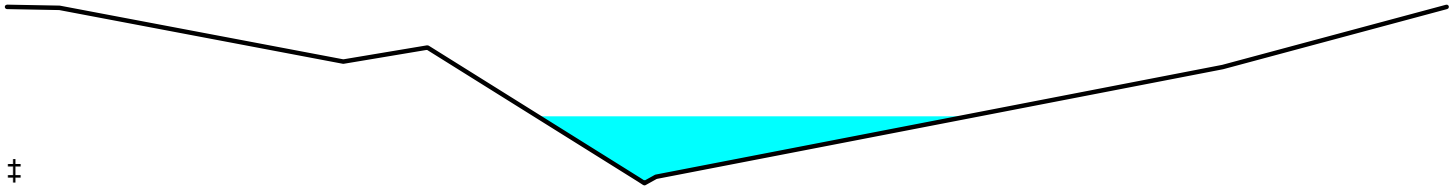
Summary for Reach 17R: Reach 1d

Inflow = 103.48 cfs @ 9.99 hrs, Volume= 3.704 af
Outflow = 90.29 cfs @ 10.06 hrs, Volume= 3.704 af, Atten= 13%, Lag= 4.1 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Max. Velocity= 2.90 fps, Min. Travel Time= 4.8 min
Avg. Velocity = 0.64 fps, Avg. Travel Time= 21.9 min

Peak Storage= 26,166 cf @ 10.06 hrs
Average Depth at Peak Storage= 0.74'
Bank-Full Depth= 1.96' Flow Area= 247.0 sf, Capacity= 1,276.84 cfs

Custom cross-section, Length= 841.0' Slope= 0.0110 '/' (102 Elevation Intervals)
Constant n= 0.027
Inlet Invert= 853.60', Outlet Invert= 844.31'

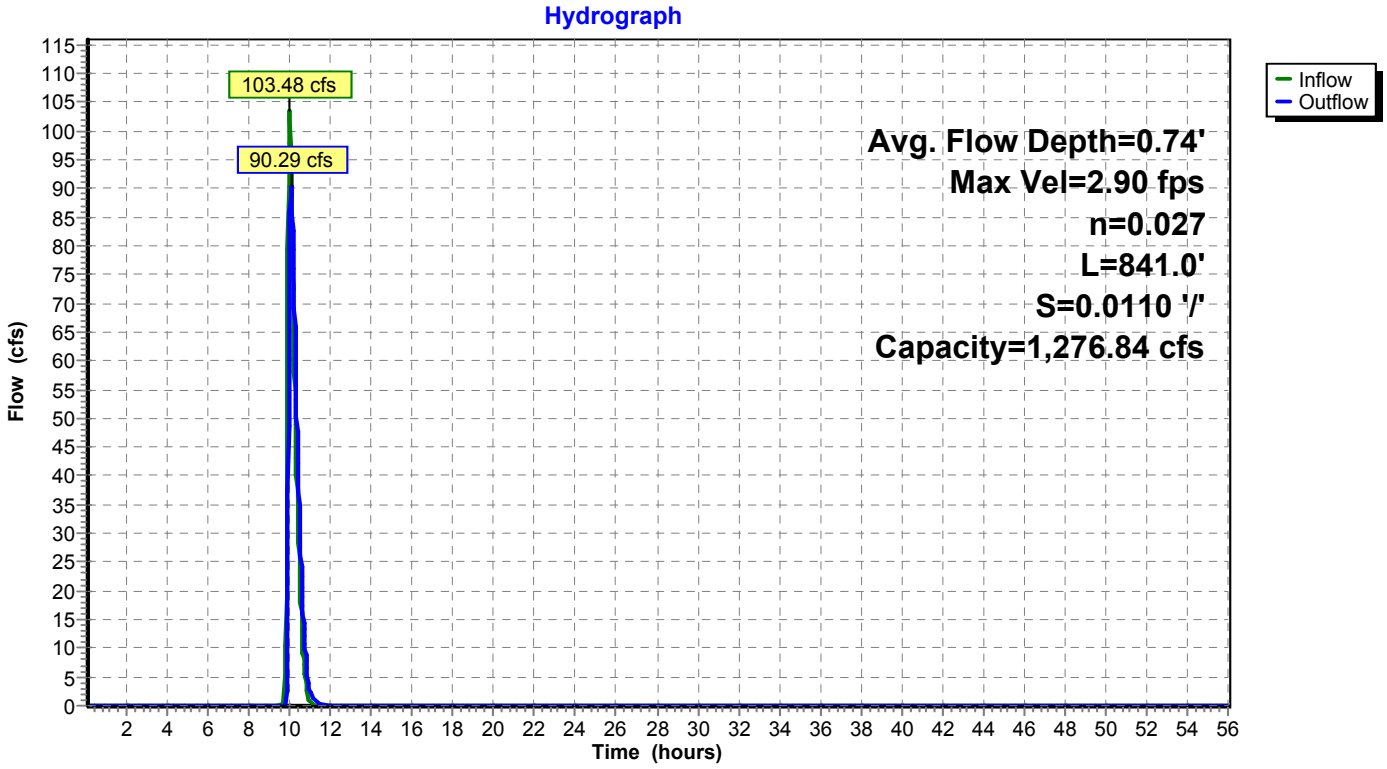


‡

Offset (feet)	Elevation (feet)	Chan.Depth (feet)
8.56	851.18	0.00
19.24	851.17	0.01
76.81	850.57	0.61
93.88	850.73	0.45
136.80	849.26	1.92
137.90	849.22	1.96
140.29	849.29	1.89
255.27	850.51	0.67
300.75	851.18	0.00

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
0.04	0.0	2.5	42	0.02
0.07	0.2	4.4	128	0.09
1.29	97.3	155.0	81,870	413.13
1.35	106.8	160.8	89,836	469.56
1.51	136.4	208.8	114,697	594.12
1.95	244.1	280.9	205,277	1,285.78
1.96	247.0	292.2	207,687	1,276.84

Reach 17R: Reach 1d



Summary for Reach 18R: Linne Road Grassed Chl

Inflow Area = 276.531 ac, 1.18% Impervious, Inflow Depth = 0.65" for 100 Year event
Inflow = 25.65 cfs @ 10.05 hrs, Volume= 14.875 af
Outflow = 24.58 cfs @ 10.15 hrs, Volume= 14.875 af, Atten= 4%, Lag= 6.4 min

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Max. Velocity= 2.78 fps, Min. Travel Time= 7.1 min
Avg. Velocity = 2.28 fps, Avg. Travel Time= 8.7 min

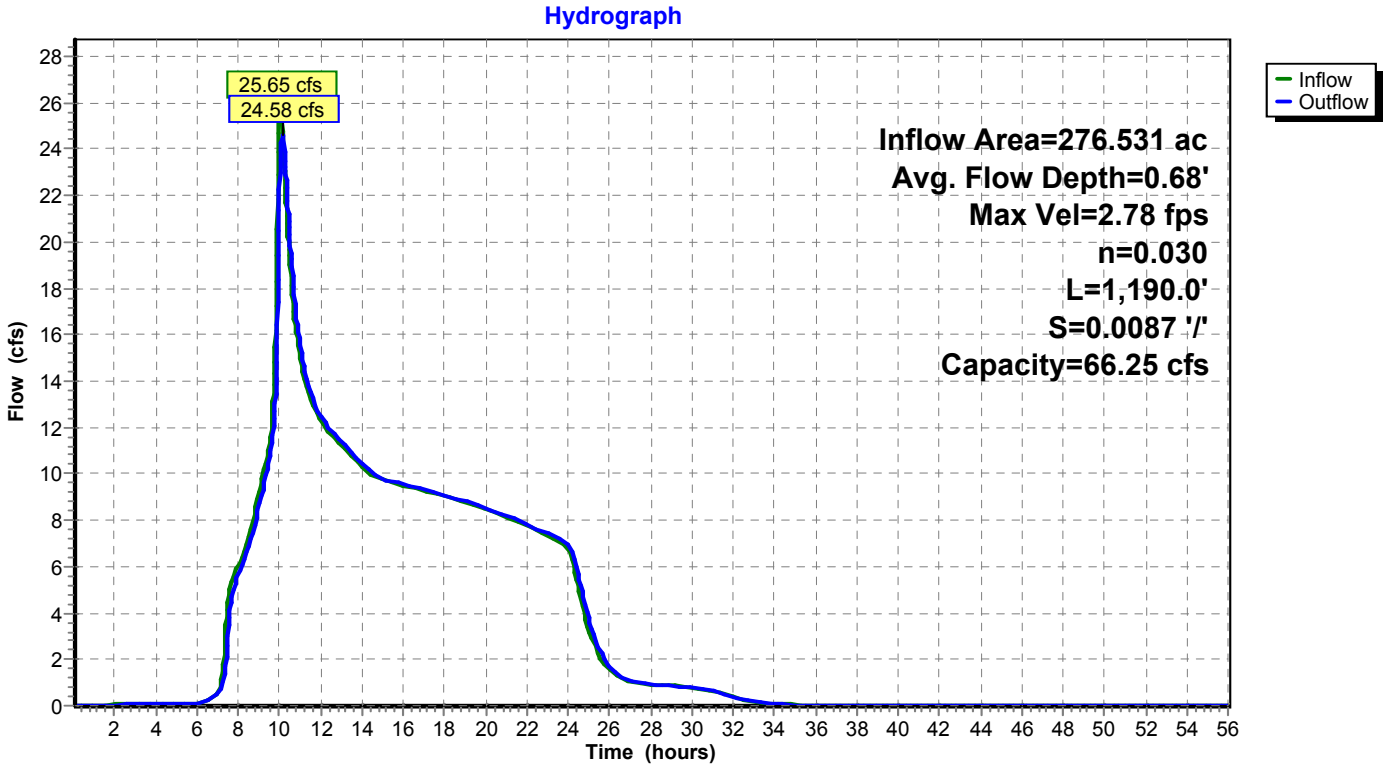
Peak Storage= 10,517 cf @ 10.15 hrs
Average Depth at Peak Storage= 0.68'
Bank-Full Depth= 1.11' Flow Area= 18.0 sf, Capacity= 66.25 cfs

Custom stage-perimeter table, n= 0.030
100 Intermediate values determined by Multi-point interpolation
Length= 1,190.0' Slope= 0.0087 '/'
Inlet Invert= 841.60', Outlet Invert= 831.20'

‡

Depth (feet)	End Area (sq-ft)	Perim. (feet)	Storage (cubic-feet)	Discharge (cfs)
0.00	0.0	0.0	0	0.00
0.52	5.8	16.9	6,916	13.23
0.93	13.8	22.4	16,431	46.30
1.11	18.0	25.4	21,420	66.25

Reach 18R: Linne Road Grassed Chl



Summary for Pond 17P: Gran Cielo Dwy

[58] Hint: Peaked 0.73' above defined flood level

Inflow Area = 166.738 ac, 0.91% Impervious, Inflow Depth = 3.00" for 100 Year event
Inflow = 222.44 cfs @ 9.99 hrs, Volume= 41.649 af
Outflow = 222.08 cfs @ 9.99 hrs, Volume= 41.649 af, Atten= 0%, Lag= 0.4 min
Primary = 117.95 cfs @ 9.99 hrs, Volume= 37.936 af
Secondary = 0.65 cfs @ 9.99 hrs, Volume= 0.009 af
Tertiary = 103.48 cfs @ 9.99 hrs, Volume= 3.704 af

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Peak Elev= 855.19' @ 9.99 hrs Surf.Area= 8,547 sf Storage= 12,556 cf
Flood Elev= 854.46' Surf.Area= 6,947 sf Storage= 6,934 cf

Plug-Flow detention time= 1.7 min calculated for 41.634 af (100% of inflow)
Center-of-Mass det. time= 1.7 min (807.2 - 805.5)

Volume	Invert	Avail.Storage	Storage Description
#1	852.84'	22,270 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
852.84	0	0	0
853.14	2,586	388	388
854.14	6,275	4,431	4,818
855.14	8,376	7,326	12,144
856.14	11,876	10,126	22,270

Device	Routing	Invert	Outlet Devices
#1	Primary	852.84'	**30.0" Round Culvert X 6.00** L= 77.0' CMP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 852.84' / 851.76' S= 0.0140 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 4.91 sf
#2	Secondary	854.90'	**Special & User-Defined** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 Disch. (cfs) 0.000 0.010 0.200 0.710 1.580 2.700 4.030 5.690 7.620 9.790 12.320 15.140 18.190 21.460 24.930 28.580 32.420 36.420 40.580 44.900 49.360 53.970
#3	Tertiary	854.40'	**Special & User-Defined** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 2.20 2.30 2.40 2.50 2.60 Disch. (cfs) 0.000 0.080 3.470 10.790 21.890 36.810 55.720 78.890 106.600 138.580 174.620 214.630 258.590 306.440 358.240 413.470 471.810 533.060 597.050 663.650 732.760 804.270 878.100 954.180 1,032.440 1,112.810 1,195.240

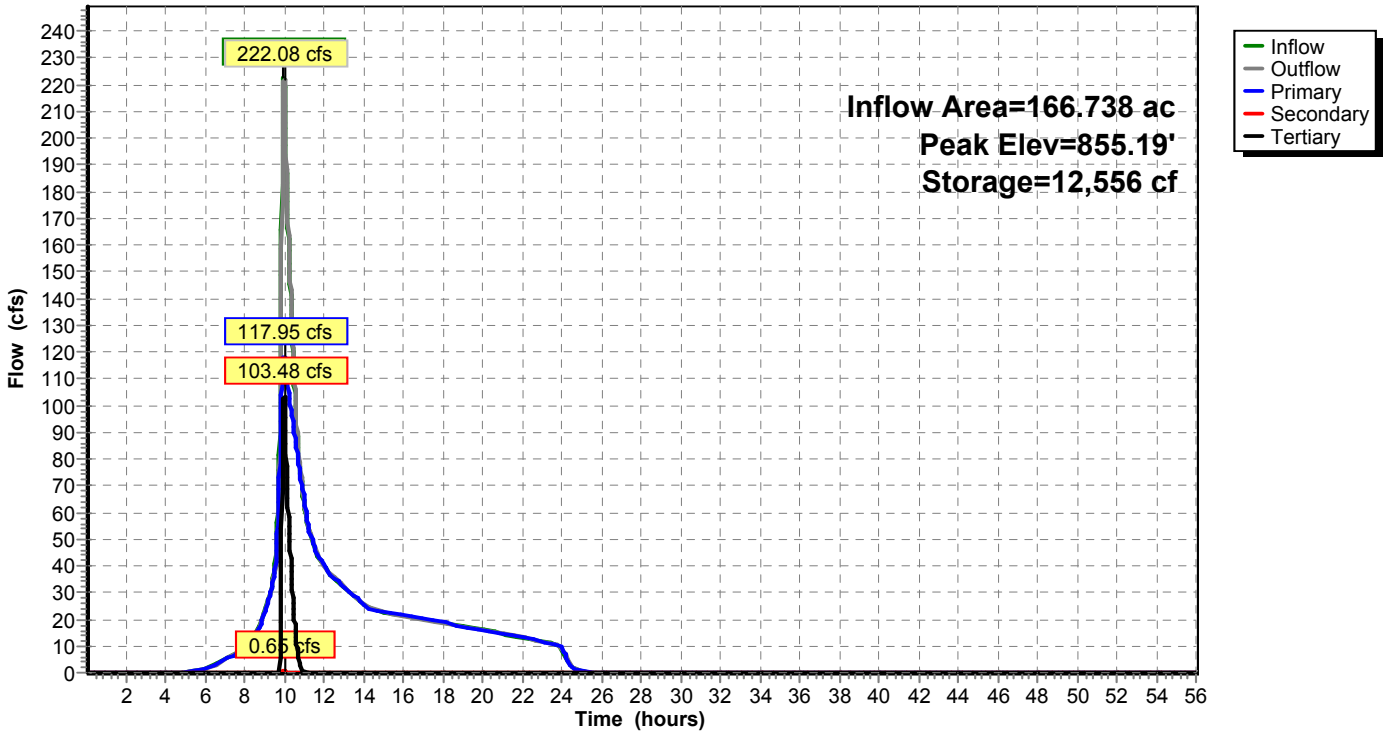
Primary OutFlow Max=117.85 cfs @ 9.99 hrs HW=855.19' TW=851.82' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 117.85 cfs @ 5.32 fps)

Secondary OutFlow Max=0.65 cfs @ 9.99 hrs HW=855.19' TW=851.82' (Dynamic Tailwater)
└**2=Special & User-Defined** (Custom Controls 0.65 cfs)

Tertiary OutFlow Max=103.09 cfs @ 9.99 hrs HW=855.19' TW=854.30' (Dynamic Tailwater)
└**3=Special & User-Defined** (Custom Controls 103.09 cfs)

Pond 17P: Gran Cielo Dwy

Hydrograph



Summary for Pond 18P: GC-CkD1

[58] Hint: Peaked 1.69' above defined flood level

Inflow Area = 240.622 ac, 1.05% Impervious, Inflow Depth = 2.86" for 100 Year event
Inflow = 223.44 cfs @ 9.99 hrs, Volume= 57.363 af
Outflow = 215.08 cfs @ 10.04 hrs, Volume= 57.300 af, Atten= 4%, Lag= 3.0 min
Primary = 1.07 cfs @ 9.99 hrs, Volume= 1.743 af
Secondary = 114.40 cfs @ 10.03 hrs, Volume= 41.965 af
Tertiary = 99.64 cfs @ 10.04 hrs, Volume= 13.592 af

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Peak Elev= 851.86' @ 10.04 hrs Surf.Area= 28,237 sf Storage= 63,522 cf
Flood Elev= 850.17' Surf.Area= 18,994 sf Storage= 23,481 cf

Plug-Flow detention time= 13.9 min calculated for 57.300 af (100% of inflow)
Center-of-Mass det. time= 12.9 min (830.1 - 817.2)

Volume	Invert	Avail.Storage	Storage Description
#1	844.56'	67,617 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
844.56	10	0	0
845.00	200	46	46
846.00	600	400	446
847.00	1,500	1,050	1,496
848.00	2,166	1,833	3,329
849.00	7,688	4,927	8,256
850.00	16,694	12,191	20,447
850.20	19,400	3,609	24,057
852.00	29,000	43,560	67,617

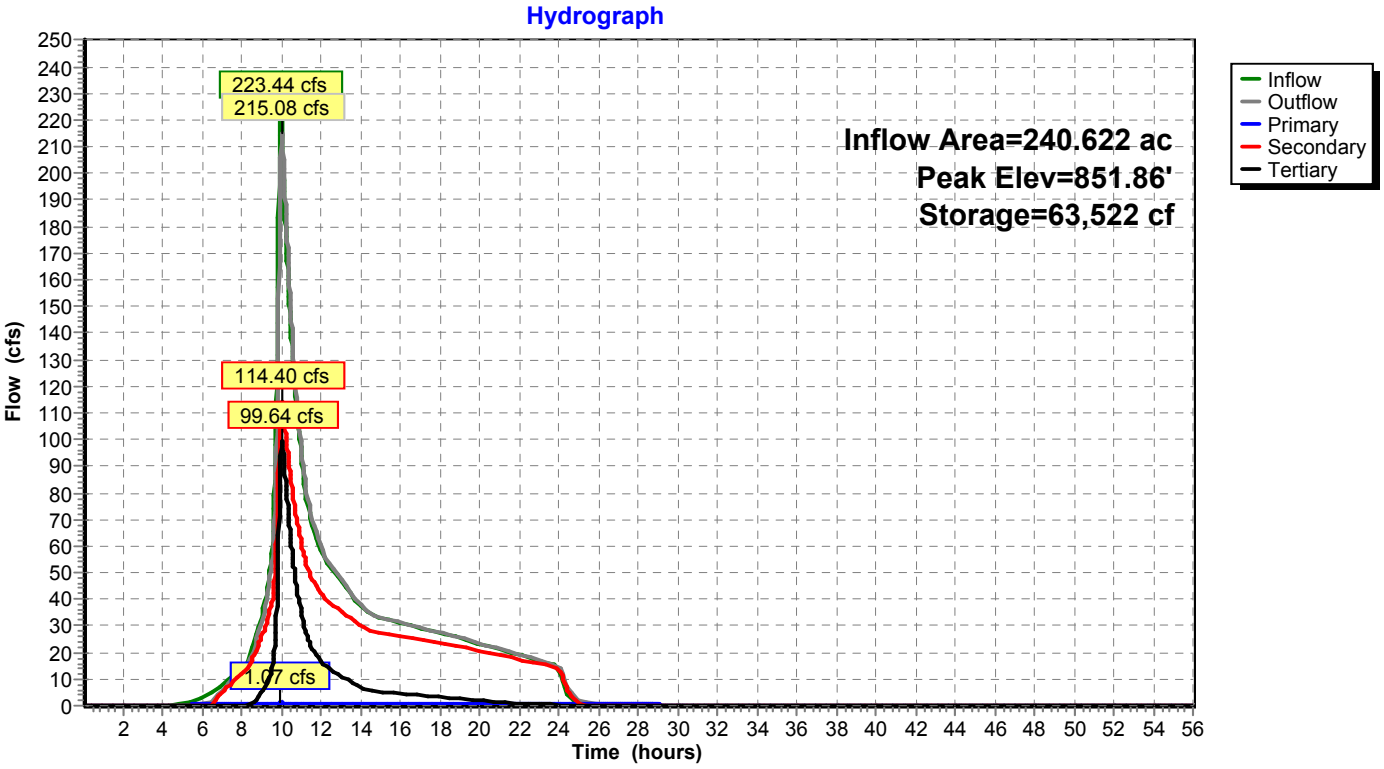
Device	Routing	Invert	Outlet Devices
#1	Primary	847.69'	**6.0" Round Culvert** L= 26.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 847.69' / 847.67' S= 0.0008 '/' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Secondary	849.50'	**9.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59
#3	Tertiary	850.00'	**Special & User-Defined (CkD1-S)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 Disch. (cfs) 0.000 0.030 0.560 1.900 4.120 7.220 11.180 15.770 20.900 26.530 32.600 39.090 45.970 53.220 60.820 68.750 77.000 85.570 94.430 103.580 113.010

Primary OutFlow Max=1.06 cfs @ 9.99 hrs HW=851.81' TW=849.80' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.06 cfs @ 5.39 fps)

Secondary OutFlow Max=114.10 cfs @ 10.03 hrs HW=851.86' TW=849.85' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 114.10 cfs @ 5.38 fps)

Tertiary OutFlow Max=99.61 cfs @ 10.04 hrs HW=851.86' TW=0.00' (Dynamic Tailwater)
└**3=Special & User-Defined (CkD1-S)** (Custom Controls 99.61 cfs)

Pond 18P: GC-CkD1



Summary for Pond 19P: GC-CkD2

[58] Hint: Peaked 1.22' above defined flood level

Inflow Area = 260.311 ac, 0.97% Impervious, Inflow Depth = 2.22" for 100 Year event
Inflow = 141.95 cfs @ 10.01 hrs, Volume= 48.150 af
Outflow = 136.09 cfs @ 10.08 hrs, Volume= 48.148 af, Atten= 4%, Lag= 4.5 min
Primary = 1.40 cfs @ 10.08 hrs, Volume= 2.285 af
Secondary = 81.70 cfs @ 10.08 hrs, Volume= 39.175 af
Tertiary = 53.00 cfs @ 10.08 hrs, Volume= 6.687 af

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Peak Elev= 849.87' @ 10.08 hrs Surf.Area= 37,109 sf Storage= 41,536 cf
Flood Elev= 848.65' Surf.Area= 11,850 sf Storage= 14,787 cf

Plug-Flow detention time= 11.0 min calculated for 48.148 af (100% of inflow)
Center-of-Mass det. time= 10.8 min (871.9 - 861.1)

Volume	Invert	Avail.Storage	Storage Description
#1	846.00'	46,430 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
846.00	267	0	0
847.00	4,055	2,161	2,161
848.00	8,178	6,117	8,278
849.00	13,828	11,003	19,281
850.00	40,470	27,149	46,430

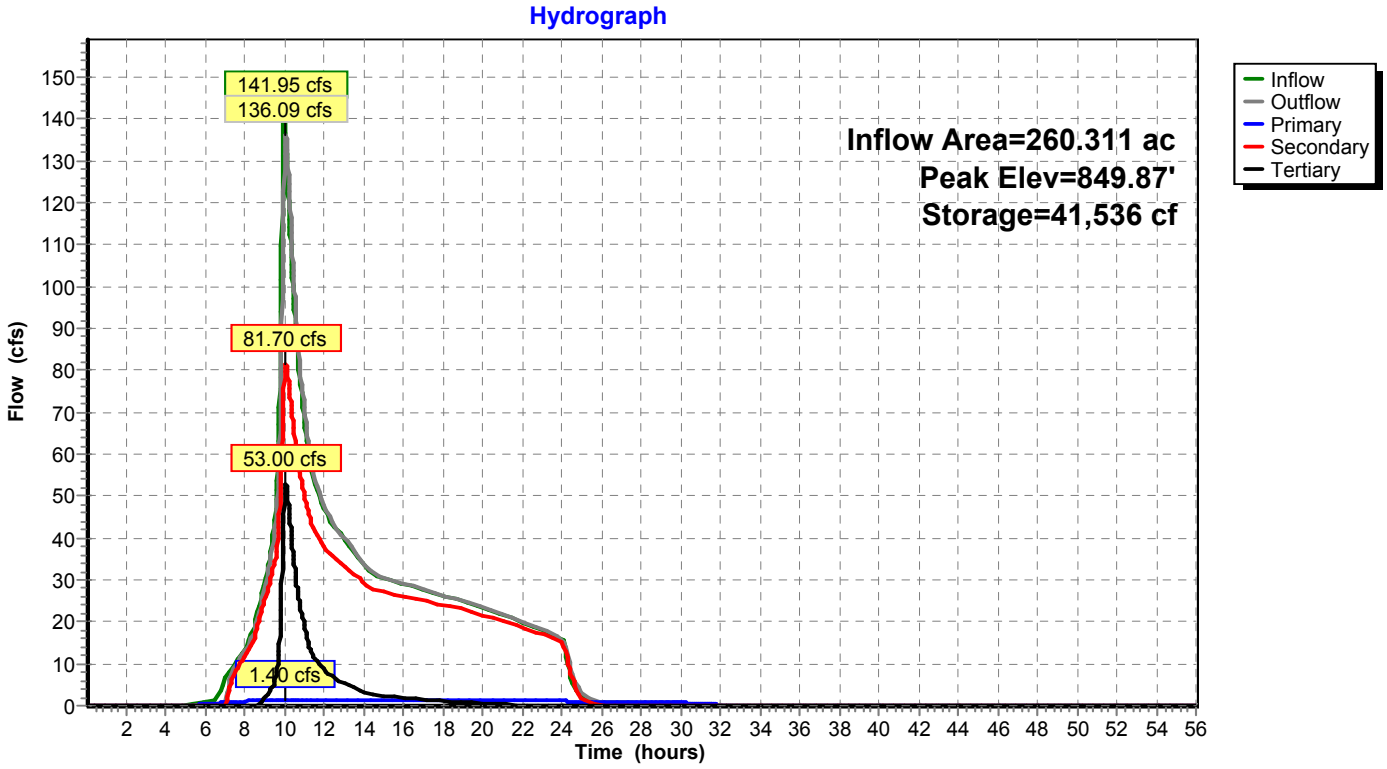
Device	Routing	Invert	Outlet Devices
#1	Primary	846.12'	**6.0" Round Culvert** L= 26.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 846.12' / 845.98' S= 0.0054 '/' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Tertiary	848.70'	**Special & User-Defined (CkD2-S)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 Disch. (cfs) 0.000 0.130 0.970 2.640 5.120 8.550 13.010 18.440 24.620 31.430 38.830 46.770 55.210 64.120
#3	Secondary	847.80'	**Special & User-Defined (CkD2-W)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 2.20 Disch. (cfs) 0.000 0.020 0.480 1.430 2.780 4.430 6.490 8.950 12.010 15.510 19.390 23.590 28.100 32.980 38.270 43.910 49.850 56.080 62.580 69.340 76.350 83.590 91.070

Primary OutFlow Max=1.40 cfs @ 10.08 hrs HW=849.87' TW=846.16' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.40 cfs @ 7.12 fps)

Secondary OutFlow Max=81.67 cfs @ 10.08 hrs HW=849.87' TW=846.16' (Dynamic Tailwater)
└**3=Special & User-Defined (CkD2-W)** (Custom Controls 81.67 cfs)

Tertiary OutFlow Max=52.97 cfs @ 10.08 hrs HW=849.87' TW=0.00' (Dynamic Tailwater)
└**2=Special & User-Defined (CkD2-S)** (Custom Controls 52.97 cfs)

Pond 19P: GC-CkD2



Summary for Pond 20P: GC-CkD3

[58] Hint: Peaked 1.14' above defined flood level

Inflow Area = 274.094 ac, 0.92% Impervious, Inflow Depth = 1.94" for 100 Year event
Inflow = 98.57 cfs @ 10.04 hrs, Volume= 44.367 af
Outflow = 98.14 cfs @ 10.07 hrs, Volume= 44.355 af, Atten= 0%, Lag= 1.8 min
Primary = 6.94 cfs @ 10.07 hrs, Volume= 7.743 af
Secondary = 16.42 cfs @ 10.07 hrs, Volume= 6.664 af
Tertiary = 74.78 cfs @ 10.07 hrs, Volume= 29.949 af

Routing by Dyn-Stor-Ind method, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs
Peak Elev= 846.16' @ 10.07 hrs Surf.Area= 16,137 sf Storage= 18,734 cf
Flood Elev= 845.02' Surf.Area= 8,229 sf Storage= 4,852 cf

Plug-Flow detention time= 7.2 min calculated for 44.355 af (100% of inflow)
Center-of-Mass det. time= 6.8 min (901.9 - 895.1)

Volume	Invert	Avail.Storage	Storage Description
#1	844.00'	24,632 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
844.00	1,288	0	0
845.00	8,090	4,689	4,689
846.50	18,500	19,943	24,632

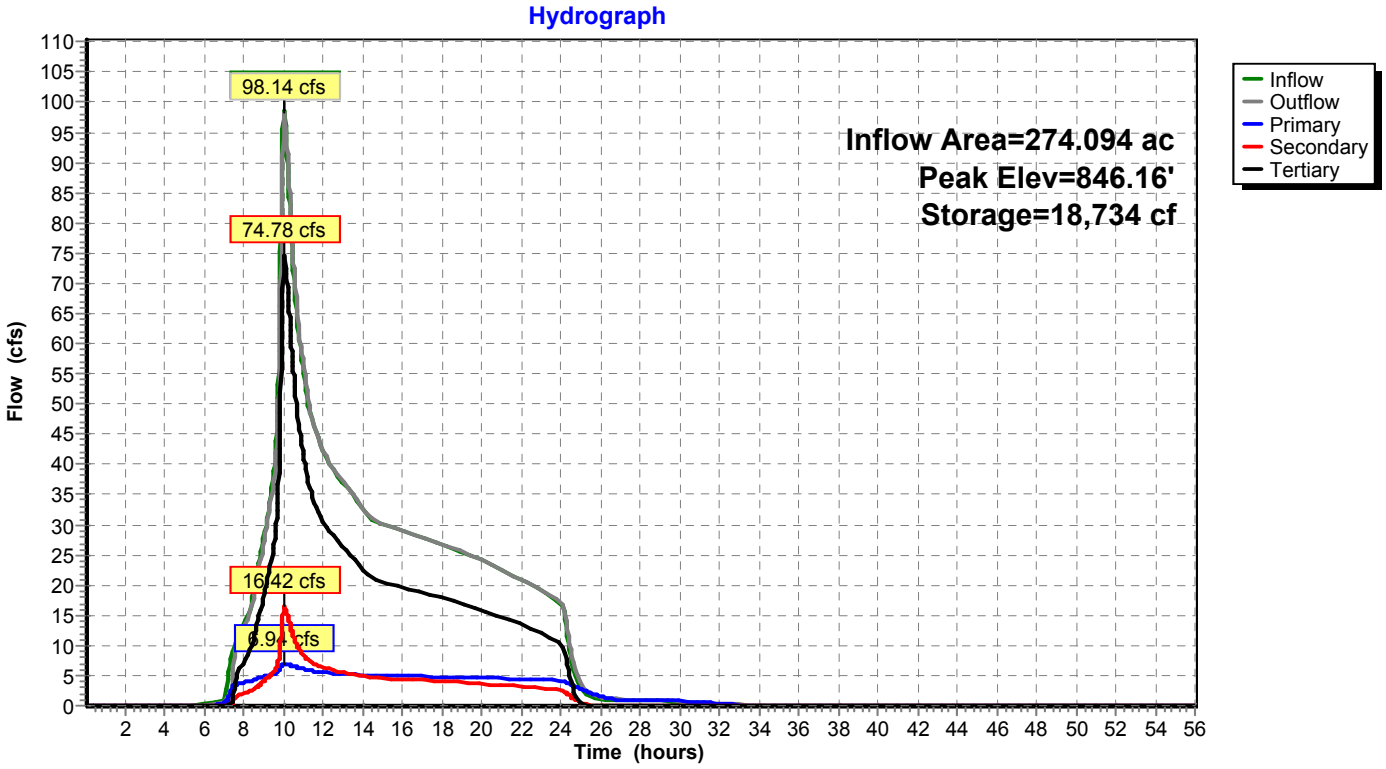
Device	Routing	Invert	Outlet Devices
#1	Primary	844.22'	**18.0" Round Culvert** L= 26.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 844.22' / 843.98' S= 0.0092 '/' Cc= 0.900 n= 0.021 Corrugated metal, Flow Area= 1.77 sf
#2	Secondary	845.00'	**Special & User-Defined (CkD3-W)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 Disch. (cfs) 0.000 0.050 0.390 0.970 1.710 2.600 3.780 5.170 6.720 8.570 11.140 14.290 17.880 21.830 26.120 30.880 36.030 41.520 47.330 53.420 59.790
#3	Tertiary	845.10'	**Special & User-Defined (CkD3-S)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 Disch. (cfs) 0.000 0.050 1.930 5.420 10.370 16.490 23.960 32.580 42.550 53.770 66.380 80.510 96.280 113.770 132.840 153.630 175.910 199.510 224.310 250.260

Primary OutFlow Max=6.94 cfs @ 10.07 hrs HW=846.16' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 6.94 cfs @ 3.96 fps)

Secondary OutFlow Max=16.42 cfs @ 10.07 hrs HW=846.16' TW=0.00' (Dynamic Tailwater)
↑—**2=Special & User-Defined (CkD3-W)** (Custom Controls 16.42 cfs)

Tertiary OutFlow Max=74.74 cfs @ 10.07 hrs HW=846.16' TW=0.00' (Dynamic Tailwater)
↑—**3=Special & User-Defined (CkD3-S)** (Custom Controls 74.74 cfs)

Pond 20P: GC-CkD3

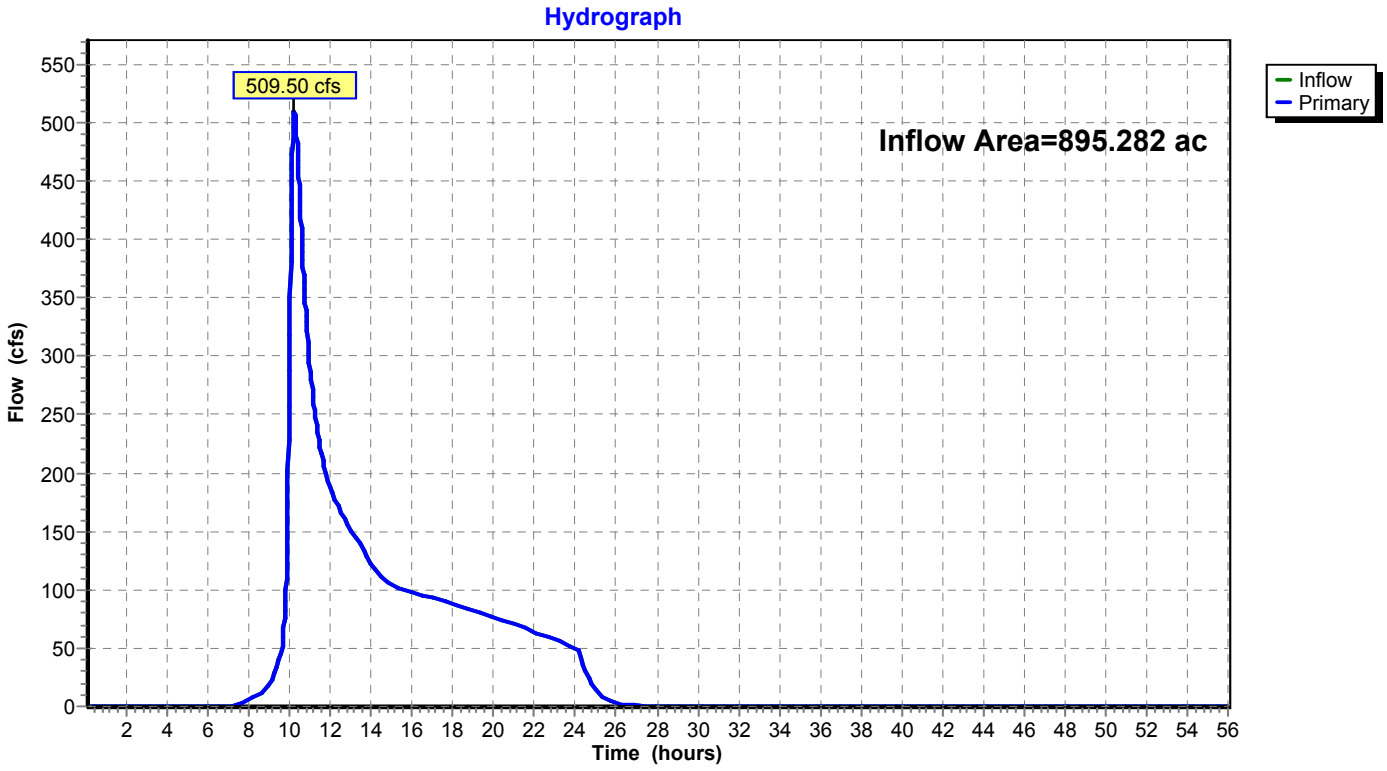


Summary for Link 3a (1,2+3)-Ex: Comb Un-dev Ck Flow

Inflow Area = 895.282 ac, 0.06% Impervious, Inflow Depth = 2.08" for 100 Year event
Inflow = 509.50 cfs @ 10.23 hrs, Volume= 155.541 af
Primary = 509.50 cfs @ 10.23 hrs, Volume= 155.541 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 3a (1,2+3)-Ex: Comb Un-dev Ck Flow

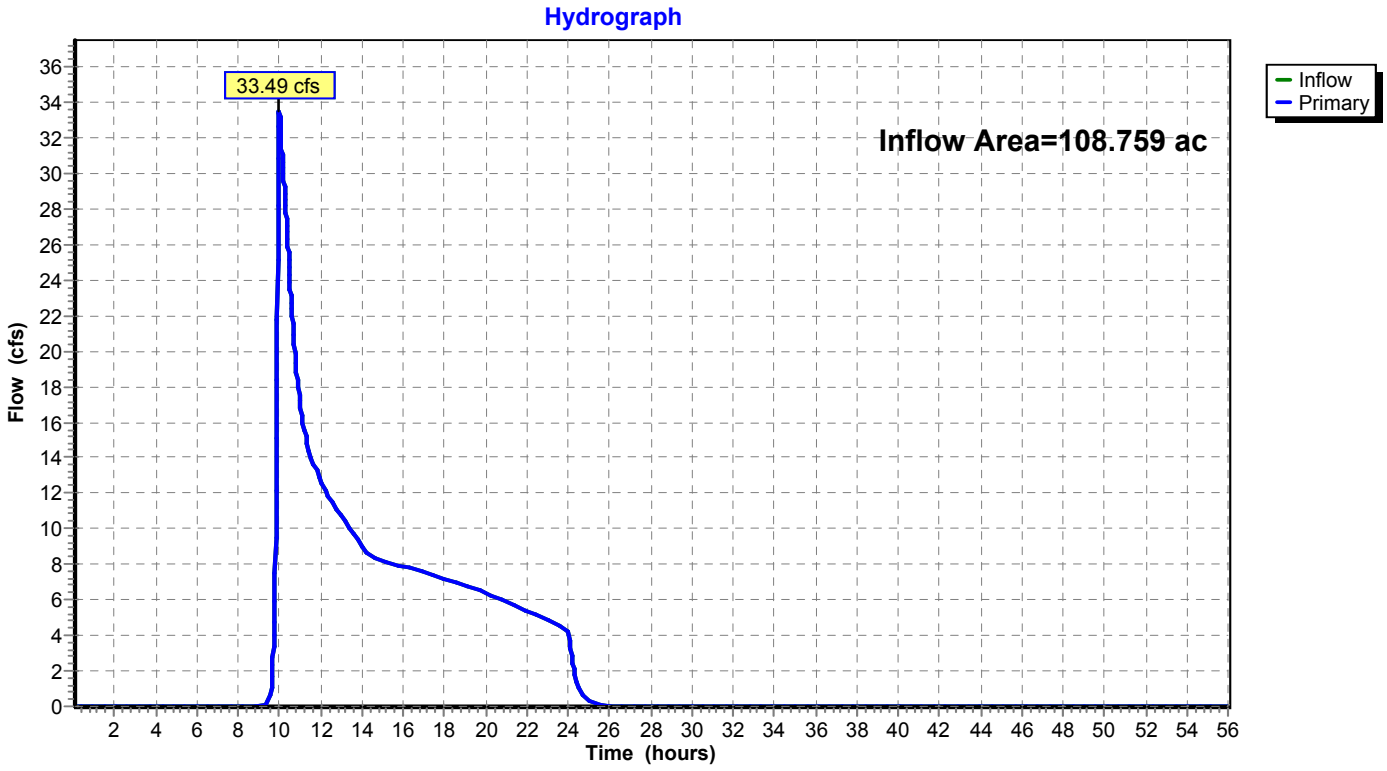


Summary for Link 5L: Outlet To Tract #1632 Ex. 36" SD

Inflow Area = 108.759 ac, 0.00% Impervious, Inflow Depth = 1.22" for 100 Year event
Inflow = 33.49 cfs @ 10.01 hrs, Volume= 11.095 af
Primary = 33.49 cfs @ 10.01 hrs, Volume= 11.095 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 5L: Outlet To Tract #1632 Ex. 36" SD

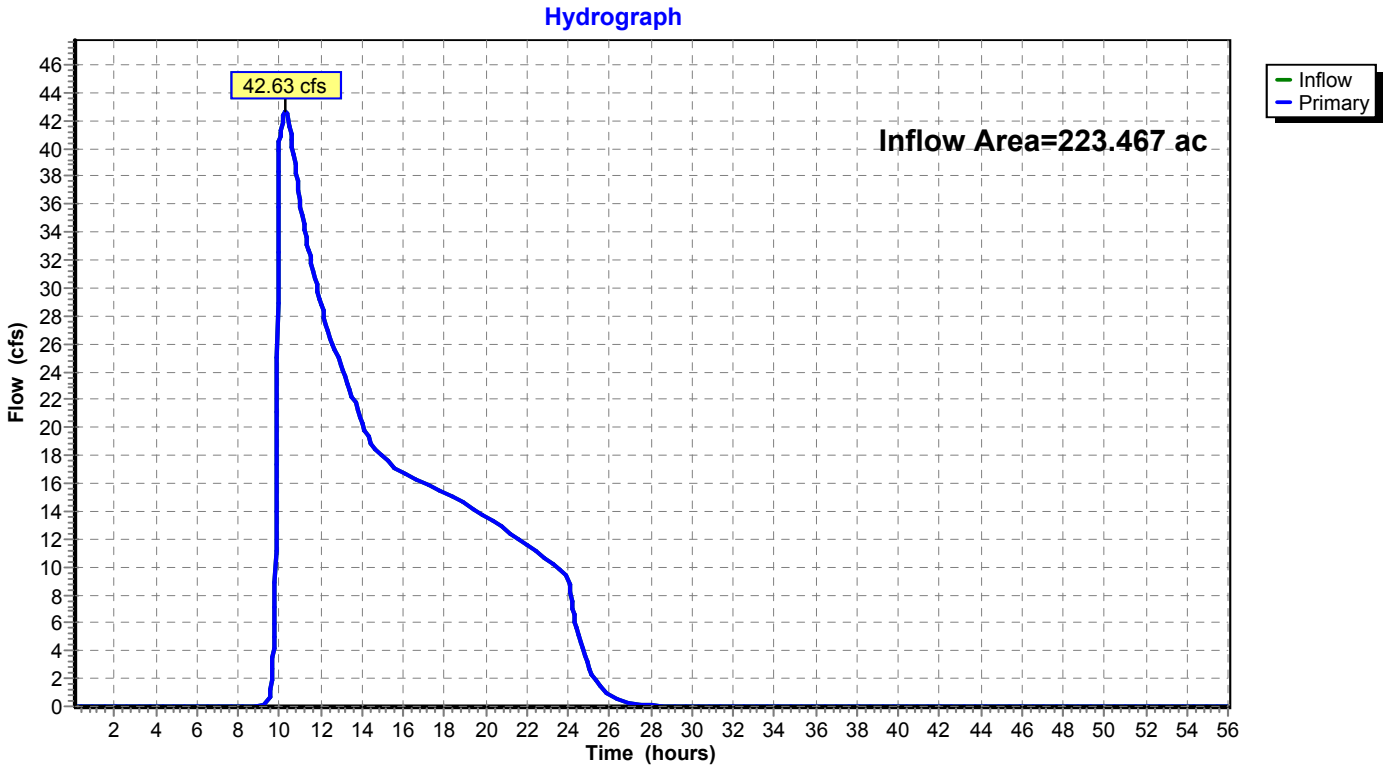


Summary for Link 6L: To Existing Meadowlark Road

Inflow Area = 223.467 ac, 0.00% Impervious, Inflow Depth = 1.24" for 100 Year event
Inflow = 42.63 cfs @ 10.31 hrs, Volume= 23.060 af
Primary = 42.63 cfs @ 10.31 hrs, Volume= 23.060 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 6L: To Existing Meadowlark Road

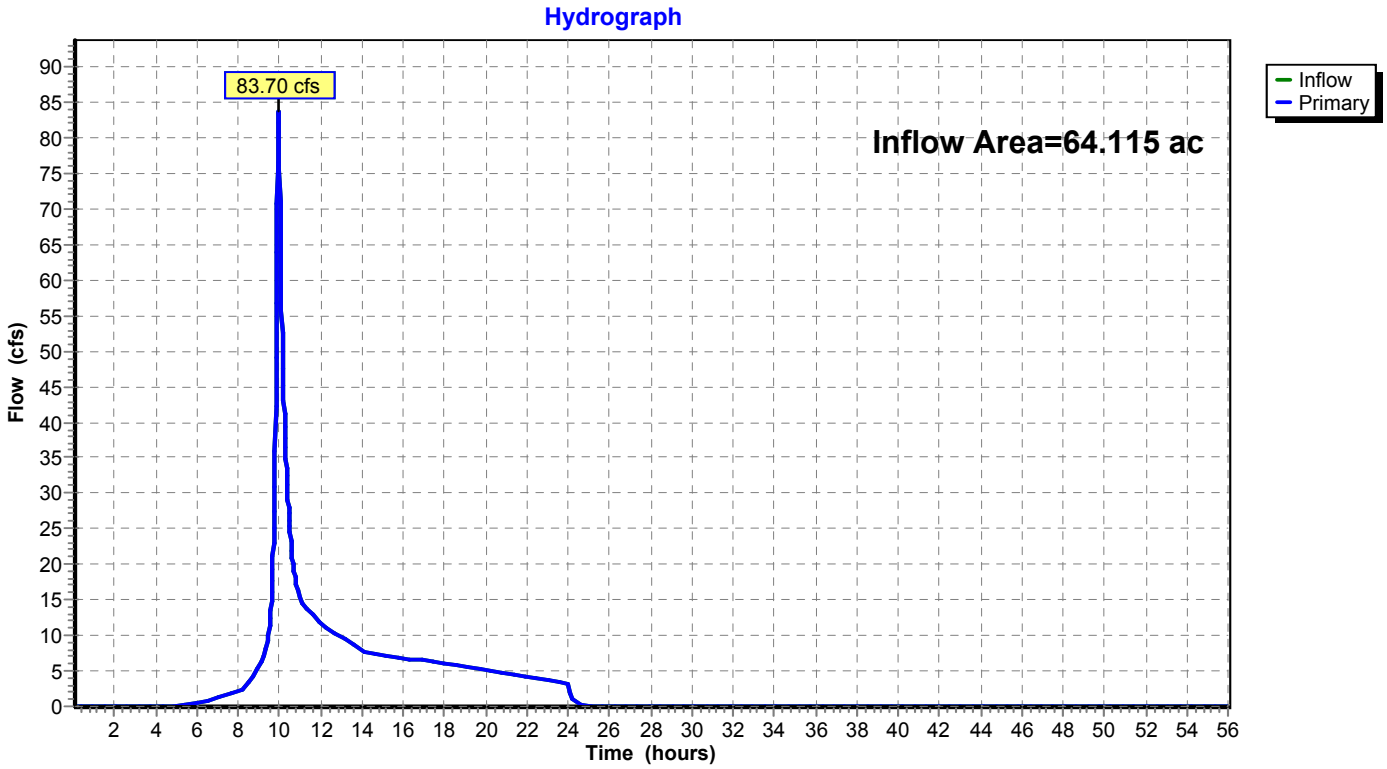


Summary for Link 7L: DMA 13

Inflow Area = 64.115 ac, 0.00% Impervious, Inflow Depth = 2.32" for 100 Year event
Inflow = 83.70 cfs @ 9.97 hrs, Volume= 12.398 af
Primary = 83.70 cfs @ 9.97 hrs, Volume= 12.398 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 7L: DMA 13

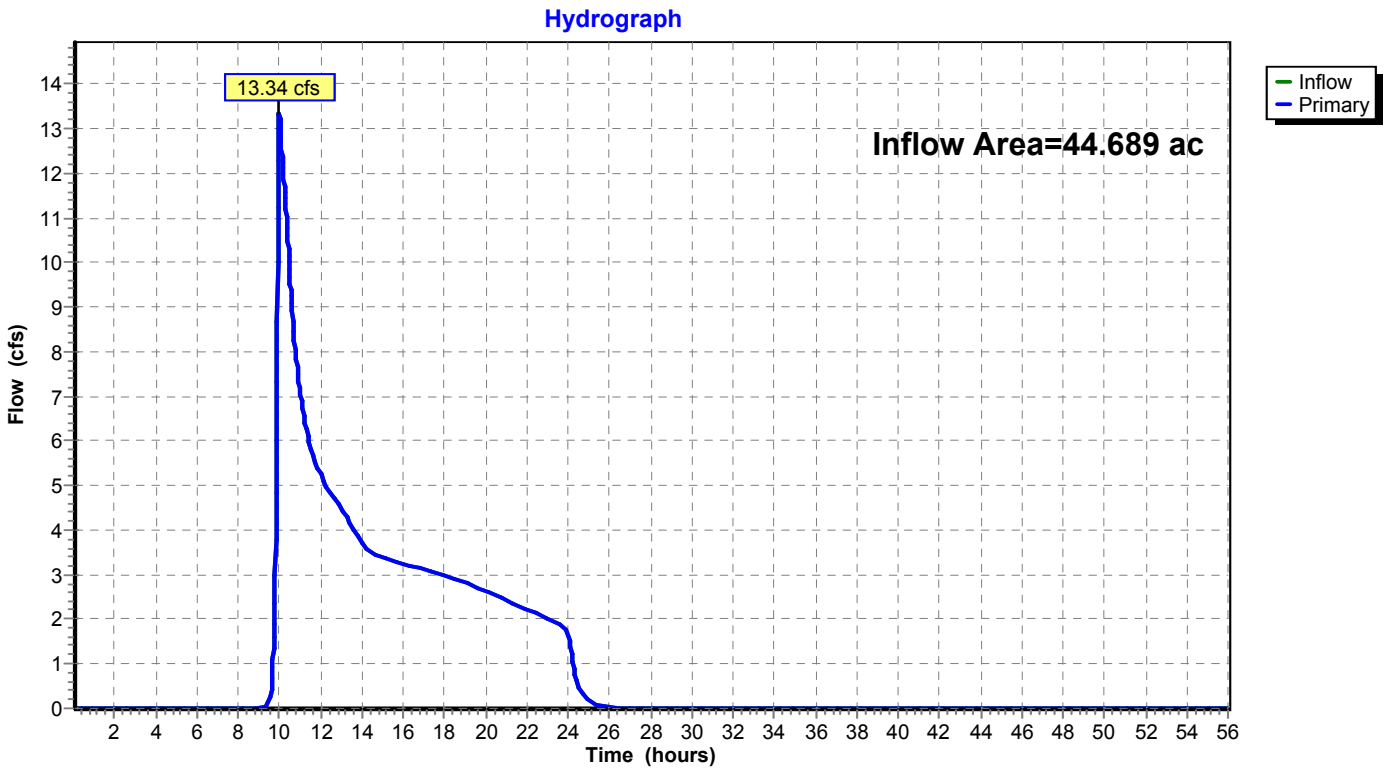


Summary for Link 8L: DMA 8

Inflow Area = 44.689 ac, 0.00% Impervious, Inflow Depth = 1.22" for 100 Year event
Inflow = 13.34 cfs @ 10.01 hrs, Volume= 4.559 af
Primary = 13.34 cfs @ 10.01 hrs, Volume= 4.559 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 8L: DMA 8

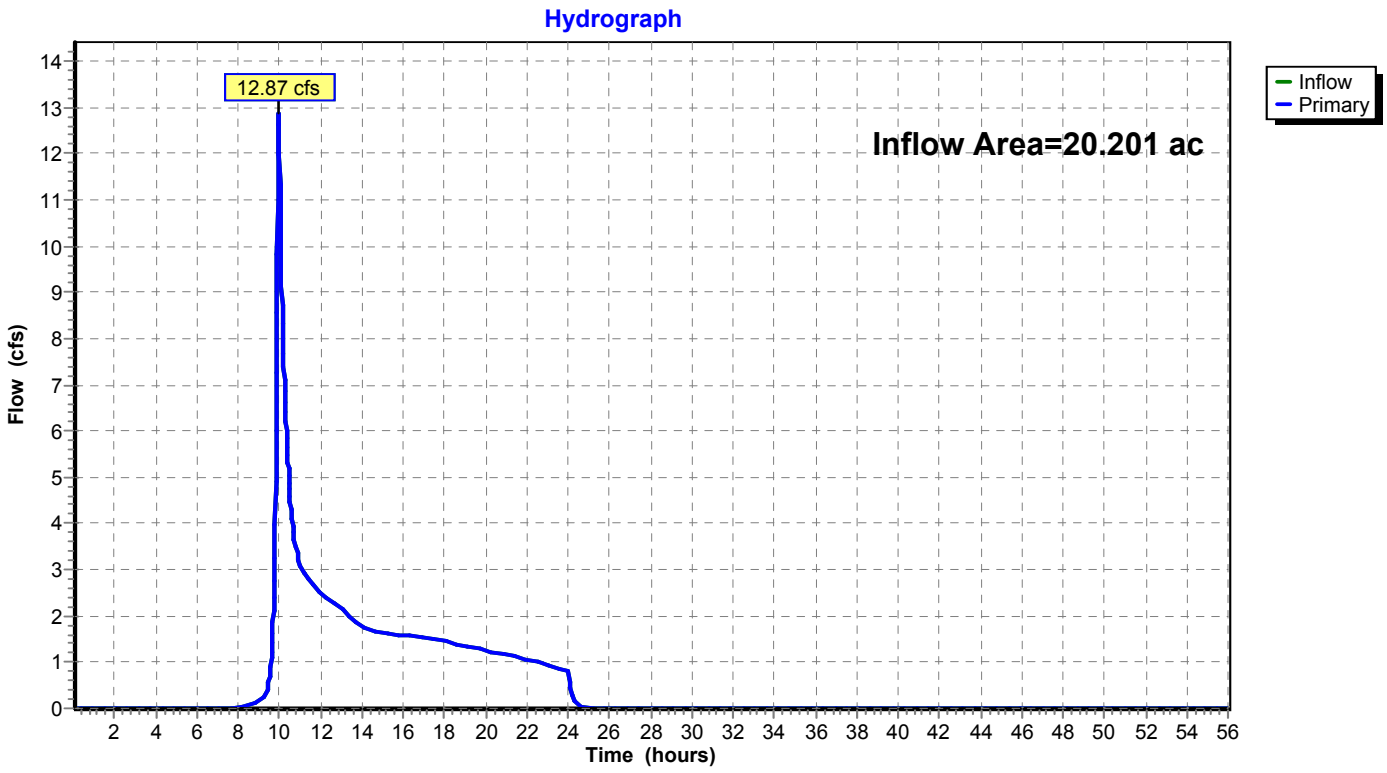


Summary for Link 9L: DMA 12

Inflow Area = 20.201 ac, 0.00% Impervious, Inflow Depth = 1.41" for 100 Year event
Inflow = 12.87 cfs @ 9.98 hrs, Volume= 2.371 af
Primary = 12.87 cfs @ 9.98 hrs, Volume= 2.371 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 9L: DMA 12

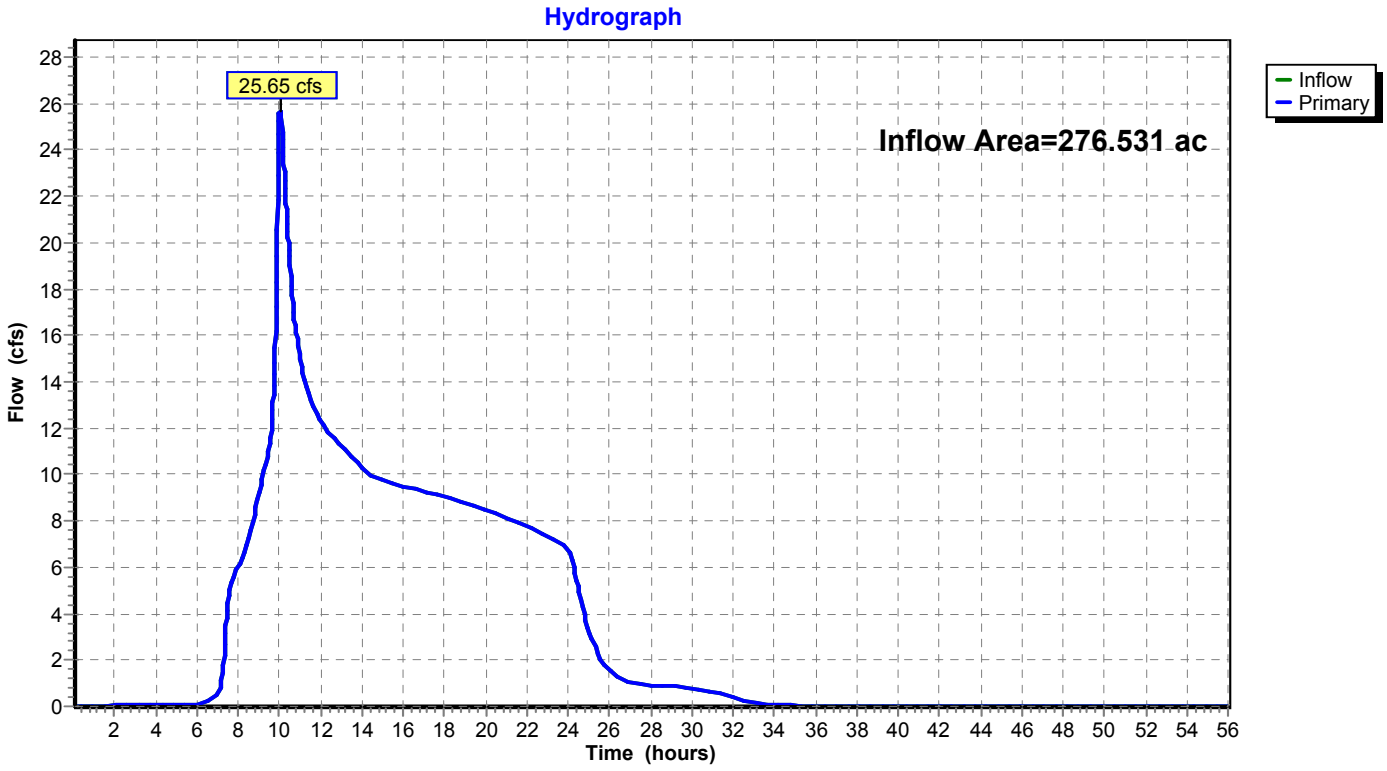


Summary for Link 10L: To Linne Road Channel

Inflow Area = 276.531 ac, 1.18% Impervious, Inflow Depth = 0.65" for 100 Year event
Inflow = 25.65 cfs @ 10.05 hrs, Volume= 14.875 af
Primary = 25.65 cfs @ 10.05 hrs, Volume= 14.875 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 10L: To Linne Road Channel

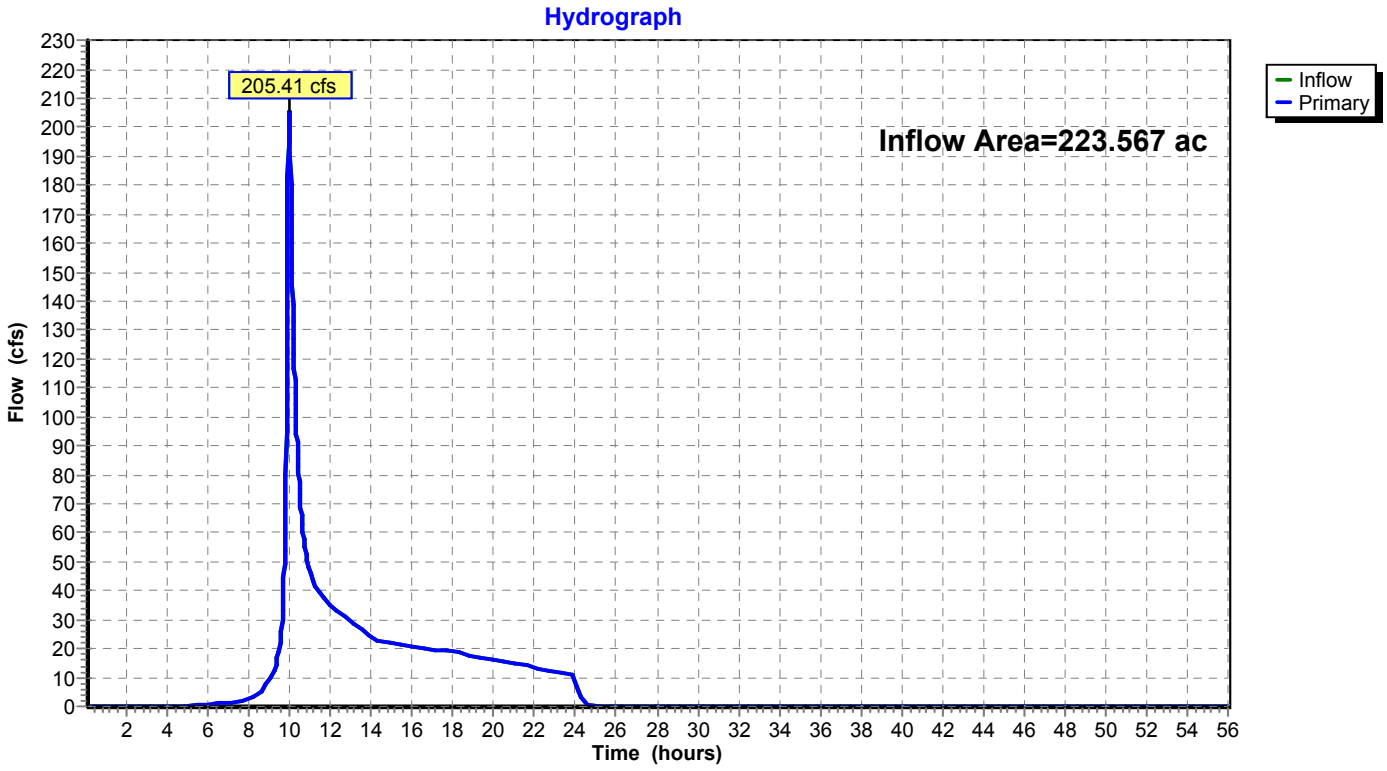


Summary for Link 11L: To Fontana Road SD

Inflow Area = 223.567 ac, 0.53% Impervious, Inflow Depth = 1.86" for 100 Year event
Inflow = 205.41 cfs @ 9.98 hrs, Volume= 34.670 af
Primary = 205.41 cfs @ 9.98 hrs, Volume= 34.670 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 11L: To Fontana Road SD

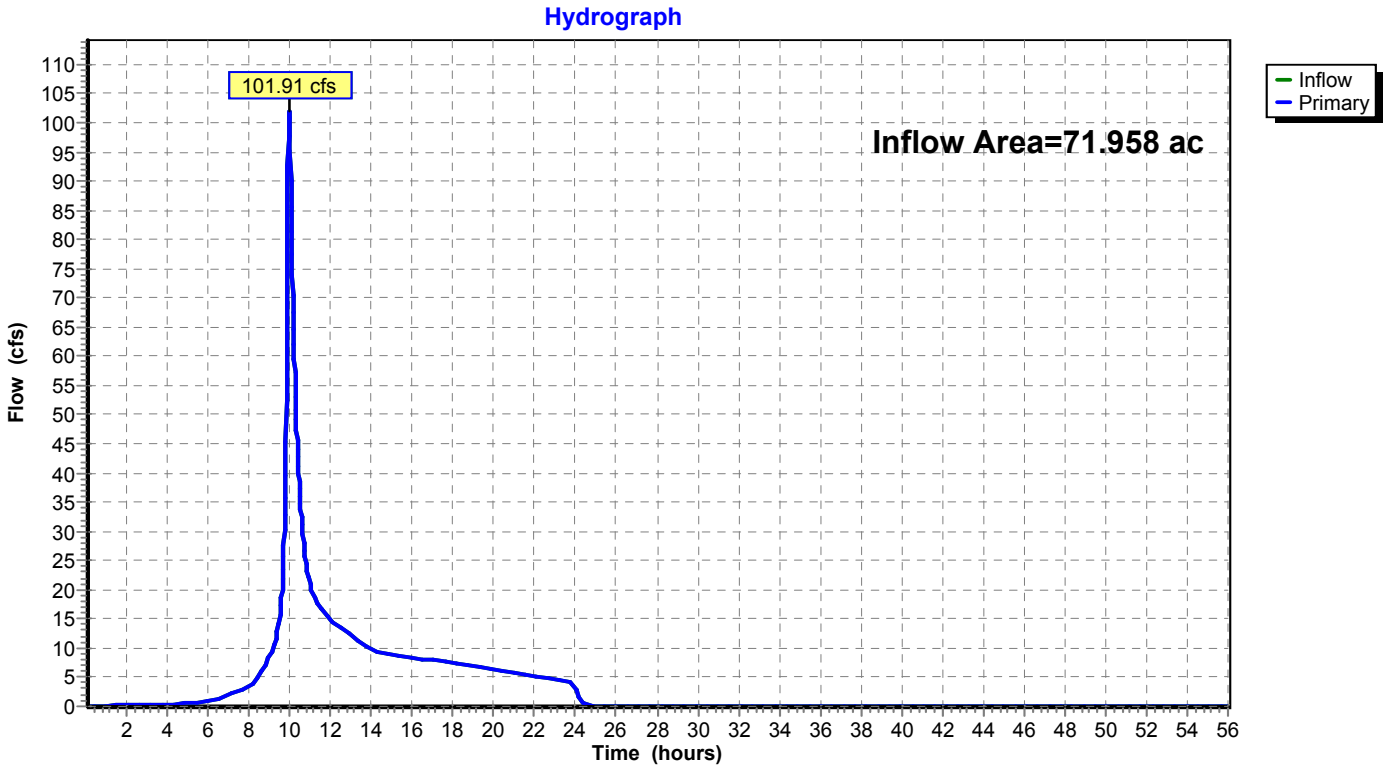


Summary for Link 15L: Sherwood/Niblick LP Xing

Inflow Area = 71.958 ac, 6.18% Impervious, Inflow Depth = 2.69" for 100 Year event
Inflow = 101.91 cfs @ 9.98 hrs, Volume= 16.110 af
Primary = 101.91 cfs @ 9.98 hrs, Volume= 16.110 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 15L: Sherwood/Niblick LP Xing

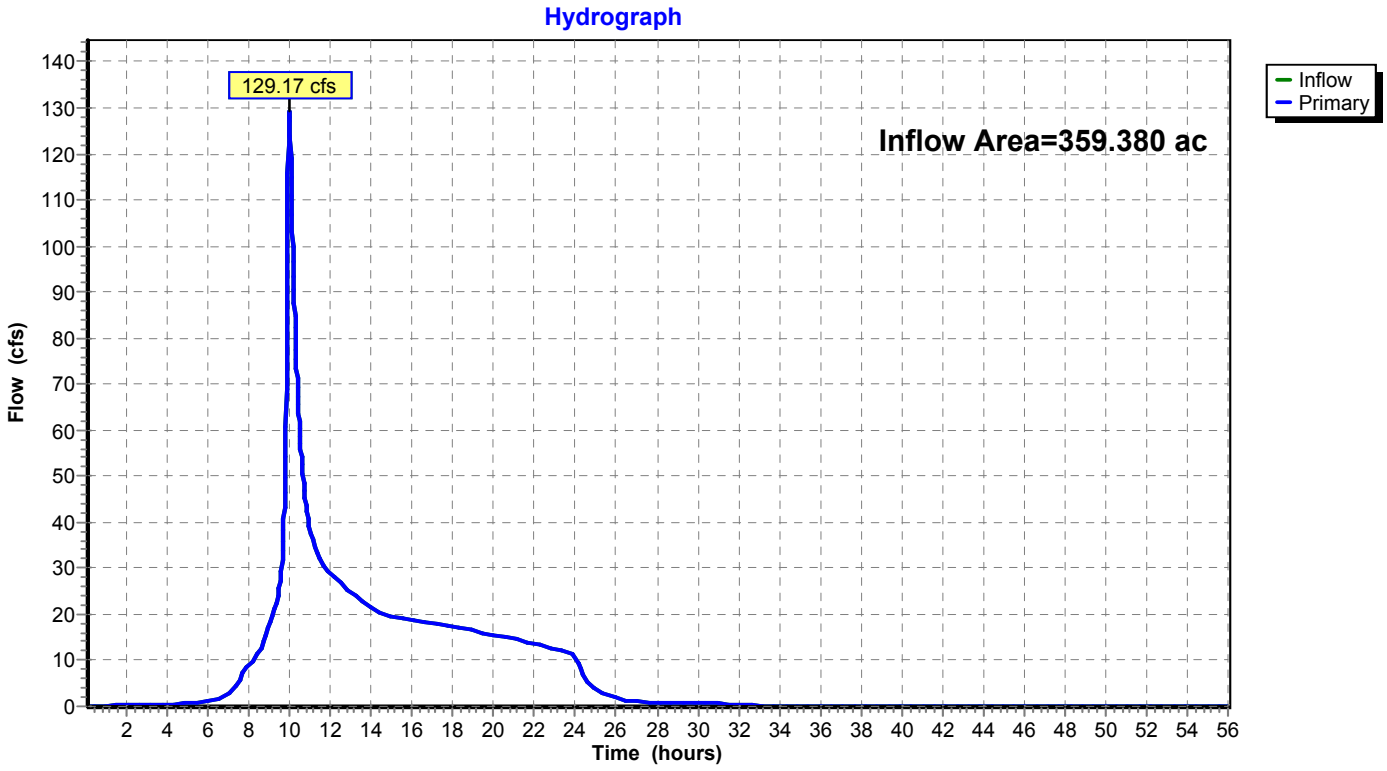


Summary for Link 16L: Airport & Linne Road SD

Inflow Area = 359.380 ac, 2.33% Impervious, Inflow Depth = 1.08" for 100 Year event
Inflow = 129.17 cfs @ 9.98 hrs, Volume= 32.296 af
Primary = 129.17 cfs @ 9.98 hrs, Volume= 32.296 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 16L: Airport & Linne Road SD



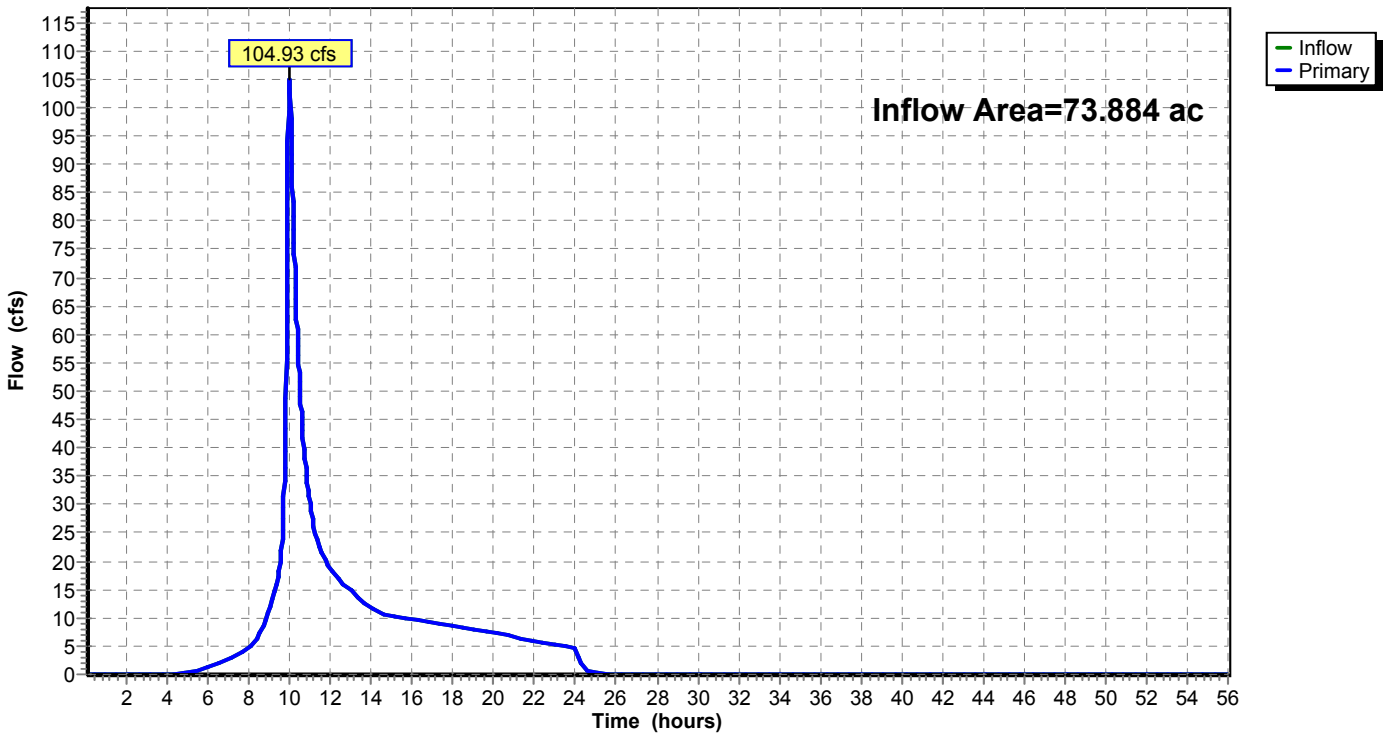
Summary for Link 19L: 14c(0+1)-Ex

Inflow Area = 73.884 ac, 1.37% Impervious, Inflow Depth = 3.15" for 100 Year event
Inflow = 104.93 cfs @ 9.98 hrs, Volume= 19.418 af
Primary = 104.93 cfs @ 9.98 hrs, Volume= 19.418 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 19L: 14c(0+1)-Ex

Hydrograph

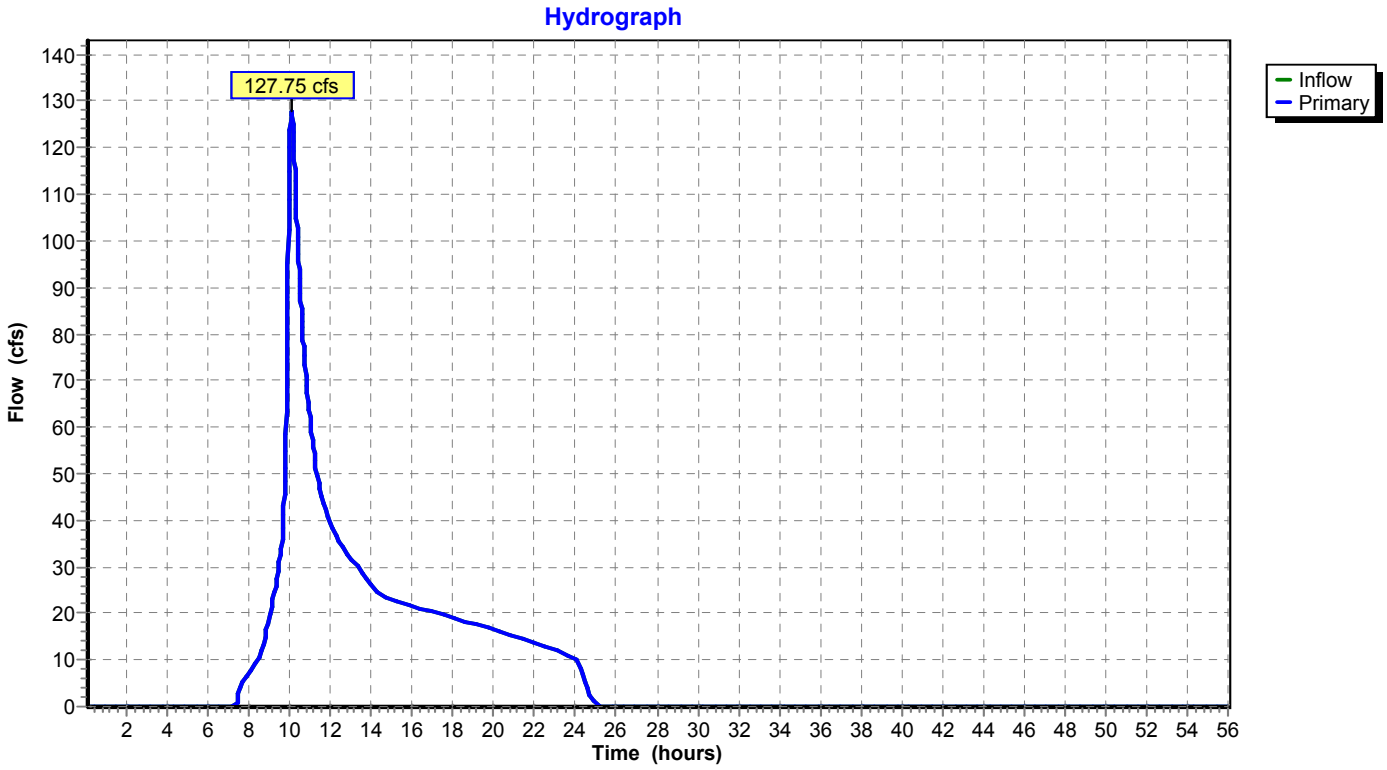


Summary for Link 22L: Linne Rd Overtopping Ex.Flow #2and#3

Inflow = 127.75 cfs @ 10.08 hrs, Volume= 36.636 af
Primary = 127.75 cfs @ 10.08 hrs, Volume= 36.636 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

Link 22L: Linne Rd Overtopping Ex.Flow #2and#3

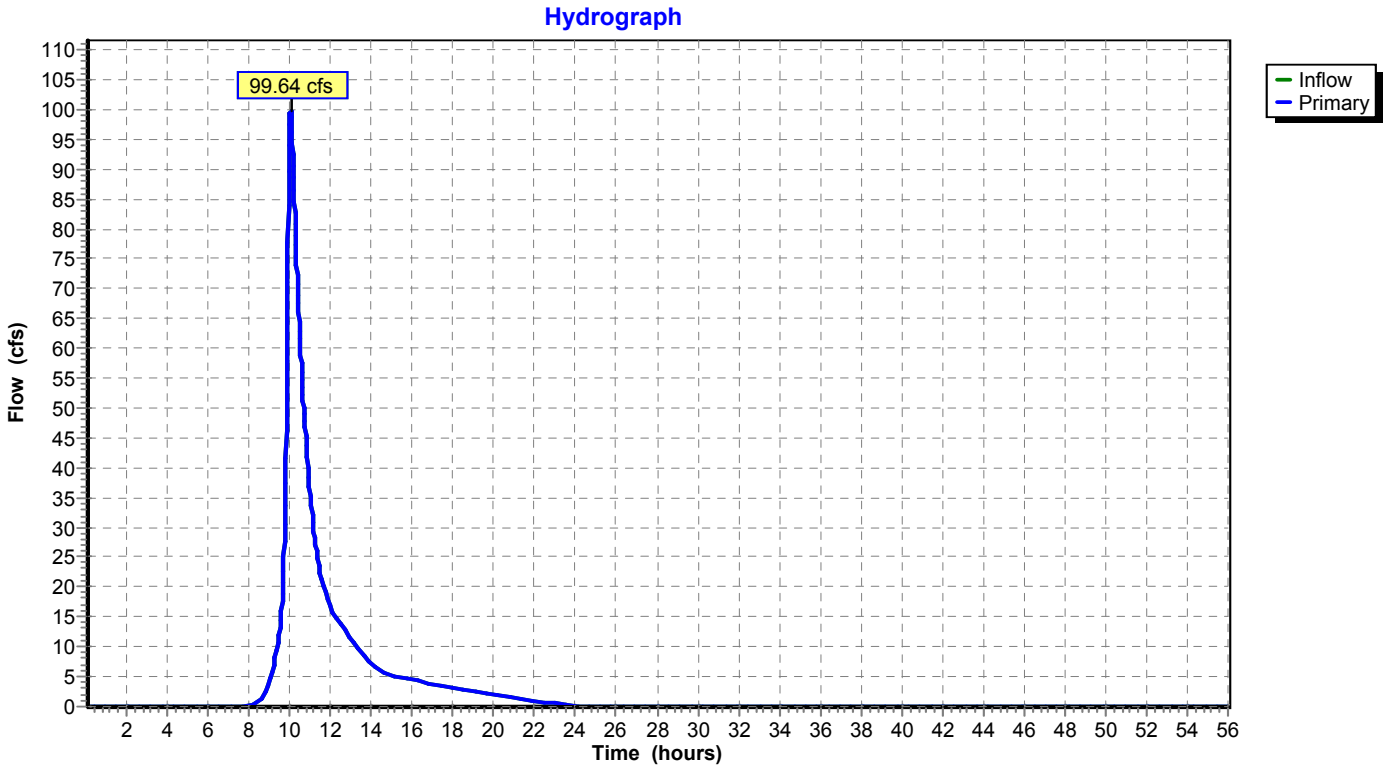


Summary for Link 23L: Linne Rd Overtop #1

Inflow = 99.64 cfs @ 10.04 hrs, Volume= 13.592 af
Primary = 99.64 cfs @ 10.04 hrs, Volume= 13.592 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.10-56.00 hrs, dt= 0.02 hrs

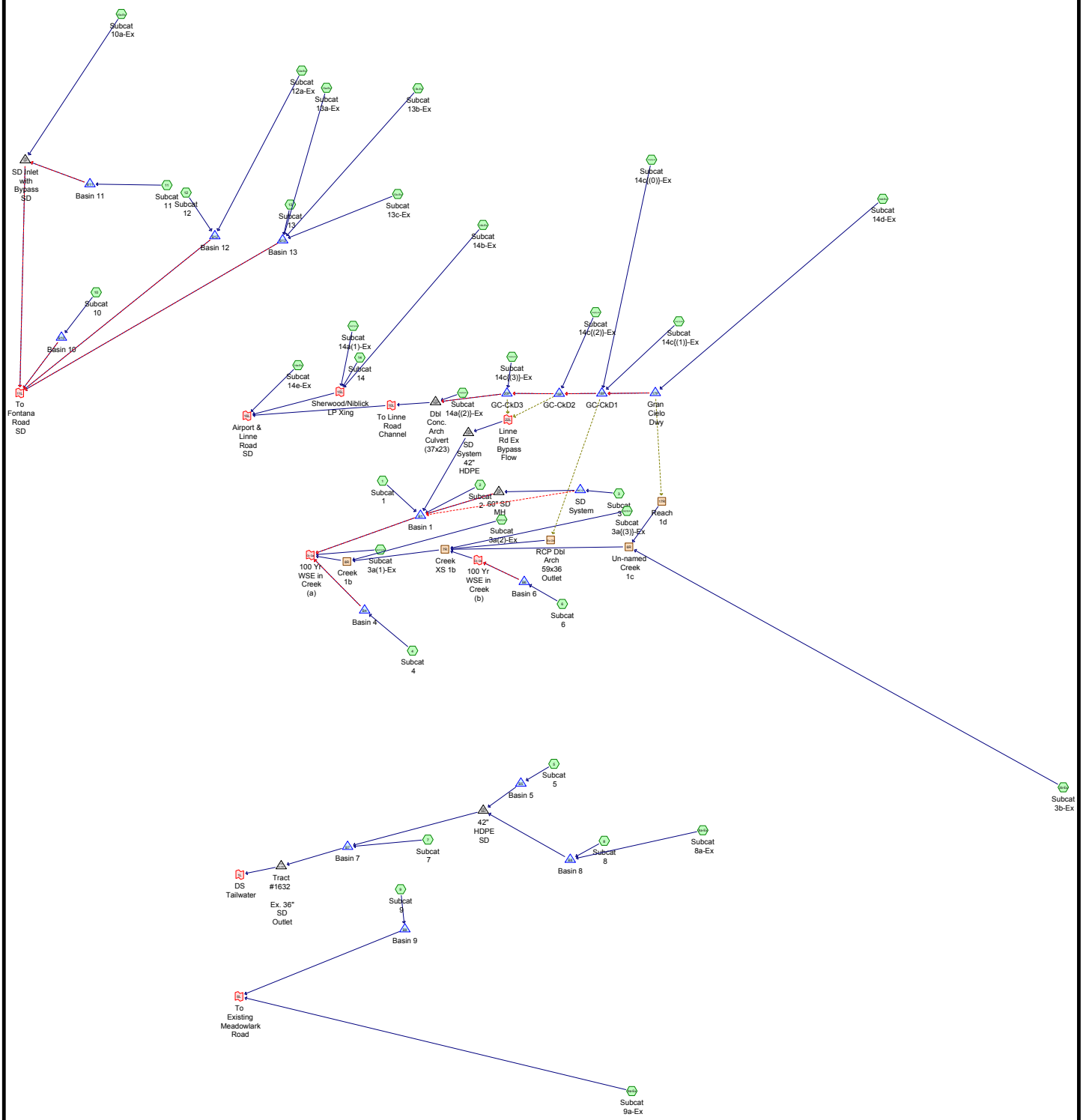
Link 23L: Linne Rd Overtop #1



Appendix I

Proposed Hydrograph Modeling with Detention Basin Sizing

Reso A - Exhibit C2 (EIR Technical Appendix)



Subcat | Reach | Pond | Link

Routing Diagram for 2019-01-22_1465.01 O-C Proposed Linne RD Interception Model_City Precip

Prepared by Wallace Group, Printed 1/24/2019

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
22.244	85	1/8 acre lots, 65% imp, HSG B (10, 14a{(1)}-Ex, 14a{(2)}-Ex)
0.007	90	1/8 acre lots, 65% imp, HSG C (10)
175.180	82	Large SF Lots, 52% imp, HSG B (3, 3a{(1)}-Ex, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14e-Ex)
11.703	88	Large SF Lots, 52% imp, HSG C (3, 6, 10, 11, 12, 13, 13a-Ex, 14d-Ex)
1.386	90	Large SF Lots, 52% imp, HSG D (9)
972.973	58	Meadow, non-grazed, HSG B (3a{(1)}-Ex, 3a{(2)}-Ex, 3a{(3)}-Ex, 3b-Ex, 5, 7, 8a-Ex, 9, 9a-Ex, 10, 10a-Ex, 14e-Ex)
173.327	71	Meadow, non-grazed, HSG C (3a{(2)}-Ex, 3a{(3)}-Ex, 3b-Ex, 10a-Ex, 12, 12a-Ex, 13, 13a-Ex)
1.254	78	Meadow, non-grazed, HSG D (9, 9a-Ex)
13.099	91	Motor Court SF Lots, 80% imp, HSG B (3)
8.398	93	Motor Court SF Lots, 80% imp, HSG C (3, 3a{(2)}-Ex, 3b-Ex)
5.408	77	Natural western desert, HSG B (4, 6, 10, 14e-Ex)
4.532	98	Paved roads w/curbs & sewers, HSG B (9, 10, 14a{(2)}-Ex, 14c{(1)}-Ex, 14d-Ex, 14e-Ex)
2.005	98	Paved roads w/curbs & sewers, HSG C (3, 3b-Ex, 14c{(0)}-Ex, 14c{(1)}-Ex, 14d-Ex)
0.163	98	Paved roads w/curbs & sewers, HSG D (9)
4.336	89	Paved roads w/open ditches, 50% imp, HSG B (14, 14c{(2)}-Ex)
107.131	75	Row crops, SR + CR, Good, HSG B (13c-Ex, 14a{(1)}-Ex, 14b-Ex, 14c{(1)}-Ex, 14c{(2)}-Ex, 14c{(3)}-Ex, 14d-Ex)
252.359	82	Row crops, SR + CR, Good, HSG C (13b-Ex, 13c-Ex, 14b-Ex, 14c{(0)}-Ex, 14c{(1)}-Ex, 14c{(2)}-Ex, 14d-Ex)
35.301	81	Small SF Lots, 58% imp, HSG B (1, 2, 10, 14c{(3)}-Ex)
19.650	92	Urban commercial, 85% imp, HSG B (4, 6, 10, 14)
1,810.455	**68**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
1,359.852	HSG B	1, 2, 3, 3a{(1)}-Ex, 3a{(2)}-Ex, 3a{(3)}-Ex, 3b-Ex, 4, 5, 6, 7, 8, 8a-Ex, 9, 9a-Ex, 10, 10a-Ex, 11, 12, 13, 13c-Ex, 14, 14a{(1)}-Ex, 14a{(2)}-Ex, 14b-Ex, 14c{(1)}-Ex, 14c{(2)}-Ex, 14c{(3)}-Ex, 14d-Ex, 14e-Ex
447.800	HSG C	3, 3a{(2)}-Ex, 3a{(3)}-Ex, 3b-Ex, 6, 10, 10a-Ex, 11, 12, 12a-Ex, 13, 13a-Ex, 13b-Ex, 13c-Ex, 14b-Ex, 14c{(0)}-Ex, 14c{(1)}-Ex, 14c{(2)}-Ex, 14d-Ex
2.803	HSG D	9, 9a-Ex
0.000	Other	
1,810.455		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	22.244	0.007	0.000	0.000	22.251	1/8 acre lots, 65% imp	10, 14a{(1)}-Ex, 14a{(2)}-Ex
0.000	175.180	11.703	1.386	0.000	188.270	Large SF Lots, 52% imp	3, 3a{(1)}-Ex, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 13a-Ex, 14d-Ex, 14e-Ex
0.000	972.973	173.327	1.254	0.000	1,147.553	Meadow, non-grazed	3a{(1)}-Ex, 3a{(2)}-Ex, 3a{(3)}-Ex, 3b-Ex, 5, 7, 8a-Ex, 9, 9a-Ex, 10, 10a-Ex, 12, 12a-Ex, 13, 13a-Ex, 14e-Ex
0.000	13.099	8.398	0.000	0.000	21.497	Motor Court SF Lots, 80% imp	3, 3a{(2)}-Ex, 3b-Ex
0.000	5.408	0.000	0.000	0.000	5.408	Natural western desert	4, 6, 10, 14e-Ex
0.000	4.532	2.005	0.163	0.000	6.699	Paved roads w/curbs & sewers	3, 3b-Ex, 9, 10, 14a{(2)}-Ex, 14c{(0)}-Ex, 14c{(1)}-Ex, 14d-Ex, 14e-Ex
0.000	4.336	0.000	0.000	0.000	4.336	Paved roads w/open ditches, 50% imp	14, 14c{(2)}-Ex
0.000	107.131	252.359	0.000	0.000	359.490	Row crops, SR + CR, Good	13b-Ex, 13c-Ex, 14a{(1)}-Ex, 14b-Ex, 14c{(0)}-Ex, 14c{(1)}-Ex, 14c{(2)}-Ex, 14c{(3)}-Ex, 14d-Ex
0.000	35.301	0.000	0.000	0.000	35.301	Small SF Lots, 58% imp	1, 2, 10, 14c{(3)}-Ex
0.000	19.650	0.000	0.000	0.000	19.650	Urban commercial, 85% imp	4, 6, 10, 14
0.000	**1,359.852**	**447.800**	**2.803**	**0.000**	**1,810.455**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1P	820.00	814.11	990.0	0.0059	0.012	48.0	0.0	0.0
2	2P	838.50	836.50	500.0	0.0040	0.012	36.0	0.0	0.0
3	15P	839.75	833.60	1,370.0	0.0045	0.012	42.0	0.0	0.0
4	16P	843.50	841.40	860.0	0.0024	0.011	36.3	22.5	0.0
5	17P	852.84	851.76	77.0	0.0140	0.025	30.0	0.0	0.0
6	18P	847.69	847.67	26.0	0.0008	0.010	6.0	0.0	0.0
7	18P	843.15	840.75	960.0	0.0025	0.013	58.5	36.0	0.0
8	19P	846.12	845.98	26.0	0.0054	0.010	6.0	0.0	0.0
9	20P	844.22	843.98	26.0	0.0092	0.021	18.0	0.0	0.0
10	B1	833.12	831.20	385.5	0.0050	0.012	36.0	0.0	0.0
11	B10	816.00	815.10	45.0	0.0200	0.012	30.0	0.0	0.0
12	B11	831.67	820.50	165.0	0.0677	0.012	24.0	0.0	0.0
13	B12	836.67	832.50	130.0	0.0321	0.012	30.0	0.0	0.0
14	B13	834.25	832.50	175.0	0.0100	0.012	48.0	0.0	0.0
15	B4	835.67	834.20	210.0	0.0070	0.012	30.0	0.0	0.0
16	B5	844.67	844.17	100.0	0.0050	0.012	30.0	0.0	0.0
17	B6	843.65	842.90	150.0	0.0050	0.012	24.0	0.0	0.0
18	B7	836.67	836.00	63.0	0.0106	0.012	36.0	0.0	0.0
19	B8	853.00	844.17	1,200.0	0.0074	0.012	30.0	0.0	0.0
20	B9	848.00	847.00	110.0	0.0091	0.012	18.0	0.0	0.0
21	Ex SD	836.00	834.00	150.0	0.0133	0.012	36.0	0.0	0.0
22	MC Q	841.50	838.50	585.0	0.0051	0.012	36.0	0.0	0.0
23	SD	844.17	839.00	840.0	0.0062	0.012	42.0	0.0	0.0

Time span=0.01-60.00 hrs, dt=0.01 hrs, 6000 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=11.244 ac 58.00% Impervious Runoff Depth=0.69"
Tc=10.0 min CN=58/98 Runoff=4.66 cfs 0.642 af

Subcatchment2: Subcat 2 Runoff Area=14.644 ac 58.00% Impervious Runoff Depth=0.69"
Tc=15.8 min CN=58/98 Runoff=5.04 cfs 0.836 af

Subcatchment3: Subcat 3 Runoff Area=21.500 ac 80.00% Impervious Runoff Depth=0.95"
Tc=16.9 min CN=67/98 Runoff=9.89 cfs 1.705 af

Subcatchment3a{(1)}-Ex: Subcat 3a(1)-Ex Runoff Area=4.164 ac 0.00% Impervious Runoff Depth=0.00"
Tc=10.0 min CN=58/98 Runoff=0.00 cfs 0.000 af

Subcatchment3a{(2)}-Ex: Subcat 3a(2)-Ex Runoff Area=7.900 ac 0.00% Impervious Runoff Depth=0.00"
Tc=10.0 min CN=61/98 Runoff=0.01 cfs 0.001 af

Subcatchment3a{(3)}-Ex: Subcat 3a{(3)}-Ex Runoff Area=6.004 ac 0.00% Impervious Runoff Depth=0.05"
Tc=10.0 min CN=69/0 Runoff=0.03 cfs 0.025 af

Subcatchment3b-Ex: Subcat 3b-Ex Runoff Area=757.079 ac 0.00% Impervious Runoff Depth=0.00"
Tc=45.5 min CN=60/98 Runoff=0.23 cfs 0.042 af

Subcatchment4: Subcat 4 Runoff Area=38.712 ac 55.38% Impervious Runoff Depth=0.67"
Tc=14.2 min CN=66/98 Runoff=13.34 cfs 2.147 af

Subcatchment5: Subcat 5 Runoff Area=32.696 ac 30.34% Impervious Runoff Depth=0.36"
Tc=21.2 min CN=61/98 Runoff=5.11 cfs 0.981 af

Subcatchment6: Subcat 6 Runoff Area=34.039 ac 52.56% Impervious Runoff Depth=0.64"
Tc=20.1 min CN=68/98 Runoff=9.46 cfs 1.817 af

Subcatchment7: Subcat 7 Runoff Area=31.369 ac 33.28% Impervious Runoff Depth=0.39"
Tc=23.2 min CN=61/98 Runoff=5.13 cfs 1.032 af

Subcatchment8: Subcat 8 Runoff Area=30.487 ac 52.00% Impervious Runoff Depth=0.62"
Tc=28.8 min CN=65/98 Runoff=6.93 cfs 1.584 af

Subcatchment8a-Ex: Subcat 8a-Ex Runoff Area=14.202 ac 0.00% Impervious Runoff Depth=0.00"
Tc=16.5 min CN=58/0 Runoff=0.00 cfs 0.000 af

Subcatchment9: Subcat 9 Runoff Area=11.446 ac 17.36% Impervious Runoff Depth=0.21"
Tc=22.3 min CN=62/98 Runoff=1.00 cfs 0.199 af

Subcatchment9a-Ex: Subcat 9a-Ex Runoff Area=212.022 ac 0.00% Impervious Runoff Depth=0.00"
Tc=51.3 min CN=58/0 Runoff=0.00 cfs 0.000 af

Subcatchment10: Subcat 10 Runoff Area=30.685 ac 61.94% Impervious Runoff Depth=0.73"
Tc=22.6 min CN=61/98 Runoff=9.47 cfs 1.874 af

Subcatchment10a-Ex: Subcat 10a-Ex Runoff Area=94.105 ac 0.00% Impervious Runoff Depth=0.03"
Tc=11.0 min CN=67/0 Runoff=0.33 cfs 0.253 af

Subcatchment11: Subcat 11 Runoff Area=14.461 ac 52.00% Impervious Runoff Depth=0.63"
Tc=11.1 min CN=66/98 Runoff=5.17 cfs 0.755 af

Subcatchment12: Subcat 12 Runoff Area=17.572 ac 50.65% Impervious Runoff Depth=0.61"
Tc=10.0 min CN=65/98 Runoff=6.36 cfs 0.890 af

Subcatchment12a-Ex: Subcat 12a-Ex Runoff Area=2.629 ac 0.00% Impervious Runoff Depth=0.07"
Tc=10.0 min CN=71/0 Runoff=0.02 cfs 0.016 af

Subcatchment13: Subcat 13 Runoff Area=27.742 ac 51.11% Impervious Runoff Depth=0.62"
Tc=10.0 min CN=68/98 Runoff=10.14 cfs 1.442 af

Subcatchment13a-Ex: Subcat 13a-Ex Runoff Area=3.505 ac 0.00% Impervious Runoff Depth=0.07"
Tc=10.0 min CN=71/98 Runoff=0.02 cfs 0.021 af

Subcatchment13b-Ex: Subcat 13b-Ex Runoff Area=18.461 ac 0.00% Impervious Runoff Depth=0.29"
Tc=10.0 min CN=82/0 Runoff=1.93 cfs 0.450 af

Subcatchment13c-Ex: Subcat 13c-Ex Runoff Area=14.407 ac 0.00% Impervious Runoff Depth=0.24"
Tc=10.0 min CN=80/0 Runoff=0.92 cfs 0.286 af

Subcatchment14: Subcat 14 Runoff Area=8.669 ac 67.94% Impervious Runoff Depth=0.85"
Tc=10.0 min CN=75/98 Runoff=4.21 cfs 0.611 af

Subcatchment14a{(1)}-Ex: Subcat 14a(1)-Ex Runoff Area=13.081 ac 40.33% Impervious Runoff Depth=0.51"
Tc=10.0 min CN=70/98 Runoff=3.77 cfs 0.559 af

Subcatchment14a{(2)}-Ex: Subcat 14a{(2)}-Ex Runoff Area=2.438 ac 75.43% Impervious Runoff Depth=0.89"
Tc=10.0 min CN=61/98 Runoff=1.31 cfs 0.181 af

Subcatchment14b-Ex: Subcat 14b-Ex Runoff Area=50.209 ac 0.00% Impervious Runoff Depth=0.21"
Tc=13.4 min CN=79/0 Runoff=1.97 cfs 0.895 af

Subcatchment14c{(0)}-Ex: Subcat 14c{(0)}-Ex Runoff Area=43.677 ac 1.21% Impervious Runoff Depth=0.30"
Tc=24.5 min CN=82/98 Runoff=2.82 cfs 1.104 af

Subcatchment14c{(1)}-Ex: Subcat 14c{(1)}-Ex Runoff Area=30.208 ac 1.61% Impervious Runoff Depth=0.28"
Tc=13.6 min CN=81/98 Runoff=2.38 cfs 0.703 af

Subcatchment14c{(2)}-Ex: Subcat 14c{(2)}-Ex Runoff Area=19.689 ac 0.28% Impervious Runoff Depth=0.17"
Tc=13.2 min CN=77/98 Runoff=0.41 cfs 0.284 af

Subcatchment14c{(3)}-Ex: Subcat 14c{(3)}-Ex Runoff Area=13.782 ac 0.00% Impervious Runoff Depth=0.13"
Tc=12.6 min CN=75/98 Runoff=0.16 cfs 0.152 af

Subcatchment14d-Ex: Subcat 14d-Ex Runoff Area=166.738 ac 0.91% Impervious Runoff Depth=0.25"
Tc=19.4 min CN=80/98 Runoff=7.71 cfs 3.430 af

Subcatchment14e-Ex: Subcat 14e-Ex Runoff Area=10.890 ac 6.07% Impervious Runoff Depth=0.07"
Tc=10.0 min CN=58/98 Runoff=0.47 cfs 0.065 af

Reach 6R: Un-named Creek 1c Avg. Flow Depth=0.01' Max Vel=3.44 fps Inflow=0.23 cfs 0.042 af
n=0.030 L=830.0' S=0.0032 '/' Capacity=3,940.38 cfs Outflow=0.23 cfs 0.042 af

Reach 7R: Creek XS 1b Avg. Flow Depth=0.59' Max Vel=1.65 fps Inflow=12.45 cfs 5.976 af
n=0.030 L=983.0' S=0.0059 '/' Capacity=1,505.35 cfs Outflow=11.11 cfs 5.976 af

Reach 8R: Creek 1b Avg. Flow Depth=0.45' Max Vel=3.91 fps Inflow=11.11 cfs 5.977 af
n=0.030 L=483.0' S=0.0041 '/' Capacity=4,478.97 cfs Outflow=11.08 cfs 5.977 af

Reach 17R: Reach 1d Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.027 L=841.0' S=0.0110 '/' Capacity=1,276.84 cfs Outflow=0.00 cfs 0.000 af

Reach Ex Chl: RCP Dbl Arch 59x36 Outlet Avg. Flow Depth=0.38' Max Vel=2.12 fps Inflow=12.48 cfs 5.202 af
n=0.025 L=150.0' S=0.0116 '/' Capacity=3,071.94 cfs Outflow=12.45 cfs 5.202 af

Pond 1P: SD Inlet with Bypass SD Peak Elev=824.53' Inflow=0.33 cfs 0.253 af
Primary=0.33 cfs 0.253 af Secondary=0.00 cfs 0.000 af Outflow=0.33 cfs 0.253 af

Pond 2P: 60" SD MH Peak Elev=839.33' Inflow=4.12 cfs 0.523 af
Primary=4.12 cfs 0.523 af Secondary=0.00 cfs 0.000 af Outflow=4.12 cfs 0.523 af

Pond 15P: SD System 42" HDPE Peak Elev=844.17' Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond 16P: Dbl Conc. Arch Culvert (37x23) Peak Elev=843.78' Inflow=1.31 cfs 0.604 af
36.3" x 22.5", R=18.8"/51.0" Pipe Arch Culvert x 2.00 n=0.011 L=860.0' S=0.0024 '/' Outflow=1.31 cfs 0.604 af

Pond 17P: Gran Cielo Dwy Peak Elev=853.35' Storage=1,021 cf Inflow=7.71 cfs 3.430 af
Primary=7.55 cfs 3.430 af Secondary=0.00 cfs 0.000 af Tertiary=0.00 cfs 0.000 af Outflow=7.55 cfs 3.430 af

Pond 18P: GC-CkD1 Peak Elev=847.34' Storage=2,050 cf Inflow=12.48 cfs 5.237 af
Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Tertiary=12.48 cfs 5.202 af Outflow=12.48 cfs 5.202 af

Pond 19P: GC-CkD2 Peak Elev=846.55' Storage=728 cf Inflow=0.41 cfs 0.284 af
Primary=0.32 cfs 0.282 af Secondary=0.00 cfs 0.000 af Tertiary=0.00 cfs 0.000 af Outflow=0.32 cfs 0.282 af

Pond 20P: GC-CkD3 Peak Elev=844.59' Storage=1,962 cf Inflow=0.48 cfs 0.434 af
Primary=0.45 cfs 0.423 af Secondary=0.00 cfs 0.000 af Tertiary=0.00 cfs 0.000 af Outflow=0.45 cfs 0.423 af

Pond B1: Basin 1 Peak Elev=834.16' Storage=1.559 af Inflow=16.44 cfs 2.556 af
Discarded=0.91 cfs 2.283 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.91 cfs 2.283 af

Pond B10: Basin 10 Peak Elev=815.90' Storage=50,223 cf Inflow=9.47 cfs 1.874 af
Discarded=0.67 cfs 1.652 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.67 cfs 1.652 af

Pond B11: Basin 11 Peak Elev=830.96' Storage=22,949 cf Inflow=5.17 cfs 0.755 af
Discarded=0.17 cfs 0.564 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.17 cfs 0.564 af

Pond B12: Basin 12 Peak Elev=835.66' Storage=23,909 cf Inflow=6.36 cfs 0.906 af
Discarded=0.31 cfs 0.743 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.31 cfs 0.743 af

Pond B13: Basin 13 Peak Elev=839.94' Storage=1.188 af Inflow=12.88 cfs 2.200 af
Discarded=0.31 cfs 1.142 af Primary=0.91 cfs 0.674 af Secondary=0.00 cfs 0.000 af Outflow=1.22 cfs 1.816 af

Pond B4: Basin 4 Peak Elev=836.28' Storage=48,879 cf Inflow=13.34 cfs 2.147 af
Discarded=0.40 cfs 1.228 af Primary=0.88 cfs 0.709 af Secondary=0.00 cfs 0.000 af Outflow=1.28 cfs 1.936 af

Pond B5: Basin 5 Peak Elev=845.12' Storage=18,337 cf Inflow=5.11 cfs 0.981 af
Discarded=0.31 cfs 0.788 af Primary=0.22 cfs 0.193 af Secondary=0.00 cfs 0.000 af Outflow=0.53 cfs 0.981 af

Pond B6: Basin 6 Peak Elev=848.49' Storage=0.958 af Inflow=9.46 cfs 1.817 af
Discarded=0.26 cfs 0.849 af Primary=0.75 cfs 0.707 af Secondary=0.00 cfs 0.000 af Outflow=1.01 cfs 1.556 af

Pond B7: Basin 7 Peak Elev=839.85' Storage=24,357 cf Inflow=5.13 cfs 1.670 af
Discarded=0.84 cfs 1.670 af Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.84 cfs 1.670 af

Pond B8: Basin 8 Peak Elev=854.68' Storage=32,697 cf Inflow=6.93 cfs 1.584 af
Discarded=0.38 cfs 1.139 af Primary=0.32 cfs 0.445 af Secondary=0.00 cfs 0.000 af Outflow=0.70 cfs 1.584 af

Pond B9: Basin 9 Peak Elev=848.33' Storage=2,059 cf Inflow=1.00 cfs 0.199 af
Outflow=0.51 cfs 0.198 af

Pond Ex SD: Tract #1632 **Ex. 36" SD Outlet** Peak Elev=836.00' Inflow=0.00 cfs 0.000 af
36.0" Round Culvert n=0.012 L=150.0' S=0.0133 '/' Outflow=0.00 cfs 0.000 af

Pond MC Q: SD System Peak Elev=845.68' Storage=0.493 af Inflow=9.89 cfs 1.705 af
Discarded=0.10 cfs 0.348 af Primary=4.12 cfs 0.523 af Secondary=4.36 cfs 0.554 af Outflow=8.58 cfs 1.426 af

Pond SD: 42" HDPE SD Peak Elev=844.44' Inflow=0.54 cfs 0.638 af
42.0" Round Culvert n=0.012 L=840.0' S=0.0062 '/' Outflow=0.54 cfs 0.638 af

Link 1L: DS Tailwater below 77.30 cfs Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af

Link 6L: To Existing Meadowlark Road Inflow=0.51 cfs 0.198 af
Primary=0.51 cfs 0.198 af

Link 10L: To Linne Road Channel Inflow=1.31 cfs 0.604 af
Primary=1.31 cfs 0.604 af

Link 11L: To Fontana Road SD Inflow=1.17 cfs 0.927 af
Primary=1.17 cfs 0.927 af

Link 15L: Sherwood/NiblickLP Xing Inflow=9.77 cfs 2.064 af
Primary=9.77 cfs 2.064 af

Link 16L: Airport & Linne Road SD Inflow=11.55 cfs 2.734 af
Primary=11.55 cfs 2.734 af

Link 22L: Linne Rd Ex Bypass Flow Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link Ck Qa: 100 Yr WSE in Creek (a) Inflow=11.15 cfs 6.686 af
Primary=11.15 cfs 6.686 af

Link Ck Qb: 100 Yr WSE in Creek (b) Inflow=0.75 cfs 0.707 af
Primary=0.75 cfs 0.707 af

Total Runoff Area = 1,810.455 ac Runoff Volume = 24.982 af Average Runoff Depth = 0.17"
90.30% Pervious = 1,634.850 ac 9.70% Impervious = 175.605 ac

Time span=0.01-60.00 hrs, dt=0.01 hrs, 6000 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=11.244 ac 58.00% Impervious Runoff Depth=1.26"
Tc=10.0 min CN=58/98 Runoff=8.11 cfs 1.180 af

Subcatchment2: Subcat 2 Runoff Area=14.644 ac 58.00% Impervious Runoff Depth=1.26"
Tc=15.8 min CN=58/98 Runoff=8.78 cfs 1.537 af

Subcatchment3: Subcat 3 Runoff Area=21.500 ac 80.00% Impervious Runoff Depth=1.74"
Tc=16.9 min CN=67/98 Runoff=17.34 cfs 3.116 af

Subcatchment3a{(1)}-Ex: Subcat 3a(1)-Ex Runoff Area=4.164 ac 0.00% Impervious Runoff Depth=0.10"
Tc=10.0 min CN=58/98 Runoff=0.04 cfs 0.033 af

Subcatchment3a{(2)}-Ex: Subcat 3a(2)-Ex Runoff Area=7.900 ac 0.00% Impervious Runoff Depth=0.15"
Tc=10.0 min CN=61/98 Runoff=0.10 cfs 0.098 af

Subcatchment3a{(3)}-Ex: Subcat 3a{(3)}-Ex Runoff Area=6.004 ac 0.00% Impervious Runoff Depth=0.35"
Tc=10.0 min CN=69/0 Runoff=0.43 cfs 0.173 af

Subcatchment3b-Ex: Subcat 3b-Ex Runoff Area=757.079 ac 0.00% Impervious Runoff Depth=0.13"
Tc=45.5 min CN=60/98 Runoff=8.34 cfs 8.178 af

Subcatchment4: Subcat 4 Runoff Area=38.712 ac 55.38% Impervious Runoff Depth=1.28"
Tc=14.2 min CN=66/98 Runoff=23.47 cfs 4.132 af

Subcatchment5: Subcat 5 Runoff Area=32.696 ac 30.34% Impervious Runoff Depth=0.74"
Tc=21.2 min CN=61/98 Runoff=8.91 cfs 2.019 af

Subcatchment6: Subcat 6 Runoff Area=34.039 ac 52.56% Impervious Runoff Depth=1.25"
Tc=20.1 min CN=68/98 Runoff=16.99 cfs 3.559 af

Subcatchment7: Subcat 7 Runoff Area=31.369 ac 33.28% Impervious Runoff Depth=0.80"
Tc=23.2 min CN=61/98 Runoff=8.96 cfs 2.087 af

Subcatchment8: Subcat 8 Runoff Area=30.487 ac 52.00% Impervious Runoff Depth=1.21"
Tc=28.8 min CN=65/98 Runoff=12.19 cfs 3.065 af

Subcatchment8a-Ex: Subcat 8a-Ex Runoff Area=14.202 ac 0.00% Impervious Runoff Depth=0.10"
Tc=16.5 min CN=58/0 Runoff=0.13 cfs 0.113 af

Subcatchment9: Subcat 9 Runoff Area=11.446 ac 17.36% Impervious Runoff Depth=0.50"
Tc=22.3 min CN=62/98 Runoff=1.74 cfs 0.481 af

Subcatchment9a-Ex: Subcat 9a-Ex Runoff Area=212.022 ac 0.00% Impervious Runoff Depth=0.10"
Tc=51.3 min CN=58/0 Runoff=1.86 cfs 1.691 af

Subcatchment10: Subcat 10 Runoff Area=30.685 ac 61.94% Impervious Runoff Depth=1.36"
Tc=22.6 min CN=61/98 Runoff=16.54 cfs 3.474 af

Subcatchment10a-Ex: Subcat 10a-Ex Runoff Area=94.105 ac 0.00% Impervious Runoff Depth=0.29"
Tc=11.0 min CN=67/0 Runoff=3.41 cfs 2.262 af

Subcatchment11: Subcat 11 Runoff Area=14.461 ac 52.00% Impervious Runoff Depth=1.22"
Tc=11.1 min CN=66/98 Runoff=9.10 cfs 1.469 af

Subcatchment12: Subcat 12 Runoff Area=17.572 ac 50.65% Impervious Runoff Depth=1.18"
Tc=10.0 min CN=65/98 Runoff=11.12 cfs 1.730 af

Subcatchment12a-Ex: Subcat 12a-Ex Runoff Area=2.629 ac 0.00% Impervious Runoff Depth=0.41"
Tc=10.0 min CN=71/0 Runoff=0.30 cfs 0.090 af

Subcatchment13: Subcat 13 Runoff Area=27.742 ac 51.11% Impervious Runoff Depth=1.23"
Tc=10.0 min CN=68/98 Runoff=18.23 cfs 2.841 af

Subcatchment13a-Ex: Subcat 13a-Ex Runoff Area=3.505 ac 0.00% Impervious Runoff Depth=0.41"
Tc=10.0 min CN=71/98 Runoff=0.41 cfs 0.119 af

Subcatchment13b-Ex: Subcat 13b-Ex Runoff Area=18.461 ac 0.00% Impervious Runoff Depth=0.88"
Tc=10.0 min CN=82/0 Runoff=8.62 cfs 1.346 af

Subcatchment13c-Ex: Subcat 13c-Ex Runoff Area=14.407 ac 0.00% Impervious Runoff Depth=0.77"
Tc=10.0 min CN=80/0 Runoff=5.63 cfs 0.929 af

Subcatchment14: Subcat 14 Runoff Area=8.669 ac 67.94% Impervious Runoff Depth=1.61"
Tc=10.0 min CN=75/98 Runoff=7.93 cfs 1.160 af

Subcatchment14a{(1)}-Ex: Subcat 14a(1)-Ex Runoff Area=13.081 ac 40.33% Impervious Runoff Depth=1.07"
Tc=10.0 min CN=70/98 Runoff=7.22 cfs 1.169 af

Subcatchment14a{(2)}-Ex: Subcat 14a{(2)}-Ex Runoff Area=2.438 ac 75.43% Impervious Runoff Depth=1.62"
Tc=10.0 min CN=61/98 Runoff=2.29 cfs 0.329 af

Subcatchment14b-Ex: Subcat 14b-Ex Runoff Area=50.209 ac 0.00% Impervious Runoff Depth=0.73"
Tc=13.4 min CN=79/0 Runoff=15.53 cfs 3.036 af

Subcatchment14c{(0)}-Ex: Subcat 14c{(0)}-Ex Runoff Area=43.677 ac 1.21% Impervious Runoff Depth=0.89"
Tc=24.5 min CN=82/98 Runoff=13.08 cfs 3.239 af

Subcatchment14c{(1)}-Ex: Subcat 14c{(1)}-Ex Runoff Area=30.208 ac 1.61% Impervious Runoff Depth=0.84"
Tc=13.6 min CN=81/98 Runoff=11.59 cfs 2.124 af

Subcatchment14c{(2)}-Ex: Subcat 14c{(2)}-Ex Runoff Area=19.689 ac 0.28% Impervious Runoff Depth=0.64"
Tc=13.2 min CN=77/98 Runoff=4.98 cfs 1.050 af

Subcatchment14c{(3)}-Ex: Subcat 14c{(3)}-Ex Runoff Area=13.782 ac 0.00% Impervious Runoff Depth=0.55"
Tc=12.6 min CN=75/98 Runoff=2.75 cfs 0.636 af

Subcatchment14d-Ex: Subcat 14d-Ex Runoff Area=166.738 ac 0.91% Impervious Runoff Depth=0.79"
Tc=19.4 min CN=80/98 Runoff=47.53 cfs 10.915 af

Subcatchment14e-Ex: Subcat 14e-Ex Runoff Area=10.890 ac 6.07% Impervious Runoff Depth=0.22"
Tc=10.0 min CN=58/98 Runoff=0.82 cfs 0.197 af

Reach 6R: Un-named Creek 1c Avg. Flow Depth=0.38' Max Vel=3.44 fps Inflow=8.34 cfs 8.178 af
n=0.030 L=830.0' S=0.0032 '/' Capacity=3,940.38 cfs Outflow=8.34 cfs 8.178 af

Reach 7R: Creek XS 1b Avg. Flow Depth=1.13' Max Vel=2.29 fps Inflow=71.24 cfs 26.924 af
n=0.030 L=983.0' S=0.0059 '/' Capacity=1,505.35 cfs Outflow=62.84 cfs 26.924 af

Reach 8R: Creek 1b Avg. Flow Depth=2.52' Max Vel=3.91 fps Inflow=62.84 cfs 27.021 af
n=0.030 L=483.0' S=0.0041 '/' Capacity=4,478.97 cfs Outflow=62.30 cfs 27.021 af

Reach 17R: Reach 1d Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.027 L=841.0' S=0.0110 '/' Capacity=1,276.84 cfs Outflow=0.00 cfs 0.000 af

Reach Ex Chl: RCP Dbl Arch 59x36 Outlet Avg. Flow Depth=0.73' Max Vel=3.26 fps Inflow=70.21 cfs 16.239 af
n=0.025 L=150.0' S=0.0116 '/' Capacity=3,071.94 cfs Outflow=70.04 cfs 16.239 af

Pond 1P: SD Inlet with Bypass SD Peak Elev=824.64' Inflow=3.41 cfs 2.735 af
Primary=3.41 cfs 2.735 af Secondary=0.00 cfs 0.000 af Outflow=3.41 cfs 2.735 af

Pond 2P: 60" SD MH Peak Elev=839.69' Inflow=8.31 cfs 1.203 af
Primary=8.31 cfs 1.203 af Secondary=0.00 cfs 0.000 af Outflow=8.31 cfs 1.203 af

Pond 15P: SD System 42" HDPE Peak Elev=844.17' Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond 16P: Dbl Conc. Arch Culvert (37x23) Peak Elev=843.88' Inflow=2.62 cfs 2.008 af
36.3" x 22.5", R=18.8"/51.0" Pipe Arch Culvert x 2.00 n=0.011 L=860.0' S=0.0024 '/' Outflow=2.62 cfs 2.008 af

Pond 17P: Gran Cielo Dwy Peak Elev=854.16' Storage=4,945 cf Inflow=47.53 cfs 10.915 af
Primary=46.40 cfs 10.915 af Secondary=0.00 cfs 0.000 af Tertiary=0.00 cfs 0.000 af Outflow=46.40 cfs 10.915 af

Pond 18P: GC-CkD1 Peak Elev=848.08' Storage=3,533 cf Inflow=70.49 cfs 16.278 af
Primary=0.19 cfs 0.004 af Secondary=0.00 cfs 0.000 af Tertiary=70.21 cfs 16.239 af Outflow=70.40 cfs 16.244 af

Pond 19P: GC-CkD2 Peak Elev=848.01' Storage=8,327 cf Inflow=5.16 cfs 1.055 af
Primary=0.95 cfs 0.982 af Secondary=0.54 cfs 0.072 af Tertiary=0.00 cfs 0.000 af Outflow=1.49 cfs 1.053 af

Pond 20P: GC-CkD3 Peak Elev=845.08' Storage=5,376 cf Inflow=3.41 cfs 1.689 af
Primary=2.17 cfs 1.674 af Secondary=0.04 cfs 0.005 af Tertiary=0.00 cfs 0.000 af Outflow=2.21 cfs 1.678 af

Pond B1: Basin 1 Peak Elev=834.95' Storage=2.513 af Inflow=33.80 cfs 5.194 af
Discarded=0.96 cfs 2.782 af Primary=2.98 cfs 2.060 af Secondary=0.00 cfs 0.000 af Outflow=3.94 cfs 4.842 af

Pond B10: Basin 10 Peak Elev=816.90' Storage=91,317 cf Inflow=16.54 cfs 3.474 af
Discarded=0.77 cfs 2.542 af Primary=0.70 cfs 0.513 af Secondary=0.00 cfs 0.000 af Outflow=1.47 cfs 3.055 af

Pond B11: Basin 11 Peak Elev=832.03' Storage=33,359 cf Inflow=9.10 cfs 1.469 af
Discarded=0.21 cfs 0.739 af Primary=0.79 cfs 0.473 af Secondary=0.00 cfs 0.000 af Outflow=1.00 cfs 1.212 af

Pond B12: Basin 12 Peak Elev=836.87' Storage=49,369 cf Inflow=11.41 cfs 1.819 af
Discarded=0.43 cfs 1.374 af Primary=0.29 cfs 0.184 af Secondary=0.00 cfs 0.000 af Outflow=0.72 cfs 1.558 af

Pond B13: Basin 13 Peak Elev=841.67' Storage=1.893 af Inflow=32.84 cfs 5.235 af
Discarded=0.38 cfs 1.221 af Primary=4.63 cfs 3.620 af Secondary=0.00 cfs 0.000 af Outflow=5.01 cfs 4.841 af

Pond B4: Basin 4 Peak Elev=837.92' Storage=85,087 cf Inflow=23.47 cfs 4.132 af
Discarded=0.48 cfs 1.470 af Primary=2.53 cfs 2.426 af Secondary=0.00 cfs 0.000 af Outflow=3.01 cfs 3.896 af

Pond B5: Basin 5 Peak Elev=846.09' Storage=35,848 cf Inflow=8.91 cfs 2.019 af
Discarded=0.34 cfs 1.073 af Primary=0.91 cfs 0.946 af Secondary=0.00 cfs 0.000 af Outflow=1.25 cfs 2.019 af

Pond B6: Basin 6 Peak Elev=849.79' Storage=1.388 af Inflow=16.99 cfs 3.559 af
Discarded=0.30 cfs 0.944 af Primary=4.94 cfs 2.333 af Secondary=0.00 cfs 0.000 af Outflow=5.24 cfs 3.277 af

Pond B7: Basin 7 Peak Elev=841.02' Storage=89,685 cf Inflow=9.38 cfs 4.548 af
Discarded=1.05 cfs 3.899 af Primary=0.96 cfs 0.621 af Secondary=0.00 cfs 0.000 af Outflow=2.01 cfs 4.520 af

Pond B8: Basin 8 Peak Elev=856.21' Storage=68,173 cf Inflow=12.19 cfs 3.178 af
Discarded=0.46 cfs 1.664 af Primary=1.05 cfs 1.514 af Secondary=0.00 cfs 0.000 af Outflow=1.51 cfs 3.178 af

Pond B9: Basin 9 Peak Elev=848.48' Storage=3,029 cf Inflow=1.74 cfs 0.481 af
Outflow=1.02 cfs 0.479 af

Pond Ex SD: Tract #1632 **Ex. 36" SD Outlet** Peak Elev=836.36' Inflow=0.96 cfs 0.621 af
36.0" Round Culvert n=0.012 L=150.0' S=0.0133 '/' Outflow=0.96 cfs 0.621 af

Pond MC Q: SD System Peak Elev=845.79' Storage=0.505 af Inflow=17.34 cfs 3.116 af
Discarded=0.11 cfs 0.358 af Primary=8.31 cfs 1.203 af Secondary=8.80 cfs 1.274 af Outflow=17.22 cfs 2.836 af

Pond SD: 42" HDPE SD Peak Elev=844.69' Inflow=1.91 cfs 2.460 af
42.0" Round Culvert n=0.012 L=840.0' S=0.0062 '/' Outflow=1.91 cfs 2.460 af

Link 1L: DS Tailwater below 77.30 cfs Inflow=0.96 cfs 0.621 af
Primary=0.96 cfs 0.621 af Secondary=0.00 cfs 0.000 af

Link 6L: To Existing Meadowlark Road Inflow=2.11 cfs 2.170 af
Primary=2.11 cfs 2.170 af

Link 10L: To Linne Road Channel Inflow=2.62 cfs 2.008 af
Primary=2.62 cfs 2.008 af

Link 11L: To Fontana Road SD Inflow=7.83 cfs 7.053 af
Primary=7.83 cfs 7.053 af

Link 15L: Sherwood/NiblickLP Xing Inflow=30.55 cfs 5.365 af
Primary=30.55 cfs 5.365 af

Link 16L: Airport & Linne Road SD Inflow=33.97 cfs 7.570 af
Primary=33.97 cfs 7.570 af

Link 22L: Linne Rd Ex Bypass Flow Inflow=0.00 cfs 0.000 af
Primary=0.00 cfs 0.000 af

Link Ck Qa: 100 Yr WSE in Creek (a) Inflow=63.77 cfs 31.540 af
Primary=63.77 cfs 31.540 af

Link Ck Qb: 100 Yr WSE in Creek (b) Inflow=4.94 cfs 2.333 af
Primary=4.94 cfs 2.333 af

Total Runoff Area = 1,810.455 ac Runoff Volume = 69.578 af Average Runoff Depth = 0.46"
90.30% Pervious = 1,634.850 ac 9.70% Impervious = 175.605 ac

Time span=0.01-60.00 hrs, dt=0.01 hrs, 6000 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=11.244 ac 58.00% Impervious Runoff Depth=2.16"
Tc=10.0 min CN=58/98 Runoff=13.08 cfs 2.023 af

Subcatchment2: Subcat 2 Runoff Area=14.644 ac 58.00% Impervious Runoff Depth=2.16"
Tc=15.8 min CN=58/98 Runoff=14.16 cfs 2.635 af

Subcatchment3: Subcat 3 Runoff Area=21.500 ac 80.00% Impervious Runoff Depth=2.87"
Tc=16.9 min CN=67/98 Runoff=28.37 cfs 5.150 af

Subcatchment3a{(1)}-Ex: Subcat 3a(1)-Ex Runoff Area=4.164 ac 0.00% Impervious Runoff Depth=0.49"
Tc=10.0 min CN=58/98 Runoff=0.35 cfs 0.171 af

Subcatchment3a{(2)}-Ex: Subcat 3a(2)-Ex Runoff Area=7.900 ac 0.00% Impervious Runoff Depth=0.62"
Tc=10.0 min CN=61/98 Runoff=1.34 cfs 0.407 af

Subcatchment3a{(3)}-Ex: Subcat 3a{(3)}-Ex Runoff Area=6.004 ac 0.00% Impervious Runoff Depth=1.01"
Tc=10.0 min CN=69/0 Runoff=2.81 cfs 0.508 af

Subcatchment3b-Ex: Subcat 3b-Ex Runoff Area=757.079 ac 0.00% Impervious Runoff Depth=0.58"
Tc=45.5 min CN=60/98 Runoff=47.38 cfs 36.285 af

Subcatchment4: Subcat 4 Runoff Area=38.712 ac 55.38% Impervious Runoff Depth=2.25"
Tc=14.2 min CN=66/98 Runoff=41.42 cfs 7.245 af

Subcatchment5: Subcat 5 Runoff Area=32.696 ac 30.34% Impervious Runoff Depth=1.45"
Tc=21.2 min CN=61/98 Runoff=16.32 cfs 3.956 af

Subcatchment6: Subcat 6 Runoff Area=34.039 ac 52.56% Impervious Runoff Depth=2.22"
Tc=20.1 min CN=68/98 Runoff=30.64 cfs 6.310 af

Subcatchment7: Subcat 7 Runoff Area=31.369 ac 33.28% Impervious Runoff Depth=1.53"
Tc=23.2 min CN=61/98 Runoff=16.07 cfs 4.007 af

Subcatchment8: Subcat 8 Runoff Area=30.487 ac 52.00% Impervious Runoff Depth=2.14"
Tc=28.8 min CN=65/98 Runoff=21.40 cfs 5.429 af

Subcatchment8a-Ex: Subcat 8a-Ex Runoff Area=14.202 ac 0.00% Impervious Runoff Depth=0.49"
Tc=16.5 min CN=58/0 Runoff=0.93 cfs 0.583 af

Subcatchment9: Subcat 9 Runoff Area=11.446 ac 17.36% Impervious Runoff Depth=1.13"
Tc=22.3 min CN=62/98 Runoff=3.86 cfs 1.080 af

Subcatchment9a-Ex: Subcat 9a-Ex Runoff Area=212.022 ac 0.00% Impervious Runoff Depth=0.49"
Tc=51.3 min CN=58/0 Runoff=9.77 cfs 8.709 af

Subcatchment10: Subcat 10 Runoff Area=30.685 ac 61.94% Impervious Runoff Depth=2.32"
Tc=22.6 min CN=61/98 Runoff=27.15 cfs 5.934 af

Subcatchment10a-Ex: Subcat 10a-Ex Runoff Area=94.105 ac 0.00% Impervious Runoff Depth=0.91"
Tc=11.0 min CN=67/0 Runoff=34.70 cfs 7.111 af

Subcatchment11: Subcat 11 Runoff Area=14.461 ac 52.00% Impervious Runoff Depth=2.16"
Tc=11.1 min CN=66/98 Runoff=16.38 cfs 2.604 af

Subcatchment12: Subcat 12 Runoff Area=17.572 ac 50.65% Impervious Runoff Depth=2.10"
Tc=10.0 min CN=65/98 Runoff=19.99 cfs 3.079 af

Subcatchment12a-Ex: Subcat 12a-Ex Runoff Area=2.629 ac 0.00% Impervious Runoff Depth=1.13"
Tc=10.0 min CN=71/0 Runoff=1.45 cfs 0.247 af

Subcatchment13: Subcat 13 Runoff Area=27.742 ac 51.11% Impervious Runoff Depth=2.19"
Tc=10.0 min CN=68/98 Runoff=33.40 cfs 5.062 af

Subcatchment13a-Ex: Subcat 13a-Ex Runoff Area=3.505 ac 0.00% Impervious Runoff Depth=1.13"
Tc=10.0 min CN=71/98 Runoff=1.94 cfs 0.329 af

Subcatchment13b-Ex: Subcat 13b-Ex Runoff Area=18.461 ac 0.00% Impervious Runoff Depth=1.87"
Tc=10.0 min CN=82/0 Runoff=20.29 cfs 2.870 af

Subcatchment13c-Ex: Subcat 13c-Ex Runoff Area=14.407 ac 0.00% Impervious Runoff Depth=1.72"
Tc=10.0 min CN=80/0 Runoff=14.27 cfs 2.060 af

Subcatchment14: Subcat 14 Runoff Area=8.669 ac 67.94% Impervious Runoff Depth=2.73"
Tc=10.0 min CN=75/98 Runoff=13.55 cfs 1.970 af

Subcatchment14a{(1)}-Ex: Subcat 14a(1)-Ex Runoff Area=13.081 ac 40.33% Impervious Runoff Depth=2.00"
Tc=10.0 min CN=70/98 Runoff=14.25 cfs 2.176 af

Subcatchment14a{(2)}-Ex: Subcat 14a{(2)}-Ex Runoff Area=2.438 ac 75.43% Impervious Runoff Depth=2.69"
Tc=10.0 min CN=61/98 Runoff=3.69 cfs 0.547 af

Subcatchment14b-Ex: Subcat 14b-Ex Runoff Area=50.209 ac 0.00% Impervious Runoff Depth=1.64"
Tc=13.4 min CN=79/0 Runoff=41.50 cfs 6.879 af

Subcatchment14c{(0)}-Ex: Subcat 14c{(0)}-Ex Runoff Area=43.677 ac 1.21% Impervious Runoff Depth=1.88"
Tc=24.5 min CN=82/98 Runoff=31.30 cfs 6.856 af

Subcatchment14c{(1)}-Ex: Subcat 14c{(1)}-Ex Runoff Area=30.208 ac 1.61% Impervious Runoff Depth=1.82"
Tc=13.6 min CN=81/98 Runoff=28.06 cfs 4.570 af

Subcatchment14c{(2)}-Ex: Subcat 14c{(2)}-Ex Runoff Area=19.689 ac 0.28% Impervious Runoff Depth=1.51"
Tc=13.2 min CN=77/98 Runoff=14.62 cfs 2.478 af

Subcatchment14c{(3)}-Ex: Subcat 14c{(3)}-Ex Runoff Area=13.782 ac 0.00% Impervious Runoff Depth=1.37"
Tc=12.6 min CN=75/98 Runoff=9.18 cfs 1.577 af

Subcatchment14d-Ex: Subcat 14d-Ex Runoff Area=166.738 ac 0.91% Impervious Runoff Depth=1.73"
Tc=19.4 min CN=80/98 Runoff=122.07 cfs 24.054 af

Subcatchment14e-Ex: Subcat 14e-Ex Runoff Area=10.890 ac 6.07% Impervious Runoff Depth=0.67"
Tc=10.0 min CN=58/98 Runoff=2.10 cfs 0.605 af

Reach 6R: Un-named Creek 1c Avg. Flow Depth=2.53' Max Vel=3.44 fps Inflow=58.19 cfs 36.890 af
n=0.030 L=830.0' S=0.0032 '/' Capacity=3,940.38 cfs Outflow=56.05 cfs 36.890 af

Reach 7R: Creek XS 1b Avg. Flow Depth=1.62' Max Vel=2.92 fps Inflow=197.04 cfs 77.017 af
n=0.030 L=983.0' S=0.0059 '/' Capacity=1,505.35 cfs Outflow=193.36 cfs 77.017 af

Reach 8R: Creek 1b Avg. Flow Depth=3.02' Max Vel=3.91 fps Inflow=194.25 cfs 77.424 af
n=0.030 L=483.0' S=0.0041 '/' Capacity=4,478.97 cfs Outflow=193.04 cfs 77.424 af

Reach 17R: Reach 1d Avg. Flow Depth=0.43' Max Vel=1.99 fps Inflow=28.32 cfs 0.605 af
n=0.027 L=841.0' S=0.0110 '/' Capacity=1,276.84 cfs Outflow=19.69 cfs 0.605 af

Reach Ex Chl: RCP Dbl Arch 59x36 Outlet Avg. Flow Depth=0.93' Max Vel=3.85 fps Inflow=136.21 cfs 34.611 af
n=0.025 L=150.0' S=0.0116 '/' Capacity=3,071.94 cfs Outflow=136.16 cfs 34.611 af

Pond 1P: SD Inlet with Bypass SD Peak Elev=825.19' Inflow=35.45 cfs 8.685 af
Primary=35.45 cfs 8.685 af Secondary=0.00 cfs 0.000 af Outflow=35.45 cfs 8.685 af

Pond 2P: 60" SD MH Peak Elev=840.06' Inflow=13.65 cfs 2.186 af
Primary=13.65 cfs 2.186 af Secondary=0.00 cfs 0.000 af Outflow=13.65 cfs 2.186 af

Pond 15P: SD System 42" HDPE Peak Elev=844.40' Inflow=17.03 cfs 0.846 af
Outflow=17.03 cfs 0.846 af

Pond 16P: Dbl Conc. Arch Culvert (37x23) Peak Elev=844.30' Inflow=10.83 cfs 3.972 af
36.3" x 22.5", R=18.8"/51.0" Pipe Arch Culvert x 2.00 n=0.011 L=860.0' S=0.0024 '/' Outflow=10.83 cfs 3.972 af

Pond 17P: Gran Cielo Dwy Peak Elev=854.84' Storage=9,750 cf Inflow=122.07 cfs 24.054 af
Primary=93.38 cfs 23.448 af Secondary=0.00 cfs 0.000 af Tertiary=28.32 cfs 0.605 af Outflow=121.70 cfs 24.054 af

Pond 18P: GC-CkD1 Peak Elev=849.10' Storage=9,110 cf Inflow=152.52 cfs 34.873 af
Primary=0.64 cfs 0.017 af Secondary=12.52 cfs 0.211 af Tertiary=136.21 cfs 34.611 af Outflow=149.21 cfs 34.839 af

Pond 19P: GC-CkD2 Peak Elev=848.77' Storage=16,306 cf Inflow=27.17 cfs 2.706 af
Primary=1.16 cfs 1.345 af Secondary=18.40 cfs 1.360 af Tertiary=0.10 cfs 0.001 af Outflow=19.65 cfs 2.705 af

Pond 20P: GC-CkD3 Peak Elev=845.61' Storage=10,869 cf Inflow=26.70 cfs 4.281 af
Primary=4.72 cfs 3.046 af Secondary=3.87 cfs 0.379 af Tertiary=16.95 cfs 0.845 af Outflow=25.54 cfs 4.270 af

Pond B1: Basin 1 Peak Elev=836.34' Storage=4.294 af Inflow=61.24 cfs 10.005 af
Discarded=1.05 cfs 3.020 af Primary=13.77 cfs 6.610 af Secondary=0.00 cfs 0.000 af Outflow=14.82 cfs 9.629 af

Pond B10: Basin 10 Peak Elev=817.66' Storage=124,636 cf Inflow=27.15 cfs 5.934 af
Discarded=0.82 cfs 2.723 af Primary=3.68 cfs 2.761 af Secondary=0.00 cfs 0.000 af Outflow=4.50 cfs 5.484 af

Pond B11: Basin 11 Peak Elev=833.00' Storage=44,390 cf Inflow=16.38 cfs 2.604 af
Discarded=0.24 cfs 0.770 af Primary=3.46 cfs 1.573 af Secondary=0.00 cfs 0.000 af Outflow=3.70 cfs 2.343 af

Pond B12: Basin 12 Peak Elev=837.54' Storage=65,439 cf Inflow=21.44 cfs 3.326 af
Discarded=0.47 cfs 1.467 af Primary=2.02 cfs 1.588 af Secondary=0.00 cfs 0.000 af Outflow=2.49 cfs 3.055 af

Pond B13: Basin 13 Peak Elev=843.39' Storage=2.730 af Inflow=69.87 cfs 10.322 af
Discarded=0.44 cfs 1.321 af Primary=34.55 cfs 8.587 af Secondary=0.00 cfs 0.000 af Outflow=34.99 cfs 9.908 af

Pond B4: Basin 4 Peak Elev=838.95' Storage=111,294 cf Inflow=41.42 cfs 7.245 af
Discarded=0.54 cfs 1.630 af Primary=14.66 cfs 5.358 af Secondary=0.00 cfs 0.000 af Outflow=15.20 cfs 6.988 af

Pond B5: Basin 5 Peak Elev=847.07' Storage=55,240 cf Inflow=16.32 cfs 3.956 af
Discarded=0.38 cfs 1.188 af Primary=4.28 cfs 2.768 af Secondary=0.00 cfs 0.000 af Outflow=4.65 cfs 3.956 af

Pond B6: Basin 6 Peak Elev=851.09' Storage=1.896 af Inflow=30.64 cfs 6.310 af
Discarded=0.37 cfs 1.011 af Primary=15.84 cfs 5.009 af Secondary=0.00 cfs 0.000 af Outflow=16.21 cfs 6.019 af

Pond B7: Basin 7 Peak Elev=841.95' Storage=145,975 cf Inflow=17.05 cfs 10.954 af
Discarded=1.14 cfs 4.271 af Primary=6.98 cfs 6.584 af Secondary=0.00 cfs 0.000 af Outflow=8.12 cfs 10.855 af

Pond B8: Basin 8 Peak Elev=857.36' Storage=98,560 cf Inflow=22.23 cfs 6.012 af
Discarded=0.51 cfs 1.833 af Primary=5.93 cfs 4.179 af Secondary=0.00 cfs 0.000 af Outflow=6.44 cfs 6.012 af

Pond B9: Basin 9 Peak Elev=848.80' Storage=5,232 cf Inflow=3.86 cfs 1.080 af
Outflow=2.51 cfs 1.078 af

Pond Ex SD: Tract #1632 **Ex. 36" SD Outlet** Peak Elev=837.00' Inflow=6.98 cfs 6.584 af
36.0" Round Culvert n=0.012 L=150.0' S=0.0133 '/' Outflow=6.98 cfs 6.584 af

Pond MC Q: SD System Peak Elev=845.91' Storage=0.519 af Inflow=28.37 cfs 5.150 af
Discarded=0.11 cfs 0.368 af Primary=13.65 cfs 2.186 af Secondary=14.45 cfs 2.315 af Outflow=28.21 cfs 4.869 af

Pond SD: 42" HDPE SD Peak Elev=845.37' Inflow=10.07 cfs 6.947 af
42.0" Round Culvert n=0.012 L=840.0' S=0.0062 '/' Outflow=10.07 cfs 6.947 af

Link 1L: DS Tailwater below 77.30 cfs Inflow=6.98 cfs 6.584 af
Primary=6.98 cfs 6.584 af Secondary=0.00 cfs 0.000 af

Link 6L: To Existing Meadowlark Road Inflow=11.61 cfs 9.787 af
Primary=11.61 cfs 9.787 af

Link 10L: To Linne Road Channel Inflow=10.83 cfs 3.972 af
Primary=10.83 cfs 3.972 af

Link 11L: To Fontana Road SD Inflow=60.91 cfs 21.621 af
Primary=60.91 cfs 21.621 af

Link 15L: Sherwood/NiblickLP Xing Inflow=69.15 cfs 11.025 af
Primary=69.15 cfs 11.025 af

Link 16L: Airport & Linne Road SD Inflow=79.54 cfs 15.602 af
Primary=79.54 cfs 15.602 af

Link 22L: Linne Rd Ex Bypass Flow Inflow=17.03 cfs 0.846 af
Primary=17.03 cfs 0.846 af

Link Ck Qa: 100 Yr WSE in Creek (a) Inflow=217.34 cfs 89.563 af
Primary=217.34 cfs 89.563 af

Link Ck Qb: 100 Yr WSE in Creek (b) Inflow=15.84 cfs 5.009 af
Primary=15.84 cfs 5.009 af

Total Runoff Area = 1,810.455 ac Runoff Volume = 165.506 af Average Runoff Depth = 1.10"
90.30% Pervious = 1,634.850 ac 9.70% Impervious = 175.605 ac

Peak Elev= 845.91' @ 9.99 hrs Surf.Area= 0.126 ac Storage= 0.519 af
Flood Elev= 845.50' Surf.Area= 0.097 ac Storage= 0.474 af

Plug-Flow detention time= 151.4 min calculated for 4.869 af (95% of inflow)
Center-of-Mass det. time= 114.6 min (838.4 - 723.9)

Volume	Invert	Avail.Storage	Storage Description
#1	839.50'	0.607 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
839.50	0.081	0.000	0.000
840.00	0.081	0.040	0.040
841.00	0.081	0.081	0.121
842.00	0.081	0.081	0.202
843.00	0.081	0.081	0.283
844.00	0.081	0.081	0.364
845.00	0.061	0.071	0.434
846.00	0.133	0.097	0.531
846.50	0.172	0.076	0.607

Device	Routing	Invert	Outlet Devices
#1	Primary	841.50'	**36.0" Round Culvert** L= 585.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 841.50' / 838.50' S= 0.0051 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf
#2	Device 1	845.50'	**48.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Discarded	839.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 750.00'
#4	Secondary	845.50'	**20.0' long (Profile 4) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.77 2.97 3.21

Discarded OutFlow Max=0.11 cfs @ 9.99 hrs HW=845.91' (Free Discharge)
└**3=Exfiltration** (Controls 0.11 cfs)

Primary OutFlow Max=13.64 cfs @ 9.99 hrs HW=845.91' TW=840.06' (Dynamic Tailwater)
└**1=Culvert** (Passes 13.64 cfs of 52.64 cfs potential flow)
└**2=Orifice/Grate** (Weir Controls 13.64 cfs @ 2.09 fps)

Secondary OutFlow Max=14.44 cfs @ 9.99 hrs HW=845.91' TW=834.93' (Dynamic Tailwater)
└**4=Broad-Crested Rectangular Weir** (Weir Controls 14.44 cfs @ 1.77 fps)

Summary for Pond SD: 42" HDPE SD

Inflow Area = 77.385 ac, 33.30% Impervious, Inflow Depth = 1.08" for 10 Year event
Inflow = 10.07 cfs @ 11.57 hrs, Volume= 6.947 af
Outflow = 10.07 cfs @ 11.57 hrs, Volume= 6.947 af, Atten= 0%, Lag= 0.0 min
Primary = 10.07 cfs @ 11.57 hrs, Volume= 6.947 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 845.37' @ 11.64 hrs
Flood Elev= 853.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	844.17'	**42.0" Round Culvert** L= 840.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 844.17' / 839.00' S= 0.0062 '/' Cc= 0.900 n= 0.012, Flow Area= 9.62 sf

Primary OutFlow Max=10.06 cfs @ 11.57 hrs HW=845.37' TW=841.29' (Dynamic Tailwater)
1=Culvert (Outlet Controls 10.06 cfs @ 5.16 fps)

Summary for Link 1L: DS Tailwater

Inflow Area = 108.754 ac, 33.30% Impervious, Inflow Depth = 0.73" for 10 Year event
Inflow = 6.98 cfs @ 14.56 hrs, Volume= 6.584 af
Primary = 6.98 cfs @ 14.56 hrs, Volume= 6.584 af, Atten= 0%, Lag= 0.0 min
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Primary outflow = Inflow below 77.30 cfs, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs

Fixed water surface Elevation= 835.00'

Summary for Link 6L: To Existing Meadowlark Road

Inflow Area = 223.467 ac, 0.89% Impervious, Inflow Depth = 0.53" for 10 Year event
Inflow = 11.61 cfs @ 10.85 hrs, Volume= 9.787 af
Primary = 11.61 cfs @ 10.85 hrs, Volume= 9.787 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs

Summary for Link 10L: To Linne Road Channel

Inflow Area = 276.531 ac, 1.60% Impervious, Inflow Depth = 0.17" for 10 Year event
Inflow = 10.83 cfs @ 10.11 hrs, Volume= 3.972 af
Primary = 10.83 cfs @ 10.11 hrs, Volume= 3.972 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs

Summary for Link 11L: To Fontana Road SD

Inflow Area = 223.567 ac, 22.19% Impervious, Inflow Depth = 1.16" for 10 Year event
Inflow = 60.91 cfs @ 10.17 hrs, Volume= 21.621 af
Primary = 60.91 cfs @ 10.17 hrs, Volume= 21.621 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs

Summary for Link 15L: Sherwood/Niblick LP Xing

Inflow Area = 71.958 ac, 15.52% Impervious, Inflow Depth = 1.84" for 10 Year event
Inflow = 69.15 cfs @ 9.97 hrs, Volume= 11.025 af
Primary = 69.15 cfs @ 9.97 hrs, Volume= 11.025 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs

Summary for Link 16L: Airport & Linne Road SD

Inflow Area = 359.380 ac, 4.52% Impervious, Inflow Depth = 0.52" for 10 Year event
Inflow = 79.54 cfs @ 9.98 hrs, Volume= 15.602 af
Primary = 79.54 cfs @ 9.98 hrs, Volume= 15.602 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs

Summary for Link 22L: Linne Rd Ex Bypass Flow

Inflow = 17.03 cfs @ 10.14 hrs, Volume= 0.846 af
Primary = 17.03 cfs @ 10.14 hrs, Volume= 0.846 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs

Summary for Link Ck Qa: 100 Yr WSE in Creek (a)

Inflow Area = 895.287 ac, 7.99% Impervious, Inflow Depth = 1.20" for 10 Year event
Inflow = 217.34 cfs @ 10.35 hrs, Volume= 89.563 af
Primary = 217.34 cfs @ 10.35 hrs, Volume= 89.563 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs

Summary for Link Ck Qb: 100 Yr WSE in Creek (b)

Inflow Area = 34.039 ac, 52.56% Impervious, Inflow Depth = 1.77" for 10 Year event
Inflow = 15.84 cfs @ 10.45 hrs, Volume= 5.009 af
Primary = 15.84 cfs @ 10.45 hrs, Volume= 5.009 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs

Fixed water surface Elevation= 842.50'

Time span=0.01-60.00 hrs, dt=0.01 hrs, 6000 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=11.244 ac 58.00% Impervious Runoff Depth=2.62"
Tc=10.0 min CN=58/98 Runoff=15.92 cfs 2.453 af

Subcatchment2: Subcat 2 Runoff Area=14.644 ac 58.00% Impervious Runoff Depth=2.62"
Tc=15.8 min CN=58/98 Runoff=17.18 cfs 3.195 af

Subcatchment3: Subcat 3 Runoff Area=21.500 ac 80.00% Impervious Runoff Depth=3.43"
Tc=16.9 min CN=67/98 Runoff=33.79 cfs 6.138 af

Subcatchment3a{(1)}-Ex: Subcat 3a(1)-Ex Runoff Area=4.164 ac 0.00% Impervious Runoff Depth=0.76"
Tc=10.0 min CN=58/98 Runoff=0.93 cfs 0.263 af

Subcatchment3a{(2)}-Ex: Subcat 3a(2)-Ex Runoff Area=7.900 ac 0.00% Impervious Runoff Depth=0.92"
Tc=10.0 min CN=61/98 Runoff=2.70 cfs 0.603 af

Subcatchment3a{(3)}-Ex: Subcat 3a{(3)}-Ex Runoff Area=6.004 ac 0.00% Impervious Runoff Depth=1.40"
Tc=10.0 min CN=69/0 Runoff=4.25 cfs 0.700 af

Subcatchment3b-Ex: Subcat 3b-Ex Runoff Area=757.079 ac 0.00% Impervious Runoff Depth=0.86"
Tc=45.5 min CN=60/98 Runoff=90.77 cfs 54.384 af

Subcatchment4: Subcat 4 Runoff Area=38.712 ac 55.38% Impervious Runoff Depth=2.73"
Tc=14.2 min CN=66/98 Runoff=50.91 cfs 8.821 af

Subcatchment5: Subcat 5 Runoff Area=32.696 ac 30.34% Impervious Runoff Depth=1.84"
Tc=21.2 min CN=61/98 Runoff=21.35 cfs 5.016 af

Subcatchment6: Subcat 6 Runoff Area=34.039 ac 52.56% Impervious Runoff Depth=2.72"
Tc=20.1 min CN=68/98 Runoff=37.81 cfs 7.705 af

Subcatchment7: Subcat 7 Runoff Area=31.369 ac 33.28% Impervious Runoff Depth=1.93"
Tc=23.2 min CN=61/98 Runoff=20.76 cfs 5.047 af

Subcatchment8: Subcat 8 Runoff Area=30.487 ac 52.00% Impervious Runoff Depth=2.61"
Tc=28.8 min CN=65/98 Runoff=26.42 cfs 6.636 af

Subcatchment8a-Ex: Subcat 8a-Ex Runoff Area=14.202 ac 0.00% Impervious Runoff Depth=0.76"
Tc=16.5 min CN=58/0 Runoff=2.34 cfs 0.897 af

Subcatchment9: Subcat 9 Runoff Area=11.446 ac 17.36% Impervious Runoff Depth=1.49"
Tc=22.3 min CN=62/98 Runoff=5.46 cfs 1.422 af

Subcatchment9a-Ex: Subcat 9a-Ex Runoff Area=212.022 ac 0.00% Impervious Runoff Depth=0.76"
Tc=51.3 min CN=58/0 Runoff=18.56 cfs 13.388 af

Subcatchment10: Subcat 10 Runoff Area=30.685 ac 61.94% Impervious Runoff Depth=2.80"
Tc=22.6 min CN=61/98 Runoff=32.90 cfs 7.171 af

Subcatchment10a-Ex: Subcat 10a-Ex Runoff Area=94.105 ac 0.00% Impervious Runoff Depth=1.27"
Tc=11.0 min CN=67/0 Runoff=55.07 cfs 9.957 af

Subcatchment11: Subcat 11 Runoff Area=14.461 ac 52.00% Impervious Runoff Depth=2.64"
Tc=11.1 min CN=66/98 Runoff=20.25 cfs 3.183 af

Subcatchment12: Subcat 12 Runoff Area=17.572 ac 50.65% Impervious Runoff Depth=2.57"
Tc=10.0 min CN=65/98 Runoff=24.79 cfs 3.769 af

Subcatchment12a-Ex: Subcat 12a-Ex Runoff Area=2.629 ac 0.00% Impervious Runoff Depth=1.53"
Tc=10.0 min CN=71/0 Runoff=2.12 cfs 0.336 af

Subcatchment13: Subcat 13 Runoff Area=27.742 ac 51.11% Impervious Runoff Depth=2.68"
Tc=10.0 min CN=68/98 Runoff=41.30 cfs 6.191 af

Subcatchment13a-Ex: Subcat 13a-Ex Runoff Area=3.505 ac 0.00% Impervious Runoff Depth=1.53"
Tc=10.0 min CN=71/98 Runoff=2.83 cfs 0.448 af

Subcatchment13b-Ex: Subcat 13b-Ex Runoff Area=18.461 ac 0.00% Impervious Runoff Depth=2.37"
Tc=10.0 min CN=82/0 Runoff=26.29 cfs 3.654 af

Subcatchment13c-Ex: Subcat 13c-Ex Runoff Area=14.407 ac 0.00% Impervious Runoff Depth=2.21"
Tc=10.0 min CN=80/0 Runoff=18.80 cfs 2.651 af

Subcatchment14: Subcat 14 Runoff Area=8.669 ac 67.94% Impervious Runoff Depth=3.28"
Tc=10.0 min CN=75/98 Runoff=16.31 cfs 2.367 af

Subcatchment14a{(1)}-Ex: Subcat 14a(1)-Ex Runoff Area=13.081 ac 40.33% Impervious Runoff Depth=2.47"
Tc=10.0 min CN=70/98 Runoff=17.95 cfs 2.696 af

Subcatchment14a{(2)}-Ex: Subcat 14a{(2)}-Ex Runoff Area=2.438 ac 75.43% Impervious Runoff Depth=3.22"
Tc=10.0 min CN=61/98 Runoff=4.41 cfs 0.653 af

Subcatchment14b-Ex: Subcat 14b-Ex Runoff Area=50.209 ac 0.00% Impervious Runoff Depth=2.13"
Tc=13.4 min CN=79/0 Runoff=55.28 cfs 8.900 af

Subcatchment14c{(0)}-Ex: Subcat 14c{(0)}-Ex Runoff Area=43.677 ac 1.21% Impervious Runoff Depth=2.39"
Tc=24.5 min CN=82/98 Runoff=40.74 cfs 8.714 af

Subcatchment14c{(1)}-Ex: Subcat 14c{(1)}-Ex Runoff Area=30.208 ac 1.61% Impervious Runoff Depth=2.32"
Tc=13.6 min CN=81/98 Runoff=36.62 cfs 5.834 af

Subcatchment14c{(2)}-Ex: Subcat 14c{(2)}-Ex Runoff Area=19.689 ac 0.28% Impervious Runoff Depth=1.98"
Tc=13.2 min CN=77/98 Runoff=19.85 cfs 3.241 af

Subcatchment14c{(3)}-Ex: Subcat 14c{(3)}-Ex Runoff Area=13.782 ac 0.00% Impervious Runoff Depth=1.82"
Tc=12.6 min CN=75/98 Runoff=12.74 cfs 2.088 af

Subcatchment14d-Ex: Subcat 14d-Ex Runoff Area=166.738 ac 0.91% Impervious Runoff Depth=2.22"
Tc=19.4 min CN=80/98 Runoff=161.34 cfs 30.903 af

Subcatchment14e-Ex: Subcat 14e-Ex Runoff Area=10.890 ac 6.07% Impervious Runoff Depth=0.95"
Tc=10.0 min CN=58/98 Runoff=3.76 cfs 0.864 af

Reach 6R: Un-named Creek 1c Avg. Flow Depth=2.81' Max Vel=3.44 fps Inflow=128.40 cfs 55.983 af
n=0.030 L=830.0' S=0.0032 '/' Capacity=3,940.38 cfs Outflow=120.77 cfs 55.983 af

Reach 7R: Creek XS 1b Avg. Flow Depth=1.82' Max Vel=3.18 fps Inflow=286.07 cfs 106.177 af
n=0.030 L=983.0' S=0.0059 '/' Capacity=1,505.35 cfs Outflow=281.52 cfs 106.177 af

Reach 8R: Creek 1b Avg. Flow Depth=3.34' Max Vel=3.91 fps Inflow=283.04 cfs 106.780 af
n=0.030 L=483.0' S=0.0041 '/' Capacity=4,478.97 cfs Outflow=281.11 cfs 106.780 af

Reach 17R: Reach 1d Avg. Flow Depth=0.58' Max Vel=2.44 fps Inflow=56.21 cfs 1.599 af
n=0.027 L=841.0' S=0.0110 '/' Capacity=1,276.84 cfs Outflow=45.09 cfs 1.599 af

Reach Ex Chl: RCP Dbl Arch 59x36 Outlet Avg. Flow Depth=0.97' Max Vel=3.94 fps Inflow=149.04 cfs 43.115 af
n=0.025 L=150.0' S=0.0116 '/' Capacity=3,071.94 cfs Outflow=149.00 cfs 43.115 af

Pond 1P: SD Inlet with Bypass SD Peak Elev=825.45' Inflow=57.87 cfs 12.093 af
Primary=57.87 cfs 12.093 af Secondary=0.00 cfs 0.000 af Outflow=57.87 cfs 12.093 af

Pond 2P: 60" SD MH Peak Elev=840.22' Inflow=16.26 cfs 2.664 af
Primary=16.26 cfs 2.664 af Secondary=0.00 cfs 0.000 af Outflow=16.26 cfs 2.664 af

Pond 15P: SD System 42" HDPE Peak Elev=844.52' Inflow=36.99 cfs 1.833 af
Outflow=36.99 cfs 1.833 af

Pond 16P: Dbl Conc. Arch Culvert (37x23) Peak Elev=844.48' Inflow=15.27 cfs 4.839 af
36.3" x 22.5", R=18.8"/51.0" Pipe Arch Culvert x 2.00 n=0.011 L=860.0' S=0.0024 '/' Outflow=15.27 cfs 4.839 af

Pond 17P: Gran Cielo Dwy Peak Elev=855.00' Storage=11,009 cf Inflow=161.34 cfs 30.903 af
Primary=104.80 cfs 29.304 af Secondary=0.01 cfs 0.000 af Tertiary=56.21 cfs 1.599 af Outflow=161.03 cfs 30.903 af

Pond 18P: GC-CkD1 Peak Elev=849.52' Storage=13,468 cf Inflow=181.92 cfs 43.852 af
Primary=0.60 cfs 0.025 af Secondary=25.90 cfs 0.677 af Tertiary=149.04 cfs 43.115 af Outflow=175.31 cfs 43.818 af

Pond 19P: GC-CkD2 Peak Elev=849.11' Storage=20,913 cf Inflow=45.55 cfs 3.943 af
Primary=1.23 cfs 1.419 af Secondary=33.35 cfs 2.431 af Tertiary=5.36 cfs 0.092 af Outflow=39.95 cfs 3.942 af

Pond 20P: GC-CkD3 Peak Elev=845.79' Storage=13,254 cf Inflow=45.11 cfs 5.938 af
Primary=5.62 cfs 3.513 af Secondary=6.57 cfs 0.672 af Tertiary=31.77 cfs 1.741 af Outflow=43.97 cfs 5.927 af

Pond B1: Basin 1 Peak Elev=837.00' Storage=5.171 af Inflow=93.80 cfs 12.965 af
Discarded=1.09 cfs 3.116 af Primary=29.18 cfs 9.465 af Secondary=0.00 cfs 0.000 af Outflow=30.26 cfs 12.581 af

Pond B10: Basin 10 Peak Elev=817.99' Storage=139,204 cf Inflow=32.90 cfs 7.171 af
Discarded=0.84 cfs 2.797 af Primary=6.57 cfs 3.913 af Secondary=0.00 cfs 0.000 af Outflow=7.40 cfs 6.710 af

Pond B11: Basin 11 Peak Elev=833.60' Storage=51,986 cf Inflow=20.25 cfs 3.183 af
Discarded=0.26 cfs 0.785 af Primary=5.24 cfs 2.136 af Secondary=0.00 cfs 0.000 af Outflow=5.50 cfs 2.921 af

Pond B12: Basin 12 Peak Elev=838.07' Storage=78,816 cf Inflow=26.91 cfs 4.105 af
Discarded=0.49 cfs 1.514 af Primary=2.71 cfs 2.317 af Secondary=0.00 cfs 0.000 af Outflow=3.20 cfs 3.831 af

Pond B13: Basin 13 Peak Elev=843.86' Storage=2.981 af Inflow=89.20 cfs 12.943 af
Discarded=0.46 cfs 1.355 af Primary=62.05 cfs 11.167 af Secondary=0.00 cfs 0.000 af Outflow=62.52 cfs 12.522 af

Pond B4: Basin 4 Peak Elev=839.49' Storage=126,212 cf Inflow=50.91 cfs 8.821 af
Discarded=0.57 cfs 1.674 af Primary=19.48 cfs 6.886 af Secondary=0.00 cfs 0.000 af Outflow=20.05 cfs 8.559 af

Pond B5: Basin 5 Peak Elev=847.51' Storage=64,298 cf Inflow=21.35 cfs 5.016 af
Discarded=0.39 cfs 1.221 af Primary=7.13 cfs 3.796 af Secondary=0.00 cfs 0.000 af Outflow=7.52 cfs 5.016 af

Pond B6: Basin 6 Peak Elev=851.40' Storage=2.036 af Inflow=37.81 cfs 7.705 af
Discarded=0.38 cfs 1.034 af Primary=23.43 cfs 6.379 af Secondary=0.00 cfs 0.000 af Outflow=23.80 cfs 7.412 af

Pond B7: Basin 7 Peak Elev=842.46' Storage=178,348 cf Inflow=28.12 cfs 14.500 af
Discarded=1.20 cfs 4.392 af Primary=11.90 cfs 9.989 af Secondary=0.00 cfs 0.000 af Outflow=13.10 cfs 14.381 af

Pond B8: Basin 8 Peak Elev=857.57' Storage=104,516 cf Inflow=28.75 cfs 7.533 af
Discarded=0.53 cfs 1.876 af Primary=12.49 cfs 5.657 af Secondary=0.00 cfs 0.000 af Outflow=13.01 cfs 7.533 af

Pond B9: Basin 9 Peak Elev=849.00' Storage=6,676 cf Inflow=5.46 cfs 1.422 af
Outflow=3.56 cfs 1.421 af

Pond Ex SD: Tract #1632 **Ex. 36" SD Outlet** Peak Elev=837.33' Inflow=11.90 cfs 9.989 af
36.0" Round Culvert n=0.012 L=150.0' S=0.0133 '/' Outflow=11.90 cfs 9.989 af

Pond MC Q: SD System Peak Elev=845.96' Storage=0.526 af Inflow=33.79 cfs 6.138 af
Discarded=0.12 cfs 0.372 af Primary=16.26 cfs 2.664 af Secondary=17.22 cfs 2.821 af Outflow=33.60 cfs 5.857 af

Pond SD: 42" HDPE SD Peak Elev=845.86' Inflow=19.61 cfs 9.453 af
42.0" Round Culvert n=0.012 L=840.0' S=0.0062 '/' Outflow=19.61 cfs 9.453 af

Link 1L: DS Tailwater below 77.30 cfs Inflow=11.90 cfs 9.989 af
Primary=11.90 cfs 9.989 af Secondary=0.00 cfs 0.000 af

Link 6L: To Existing Meadowlark Road Inflow=22.10 cfs 14.809 af
Primary=22.10 cfs 14.809 af

Link 10L: To Linne Road Channel Inflow=15.27 cfs 4.839 af
Primary=15.27 cfs 4.839 af

Link 11L: To Fontana Road SD Inflow=111.64 cfs 29.489 af
Primary=111.64 cfs 29.489 af

Link 15L: Sherwood/NiblickLP Xing Inflow=89.39 cfs 13.962 af
Primary=89.39 cfs 13.962 af

Link 16L: Airport & Linne Road SD Inflow=106.29 cfs 19.666 af
Primary=106.29 cfs 19.666 af

Link 22L: Linne Rd Ex Bypass Flow Inflow=36.99 cfs 1.833 af
Primary=36.99 cfs 1.833 af

Link Ck Qa: 100 Yr WSE in Creek (a) Inflow=327.08 cfs 123.393 af
Primary=327.08 cfs 123.393 af

Link Ck Qb: 100 Yr WSE in Creek (b) Inflow=23.43 cfs 6.379 af
Primary=23.43 cfs 6.379 af

Total Runoff Area = 1,810.455 ac Runoff Volume = 220.287 af Average Runoff Depth = 1.46"
90.30% Pervious = 1,634.850 ac 9.70% Impervious = 175.605 ac

Pond 1P: SD Inlet with Bypass SD Peak Elev=825.62' Inflow=73.26 cfs 14.523 af
Primary=73.26 cfs 14.523 af Secondary=0.00 cfs 0.000 af Outflow=73.26 cfs 14.523 af

Pond 2P: 60" SD MH Peak Elev=840.33' Inflow=18.03 cfs 2.986 af
Primary=18.03 cfs 2.986 af Secondary=0.00 cfs 0.000 af Outflow=18.03 cfs 2.986 af

Pond 15P: SD System 42" HDPE Peak Elev=844.59' Inflow=51.10 cfs 2.683 af
Outflow=51.10 cfs 2.683 af

Pond 16P: Dbl Conc. Arch Culvert (37x23) Peak Elev=844.57' Inflow=17.74 cfs 5.377 af
36.3" x 22.5", R=18.8"/51.0" Pipe Arch Culvert x 2.00 n=0.011 L=860.0' S=0.0024 '/' Outflow=17.74 cfs 5.377 af

Pond 17P: Gran Cielo Dwy Peak Elev=855.09' Storage=11,735 cf Inflow=188.40 cfs 35.620 af
Primary=111.11 cfs 33.164 af Secondary=0.18 cfs 0.002 af Tertiary=76.79 cfs 2.454 af Outflow=188.08 cfs 35.620 af

Pond 18P: GC-CkD1 Peak Elev=849.76' Storage=16,732 cf Inflow=200.71 cfs 49.854 af
Primary=0.59 cfs 0.031 af Secondary=35.96 cfs 1.101 af Tertiary=156.05 cfs 48.688 af Outflow=192.48 cfs 49.820 af

Pond 19P: GC-CkD2 Peak Elev=849.25' Storage=23,653 cf Inflow=58.68 cfs 4.902 af
Primary=1.27 cfs 1.460 af Secondary=41.32 cfs 3.201 af Tertiary=10.96 cfs 0.240 af Outflow=53.55 cfs 4.901 af

Pond 20P: GC-CkD3 Peak Elev=845.88' Storage=14,445 cf Inflow=55.32 cfs 7.106 af
Primary=6.01 cfs 3.774 af Secondary=8.13 cfs 0.878 af Tertiary=40.20 cfs 2.444 af Outflow=54.35 cfs 7.095 af

Pond B1: Basin 1 Peak Elev=837.56' Storage=5.949 af Inflow=115.89 cfs 15.158 af
Discarded=1.12 cfs 3.177 af Primary=35.49 cfs 11.591 af Secondary=0.00 cfs 0.000 af Outflow=36.61 cfs 14.768 af

Pond B10: Basin 10 Peak Elev=818.15' Storage=146,516 cf Inflow=36.90 cfs 8.017 af
Discarded=0.85 cfs 2.841 af Primary=9.72 cfs 4.707 af Secondary=0.00 cfs 0.000 af Outflow=10.57 cfs 7.548 af

Pond B11: Basin 11 Peak Elev=833.87' Storage=55,671 cf Inflow=22.92 cfs 3.580 af
Discarded=0.27 cfs 0.793 af Primary=7.55 cfs 2.524 af Secondary=0.00 cfs 0.000 af Outflow=7.82 cfs 3.317 af

Pond B12: Basin 12 Peak Elev=838.38' Storage=87,046 cf Inflow=30.70 cfs 4.642 af
Discarded=0.51 cfs 1.546 af Primary=3.48 cfs 2.819 af Secondary=0.00 cfs 0.000 af Outflow=3.99 cfs 4.365 af

Pond B13: Basin 13 Peak Elev=844.03' Storage=3.076 af Inflow=102.50 cfs 14.744 af
Discarded=0.47 cfs 1.375 af Primary=84.13 cfs 12.945 af Secondary=0.00 cfs 0.000 af Outflow=84.60 cfs 14.320 af

Pond B4: Basin 4 Peak Elev=839.85' Storage=136,770 cf Inflow=57.43 cfs 9.900 af
Discarded=0.59 cfs 1.698 af Primary=23.63 cfs 7.938 af Secondary=0.00 cfs 0.000 af Outflow=24.21 cfs 9.636 af

Pond B5: Basin 5 Peak Elev=847.79' Storage=70,408 cf Inflow=25.03 cfs 5.762 af
Discarded=0.41 cfs 1.238 af Primary=9.31 cfs 4.524 af Secondary=0.00 cfs 0.000 af Outflow=9.72 cfs 5.762 af

Pond B6: Basin 6 Peak Elev=851.60' Storage=2.127 af Inflow=42.75 cfs 8.660 af
Discarded=0.38 cfs 1.047 af Primary=27.62 cfs 7.319 af Secondary=0.00 cfs 0.000 af Outflow=28.00 cfs 8.366 af

Pond B7: Basin 7 Peak Elev=842.80' Storage=200,494 cf Inflow=38.88 cfs 16.997 af
Discarded=1.23 cfs 4.463 af Primary=16.23 cfs 12.404 af Secondary=0.00 cfs 0.000 af Outflow=17.47 cfs 16.867 af

Pond B8: Basin 8 Peak Elev=857.70' Storage=108,148 cf Inflow=33.51 cfs 8.595 af
Discarded=0.53 cfs 1.899 af Primary=17.63 cfs 6.696 af Secondary=0.00 cfs 0.000 af Outflow=18.16 cfs 8.596 af

Pond B9: Basin 9 Peak Elev=849.15' Storage=7,800 cf Inflow=6.65 cfs 1.667 af
Outflow=4.29 cfs 1.665 af

Pond Ex SD: Tract #1632 Ex. 36" SD Outlet Peak Elev=837.58' Inflow=16.23 cfs 12.404 af
36.0" Round Culvert n=0.012 L=150.0' S=0.0133 '/' Outflow=16.23 cfs 12.404 af

Pond MC Q: SD System Peak Elev=845.99' Storage=0.530 af Inflow=37.43 cfs 6.803 af
Discarded=0.12 cfs 0.374 af Primary=18.03 cfs 2.986 af Secondary=19.09 cfs 3.162 af Outflow=37.24 cfs 6.522 af

Pond SD: 42" HDPE SD Peak Elev=846.18' Inflow=26.80 cfs 11.220 af
42.0" Round Culvert n=0.012 L=840.0' S=0.0062 '/' Outflow=26.80 cfs 11.220 af

Link 1L: DS Tailwater below 77.30 cfs Inflow=16.23 cfs 12.404 af
Primary=16.23 cfs 12.404 af Secondary=0.00 cfs 0.000 af

Link 6L: To Existing Meadowlark Road Inflow=31.00 cfs 18.552 af
Primary=31.00 cfs 18.552 af

Link 10L: To Linne Road Channel Inflow=17.74 cfs 5.377 af
Primary=17.74 cfs 5.377 af

Link 11L: To Fontana Road SD Inflow=154.03 cfs 34.994 af
Primary=154.03 cfs 34.994 af

Link 15L: Sherwood/NiblickLP Xing Inflow=103.34 cfs 15.984 af
Primary=103.34 cfs 15.984 af

Link 16L: Airport & Linne Road SD Inflow=124.53 cfs 22.416 af
Primary=124.53 cfs 22.416 af

Link 22L: Linne Rd Ex Bypass Flow Inflow=51.10 cfs 2.683 af
Primary=51.10 cfs 2.683 af

Link Ck Qa: 100 Yr WSE in Creek (a) Inflow=403.95 cfs 147.682 af
Primary=403.95 cfs 147.682 af

Link Ck Qb: 100 Yr WSE in Creek (b) Inflow=27.62 cfs 7.319 af
Primary=27.62 cfs 7.319 af

Total Runoff Area = 1,810.455 ac Runoff Volume = 259.341 af Average Runoff Depth = 1.72"
90.30% Pervious = 1,634.850 ac 9.70% Impervious = 175.605 ac

Time span=0.01-60.00 hrs, dt=0.01 hrs, 6000 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1: Subcat 1 Runoff Area=11.244 ac 58.00% Impervious Runoff Depth=3.33"
Tc=10.0 min CN=58/98 Runoff=20.49 cfs 3.125 af

Subcatchment2: Subcat 2 Runoff Area=14.644 ac 58.00% Impervious Runoff Depth=3.33"
Tc=15.8 min CN=58/98 Runoff=22.09 cfs 4.070 af

Subcatchment3: Subcat 3 Runoff Area=21.500 ac 80.00% Impervious Runoff Depth=4.27"
Tc=16.9 min CN=67/98 Runoff=42.04 cfs 7.642 af

Subcatchment3a{(1)}-Ex: Subcat 3a(1)-Ex Runoff Area=4.164 ac 0.00% Impervious Runoff Depth=1.22"
Tc=10.0 min CN=58/98 Runoff=2.08 cfs 0.425 af

Subcatchment3a{(2)}-Ex: Subcat 3a(2)-Ex Runoff Area=7.900 ac 0.00% Impervious Runoff Depth=1.43"
Tc=10.0 min CN=61/98 Runoff=5.19 cfs 0.941 af

Subcatchment3a{(3)}-Ex: Subcat 3a{(3)}-Ex Runoff Area=6.004 ac 0.00% Impervious Runoff Depth=2.03"
Tc=10.0 min CN=69/0 Runoff=6.65 cfs 1.016 af

Subcatchment3b-Ex: Subcat 3b-Ex Runoff Area=757.079 ac 0.00% Impervious Runoff Depth=1.36"
Tc=45.5 min CN=60/98 Runoff=178.44 cfs 85.793 af

Subcatchment4: Subcat 4 Runoff Area=38.712 ac 55.38% Impervious Runoff Depth=3.49"
Tc=14.2 min CN=66/98 Runoff=65.77 cfs 11.274 af

Subcatchment5: Subcat 5 Runoff Area=32.696 ac 30.34% Impervious Runoff Depth=2.47"
Tc=21.2 min CN=61/98 Runoff=29.91 cfs 6.733 af

Subcatchment6: Subcat 6 Runoff Area=34.039 ac 52.56% Impervious Runoff Depth=3.48"
Tc=20.1 min CN=68/98 Runoff=49.06 cfs 9.876 af

Subcatchment7: Subcat 7 Runoff Area=31.369 ac 33.28% Impervious Runoff Depth=2.57"
Tc=23.2 min CN=61/98 Runoff=28.70 cfs 6.724 af

Subcatchment8: Subcat 8 Runoff Area=30.487 ac 52.00% Impervious Runoff Depth=3.35"
Tc=28.8 min CN=65/98 Runoff=34.41 cfs 8.523 af

Subcatchment8a-Ex: Subcat 8a-Ex Runoff Area=14.202 ac 0.00% Impervious Runoff Depth=1.22"
Tc=16.5 min CN=58/0 Runoff=5.42 cfs 1.449 af

Subcatchment9: Subcat 9 Runoff Area=11.446 ac 17.36% Impervious Runoff Depth=2.08"
Tc=22.3 min CN=62/98 Runoff=8.24 cfs 1.988 af

Subcatchment9a-Ex: Subcat 9a-Ex Runoff Area=212.022 ac 0.00% Impervious Runoff Depth=1.22"
Tc=51.3 min CN=58/0 Runoff=38.64 cfs 21.629 af

Subcatchment10: Subcat 10 Runoff Area=30.685 ac 61.94% Impervious Runoff Depth=3.56"
Tc=22.6 min CN=61/98 Runoff=42.03 cfs 9.094 af

Subcatchment10a-Ex: Subcat 10a-Ex Runoff Area=94.105 ac 0.00% Impervious Runoff Depth=1.87"
Tc=11.0 min CN=67/0 Runoff=89.48 cfs 14.688 af

Subcatchment11: Subcat 11 Runoff Area=14.461 ac 52.00% Impervious Runoff Depth=3.39"
Tc=11.1 min CN=66/98 Runoff=26.34 cfs 4.086 af

Subcatchment12: Subcat 12 Runoff Area=17.572 ac 50.65% Impervious Runoff Depth=3.31"
Tc=10.0 min CN=65/98 Runoff=32.36 cfs 4.850 af

Subcatchment12a-Ex: Subcat 12a-Ex Runoff Area=2.629 ac 0.00% Impervious Runoff Depth=2.19"
Tc=10.0 min CN=71/0 Runoff=3.23 cfs 0.480 af

Subcatchment13: Subcat 13 Runoff Area=27.742 ac 51.11% Impervious Runoff Depth=3.44"
Tc=10.0 min CN=68/98 Runoff=53.68 cfs 7.951 af

Subcatchment13a-Ex: Subcat 13a-Ex Runoff Area=3.505 ac 0.00% Impervious Runoff Depth=2.19"
Tc=10.0 min CN=71/98 Runoff=4.30 cfs 0.640 af

Subcatchment13b-Ex: Subcat 13b-Ex Runoff Area=18.461 ac 0.00% Impervious Runoff Depth=3.17"
Tc=10.0 min CN=82/0 Runoff=35.59 cfs 4.875 af

Subcatchment13c-Ex: Subcat 13c-Ex Runoff Area=14.407 ac 0.00% Impervious Runoff Depth=2.98"
Tc=10.0 min CN=80/0 Runoff=25.89 cfs 3.578 af

Subcatchment14: Subcat 14 Runoff Area=8.669 ac 67.94% Impervious Runoff Depth=4.12"
Tc=10.0 min CN=75/98 Runoff=20.52 cfs 2.973 af

Subcatchment14a{(1)}-Ex: Subcat 14a(1)-Ex Runoff Area=13.081 ac 40.33% Impervious Runoff Depth=3.22"
Tc=10.0 min CN=70/98 Runoff=23.79 cfs 3.511 af

Subcatchment14a{(2)}-Ex: Subcat 14a{(2)}-Ex Runoff Area=2.438 ac 75.43% Impervious Runoff Depth=4.02"
Tc=10.0 min CN=61/98 Runoff=5.52 cfs 0.817 af

Subcatchment14b-Ex: Subcat 14b-Ex Runoff Area=50.209 ac 0.00% Impervious Runoff Depth=2.89"
Tc=13.4 min CN=79/0 Runoff=77.01 cfs 12.083 af

Subcatchment14c{(0)}-Ex: Subcat 14c{(0)}-Ex Runoff Area=43.677 ac 1.21% Impervious Runoff Depth=3.19"
Tc=24.5 min CN=82/98 Runoff=55.41 cfs 11.607 af

Subcatchment14c{(1)}-Ex: Subcat 14c{(1)}-Ex Runoff Area=30.208 ac 1.61% Impervious Runoff Depth=3.10"
Tc=13.6 min CN=81/98 Runoff=49.95 cfs 7.810 af

Subcatchment14c{(2)}-Ex: Subcat 14c{(2)}-Ex Runoff Area=19.689 ac 0.28% Impervious Runoff Depth=2.71"
Tc=13.2 min CN=77/98 Runoff=28.16 cfs 4.451 af

Subcatchment14c{(3)}-Ex: Subcat 14c{(3)}-Ex Runoff Area=13.782 ac 0.00% Impervious Runoff Depth=2.53"
Tc=12.6 min CN=75/98 Runoff=18.46 cfs 2.906 af

Subcatchment14d-Ex: Subcat 14d-Ex Runoff Area=166.738 ac 0.91% Impervious Runoff Depth=3.00"
Tc=19.4 min CN=80/98 Runoff=222.96 cfs 41.649 af

Subcatchment14e-Ex: Subcat 14e-Ex Runoff Area=10.890 ac 6.07% Impervious Runoff Depth=1.44"
Tc=10.0 min CN=58/98 Runoff=6.93 cfs 1.311 af

Reach 6R: Un-named Creek 1c Avg. Flow Depth=3.35' Max Vel=3.44 fps Inflow=265.18 cfs 89.498 af
n=0.030 L=830.0' S=0.0032 '/' Capacity=3,940.38 cfs Outflow=248.04 cfs 89.498 af

Reach 7R: Creek XS 1b Avg. Flow Depth=2.09' Max Vel=3.58 fps Inflow=440.34 cfs 154.593 af
n=0.030 L=983.0' S=0.0059 '/' Capacity=1,505.35 cfs Outflow=434.74 cfs 154.593 af

Reach 8R: Creek 1b Avg. Flow Depth=3.91' Max Vel=3.91 fps Inflow=437.48 cfs 155.534 af
n=0.030 L=483.0' S=0.0041 '/' Capacity=4,478.97 cfs Outflow=434.10 cfs 155.534 af

Reach 17R: Reach 1d Avg. Flow Depth=0.74' Max Vel=2.90 fps Inflow=103.94 cfs 3.705 af
n=0.027 L=841.0' S=0.0110 '/' Capacity=1,276.84 cfs Outflow=90.36 cfs 3.705 af

Reach Ex Chl: RCP Dbl Arch 59x36 Outlet Avg. Flow Depth=1.00' Max Vel=4.03 fps Inflow=163.56 cfs 55.561 af
n=0.025 L=150.0' S=0.0116 '/' Capacity=3,071.94 cfs Outflow=163.52 cfs 55.561 af

Pond 1P: SD Inlet with Bypass SD Peak Elev=825.82' Inflow=93.81 cfs 17.708 af
Primary=93.81 cfs 17.708 af Secondary=0.00 cfs 0.000 af Outflow=93.81 cfs 17.708 af

Pond 2P: 60" SD MH Peak Elev=840.46' Inflow=20.20 cfs 3.392 af
Primary=20.20 cfs 3.392 af Secondary=0.00 cfs 0.000 af Outflow=20.20 cfs 3.392 af

Pond 15P: SD System 42" HDPE Peak Elev=844.66' Inflow=68.70 cfs 3.916 af
Outflow=68.70 cfs 3.916 af

Pond 16P: Dbl Conc. Arch Culvert (37x23) Peak Elev=844.69' Inflow=20.76 cfs 6.013 af
36.3" x 22.5", R=18.8"/51.0" Pipe Arch Culvert x 2.00 n=0.011 L=860.0' S=0.0024 '/' Outflow=20.76 cfs 6.013 af

Pond 17P: Gran Cielo Dwy Peak Elev=855.19' Storage=12,570 cf Inflow=222.96 cfs 41.649 af
Primary=118.06 cfs 37.935 af Secondary=0.66 cfs 0.009 af Tertiary=103.94 cfs 3.705 af Outflow=222.66 cfs 41.649 af

Pond 18P: GC-CkD1 Peak Elev=850.03' Storage=21,023 cf Inflow=223.80 cfs 57.362 af
Primary=0.62 cfs 0.037 af Secondary=49.36 cfs 1.730 af Tertiary=163.56 cfs 55.561 af Outflow=213.46 cfs 57.328 af

Pond 19P: GC-CkD2 Peak Elev=849.41' Storage=27,160 cf Inflow=76.40 cfs 6.218 af
Primary=1.30 cfs 1.510 af Secondary=50.40 cfs 4.202 af Tertiary=18.98 cfs 0.506 af Outflow=70.68 cfs 6.217 af

Pond 20P: GC-CkD3 Peak Elev=845.96' Storage=15,712 cf Inflow=67.10 cfs 8.618 af
Primary=6.37 cfs 4.056 af Secondary=10.21 cfs 1.141 af Tertiary=49.73 cfs 3.410 af Outflow=66.32 cfs 8.607 af

Pond B1: Basin 1 Peak Elev=838.35' Storage=7.075 af Inflow=143.08 cfs 18.094 af
Discarded=1.18 cfs 3.251 af Primary=42.68 cfs 14.446 af Secondary=0.00 cfs 0.000 af Outflow=43.86 cfs 17.698 af

Pond B10: Basin 10 Peak Elev=818.33' Storage=154,822 cf Inflow=42.03 cfs 9.094 af
Discarded=0.86 cfs 2.890 af Primary=14.28 cfs 5.727 af Secondary=0.00 cfs 0.000 af Outflow=15.14 cfs 8.617 af

Pond B11: Basin 11 Peak Elev=834.16' Storage=59,695 cf Inflow=26.34 cfs 4.086 af
Discarded=0.28 cfs 0.803 af Primary=10.23 cfs 3.020 af Secondary=0.00 cfs 0.000 af Outflow=10.51 cfs 3.823 af

Pond B12: Basin 12 Peak Elev=838.70' Storage=95,925 cf Inflow=35.58 cfs 5.330 af
Discarded=0.53 cfs 1.585 af Primary=5.12 cfs 3.464 af Secondary=0.00 cfs 0.000 af Outflow=5.64 cfs 5.049 af

Pond B13: Basin 13 Peak Elev=844.19' Storage=3.165 af Inflow=119.46 cfs 17.044 af
Discarded=0.48 cfs 1.396 af Primary=108.10 cfs 15.220 af Secondary=0.00 cfs 0.000 af Outflow=108.58 cfs 16.616 af

Pond B4: Basin 4 Peak Elev=840.12' Storage=144,637 cf Inflow=65.77 cfs 11.274 af
Discarded=0.60 cfs 1.723 af Primary=34.06 cfs 9.285 af Secondary=0.00 cfs 0.000 af Outflow=34.66 cfs 11.007 af

Pond B5: Basin 5 Peak Elev=848.15' Storage=78,258 cf Inflow=29.91 cfs 6.733 af
Discarded=0.42 cfs 1.257 af Primary=12.28 cfs 5.476 af Secondary=0.00 cfs 0.000 af Outflow=12.70 cfs 6.733 af

Pond B6: Basin 6 Peak Elev=851.88' Storage=2.255 af Inflow=49.06 cfs 9.876 af
Discarded=0.39 cfs 1.062 af Primary=32.02 cfs 8.518 af Secondary=0.00 cfs 0.000 af Outflow=32.41 cfs 9.581 af

Pond B7: Basin 7 Peak Elev=843.21' Storage=227,792 cf Inflow=53.39 cfs 20.246 af
Discarded=1.28 cfs 4.541 af Primary=22.91 cfs 15.562 af Secondary=0.00 cfs 0.000 af Outflow=24.18 cfs 20.103 af

Pond B8: Basin 8 Peak Elev=857.85' Storage=112,464 cf Inflow=39.82 cfs 9.971 af
Discarded=0.54 cfs 1.926 af Primary=24.66 cfs 8.046 af Secondary=0.00 cfs 0.000 af Outflow=25.20 cfs 9.971 af

Pond B9: Basin 9 Peak Elev=849.37' Storage=9,543 cf Inflow=8.24 cfs 1.988 af
Outflow=5.10 cfs 1.986 af

Pond Ex SD: Tract #1632 **Ex. 36" SD Outlet** Peak Elev=837.94' Inflow=22.91 cfs 15.562 af
36.0" Round Culvert n=0.012 L=150.0' S=0.0133 '/' Outflow=22.91 cfs 15.562 af

Pond MC Q: SD System Peak Elev=846.03' Storage=0.535 af Inflow=42.04 cfs 7.642 af
Discarded=0.12 cfs 0.377 af Primary=20.20 cfs 3.392 af Secondary=21.51 cfs 3.592 af Outflow=41.83 cfs 7.360 af

Pond SD: 42" HDPE SD Peak Elev=846.57' Inflow=36.40 cfs 13.522 af
42.0" Round Culvert n=0.012 L=840.0' S=0.0062 '/' Outflow=36.40 cfs 13.522 af

Link 1L: DS Tailwater below 77.30 cfs Inflow=22.91 cfs 15.562 af
Primary=22.91 cfs 15.562 af Secondary=0.00 cfs 0.000 af

Link 6L: To Existing Meadowlark Road Inflow=43.71 cfs 23.616 af
Primary=43.71 cfs 23.616 af

Link 10L: To Linne Road Channel Inflow=20.76 cfs 6.013 af
Primary=20.76 cfs 6.013 af

Link 11L: To Fontana Road SD Inflow=203.22 cfs 42.120 af
Primary=203.22 cfs 42.120 af

Link 15L: Sherwood/NiblickLP Xing Inflow=121.15 cfs 18.567 af
Primary=121.15 cfs 18.567 af

Link 16L: Airport & Linne Road SD Inflow=147.31 cfs 25.891 af
Primary=147.31 cfs 25.891 af

Link 22L: Linne Rd Ex Bypass Flow Inflow=68.70 cfs 3.916 af
Primary=68.70 cfs 3.916 af

Link Ck Qa: 100 Yr WSE in Creek (a) Inflow=508.94 cfs 179.690 af
Primary=508.94 cfs 179.690 af

Link Ck Qb: 100 Yr WSE in Creek (b) Inflow=32.02 cfs 8.518 af
Primary=32.02 cfs 8.518 af

Total Runoff Area = 1,810.455 ac Runoff Volume = 310.568 af Average Runoff Depth = 2.06"
90.30% Pervious = 1,634.850 ac 9.70% Impervious = 175.605 ac

Reso A - Exhibit C2 (EIR Technical Appendix)

OLSEN-CHANDLER RANCH TENTATIVE TRACT MAP

PRELIMINARY DETENTION BASIN SUMMARY
95th Percentile Storm Event
Proposed Conditions

Node Type	Node Number	Node Name	Rainfall Depth (inches)	Inflow Peak (cfs)	Inflow Peak Time (hours)	Inflow Volume (acre-feet)	Inflow Area (acres)	Imperv. Inflow Area (%)	Inflow Depth (inches)	Discarded Outflow Peak (cfs)	Discarded Outflow Peak Time (hours)	Discarded Outflow Volume (AF)	Primary Routing	Primary Outflow Peak (cfs)	Primary Outflow Peak Time (hours)	Primary Outflow Volume (acre-feet)	Secondary Routing	Secondary Outflow Peak (cfs)	Secondary Outflow Peak Time (hours)	Secondary Outflow Volume (AF)	Tertiary Routing	Tertiary Outflow Peak (cfs)	Outflow Total Peak (cfs)	Peak Elevation (feet)	Peak Elevation Time (hours)	Peak Storage (acre-feet)	Top Elevation (feet)	Top Storage (acre-feet)
Pond	1P	SD Inlet with Bypass SD	1.4	0.33	19.74	0.253	108.566	6.93	0.03	0	0	0	11L	0.33	19.74	0.253	11L	0	0.01	0		0	0.33	824.53	19.74	0	0	0
Pond	2P	60" SD MH	1.4	4.12	10.06	0.523	21.5	80	0.29	0	0	0	B1	4.12	10.06	0.523	B1	0	0.01	0		0	4.12	839.33	10.06	0	0	0
Pond	15P	SD System 42" HDPE	1.4	0	0.01	0	0	0	0	0	0	0	B1	0	0.01	0		0	0	0		0	0	844.17	0.85	0	0	0
Pond	16P	Dbl Conc. Arch Culvert (37x23)	1.4	1.31	9.96	0.604	276.531	1.6	0.03	0	0	0	10L	1.31	9.96	0.604		0	0	0		0	1.31	843.78	9.96	0	0	0
Pond	17P	Gran Cielo Dwy	1.4	7.71	10.01	3.43	166.738	0.91	0.25	0	0	0	18P	7.55	10.08	3.43	18P	0	0.01	0	17R	0	7.55	853.35	10.08	0.023	856.14	0.511
Pond	18P	GC-CkD1	1.4	12.48	10.05	5.237	240.622	1.05	0.26	0	0	0	19P	0	0.01	0	19P	0	0.01	0	Ex Chl	12.48	12.48	847.34	10.06	0.047	852	1.614
Pond	19P	GC-CkD2	1.4	0.41	10.32	0.284	260.311	0.99	0.01	0	0	0	20P	0.32	11.62	0.282	20P	0	0.01	0	22L	0	0.32	846.55	11.62	0.017	850	1.066
Pond	20P	GC-CkD3	1.4	0.48	11.78	0.434	274.094	0.94	0.02	0	0	0	16P	0.45	13.17	0.423	16P	0	0.01	0	22L	0	0.45	844.59	13.17	0.045	846.5	0.565
Pond	B1	Basin 1	1.4	16.44	10.05	2.556	47.388	67.98	0.65	0.91	19.68	2.283	Ck Qa	0	0.01	0	Ck Qa	0	0.01	0		0	0.91	834.16	19.68	1.559	839.35	8.595
Pond	B10	Basin 10	1.4	9.47	9.98	1.874	30.685	61.94	0.73	0.67	18.17	1.652	11L	0	0.01	0	11L	0	0.01	0		0	0.67	815.9	18.17	1.153	820	5.425
Pond	B11	Basin 11	1.4	5.17	9.96	0.755	14.461	52	0.63	0.17	23.18	0.564	1P	0	0.01	0	1P	0	0.01	0		0	0.17	830.96	23.18	0.527	836	2.037
Pond	B12	Basin 12	1.4	6.36	9.96	0.906	20.201	44.06	0.54	0.31	19.49	0.743	11L	0	0.01	0	11L	0	0.01	0		0	0.31	835.66	19.49	0.549	841	3.803
Pond	B13	Basin 13	1.4	12.88	9.97	2.2	64.115	22.11	0.41	0.31	15.55	1.142	11L	0.91	15.55	0.674	11L	0	0.01	0		0	1.22	839.94	15.55	1.188	846	4.267
Pond	B4	Basin 4	1.4	13.34	9.97	2.147	38.712	55.38	0.67	0.4	13.17	1.228	Ck Qa	0.88	13.17	0.709	Ck Qa	0	0.01	0		0	1.28	836.28	13.17	1.122	842.5	5.149
Pond	B5	Basin 5	1.4	5.11	9.98	0.981	32.696	30.34	0.36	0.31	13.76	0.788	SD	0.22	13.76	0.193		0	0.01	0		0	0.53	845.12	13.76	0.421	852	4.099
Pond	B6	Basin 6	1.4	9.46	9.98	1.817	34.039	52.56	0.64	0.26	13.68	0.849	Ck Qb	0.75	13.68	0.707	Ck Qb	0	0.01	0		0	1.01	848.49	13.68	0.958	854.4	3.598
Pond	B7	Basin 7	1.4	5.13	9.98	1.67	108.754	33.3	0.18	0.84	18.68	1.67	Ex SD	0	0.01	0		0	0.01	0		0	0.84	839.85	18.68	0.559	847	11.849
Pond	B8	Basin 8	1.4	6.93	9.99	1.584	44.689	35.47	0.43	0.38	15.34	1.139	SD	0.32	15.34	0.445		0	0.01	0		0	0.7	854.68	15.34	0.751	859	3.387
Pond	B9	Basin 9	1.4	1	9.98	0.199	11.446	17.36	0.21	0	0	0	6L	0.51	10.5	0.198		0	0	0		0	0.51	848.33	10.5	0.047	853	1.119
Pond	Ex SD	Tract #1632 Ex. 36" SD Outlet	1.4	0	0.01	0	108.754	33.3	0	0	0	0	1L	0	0.01	0		0	0	0		0	0	836	0.01	0	0	0
Pond	MC Q	SD System	1.4	9.89	9.97	1.705	21.5	80	0.95	0.1	10.06	0.348	2P	4.12	10.06	0.523	B1	4.36	10.06	0.554		0	8.58	845.68	10.06	0.493	846.5	0.607
Pond	SD	42" HDPE SD	1.4	0.54	14.08	0.638	77.385	33.3	0.1	0	0	0	B7	0.54	14.08	0.638		0	0	0		0	0.54	844.44	14.16	0	0	0

Reso A - Exhibit C2 (EIR Technical Appendix)

OLSEN-CHANDLER RANCH TENTATIVE TRACT MAP

PRELIMINARY DETENTION BASIN SUMMARY
1 Year Storm Event
Proposed Conditions

Node Type	Node Number	Node Name	Rainfall Depth (inches)	Inflow Peak (cfs)	Inflow Peak Time (hours)	Inflow Volume (acre-feet)	Inflow Area (acres)	Imperv. Inflow Area (%)	Inflow Depth (inches)	Discarded Outflow Peak (cfs)	Discarded Outflow Peak Time (hours)	Discarded Outflow Volume (AF)	Primary Routing	Primary Outflow Peak (cfs)	Primary Outflow Peak Time (hours)	Primary Outflow Volume (acre-feet)	Secondary Routing	Secondary Outflow Peak (cfs)	Secondary Outflow Peak Time (hours)	Secondary Outflow Volume (AF)	Tertiary Routing	Tertiary Outflow Peak (cfs)	Outflow Total Peak (cfs)	Peak Elevation (feet)	Peak Elevation Time (hours)	Peak Storage (acre-feet)	Top Elevation (feet)	Top Storage (acre-feet)
Pond	1P	SD Inlet with Bypass SD	1.61	0.6	18.2	0.552	108.566	6.93	0.06	0	0	0	11L	0.6	18.19	0.552	11L	0	0.01	0		0	0.6	824.55	18.19	0	0	0
Pond	2P	60" SD MH	1.61	5.51	9.99	0.673	21.5	80	0.38	0	0	0	B1	5.51	9.99	0.673	B1	0	0.01	0		0	5.51	839.46	9.99	0	0	0
Pond	15P	SD System 42" HDPE	1.61	0	0.01	0	0	0	0	0	0	0	B1	0	0.01	0		0	0	0		0	0	844.17	0.85	0	0	0
Pond	16P	Dbl Conc. Arch Culvert (37x23)	1.61	1.54	9.96	0.866	276.531	1.6	0.04	0	0	0	10L	1.54	9.96	0.866		0	0	0		0	1.54	843.8	9.96	0	0	0
Pond	17P	Gran Cielo Dwy	1.61	14.73	10	4.875	166.738	0.91	0.35	0	0	0	18P	14.33	10.04	4.875	18P	0	0.01	0	17R	0	14.33	853.55	10.04	0.04	856.14	0.511
Pond	18P	GC-CkD1	1.61	22.86	10.02	7.382	240.622	1.05	0.37	0	0	0	19P	0	0.01	0	19P	0	0.01	0	Ex Chl	22.84	22.84	847.51	10.03	0.054	852	1.614
Pond	19P	GC-CkD2	1.61	1.06	10	0.426	260.311	0.99	0.02	0	0	0	20P	0.51	11.27	0.424	20P	0	0.01	0	22L	0	0.51	846.84	11.27	0.036	850	1.066
Pond	20P	GC-CkD3	1.61	0.82	10.46	0.663	274.094	0.94	0.03	0	0	0	16P	0.75	12.5	0.653	16P	0	0.01	0	22L	0	0.75	844.7	12.5	0.06	846.5	0.565
Pond	B1	Basin 1	1.61	22.52	9.98	3.126	47.388	67.98	0.79	0.93	17.9	2.603	Ck Qa	0.33	17.9	0.195	Ck Qa	0	0.01	0		0	1.26	834.45	17.9	1.914	839.35	8.595
Pond	B10	Basin 10	1.61	11.08	9.98	2.215	30.685	61.94	0.87	0.73	19.33	1.951	11L	0	0.01	0	11L	0	0.01	0		0	0.73	816.15	19.33	1.384	820	5.425
Pond	B11	Basin 11	1.61	6.04	9.96	0.904	14.461	52	0.75	0.19	23.9	0.668	1P	0	0.01	0	1P	0	0.01	0		0	0.19	831.54	23.9	0.652	836	2.037
Pond	B12	Basin 12	1.61	7.43	9.96	1.093	20.201	44.06	0.65	0.37	19.86	0.908	11L	0	0.01	0	11L	0	0.01	0		0	0.37	835.94	19.86	0.664	841	3.803
Pond	B13	Basin 13	1.61	16.74	9.97	2.809	64.115	22.11	0.53	0.32	13.16	1.157	11L	1.73	13.16	1.265	11L	0	0.01	0		0	2.05	840.14	13.16	1.26	846	4.267
Pond	B4	Basin 4	1.61	15.59	9.97	2.565	38.712	55.38	0.8	0.42	13.01	1.271	Ck Qa	1.18	13.01	1.08	Ck Qa	0	0.01	0		0	1.6	836.62	13.01	1.285	842.5	5.149
Pond	B5	Basin 5	1.61	5.97	9.98	1.179	32.696	30.34	0.43	0.31	13.78	0.862	SD	0.3	13.78	0.317		0	0.01	0		0	0.61	845.33	13.78	0.507	852	4.099
Pond	B6	Basin 6	1.61	11.07	9.98	2.182	34.039	52.56	0.77	0.27	12.96	0.88	Ck Qb	1.16	12.96	1.034	Ck Qb	0	0.01	0		0	1.43	848.91	12.96	1.091	854.4	3.598
Pond	B7	Basin 7	1.61	6.04	9.98	2.165	108.754	33.3	0.24	0.96	21.35	2.165	Ex SD	0	0.01	0		0	0.01	0		0	0.96	840.01	21.35	0.751	847	11.849
Pond	B8	Basin 8	1.61	8.11	9.99	1.897	44.689	35.47	0.51	0.4	16.96	1.286	SD	0.37	16.96	0.612		0	0.01	0		0	0.77	855.05	16.96	0.934	859	3.387
Pond	B9	Basin 9	1.61	1.17	9.98	0.248	11.446	17.36	0.26	0	0	0	6L	0.62	10.47	0.246		0	0	0		0	0.62	848.37	10.47	0.053	853	1.119
Pond	Ex SD	Tract #1632 Ex. 36" SD Outlet	1.61	0	0.01	0	108.754	33.3	0	0	0	0	1L	0	0.01	0		0	0	0		0	0	836	0.01	0	0	0
Pond	MC Q	SD System	1.61	11.57	9.97	2.016	21.5	80	1.12	0.1	9.99	0.351	2P	5.51	9.99	0.673	B1	5.84	9.99	0.712		0	11.45	845.72	9.99	0.497	846.5	0.607
Pond	SD	42" HDPE SD	1.61	0.67	14.3	0.928	77.385	33.3	0.14	0	0	0	B7	0.67	14.31	0.928		0	0	0		0	0.67	844.47	14.51	0	0	0

Reso A - Exhibit C2 (EIR Technical Appendix)

OLSEN-CHANDLER RANCH TENTATIVE TRACT MAP

PRELIMINARY DETENTION BASIN SUMMARY
2 Year Storm Event
Proposed Conditions

Node Type	Node Number	Node Name	Rainfall Depth (inches)	Inflow Peak (cfs)	Inflow Peak Time (hours)	Inflow Volume (acre-feet)	Inflow Area (acres)	Imperv. Inflow Area (%)	Inflow Depth (inches)	Discarded Outflow Peak (cfs)	Discarded Outflow Peak Time (hours)	Discarded Outflow Volume (AF)	Primary Routing	Primary Outflow Peak (cfs)	Primary Outflow Peak Time (hours)	Primary Outflow Volume (acre-feet)	Secondary Routing	Secondary Outflow Peak (cfs)	Secondary Outflow Peak Time (hours)	Secondary Outflow Volume (AF)	Tertiary Routing	Tertiary Outflow Peak (cfs)	Outflow Total Peak (cfs)	Peak Elevation (feet)	Peak Elevation Time (hours)	Peak Storage (acre-feet)	Top Elevation (feet)	Top Storage (acre-feet)
Pond	1P	SD Inlet with Bypass SD	2.33	3.41	10.27	2.735	108.566	6.93	0.3	0	0	0	11L	3.41	10.27	2.735	11L	0	0.01	0		0	3.41	824.64	10.27	0	0	0
Pond	2P	60" SD MH	2.33	8.31	9.99	1.203	21.5	80	0.67	0	0	0	B1	8.31	9.99	1.203	B1	0	0.01	0		0	8.31	839.69	9.99	0	0	0
Pond	15P	SD System 42" HDPE	2.33	0	0.01	0	0	0	0	0	0	0	B1	0	0.01	0		0	0	0		0	0	844.17	0.85	0	0	0
Pond	16P	Dbl Conc. Arch Culvert (37x23)	2.33	2.62	9.99	2.008	276.531	1.6	0.09	0	0	0	10L	2.62	9.99	2.008		0	0	0		0	2.62	843.88	9.99	0	0	0
Pond	17P	Gran Cielo Dwy	2.33	47.53	9.99	10.915	166.738	0.91	0.79	0	0	0	18P	46.4	10.02	10.915	18P	0	0.01	0	17R	0	46.4	854.16	10.02	0.114	856.14	0.511
Pond	18P	GC-CkD1	2.33	70.49	10.01	16.278	240.622	1.05	0.81	0	0	0	19P	0.19	10.01	0.004	19P	0	0.01	0	Ex Chl	70.21	70.4	848.08	10.01	0.081	852	1.614
Pond	19P	GC-CkD2	2.33	5.16	9.99	1.055	260.311	0.99	0.05	0	0	0	20P	0.95	10.96	0.982	20P	0.54	10.96	0.072	22L	0	1.49	848.01	10.96	0.191	850	1.066
Pond	20P	GC-CkD3	2.33	3.41	9.99	1.689	274.094	0.94	0.07	0	0	0	16P	2.17	11.26	1.674	16P	0.04	11.26	0.005	22L	0	2.21	845.08	11.26	0.123	846.5	0.565
Pond	B1	Basin 1	2.33	33.8	9.98	5.194	47.388	67.98	1.32	0.96	12.43	2.782	Ck Qa	2.98	12.43	2.06	Ck Qa	0	0.01	0		0	3.94	834.95	12.43	2.513	839.35	8.595
Pond	B10	Basin 10	2.33	16.54	9.98	3.474	30.685	61.94	1.36	0.77	15.89	2.542	11L	0.7	15.89	0.513	11L	0	0.01	0		0	1.47	816.9	15.89	2.096	820	5.425
Pond	B11	Basin 11	2.33	9.1	9.96	1.469	14.461	52	1.22	0.21	12.68	0.739	1P	0.79	12.68	0.473	1P	0	0.01	0		0	1	832.03	12.68	0.766	836	2.037
Pond	B12	Basin 12	2.33	11.41	9.96	1.819	20.201	44.06	1.08	0.43	18.3	1.374	11L	0.29	18.3	0.184	11L	0	0.01	0		0	0.72	836.87	18.3	1.133	841	3.803
Pond	B13	Basin 13	2.33	32.84	9.97	5.235	64.115	22.11	0.98	0.38	11.7	1.221	11L	4.63	11.7	3.62	11L	0	0.01	0		0	5.01	841.67	11.7	1.893	846	4.267
Pond	B4	Basin 4	2.33	23.47	9.97	4.132	38.712	55.38	1.28	0.48	12.33	1.47	Ck Qa	2.53	12.33	2.426	Ck Qa	0	0.01	0		0	3.01	837.92	12.33	1.953	842.5	5.149
Pond	B5	Basin 5	2.33	8.91	9.98	2.019	32.696	30.34	0.74	0.34	13.45	1.073	SD	0.91	13.45	0.946		0	0.01	0		0	1.25	846.09	13.45	0.823	852	4.099
Pond	B6	Basin 6	2.33	16.99	9.98	3.559	34.039	52.56	1.25	0.3	10.89	0.944	Ck Qb	4.94	10.89	2.333	Ck Qb	0	0.01	0		0	5.24	849.79	10.89	1.388	854.4	3.598
Pond	B7	Basin 7	2.33	9.38	9.98	4.548	108.754	33.3	0.5	1.05	21.83	3.899	Ex SD	0.96	21.83	0.621		0	0.01	0		0	2.01	841.02	21.83	2.059	847	11.849
Pond	B8	Basin 8	2.33	12.19	9.99	3.178	44.689	35.47	0.85	0.46	15.62	1.664	SD	1.05	15.62	1.514		0	0.01	0		0	1.51	856.21	15.62	1.565	859	3.387
Pond	B9	Basin 9	2.33	1.74	9.98	0.481	11.446	17.36	0.5	0	0	0	6L	1.02	10.42	0.479		0	0	0		0	1.02	848.48	10.42	0.07	853	1.119
Pond	Ex SD	Tract #1632 Ex. 36" SD Outlet	2.33	0.96	21.83	0.621	108.754	33.3	0.07	0	0	0	1L	0.96	21.84	0.621		0	0	0		0	0.96	836.36	21.84	0	0	0
Pond	MC Q	SD System	2.33	17.34	9.97	3.116	21.5	80	1.74	0.11	9.99	0.358	2P	8.31	9.99	1.203	B1	8.8	9.99	1.274		0	17.22	845.79	9.99	0.505	846.5	0.607
Pond	SD	42" HDPE SD	2.33	1.91	14.17	2.46	77.385	33.3	0.38	0	0	0	B7	1.91	14.17	2.46		0	0	0		0	1.91	844.69	14.52	0	0	0

Reso A - Exhibit C2 (EIR Technical Appendix)

OLSEN-CHANDLER RANCH TENTATIVE TRACT MAP

PRELIMINARY DETENTION BASIN SUMMARY
5 Year Storm Event
Proposed Conditions

Node Type	Node Number	Node Name	Rainfall Depth (inches)	Inflow Peak (cfs)	Inflow Peak Time (hours)	Inflow Volume (acre-feet)	Inflow Area (acres)	Imperv. Inflow Area (%)	Inflow Depth (inches)	Discarded Outflow Peak (cfs)	Discarded Outflow Peak Time (hours)	Discarded Outflow Volume (AF)	Primary Routing	Primary Outflow Peak (cfs)	Primary Outflow Peak Time (hours)	Primary Outflow Volume (acre-feet)	Secondary Routing	Secondary Outflow Peak (cfs)	Secondary Outflow Peak Time (hours)	Secondary Outflow Volume (AF)	Tertiary Routing	Tertiary Outflow Peak (cfs)	Outflow Total Peak (cfs)	Peak Elevation (feet)	Peak Elevation Time (hours)	Peak Storage (acre-feet)	Top Elevation (feet)	Top Storage (acre-feet)
Pond	1P	SD Inlet with Bypass SD	3.27	24.63	9.98	6.953	108.566	6.93	0.77	0	0	0	11L	24.63	9.98	6.953	11L	0	0.01	0		0	24.63	825.04	9.98	0	0	0
Pond	2P	60" SD MH	3.27	12.22	9.99	1.926	21.5	80	1.08	0	0	0	B1	12.22	9.99	1.926	B1	0	0.01	0		0	12.22	839.97	9.99	0	0	0
Pond	15P	SD System 42" HDPE	3.27	8.49	10.19	0.455	0	0	0	0	0	0	B1	8.49	10.19	0.455		0	0	0		0	8.49	844.34	10.19	0	0	0
Pond	16P	Dbl Conc. Arch Culvert (37x23)	3.27	8.06	10.14	3.487	276.531	1.6	0.15	0	0	0	10L	8.06	10.14	3.487		0	0	0		0	8.06	844.18	10.14	0	0	0
Pond	17P	Gran Cielo Dwy	3.27	101.36	9.99	20.431	166.738	0.91	1.47	0	0	0	18P	85.85	10	20.189	18P	0	0.01	0	17R	15.06	100.91	854.74	10	0.205	856.14	0.511
Pond	18P	GC-CkD1	3.27	135.42	9.99	29.955	240.622	1.05	1.49	0	0	0	19P	0.65	9.96	0.013	19P	5.16	10.02	0.062	Ex Chl	127.28	133	848.84	10.02	0.163	852	1.614
Pond	19P	GC-CkD2	3.27	17.12	10	2.154	260.311	0.99	0.1	0	0	0	20P	1.09	10.14	1.289	20P	9.21	10.14	0.864	22L	0	10.3	848.51	10.14	0.302	850	1.066
Pond	20P	GC-CkD3	3.27	15.67	10.12	3.464	274.094	0.94	0.15	0	0	0	16P	3.99	10.19	2.748	16P	2.26	10.19	0.25	22L	8.49	14.75	845.46	10.19	0.21	846.5	0.565
Pond	B1	Basin 1	3.27	49.24	9.98	8.553	47.388	67.98	2.17	1.02	11.12	2.96	Ck Qa	9.63	11.12	5.222	Ck Qa	0	0.01	0		0	10.65	835.93	11.12	3.753	839.35	8.595
Pond	B10	Basin 10	3.27	24.16	9.98	5.271	30.685	61.94	2.06	0.8	12.86	2.679	11L	2.71	12.86	2.15	11L	0	0.01	0		0	3.51	817.46	12.86	2.653	820	5.425
Pond	B11	Basin 11	3.27	14.34	9.96	2.296	14.461	52	1.91	0.23	10.73	0.761	1P	2.88	10.73	1.274	1P	0	0.01	0		0	3.11	832.65	10.73	0.922	836	2.037
Pond	B12	Basin 12	3.27	18.57	9.96	2.913	20.201	44.06	1.73	0.45	12.63	1.444	11L	1.62	12.63	1.2	11L	0	0.01	0		0	2.08	837.3	12.63	1.363	841	3.803
Pond	B13	Basin 13	3.27	59.63	9.96	8.93	64.115	22.11	1.67	0.43	10.31	1.298	11L	23.88	10.31	7.223	11L	0	0.01	0		0	24.31	843.07	10.31	2.561	846	4.267
Pond	B4	Basin 4	3.27	36.4	9.97	6.403	38.712	55.38	1.98	0.52	10.57	1.6	Ck Qa	11.42	10.57	4.55	Ck Qa	0	0.01	0		0	11.94	838.69	10.57	2.4	842.5	5.149
Pond	B5	Basin 5	3.27	13.89	9.99	3.408	32.696	30.34	1.25	0.37	11.51	1.166	SD	3.09	11.5	2.242		0	0.01	0		0	3.45	846.82	11.51	1.152	852	4.099
Pond	B6	Basin 6	3.27	26.85	9.98	5.566	34.039	52.56	1.96	0.35	10.57	0.996	Ck Qb	11.64	10.57	4.28	Ck Qb	0	0.01	0		0	12	850.86	10.57	1.798	854.4	3.598
Pond	B7	Basin 7	3.27	14.56	9.99	9.126	108.754	33.3	1.01	1.11	15.63	4.196	Ex SD	5.13	15.63	4.846		0	0.01	0		0	6.24	841.67	15.63	2.955	847	11.849
Pond	B8	Basin 8	3.27	19.07	9.99	5.22	44.689	35.47	1.4	0.5	12.6	1.803	SD	3.61	12.6	3.417		0	0.01	0		0	4.11	857.14	12.6	2.124	859	3.387
Pond	B9	Basin 9	3.27	3.11	9.99	0.906	11.446	17.36	0.95	0	0	0	6L	2.01	10.45	0.904		0	0	0		0	2.01	848.7	10.45	0.104	853	1.119
Pond	Ex SD	Tract #1632 Ex. 36" SD Outlet	3.27	5.13	15.63	4.846	108.754	33.3	0.53	0	0	0	1L	5.13	15.63	4.846		0	0	0		0	5.13	836.85	15.63	0	0	0
Pond	MC Q	SD System	3.27	25.44	9.97	4.613	21.5	80	2.57	0.11	9.99	0.366	2P	12.22	9.99	1.926	B1	12.94	9.99	2.04		0	25.28	845.88	9.99	0.516	846.5	0.607
Pond	SD	42" HDPE SD	3.27	6.5	12.07	5.659	77.385	33.3	0.88	0	0	0	B7	6.5	12.07	5.659		0	0	0		0	6.5	845.13	12.39	0	0	0

Reso A - Exhibit C2 (EIR Technical Appendix)

OLSEN-CHANDLER RANCH TENTATIVE TRACT MAP

PRELIMINARY DETENTION BASIN SUMMARY
10 Year Storm Event
Proposed Conditions

Node Type	Node Number	Node Name	Rainfall Depth (inches)	Inflow Peak (cfs)	Inflow Peak Time (hours)	Inflow Volume (acre-feet)	Inflow Area (acres)	Imperv. Inflow Area (%)	Inflow Depth (inches)	Discarded Outflow Peak (cfs)	Discarded Outflow Peak Time (hours)	Discarded Outflow Volume (AF)	Primary Routing	Primary Outflow Peak (cfs)	Primary Outflow Peak Time (hours)	Primary Outflow Volume (acre-feet)	Secondary Routing	Secondary Outflow Peak (cfs)	Secondary Outflow Peak Time (hours)	Secondary Outflow Volume (AF)	Tertiary Routing	Tertiary Outflow Peak (cfs)	Outflow Total Peak (cfs)	Peak Elevation (feet)	Peak Elevation Time (hours)	Peak Storage (acre-feet)	Top Elevation (feet)	Top Storage (acre-feet)
Pond	1P	SD Inlet with Bypass SD	3.6	35.45	9.99	8.685	108.566	6.93	0.96	0	0	0	11L	35.45	9.99	8.685	11L	0	0.01	0		0	35.45	825.19	9.99	0	0	0
Pond	2P	60" SD MH	3.6	13.65	9.99	2.186	21.5	80	1.22	0	0	0	B1	13.65	9.99	2.186	B1	0	0.01	0		0	13.65	840.06	9.99	0	0	0
Pond	15P	SD System 42" HDPE	3.6	17.03	10.14	0.846	0	0	0	0	0	0	B1	17.03	10.14	0.846		0	0	0		0	17.03	844.4	10.14	0	0	0
Pond	16P	Dbl Conc. Arch Culvert (37x23)	3.6	10.83	10.11	3.972	276.531	1.6	0.17	0	0	0	10L	10.83	10.11	3.972		0	0	0		0	10.83	844.3	10.11	0	0	0
Pond	17P	Gran Cielo Dwy	3.6	122.07	9.98	24.054	166.738	0.91	1.73	0	0	0	18P	93.38	9.99	23.448	18P	0	0.01	0	17R	28.32	121.7	854.84	9.99	0.224	856.14	0.511
Pond	18P	GC-CkD1	3.6	152.52	9.99	34.873	240.622	1.05	1.74	0	0	0	19P	0.64	9.93	0.017	19P	12.52	10.01	0.211	Ex Chl	136.21	149.21	849.1	10.02	0.209	852	1.614
Pond	19P	GC-CkD2	3.6	27.17	10	2.706	260.311	0.99	0.12	0	0	0	20P	1.16	10.11	1.345	20P	18.4	10.11	1.36	22L	0.1	19.65	848.77	10.11	0.374	850	1.066
Pond	20P	GC-CkD3	3.6	26.7	10.09	4.281	274.094	0.94	0.19	0	0	0	16P	4.72	10.14	3.046	16P	3.87	10.14	0.379	22L	16.95	25.54	845.61	10.14	0.25	846.5	0.565
Pond	B1	Basin 1	3.6	61.24	10.05	10.005	47.388	67.98	2.53	1.05	10.93	3.02	Ck Qa	13.77	10.93	6.61	Ck Qa	0	0.01	0		0	14.82	836.34	10.93	4.294	839.35	8.595
Pond	B10	Basin 10	3.6	27.15	9.98	5.934	30.685	61.94	2.32	0.82	12.3	2.723	11L	3.68	12.3	2.761	11L	0	0.01	0		0	4.5	817.66	12.3	2.861	820	5.425
Pond	B11	Basin 11	3.6	16.38	9.96	2.604	14.461	52	2.16	0.24	10.69	0.77	1P	3.46	10.69	1.573	1P	0	0.01	0		0	3.7	833	10.69	1.019	836	2.037
Pond	B12	Basin 12	3.6	21.44	9.96	3.326	20.201	44.06	1.98	0.47	12.37	1.467	11L	2.02	12.37	1.588	11L	0	0.01	0		0	2.49	837.54	12.37	1.502	841	3.803
Pond	B13	Basin 13	3.6	69.87	9.96	10.322	64.115	22.11	1.93	0.44	10.22	1.321	11L	34.55	10.22	8.587	11L	0	0.01	0		0	34.99	843.39	10.22	2.73	846	4.267
Pond	B4	Basin 4	3.6	41.42	9.97	7.245	38.712	55.38	2.25	0.54	10.5	1.63	Ck Qa	14.66	10.5	5.358	Ck Qa	0	0.01	0		0	15.2	838.95	10.5	2.555	842.5	5.149
Pond	B5	Basin 5	3.6	16.32	9.99	3.956	32.696	30.34	1.45	0.38	11.22	1.188	SD	4.28	11.19	2.768		0	0.01	0		0	4.65	847.07	11.22	1.268	852	4.099
Pond	B6	Basin 6	3.6	30.64	9.98	6.31	34.039	52.56	2.22	0.37	10.45	1.011	Ck Qb	15.84	10.45	5.009	Ck Qb	0	0.01	0		0	16.21	851.09	10.45	1.896	854.4	3.598
Pond	B7	Basin 7	3.6	17.05	9.99	10.954	108.754	33.3	1.21	1.14	14.56	4.271	Ex SD	6.98	14.56	6.584		0	0.01	0		0	8.12	841.95	14.56	3.351	847	11.849
Pond	B8	Basin 8	3.6	22.23	9.99	6.012	44.689	35.47	1.61	0.51	11.62	1.833	SD	5.93	11.62	4.179		0	0.01	0		0	6.44	857.36	11.62	2.263	859	3.387
Pond	B9	Basin 9	3.6	3.86	9.99	1.08	11.446	17.36	1.13	0	0	0	6L	2.51	10.44	1.078		0	0	0		0	2.51	848.8	10.44	0.12	853	1.119
Pond	Ex SD	Tract #1632 Ex. 36" SD Outlet	3.6	6.98	14.56	6.584	108.754	33.3	0.73	0	0	0	1L	6.98	14.56	6.584		0	0	0		0	6.98	837	14.56	0	0	0
Pond	MC Q	SD System	3.6	28.37	9.97	5.15	21.5	80	2.87	0.11	9.99	0.368	2P	13.65	9.99	2.186	B1	14.45	9.99	2.315		0	28.21	845.91	9.99	0.519	846.5	0.607
Pond	SD	42" HDPE SD	3.6	10.07	11.57	6.947	77.385	33.3	1.08	0	0	0	B7	10.07	11.57	6.947		0	0	0		0	10.07	845.37	11.64	0	0	0

Reso A - Exhibit C2 (EIR Technical Appendix)

OLSEN-CHANDLER RANCH TENTATIVE TRACT MAP

PRELIMINARY DETENTION BASIN SUMMARY
25 Year Storm Event
Proposed Conditions

Node Type	Node Number	Node Name	Rainfall Depth (inches)	Inflow Peak (cfs)	Inflow Peak Time (hours)	Inflow Volume (acre-feet)	Inflow Area (acres)	Imperv. Inflow Area (%)	Inflow Depth (inches)	Discarded Outflow Peak (cfs)	Discarded Outflow Peak Time (hours)	Discarded Outflow Volume (AF)	Primary Routing	Primary Outflow Peak (cfs)	Primary Outflow Peak Time (hours)	Primary Outflow Volume (acre-feet)	Secondary Routing	Secondary Outflow Peak (cfs)	Secondary Outflow Peak Time (hours)	Secondary Outflow Volume (AF)	Tertiary Routing	Tertiary Outflow Peak (cfs)	Outflow Total Peak (cfs)	Peak Elevation (feet)	Peak Elevation Time (hours)	Peak Storage (acre-feet)	Top Elevation (feet)	Top Storage (acre-feet)
Pond	1P	SD Inlet with Bypass SD	4.2	57.87	9.98	12.093	108.566	6.93	1.34	0	0	0	11L	57.87	9.98	12.093	11L	0	0.01	0		0	57.87	825.45	9.98	0	0	0
Pond	2P	60" SD MH	4.2	16.26	9.99	2.664	21.5	80	1.49	0	0	0	B1	16.26	9.99	2.664	B1	0	0.01	0		0	16.26	840.22	9.99	0	0	0
Pond	15P	SD System 42" HDPE	4.2	36.99	10.09	1.833	0	0	0	0	0	0	B1	36.99	10.09	1.833		0	0	0		0	36.99	844.52	10.09	0	0	0
Pond	16P	Dbl Conc. Arch Culvert (37x23)	4.2	15.27	10.07	4.839	276.531	1.6	0.21	0	0	0	10L	15.27	10.07	4.839		0	0	0		0	15.27	844.48	10.07	0	0	0
Pond	17P	Gran Cielo Dwy	4.2	161.34	9.98	30.903	166.738	0.91	2.22	0	0	0	18P	104.8	9.99	29.304	18P	0.01	9.99	0	17R	56.21	161.03	855	9.99	0.253	856.14	0.511
Pond	18P	GC-CkD1	4.2	181.92	9.98	43.852	240.622	1.05	2.19	0	0	0	19P	0.6	9.92	0.025	19P	25.9	10.01	0.677	Ex Chl	149.04	175.31	849.52	10.03	0.309	852	1.614
Pond	19P	GC-CkD2	4.2	45.55	10	3.943	260.311	0.99	0.18	0	0	0	20P	1.23	10.08	1.419	20P	33.35	10.08	2.431	22L	5.36	39.95	849.11	10.08	0.48	850	1.066
Pond	20P	GC-CkD3	4.2	45.11	10.06	5.938	274.094	0.94	0.26	0	0	0	16P	5.62	10.1	3.513	16P	6.57	10.1	0.672	22L	31.77	43.97	845.79	10.1	0.304	846.5	0.565
Pond	B1	Basin 1	4.2	93.8	10.04	12.965	47.388	67.98	3.28	1.09	10.6	3.116	Ck Qa	29.18	10.6	9.465	Ck Qa	0	0.01	0		0	30.26	837	10.6	5.171	839.35	8.595
Pond	B10	Basin 10	4.2	32.9	9.98	7.171	30.685	61.94	2.8	0.84	11.45	2.797	11L	6.57	11.45	3.913	11L	0	0.01	0		0	7.4	817.99	11.45	3.196	820	5.425
Pond	B11	Basin 11	4.2	20.25	9.96	3.183	14.461	52	2.64	0.26	10.55	0.785	1P	5.24	10.55	2.136	1P	0	0.01	0		0	5.5	833.6	10.55	1.193	836	2.037
Pond	B12	Basin 12	4.2	26.91	9.96	4.105	20.201	44.06	2.44	0.49	12.16	1.514	11L	2.71	12.16	2.317	11L	0	0.01	0		0	3.2	838.07	12.16	1.809	841	3.803
Pond	B13	Basin 13	4.2	89.2	9.96	12.943	64.115	22.11	2.42	0.46	10.09	1.355	11L	62.05	10.09	11.167	11L	0	0.01	0		0	62.52	843.86	10.09	2.981	846	4.267
Pond	B4	Basin 4	4.2	50.91	9.97	8.821	38.712	55.38	2.73	0.57	10.46	1.674	Ck Qa	19.48	10.46	6.886	Ck Qa	0	0.01	0		0	20.05	839.49	10.46	2.897	842.5	5.149
Pond	B5	Basin 5	4.2	21.35	9.99	5.016	32.696	30.34	1.84	0.39	10.91	1.221	SD	7.13	10.91	3.796		0	0.01	0		0	7.52	847.51	10.91	1.476	852	4.099
Pond	B6	Basin 6	4.2	37.81	9.98	7.705	34.039	52.56	2.72	0.38	10.32	1.034	Ck Qb	23.43	10.32	6.379	Ck Qb	0	0.01	0		0	23.8	851.4	10.32	2.036	854.4	3.598
Pond	B7	Basin 7	4.2	28.12	10.77	14.5	108.754	33.3	1.6	1.2	13.1	4.392	Ex SD	11.9	13.1	9.989		0	0.01	0		0	13.1	842.46	13.1	4.094	847	11.849
Pond	B8	Basin 8	4.2	28.75	9.99	7.533	44.689	35.47	2.02	0.53	10.87	1.876	SD	12.49	10.87	5.657		0	0.01	0		0	13.01	857.57	10.87	2.399	859	3.387
Pond	B9	Basin 9	4.2	5.46	9.99	1.422	11.446	17.36	1.49	0	0	0	6L	3.56	10.42	1.421		0	0	0		0	3.56	849	10.42	0.153	853	1.119
Pond	Ex SD	Tract #1632 Ex. 36" SD Outlet	4.2	11.9	13.1	9.989	108.754	33.3	1.1	0	0	0	1L	11.9	13.1	9.989		0	0	0		0	11.9	837.33	13.1	0	0	0
Pond	MC Q	SD System	4.2	33.79	9.97	6.138	21.5	80	3.43	0.12	9.99	0.372	2P	16.26	9.99	2.664	B1	17.22	9.99	2.821		0	33.6	845.96	9.99	0.526	846.5	0.607
Pond	SD	42" HDPE SD	4.2	19.61	10.87	9.453	77.385	33.3	1.47	0	0	0	B7	19.61	10.87	9.453		0	0	0		0	19.61	845.86	10.93	0	0	0

Reso A - Exhibit C2 (EIR Technical Appendix)

OLSEN-CHANDLER RANCH TENTATIVE TRACT MAP

PRELIMINARY DETENTION BASIN SUMMARY
50 Year Storm Event
Proposed Conditions

Node Type	Node Number	Node Name	Rainfall Depth (inches)	Inflow Peak (cfs)	Inflow Peak Time (hours)	Inflow Volume (acre-feet)	Inflow Area (acres)	Imperv. Inflow Area (%)	Inflow Depth (inches)	Discarded Outflow Peak (cfs)	Discarded Outflow Peak Time (hours)	Discarded Outflow Volume (AF)	Primary Routing	Primary Outflow Peak (cfs)	Primary Outflow Peak Time (hours)	Primary Outflow Volume (acre-feet)	Secondary Routing	Secondary Outflow Peak (cfs)	Secondary Outflow Peak Time (hours)	Secondary Outflow Volume (AF)	Tertiary Routing	Tertiary Outflow Peak (cfs)	Outflow Total Peak (cfs)	Peak Elevation (feet)	Peak Elevation Time (hours)	Peak Storage (acre-feet)	Top Elevation (feet)	Top Storage (acre-feet)
Pond	1P	SD Inlet with Bypass SD	4.6	73.26	9.98	14.523	108.566	6.93	1.61	0	0	0	11L	73.26	9.98	14.523	11L	0	0.01	0		0	73.26	825.62	9.98	0	0	0
Pond	2P	60" SD MH	4.6	18.03	9.99	2.986	21.5	80	1.67	0	0	0	B1	18.03	9.99	2.986	B1	0	0.01	0		0	18.03	840.33	9.99	0	0	0
Pond	15P	SD System 42" HDPE	4.6	51.1	10.08	2.683	0	0	0	0	0	0	B1	51.1	10.08	2.683		0	0	0		0	51.1	844.59	10.08	0	0	0
Pond	16P	Dbl Conc. Arch Culvert (37x23)	4.6	17.74	10.05	5.377	276.531	1.6	0.23	0	0	0	10L	17.74	10.05	5.377		0	0	0		0	17.74	844.57	10.05	0	0	0
Pond	17P	Gran Cielo Dwy	4.6	188.4	9.98	35.62	166.738	0.91	2.56	0	0	0	18P	111.11	9.99	33.164	18P	0.18	9.99	0.002	17R	76.79	188.08	855.09	9.99	0.269	856.14	0.511
Pond	18P	GC-CkD1	4.6	200.71	9.98	49.854	240.622	1.05	2.49	0	0	0	19P	0.59	9.91	0.031	19P	35.96	10.02	1.101	Ex Chl	156.05	192.48	849.76	10.04	0.384	852	1.614
Pond	19P	GC-CkD2	4.6	58.68	10.01	4.902	260.311	0.99	0.23	0	0	0	20P	1.27	10.07	1.46	20P	41.32	10.07	3.201	22L	10.96	53.55	849.25	10.07	0.543	850	1.066
Pond	20P	GC-CkD3	4.6	55.32	10.05	7.106	274.094	0.94	0.31	0	0	0	16P	6.01	10.09	3.774	16P	8.13	10.09	0.878	22L	40.2	54.35	845.88	10.09	0.332	846.5	0.565
Pond	B1	Basin 1	4.6	115.89	10.03	15.158	47.388	67.98	3.84	1.12	10.6	3.177	Ck Qa	35.49	10.6	11.591	Ck Qa	0	0.01	0		0	36.61	837.56	10.6	5.949	839.35	8.595
Pond	B10	Basin 10	4.6	36.9	9.98	8.017	30.685	61.94	3.14	0.85	11.07	2.841	11L	9.72	11.07	4.707	11L	0	0.01	0		0	10.57	818.15	11.07	3.364	820	5.425
Pond	B11	Basin 11	4.6	22.92	9.96	3.58	14.461	52	2.97	0.27	10.42	0.793	1P	7.55	10.42	2.524	1P	0	0.01	0		0	7.82	833.87	10.42	1.278	836	2.037
Pond	B12	Basin 12	4.6	30.7	9.96	4.642	20.201	44.06	2.76	0.51	11.75	1.546	11L	3.48	11.75	2.819	11L	0	0.01	0		0	3.99	838.38	11.75	1.998	841	3.803
Pond	B13	Basin 13	4.6	102.5	9.96	14.744	64.115	22.11	2.76	0.47	10.04	1.375	11L	84.13	10.04	12.945	11L	0	0.01	0		0	84.6	844.03	10.04	3.076	846	4.267
Pond	B4	Basin 4	4.6	57.43	9.97	9.9	38.712	55.38	3.07	0.59	10.42	1.698	Ck Qa	23.63	10.42	7.938	Ck Qa	0	0.01	0		0	24.21	839.85	10.42	3.14	842.5	5.149
Pond	B5	Basin 5	4.6	25.03	9.99	5.762	32.696	30.34	2.11	0.41	10.8	1.238	SD	9.31	10.8	4.524		0	0.01	0		0	9.72	847.79	10.8	1.616	852	4.099
Pond	B6	Basin 6	4.6	42.75	9.98	8.66	34.039	52.56	3.05	0.38	10.29	1.047	Ck Qb	27.62	10.29	7.319	Ck Qb	0	0.01	0		0	28	851.6	10.29	2.127	854.4	3.598
Pond	B7	Basin 7	4.6	38.88	10.57	16.997	108.754	33.3	1.88	1.23	12.48	4.463	Ex SD	16.23	12.48	12.404		0	0.01	0		0	17.47	842.8	12.48	4.603	847	11.849
Pond	B8	Basin 8	4.6	33.51	9.99	8.595	44.689	35.47	2.31	0.53	10.65	1.899	SD	17.63	10.65	6.696		0	0.01	0		0	18.16	857.7	10.65	2.483	859	3.387
Pond	B9	Basin 9	4.6	6.65	9.99	1.667	11.446	17.36	1.75	0	0	0	6L	4.29	10.42	1.665		0	0	0		0	4.29	849.15	10.42	0.179	853	1.119
Pond	Ex SD	Tract #1632 Ex. 36" SD Outlet	4.6	16.23	12.48	12.404	108.754	33.3	1.37	0	0	0	1L	16.23	12.48	12.404		0	0	0		0	16.23	837.58	12.48	0	0	0
Pond	MC Q	SD System	4.6	37.43	9.97	6.803	21.5	80	3.8	0.12	9.99	0.374	2P	18.03	9.99	2.986	B1	19.09	9.99	3.162		0	37.24	845.99	9.99	0.53	846.5	0.607
Pond	SD	42" HDPE SD	4.6	26.8	10.67	11.22	77.385	33.3	1.74	0	0	0	B7	26.8	10.67	11.22		0	0	0		0	26.8	846.18	10.74	0	0	0

Reso A - Exhibit C2 (EIR Technical Appendix)

OLSEN-CHANDLER RANCH TENTATIVE TRACT MAP

PRELIMINARY DETENTION BASIN SUMMARY
100 Year Storm Event
Proposed Conditions

Node Type	Node Number	Node Name	Rainfall Depth (inches)	Inflow Peak (cfs)	Inflow Peak Time (hours)	Inflow Volume (acre-feet)	Inflow Area (acres)	Imperv. Inflow Area (%)	Inflow Depth (inches)	Discarded Outflow Peak (cfs)	Discarded Outflow Peak Time (hours)	Discarded Outflow Volume (AF)	Primary Routing	Primary Outflow Peak (cfs)	Primary Outflow Peak Time (hours)	Primary Outflow Volume (acre-feet)	Secondary Routing	Secondary Outflow Peak (cfs)	Secondary Outflow Peak Time (hours)	Secondary Outflow Volume (AF)	Tertiary Routing	Tertiary Outflow Peak (cfs)	Outflow Total Peak (cfs)	Peak Elevation (feet)	Peak Elevation Time (hours)	Peak Storage (acre-feet)	Top Elevation (feet)	Top Storage (acre-feet)
Pond	1P	SD Inlet with Bypass SD	5.1	93.81	9.98	17.708	108.566	6.93	1.96	0	0	0	11L	93.81	9.98	17.708	11L	0	0.01	0		0	93.81	825.82	9.98	0	0	0
Pond	2P	60" SD MH	5.1	20.2	9.99	3.392	21.5	80	1.89	0	0	0	B1	20.2	9.99	3.392	B1	0	0.01	0		0	20.2	840.46	9.99	0	0	0
Pond	15P	SD System 42" HDPE	5.1	68.7	10.08	3.916	0	0	0	0	0	0	B1	68.7	10.08	3.916		0	0	0		0	68.7	844.66	10.08	0	0	0
Pond	16P	Dbl Conc. Arch Culvert (37x23)	5.1	20.76	10.04	6.013	276.531	1.6	0.26	0	0	0	10L	20.76	10.04	6.013		0	0	0		0	20.76	844.69	10.04	0	0	0
Pond	17P	Gran Cielo Dwy	5.1	222.96	9.98	41.649	166.738	0.91	3	0	0	0	18P	118.06	9.99	37.935	18P	0.66	9.99	0.009	17R	103.94	222.66	855.19	9.99	0.289	856.14	0.511
Pond	18P	GC-CkD1	5.1	223.8	9.98	57.362	240.622	1.05	2.86	0	0	0	19P	0.62	9.99	0.037	19P	49.36	10.03	1.73	Ex Chl	163.56	213.46	850.03	10.04	0.483	852	1.614
Pond	19P	GC-CkD2	5.1	76.4	10.01	6.218	260.311	0.99	0.29	0	0	0	20P	1.3	10.07	1.51	20P	50.4	10.07	4.202	22L	18.98	70.68	849.41	10.07	0.624	850	1.066
Pond	20P	GC-CkD3	5.1	67.1	10.05	8.618	274.094	0.94	0.38	0	0	0	16P	6.37	10.08	4.056	16P	10.21	10.08	1.141	22L	49.73	66.32	845.96	10.08	0.361	846.5	0.565
Pond	B1	Basin 1	5.1	143.08	10.02	18.094	47.388	67.98	4.58	1.18	10.61	3.251	Ck Qa	42.68	10.61	14.446	Ck Qa	0	0.01	0		0	43.86	838.35	10.61	7.075	839.35	8.595
Pond	B10	Basin 10	5.1	42.03	9.98	9.094	30.685	61.94	3.56	0.86	10.82	2.89	11L	14.28	10.82	5.727	11L	0	0.01	0		0	15.14	818.33	10.82	3.554	820	5.425
Pond	B11	Basin 11	5.1	26.34	9.96	4.086	14.461	52	3.39	0.28	10.34	0.803	1P	10.23	10.34	3.02	1P	0	0.01	0		0	10.51	834.16	10.34	1.37	836	2.037
Pond	B12	Basin 12	5.1	35.58	9.96	5.33	20.201	44.06	3.17	0.53	11.06	1.585	11L	5.12	11.06	3.464	11L	0	0.01	0		0	5.64	838.7	11.06	2.202	841	3.803
Pond	B13	Basin 13	5.1	119.46	9.96	17.044	64.115	22.11	3.19	0.48	10.01	1.396	11L	108.1	10.01	15.22	11L	0	0.01	0		0	108.58	844.19	10.01	3.165	846	4.267
Pond	B4	Basin 4	5.1	65.77	9.97	11.274	38.712	55.38	3.49	0.6	10.29	1.723	Ck Qa	34.06	10.29	9.285	Ck Qa	0	0.01	0		0	34.66	840.12	10.29	3.32	842.5	5.149
Pond	B5	Basin 5	5.1	29.91	9.99	6.733	32.696	30.34	2.47	0.42	10.7	1.257	SD	12.28	10.72	5.476		0	0.01	0		0	12.7	848.15	10.7	1.797	852	4.099
Pond	B6	Basin 6	5.1	49.06	9.98	9.876	34.039	52.56	3.48	0.39	10.28	1.062	Ck Qb	32.02	10.28	8.518	Ck Qb	0	0.01	0		0	32.41	851.88	10.28	2.255	854.4	3.598
Pond	B7	Basin 7	5.1	53.39	10.42	20.246	108.754	33.3	2.23	1.28	11.97	4.541	Ex SD	22.91	11.97	15.562		0	0.01	0		0	24.18	843.21	11.97	5.229	847	11.849
Pond	B8	Basin 8	5.1	39.82	9.99	9.971	44.689	35.47	2.68	0.54	10.48	1.926	SD	24.66	10.48	8.046		0	0.01	0		0	25.2	857.85	10.48	2.582	859	3.387
Pond	B9	Basin 9	5.1	8.24	9.99	1.988	11.446	17.36	2.08	0	0	0	6L	5.1	10.45	1.986		0	0	0		0	5.1	849.37	10.45	0.219	853	1.119
Pond	Ex SD	Tract #1632 Ex. 36" SD Outlet	5.1	22.91	11.97	15.562	108.754	33.3	1.72	0	0	0	1L	22.91	11.97	15.562		0	0	0		0	22.91	837.94	11.97	0	0	0
Pond	MC Q	SD System	5.1	42.04	9.97	7.642	21.5	80	4.27	0.12	9.99	0.377	2P	20.2	9.99	3.392	B1	21.51	9.99	3.592		0	41.83	846.03	9.99	0.535	846.5	0.607
Pond	SD	42" HDPE SD	5.1	36.4	10.52	13.522	77.385	33.3	2.1	0	0	0	B7	36.4	10.52	13.522		0	0	0		0	36.4	846.57	10.6	0	0	0

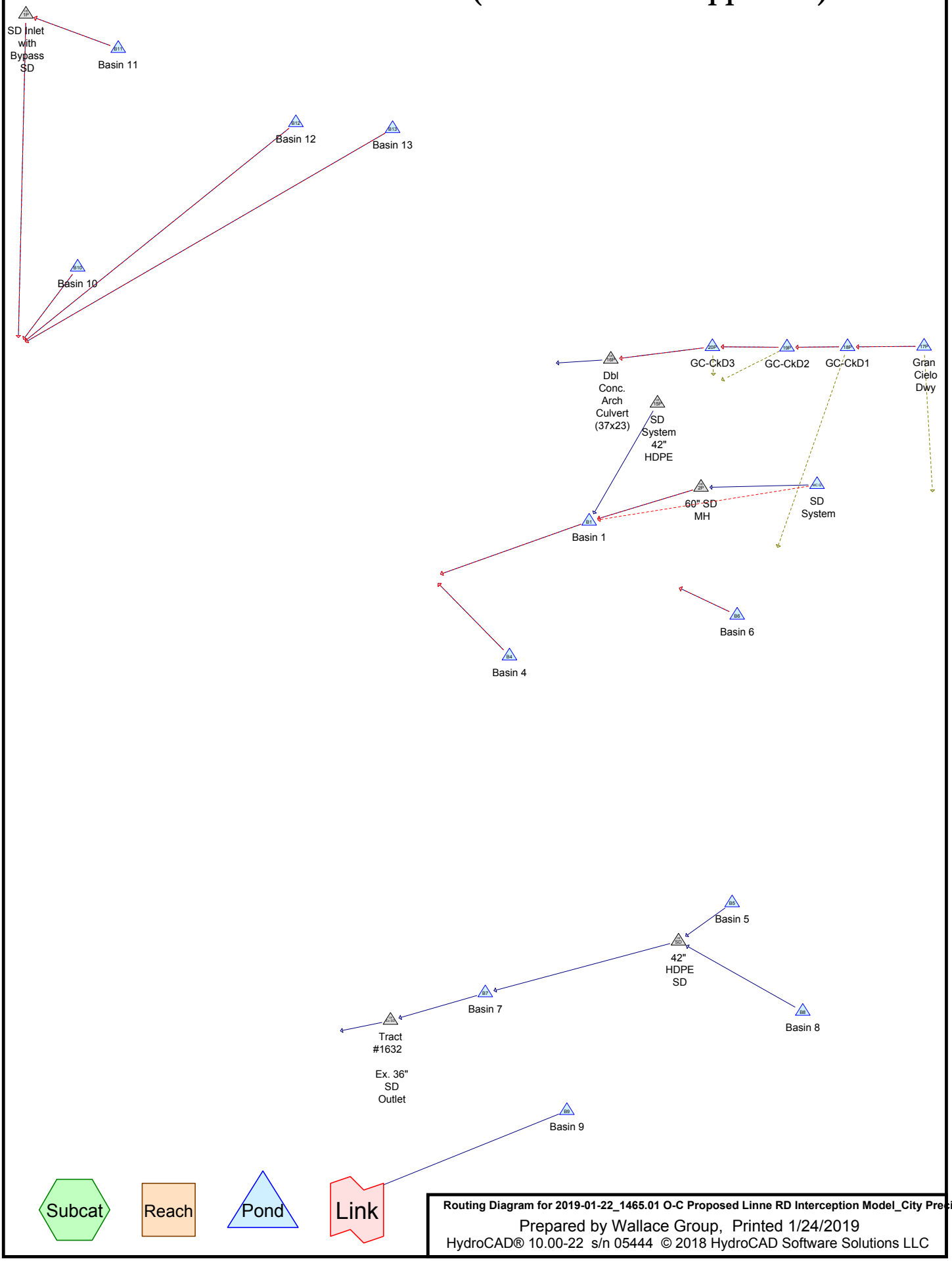
Reso A - Exhibit C2 (EIR Technical Appendix)

OLSEN-CHANDLER RANCH TENTATIVE TRACT MAP

PRELIMINARY DETENTION BASIN SUMMARY
100 Year Storm Detention Route
Proposed Conditions

Detention Pond Number	Detention Pond Name	Rainfall Depth (inches)	Inflow Peak (cfs)	Inflow Area (acres)	Outflow Total Peak (cfs)	Outflow Total Peak Time (hours)	Peak Elevation (feet)	Peak Storage (acre-feet)	Top Elevation (feet)	Top Storage (acre-feet)
B1	Basin 1	5.1	143.08	47.388	43.86	10.61	838.35	7.075	839.35	8.595
B4	Basin 4	5.1	65.77	38.712	34.66	10.29	840.12	3.32	842.5	5.149
B5	Basin 5	5.1	29.91	32.696	12.7	10.72	848.15	1.797	852	4.099
B6	Basin 6	5.1	49.06	34.039	32.41	10.28	851.88	2.255	854.4	3.598
B7	Basin 7	5.1	53.39	108.754	24.18	11.97	843.21	5.229	847	11.849
B8	Basin 8	5.1	39.82	44.689	25.2	10.48	857.85	2.582	859	3.387
B9	Basin 9	5.1	8.24	11.446	5.1	10.45	849.37	0.219	853	1.119
B10	Basin 10	5.1	42.03	30.685	15.14	10.82	818.33	3.554	820	5.425
B11	Basin 11	5.1	26.34	14.461	10.51	10.34	834.16	1.37	836	2.037
B12	Basin 12	5.1	35.58	20.201	5.64	11.06	838.7	2.202	841	3.803
B13	Basin 13	5.1	119.46	64.115	108.58	10.01	844.19	3.165	846	4.267

Reso A - Exhibit C2 (EIR Technical Appendix)



Routing Diagram for 2019-01-22_1465.01 O-C Proposed Linne RD Interception Model_City Precip

Prepared by Wallace Group, Printed 1/24/2019

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Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1P	820.00	814.11	990.0	0.0059	0.012	48.0	0.0	0.0
2	2P	838.50	836.50	500.0	0.0040	0.012	36.0	0.0	0.0
3	15P	839.75	833.60	1,370.0	0.0045	0.012	42.0	0.0	0.0
4	16P	843.50	841.40	860.0	0.0024	0.011	36.3	22.5	0.0
5	17P	852.84	851.76	77.0	0.0140	0.025	30.0	0.0	0.0
6	18P	847.69	847.67	26.0	0.0008	0.010	6.0	0.0	0.0
7	18P	843.15	840.75	960.0	0.0025	0.013	58.5	36.0	0.0
8	19P	846.12	845.98	26.0	0.0054	0.010	6.0	0.0	0.0
9	20P	844.22	843.98	26.0	0.0092	0.021	18.0	0.0	0.0
10	B1	833.12	831.20	385.5	0.0050	0.012	36.0	0.0	0.0
11	B10	816.00	815.10	45.0	0.0200	0.012	30.0	0.0	0.0
12	B11	831.67	820.50	165.0	0.0677	0.012	24.0	0.0	0.0
13	B12	836.67	832.50	130.0	0.0321	0.012	30.0	0.0	0.0
14	B13	834.25	832.50	175.0	0.0100	0.012	48.0	0.0	0.0
15	B4	835.67	834.20	210.0	0.0070	0.012	30.0	0.0	0.0
16	B5	844.67	844.17	100.0	0.0050	0.012	30.0	0.0	0.0
17	B6	843.65	842.90	150.0	0.0050	0.012	24.0	0.0	0.0
18	B7	836.67	836.00	63.0	0.0106	0.012	36.0	0.0	0.0
19	B8	853.00	844.17	1,200.0	0.0074	0.012	30.0	0.0	0.0
20	B9	848.00	847.00	110.0	0.0091	0.012	18.0	0.0	0.0
21	Ex SD	836.00	834.00	150.0	0.0133	0.012	36.0	0.0	0.0
22	MC Q	841.50	838.50	585.0	0.0051	0.012	36.0	0.0	0.0
23	SD	844.17	839.00	840.0	0.0062	0.012	42.0	0.0	0.0

Time span=0.01-60.00 hrs, dt=0.01 hrs, 6000 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Pond 1P: SD Inlet with Bypass SD Peak Elev=824.64' Inflow=3.41 cfs 2.735 af
Primary=3.41 cfs 2.735 af Secondary=0.00 cfs 0.000 af Outflow=3.41 cfs 2.735 af

Pond 2P: 60" SD MH Peak Elev=839.69' Inflow=8.31 cfs 1.203 af
Primary=8.31 cfs 1.203 af Secondary=0.00 cfs 0.000 af Outflow=8.31 cfs 1.203 af

Pond 15P: SD System 42" HDPE Peak Elev=844.17' Inflow=0.00 cfs 0.000 af
Outflow=0.00 cfs 0.000 af

Pond 16P: Dbl Conc. Arch Culvert (37x23) Peak Elev=843.88' Inflow=2.62 cfs 2.008 af
36.3" x 22.5", R=18.8"/51.0" Pipe Arch Culvert x 2.00 n=0.011 L=860.0' S=0.0024 '/' Outflow=2.62 cfs 2.008 af

Pond 17P: Gran Cielo Dwy Peak Elev=854.16' Storage=4,945 cf Inflow=47.53 cfs 10.915 af
Primary=46.40 cfs 10.915 af Secondary=0.00 cfs 0.000 af Tertiary=0.00 cfs 0.000 af Outflow=46.40 cfs 10.915 af

Pond 18P: GC-CkD1 Peak Elev=848.08' Storage=3,533 cf Inflow=70.49 cfs 16.278 af
Primary=0.19 cfs 0.004 af Secondary=0.00 cfs 0.000 af Tertiary=70.21 cfs 16.239 af Outflow=70.40 cfs 16.244 af

Pond 19P: GC-CkD2 Peak Elev=848.01' Storage=8,327 cf Inflow=5.16 cfs 1.055 af
Primary=0.95 cfs 0.982 af Secondary=0.54 cfs 0.072 af Tertiary=0.00 cfs 0.000 af Outflow=1.49 cfs 1.053 af

Pond 20P: GC-CkD3 Peak Elev=845.08' Storage=5,376 cf Inflow=3.41 cfs 1.689 af
Primary=2.17 cfs 1.674 af Secondary=0.04 cfs 0.005 af Tertiary=0.00 cfs 0.000 af Outflow=2.21 cfs 1.678 af

Pond B1: Basin 1 Peak Elev=834.95' Storage=2.513 af Inflow=33.80 cfs 5.194 af
Discarded=0.96 cfs 2.782 af Primary=2.98 cfs 2.060 af Secondary=0.00 cfs 0.000 af Outflow=3.94 cfs 4.842 af

Pond B10: Basin 10 Peak Elev=816.90' Storage=91,317 cf Inflow=16.54 cfs 3.474 af
Discarded=0.77 cfs 2.542 af Primary=0.70 cfs 0.513 af Secondary=0.00 cfs 0.000 af Outflow=1.47 cfs 3.055 af

Pond B11: Basin 11 Peak Elev=832.03' Storage=33,359 cf Inflow=9.10 cfs 1.469 af
Discarded=0.21 cfs 0.739 af Primary=0.79 cfs 0.473 af Secondary=0.00 cfs 0.000 af Outflow=1.00 cfs 1.212 af

Pond B12: Basin 12 Peak Elev=836.87' Storage=49,369 cf Inflow=11.41 cfs 1.819 af
Discarded=0.43 cfs 1.374 af Primary=0.29 cfs 0.184 af Secondary=0.00 cfs 0.000 af Outflow=0.72 cfs 1.558 af

Pond B13: Basin 13 Peak Elev=841.67' Storage=1.893 af Inflow=32.84 cfs 5.235 af
Discarded=0.38 cfs 1.221 af Primary=4.63 cfs 3.620 af Secondary=0.00 cfs 0.000 af Outflow=5.01 cfs 4.841 af

Pond B4: Basin 4 Peak Elev=837.92' Storage=85,087 cf Inflow=23.47 cfs 4.132 af
Discarded=0.48 cfs 1.470 af Primary=2.53 cfs 2.426 af Secondary=0.00 cfs 0.000 af Outflow=3.01 cfs 3.896 af

Pond B5: Basin 5 Peak Elev=846.09' Storage=35,848 cf Inflow=8.91 cfs 2.019 af
Discarded=0.34 cfs 1.073 af Primary=0.91 cfs 0.946 af Secondary=0.00 cfs 0.000 af Outflow=1.25 cfs 2.019 af

Pond B6: Basin 6 Peak Elev=849.79' Storage=1.388 af Inflow=16.99 cfs 3.559 af
Discarded=0.30 cfs 0.944 af Primary=4.94 cfs 2.333 af Secondary=0.00 cfs 0.000 af Outflow=5.24 cfs 3.277 af

Pond B7: Basin 7 Peak Elev=841.02' Storage=89,685 cf Inflow=9.38 cfs 4.548 af
Discarded=1.05 cfs 3.899 af Primary=0.96 cfs 0.621 af Secondary=0.00 cfs 0.000 af Outflow=2.01 cfs 4.520 af

Pond B8: Basin 8 Peak Elev=856.21' Storage=68,173 cf Inflow=12.19 cfs 3.178 af
Discarded=0.46 cfs 1.664 af Primary=1.05 cfs 1.514 af Secondary=0.00 cfs 0.000 af Outflow=1.51 cfs 3.178 af

Pond B9: Basin 9 Peak Elev=848.48' Storage=3,029 cf Inflow=1.74 cfs 0.481 af
Outflow=1.02 cfs 0.479 af

Pond Ex SD: Tract #1632 **Ex. 36" SD Outlet** Peak Elev=836.36' Inflow=0.96 cfs 0.621 af
36.0" Round Culvert n=0.012 L=150.0' S=0.0133 '/' Outflow=0.96 cfs 0.621 af

Pond MC Q: SD System Peak Elev=845.79' Storage=0.505 af Inflow=17.34 cfs 3.116 af
Discarded=0.11 cfs 0.358 af Primary=8.31 cfs 1.203 af Secondary=8.80 cfs 1.274 af Outflow=17.22 cfs 2.836 af

Pond SD: 42" HDPE SD Peak Elev=844.69' Inflow=1.91 cfs 2.460 af
42.0" Round Culvert n=0.012 L=840.0' S=0.0062 '/' Outflow=1.91 cfs 2.460 af

Summary for Pond 1P: SD Inlet with Bypass SD

Inflow Area = 108.566 ac, 6.93% Impervious, Inflow Depth = 0.30" for 2 Year event
Inflow = 3.41 cfs @ 10.27 hrs, Volume= 2.735 af
Outflow = 3.41 cfs @ 10.27 hrs, Volume= 2.735 af, Atten= 0%, Lag= 0.0 min
Primary = 3.41 cfs @ 10.27 hrs, Volume= 2.735 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

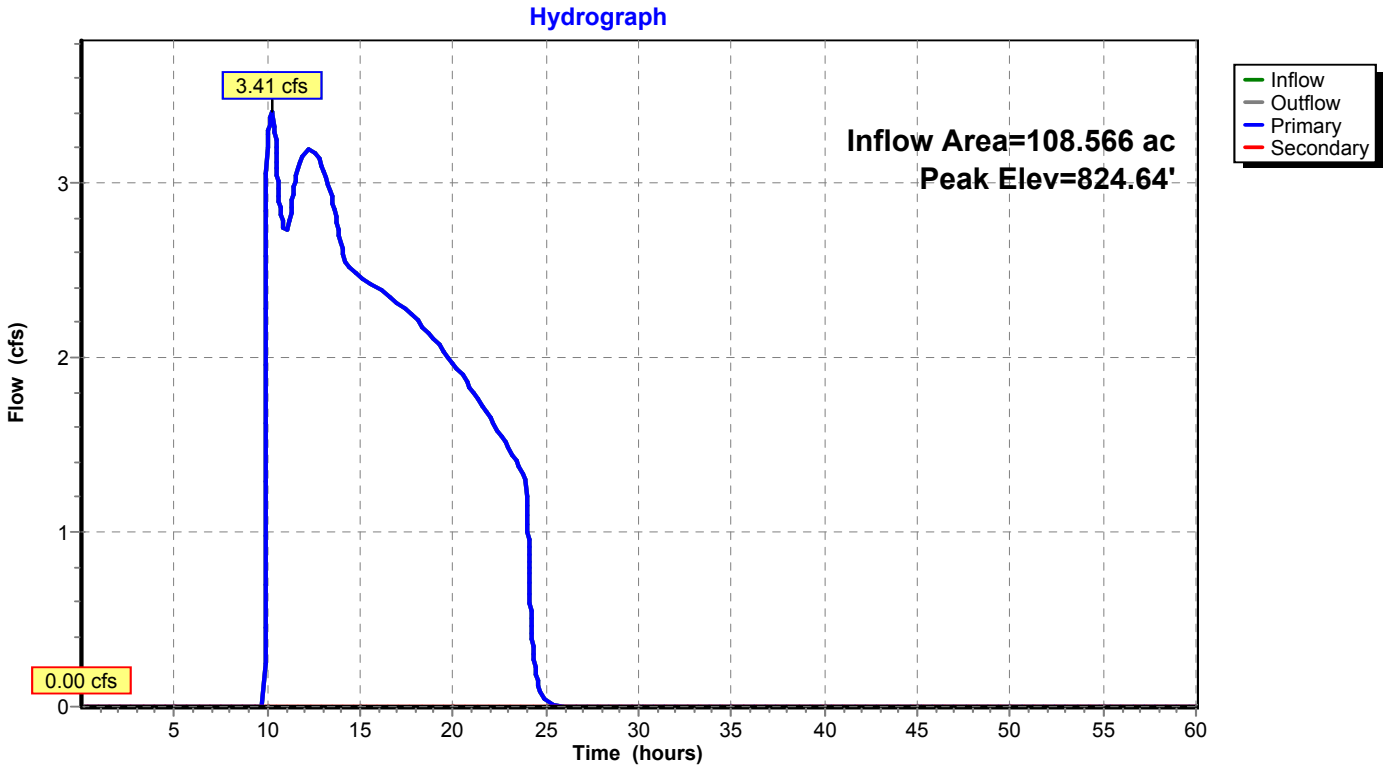
Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 824.64' @ 10.27 hrs
Flood Elev= 826.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	820.00'	**48.0" Round Culvert** L= 990.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 820.00' / 814.11' S= 0.0059 '/' Cc= 0.900 n= 0.012, Flow Area= 12.57 sf
#2	Device 1	824.50'	**78.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	825.90'	**Special & User-Defined** Head (feet) 0.00 0.50 0.67 0.83 Disch. (cfs) 0.000 200.000 450.000 1,200.000

Primary OutFlow Max=3.41 cfs @ 10.27 hrs HW=824.64' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 3.41 cfs of 98.40 cfs potential flow)
└─**2=Orifice/Grate** (Weir Controls 3.41 cfs @ 1.24 fps)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=820.00' TW=0.00' (Dynamic Tailwater)
└─**3=Special & User-Defined** (Controls 0.00 cfs)

Pond 1P: SD Inlet with Bypass SD



Summary for Pond 2P: 60" SD MH

Inflow Area = 21.500 ac, 80.00% Impervious, Inflow Depth = 0.67" for 2 Year event
Inflow = 8.31 cfs @ 9.99 hrs, Volume= 1.203 af
Outflow = 8.31 cfs @ 9.99 hrs, Volume= 1.203 af, Atten= 0%, Lag= 0.0 min
Primary = 8.31 cfs @ 9.99 hrs, Volume= 1.203 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

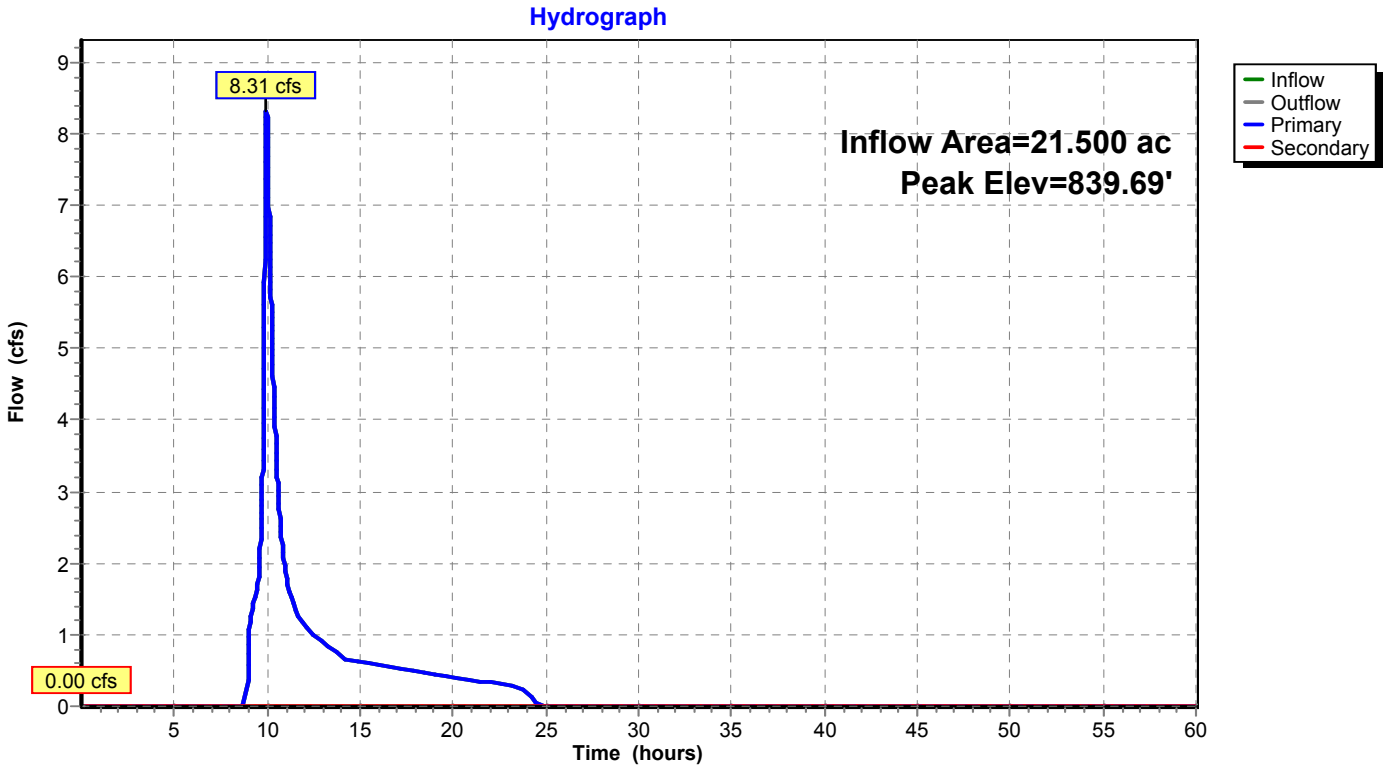
Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 839.69' @ 9.99 hrs
Flood Elev= 845.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	838.50'	**36.0" Round Culvert** L= 500.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 838.50' / 836.50' S= 0.0040 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 7.07 sf
#2	Secondary	844.25'	**69.6" W x 9.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=8.31 cfs @ 9.99 hrs HW=839.69' TW=833.92' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 8.31 cfs @ 4.71 fps)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=838.50' TW=826.50' (Dynamic Tailwater)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 2P: 60" SD MH



Summary for Pond 15P: SD System 42" HDPE

2 - 6 foot long curb openings (one on both sides of Linne Rd)
with 25 foot x 12 inch wide channel drain in Conc C&G

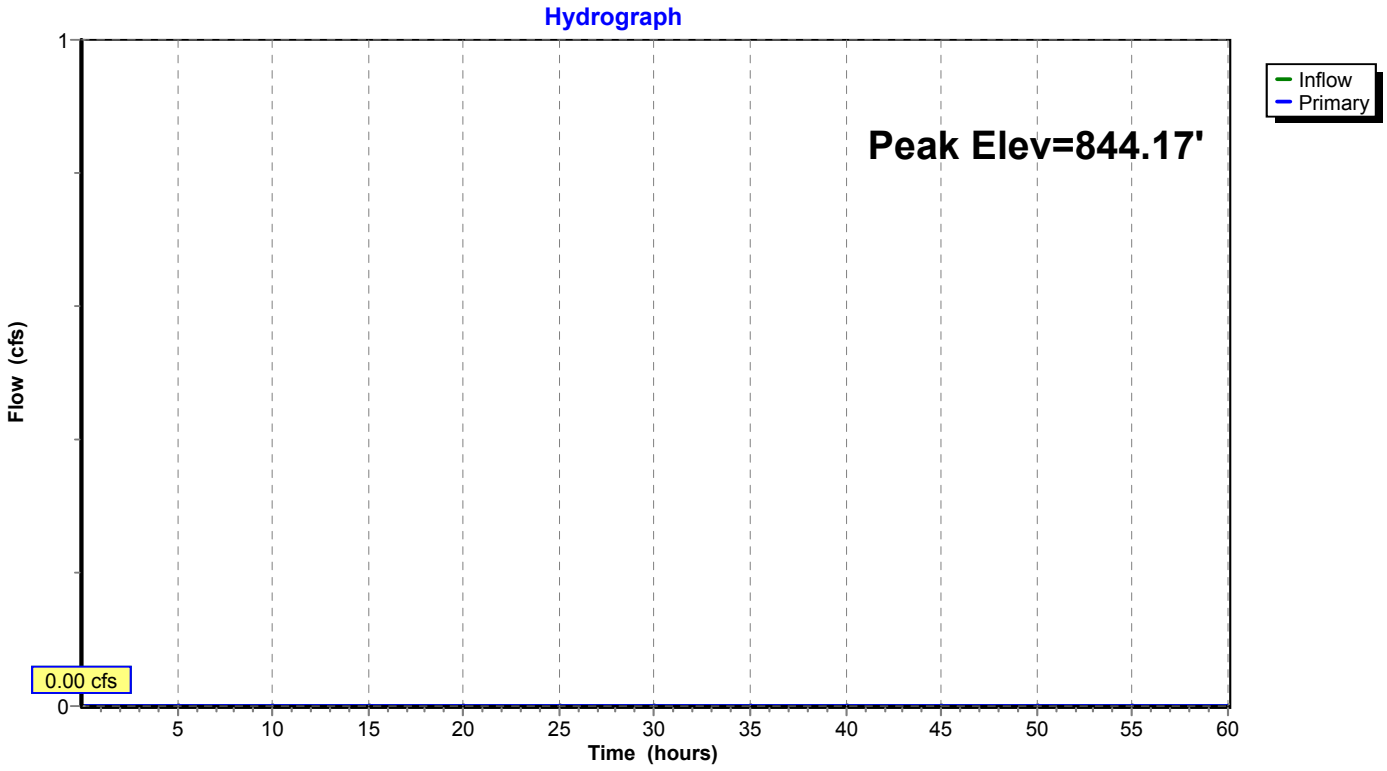
Inflow	=	0.00 cfs @	0.01 hrs, Volume=	0.000 af
Outflow	=	0.00 cfs @	0.01 hrs, Volume=	0.000 af, Atten= 0%, Lag= 0.0 min
Primary	=	0.00 cfs @	0.01 hrs, Volume=	0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 844.17' @ 0.85 hrs
Flood Elev= 845.02'

Device	Routing	Invert	Outlet Devices
#1	Primary	839.75'	**42.0" Round Culvert** L= 1,370.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 839.75' / 833.60' S= 0.0045 '/' Cc= 0.900 n= 0.012, Flow Area= 9.62 sf
#2	Device 1	844.17'	**72.0" W x 9.0" H Vert. Orifice/Grate X 2.00** C= 0.600
#3	Device 1	844.25'	**12.0" x 180.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.01 hrs HW=839.75' TW=826.50' (Dynamic Tailwater)
└─**1=Culvert** (Controls 0.00 cfs)
└─**2=Orifice/Grate** (Controls 0.00 cfs)
└─**3=Orifice/Grate** (Controls 0.00 cfs)

Pond 15P: SD System 42" HDPE



Summary for Pond 16P: Dbl Conc. Arch Culvert (37x23)

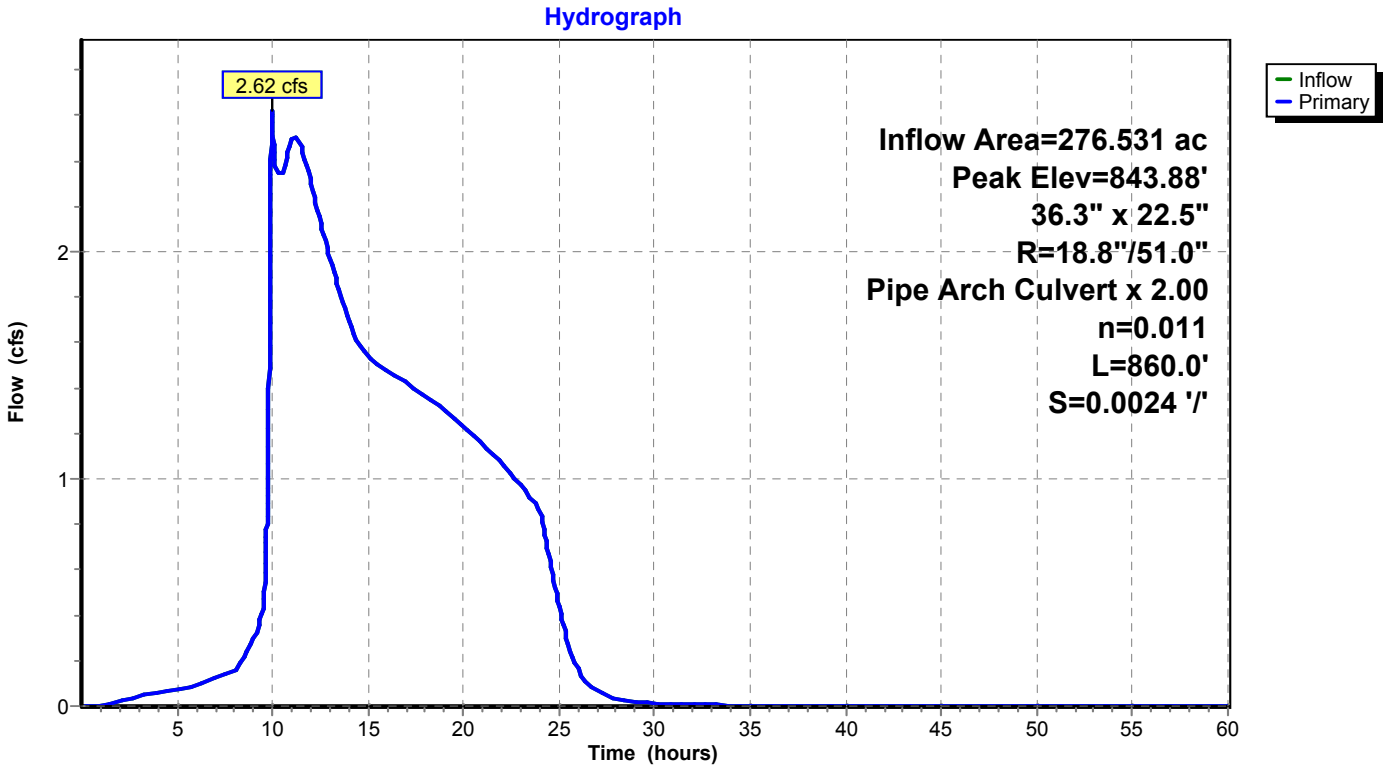
Inflow Area = 276.531 ac, 1.60% Impervious, Inflow Depth = 0.09" for 2 Year event
Inflow = 2.62 cfs @ 9.99 hrs, Volume= 2.008 af
Outflow = 2.62 cfs @ 9.99 hrs, Volume= 2.008 af, Atten= 0%, Lag= 0.0 min
Primary = 2.62 cfs @ 9.99 hrs, Volume= 2.008 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 843.88' @ 9.99 hrs
Flood Elev= 846.02'

Device	Routing	Invert	Outlet Devices
#1	Primary	843.50'	**36.3" W x 22.5" H, R=18.8"/51.0" Pipe Arch RCP_Arch 37x23 X 2.00** L= 860.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 843.50' / 841.40' S= 0.0024 '/' Cc= 0.900 n= 0.011, Flow Area= 4.43 sf

Primary OutFlow Max=2.62 cfs @ 9.99 hrs HW=843.88' TW=0.00' (Dynamic Tailwater)
↑—**1=RCP_Arch 37x23** (Barrel Controls 2.62 cfs @ 2.28 fps)

Pond 16P: Dbl Conc. Arch Culvert (37x23)

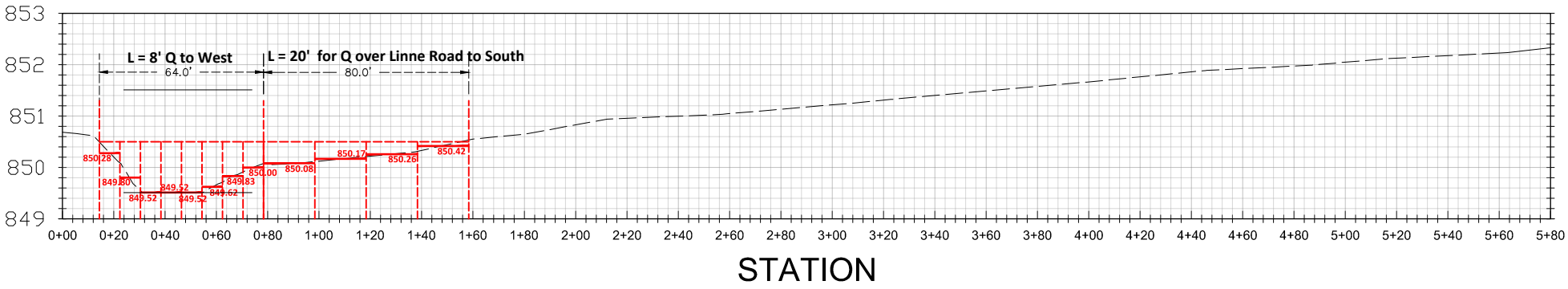


OLSEN RANCH PROJECT

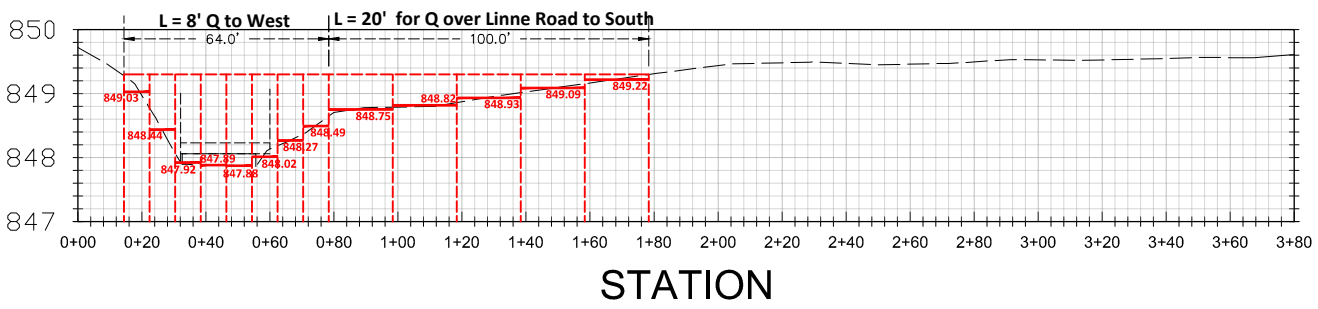
Broad Crested Weir Sizing Details

Linne Road Overtopping

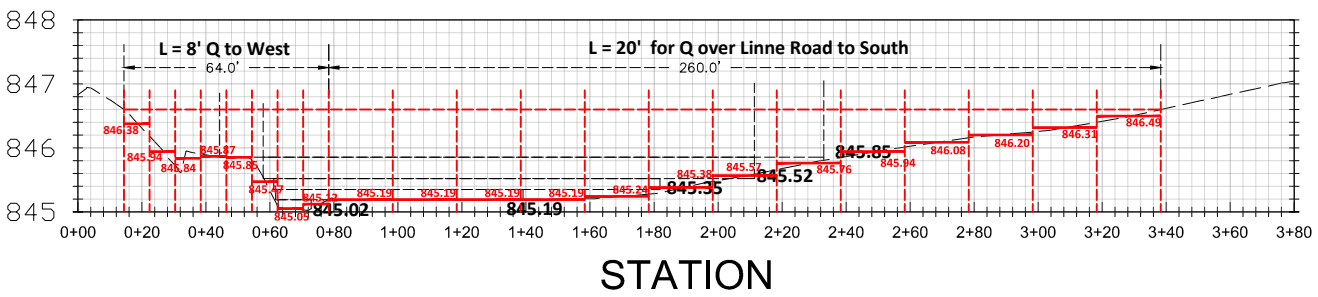
PROFILE OF CHECK DAM #1 (NORTH OF LINNE ROAD)



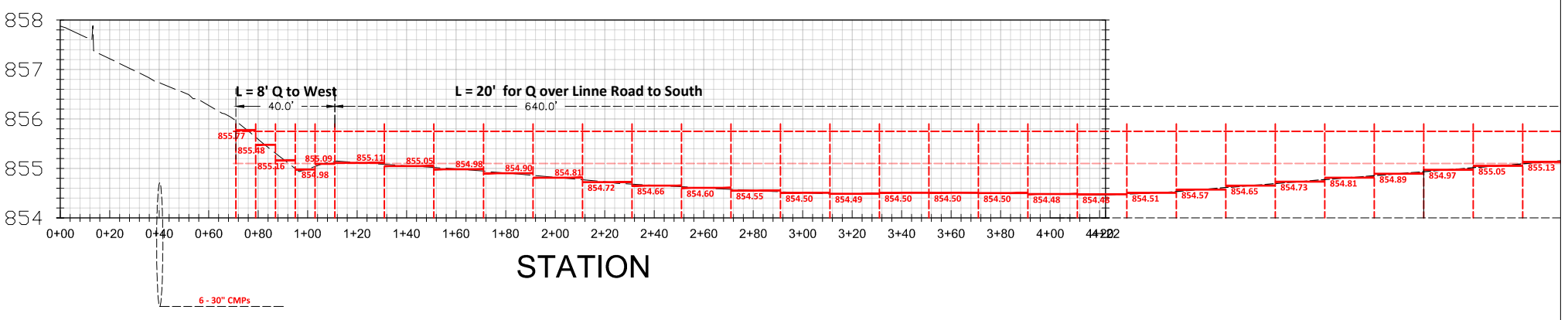
PROFILE OF CHECK DAM #2 (NORTH OF LINNE ROAD)



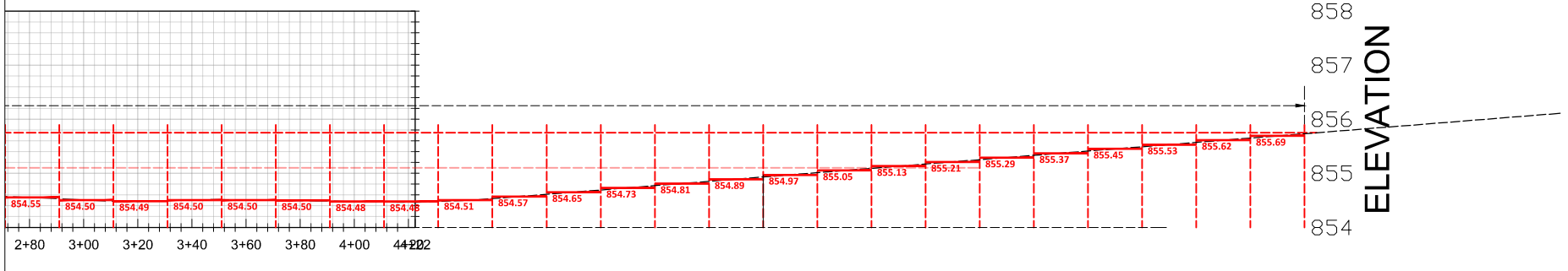
PROFILE OF CHECK DAM #3 (NORTH OF LINNE ROAD)



PROFILE OF Gran Cielo Driveway (NORTH OF LINNE ROAD)



Gran Cielo Driveway (NORTH OF LINNE ROAD)



Reso A - Exhibit C2 (EIR Technical Appendix)

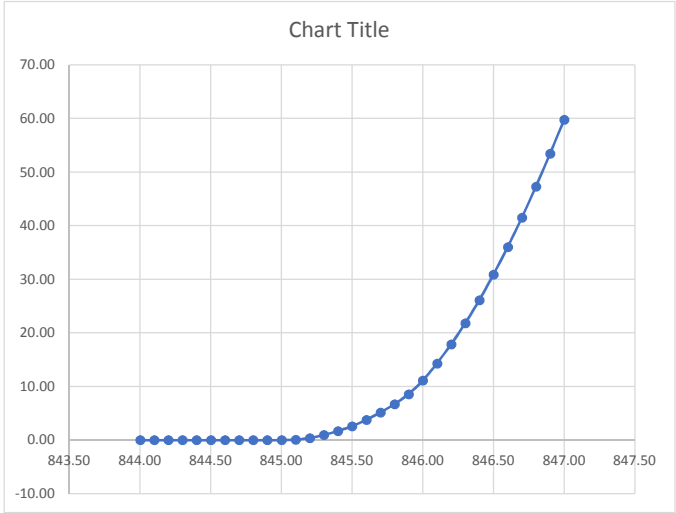
CHECK DAM CkD3 Q to West

IRREGULAR BROAD CRESTED WEIR METHOD

Q = CL(H^1.5)

C	0.60
L	8.00

0.10	W1	W2	W3	W4	W5	W6	W7	W8	W9	Total
WSE	846.38	845.94	845.84	845.87	845.85	845.47	845.05	845.12		
844.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
844.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
844.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
844.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
844.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
844.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
844.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
844.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
844.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
844.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
845.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
845.10	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00		0.05
845.20	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.11		0.39
845.30	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.37		0.97
845.40	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.71		1.71
845.50	0.00	0.00	0.00	0.00	0.00	0.02	1.45	1.12		2.60
845.60	0.00	0.00	0.00	0.00	0.00	0.22	1.96	1.60		3.78
845.70	0.00	0.00	0.00	0.00	0.00	0.53	2.52	2.12		5.17
845.80	0.00	0.00	0.00	0.00	0.00	0.91	3.12	2.69		6.72
845.90	0.00	0.00	0.07	0.02	0.05	1.35	3.76	3.31		8.57
846.00	0.00	0.07	0.31	0.22	0.28	1.85	4.44	3.96		11.14
846.10	0.00	0.31	0.64	0.53	0.60	2.40	5.16	4.66		14.29
846.20	0.00	0.64	1.04	0.91	0.99	2.99	5.92	5.39		17.88
846.30	0.00	1.04	1.50	1.35	1.45	3.63	6.71	6.15		21.83
846.40	0.01	1.50	2.01	1.85	1.96	4.30	7.53	6.95		26.12
846.50	0.20	2.01	2.57	2.40	2.52	5.02	8.38	7.78		30.88
846.60	0.50	2.57	3.18	2.99	3.12	5.77	9.26	8.64		36.03
846.70	0.87	3.18	3.83	3.63	3.76	6.55	10.17	9.53		41.52
846.80	1.31	3.83	4.51	4.30	4.44	7.36	11.11	10.45		47.33
846.90	1.80	4.51	5.24	5.02	5.16	8.21	12.08	11.40		53.42
847.00	2.34	5.24	6.00	5.77	5.92	9.08	13.07	12.37		59.79



Reso A - Exhibit C2 (EIR Technical Appendix)

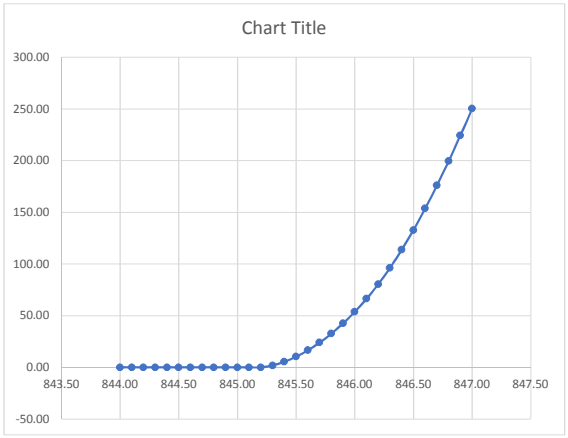
CHECK DAM CkD3 Q to South

IRREGULAR BROAD CRESTED WEIR METHOD

Q = CL(H^1.5)

C	0.60
L	20.00

0.10	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	Total
WSE	845.19	845.19	845.19	845.19	845.24	845.38	845.57	845.76	845.94	846.08	846.20	846.31	846.49	
844.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
844.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
844.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
844.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
844.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
844.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
844.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
844.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
844.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
844.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
845.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
845.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
845.20	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
845.30	0.44	0.44	0.44	0.44	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.93
845.40	1.15	1.15	1.15	1.15	0.77	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.42
845.50	2.07	2.07	2.07	2.07	1.59	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.37
845.60	3.15	3.15	3.15	3.15	2.59	1.24	0.06	0.00	0.00	0.00	0.00	0.00	0.00	16.49
845.70	4.37	4.37	4.37	4.37	3.74	2.17	0.56	0.00	0.00	0.00	0.00	0.00	0.00	23.96
845.80	5.72	5.72	5.72	5.72	5.03	3.27	1.32	0.10	0.00	0.00	0.00	0.00	0.00	32.58
845.90	7.18	7.18	7.18	7.18	6.43	4.50	2.27	0.63	0.00	0.00	0.00	0.00	0.00	42.55
846.00	8.75	8.75	8.75	8.75	7.95	5.86	3.38	1.41	0.18	0.00	0.00	0.00	0.00	53.77
846.10	10.42	10.42	10.42	10.42	9.57	7.33	4.63	2.38	0.77	0.03	0.00	0.00	0.00	66.38
846.20	12.18	12.18	12.18	12.18	11.29	8.91	6.00	3.50	1.59	0.50	0.00	0.00	0.00	80.51
846.30	14.03	14.03	14.03	14.03	13.10	10.59	7.48	4.76	2.59	1.24	0.38	0.00	0.00	96.28
846.40	15.97	15.97	15.97	15.97	14.99	12.36	9.07	6.14	3.74	2.17	1.07	0.32	0.00	113.77
846.50	17.99	17.99	17.99	17.99	16.97	14.22	10.76	7.64	5.03	3.27	1.97	0.99	0.01	132.84
846.60	20.09	20.09	20.09	20.09	19.03	16.17	12.54	9.24	6.43	4.50	3.04	1.87	0.44	153.63
846.70	22.27	22.27	22.27	22.27	21.17	18.20	14.41	10.94	7.95	5.86	4.24	2.92	1.15	175.91
846.80	24.51	24.51	24.51	24.51	23.38	20.31	16.37	12.73	9.57	7.33	5.58	4.12	2.07	199.51
846.90	26.83	26.83	26.83	26.83	25.67	22.49	18.41	14.61	11.29	8.91	7.03	5.44	3.15	224.31
847.00	29.22	29.22	29.22	29.22	28.02	24.74	20.52	16.57	13.10	10.59	8.59	6.88	4.37	250.26



Reso A - Exhibit C2 (EIR Technical Appendix)

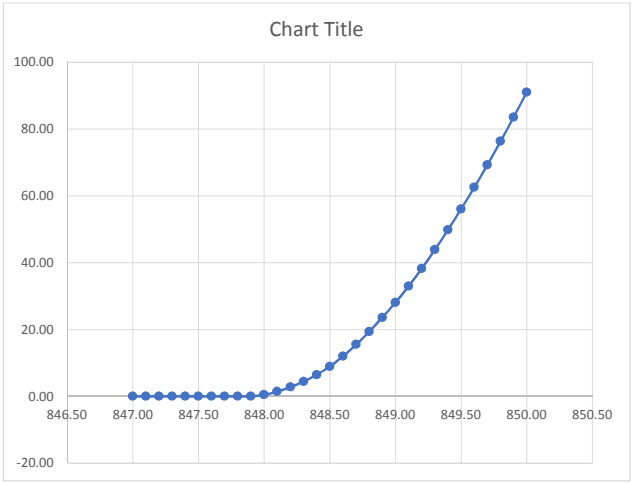
CHECK DAM CkD2 Q to West

IRREGULAR BROAD CRESTED WEIR METHOD

Q = CL(H^1.5)

C	0.60
L	8.00

0.10	W1	W2	W3	W4	W5	W6	W7	W8	W9	Total
WSE	849.03	848.44	847.92	847.89	847.88	848.02	848.27	848.49		
847.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
847.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
847.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
847.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
847.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
847.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
847.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
847.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
847.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
847.90	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00		0.02
848.00	0.00	0.00	0.11	0.18	0.20	0.00	0.00	0.00		0.48
848.10	0.00	0.00	0.37	0.46	0.50	0.11	0.00	0.00		1.43
848.20	0.00	0.00	0.71	0.83	0.87	0.37	0.00	0.00		2.78
848.30	0.00	0.00	1.12	1.26	1.31	0.71	0.02	0.00		4.43
848.40	0.00	0.00	1.60	1.75	1.80	1.12	0.22	0.00		6.49
848.50	0.00	0.07	2.12	2.29	2.34	1.60	0.53	0.00		8.95
848.60	0.00	0.31	2.69	2.87	2.93	2.12	0.91	0.18		12.01
848.70	0.00	0.64	3.31	3.50	3.56	2.69	1.35	0.46		15.51
848.80	0.00	1.04	3.96	4.17	4.24	3.31	1.85	0.83		19.39
848.90	0.00	1.50	4.66	4.87	4.94	3.96	2.40	1.26		23.59
849.00	0.00	2.01	5.39	5.61	5.69	4.66	2.99	1.75		28.10
849.10	0.09	2.57	6.15	6.39	6.47	5.39	3.63	2.29		32.98
849.20	0.34	3.18	6.95	7.20	7.28	6.15	4.30	2.87		38.27
849.30	0.67	3.83	7.78	8.04	8.12	6.95	5.02	3.50		43.91
849.40	1.08	4.51	8.64	8.91	9.00	7.78	5.77	4.17		49.85
849.50	1.55	5.24	9.53	9.81	9.90	8.64	6.55	4.87		56.08
849.60	2.07	6.00	10.45	10.73	10.83	9.53	7.36	5.61		62.58
849.70	2.63	6.79	11.40	11.69	11.79	10.45	8.21	6.39		69.34
849.80	3.24	7.61	12.37	12.67	12.77	11.40	9.08	7.20		76.35
849.90	3.90	8.47	13.37	13.68	13.78	12.37	9.99	8.04		83.59
850.00	4.59	9.35	14.40	14.71	14.82	13.37	10.92	8.91		91.07
850.10	5.31	10.27	15.45	15.77	15.88	14.40	11.88	9.81		98.76
850.20	6.07	11.21	16.53	16.85	16.96	15.45	12.87	10.73		106.67
850.30	6.87	12.18	17.62	17.96	18.07	16.53	13.88	11.69		114.80
850.40	7.70	13.17	18.75	19.09	19.20	17.62	14.92	12.67		123.12
850.50	8.55	14.19	19.89	20.24	20.36	18.75	15.98	13.68		131.64
850.60	9.44	15.24	21.06	21.41	21.53	19.89	17.07	14.71		140.36
850.70	10.36	16.31	22.25	22.61	22.73	21.06	18.18	15.77		149.27
850.80	11.30	17.40	23.46	23.83	23.95	22.25	19.32	16.85		158.36
850.90	12.27	18.52	24.69	25.07	25.19	23.46	20.47	17.96		167.64
851.00	13.27	19.66	25.95	26.33	26.45	24.69	21.65	19.09		177.09
851.10	14.30	20.82	27.22	27.61	27.73	25.95	22.85	20.24		186.72
851.20	15.34	22.01	28.51	28.91	29.04	27.22	24.07	21.41		196.52
851.30	16.42	23.22	29.83	30.23	30.36	28.51	25.32	22.61		206.48
851.40	17.51	24.44	31.16	31.56	31.70	29.83	26.58	23.83		216.62
851.50	18.63	25.69	32.51	32.92	33.06	31.16	27.86	25.07		226.91



Reso A - Exhibit C2 (EIR Technical Appendix)

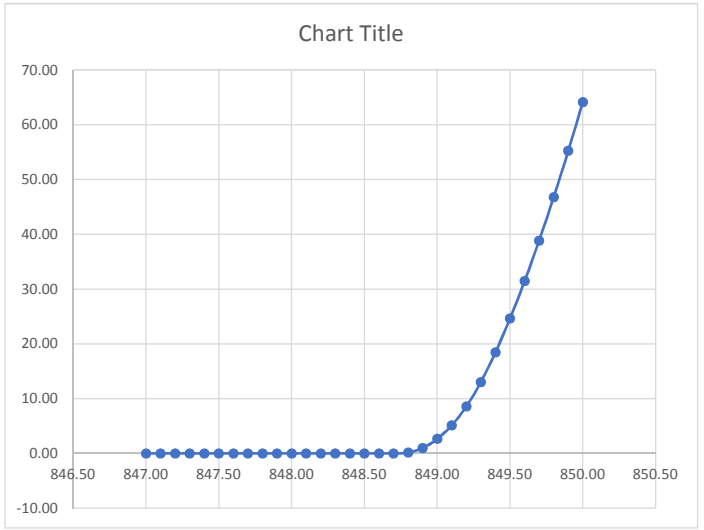
CHECK DAM CkD2 Q to South

IRREGULAR BROAD CRESTED WEIR METHOD

Q = CL(H^1.5)

C	0.60
L	20.00

0.10	W1	W2	W3	W4	W5	W6	W7	Total
WSE	848.75	848.82	848.93	849.09	849.22			
847.00	0.00	0.00	0.00	0.00	0.00			0.00
847.10	0.00	0.00	0.00	0.00	0.00			0.00
847.20	0.00	0.00	0.00	0.00	0.00			0.00
847.30	0.00	0.00	0.00	0.00	0.00			0.00
847.40	0.00	0.00	0.00	0.00	0.00			0.00
847.50	0.00	0.00	0.00	0.00	0.00			0.00
847.60	0.00	0.00	0.00	0.00	0.00			0.00
847.70	0.00	0.00	0.00	0.00	0.00			0.00
847.80	0.00	0.00	0.00	0.00	0.00			0.00
847.90	0.00	0.00	0.00	0.00	0.00			0.00
848.00	0.00	0.00	0.00	0.00	0.00			0.00
848.10	0.00	0.00	0.00	0.00	0.00			0.00
848.20	0.00	0.00	0.00	0.00	0.00			0.00
848.30	0.00	0.00	0.00	0.00	0.00			0.00
848.40	0.00	0.00	0.00	0.00	0.00			0.00
848.50	0.00	0.00	0.00	0.00	0.00			0.00
848.60	0.00	0.00	0.00	0.00	0.00			0.00
848.70	0.00	0.00	0.00	0.00	0.00			0.00
848.80	0.13	0.00	0.00	0.00	0.00			0.13
848.90	0.70	0.27	0.00	0.00	0.00			0.97
849.00	1.50	0.92	0.22	0.00	0.00			2.64
849.10	2.48	1.78	0.84	0.01	0.00			5.12
849.20	3.62	2.81	1.68	0.44	0.00			8.55
849.30	4.89	3.99	2.70	1.15	0.27			13.01
849.40	6.29	5.30	3.87	2.07	0.92			18.44
849.50	7.79	6.73	5.16	3.15	1.78			24.62
849.60	9.40	8.27	6.58	4.37	2.81			31.43
849.70	11.11	9.91	8.11	5.72	3.99			38.83
849.80	12.91	11.64	9.74	7.18	5.30			46.77
849.90	14.80	13.47	11.46	8.75	6.73			55.21
850.00	16.77	15.38	13.28	10.42	8.27			64.12



Reso A - Exhibit C2 (EIR Technical Appendix)

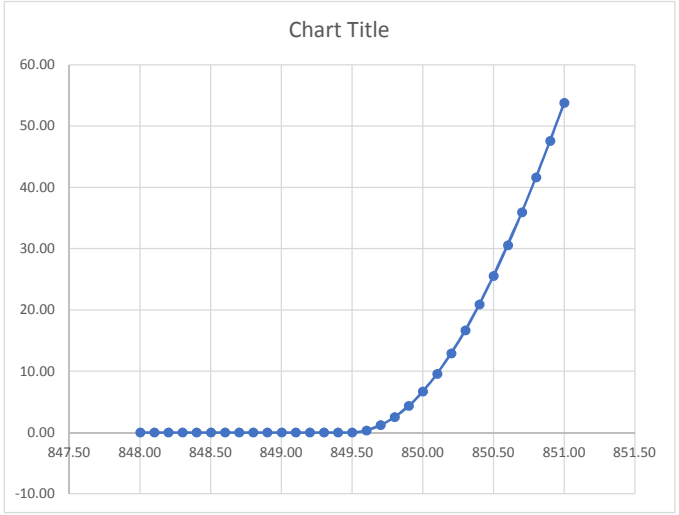
CHECK DAM CkD1 Q to West

IRREGULAR BROAD CRESTED WEIR METHOD

Q = CL(H^1.5)

C	0.60
L	8.00

0.10	W1	W2	W3	W4	W5	W6	W7	W8	W9	Total
WSE	850.28	849.80	849.52	849.52	849.52	849.62	849.83	850.00		
848.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
848.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
848.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
848.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
848.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
848.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
848.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
848.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
848.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
848.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
849.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
849.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
849.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
849.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
849.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
849.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00
849.60	0.00	0.00	0.11	0.11	0.11	0.00	0.00	0.00		0.33
849.70	0.00	0.00	0.37	0.37	0.37	0.11	0.00	0.00		1.21
849.80	0.00	0.00	0.71	0.71	0.71	0.37	0.00	0.00		2.50
849.90	0.00	0.15	1.12	1.12	1.12	0.71	0.09	0.00		4.33
850.00	0.00	0.43	1.60	1.60	1.60	1.12	0.34	0.00		6.68
850.10	0.00	0.79	2.12	2.12	2.12	1.60	0.67	0.15		9.57
850.20	0.00	1.21	2.69	2.69	2.69	2.12	1.08	0.43		12.92
850.30	0.01	1.70	3.31	3.31	3.31	2.69	1.55	0.79		16.66
850.40	0.20	2.23	3.96	3.96	3.96	3.31	2.07	1.21		20.90
850.50	0.50	2.81	4.66	4.66	4.66	3.96	2.63	1.70		25.57
850.60	0.87	3.43	5.39	5.39	5.39	4.66	3.24	2.23		30.60
850.70	1.31	4.10	6.15	6.15	6.15	5.39	3.90	2.81		35.96
850.80	1.80	4.80	6.95	6.95	6.95	6.15	4.59	3.43		41.63
850.90	2.34	5.54	7.78	7.78	7.78	6.95	5.31	4.10		47.59
851.00	2.93	6.31	8.64	8.64	8.64	7.78	6.07	4.80		53.83
851.10	3.56	7.11	9.53	9.53	9.53	8.64	6.87	5.54		60.33
851.20	4.24	7.95	10.45	10.45	10.45	9.53	7.70	6.31		67.08
851.30	4.94	8.82	11.40	11.40	11.40	10.45	8.55	7.11		74.08
851.40	5.69	9.71	12.37	12.37	12.37	11.40	9.44	7.95		81.32
851.50	6.47	10.64	13.37	13.37	13.37	12.37	10.36	8.82		88.78
851.60	7.28	11.59	14.40	14.40	14.40	13.37	11.30	9.71		96.46
851.70	8.12	12.57	15.45	15.45	15.45	14.40	12.27	10.64		104.36
851.80	9.00	13.58	16.53	16.53	16.53	15.45	13.27	11.59		112.46
851.90	9.90	14.61	17.62	17.62	17.62	16.53	14.30	12.57		120.77
852.00	10.83	15.66	18.75	18.75	18.75	17.62	15.34	13.58		129.27



Reso A - Exhibit C2 (EIR Technical Appendix)

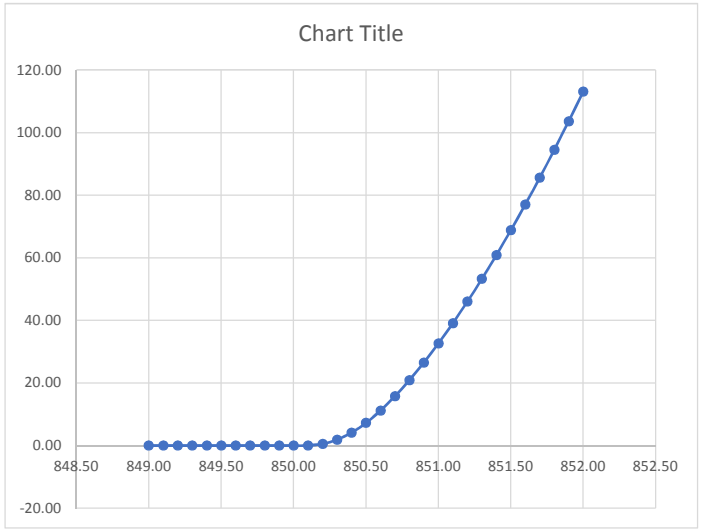
CHECK DAM CkD1 Q to South

IRREGULAR BROAD CRESTED WEIR METHOD

Q = CL(H^1.5)

C	0.60
L	20.00

0.10	W1	W2	W3	W4	W5	W6	W7	Total
WSE	850.08	850.17	850.26	850.42				
849.00	0.00	0.00	0.00	0.00				0.00
849.10	0.00	0.00	0.00	0.00				0.00
849.20	0.00	0.00	0.00	0.00				0.00
849.30	0.00	0.00	0.00	0.00				0.00
849.40	0.00	0.00	0.00	0.00				0.00
849.50	0.00	0.00	0.00	0.00				0.00
849.60	0.00	0.00	0.00	0.00				0.00
849.70	0.00	0.00	0.00	0.00				0.00
849.80	0.00	0.00	0.00	0.00				0.00
849.90	0.00	0.00	0.00	0.00				0.00
850.00	0.00	0.00	0.00	0.00				0.00
850.10	0.03	0.00	0.00	0.00				0.03
850.20	0.50	0.06	0.00	0.00				0.56
850.30	1.24	0.56	0.10	0.00				1.90
850.40	2.17	1.32	0.63	0.00				4.12
850.50	3.27	2.27	1.41	0.27				7.22
850.60	4.50	3.38	2.38	0.92				11.18
850.70	5.86	4.63	3.50	1.78				15.77
850.80	7.33	6.00	4.76	2.81				20.90
850.90	8.91	7.48	6.14	3.99				26.53
851.00	10.59	9.07	7.64	5.30				32.60
851.10	12.36	10.76	9.24	6.73				39.09
851.20	14.22	12.54	10.94	8.27				45.97
851.30	16.17	14.41	12.73	9.91				53.22
851.40	18.20	16.37	14.61	11.64				60.82
851.50	20.31	18.41	16.57	13.47				68.75
851.60	22.49	20.52	18.61	15.38				77.00
851.70	24.74	22.71	20.74	17.38				85.57
851.80	27.07	24.97	22.93	19.45				94.43
851.90	29.46	27.31	25.20	21.61				103.58
852.00	31.93	29.71	27.54	23.83				113.01



Reso A - Exhibit C2 (EIR Technical Appendix)

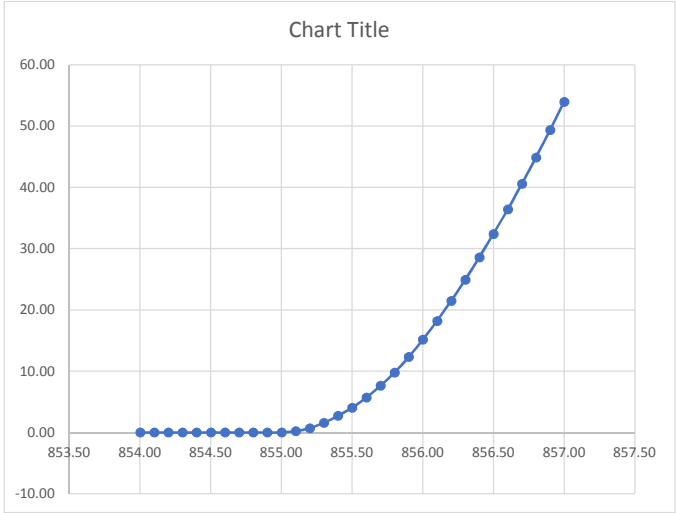
Gran Cielo Driveway GCDwy Q to West

IRREGULAR BROAD CRESTED WEIR METHOD

Q = CL(H^1.5)

C	0.60
L	8.00

0.10	W1	W2	W3	W4	W5	W6	W7	W8	W9	Total
WSE	855.77	855.48	855.16	854.98	855.09					
854.00	0.00	0.00	0.00	0.00	0.00					0.00
854.10	0.00	0.00	0.00	0.00	0.00					0.00
854.20	0.00	0.00	0.00	0.00	0.00					0.00
854.30	0.00	0.00	0.00	0.00	0.00					0.00
854.40	0.00	0.00	0.00	0.00	0.00					0.00
854.50	0.00	0.00	0.00	0.00	0.00					0.00
854.60	0.00	0.00	0.00	0.00	0.00					0.00
854.70	0.00	0.00	0.00	0.00	0.00					0.00
854.80	0.00	0.00	0.00	0.00	0.00					0.00
854.90	0.00	0.00	0.00	0.00	0.00					0.00
855.00	0.00	0.00	0.00	0.01	0.00					0.01
855.10	0.00	0.00	0.00	0.20	0.00					0.20
855.20	0.00	0.00	0.04	0.50	0.18					0.71
855.30	0.00	0.00	0.25	0.87	0.46					1.58
855.40	0.00	0.00	0.56	1.31	0.83					2.70
855.50	0.00	0.01	0.95	1.80	1.26					4.03
855.60	0.00	0.20	1.40	2.34	1.75					5.69
855.70	0.00	0.50	1.90	2.93	2.29					7.62
855.80	0.02	0.87	2.46	3.56	2.87					9.79
855.90	0.22	1.31	3.06	4.24	3.50					12.32
856.00	0.53	1.80	3.70	4.94	4.17					15.14
856.10	0.91	2.34	4.37	5.69	4.87					18.19
856.20	1.35	2.93	5.09	6.47	5.61					21.46
856.30	1.85	3.56	5.84	7.28	6.39					24.93
856.40	2.40	4.24	6.63	8.12	7.20					28.58
856.50	2.99	4.94	7.45	9.00	8.04					32.42
856.60	3.63	5.69	8.29	9.90	8.91					36.42
856.70	4.30	6.47	9.17	10.83	9.81					40.58
856.80	5.02	7.28	10.08	11.79	10.73					44.90
856.90	5.77	8.12	11.02	12.77	11.69					49.36
857.00	6.55	9.00	11.98	13.78	12.67					53.97



Reso A - Exhibit C2 (EIR Technical Appendix)

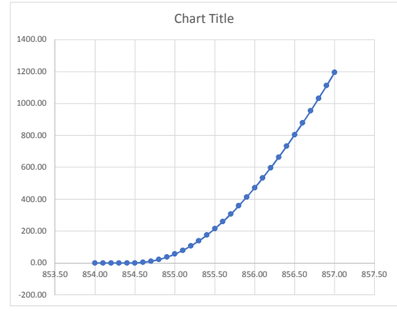
Gran Cielo Driveway GCDwy Q to South

IRREGULAR BROAD CRESTED WEIR METHOD

Q = CL(H^1.5)

C	0.60
L	20.00

0.10	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W13	W14	W15	W16	W17	W18	W19	W20	W21	W22	W23	W24	W25	W26	W27	W28	W29	W30	W31	Total
WSE	855.11	855.05	854.98	854.90	854.81	854.72	854.66	854.60	854.55	854.50	854.49	854.50	854.50	854.50	854.48	854.48	854.51	854.57	854.65	854.73	854.81	854.89	854.97	855.05	855.13	855.21	855.29	855.37	855.45	855.53	855.62	855.69	
854.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
854.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
854.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
854.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
854.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
854.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
854.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.38	0.44	0.38	0.38	0.38	0.50	0.50	0.32	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.47
854.70	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.38	0.70	1.07	1.15	1.07	1.07	1.07	1.24	1.24	0.99	0.56	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.79
854.80	0.00	0.00	0.00	0.00	0.00	0.27	0.63	1.07	1.50	1.97	2.07	1.97	1.97	1.97	2.17	2.17	1.87	1.32	0.70	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.89
854.90	0.00	0.00	0.00	0.00	0.32	0.92	1.41	1.97	2.48	3.04	3.15	3.04	3.04	3.04	3.27	3.27	2.92	2.27	1.50	0.84	0.32	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.81
855.00	0.00	0.00	0.03	0.38	0.99	1.78	2.38	3.04	3.62	4.24	4.37	4.24	4.24	4.24	4.50	4.50	4.12	3.38	2.48	1.68	0.99	0.44	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	55.72
855.10	0.00	0.13	0.50	1.07	1.87	2.81	3.50	4.24	4.89	5.58	5.72	5.58	5.58	5.58	5.86	5.86	5.44	4.63	3.62	2.70	1.87	1.15	0.56	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	78.89
855.20	0.32	0.70	1.24	1.97	2.92	3.99	4.76	5.58	6.29	7.03	7.18	7.03	7.03	7.03	7.33	7.33	6.88	6.00	4.89	3.87	2.92	2.07	1.32	0.70	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	106.60
855.30	0.99	1.50	2.17	3.04	4.12	5.30	6.14	7.03	7.79	8.59	8.75	8.59	8.59	8.59	8.91	8.91	8.43	7.48	6.29	5.16	4.12	3.15	2.27	1.50	0.84	0.32	0.01	0.00	0.00	0.00	0.00	0.00	138.58
855.40	1.87	2.48	3.27	4.24	5.44	6.73	7.64	8.59	9.40	10.25	10.42	10.25	10.25	10.25	10.59	10.59	10.08	9.07	7.79	6.58	5.44	4.37	3.38	2.48	1.68	0.99	0.44	0.06	0.00	0.00	0.00	0.00	174.62
855.50	2.92	3.62	4.50	5.58	6.88	8.27	9.24	10.25	11.11	12.00	12.18	12.00	12.00	12.00	12.36	12.36	11.82	10.76	9.40	8.11	6.88	5.72	4.63	3.62	2.70	1.87	1.15	0.56	0.13	0.00	0.00	0.00	214.63
855.60	4.12	4.89	5.86	7.03	8.43	9.91	10.94	12.00	12.91	13.84	14.03	13.84	13.84	13.84	14.22	14.22	13.66	12.54	11.11	9.74	8.43	7.18	6.00	4.89	3.87	2.92	2.07	1.32	0.70	0.22	0.00	0.00	258.59
855.70	5.44	6.29	7.33	8.59	10.08	11.64	12.73	13.84	14.80	15.77	15.97	15.77	15.77	15.77	16.17	16.17	15.58	14.41	12.91	11.46	10.08	8.75	7.48	6.29	5.16	4.12	3.15	2.27	1.50	0.84	0.27	0.01	306.44
855.80	6.88	7.79	8.91	10.25	11.82	13.47	14.61	15.77	16.77	17.79	17.99	17.79	17.79	17.79	18.20	18.20	17.58	16.37	14.80	13.28	11.82	10.42	9.07	7.79	6.58	5.44	4.37	3.38	2.48	1.68	0.92	0.44	358.24
855.90	8.43	9.40	10.59	12.00	13.66	15.38	16.57	17.79	18.82	19.88	20.09	19.88	19.88	19.88	20.31	20.31	19.67	18.41	16.77	15.19	13.66	12.18	10.76	9.40	8.11	6.88	5.72	4.63	3.62	2.70	1.78	1.15	413.47
856.00	10.08	11.11	12.36	13.84	15.58	17.38	18.61	19.88	20.95	22.05	22.27	22.05	22.05	22.05	22.49	22.49	21.83	20.52	18.82	17.17	15.58	14.03	12.54	11.11	9.74	8.43	7.18	6.00	4.89	3.87	2.81	2.07	471.81
856.10	11.82	12.91	14.22	15.77	17.58	19.45	20.74	22.05	23.16	24.29	24.51	24.29	24.29	24.29	24.74	24.74	24.06	22.71	20.95	19.24	17.58	15.97	14.41	12.91	11.46	10.08	8.75	7.48	6.29	5.16	3.99	3.15	533.06
856.20	13.66	14.80	16.17	17.79	19.67	21.61	22.93	24.29	25.43	26.60	26.83	26.60	26.60	26.60	27.07	27.07	26.36	24.97	23.16	21.39	19.67	17.99	16.37	14.80	13.28	11.82	10.42	9.07	7.79	6.58	5.30	4.37	597.05
856.30	15.58	16.77	18.20	19.88	21.83	23.83	25.20	26.60	27.78	28.98	29.22	28.98	28.98	28.98	29.46	29.46	28.74	27.31	25.43	23.61	21.83	20.09	18.41	16.77	15.19	13.66	12.18	10.76	9.40	8.11	6.73	5.72	663.65
856.40	17.58	18.82	20.31	22.05	24.06	26.13	27.54	28.98	30.20	31.43	31.68	31.43	31.43	31.43	31.93	31.93	31.18	29.71	27.78	25.90	24.06	22.27	20.52	18.82	17.17	15.58	14.03	12.54	11.11	9.74	8.27	7.18	732.76
856.50	19.67	20.95	22.49	24.29	26.36	28.50	29.95	31.43	32.68	33.94	34.20	33.94	33.94	33.94	34.45	34.45	33.69	32.17	30.20	28.26	26.36	24.51	22.71	20.95	19.24	17.58	15.97	14.41	12.91	11.46	9.91	8.75	804.27
856.60	21.83	23.16	24.74	26.60	28.74	30.93	32.43	33.94	35.22	36.52	36.78	36.52	36.52	36.52	37.04	37.04	36.26	34.71	32.68	30.69	28.74	26.83	24.97	23.16	21.39	19.67	17.99	16.37	14.80	13.28	11.64	10.42	878.10
856.70	24.06	25.43	27.07	28.98	31.18	33.43	34.96	36.52	37.83	39.16	39.42	39.16	39.16	39.16	39.69	39.69	38.89	37.30	35.22	33.18	31.18	29.22	27.31	25.43	23.61	21.83	20.09	18.41	16.77	15.19	13.47	12.18	954.18
856.80	26.36	27.78	29.46	31.43	33.69	36.00	37.57	39.16	40.50	41.86	42.13	41.86	41.86	41.86	42.40	42.40	41.58	39.96	37.83	35.74	33.69	31.68	29.71	27.78	25.90	24.06	22.27	20.52	18.82	17.17	15.38	14.03	1032.44
856.90	28.74	30.20	31.93	33.94	36.26	38.62	40.23	41.86	43.23	44.62	44.90	44.62	44.62	44.62	45.18	45.18	44.34	42.68	40.50	38.36	36.26	34.20	32.17	30.20	28.26	26.36	24.51	22.71	20.95	19.24	17.38	15.97	1112.81
857.00	31.18	32.68	34.45	36.52	38.89	41.31	42.95	44.62	46.02	47.43	47.72	47.43	47.43	47.43	48.00	48.00	47.15	45.46	43.23	41.04	38.89	36.78	34.71	32.68	30.69	28.74	26.83	24.97	23.16	21.39	19.45	17.99	1195.24



Summary for Pond 17P: Gran Cielo Dwy

Inflow Area = 166.738 ac, 0.91% Impervious, Inflow Depth = 0.79" for 2 Year event
Inflow = 47.53 cfs @ 9.99 hrs, Volume= 10.915 af
Outflow = 46.40 cfs @ 10.02 hrs, Volume= 10.915 af, Atten= 2%, Lag= 1.7 min
Primary = 46.40 cfs @ 10.02 hrs, Volume= 10.915 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af
Tertiary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 854.16' @ 10.02 hrs Surf.Area= 6,317 sf Storage= 4,945 cf
Flood Elev= 854.46' Surf.Area= 6,947 sf Storage= 6,934 cf

Plug-Flow detention time= 2.2 min calculated for 10.913 af (100% of inflow)
Center-of-Mass det. time= 2.2 min (868.6 - 866.5)

Volume	Invert	Avail.Storage	Storage Description
#1	852.84'	22,270 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
852.84	0	0	0
853.14	2,586	388	388
854.14	6,275	4,431	4,818
855.14	8,376	7,326	12,144
856.14	11,876	10,126	22,270

Device	Routing	Invert	Outlet Devices
#1	Primary	852.84'	**30.0" Round Culvert X 6.00** L= 77.0' CMP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 852.84' / 851.76' S= 0.0140 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 4.91 sf
#2	Secondary	854.90'	**Special & User-Defined** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 Disch. (cfs) 0.000 0.010 0.200 0.710 1.580 2.700 4.030 5.690 7.620 9.790 12.320 15.140 18.190 21.460 24.930 28.580 32.420 36.420 40.580 44.900 49.360 53.970
#3	Tertiary	854.40'	**Special & User-Defined** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 2.20 2.30 2.40 2.50 2.60 Disch. (cfs) 0.000 0.080 3.470 10.790 21.890 36.810 55.720 78.890 106.600 138.580 174.620 214.630 258.590 306.440 358.240 413.470 471.810 533.060 597.050 663.650 732.760 804.270 878.100 954.180 1,032.440 1,112.810 1,195.240

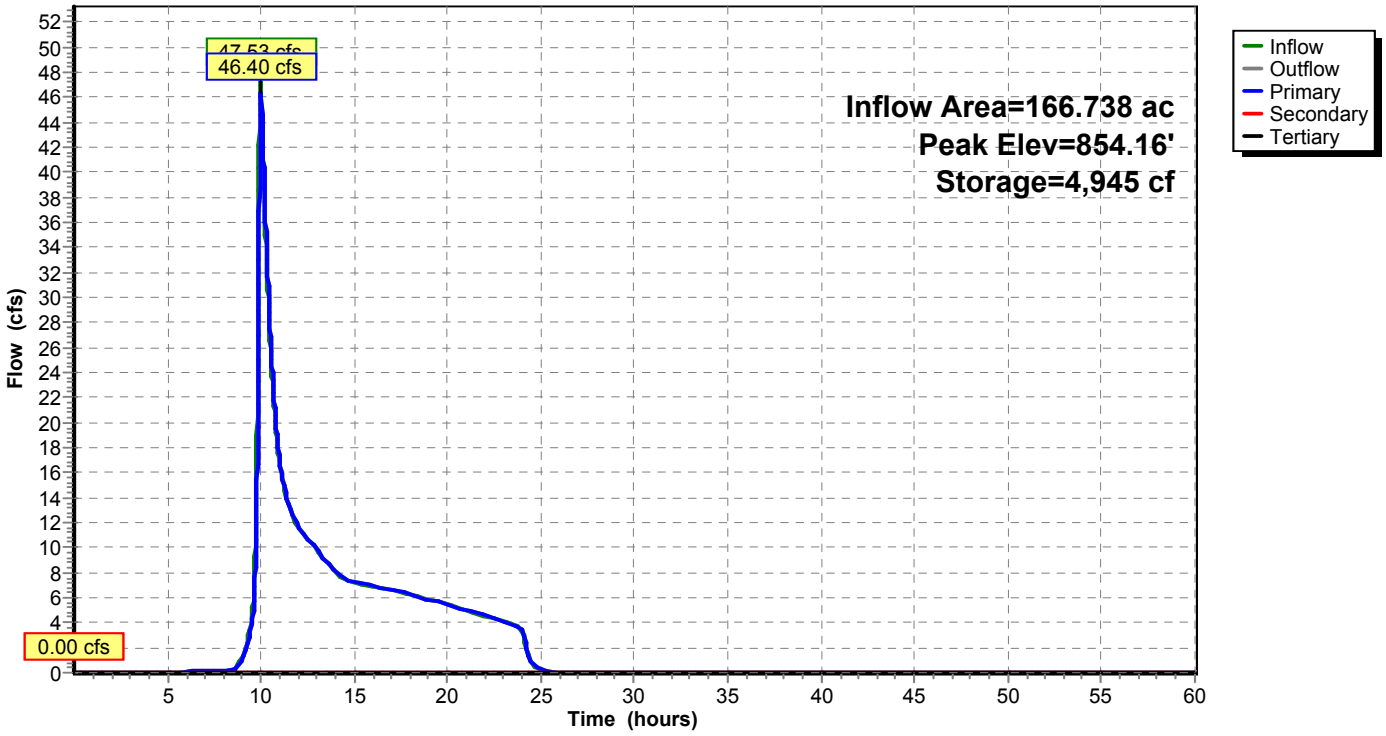
Primary OutFlow Max=46.39 cfs @ 10.02 hrs HW=854.16' TW=848.08' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 46.39 cfs @ 4.27 fps)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=852.84' TW=844.56' (Dynamic Tailwater)
└**2=Special & User-Defined** (Controls 0.00 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.01 hrs HW=852.84' TW=853.60' (Dynamic Tailwater)
└**3=Special & User-Defined** (Controls 0.00 cfs)

Pond 17P: Gran Cielo Dwy

Hydrograph



Summary for Pond 18P: GC-CkD1

Inflow Area = 240.622 ac, 1.05% Impervious, Inflow Depth = 0.81" for 2 Year event
Inflow = 70.49 cfs @ 10.01 hrs, Volume= 16.278 af
Outflow = 70.40 cfs @ 10.01 hrs, Volume= 16.244 af, Atten= 0%, Lag= 0.5 min
Primary = 0.19 cfs @ 10.01 hrs, Volume= 0.004 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af
Tertiary = 70.21 cfs @ 10.01 hrs, Volume= 16.239 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 848.08' @ 10.01 hrs Surf.Area= 2,635 sf Storage= 3,533 cf
Flood Elev= 850.17' Surf.Area= 18,446 sf Storage= 23,434 cf

Plug-Flow detention time= 3.2 min calculated for 16.241 af (100% of inflow)
Center-of-Mass det. time= 1.9 min (866.4 - 864.5)

Volume	Invert	Avail.Storage	Storage Description
#1	844.56'	70,294 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
844.56	10	0	0
845.00	200	46	46
846.00	600	400	446
847.00	1,500	1,050	1,496
848.00	2,166	1,833	3,329
849.00	7,688	4,927	8,256
850.00	16,694	12,191	20,447
851.00	27,000	21,847	42,294
852.00	29,000	28,000	70,294

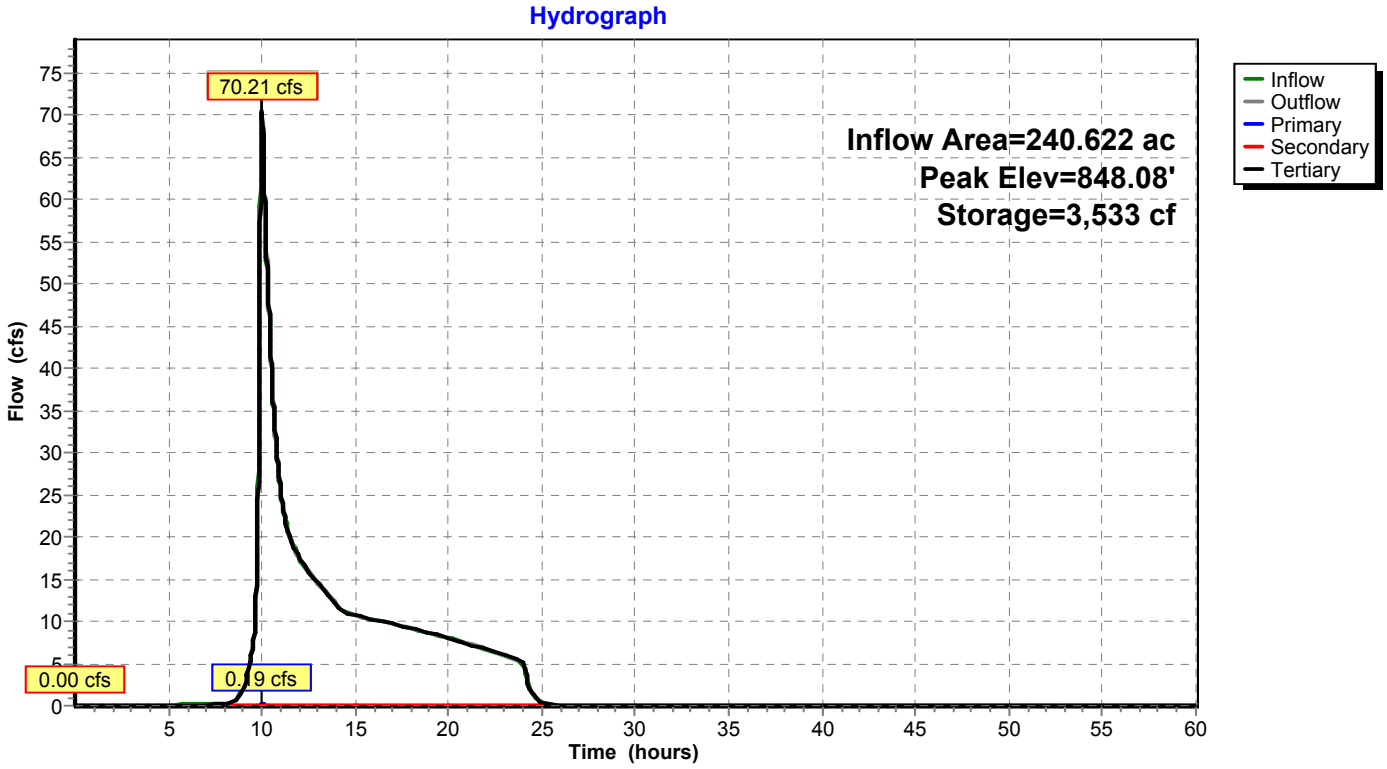
Device	Routing	Invert	Outlet Devices
#1	Primary	847.69'	**6.0" Round Culvert** L= 26.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 847.69' / 847.67' S= 0.0008 '/' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Secondary	848.50'	**9.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59
#3	Tertiary	843.15'	**58.5" W x 36.0" H, R=30.0"/84.0" Pipe Arch RCP_Arch 59x36 X 2.00** L= 960.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 843.15' / 840.75' S= 0.0025 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 11.40 sf
#4	Device 3	847.00'	**78.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Tertiary	850.00'	**Special & User-Defined (CkD1-S)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 Disch. (cfs) 0.000 0.030 0.560 1.900 4.120 7.220 11.180 15.770 20.900 26.530 32.600 39.090 45.970 53.220 60.820 68.750 77.000 85.570 94.430 103.580 113.010

Primary OutFlow Max=0.19 cfs @ 10.01 hrs HW=848.08' TW=847.23' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 0.19 cfs @ 1.60 fps)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=844.56' TW=846.00' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Tertiary OutFlow Max=70.16 cfs @ 10.01 hrs HW=848.08' TW=841.48' (Dynamic Tailwater)
├**3=RCP_Arch 59x36** (Passes 70.16 cfs of 148.65 cfs potential flow)
│└**4=Orifice/Grate** (Weir Controls 70.16 cfs @ 3.41 fps)
└**5=Special & User-Defined (CkD1-S)** (Controls 0.00 cfs)

Pond 18P: GC-CkD1



Summary for Pond 19P: GC-CkD2

[80] Warning: Exceeded Pond 18P by 0.55' @ 13.82 hrs (0.05 cfs 0.029 af)

Inflow Area =	260.311 ac,	0.99% Impervious,	Inflow Depth =	0.05"	for 2 Year event
Inflow =	5.16 cfs @	9.99 hrs,	Volume=	1.055 af	
Outflow =	1.49 cfs @	10.96 hrs,	Volume=	1.053 af,	Atten= 71%, Lag= 58.6 min
Primary =	0.95 cfs @	10.96 hrs,	Volume=	0.982 af	
Secondary =	0.54 cfs @	10.96 hrs,	Volume=	0.072 af	
Tertiary =	0.00 cfs @	0.01 hrs,	Volume=	0.000 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 848.01' @ 10.96 hrs Surf.Area= 8,212 sf Storage= 8,327 cf
Flood Elev= 848.65' Surf.Area= 11,850 sf Storage= 14,787 cf

Plug-Flow detention time= 99.9 min calculated for 1.053 af (100% of inflow)
Center-of-Mass det. time= 99.1 min (979.8 - 880.7)

Volume	Invert	Avail.Storage	Storage Description
#1	846.00'	46,430 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
846.00	267	0	0
847.00	4,055	2,161	2,161
848.00	8,178	6,117	8,278
849.00	13,828	11,003	19,281
850.00	40,470	27,149	46,430

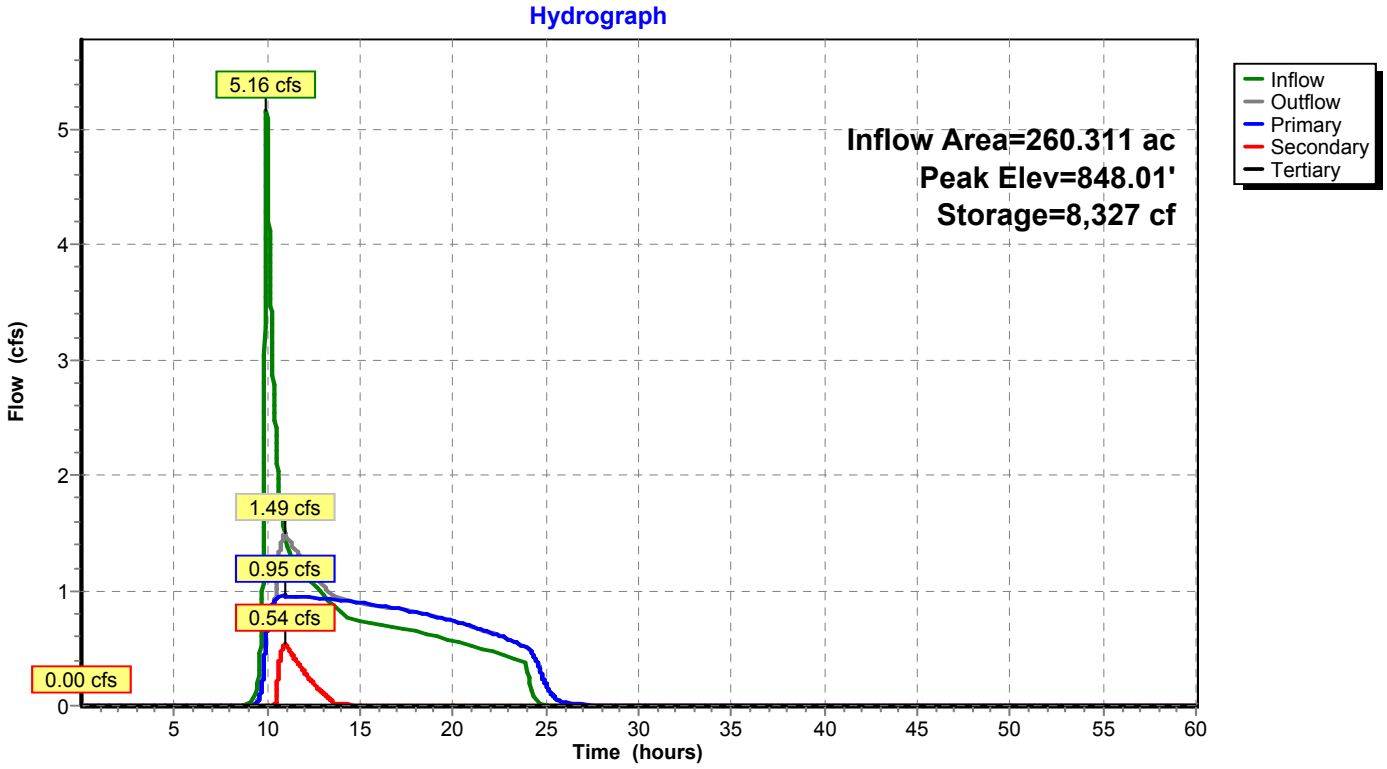
Device	Routing	Invert	Outlet Devices
#1	Primary	846.12'	**6.0" Round Culvert** L= 26.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 846.12' / 845.98' S= 0.0054 '/' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Tertiary	848.70'	**Special & User-Defined (CkD2-S)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 Disch. (cfs) 0.000 0.130 0.970 2.640 5.120 8.550 13.010 18.440 24.620 31.430 38.830 46.770 55.210 64.120
#3	Secondary	847.80'	**Special & User-Defined (CkD2-W)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 2.20 Disch. (cfs) 0.000 0.020 0.480 1.430 2.780 4.430 6.490 8.950 12.010 15.510 19.390 23.590 28.100 32.980 38.270 43.910 49.850 56.080 62.580 69.340 76.350 83.590 91.070

Primary OutFlow Max=0.95 cfs @ 10.96 hrs HW=848.01' TW=845.07' (Dynamic Tailwater)
↑—**1=Culvert** (Inlet Controls 0.95 cfs @ 4.86 fps)

Secondary OutFlow Max=0.54 cfs @ 10.96 hrs HW=848.01' TW=845.07' (Dynamic Tailwater)
↑—**3=Special & User-Defined (CkD2-W)** (Custom Controls 0.54 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.01 hrs HW=846.00' TW=0.00' (Dynamic Tailwater)
↑—**2=Special & User-Defined (CkD2-S)** (Controls 0.00 cfs)

Pond 19P: GC-CkD2



Summary for Pond 20P: GC-CkD3

[58] Hint: Peaked 0.06' above defined flood level

Inflow Area = 274.094 ac, 0.94% Impervious, Inflow Depth = 0.07" for 2 Year event
Inflow = 3.41 cfs @ 9.99 hrs, Volume= 1.689 af
Outflow = 2.21 cfs @ 11.26 hrs, Volume= 1.678 af, Atten= 35%, Lag= 76.2 min
Primary = 2.17 cfs @ 11.26 hrs, Volume= 1.674 af
Secondary = 0.04 cfs @ 11.26 hrs, Volume= 0.005 af
Tertiary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 845.08' @ 11.26 hrs Surf.Area= 8,659 sf Storage= 5,376 cf
Flood Elev= 845.02' Surf.Area= 8,229 sf Storage= 4,852 cf

Plug-Flow detention time= 49.1 min calculated for 1.678 af (99% of inflow)
Center-of-Mass det. time= 45.1 min (993.6 - 948.5)

Volume	Invert	Avail.Storage	Storage Description
#1	844.00'	24,632 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
844.00	1,288	0	0
845.00	8,090	4,689	4,689
846.50	18,500	19,943	24,632

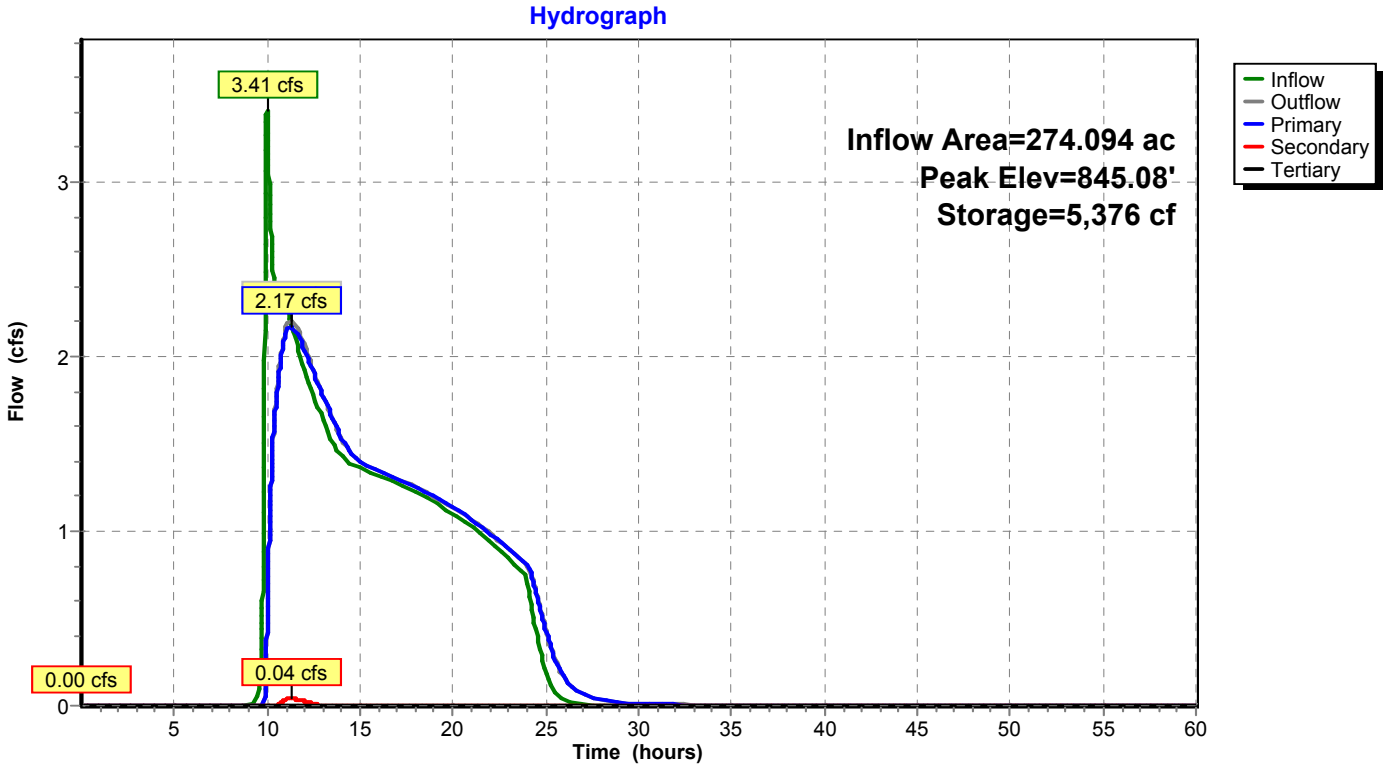
Device	Routing	Invert	Outlet Devices
#1	Primary	844.22'	**18.0" Round Culvert** L= 26.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 844.22' / 843.98' S= 0.0092 '/' Cc= 0.900 n= 0.021 Corrugated metal, Flow Area= 1.77 sf
#2	Secondary	845.00'	**Special & User-Defined (CkD3-W)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 Disch. (cfs) 0.000 0.050 0.390 0.970 1.710 2.600 3.780 5.170 6.720 8.570 11.140 14.290 17.880 21.830 26.120 30.880 36.030 41.520 47.330 53.420 59.790
#3	Tertiary	845.10'	**Special & User-Defined (CkD3-S)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 Disch. (cfs) 0.000 0.050 1.930 5.420 10.370 16.490 23.960 32.580 42.550 53.770 66.380 80.510 96.280 113.770 132.840 153.630 175.910 199.510 224.310 250.260

Primary OutFlow Max=2.17 cfs @ 11.26 hrs HW=845.08' TW=843.88' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 2.17 cfs @ 2.97 fps)

Secondary OutFlow Max=0.04 cfs @ 11.26 hrs HW=845.08' TW=843.88' (Dynamic Tailwater)
↑**2=Special & User-Defined (CkD3-W)** (Custom Controls 0.04 cfs)

Tertiary OutFlow Max=0.00 cfs @ 0.01 hrs HW=844.00' TW=0.00' (Dynamic Tailwater)
↑**3=Special & User-Defined (CkD3-S)** (Controls 0.00 cfs)

Pond 20P: GC-CkD3



Summary for Pond B1: Basin 1

Inflow Area = 47.388 ac, 67.98% Impervious, Inflow Depth = 1.32" for 2 Year event
Inflow = 33.80 cfs @ 9.98 hrs, Volume= 5.194 af
Outflow = 3.94 cfs @ 12.43 hrs, Volume= 4.842 af, Atten= 88%, Lag= 147.5 min
Discarded = 0.96 cfs @ 12.43 hrs, Volume= 2.782 af
Primary = 2.98 cfs @ 12.43 hrs, Volume= 2.060 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 834.95' @ 12.43 hrs Surf.Area= 1.231 ac Storage= 2.513 af

Plug-Flow detention time= 653.8 min calculated for 4.841 af (93% of inflow)
Center-of-Mass det. time= 611.3 min (1,371.1 - 759.9)

Volume	Invert	Avail.Storage	Storage Description
#1	826.50'	8.466 af	**Custom Stage Data (Prismatic)** Listed below (Recalc) 8.789 af Overall - 0.323 af Embedded = 8.466 af
#2	826.50'	0.129 af	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 0.323 af Overall x 40.0% Voids
		8.595 af	Total Available Storage

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
826.50	0.081	0.000	0.000
827.00	0.081	0.040	0.040
828.00	0.081	0.081	0.121
829.00	0.081	0.081	0.202
830.00	0.081	0.081	0.283
831.00	0.081	0.081	0.365
832.00	0.203	0.142	0.506
833.00	0.376	0.289	0.796
834.00	1.171	0.774	1.569
835.00	1.234	1.202	2.772
836.00	1.299	1.267	4.038
837.00	1.365	1.332	5.370
838.00	1.432	1.399	6.769
839.00	1.500	1.466	8.235
839.35	1.665	0.554	8.789

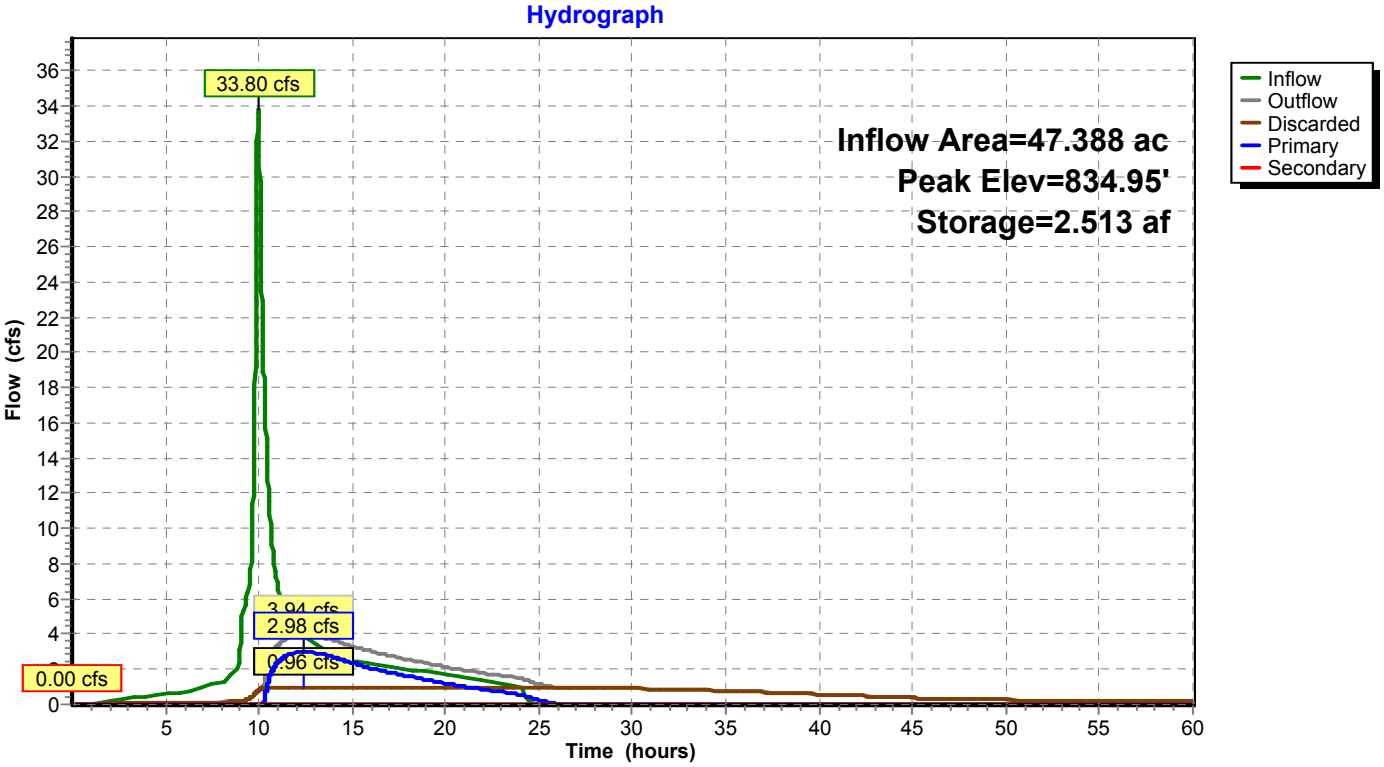
Device	Routing	Invert	Outlet Devices
#1	Primary	833.12'	**36.0" Round Culvert** L= 385.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 833.12' / 831.20' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf
#2	Discarded	826.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	834.33'	**16.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	834.33'	**12.0" W x 8.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	835.33'	**30.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	836.17'	**24.0" Horiz. Orifice/Grate** C= 0.600 in 78.0" x 36.0" Grate (16% open area) Limited to weir flow at low heads
#7	Secondary	838.35'	**30.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.96 cfs @ 12.43 hrs HW=834.95' (Free Discharge)
└**2=Exfiltration** (Controls 0.96 cfs)

Primary OutFlow Max=2.98 cfs @ 12.43 hrs HW=834.95' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 2.98 cfs of 19.26 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 1.43 cfs @ 3.21 fps)
  └**4=Orifice/Grate** (Orifice Controls 1.56 cfs @ 2.52 fps)
  └**5=Orifice/Grate** (Controls 0.00 cfs)
  └**6=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=826.50' TW=0.00' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B1: Basin 1



Summary for Pond B10: Basin 10

Inflow Area = 30.685 ac, 61.94% Impervious, Inflow Depth = 1.36" for 2 Year event
Inflow = 16.54 cfs @ 9.98 hrs, Volume= 3.474 af
Outflow = 1.47 cfs @ 15.89 hrs, Volume= 3.055 af, Atten= 91%, Lag= 354.3 min
Discarded = 0.77 cfs @ 15.89 hrs, Volume= 2.542 af
Primary = 0.70 cfs @ 15.89 hrs, Volume= 0.513 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 816.90' @ 15.89 hrs Surf.Area= 42,517 sf Storage= 91,317 cf

Plug-Flow detention time= 999.1 min calculated for 3.055 af (88% of inflow)
Center-of-Mass det. time= 924.6 min (1,667.4 - 742.8)

Volume	Invert	Avail.Storage	Storage Description
#1	808.50'	230,693 cf	**Custom Stage Data (Conic)** Listed below (Recalc) 244,773 cf Overall - 14,080 cf Embedded = 230,693 cf
#2	808.50'	5,632 cf	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 14,080 cf Overall x 40.0% Voids
		236,325 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
808.50	3,520	0	0	3,520
809.00	3,520	1,760	1,760	3,625
810.00	3,520	3,520	5,280	3,835
811.00	3,520	3,520	8,800	4,046
812.00	3,520	3,520	12,320	4,256
813.00	3,520	3,520	15,840	4,466
814.00	8,931	6,019	21,859	9,884
815.00	17,294	12,884	34,744	18,257
816.00	40,146	27,930	62,673	41,116
817.00	42,792	41,462	104,135	43,859
818.00	45,490	44,134	148,269	46,658
819.00	48,243	46,860	195,129	49,516
820.00	51,058	49,644	244,773	52,440

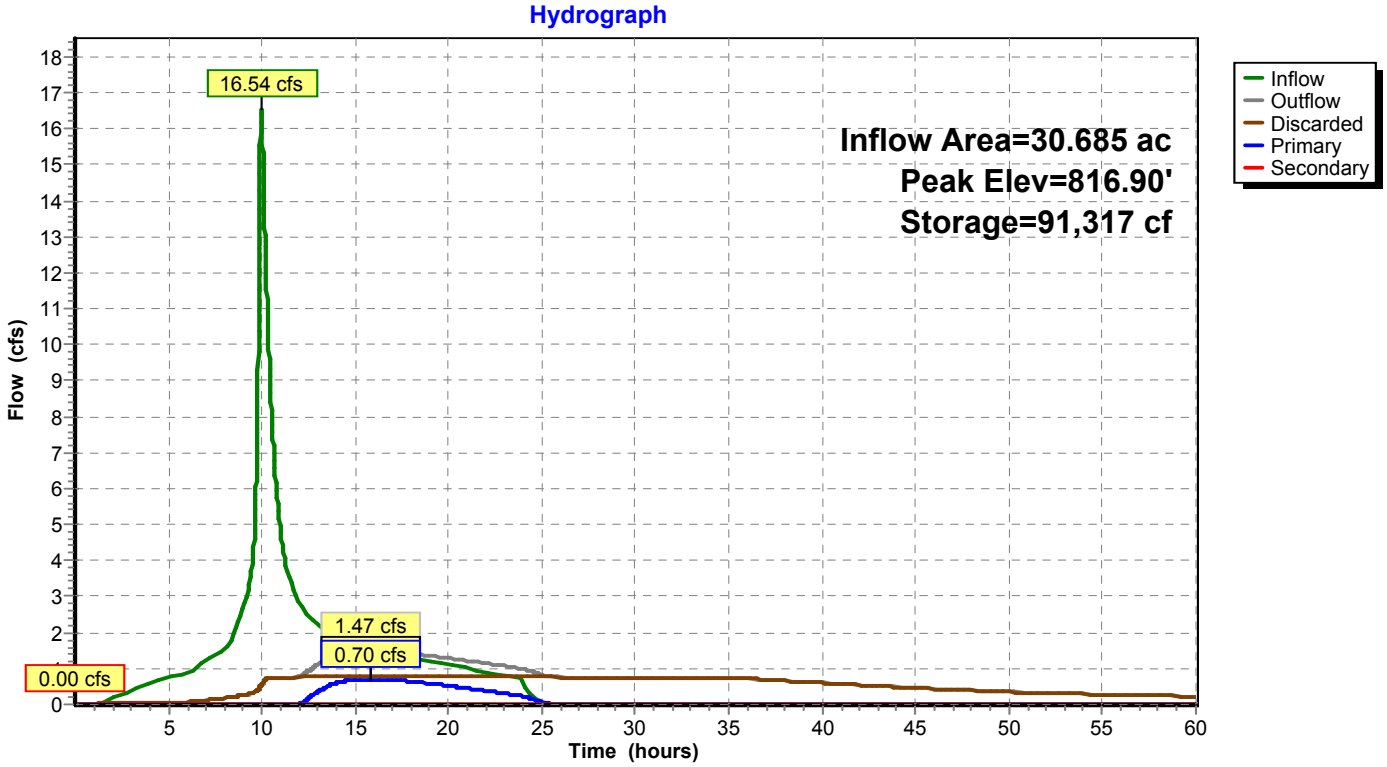
Device	Routing	Invert	Outlet Devices
#1	Primary	816.00'	**30.0" Round Culvert** L= 45.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 816.00' / 815.10' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Discarded	808.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	816.67'	**24.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	817.33'	**15.0" W x 18.0" H Vert. Orifice/Grate** X 2 rows with 8.0" cc spacing C= 0.600
#5	Device 1	817.83'	**60.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	819.00'	**78.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#7	Secondary	819.33'	**36.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.77 cfs @ 15.89 hrs HW=816.90' (Free Discharge)
└**2=Exfiltration** (Controls 0.77 cfs)

Primary OutFlow Max=0.70 cfs @ 15.89 hrs HW=816.90' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.70 cfs of 5.11 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 0.70 cfs @ 1.53 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)
  └**5=Orifice/Grate** (Controls 0.00 cfs)
  └**6=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=808.50' TW=0.00' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B10: Basin 10



Summary for Pond B11: Basin 11

Inflow Area = 14.461 ac, 52.00% Impervious, Inflow Depth = 1.22" for 2 Year event
Inflow = 9.10 cfs @ 9.96 hrs, Volume= 1.469 af
Outflow = 1.00 cfs @ 12.68 hrs, Volume= 1.212 af, Atten= 89%, Lag= 163.1 min
Discarded = 0.21 cfs @ 12.68 hrs, Volume= 0.739 af
Primary = 0.79 cfs @ 12.68 hrs, Volume= 0.473 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 832.03' @ 12.68 hrs Surf.Area= 10,567 sf Storage= 33,359 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 752.1 min (1,496.5 - 744.4)

Volume	Invert	Avail.Storage	Storage Description
#1	823.50'	83,101 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 97,181 cf Overall - 14,080 cf Embedded = 83,101 cf
#2	823.50'	5,632 cf	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 14,080 cf Overall x 40.0% Voids
		88,733 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
823.50	3,520	0	0
824.00	3,520	1,760	1,760
825.00	3,520	3,520	5,280
826.00	3,520	3,520	8,800
827.00	3,520	3,520	12,320
828.00	3,520	3,520	15,840
829.00	2,800	3,160	19,000
830.00	6,900	4,850	23,850
831.00	8,919	7,910	31,760
832.00	10,515	9,717	41,477
833.00	12,169	11,342	52,819
834.00	13,879	13,024	65,843
835.00	15,655	14,767	80,610
836.00	17,488	16,572	97,181

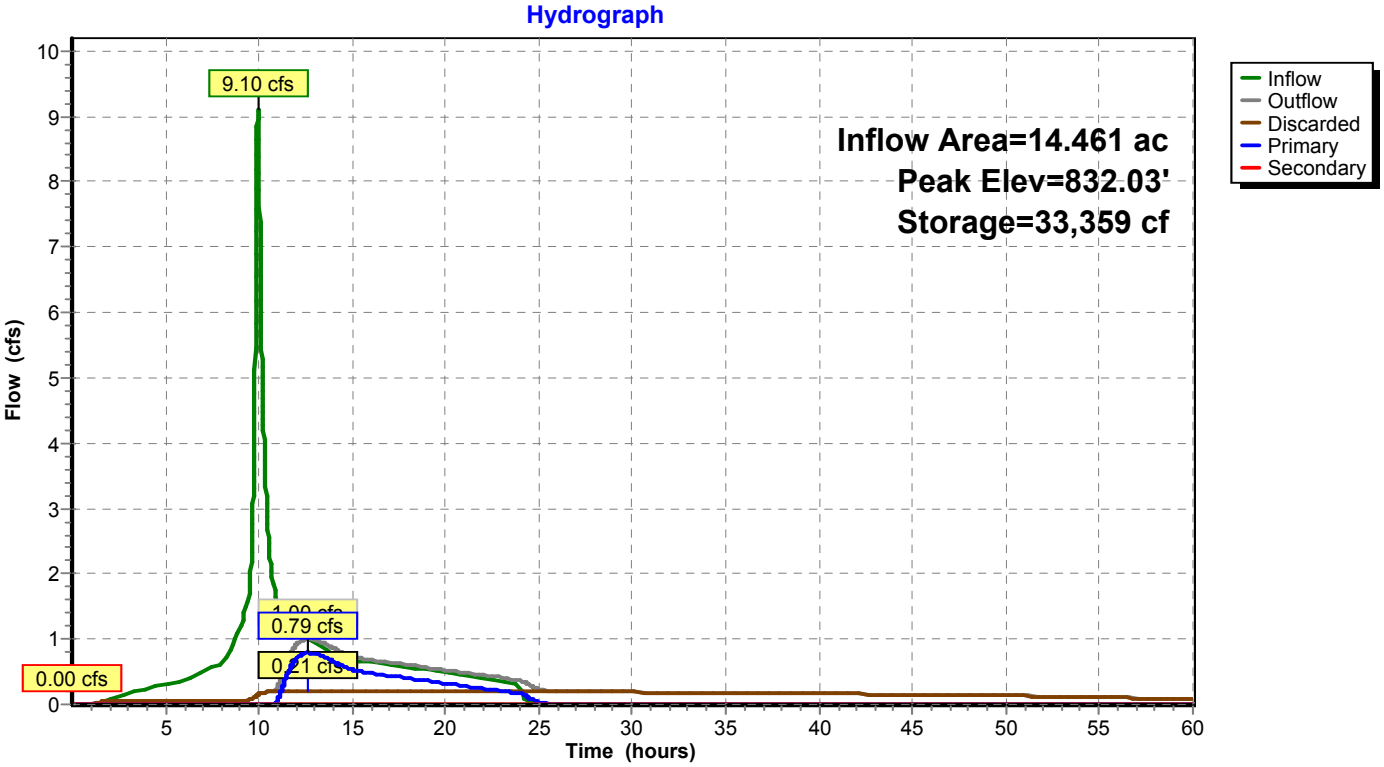
Device	Routing	Invert	Outlet Devices
#1	Primary	831.67'	**24.0" Round Culvert** L= 165.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 831.67' / 820.50' S= 0.0677 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Discarded	823.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	831.67'	**24.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	833.00'	**6.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	833.50'	**27.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	834.50'	**48.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#7	Secondary	834.83'	**16.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.21 cfs @ 12.68 hrs HW=832.03' (Free Discharge)
└**2=Exfiltration** (Controls 0.21 cfs)

Primary OutFlow Max=0.79 cfs @ 12.68 hrs HW=832.03' TW=824.64' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.79 cfs @ 2.05 fps)
  └**3=Orifice/Grate** (Passes 0.79 cfs of 1.36 cfs potential flow)
  └**4=Orifice/Grate** (Controls 0.00 cfs)
  └**5=Orifice/Grate** (Controls 0.00 cfs)
  └**6=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=823.50' TW=820.00' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B11: Basin 11



Summary for Pond B12: Basin 12

Inflow Area = 20.201 ac, 44.06% Impervious, Inflow Depth = 1.08" for 2 Year event
Inflow = 11.41 cfs @ 9.96 hrs, Volume= 1.819 af
Outflow = 0.72 cfs @ 18.30 hrs, Volume= 1.558 af, Atten= 94%, Lag= 500.5 min
Discarded = 0.43 cfs @ 18.30 hrs, Volume= 1.374 af
Primary = 0.29 cfs @ 18.30 hrs, Volume= 0.184 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 836.87' @ 18.30 hrs Surf.Area= 23,091 sf Storage= 49,369 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 929.6 min (1,681.8 - 752.2)

Volume	Invert	Avail.Storage	Storage Description
#1	828.50'	160,016 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 174,096 cf Overall - 14,080 cf Embedded = 160,016 cf
#2	828.50'	5,632 cf	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 14,080 cf Overall x 40.0% Voids
		165,648 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
828.50	3,520	0	0
829.00	3,520	1,760	1,760
830.00	3,520	3,520	5,280
831.00	3,520	3,520	8,800
832.00	3,520	3,520	12,320
833.00	3,520	3,520	15,840
834.00	2,600	3,060	18,900
835.00	8,000	5,300	24,200
836.00	20,849	14,425	38,625
837.00	23,415	22,132	60,757
838.00	26,037	24,726	85,483
839.00	28,717	27,377	112,860
840.00	31,383	30,050	142,910
841.00	30,990	31,187	174,096

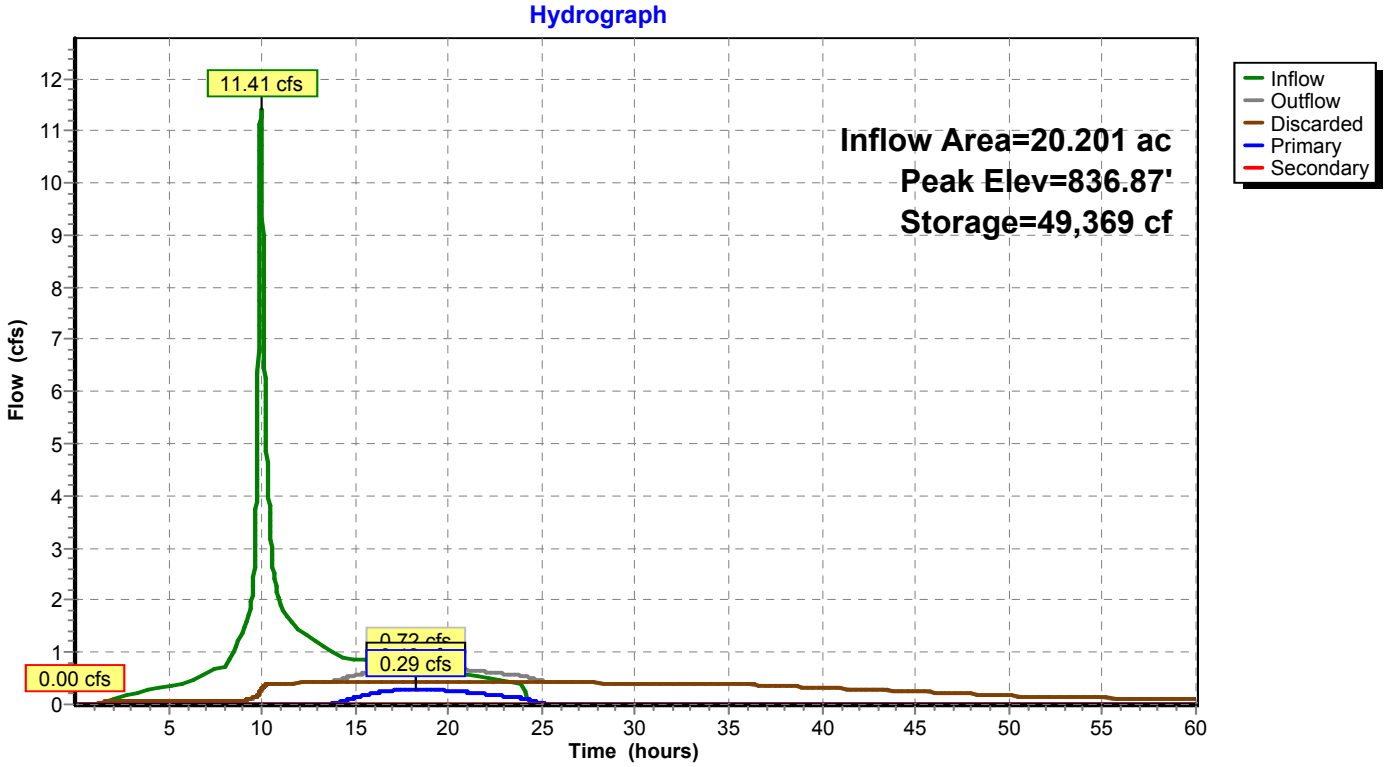
Device	Routing	Invert	Outlet Devices
#1	Primary	836.67'	**30.0" Round Culvert** L= 130.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 836.67' / 832.50' S= 0.0321 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Discarded	828.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	836.67'	**18.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	838.00'	**8.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	838.50'	**24.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	839.50'	**36.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#7	Secondary	840.00'	**18.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.43 cfs @ 18.30 hrs HW=836.87' (Free Discharge)
└**2=Exfiltration** (Controls 0.43 cfs)

Primary OutFlow Max=0.29 cfs @ 18.30 hrs HW=836.87' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.29 cfs @ 1.54 fps)
  └**3=Orifice/Grate** (Passes 0.29 cfs of 0.44 cfs potential flow)
  └**4=Orifice/Grate** (Controls 0.00 cfs)
  └**5=Orifice/Grate** (Controls 0.00 cfs)
  └**6=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=828.50' TW=0.00' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B12: Basin 12



Summary for Pond B13: Basin 13

Inflow Area = 64.115 ac, 22.11% Impervious, Inflow Depth = 0.98" for 2 Year event
Inflow = 32.84 cfs @ 9.97 hrs, Volume= 5.235 af
Outflow = 5.01 cfs @ 11.70 hrs, Volume= 4.841 af, Atten= 85%, Lag= 104.3 min
Discarded = 0.38 cfs @ 11.70 hrs, Volume= 1.221 af
Primary = 4.63 cfs @ 11.70 hrs, Volume= 3.620 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 841.67' @ 11.70 hrs Surf.Area= 0.446 ac Storage= 1.893 af

Plug-Flow detention time= 434.7 min calculated for 4.840 af (92% of inflow)
Center-of-Mass det. time= 389.4 min (1,186.2 - 796.9)

Volume	Invert	Avail.Storage	Storage Description
#1	830.50'	4.138 af	**Custom Stage Data (Prismatic)** Listed below (Recalc) 4.461 af Overall - 0.323 af Embedded = 4.138 af
#2	830.50'	0.129 af	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 0.323 af Overall x 40.0% Voids
		4.267 af	Total Available Storage

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
830.50	0.081	0.000	0.000
831.00	0.081	0.040	0.040
832.00	0.081	0.081	0.121
833.00	0.081	0.081	0.202
834.00	0.081	0.081	0.283
835.00	0.081	0.081	0.364
836.00	0.059	0.070	0.433
837.00	0.139	0.099	0.532
838.00	0.287	0.213	0.745
839.00	0.329	0.308	1.053
840.00	0.372	0.350	1.403
841.00	0.416	0.394	1.797
842.00	0.461	0.439	2.236
843.00	0.508	0.484	2.720
844.00	0.555	0.531	3.251
845.00	0.605	0.580	3.831
846.00	0.655	0.630	4.461

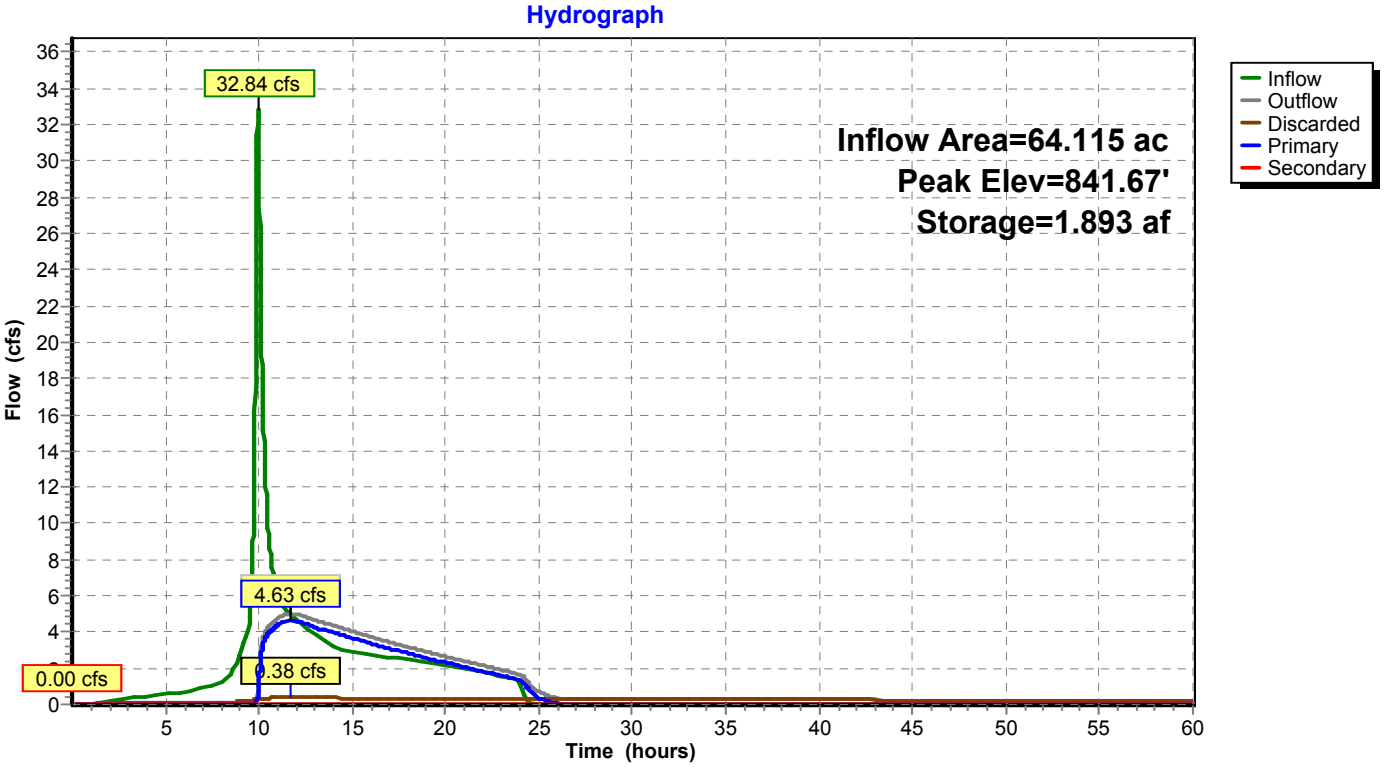
Device	Routing	Invert	Outlet Devices
#1	Primary	834.25'	**48.0" Round Culvert** L= 175.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 834.25' / 832.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 12.57 sf
#2	Discarded	830.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	839.67'	**24.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	841.50'	**15.0" W x 18.0" H Vert. Orifice/Grate** X 2 rows with 8.0" cc spacing C= 0.600
#5	Device 1	842.50'	**60.0" W x 8.0" H Vert. Orifice/Grate** X 2 rows with 8.0" cc spacing C= 0.600
#6	Device 1	843.67'	**78.0" x 36.0" Horiz. Orifice/Grate** X 2 rows C= 0.600 Limited to weir flow at low heads
#7	Secondary	844.67'	**36.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.38 cfs @ 11.70 hrs HW=841.67' (Free Discharge)
└**2=Exfiltration** (Controls 0.38 cfs)

Primary OutFlow Max=4.63 cfs @ 11.70 hrs HW=841.67' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 4.63 cfs of 140.89 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 4.35 cfs @ 6.52 fps)
  └**4=Orifice/Grate** (Orifice Controls 0.29 cfs @ 1.33 fps)
  └**5=Orifice/Grate** (Controls 0.00 cfs)
  └**6=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=830.50' TW=0.00' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B13: Basin 13



Summary for Pond B4: Basin 4

Inflow Area = 38.712 ac, 55.38% Impervious, Inflow Depth = 1.28" for 2 Year event
Inflow = 23.47 cfs @ 9.97 hrs, Volume= 4.132 af
Outflow = 3.01 cfs @ 12.33 hrs, Volume= 3.896 af, Atten= 87%, Lag= 141.9 min
Discarded = 0.48 cfs @ 12.33 hrs, Volume= 1.470 af
Primary = 2.53 cfs @ 12.33 hrs, Volume= 2.426 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 837.92' @ 12.33 hrs Surf.Area= 24,142 sf Storage= 85,087 cf

Plug-Flow detention time= 592.9 min calculated for 3.896 af (94% of inflow)
Center-of-Mass det. time= 555.6 min (1,300.1 - 744.5)

Volume	Invert	Avail.Storage	Storage Description
#1	827.50'	218,652 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 232,732 cf Overall - 14,080 cf Embedded = 218,652 cf
#2	827.50'	5,632 cf	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 14,080 cf Overall x 40.0% Voids
		224,284 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
827.50	3,520	0	0
828.00	3,520	1,760	1,760
829.00	3,520	3,520	5,280
830.00	3,520	3,520	8,800
831.00	3,520	3,520	12,320
832.00	3,520	3,520	15,840
833.00	1,064	2,292	18,132
834.00	6,719	3,892	22,024
835.00	16,858	11,789	33,812
836.00	19,297	18,078	51,890
837.00	21,780	20,539	72,428
838.00	24,350	23,065	95,493
839.00	27,007	25,679	121,172
840.00	29,708	28,358	149,529
841.00	32,452	31,080	180,609
842.00	35,196	33,824	214,433
842.50	38,000	18,299	232,732

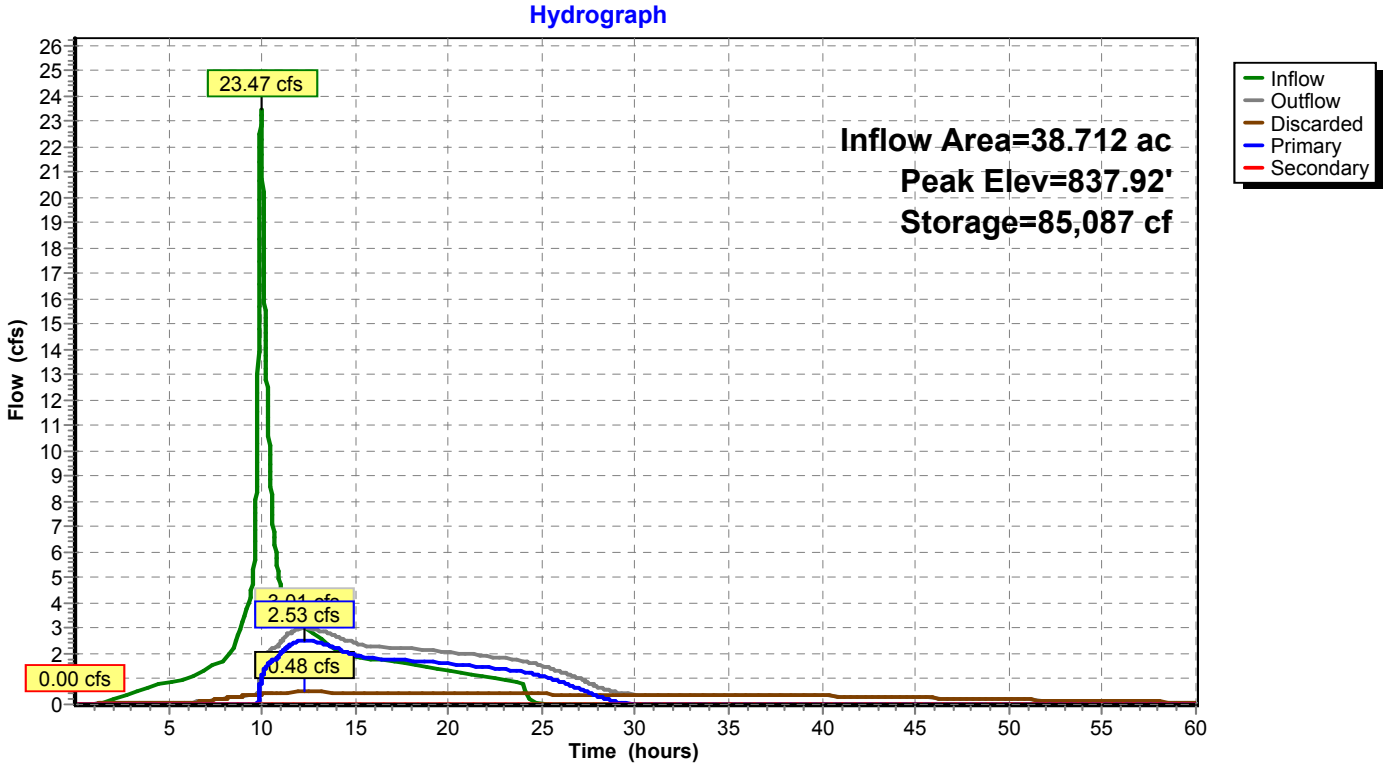
Device	Routing	Invert	Outlet Devices
#1	Primary	835.67'	**30.0" Round Culvert** L= 210.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 835.67' / 834.20' S= 0.0070 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Discarded	827.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	835.67'	**10.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	837.67'	**18.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	838.17'	**42.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	839.75'	**48.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 in 78.0" x 36.0" Grate (62% open area) Limited to weir flow at low heads
#7	Secondary	841.12'	**40.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.48 cfs @ 12.33 hrs HW=837.92' (Free Discharge)
└**2=Exfiltration** (Controls 0.48 cfs)

Primary OutFlow Max=2.53 cfs @ 12.33 hrs HW=837.92' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 2.53 cfs of 23.75 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 1.93 cfs @ 6.95 fps)
  └**4=Orifice/Grate** (Orifice Controls 0.60 cfs @ 1.60 fps)
  └**5=Orifice/Grate** (Controls 0.00 cfs)
  └**6=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=827.50' TW=0.00' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B4: Basin 4



Summary for Pond B5: Basin 5

Inflow Area = 32.696 ac, 30.34% Impervious, Inflow Depth = 0.74" for 2 Year event
Inflow = 8.91 cfs @ 9.98 hrs, Volume= 2.019 af
Outflow = 1.25 cfs @ 13.45 hrs, Volume= 2.019 af, Atten= 86%, Lag= 208.1 min
Discarded = 0.34 cfs @ 13.45 hrs, Volume= 1.073 af
Primary = 0.91 cfs @ 13.45 hrs, Volume= 0.946 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 846.09' @ 13.45 hrs Surf.Area= 18,858 sf Storage= 35,848 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 497.5 min (1,270.1 - 772.6)

Volume	Invert	Avail.Storage	Storage Description
#1	844.00'	178,542 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
844.00	15,500	0	0
845.00	17,076	16,288	16,288
846.00	18,708	17,892	34,180
847.00	20,397	19,553	53,733
848.00	22,143	21,270	75,003
849.00	23,945	23,044	98,047
850.00	25,804	24,875	122,921
851.00	27,719	26,762	149,683
852.00	30,000	28,860	178,542

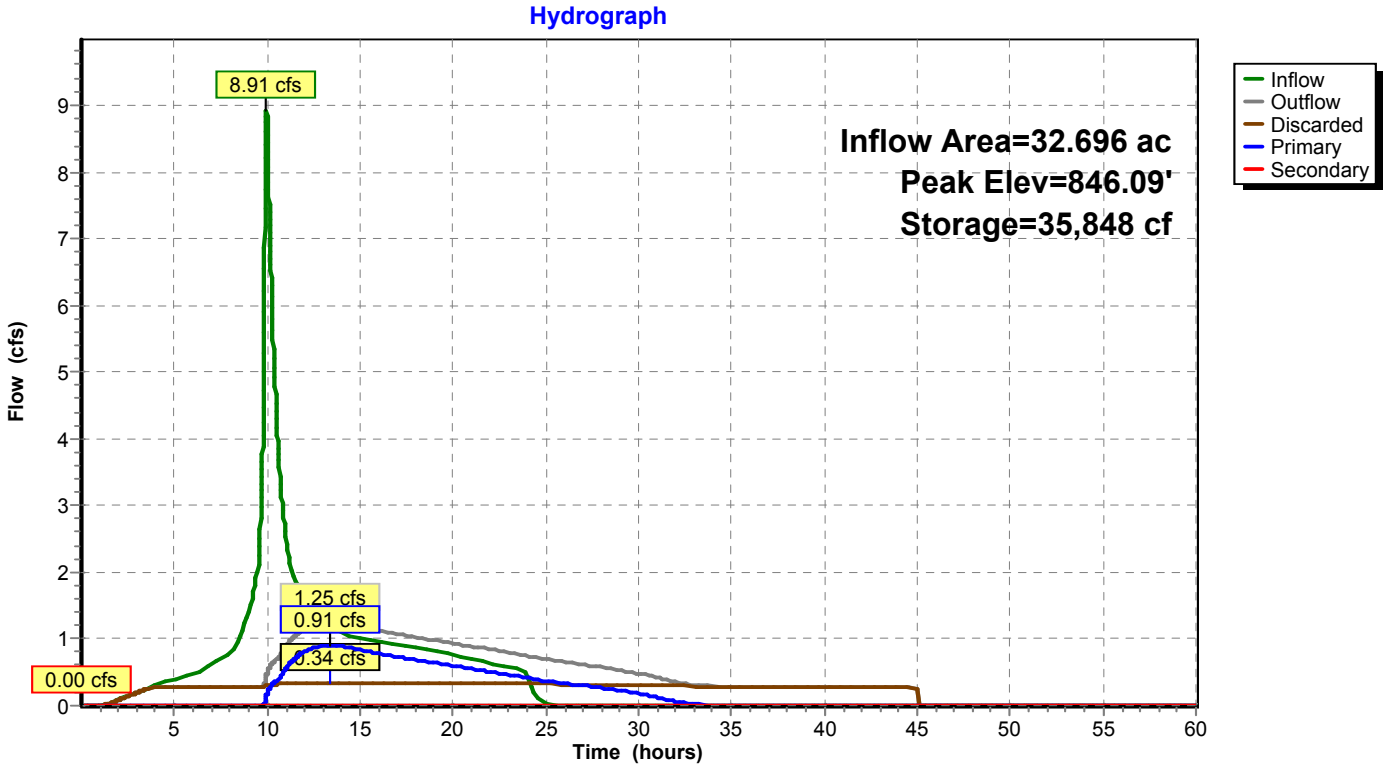
Device	Routing	Invert	Outlet Devices
#1	Primary	844.67'	**30.0" Round Culvert** L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 844.67' / 844.17' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Discarded	844.00'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 800.00'
#3	Device 1	844.67'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	845.67'	**6.0" W x 37.0" H Vert. Orifice/Grate** X 3 rows with 8.0" cc spacing C= 0.600
#5	Device 1	849.75'	**36.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 in 36.0" x 24.0" Grate (100% open area) Limited to weir flow at low heads
#6	Secondary	851.00'	**12.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.34 cfs @ 13.45 hrs HW=846.09' (Free Discharge)
└**2=Exfiltration** (Controls 0.34 cfs)

Primary OutFlow Max=0.91 cfs @ 13.45 hrs HW=846.09' TW=844.68' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.91 cfs of 9.51 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 0.47 cfs @ 5.39 fps)
  ├**4=Orifice/Grate** (Orifice Controls 0.44 cfs @ 2.08 fps)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=844.00' (Free Discharge)
└**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond B5: Basin 5



Summary for Pond B6: Basin 6

Inflow Area = 34.039 ac, 52.56% Impervious, Inflow Depth = 1.25" for 2 Year event
Inflow = 16.99 cfs @ 9.98 hrs, Volume= 3.559 af
Outflow = 5.24 cfs @ 10.89 hrs, Volume= 3.277 af, Atten= 69%, Lag= 54.8 min
Discarded = 0.30 cfs @ 10.89 hrs, Volume= 0.944 af
Primary = 4.94 cfs @ 10.89 hrs, Volume= 2.333 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 849.79' @ 10.89 hrs Surf.Area= 0.353 ac Storage= 1.388 af

Plug-Flow detention time= 478.9 min calculated for 3.276 af (92% of inflow)
Center-of-Mass det. time= 428.3 min (1,183.5 - 755.2)

Volume	Invert	Avail.Storage	Storage Description
#1	839.50'	3.469 af	**Custom Stage Data (Prismatic)** Listed below (Recalc) 3.792 af Overall - 0.323 af Embedded = 3.469 af
#2	839.50'	0.129 af	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 0.323 af Overall x 40.0% Voids
		3.598 af	Total Available Storage

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
839.50	0.081	0.000	0.000
840.00	0.081	0.040	0.040
841.00	0.081	0.081	0.121
842.00	0.081	0.081	0.202
843.00	0.081	0.081	0.283
844.00	0.081	0.081	0.364
845.00	0.061	0.071	0.435
846.00	0.133	0.097	0.532
847.00	0.260	0.196	0.729
848.00	0.292	0.276	1.005
849.00	0.325	0.309	1.313
850.00	0.360	0.343	1.656
851.00	0.434	0.397	2.053
852.00	0.474	0.454	2.507
854.40	0.597	1.285	3.792

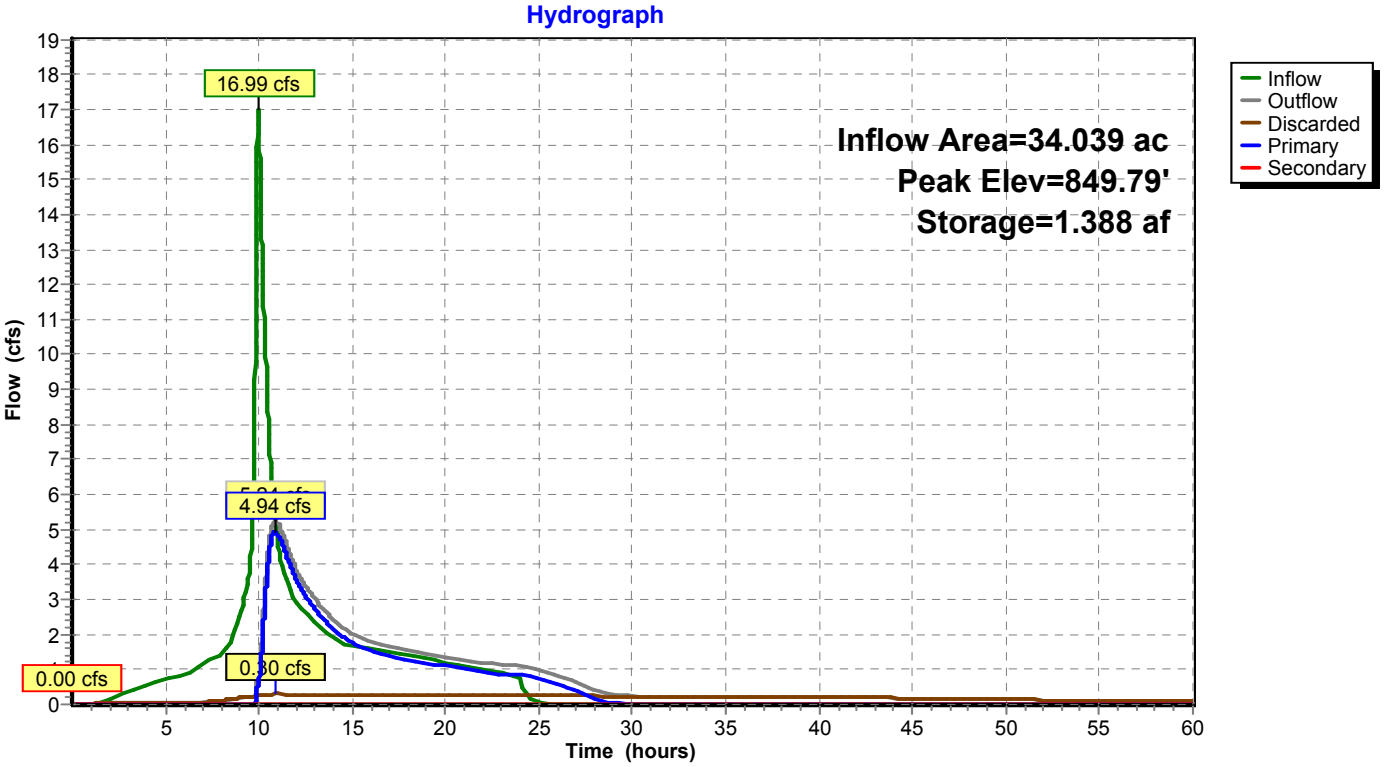
Device	Routing	Invert	Outlet Devices
#1	Primary	843.65'	**24.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 843.65' / 842.90' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Discarded	839.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	847.67'	**9.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	848.75'	**12.0" W x 9.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	849.50'	**18.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	850.67'	**69.6" W x 9.0" H Vert. Orifice/Grate** C= 0.600
#7	Secondary	852.88'	**40.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.30 cfs @ 10.89 hrs HW=849.79' (Free Discharge)
└**2=Exfiltration** (Controls 0.30 cfs)

Primary OutFlow Max=4.94 cfs @ 10.89 hrs HW=849.79' TW=842.50' (Dynamic Tailwater)
└**1=Culvert** (Passes 4.94 cfs of 31.71 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 1.28 cfs @ 6.80 fps)
  └**4=Orifice/Grate** (Orifice Controls 2.91 cfs @ 3.88 fps)
  └**5=Orifice/Grate** (Orifice Controls 0.76 cfs @ 1.73 fps)
  └**6=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=839.50' TW=842.50' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B6: Basin 6



Summary for Pond B7: Basin 7

Inflow Area = 108.754 ac, 33.30% Impervious, Inflow Depth = 0.50" for 2 Year event
Inflow = 9.38 cfs @ 9.98 hrs, Volume= 4.548 af
Outflow = 2.01 cfs @ 21.83 hrs, Volume= 4.520 af, Atten= 79%, Lag= 711.0 min
Discarded = 1.05 cfs @ 21.83 hrs, Volume= 3.899 af
Primary = 0.96 cfs @ 21.83 hrs, Volume= 0.621 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 841.02' @ 21.83 hrs Surf.Area= 58,402 sf Storage= 89,685 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 768.6 min (1,791.8 - 1,023.2)

Volume	Invert	Avail.Storage	Storage Description
#1	839.00'	516,122 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
839.00	10,000	0	0
840.00	54,515	32,258	32,258
841.00	58,335	56,425	88,683
842.00	62,211	60,273	148,956
843.00	66,912	64,562	213,517
844.00	71,188	69,050	282,567
845.00	75,535	73,362	355,929
846.00	79,981	77,758	433,687
847.00	84,890	82,436	516,122

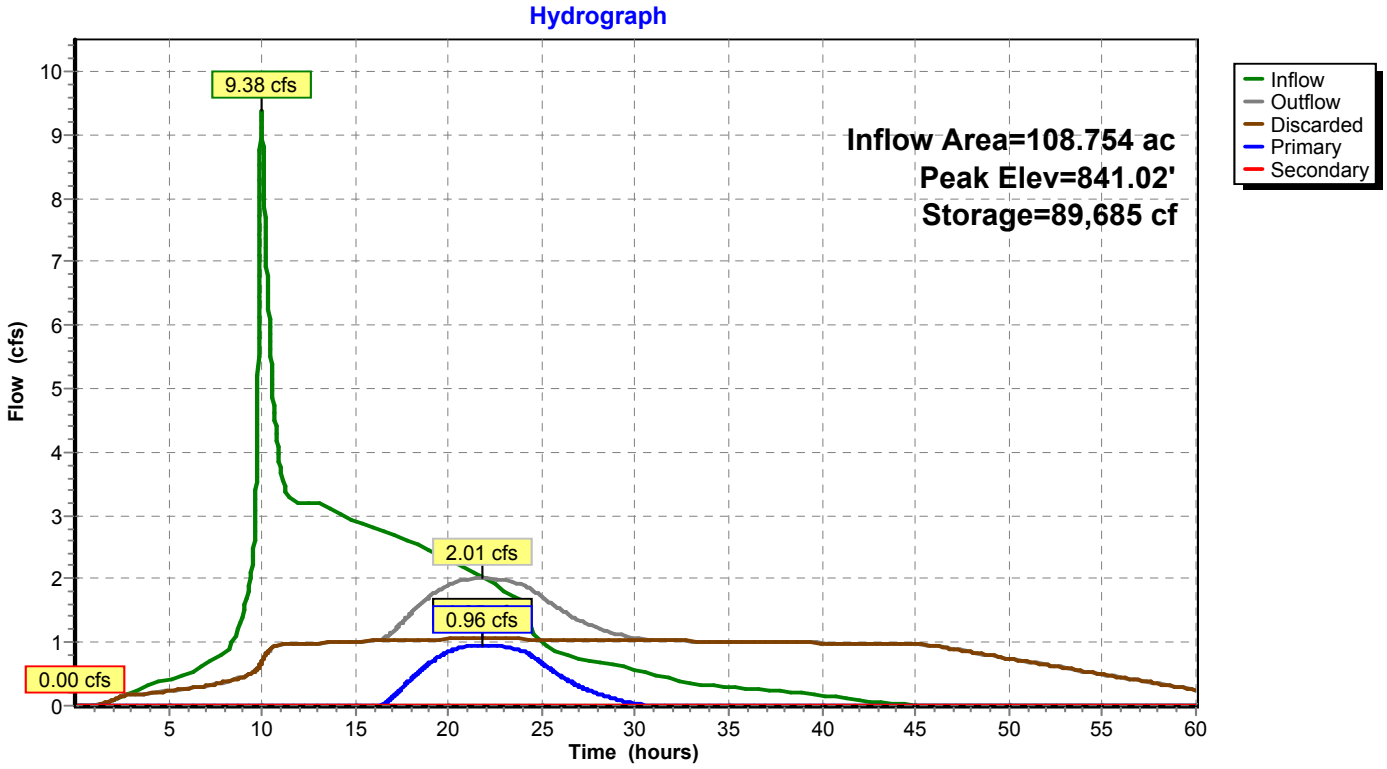
Device	Routing	Invert	Outlet Devices
#1	Primary	836.67'	**36.0" Round Culvert** L= 63.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 836.67' / 836.00' S= 0.0106 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf
#2	Discarded	839.00'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 800.00'
#3	Device 1	840.75'	**26.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	841.25'	**12.0" W x 36.0" H Vert. Orifice/Grate** X 3 rows with 8.0" cc spacing C= 0.600
#5	Device 1	844.50'	**48.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 in 48.0" x 36.0" Grate (100% open area) Limited to weir flow at low heads
#6	Secondary	845.50'	**12.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=1.05 cfs @ 21.83 hrs HW=841.02' (Free Discharge)
└**2=Exfiltration** (Controls 1.05 cfs)

Primary OutFlow Max=0.96 cfs @ 21.83 hrs HW=841.02' TW=836.36' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.96 cfs of 57.43 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 0.96 cfs @ 1.66 fps)
  ├**4=Orifice/Grate** (Controls 0.00 cfs)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=839.00' (Free Discharge)
└**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond B7: Basin 7



Summary for Pond B8: Basin 8

Inflow Area = 44.689 ac, 35.47% Impervious, Inflow Depth = 0.85" for 2 Year event
Inflow = 12.19 cfs @ 9.99 hrs, Volume= 3.178 af
Outflow = 1.51 cfs @ 15.62 hrs, Volume= 3.178 af, Atten= 88%, Lag= 337.9 min
Discarded = 0.46 cfs @ 15.62 hrs, Volume= 1.664 af
Primary = 1.05 cfs @ 15.62 hrs, Volume= 1.514 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 856.21' @ 15.62 hrs Surf.Area= 25,008 sf Storage= 68,173 cf

Plug-Flow detention time= 734.3 min calculated for 3.178 af (100% of inflow)
Center-of-Mass det. time= 734.4 min (1,507.0 - 772.6)

Volume	Invert	Avail.Storage	Storage Description
#1	853.00'	147,517 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
853.00	17,554	0	0
854.00	19,812	18,683	18,683
855.00	22,126	20,969	39,652
856.00	24,497	23,312	62,964
857.00	26,924	25,711	88,674
858.00	29,407	28,166	116,840
859.00	31,948	30,678	147,517

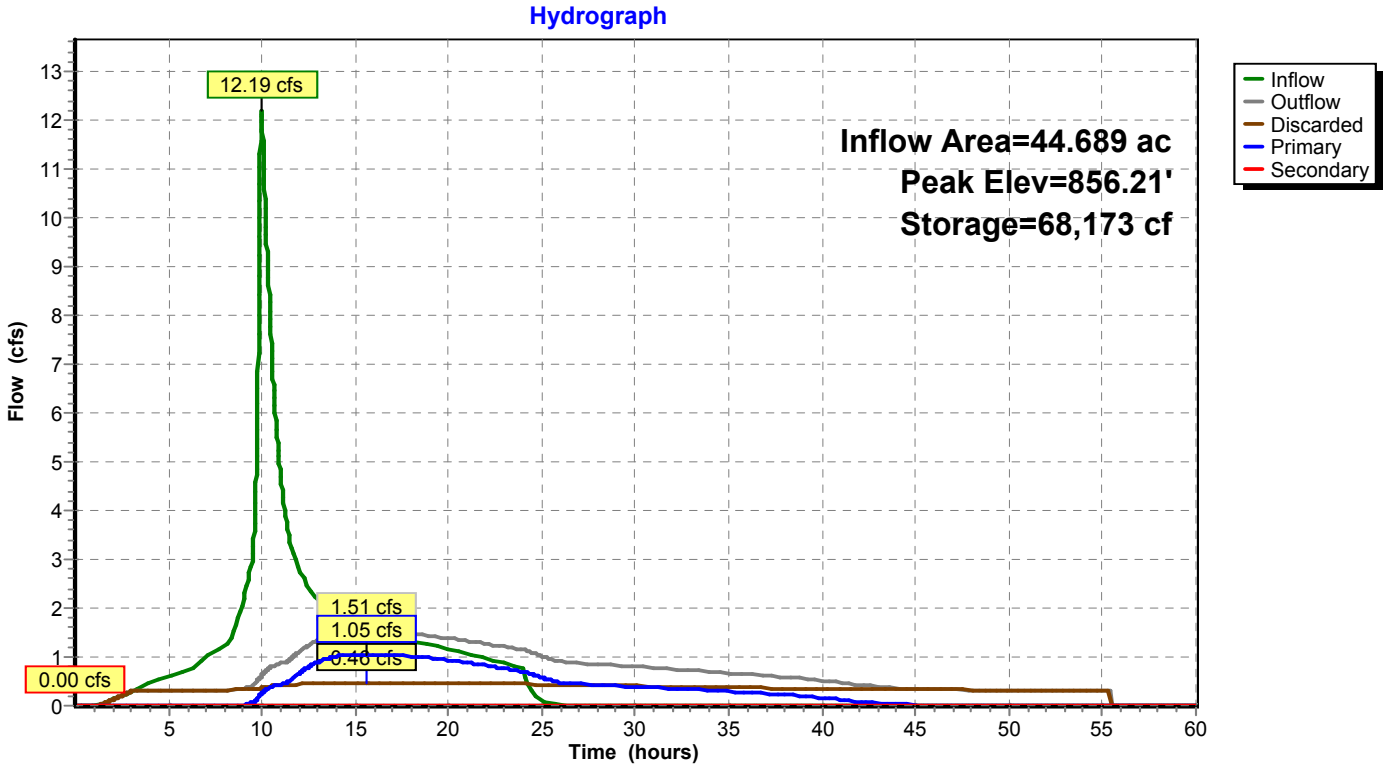
Device	Routing	Invert	Outlet Devices
#1	Primary	853.00'	**30.0" Round Culvert** L= 1,200.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 853.00' / 844.17' S= 0.0074 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Discarded	853.00'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 800.00'
#3	Device 1	853.58'	**2.0" W x 5.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	855.67'	**5.0" W x 12.0" H Vert. Orifice/Grate** X 4 rows with 8.0" cc spacing C= 0.600
#5	Device 1	857.25'	**36.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 in 36.0" x 36.0" Grate (100% open area) Limited to weir flow at low heads
#6	Secondary	858.75'	**16.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.46 cfs @ 15.62 hrs HW=856.21' (Free Discharge)
└**2=Exfiltration** (Controls 0.46 cfs)

Primary OutFlow Max=1.05 cfs @ 15.62 hrs HW=856.21' TW=844.68' (Dynamic Tailwater)
└**1=Culvert** (Passes 1.05 cfs of 33.09 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 0.52 cfs @ 7.49 fps)
  ├**4=Orifice/Grate** (Orifice Controls 0.53 cfs @ 2.36 fps)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=853.00' (Free Discharge)
└**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond B8: Basin 8



Summary for Pond B9: Basin 9

Inflow Area = 11.446 ac, 17.36% Impervious, Inflow Depth = 0.50" for 2 Year event
Inflow = 1.74 cfs @ 9.98 hrs, Volume= 0.481 af
Outflow = 1.02 cfs @ 10.42 hrs, Volume= 0.479 af, Atten= 42%, Lag= 26.5 min
Primary = 1.02 cfs @ 10.42 hrs, Volume= 0.479 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 848.48' @ 10.42 hrs Surf.Area= 6,668 sf Storage= 3,029 cf

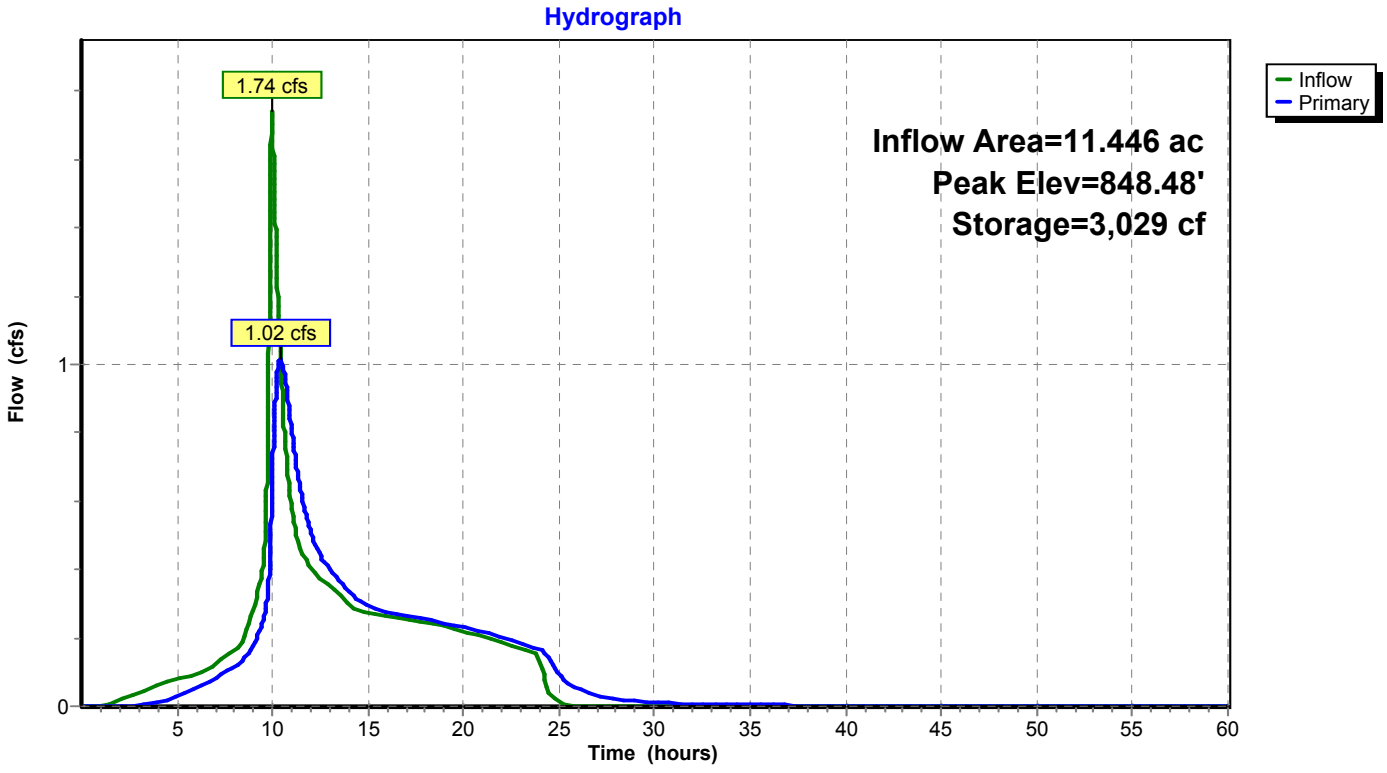
Plug-Flow detention time= 93.3 min calculated for 0.479 af (100% of inflow)
Center-of-Mass det. time= 91.6 min (904.8 - 813.2)

Volume	Invert	Avail.Storage	Storage Description
#1	848.00'	48,750 cf	**30.00'W x 200.00'L x 5.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	848.00'	**18.0" Round Culvert** L= 110.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 848.00' / 847.00' S= 0.0091 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Device 1	848.00'	**15.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.02 cfs @ 10.42 hrs HW=848.48' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 1.02 cfs of 1.14 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 1.02 cfs @ 2.35 fps)

Pond B9: Basin 9



Summary for Pond Ex SD: Tract #1632 Ex. 36" SD Outlet

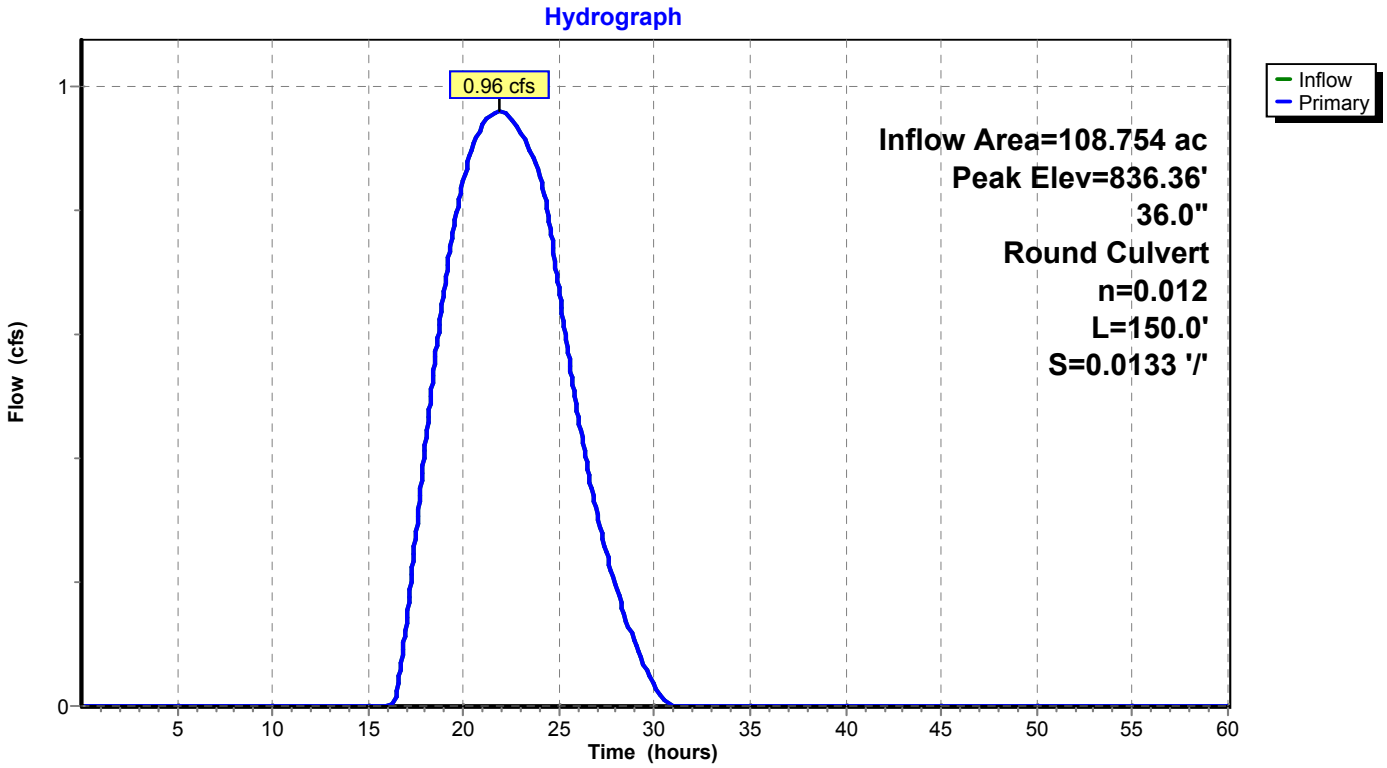
Inflow Area = 108.754 ac, 33.30% Impervious, Inflow Depth = 0.07" for 2 Year event
Inflow = 0.96 cfs @ 21.83 hrs, Volume= 0.621 af
Outflow = 0.96 cfs @ 21.84 hrs, Volume= 0.621 af, Atten= 0%, Lag= 0.2 min
Primary = 0.96 cfs @ 21.84 hrs, Volume= 0.621 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 836.36' @ 21.84 hrs
Flood Elev= 843.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	836.00'	**36.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 836.00' / 834.00' S= 0.0133 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf

Primary OutFlow Max=0.96 cfs @ 21.84 hrs HW=836.36' TW=835.00' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.96 cfs @ 2.03 fps)

Pond Ex SD: Tract #1632 Ex. 36" SD Outlet



Summary for Pond MC Q: SD System

[58] Hint: Peaked 0.29' above defined flood level

Inflow Area = 21.500 ac, 80.00% Impervious, Inflow Depth = 1.74" for 2 Year event
Inflow = 17.34 cfs @ 9.97 hrs, Volume= 3.116 af
Outflow = 17.22 cfs @ 9.99 hrs, Volume= 2.836 af, Atten= 1%, Lag= 0.9 min
Discarded = 0.11 cfs @ 9.99 hrs, Volume= 0.358 af
Primary = 8.31 cfs @ 9.99 hrs, Volume= 1.203 af
Secondary = 8.80 cfs @ 9.99 hrs, Volume= 1.274 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 845.79' @ 9.99 hrs Surf.Area= 0.118 ac Storage= 0.505 af
Flood Elev= 845.50' Surf.Area= 0.097 ac Storage= 0.474 af

Plug-Flow detention time= 236.1 min calculated for 2.836 af (91% of inflow)
Center-of-Mass det. time= 178.6 min (910.6 - 732.0)

Volume	Invert	Avail.Storage	Storage Description
#1	839.50'	0.607 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
839.50	0.081	0.000	0.000
840.00	0.081	0.040	0.040
841.00	0.081	0.081	0.121
842.00	0.081	0.081	0.202
843.00	0.081	0.081	0.283
844.00	0.081	0.081	0.364
845.00	0.061	0.071	0.434
846.00	0.133	0.097	0.531
846.50	0.172	0.076	0.607

Device	Routing	Invert	Outlet Devices
#1	Primary	841.50'	**36.0" Round Culvert** L= 585.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 841.50' / 838.50' S= 0.0051 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf
#2	Device 1	845.50'	**48.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Discarded	839.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 750.00'
#4	Secondary	845.50'	**20.0' long (Profile 4) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.77 2.97 3.21

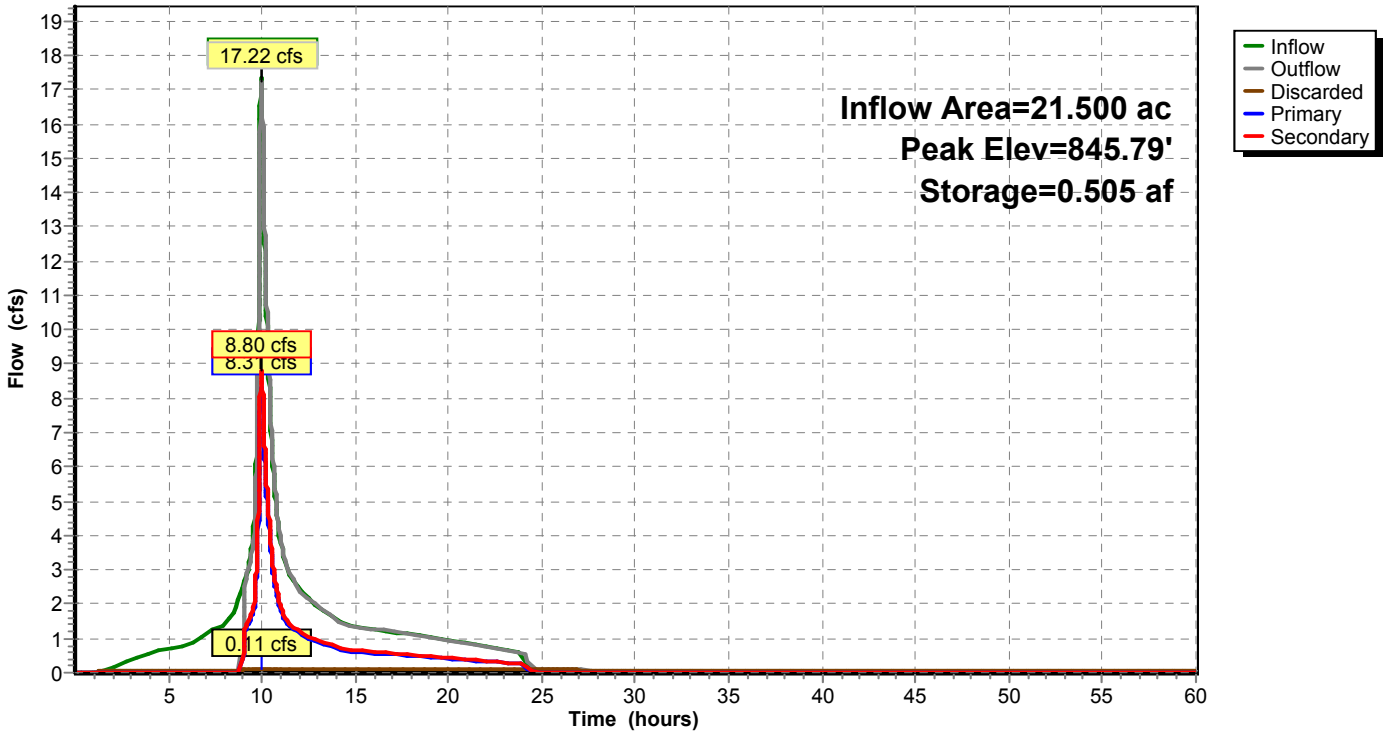
Discarded OutFlow Max=0.11 cfs @ 9.99 hrs HW=845.79' (Free Discharge)
└**3=Exfiltration** (Controls 0.11 cfs)

Primary OutFlow Max=8.31 cfs @ 9.99 hrs HW=845.79' TW=839.69' (Dynamic Tailwater)
└**1=Culvert** (Passes 8.31 cfs of 51.95 cfs potential flow)
└**2=Orifice/Grate** (Weir Controls 8.31 cfs @ 1.77 fps)

Secondary OutFlow Max=8.80 cfs @ 9.99 hrs HW=845.79' TW=833.92' (Dynamic Tailwater)
└**4=Broad-Crested Rectangular Weir** (Weir Controls 8.80 cfs @ 1.50 fps)

Pond MC Q: SD System

Hydrograph



Summary for Pond SD: 42" HDPE SD

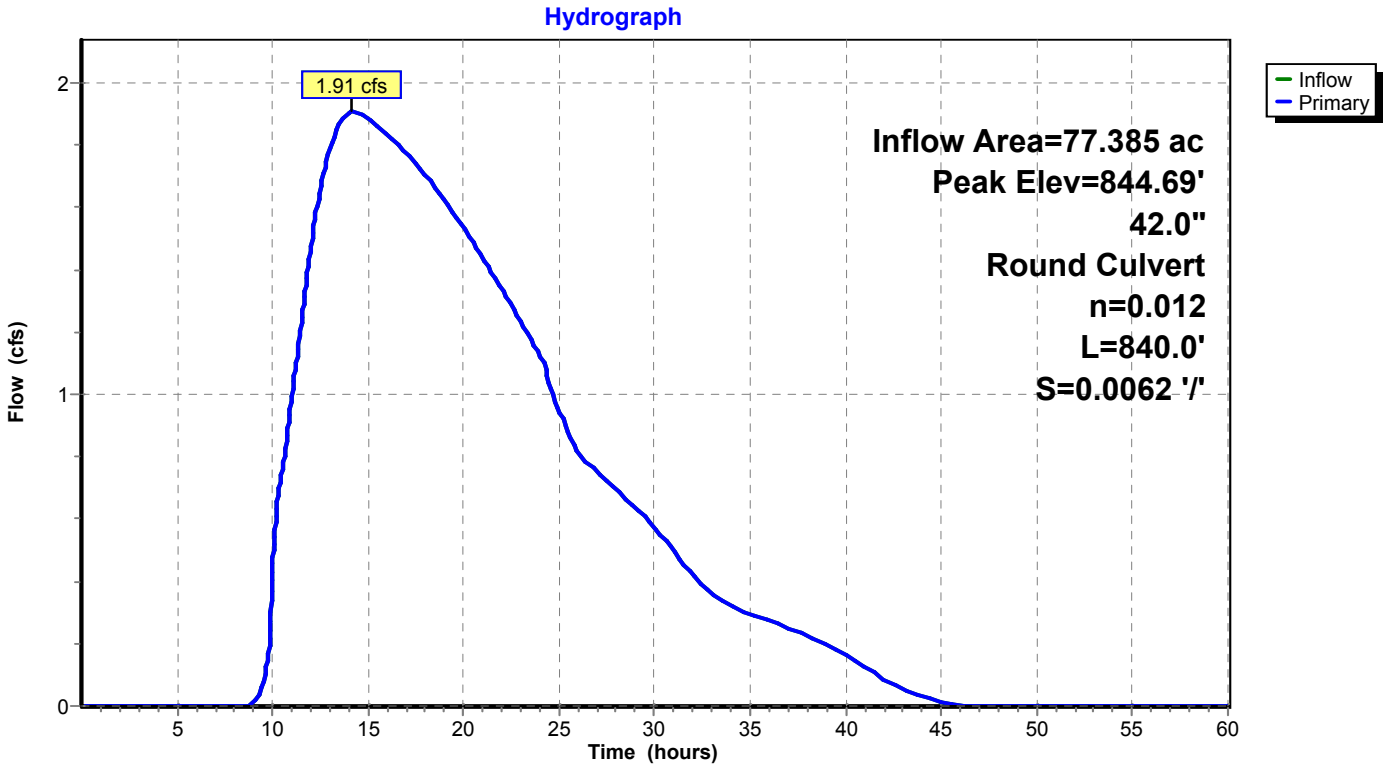
Inflow Area = 77.385 ac, 33.30% Impervious, Inflow Depth = 0.38" for 2 Year event
Inflow = 1.91 cfs @ 14.17 hrs, Volume= 2.460 af
Outflow = 1.91 cfs @ 14.17 hrs, Volume= 2.460 af, Atten= 0%, Lag= 0.0 min
Primary = 1.91 cfs @ 14.17 hrs, Volume= 2.460 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 844.69' @ 14.52 hrs
Flood Elev= 853.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	844.17'	**42.0" Round Culvert** L= 840.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 844.17' / 839.00' S= 0.0062 '/' Cc= 0.900 n= 0.012, Flow Area= 9.62 sf

Primary OutFlow Max=1.91 cfs @ 14.17 hrs HW=844.68' TW=840.50' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 1.91 cfs @ 3.30 fps)

Pond SD: 42" HDPE SD



Time span=0.01-60.00 hrs, dt=0.01 hrs, 6000 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Pond 1P: SD Inlet with Bypass SD Peak Elev=825.19' Inflow=35.45 cfs 8.685 af
Primary=35.45 cfs 8.685 af Secondary=0.00 cfs 0.000 af Outflow=35.45 cfs 8.685 af

Pond 2P: 60" SD MH Peak Elev=840.06' Inflow=13.65 cfs 2.186 af
Primary=13.65 cfs 2.186 af Secondary=0.00 cfs 0.000 af Outflow=13.65 cfs 2.186 af

Pond 15P: SD System 42" HDPE Peak Elev=844.40' Inflow=17.03 cfs 0.846 af
Outflow=17.03 cfs 0.846 af

Pond 16P: Dbl Conc. Arch Culvert (37x23) Peak Elev=844.30' Inflow=10.83 cfs 3.972 af
36.3" x 22.5", R=18.8"/51.0" Pipe Arch Culvert x 2.00 n=0.011 L=860.0' S=0.0024 '/' Outflow=10.83 cfs 3.972 af

Pond 17P: Gran Cielo Dwy Peak Elev=854.84' Storage=9,750 cf Inflow=122.07 cfs 24.054 af
Primary=93.38 cfs 23.448 af Secondary=0.00 cfs 0.000 af Tertiary=28.32 cfs 0.605 af Outflow=121.70 cfs 24.054 af

Pond 18P: GC-CkD1 Peak Elev=849.10' Storage=9,110 cf Inflow=152.52 cfs 34.873 af
Primary=0.64 cfs 0.017 af Secondary=12.52 cfs 0.211 af Tertiary=136.21 cfs 34.611 af Outflow=149.21 cfs 34.839 af

Pond 19P: GC-CkD2 Peak Elev=848.77' Storage=16,306 cf Inflow=27.17 cfs 2.706 af
Primary=1.16 cfs 1.345 af Secondary=18.40 cfs 1.360 af Tertiary=0.10 cfs 0.001 af Outflow=19.65 cfs 2.705 af

Pond 20P: GC-CkD3 Peak Elev=845.61' Storage=10,869 cf Inflow=26.70 cfs 4.281 af
Primary=4.72 cfs 3.046 af Secondary=3.87 cfs 0.379 af Tertiary=16.95 cfs 0.845 af Outflow=25.54 cfs 4.270 af

Pond B1: Basin 1 Peak Elev=836.34' Storage=4.294 af Inflow=61.24 cfs 10.005 af
Discarded=1.05 cfs 3.020 af Primary=13.77 cfs 6.610 af Secondary=0.00 cfs 0.000 af Outflow=14.82 cfs 9.629 af

Pond B10: Basin 10 Peak Elev=817.66' Storage=124,636 cf Inflow=27.15 cfs 5.934 af
Discarded=0.82 cfs 2.723 af Primary=3.68 cfs 2.761 af Secondary=0.00 cfs 0.000 af Outflow=4.50 cfs 5.484 af

Pond B11: Basin 11 Peak Elev=833.00' Storage=44,390 cf Inflow=16.38 cfs 2.604 af
Discarded=0.24 cfs 0.770 af Primary=3.46 cfs 1.573 af Secondary=0.00 cfs 0.000 af Outflow=3.70 cfs 2.343 af

Pond B12: Basin 12 Peak Elev=837.54' Storage=65,439 cf Inflow=21.44 cfs 3.326 af
Discarded=0.47 cfs 1.467 af Primary=2.02 cfs 1.588 af Secondary=0.00 cfs 0.000 af Outflow=2.49 cfs 3.055 af

Pond B13: Basin 13 Peak Elev=843.39' Storage=2.730 af Inflow=69.87 cfs 10.322 af
Discarded=0.44 cfs 1.321 af Primary=34.55 cfs 8.587 af Secondary=0.00 cfs 0.000 af Outflow=34.99 cfs 9.908 af

Pond B4: Basin 4 Peak Elev=838.95' Storage=111,294 cf Inflow=41.42 cfs 7.245 af
Discarded=0.54 cfs 1.630 af Primary=14.66 cfs 5.358 af Secondary=0.00 cfs 0.000 af Outflow=15.20 cfs 6.988 af

Pond B5: Basin 5 Peak Elev=847.07' Storage=55,240 cf Inflow=16.32 cfs 3.956 af
Discarded=0.38 cfs 1.188 af Primary=4.28 cfs 2.768 af Secondary=0.00 cfs 0.000 af Outflow=4.65 cfs 3.956 af

Pond B6: Basin 6 Peak Elev=851.09' Storage=1.896 af Inflow=30.64 cfs 6.310 af
Discarded=0.37 cfs 1.011 af Primary=15.84 cfs 5.009 af Secondary=0.00 cfs 0.000 af Outflow=16.21 cfs 6.019 af

Pond B7: Basin 7 Peak Elev=841.95' Storage=145,975 cf Inflow=17.05 cfs 10.954 af
Discarded=1.14 cfs 4.271 af Primary=6.98 cfs 6.584 af Secondary=0.00 cfs 0.000 af Outflow=8.12 cfs 10.855 af

Pond B8: Basin 8 Peak Elev=857.36' Storage=98,560 cf Inflow=22.23 cfs 6.012 af
Discarded=0.51 cfs 1.833 af Primary=5.93 cfs 4.179 af Secondary=0.00 cfs 0.000 af Outflow=6.44 cfs 6.012 af

Pond B9: Basin 9 Peak Elev=848.80' Storage=5,232 cf Inflow=3.86 cfs 1.080 af
Outflow=2.51 cfs 1.078 af

Pond Ex SD: Tract #1632 **Ex. 36" SD Outlet** Peak Elev=837.00' Inflow=6.98 cfs 6.584 af
36.0" Round Culvert n=0.012 L=150.0' S=0.0133 '/' Outflow=6.98 cfs 6.584 af

Pond MC Q: SD System Peak Elev=845.91' Storage=0.519 af Inflow=28.37 cfs 5.150 af
Discarded=0.11 cfs 0.368 af Primary=13.65 cfs 2.186 af Secondary=14.45 cfs 2.315 af Outflow=28.21 cfs 4.869 af

Pond SD: 42" HDPE SD Peak Elev=845.37' Inflow=10.07 cfs 6.947 af
42.0" Round Culvert n=0.012 L=840.0' S=0.0062 '/' Outflow=10.07 cfs 6.947 af

Summary for Pond 1P: SD Inlet with Bypass SD

Inflow Area = 108.566 ac, 6.93% Impervious, Inflow Depth = 0.96" for 10 Year event
Inflow = 35.45 cfs @ 9.99 hrs, Volume= 8.685 af
Outflow = 35.45 cfs @ 9.99 hrs, Volume= 8.685 af, Atten= 0%, Lag= 0.0 min
Primary = 35.45 cfs @ 9.99 hrs, Volume= 8.685 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

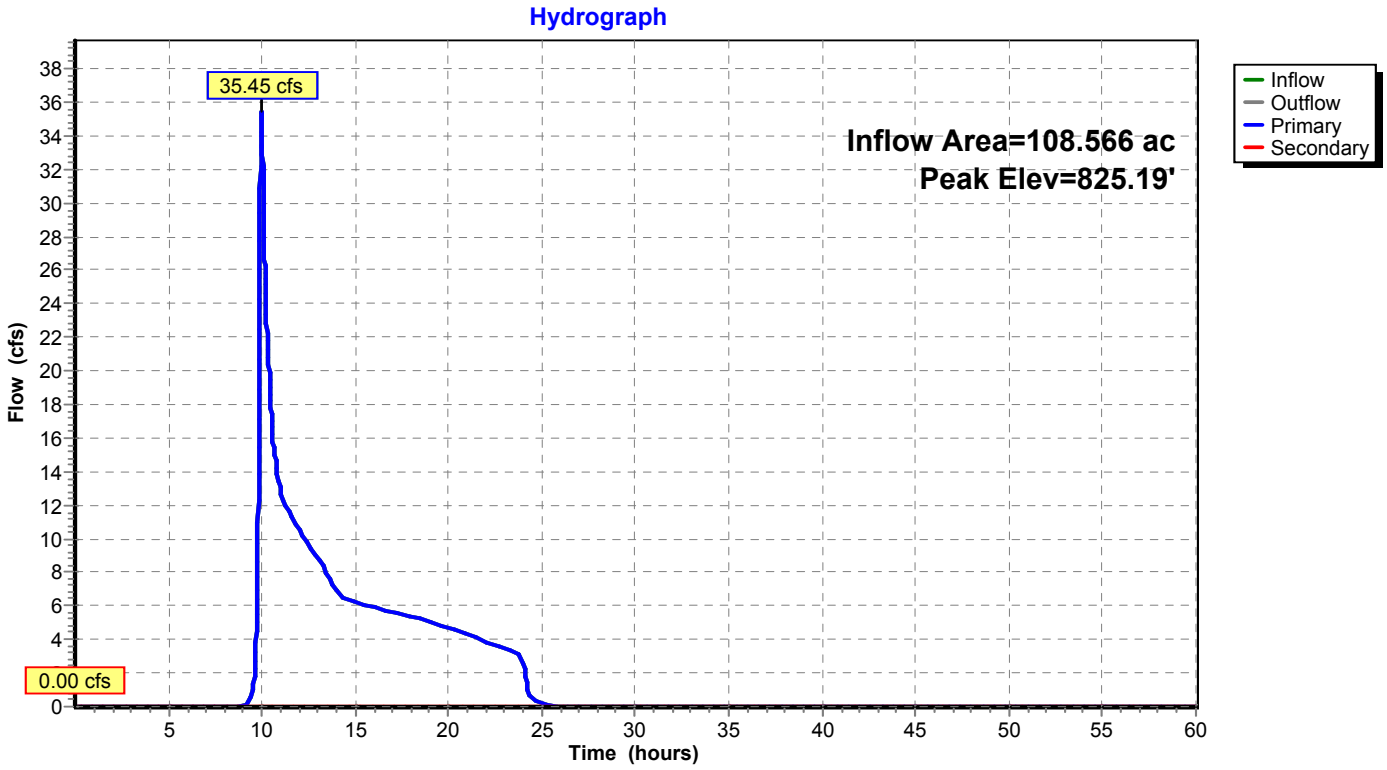
Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 825.19' @ 9.99 hrs
Flood Elev= 826.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	820.00'	**48.0" Round Culvert** L= 990.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 820.00' / 814.11' S= 0.0059 '/' Cc= 0.900 n= 0.012, Flow Area= 12.57 sf
#2	Device 1	824.50'	**78.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	825.90'	**Special & User-Defined** Head (feet) 0.00 0.50 0.67 0.83 Disch. (cfs) 0.000 200.000 450.000 1,200.000

Primary OutFlow Max=35.41 cfs @ 9.99 hrs HW=825.19' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 35.41 cfs of 108.02 cfs potential flow)
└─**2=Orifice/Grate** (Weir Controls 35.41 cfs @ 2.71 fps)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=820.00' TW=0.00' (Dynamic Tailwater)
└─**3=Special & User-Defined** (Controls 0.00 cfs)

Pond 1P: SD Inlet with Bypass SD



Summary for Pond 2P: 60" SD MH

Inflow Area = 21.500 ac, 80.00% Impervious, Inflow Depth = 1.22" for 10 Year event
Inflow = 13.65 cfs @ 9.99 hrs, Volume= 2.186 af
Outflow = 13.65 cfs @ 9.99 hrs, Volume= 2.186 af, Atten= 0%, Lag= 0.0 min
Primary = 13.65 cfs @ 9.99 hrs, Volume= 2.186 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

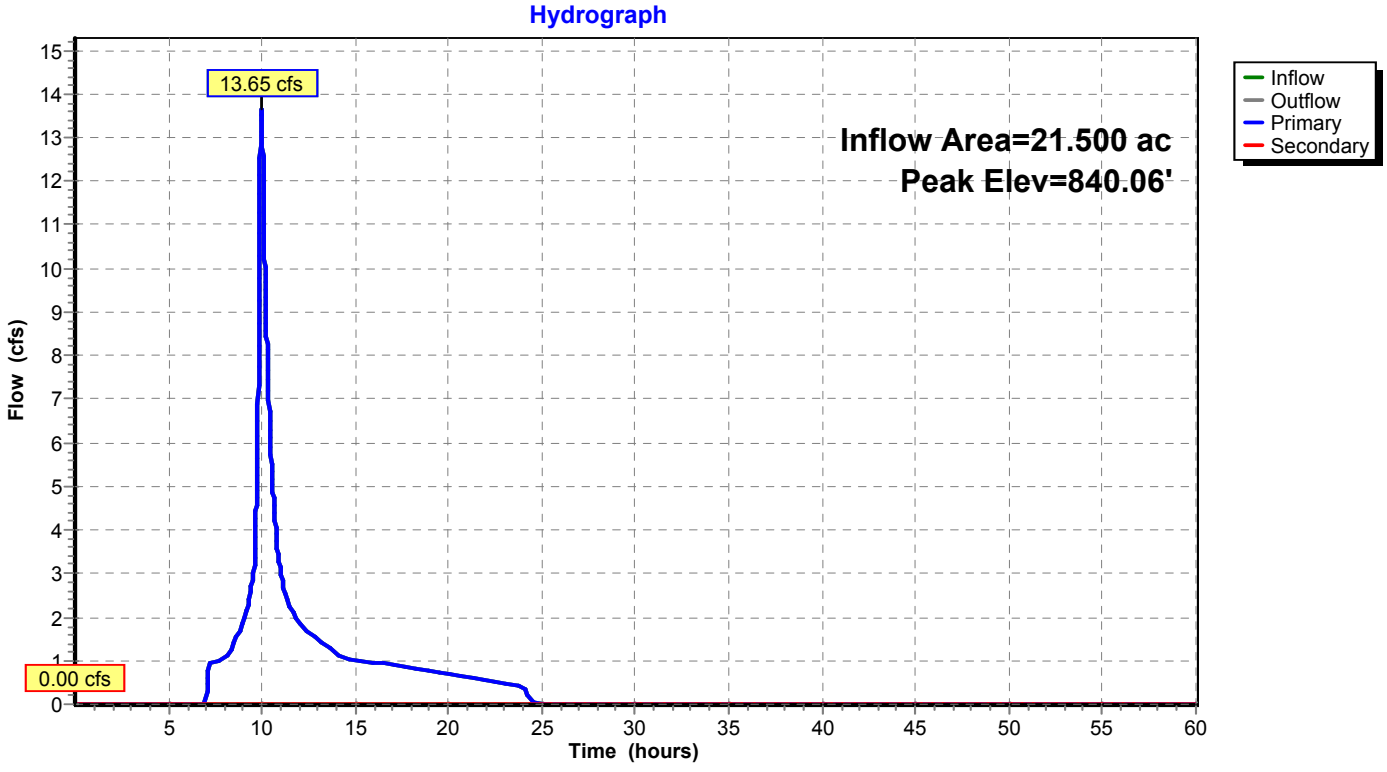
Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 840.06' @ 9.99 hrs
Flood Elev= 845.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	838.50'	**36.0" Round Culvert** L= 500.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 838.50' / 836.50' S= 0.0040 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 7.07 sf
#2	Secondary	844.25'	**69.6" W x 9.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=13.64 cfs @ 9.99 hrs HW=840.06' TW=834.93' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 13.64 cfs @ 5.34 fps)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=838.50' TW=826.50' (Dynamic Tailwater)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 2P: 60" SD MH



Summary for Pond 15P: SD System 42" HDPE

2 - 6 foot long curb openings (one on both sides of Linne Rd)
with 25 foot x 12 inch wide channel drain in Conc C&G

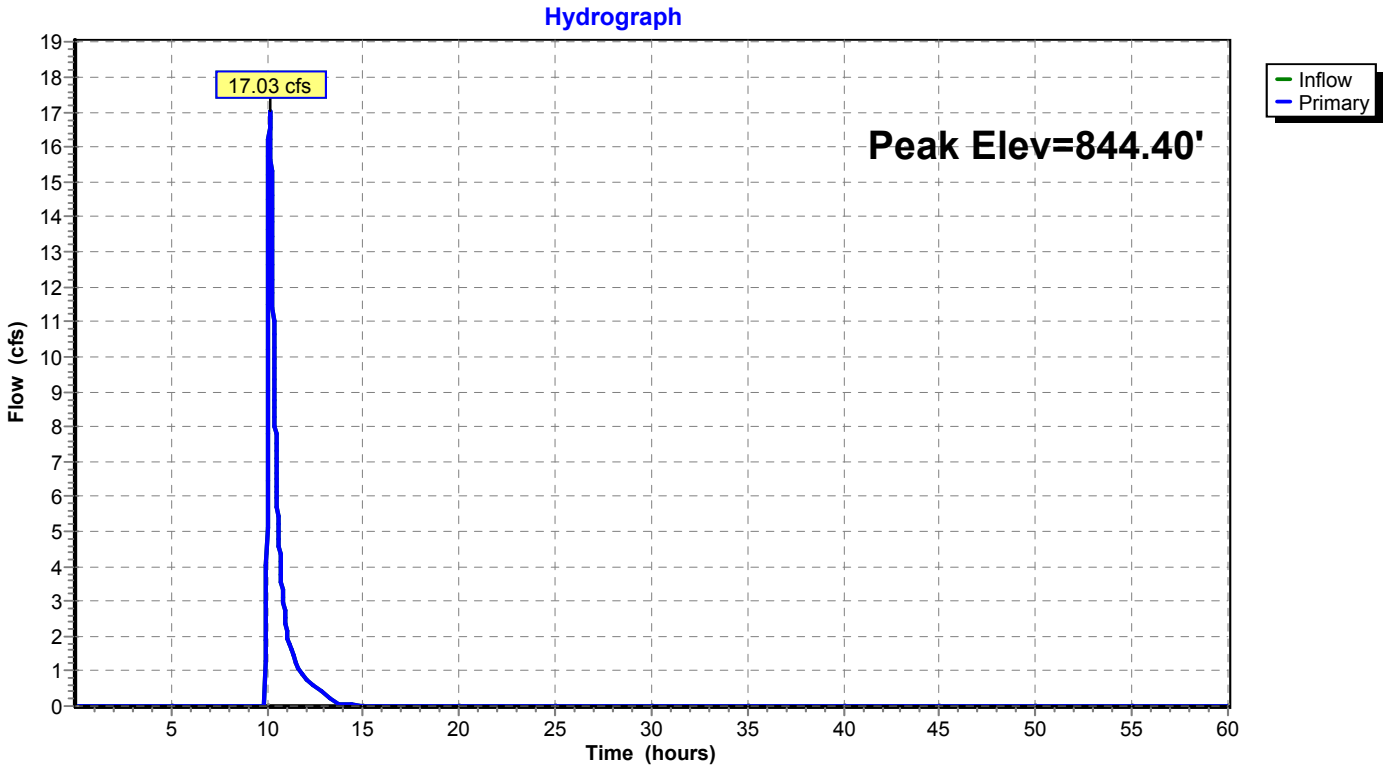
Inflow	=	17.03 cfs @	10.14 hrs, Volume=	0.846 af
Outflow	=	17.03 cfs @	10.14 hrs, Volume=	0.846 af, Atten= 0%, Lag= 0.0 min
Primary	=	17.03 cfs @	10.14 hrs, Volume=	0.846 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 844.40' @ 10.14 hrs
Flood Elev= 845.02'

Device	Routing	Invert	Outlet Devices
#1	Primary	839.75'	**42.0" Round Culvert** L= 1,370.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 839.75' / 833.60' S= 0.0045 '/' Cc= 0.900 n= 0.012, Flow Area= 9.62 sf
#2	Device 1	844.17'	**72.0" W x 9.0" H Vert. Orifice/Grate X 2.00** C= 0.600
#3	Device 1	844.25'	**12.0" x 180.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=17.03 cfs @ 10.14 hrs HW=844.40' TW=835.48' (Dynamic Tailwater)
└─**1=Culvert** (Passes 17.03 cfs of 75.23 cfs potential flow)
  └─**2=Orifice/Grate** (Orifice Controls 4.36 cfs @ 1.55 fps)
  └─**3=Orifice/Grate** (Weir Controls 12.67 cfs @ 1.28 fps)

Pond 15P: SD System 42" HDPE



Summary for Pond 16P: Dbl Conc. Arch Culvert (37x23)

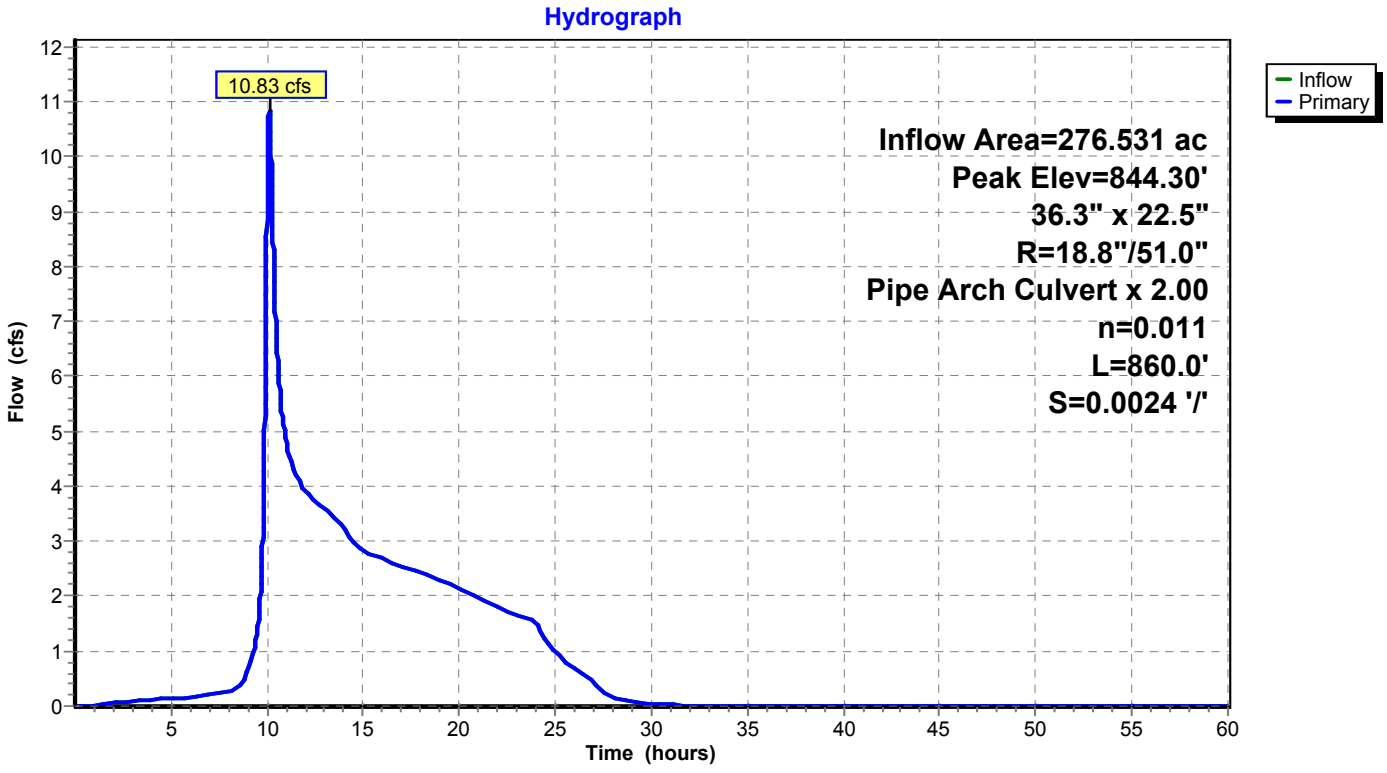
Inflow Area = 276.531 ac, 1.60% Impervious, Inflow Depth = 0.17" for 10 Year event
Inflow = 10.83 cfs @ 10.11 hrs, Volume= 3.972 af
Outflow = 10.83 cfs @ 10.11 hrs, Volume= 3.972 af, Atten= 0%, Lag= 0.0 min
Primary = 10.83 cfs @ 10.11 hrs, Volume= 3.972 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 844.30' @ 10.11 hrs
Flood Elev= 846.02'

Device	Routing	Invert	Outlet Devices
#1	Primary	843.50'	**36.3" W x 22.5" H, R=18.8"/51.0" Pipe Arch RCP_Arch 37x23 X 2.00** L= 860.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 843.50' / 841.40' S= 0.0024 '/' Cc= 0.900 n= 0.011, Flow Area= 4.43 sf

Primary OutFlow Max=10.83 cfs @ 10.11 hrs HW=844.30' TW=0.00' (Dynamic Tailwater)
1=RCP_Arch 37x23 (Barrel Controls 10.83 cfs @ 3.64 fps)

Pond 16P: Dbl Conc. Arch Culvert (37x23)



Summary for Pond 17P: Gran Cielo Dwy

[58] Hint: Peaked 0.38' above defined flood level

Inflow Area = 166.738 ac, 0.91% Impervious, Inflow Depth = 1.73" for 10 Year event
Inflow = 122.07 cfs @ 9.98 hrs, Volume= 24.054 af
Outflow = 121.70 cfs @ 9.99 hrs, Volume= 24.054 af, Atten= 0%, Lag= 0.6 min
Primary = 93.38 cfs @ 9.99 hrs, Volume= 23.448 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af
Tertiary = 28.32 cfs @ 9.99 hrs, Volume= 0.605 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 854.84' @ 9.99 hrs Surf.Area= 7,752 sf Storage= 9,750 cf
Flood Elev= 854.46' Surf.Area= 6,947 sf Storage= 6,934 cf

Plug-Flow detention time= 1.9 min calculated for 24.050 af (100% of inflow)
Center-of-Mass det. time= 1.9 min (831.4 - 829.5)

Volume	Invert	Avail.Storage	Storage Description
#1	852.84'	22,270 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
852.84	0	0	0
853.14	2,586	388	388
854.14	6,275	4,431	4,818
855.14	8,376	7,326	12,144
856.14	11,876	10,126	22,270

Device	Routing	Invert	Outlet Devices
#1	Primary	852.84'	**30.0" Round Culvert X 6.00** L= 77.0' CMP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 852.84' / 851.76' S= 0.0140 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 4.91 sf
#2	Secondary	854.90'	**Special & User-Defined** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 Disch. (cfs) 0.000 0.010 0.200 0.710 1.580 2.700 4.030 5.690 7.620 9.790 12.320 15.140 18.190 21.460 24.930 28.580 32.420 36.420 40.580 44.900 49.360 53.970
#3	Tertiary	854.40'	**Special & User-Defined** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 2.20 2.30 2.40 2.50 2.60 Disch. (cfs) 0.000 0.080 3.470 10.790 21.890 36.810 55.720 78.890 106.600 138.580 174.620 214.630 258.590 306.440 358.240 413.470 471.810 533.060 597.050 663.650 732.760 804.270 878.100 954.180 1,032.440 1,112.810 1,195.240

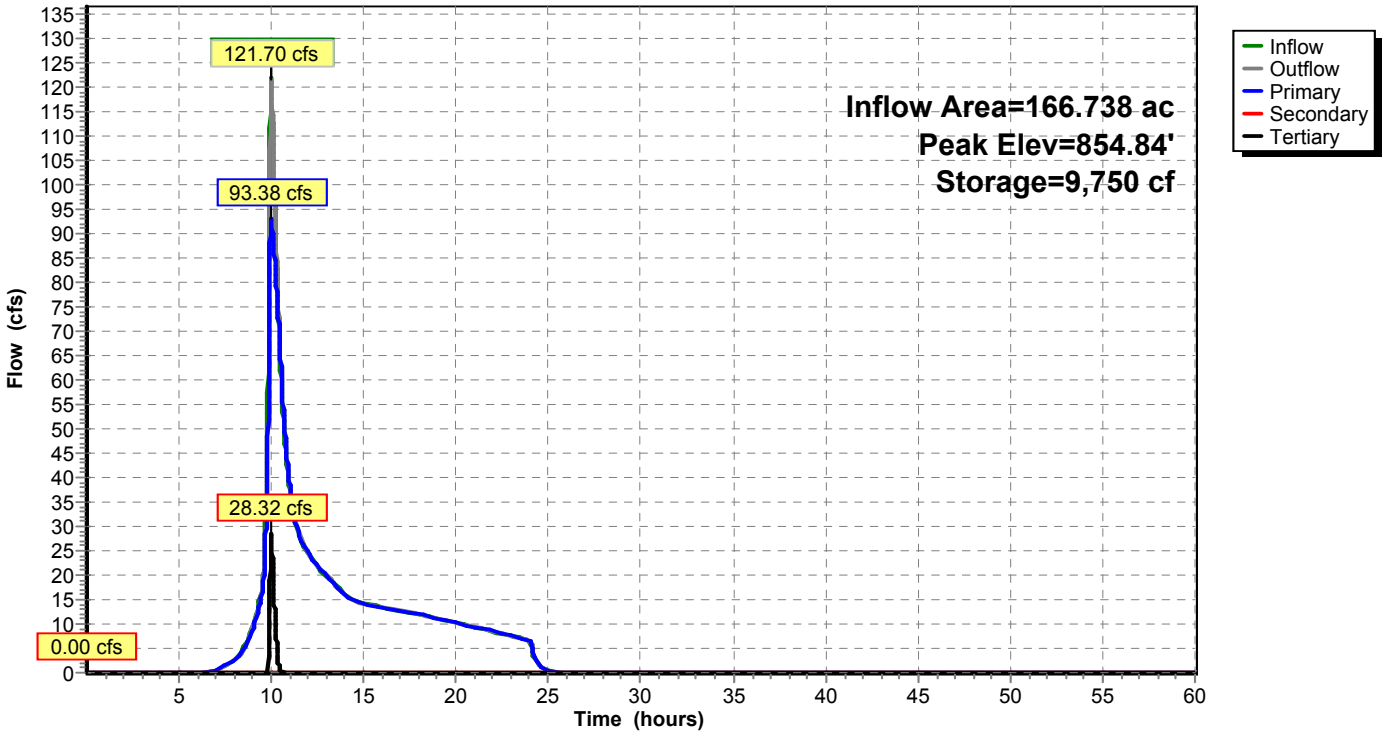
Primary OutFlow Max=93.35 cfs @ 9.99 hrs HW=854.84' TW=849.08' (Dynamic Tailwater)
1=Culvert (Barrel Controls 93.35 cfs @ 5.05 fps)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=852.84' TW=844.56' (Dynamic Tailwater)
2=Special & User-Defined (Controls 0.00 cfs)

Tertiary OutFlow Max=28.26 cfs @ 9.99 hrs HW=854.84' TW=853.97' (Dynamic Tailwater)
3=Special & User-Defined (Custom Controls 28.26 cfs)

Pond 17P: Gran Cielo Dwy

Hydrograph



Summary for Pond 18P: GC-CkD1

Inflow Area = 240.622 ac, 1.05% Impervious, Inflow Depth = 1.74" for 10 Year event
Inflow = 152.52 cfs @ 9.99 hrs, Volume= 34.873 af
Outflow = 149.21 cfs @ 10.02 hrs, Volume= 34.839 af, Atten= 2%, Lag= 1.8 min
Primary = 0.64 cfs @ 9.93 hrs, Volume= 0.017 af
Secondary = 12.52 cfs @ 10.01 hrs, Volume= 0.211 af
Tertiary = 136.21 cfs @ 10.02 hrs, Volume= 34.611 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 849.10' @ 10.02 hrs Surf.Area= 8,631 sf Storage= 9,110 cf
Flood Elev= 850.17' Surf.Area= 18,446 sf Storage= 23,434 cf

Plug-Flow detention time= 1.9 min calculated for 34.833 af (100% of inflow)
Center-of-Mass det. time= 1.3 min (833.4 - 832.2)

Volume	Invert	Avail.Storage	Storage Description
#1	844.56'	70,294 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
844.56	10	0	0
845.00	200	46	46
846.00	600	400	446
847.00	1,500	1,050	1,496
848.00	2,166	1,833	3,329
849.00	7,688	4,927	8,256
850.00	16,694	12,191	20,447
851.00	27,000	21,847	42,294
852.00	29,000	28,000	70,294

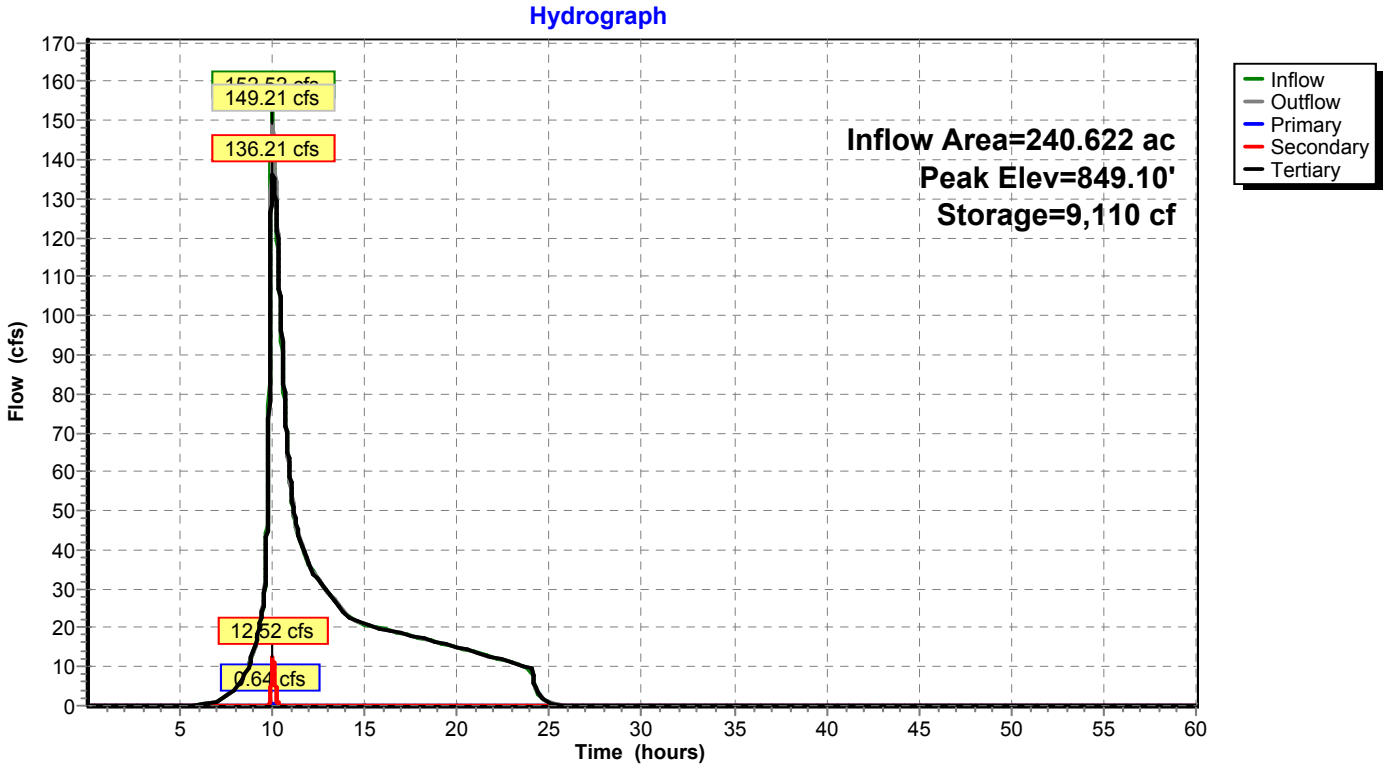
Device	Routing	Invert	Outlet Devices
#1	Primary	847.69'	**6.0" Round Culvert** L= 26.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 847.69' / 847.67' S= 0.0008 '/' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Secondary	848.50'	**9.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59
#3	Tertiary	843.15'	**58.5" W x 36.0" H, R=30.0"/84.0" Pipe Arch RCP_Arch 59x36 X 2.00** L= 960.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 843.15' / 840.75' S= 0.0025 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 11.40 sf
#4	Device 3	847.00'	**78.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Tertiary	850.00'	**Special & User-Defined (CkD1-S)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 Disch. (cfs) 0.000 0.030 0.560 1.900 4.120 7.220 11.180 15.770 20.900 26.530 32.600 39.090 45.970 53.220 60.820 68.750 77.000 85.570 94.430 103.580 113.010

Primary OutFlow Max=0.61 cfs @ 9.93 hrs HW=848.81' TW=848.13' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.61 cfs @ 3.12 fps)

Secondary OutFlow Max=12.28 cfs @ 10.01 hrs HW=849.10' TW=848.61' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 12.28 cfs @ 2.27 fps)

Tertiary OutFlow Max=136.20 cfs @ 10.02 hrs HW=849.10' TW=841.68' (Dynamic Tailwater)
└**3=RCP_Arch 59x36** (Passes 136.20 cfs of 165.22 cfs potential flow)
└**4=Orifice/Grate** (Orifice Controls 136.20 cfs @ 6.98 fps)
└**5=Special & User-Defined (CkD1-S)** (Controls 0.00 cfs)

Pond 18P: GC-CkD1



Summary for Pond 19P: GC-CkD2

[58] Hint: Peaked 0.12' above defined flood level
[80] Warning: Exceeded Pond 18P by 0.56' @ 22.37 hrs (0.06 cfs 0.144 af)
[80] Warning: Exceeded Pond 18P by 0.03' @ 10.36 hrs (0.01 cfs 0.000 af)

Inflow Area =	260.311 ac,	0.99% Impervious,	Inflow Depth =	0.12"	for 10 Year event
Inflow =	27.17 cfs @	10.00 hrs,	Volume=	2.706 af	
Outflow =	19.65 cfs @	10.11 hrs,	Volume=	2.705 af,	Atten= 28%, Lag= 6.1 min
Primary =	1.16 cfs @	10.11 hrs,	Volume=	1.345 af	
Secondary =	18.40 cfs @	10.11 hrs,	Volume=	1.360 af	
Tertiary =	0.10 cfs @	10.11 hrs,	Volume=	0.001 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 848.77' @ 10.11 hrs Surf.Area= 12,554 sf Storage= 16,306 cf
Flood Elev= 848.65' Surf.Area= 11,850 sf Storage= 14,787 cf

Plug-Flow detention time= 67.9 min calculated for 2.705 af (100% of inflow)
Center-of-Mass det. time= 67.5 min (886.6 - 819.1)

Volume	Invert	Avail.Storage	Storage Description
#1	846.00'	46,430 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
846.00	267	0	0
847.00	4,055	2,161	2,161
848.00	8,178	6,117	8,278
849.00	13,828	11,003	19,281
850.00	40,470	27,149	46,430

Device	Routing	Invert	Outlet Devices
#1	Primary	846.12'	**6.0" Round Culvert** L= 26.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 846.12' / 845.98' S= 0.0054 '/' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Tertiary	848.70'	**Special & User-Defined (CkD2-S)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 Disch. (cfs) 0.000 0.130 0.970 2.640 5.120 8.550 13.010 18.440 24.620 31.430 38.830 46.770 55.210 64.120
#3	Secondary	847.80'	**Special & User-Defined (CkD2-W)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 2.20 Disch. (cfs) 0.000 0.020 0.480 1.430 2.780 4.430 6.490 8.950 12.010 15.510 19.390 23.590 28.100 32.980 38.270 43.910 49.850 56.080 62.580 69.340 76.350 83.590 91.070

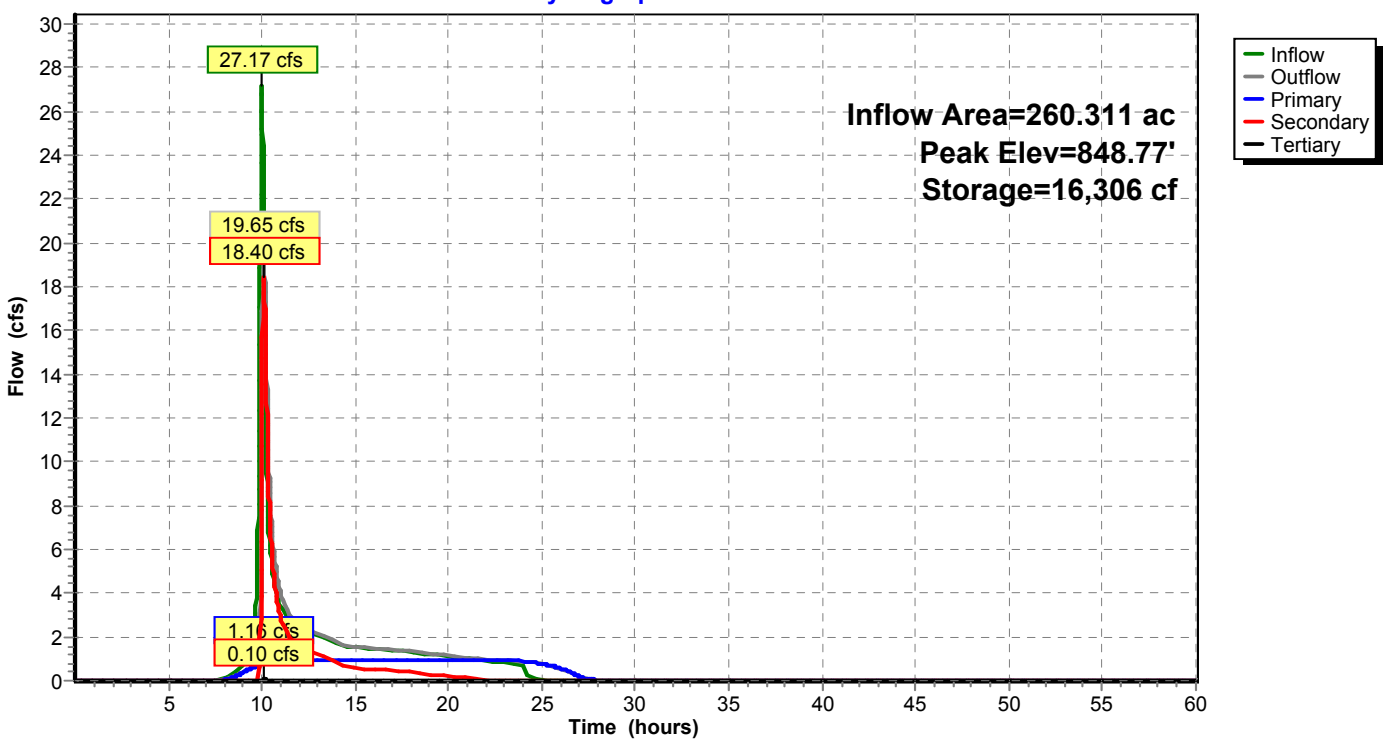
Primary OutFlow Max=1.16 cfs @ 10.11 hrs HW=848.77' TW=845.60' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.16 cfs @ 5.89 fps)

Secondary OutFlow Max=18.39 cfs @ 10.11 hrs HW=848.77' TW=845.60' (Dynamic Tailwater)
└**3=Special & User-Defined (CkD2-W)** (Custom Controls 18.39 cfs)

Tertiary OutFlow Max=0.10 cfs @ 10.11 hrs HW=848.77' TW=0.00' (Dynamic Tailwater)
└**2=Special & User-Defined (CkD2-S)** (Custom Controls 0.10 cfs)

Pond 19P: GC-CkD2

Hydrograph



Summary for Pond 20P: GC-CkD3

[58] Hint: Peaked 0.59' above defined flood level

Inflow Area = 274.094 ac, 0.94% Impervious, Inflow Depth = 0.19" for 10 Year event
Inflow = 26.70 cfs @ 10.09 hrs, Volume= 4.281 af
Outflow = 25.54 cfs @ 10.14 hrs, Volume= 4.270 af, Atten= 4%, Lag= 3.1 min
Primary = 4.72 cfs @ 10.14 hrs, Volume= 3.046 af
Secondary = 3.87 cfs @ 10.14 hrs, Volume= 0.379 af
Tertiary = 16.95 cfs @ 10.14 hrs, Volume= 0.845 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 845.61' @ 10.14 hrs Surf.Area= 12,297 sf Storage= 10,869 cf
Flood Elev= 845.02' Surf.Area= 8,229 sf Storage= 4,852 cf

Plug-Flow detention time= 31.0 min calculated for 4.270 af (100% of inflow)
Center-of-Mass det. time= 28.9 min (901.7 - 872.8)

Volume	Invert	Avail.Storage	Storage Description
#1	844.00'	24,632 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
844.00	1,288	0	0
845.00	8,090	4,689	4,689
846.50	18,500	19,943	24,632

Device	Routing	Invert	Outlet Devices
#1	Primary	844.22'	**18.0" Round Culvert** L= 26.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 844.22' / 843.98' S= 0.0092 '/' Cc= 0.900 n= 0.021 Corrugated metal, Flow Area= 1.77 sf
#2	Secondary	845.00'	**Special & User-Defined (CkD3-W)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 Disch. (cfs) 0.000 0.050 0.390 0.970 1.710 2.600 3.780 5.170 6.720 8.570 11.140 14.290 17.880 21.830 26.120 30.880 36.030 41.520 47.330 53.420 59.790
#3	Tertiary	845.10'	**Special & User-Defined (CkD3-S)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 Disch. (cfs) 0.000 0.050 1.930 5.420 10.370 16.490 23.960 32.580 42.550 53.770 66.380 80.510 96.280 113.770 132.840 153.630 175.910 199.510 224.310 250.260

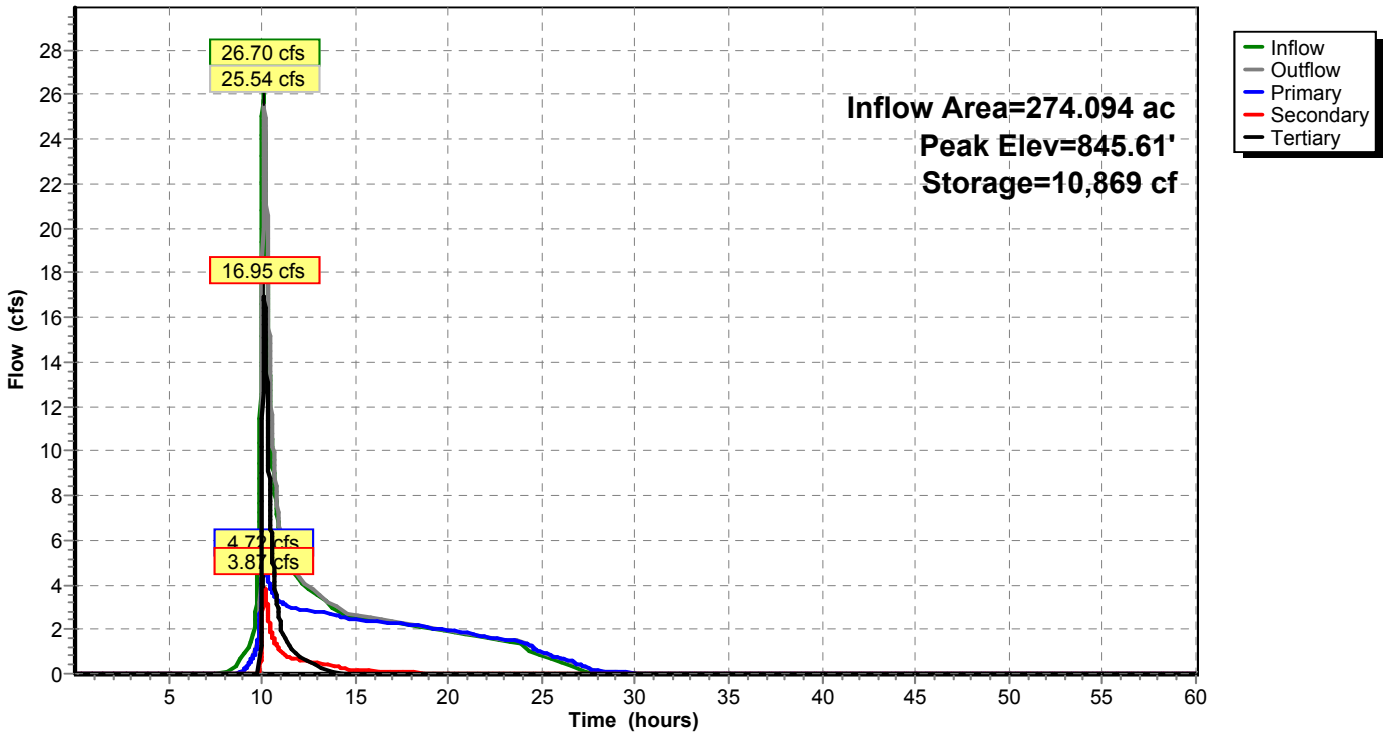
Primary OutFlow Max=4.72 cfs @ 10.14 hrs HW=845.61' TW=844.30' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 4.72 cfs @ 3.61 fps)

Secondary OutFlow Max=3.87 cfs @ 10.14 hrs HW=845.61' TW=844.30' (Dynamic Tailwater)
└**2=Special & User-Defined (CkD3-W)** (Custom Controls 3.87 cfs)

Tertiary OutFlow Max=16.95 cfs @ 10.14 hrs HW=845.61' TW=0.00' (Dynamic Tailwater)
└**3=Special & User-Defined (CkD3-S)** (Custom Controls 16.95 cfs)

Pond 20P: GC-CkD3

Hydrograph



Summary for Pond B1: Basin 1

Inflow Area = 47.388 ac, 67.98% Impervious, Inflow Depth = 2.53" for 10 Year event
Inflow = 61.24 cfs @ 10.05 hrs, Volume= 10.005 af
Outflow = 14.82 cfs @ 10.93 hrs, Volume= 9.629 af, Atten= 76%, Lag= 52.6 min
Discarded = 1.05 cfs @ 10.93 hrs, Volume= 3.020 af
Primary = 13.77 cfs @ 10.93 hrs, Volume= 6.610 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 836.34' @ 10.93 hrs Surf.Area= 1.322 ac Storage= 4.294 af

Plug-Flow detention time= 423.9 min calculated for 9.629 af (96% of inflow)
Center-of-Mass det. time= 398.7 min (1,138.8 - 740.1)

Volume	Invert	Avail.Storage	Storage Description
#1	826.50'	8.466 af	**Custom Stage Data (Prismatic)** Listed below (Recalc) 8.789 af Overall - 0.323 af Embedded = 8.466 af
#2	826.50'	0.129 af	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 0.323 af Overall x 40.0% Voids
		8.595 af	Total Available Storage

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
826.50	0.081	0.000	0.000
827.00	0.081	0.040	0.040
828.00	0.081	0.081	0.121
829.00	0.081	0.081	0.202
830.00	0.081	0.081	0.283
831.00	0.081	0.081	0.365
832.00	0.203	0.142	0.506
833.00	0.376	0.289	0.796
834.00	1.171	0.774	1.569
835.00	1.234	1.202	2.772
836.00	1.299	1.267	4.038
837.00	1.365	1.332	5.370
838.00	1.432	1.399	6.769
839.00	1.500	1.466	8.235
839.35	1.665	0.554	8.789

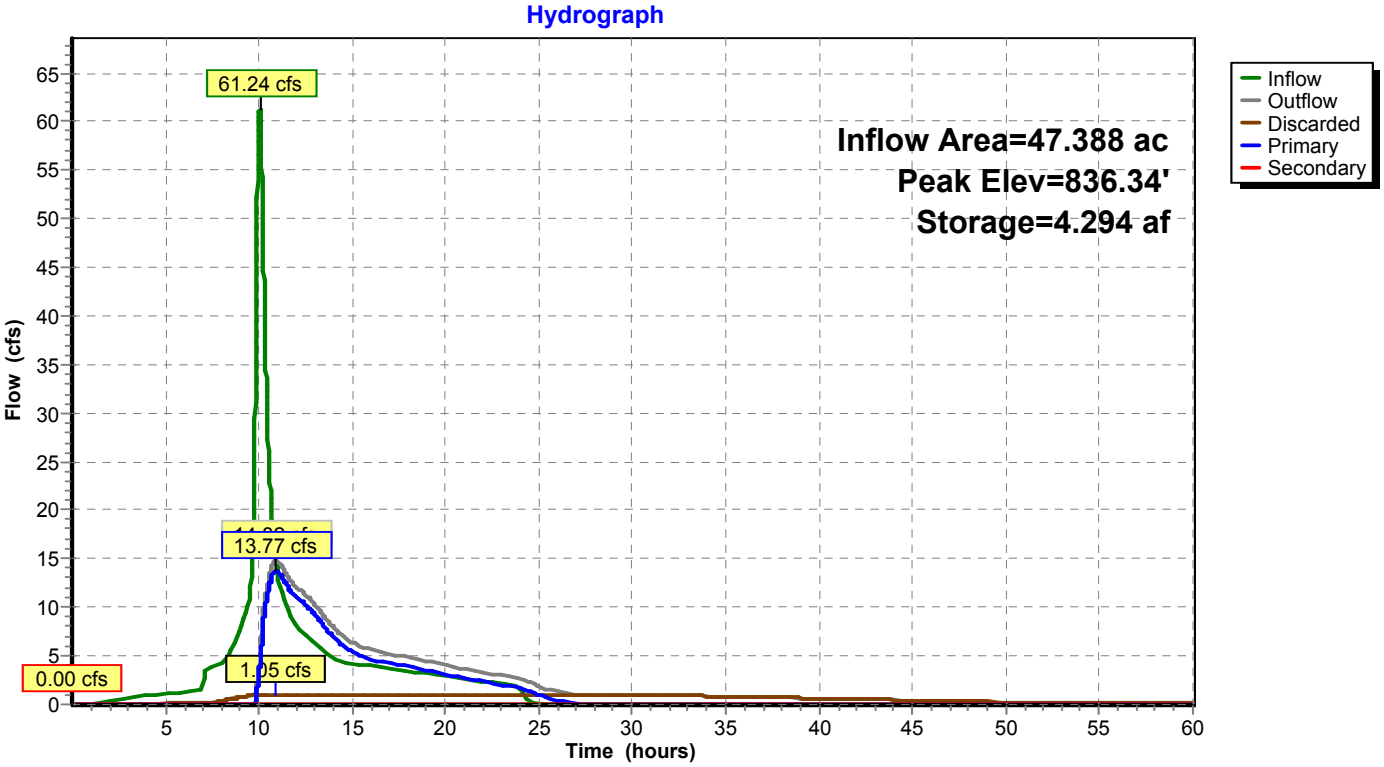
Device	Routing	Invert	Outlet Devices
#1	Primary	833.12'	**36.0" Round Culvert** L= 385.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 833.12' / 831.20' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf
#2	Discarded	826.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	834.33'	**16.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	834.33'	**12.0" W x 8.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	835.33'	**30.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	836.17'	**24.0" Horiz. Orifice/Grate** C= 0.600 in 78.0" x 36.0" Grate (16% open area) Limited to weir flow at low heads
#7	Secondary	838.35'	**30.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=1.05 cfs @ 10.93 hrs HW=836.34' (Free Discharge)
└**2=Exfiltration** (Controls 1.05 cfs)

Primary OutFlow Max=13.77 cfs @ 10.93 hrs HW=836.34' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 13.77 cfs of 44.28 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 2.91 cfs @ 6.54 fps)
  └**4=Orifice/Grate** (Orifice Controls 4.15 cfs @ 6.23 fps)
  └**5=Orifice/Grate** (Orifice Controls 5.23 cfs @ 4.19 fps)
  └**6=Orifice/Grate** (Weir Controls 1.48 cfs @ 1.36 fps)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=826.50' TW=0.00' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B1: Basin 1



Summary for Pond B10: Basin 10

Inflow Area = 30.685 ac, 61.94% Impervious, Inflow Depth = 2.32" for 10 Year event
Inflow = 27.15 cfs @ 9.98 hrs, Volume= 5.934 af
Outflow = 4.50 cfs @ 12.30 hrs, Volume= 5.484 af, Atten= 83%, Lag= 138.8 min
Discarded = 0.82 cfs @ 12.30 hrs, Volume= 2.723 af
Primary = 3.68 cfs @ 12.30 hrs, Volume= 2.761 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 817.66' @ 12.30 hrs Surf.Area= 44,571 sf Storage= 124,636 cf

Plug-Flow detention time= 675.4 min calculated for 5.483 af (92% of inflow)
Center-of-Mass det. time= 626.2 min (1,366.7 - 740.5)

Volume	Invert	Avail.Storage	Storage Description
#1	808.50'	230,693 cf	**Custom Stage Data (Conic)** Listed below (Recalc) 244,773 cf Overall - 14,080 cf Embedded = 230,693 cf
#2	808.50'	5,632 cf	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 14,080 cf Overall x 40.0% Voids
		236,325 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
808.50	3,520	0	0	3,520
809.00	3,520	1,760	1,760	3,625
810.00	3,520	3,520	5,280	3,835
811.00	3,520	3,520	8,800	4,046
812.00	3,520	3,520	12,320	4,256
813.00	3,520	3,520	15,840	4,466
814.00	8,931	6,019	21,859	9,884
815.00	17,294	12,884	34,744	18,257
816.00	40,146	27,930	62,673	41,116
817.00	42,792	41,462	104,135	43,859
818.00	45,490	44,134	148,269	46,658
819.00	48,243	46,860	195,129	49,516
820.00	51,058	49,644	244,773	52,440

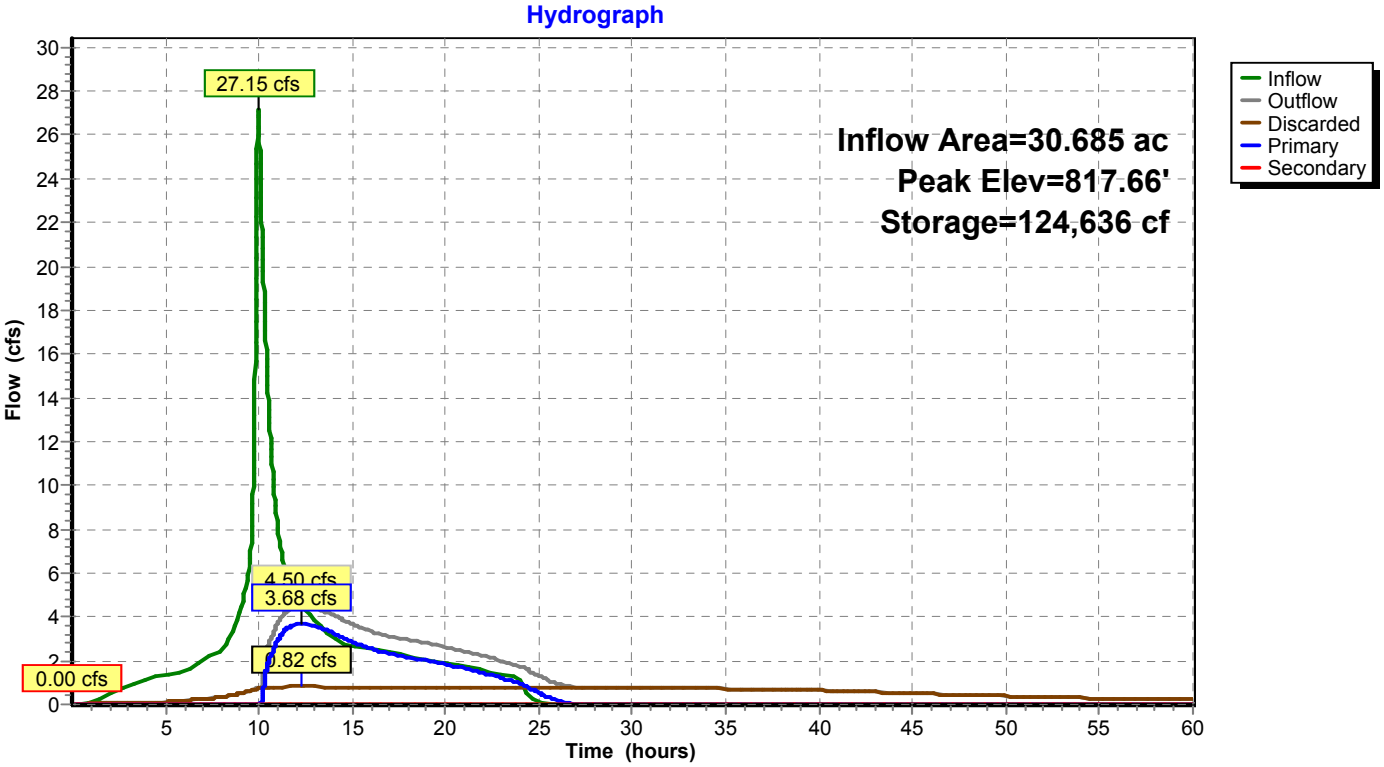
Device	Routing	Invert	Outlet Devices
#1	Primary	816.00'	**30.0" Round Culvert** L= 45.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 816.00' / 815.10' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Discarded	808.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	816.67'	**24.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	817.33'	**15.0" W x 18.0" H Vert. Orifice/Grate** X 2 rows with 8.0" cc spacing C= 0.600
#5	Device 1	817.83'	**60.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	819.00'	**78.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#7	Secondary	819.33'	**36.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.82 cfs @ 12.30 hrs HW=817.66' (Free Discharge)
└**2=Exfiltration** (Controls 0.82 cfs)

Primary OutFlow Max=3.68 cfs @ 12.30 hrs HW=817.66' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 3.68 cfs of 15.22 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 2.91 cfs @ 4.37 fps)
  └**4=Orifice/Grate** (Orifice Controls 0.77 cfs @ 1.85 fps)
  └**5=Orifice/Grate** (Controls 0.00 cfs)
  └**6=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=808.50' TW=0.00' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B10: Basin 10



Summary for Pond B11: Basin 11

Inflow Area = 14.461 ac, 52.00% Impervious, Inflow Depth = 2.16" for 10 Year event
Inflow = 16.38 cfs @ 9.96 hrs, Volume= 2.604 af
Outflow = 3.70 cfs @ 10.69 hrs, Volume= 2.343 af, Atten= 77%, Lag= 43.5 min
Discarded = 0.24 cfs @ 10.69 hrs, Volume= 0.770 af
Primary = 3.46 cfs @ 10.69 hrs, Volume= 1.573 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 833.00' @ 10.69 hrs Surf.Area= 12,172 sf Storage= 44,390 cf

Plug-Flow detention time= 499.1 min calculated for 2.343 af (90% of inflow)
Center-of-Mass det. time= 436.4 min (1,178.8 - 742.4)

Volume	Invert	Avail.Storage	Storage Description
#1	823.50'	83,101 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 97,181 cf Overall - 14,080 cf Embedded = 83,101 cf
#2	823.50'	5,632 cf	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 14,080 cf Overall x 40.0% Voids
		88,733 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
823.50	3,520	0	0
824.00	3,520	1,760	1,760
825.00	3,520	3,520	5,280
826.00	3,520	3,520	8,800
827.00	3,520	3,520	12,320
828.00	3,520	3,520	15,840
829.00	2,800	3,160	19,000
830.00	6,900	4,850	23,850
831.00	8,919	7,910	31,760
832.00	10,515	9,717	41,477
833.00	12,169	11,342	52,819
834.00	13,879	13,024	65,843
835.00	15,655	14,767	80,610
836.00	17,488	16,572	97,181

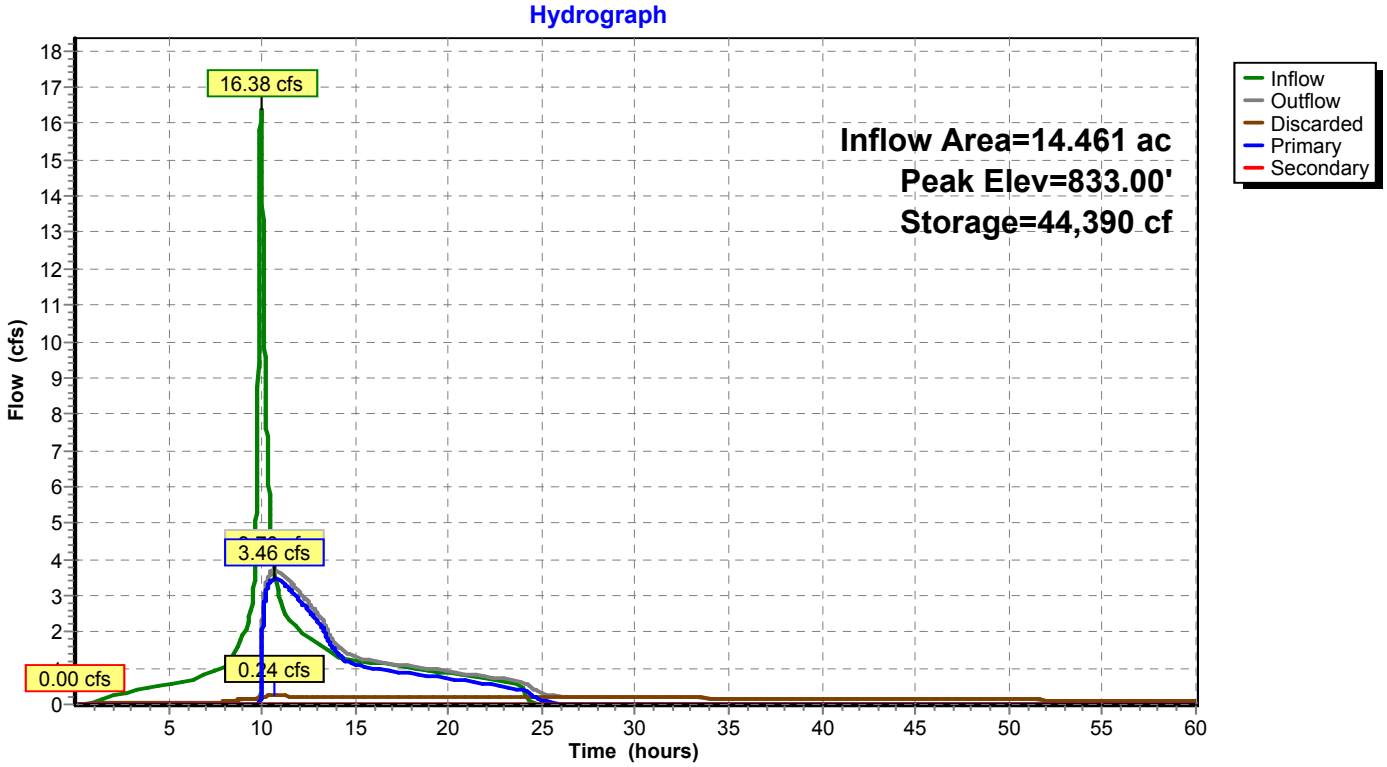
Device	Routing	Invert	Outlet Devices
#1	Primary	831.67'	**24.0" Round Culvert** L= 165.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 831.67' / 820.50' S= 0.0677 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Discarded	823.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	831.67'	**24.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	833.00'	**6.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	833.50'	**27.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	834.50'	**48.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#7	Secondary	834.83'	**16.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.24 cfs @ 10.69 hrs HW=833.00' (Free Discharge)
└**2=Exfiltration** (Controls 0.24 cfs)

Primary OutFlow Max=3.46 cfs @ 10.69 hrs HW=833.00' TW=824.89' (Dynamic Tailwater)
└**1=Culvert** (Passes 3.46 cfs of 8.73 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 3.46 cfs @ 5.19 fps)
  └**4=Orifice/Grate** (Orifice Controls 0.00 cfs @ 0.13 fps)
  └**5=Orifice/Grate** (Controls 0.00 cfs)
  └**6=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=823.50' TW=820.00' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B11: Basin 11



Summary for Pond B12: Basin 12

Inflow Area = 20.201 ac, 44.06% Impervious, Inflow Depth = 1.98" for 10 Year event
Inflow = 21.44 cfs @ 9.96 hrs, Volume= 3.326 af
Outflow = 2.49 cfs @ 12.37 hrs, Volume= 3.055 af, Atten= 88%, Lag= 144.7 min
Discarded = 0.47 cfs @ 12.37 hrs, Volume= 1.467 af
Primary = 2.02 cfs @ 12.37 hrs, Volume= 1.588 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 837.54' @ 12.37 hrs Surf.Area= 24,842 sf Storage= 65,439 cf

Plug-Flow detention time= 626.8 min calculated for 3.055 af (92% of inflow)
Center-of-Mass det. time= 575.1 min (1,326.6 - 751.5)

Volume	Invert	Avail.Storage	Storage Description
#1	828.50'	160,016 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 174,096 cf Overall - 14,080 cf Embedded = 160,016 cf
#2	828.50'	5,632 cf	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 14,080 cf Overall x 40.0% Voids
		165,648 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
828.50	3,520	0	0
829.00	3,520	1,760	1,760
830.00	3,520	3,520	5,280
831.00	3,520	3,520	8,800
832.00	3,520	3,520	12,320
833.00	3,520	3,520	15,840
834.00	2,600	3,060	18,900
835.00	8,000	5,300	24,200
836.00	20,849	14,425	38,625
837.00	23,415	22,132	60,757
838.00	26,037	24,726	85,483
839.00	28,717	27,377	112,860
840.00	31,383	30,050	142,910
841.00	30,990	31,187	174,096

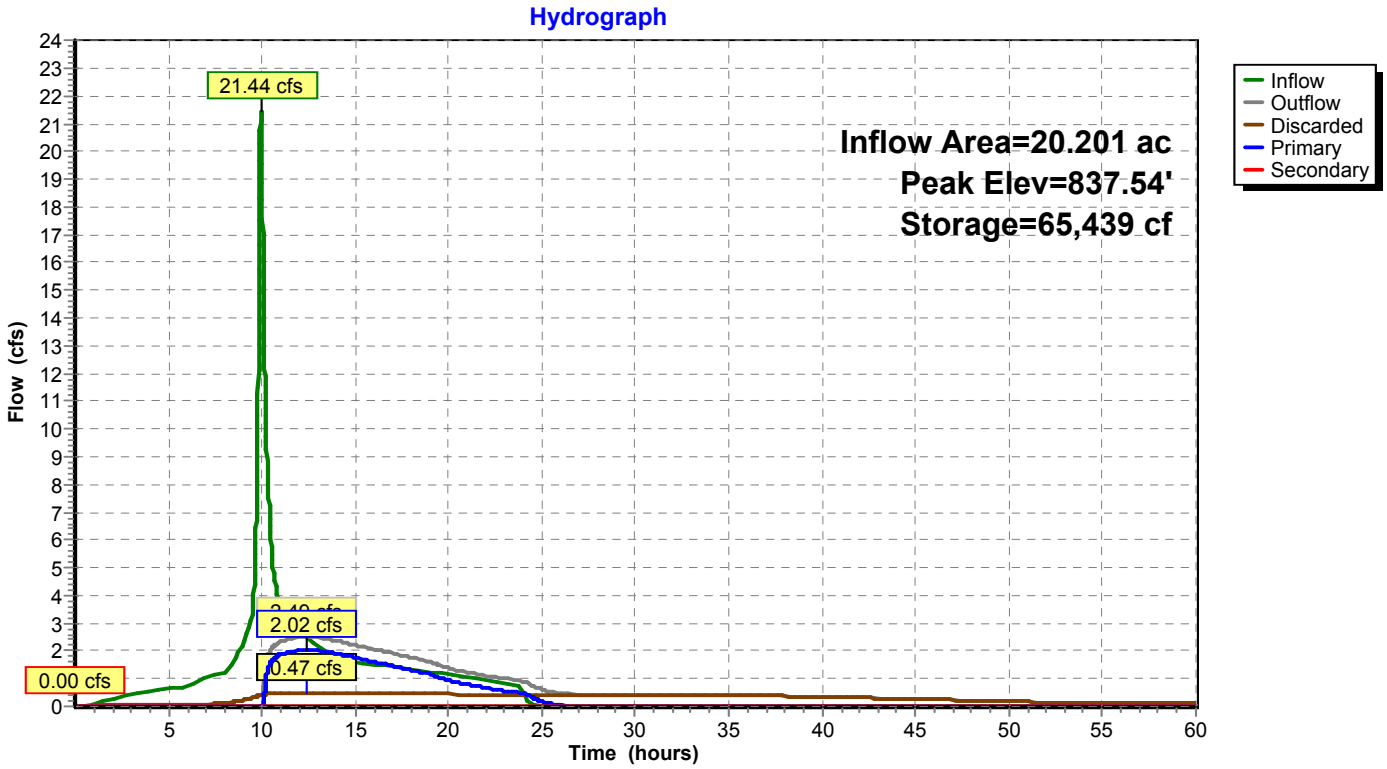
Device	Routing	Invert	Outlet Devices
#1	Primary	836.67'	**30.0" Round Culvert** L= 130.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 836.67' / 832.50' S= 0.0321 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Discarded	828.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	836.67'	**18.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	838.00'	**8.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	838.50'	**24.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	839.50'	**36.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#7	Secondary	840.00'	**18.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.47 cfs @ 12.37 hrs HW=837.54' (Free Discharge)
└**2=Exfiltration** (Controls 0.47 cfs)

Primary OutFlow Max=2.02 cfs @ 12.37 hrs HW=837.54' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 2.02 cfs of 4.87 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 2.02 cfs @ 4.04 fps)
  └**4=Orifice/Grate** (Controls 0.00 cfs)
  └**5=Orifice/Grate** (Controls 0.00 cfs)
  └**6=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=828.50' TW=0.00' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B12: Basin 12



Summary for Pond B13: Basin 13

Inflow Area = 64.115 ac, 22.11% Impervious, Inflow Depth = 1.93" for 10 Year event
Inflow = 69.87 cfs @ 9.96 hrs, Volume= 10.322 af
Outflow = 34.99 cfs @ 10.22 hrs, Volume= 9.908 af, Atten= 50%, Lag= 15.1 min
Discarded = 0.44 cfs @ 10.22 hrs, Volume= 1.321 af
Primary = 34.55 cfs @ 10.22 hrs, Volume= 8.587 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 843.39' @ 10.22 hrs Surf.Area= 0.526 ac Storage= 2.730 af

Plug-Flow detention time= 265.3 min calculated for 9.908 af (96% of inflow)
Center-of-Mass det. time= 239.7 min (1,021.9 - 782.2)

Volume	Invert	Avail.Storage	Storage Description
#1	830.50'	4.138 af	**Custom Stage Data (Prismatic)** Listed below (Recalc) 4.461 af Overall - 0.323 af Embedded = 4.138 af
#2	830.50'	0.129 af	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 0.323 af Overall x 40.0% Voids
		4.267 af	Total Available Storage

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
830.50	0.081	0.000	0.000
831.00	0.081	0.040	0.040
832.00	0.081	0.081	0.121
833.00	0.081	0.081	0.202
834.00	0.081	0.081	0.283
835.00	0.081	0.081	0.364
836.00	0.059	0.070	0.433
837.00	0.139	0.099	0.532
838.00	0.287	0.213	0.745
839.00	0.329	0.308	1.053
840.00	0.372	0.350	1.403
841.00	0.416	0.394	1.797
842.00	0.461	0.439	2.236
843.00	0.508	0.484	2.720
844.00	0.555	0.531	3.251
845.00	0.605	0.580	3.831
846.00	0.655	0.630	4.461

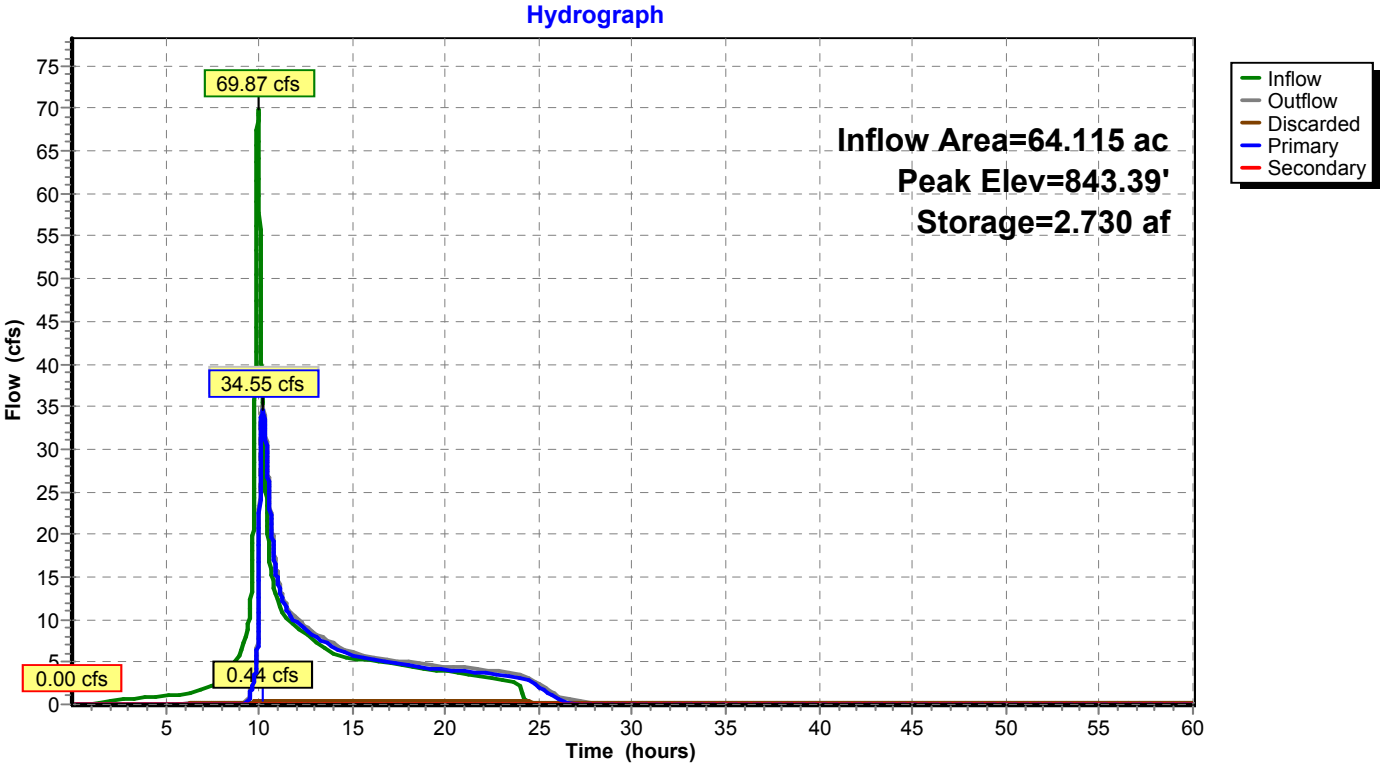
Device	Routing	Invert	Outlet Devices
#1	Primary	834.25'	**48.0" Round Culvert** L= 175.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 834.25' / 832.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 12.57 sf
#2	Discarded	830.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	839.67'	**24.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	841.50'	**15.0" W x 18.0" H Vert. Orifice/Grate** X 2 rows with 8.0" cc spacing C= 0.600
#5	Device 1	842.50'	**60.0" W x 8.0" H Vert. Orifice/Grate** X 2 rows with 8.0" cc spacing C= 0.600
#6	Device 1	843.67'	**78.0" x 36.0" Horiz. Orifice/Grate** X 2 rows C= 0.600 Limited to weir flow at low heads
#7	Secondary	844.67'	**36.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.44 cfs @ 10.22 hrs HW=843.39' (Free Discharge)
└**2=Exfiltration** (Controls 0.44 cfs)

Primary OutFlow Max=34.54 cfs @ 10.22 hrs HW=843.39' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 34.54 cfs of 161.72 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 6.05 cfs @ 9.08 fps)
  └**4=Orifice/Grate** (Orifice Controls 14.92 cfs @ 4.38 fps)
  └**5=Orifice/Grate** (Orifice Controls 13.57 cfs @ 3.03 fps)
  └**6=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=830.50' TW=0.00' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B13: Basin 13



Summary for Pond B4: Basin 4

Inflow Area = 38.712 ac, 55.38% Impervious, Inflow Depth = 2.25" for 10 Year event
Inflow = 41.42 cfs @ 9.97 hrs, Volume= 7.245 af
Outflow = 15.20 cfs @ 10.50 hrs, Volume= 6.988 af, Atten= 63%, Lag= 31.6 min
Discarded = 0.54 cfs @ 10.50 hrs, Volume= 1.630 af
Primary = 14.66 cfs @ 10.50 hrs, Volume= 5.358 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 838.95' @ 10.50 hrs Surf.Area= 26,866 sf Storage= 111,294 cf

Plug-Flow detention time= 407.0 min calculated for 6.987 af (96% of inflow)
Center-of-Mass det. time= 383.2 min (1,124.9 - 741.7)

Volume	Invert	Avail.Storage	Storage Description
#1	827.50'	218,652 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 232,732 cf Overall - 14,080 cf Embedded = 218,652 cf
#2	827.50'	5,632 cf	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 14,080 cf Overall x 40.0% Voids
		224,284 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
827.50	3,520	0	0
828.00	3,520	1,760	1,760
829.00	3,520	3,520	5,280
830.00	3,520	3,520	8,800
831.00	3,520	3,520	12,320
832.00	3,520	3,520	15,840
833.00	1,064	2,292	18,132
834.00	6,719	3,892	22,024
835.00	16,858	11,789	33,812
836.00	19,297	18,078	51,890
837.00	21,780	20,539	72,428
838.00	24,350	23,065	95,493
839.00	27,007	25,679	121,172
840.00	29,708	28,358	149,529
841.00	32,452	31,080	180,609
842.00	35,196	33,824	214,433
842.50	38,000	18,299	232,732

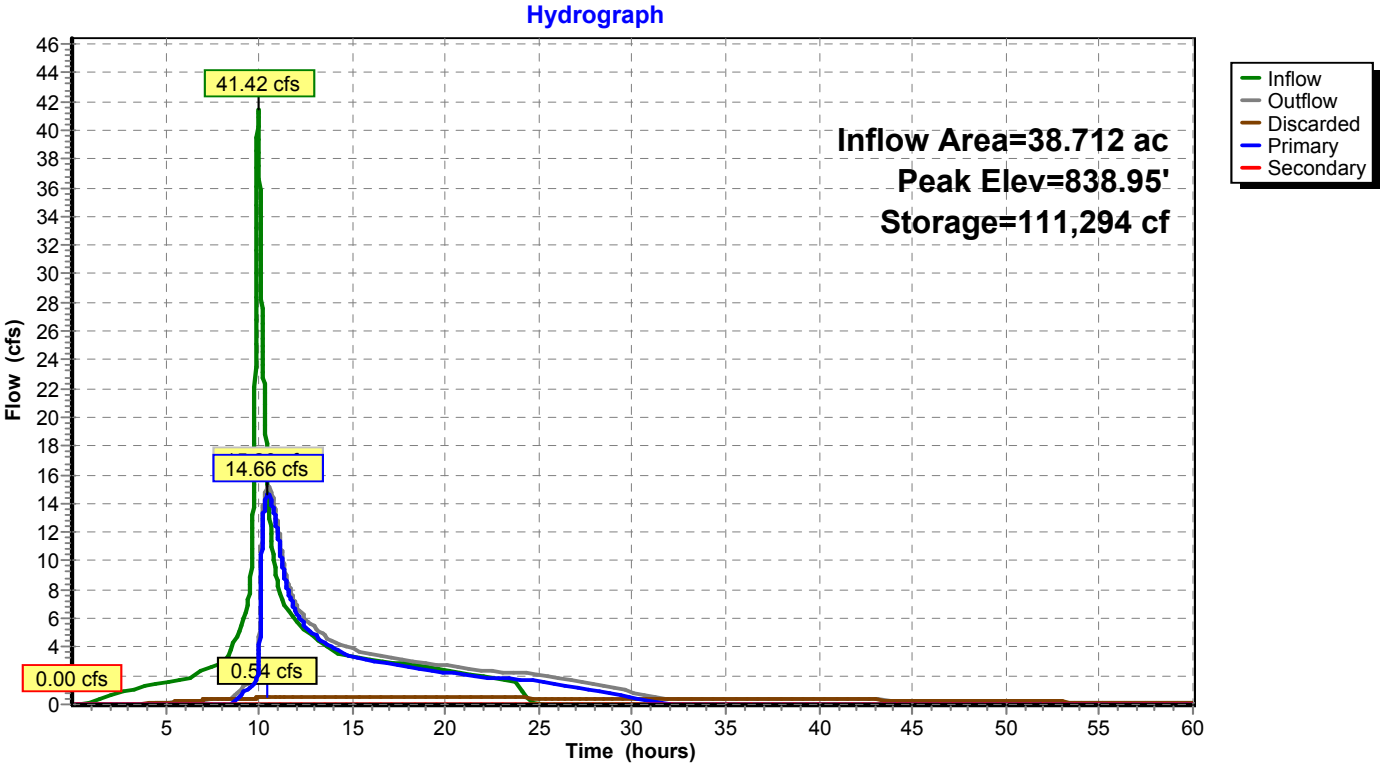
Device	Routing	Invert	Outlet Devices
#1	Primary	835.67'	**30.0" Round Culvert** L= 210.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 835.67' / 834.20' S= 0.0070 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Discarded	827.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	835.67'	**10.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	837.67'	**18.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	838.17'	**42.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	839.75'	**48.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 in 78.0" x 36.0" Grate (62% open area) Limited to weir flow at low heads
#7	Secondary	841.12'	**40.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.54 cfs @ 10.50 hrs HW=838.95' (Free Discharge)
└**2=Exfiltration** (Controls 0.54 cfs)

Primary OutFlow Max=14.66 cfs @ 10.50 hrs HW=838.95' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 14.66 cfs of 33.65 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 2.36 cfs @ 8.49 fps)
  └**4=Orifice/Grate** (Orifice Controls 6.25 cfs @ 4.16 fps)
  └**5=Orifice/Grate** (Orifice Controls 6.06 cfs @ 3.46 fps)
  └**6=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=827.50' TW=0.00' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B4: Basin 4



Summary for Pond B5: Basin 5

Inflow Area = 32.696 ac, 30.34% Impervious, Inflow Depth = 1.45" for 10 Year event
Inflow = 16.32 cfs @ 9.99 hrs, Volume= 3.956 af
Outflow = 4.65 cfs @ 11.19 hrs, Volume= 3.956 af, Atten= 71%, Lag= 72.4 min
Discarded = 0.38 cfs @ 11.22 hrs, Volume= 1.188 af
Primary = 4.28 cfs @ 11.19 hrs, Volume= 2.768 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 847.07' @ 11.22 hrs Surf.Area= 20,526 sf Storage= 55,240 cf

Plug-Flow detention time= 348.7 min calculated for 3.955 af (100% of inflow)
Center-of-Mass det. time= 348.8 min (1,131.2 - 782.3)

Volume	Invert	Avail.Storage	Storage Description
#1	844.00'	178,542 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
844.00	15,500	0	0
845.00	17,076	16,288	16,288
846.00	18,708	17,892	34,180
847.00	20,397	19,553	53,733
848.00	22,143	21,270	75,003
849.00	23,945	23,044	98,047
850.00	25,804	24,875	122,921
851.00	27,719	26,762	149,683
852.00	30,000	28,860	178,542

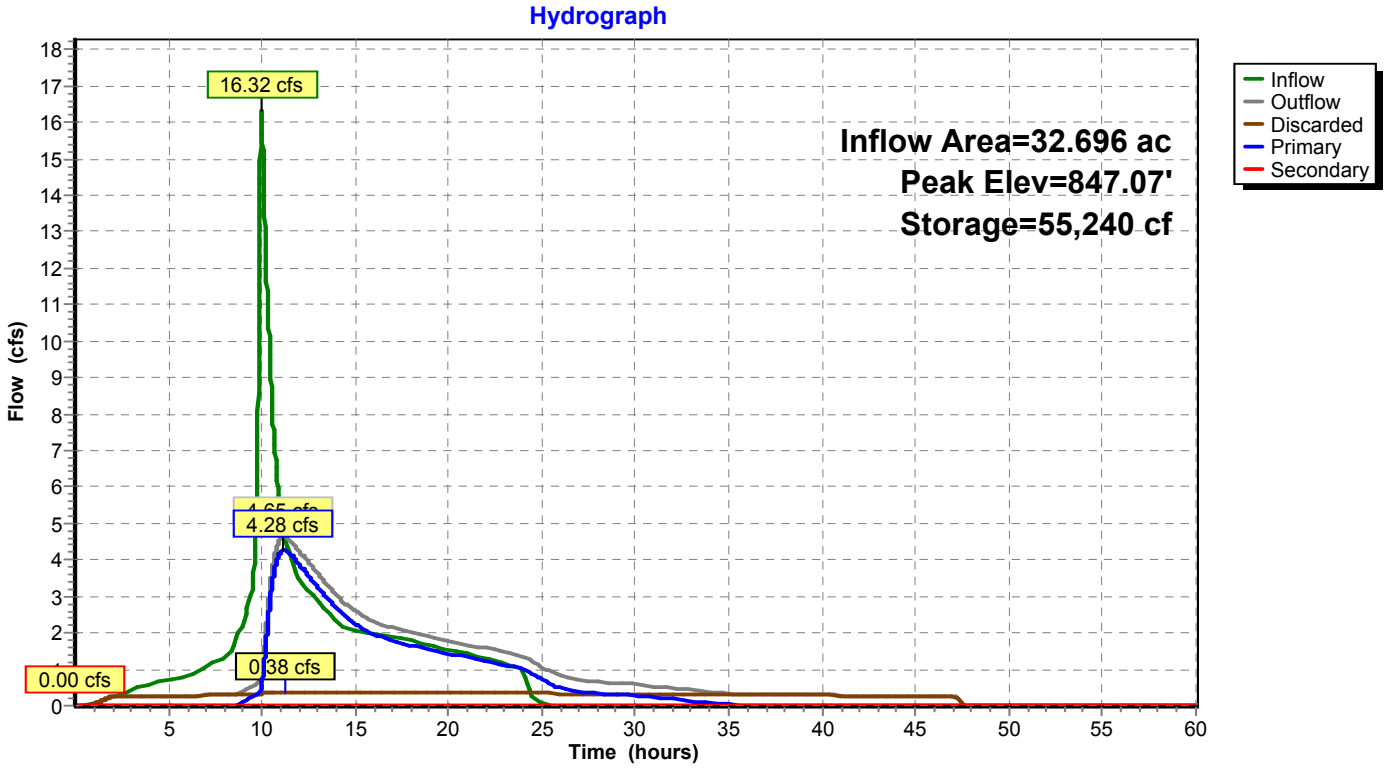
Device	Routing	Invert	Outlet Devices
#1	Primary	844.67'	**30.0" Round Culvert** L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 844.67' / 844.17' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Discarded	844.00'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 800.00'
#3	Device 1	844.67'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	845.67'	**6.0" W x 37.0" H Vert. Orifice/Grate** X 3 rows with 8.0" cc spacing C= 0.600
#5	Device 1	849.75'	**36.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 in 36.0" x 24.0" Grate (100% open area) Limited to weir flow at low heads
#6	Secondary	851.00'	**12.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.38 cfs @ 11.22 hrs HW=847.07' (Free Discharge)
└**2=Exfiltration** (Controls 0.38 cfs)

Primary OutFlow Max=4.28 cfs @ 11.19 hrs HW=847.07' TW=845.28' (Dynamic Tailwater)
└**1=Culvert** (Passes 4.28 cfs of 21.91 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 0.56 cfs @ 6.45 fps)
  ├**4=Orifice/Grate** (Orifice Controls 3.71 cfs @ 3.36 fps)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=844.00' (Free Discharge)
└**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond B5: Basin 5



Summary for Pond B6: Basin 6

Inflow Area = 34.039 ac, 52.56% Impervious, Inflow Depth = 2.22" for 10 Year event
Inflow = 30.64 cfs @ 9.98 hrs, Volume= 6.310 af
Outflow = 16.21 cfs @ 10.45 hrs, Volume= 6.019 af, Atten= 47%, Lag= 28.0 min
Discarded = 0.37 cfs @ 10.45 hrs, Volume= 1.011 af
Primary = 15.84 cfs @ 10.45 hrs, Volume= 5.009 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 851.09' @ 10.45 hrs Surf.Area= 0.437 ac Storage= 1.896 af

Plug-Flow detention time= 306.1 min calculated for 6.018 af (95% of inflow)
Center-of-Mass det. time= 275.7 min (1,027.5 - 751.8)

Volume	Invert	Avail.Storage	Storage Description
#1	839.50'	3.469 af	**Custom Stage Data (Prismatic)** Listed below (Recalc) 3.792 af Overall - 0.323 af Embedded = 3.469 af
#2	839.50'	0.129 af	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 0.323 af Overall x 40.0% Voids
		3.598 af	Total Available Storage

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
839.50	0.081	0.000	0.000
840.00	0.081	0.040	0.040
841.00	0.081	0.081	0.121
842.00	0.081	0.081	0.202
843.00	0.081	0.081	0.283
844.00	0.081	0.081	0.364
845.00	0.061	0.071	0.435
846.00	0.133	0.097	0.532
847.00	0.260	0.196	0.729
848.00	0.292	0.276	1.005
849.00	0.325	0.309	1.313
850.00	0.360	0.343	1.656
851.00	0.434	0.397	2.053
852.00	0.474	0.454	2.507
854.40	0.597	1.285	3.792

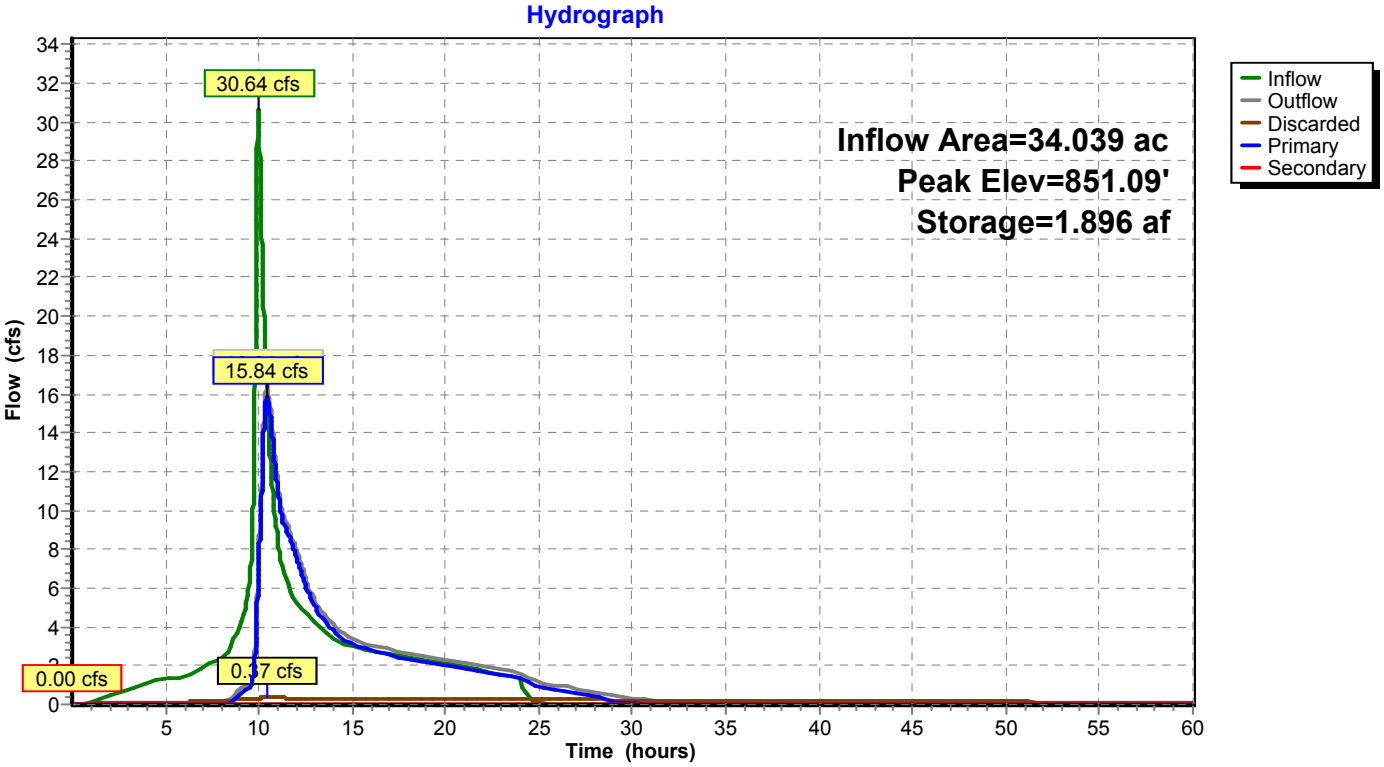
Device	Routing	Invert	Outlet Devices
#1	Primary	843.65'	**24.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 843.65' / 842.90' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Discarded	839.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	847.67'	**9.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	848.75'	**12.0" W x 9.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	849.50'	**18.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	850.67'	**69.6" W x 9.0" H Vert. Orifice/Grate** C= 0.600
#7	Secondary	852.88'	**40.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.37 cfs @ 10.45 hrs HW=851.09' (Free Discharge)
└**2=Exfiltration** (Controls 0.37 cfs)

Primary OutFlow Max=15.84 cfs @ 10.45 hrs HW=851.09' TW=842.50' (Dynamic Tailwater)
└**1=Culvert** (Passes 15.84 cfs of 35.65 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 1.64 cfs @ 8.73 fps)
  └**4=Orifice/Grate** (Orifice Controls 5.05 cfs @ 6.73 fps)
  └**5=Orifice/Grate** (Orifice Controls 4.17 cfs @ 5.56 fps)
  └**6=Orifice/Grate** (Orifice Controls 4.99 cfs @ 2.07 fps)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=839.50' TW=842.50' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B6: Basin 6



Summary for Pond B7: Basin 7

Inflow Area = 108.754 ac, 33.30% Impervious, Inflow Depth = 1.21" for 10 Year event
Inflow = 17.05 cfs @ 9.99 hrs, Volume= 10.954 af
Outflow = 8.12 cfs @ 14.56 hrs, Volume= 10.855 af, Atten= 52%, Lag= 274.1 min
Discarded = 1.14 cfs @ 14.56 hrs, Volume= 4.271 af
Primary = 6.98 cfs @ 14.56 hrs, Volume= 6.584 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 841.95' @ 14.56 hrs Surf.Area= 62,025 sf Storage= 145,975 cf

Plug-Flow detention time= 456.0 min calculated for 10.855 af (99% of inflow)
Center-of-Mass det. time= 442.2 min (1,401.6 - 959.5)

Volume	Invert	Avail.Storage	Storage Description
#1	839.00'	516,122 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
839.00	10,000	0	0
840.00	54,515	32,258	32,258
841.00	58,335	56,425	88,683
842.00	62,211	60,273	148,956
843.00	66,912	64,562	213,517
844.00	71,188	69,050	282,567
845.00	75,535	73,362	355,929
846.00	79,981	77,758	433,687
847.00	84,890	82,436	516,122

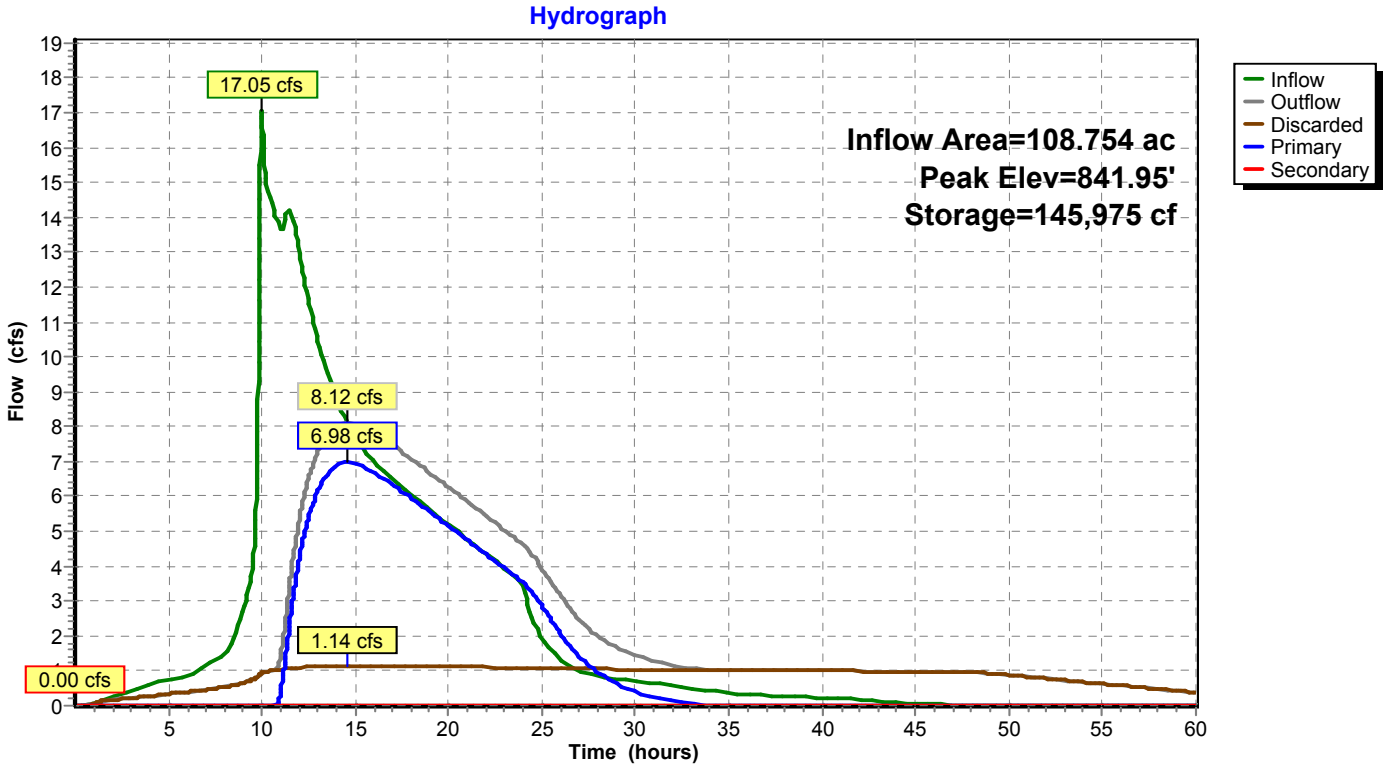
Device	Routing	Invert	Outlet Devices
#1	Primary	836.67'	**36.0" Round Culvert** L= 63.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 836.67' / 836.00' S= 0.0106 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf
#2	Discarded	839.00'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 800.00'
#3	Device 1	840.75'	**26.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	841.25'	**12.0" W x 36.0" H Vert. Orifice/Grate** X 3 rows with 8.0" cc spacing C= 0.600
#5	Device 1	844.50'	**48.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 in 48.0" x 36.0" Grate (100% open area) Limited to weir flow at low heads
#6	Secondary	845.50'	**12.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=1.14 cfs @ 14.56 hrs HW=841.95' (Free Discharge)
└**2=Exfiltration** (Controls 1.14 cfs)

Primary OutFlow Max=6.98 cfs @ 14.56 hrs HW=841.95' TW=837.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 6.98 cfs of 66.19 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 5.07 cfs @ 4.68 fps)
  ├**4=Orifice/Grate** (Orifice Controls 1.91 cfs @ 2.59 fps)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=839.00' (Free Discharge)
└**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond B7: Basin 7



Summary for Pond B8: Basin 8

Inflow Area = 44.689 ac, 35.47% Impervious, Inflow Depth = 1.61" for 10 Year event
Inflow = 22.23 cfs @ 9.99 hrs, Volume= 6.012 af
Outflow = 6.44 cfs @ 11.62 hrs, Volume= 6.012 af, Atten= 71%, Lag= 97.9 min
Discarded = 0.51 cfs @ 11.62 hrs, Volume= 1.833 af
Primary = 5.93 cfs @ 11.62 hrs, Volume= 4.179 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 857.36' @ 11.62 hrs Surf.Area= 27,821 sf Storage= 98,560 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 506.8 min (1,285.4 - 778.6)

Volume	Invert	Avail.Storage	Storage Description
#1	853.00'	147,517 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
853.00	17,554	0	0
854.00	19,812	18,683	18,683
855.00	22,126	20,969	39,652
856.00	24,497	23,312	62,964
857.00	26,924	25,711	88,674
858.00	29,407	28,166	116,840
859.00	31,948	30,678	147,517

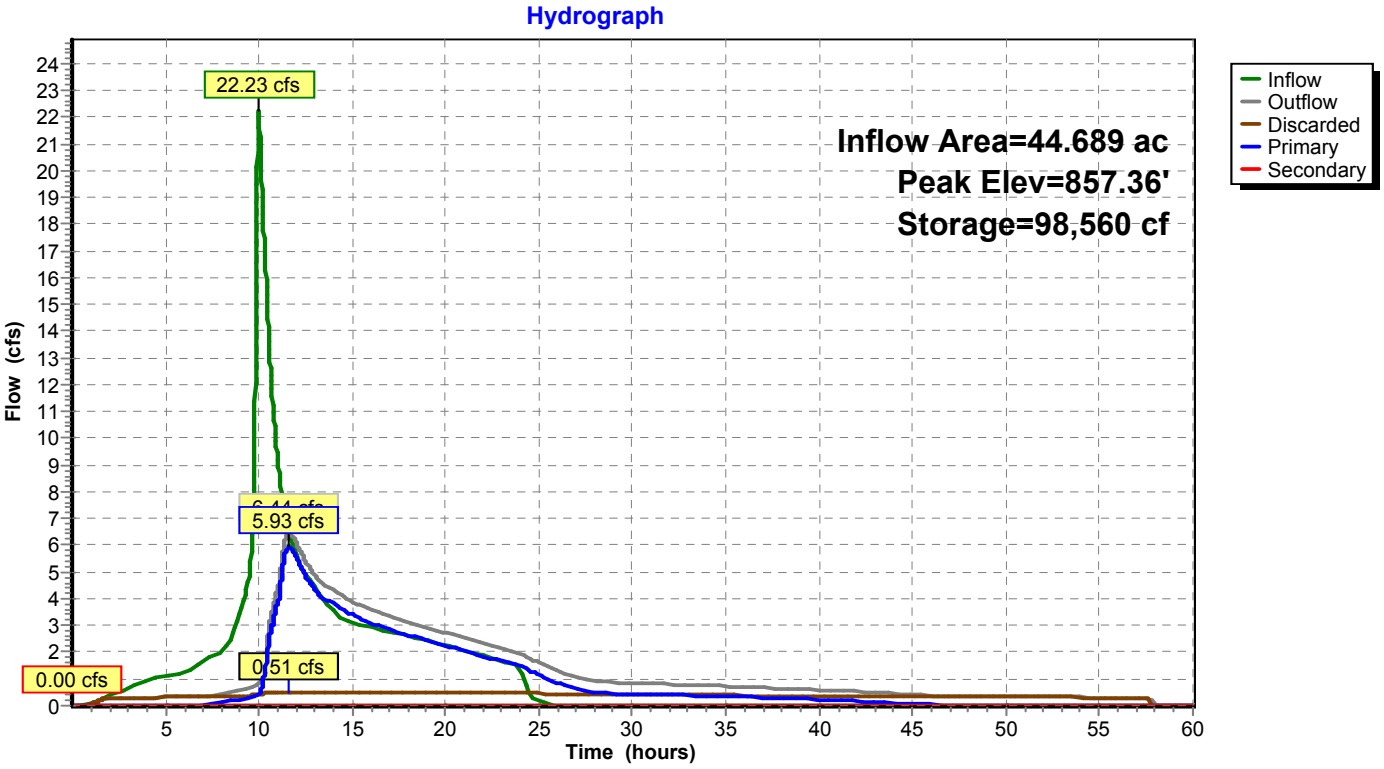
Device	Routing	Invert	Outlet Devices
#1	Primary	853.00'	**30.0" Round Culvert** L= 1,200.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 853.00' / 844.17' S= 0.0074 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Discarded	853.00'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 800.00'
#3	Device 1	853.58'	**2.0" W x 5.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	855.67'	**5.0" W x 12.0" H Vert. Orifice/Grate** X 4 rows with 8.0" cc spacing C= 0.600
#5	Device 1	857.25'	**36.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 in 36.0" x 36.0" Grate (100% open area) Limited to weir flow at low heads
#6	Secondary	858.75'	**16.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.51 cfs @ 11.62 hrs HW=857.36' (Free Discharge)
└**2=Exfiltration** (Controls 0.51 cfs)

Primary OutFlow Max=5.93 cfs @ 11.62 hrs HW=857.36' TW=845.37' (Dynamic Tailwater)
└**1=Culvert** (Passes 5.93 cfs of 38.90 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 0.63 cfs @ 9.10 fps)
  ├**4=Orifice/Grate** (Orifice Controls 3.84 cfs @ 3.91 fps)
  └**5=Orifice/Grate** (Weir Controls 1.45 cfs @ 1.09 fps)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=853.00' (Free Discharge)
└**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond B8: Basin 8



Summary for Pond B9: Basin 9

Inflow Area = 11.446 ac, 17.36% Impervious, Inflow Depth = 1.13" for 10 Year event
Inflow = 3.86 cfs @ 9.99 hrs, Volume= 1.080 af
Outflow = 2.51 cfs @ 10.44 hrs, Volume= 1.078 af, Atten= 35%, Lag= 26.9 min
Primary = 2.51 cfs @ 10.44 hrs, Volume= 1.078 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 848.80' @ 10.44 hrs Surf.Area= 7,124 sf Storage= 5,232 cf

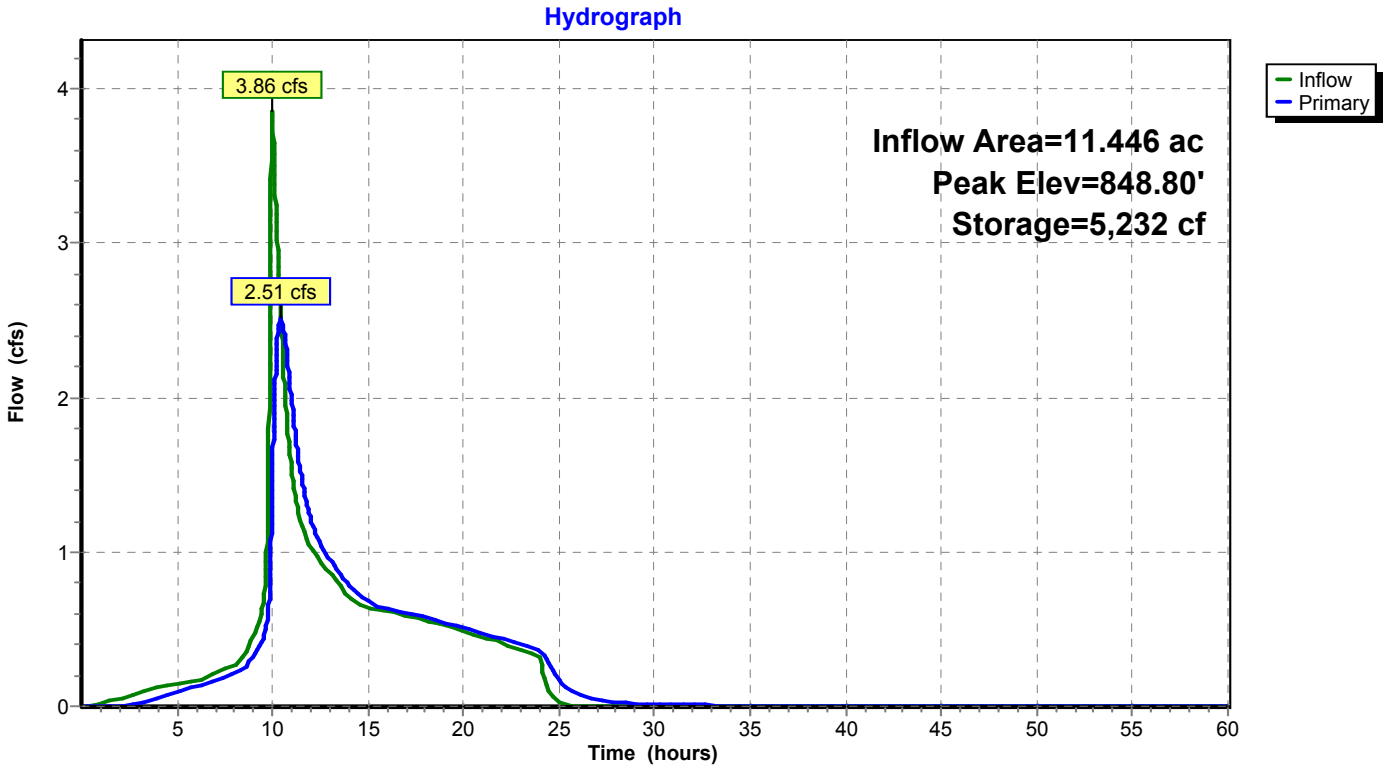
Plug-Flow detention time= 63.1 min calculated for 1.078 af (100% of inflow)
Center-of-Mass det. time= 62.5 min (883.9 - 821.4)

Volume	Invert	Avail.Storage	Storage Description
#1	848.00'	48,750 cf	**30.00'W x 200.00'L x 5.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	848.00'	**18.0" Round Culvert** L= 110.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 848.00' / 847.00' S= 0.0091 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Device 1	848.00'	**15.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=2.51 cfs @ 10.44 hrs HW=848.80' TW=0.00' (Dynamic Tailwater)
↑└─**1=Culvert** (Passes 2.51 cfs of 2.90 cfs potential flow)
↑└─**2=Orifice/Grate** (Orifice Controls 2.51 cfs @ 3.04 fps)

Pond B9: Basin 9



Summary for Pond Ex SD: Tract #1632 Ex. 36" SD Outlet

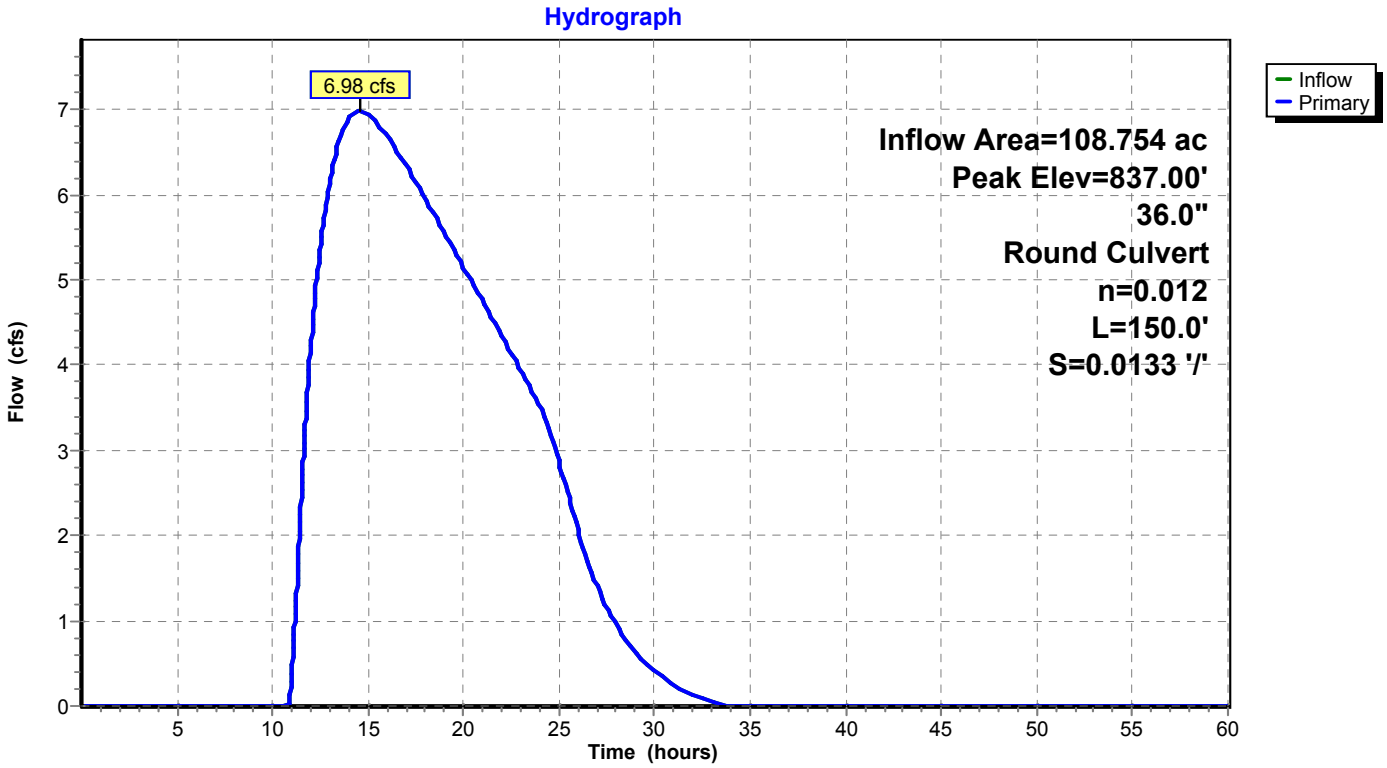
Inflow Area = 108.754 ac, 33.30% Impervious, Inflow Depth = 0.73" for 10 Year event
Inflow = 6.98 cfs @ 14.56 hrs, Volume= 6.584 af
Outflow = 6.98 cfs @ 14.56 hrs, Volume= 6.584 af, Atten= 0%, Lag= 0.0 min
Primary = 6.98 cfs @ 14.56 hrs, Volume= 6.584 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 837.00' @ 14.56 hrs
Flood Elev= 843.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	836.00'	**36.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 836.00' / 834.00' S= 0.0133 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf

Primary OutFlow Max=6.98 cfs @ 14.56 hrs HW=837.00' TW=835.00' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 6.98 cfs @ 3.40 fps)

Pond Ex SD: Tract #1632 Ex. 36" SD Outlet



Summary for Pond MC Q: SD System

[58] Hint: Peaked 0.41' above defined flood level

Inflow Area = 21.500 ac, 80.00% Impervious, Inflow Depth = 2.87" for 10 Year event
Inflow = 28.37 cfs @ 9.97 hrs, Volume= 5.150 af
Outflow = 28.21 cfs @ 9.99 hrs, Volume= 4.869 af, Atten= 1%, Lag= 0.8 min
Discarded = 0.11 cfs @ 9.99 hrs, Volume= 0.368 af
Primary = 13.65 cfs @ 9.99 hrs, Volume= 2.186 af
Secondary = 14.45 cfs @ 9.99 hrs, Volume= 2.315 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 845.91' @ 9.99 hrs Surf.Area= 0.126 ac Storage= 0.519 af
Flood Elev= 845.50' Surf.Area= 0.097 ac Storage= 0.474 af

Plug-Flow detention time= 151.4 min calculated for 4.869 af (95% of inflow)
Center-of-Mass det. time= 114.6 min (838.4 - 723.9)

Volume	Invert	Avail.Storage	Storage Description
#1	839.50'	0.607 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
839.50	0.081	0.000	0.000
840.00	0.081	0.040	0.040
841.00	0.081	0.081	0.121
842.00	0.081	0.081	0.202
843.00	0.081	0.081	0.283
844.00	0.081	0.081	0.364
845.00	0.061	0.071	0.434
846.00	0.133	0.097	0.531
846.50	0.172	0.076	0.607

Device	Routing	Invert	Outlet Devices
#1	Primary	841.50'	**36.0" Round Culvert** L= 585.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 841.50' / 838.50' S= 0.0051 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf
#2	Device 1	845.50'	**48.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Discarded	839.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 750.00'
#4	Secondary	845.50'	**20.0' long (Profile 4) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.77 2.97 3.21

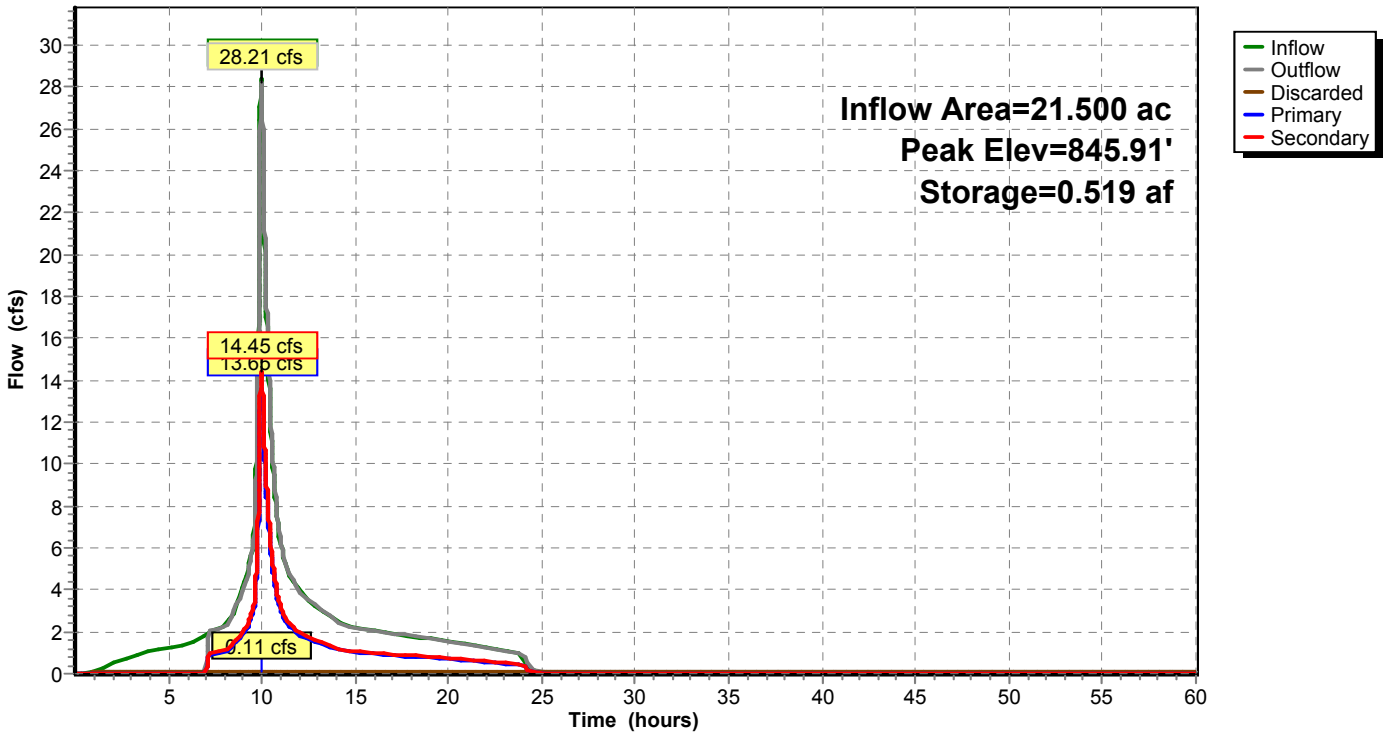
Discarded OutFlow Max=0.11 cfs @ 9.99 hrs HW=845.91' (Free Discharge)
└**3=Exfiltration** (Controls 0.11 cfs)

Primary OutFlow Max=13.64 cfs @ 9.99 hrs HW=845.91' TW=840.06' (Dynamic Tailwater)
└**1=Culvert** (Passes 13.64 cfs of 52.64 cfs potential flow)
└**2=Orifice/Grate** (Weir Controls 13.64 cfs @ 2.09 fps)

Secondary OutFlow Max=14.44 cfs @ 9.99 hrs HW=845.91' TW=834.93' (Dynamic Tailwater)
└**4=Broad-Crested Rectangular Weir** (Weir Controls 14.44 cfs @ 1.77 fps)

Pond MC Q: SD System

Hydrograph



Summary for Pond SD: 42" HDPE SD

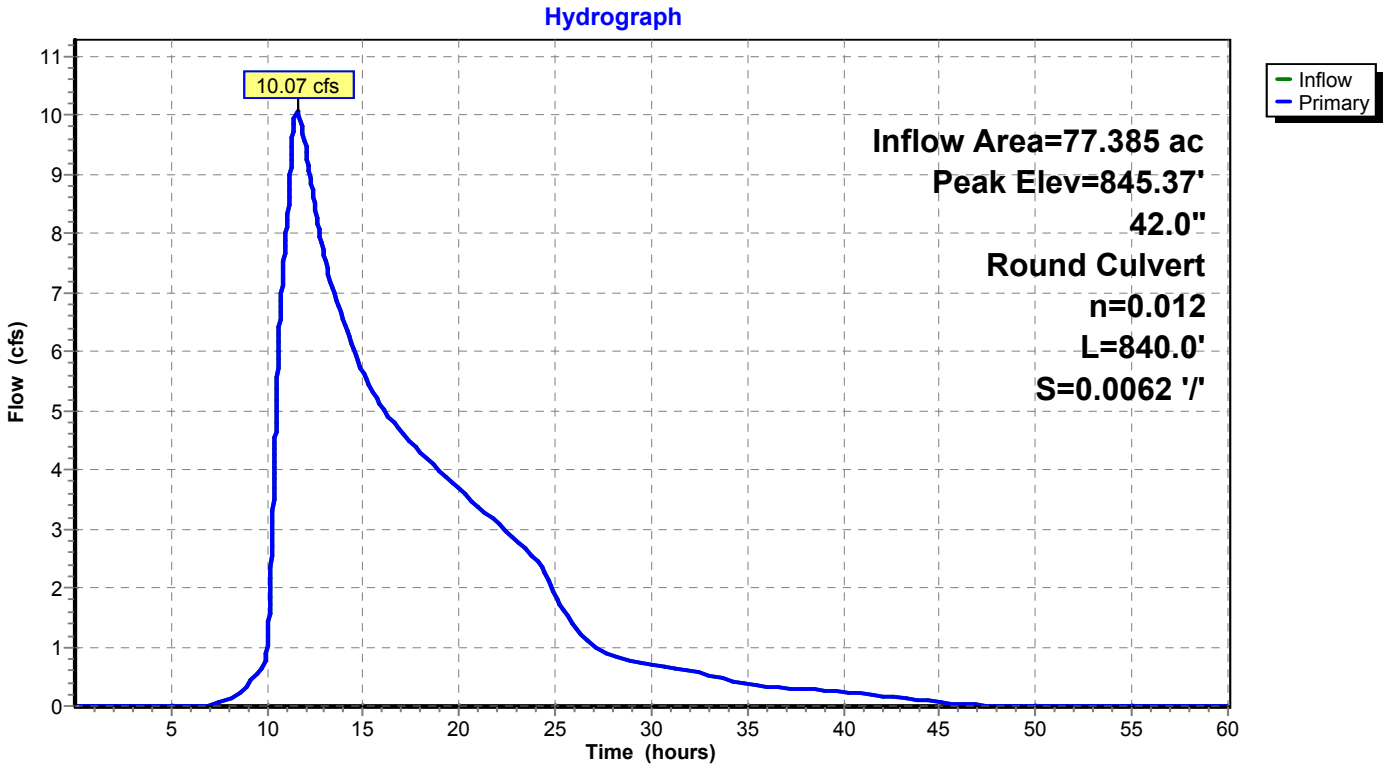
Inflow Area = 77.385 ac, 33.30% Impervious, Inflow Depth = 1.08" for 10 Year event
Inflow = 10.07 cfs @ 11.57 hrs, Volume= 6.947 af
Outflow = 10.07 cfs @ 11.57 hrs, Volume= 6.947 af, Atten= 0%, Lag= 0.0 min
Primary = 10.07 cfs @ 11.57 hrs, Volume= 6.947 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 845.37' @ 11.64 hrs
Flood Elev= 853.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	844.17'	**42.0" Round Culvert** L= 840.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 844.17' / 839.00' S= 0.0062 '/' Cc= 0.900 n= 0.012, Flow Area= 9.62 sf

Primary OutFlow Max=10.06 cfs @ 11.57 hrs HW=845.37' TW=841.29' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 10.06 cfs @ 5.16 fps)

Pond SD: 42" HDPE SD



Time span=0.01-60.00 hrs, dt=0.01 hrs, 6000 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Pond 1P: SD Inlet with Bypass SD Peak Elev=825.45' Inflow=57.87 cfs 12.093 af
Primary=57.87 cfs 12.093 af Secondary=0.00 cfs 0.000 af Outflow=57.87 cfs 12.093 af

Pond 2P: 60" SD MH Peak Elev=840.22' Inflow=16.26 cfs 2.664 af
Primary=16.26 cfs 2.664 af Secondary=0.00 cfs 0.000 af Outflow=16.26 cfs 2.664 af

Pond 15P: SD System 42" HDPE Peak Elev=844.52' Inflow=36.99 cfs 1.833 af
Outflow=36.99 cfs 1.833 af

Pond 16P: Dbl Conc. Arch Culvert (37x23) Peak Elev=844.48' Inflow=15.27 cfs 4.839 af
36.3" x 22.5", R=18.8"/51.0" Pipe Arch Culvert x 2.00 n=0.011 L=860.0' S=0.0024 '/' Outflow=15.27 cfs 4.839 af

Pond 17P: Gran Cielo Dwy Peak Elev=855.00' Storage=11,009 cf Inflow=161.34 cfs 30.903 af
Primary=104.80 cfs 29.304 af Secondary=0.01 cfs 0.000 af Tertiary=56.21 cfs 1.599 af Outflow=161.03 cfs 30.903 af

Pond 18P: GC-CkD1 Peak Elev=849.52' Storage=13,468 cf Inflow=181.92 cfs 43.852 af
Primary=0.60 cfs 0.025 af Secondary=25.90 cfs 0.677 af Tertiary=149.04 cfs 43.115 af Outflow=175.31 cfs 43.818 af

Pond 19P: GC-CkD2 Peak Elev=849.11' Storage=20,913 cf Inflow=45.55 cfs 3.943 af
Primary=1.23 cfs 1.419 af Secondary=33.35 cfs 2.431 af Tertiary=5.36 cfs 0.092 af Outflow=39.95 cfs 3.942 af

Pond 20P: GC-CkD3 Peak Elev=845.79' Storage=13,254 cf Inflow=45.11 cfs 5.938 af
Primary=5.62 cfs 3.513 af Secondary=6.57 cfs 0.672 af Tertiary=31.77 cfs 1.741 af Outflow=43.97 cfs 5.927 af

Pond B1: Basin 1 Peak Elev=837.00' Storage=5.171 af Inflow=93.80 cfs 12.965 af
Discarded=1.09 cfs 3.116 af Primary=29.18 cfs 9.465 af Secondary=0.00 cfs 0.000 af Outflow=30.26 cfs 12.581 af

Pond B10: Basin 10 Peak Elev=817.99' Storage=139,204 cf Inflow=32.90 cfs 7.171 af
Discarded=0.84 cfs 2.797 af Primary=6.57 cfs 3.913 af Secondary=0.00 cfs 0.000 af Outflow=7.40 cfs 6.710 af

Pond B11: Basin 11 Peak Elev=833.60' Storage=51,986 cf Inflow=20.25 cfs 3.183 af
Discarded=0.26 cfs 0.785 af Primary=5.24 cfs 2.136 af Secondary=0.00 cfs 0.000 af Outflow=5.50 cfs 2.921 af

Pond B12: Basin 12 Peak Elev=838.07' Storage=78,816 cf Inflow=26.91 cfs 4.105 af
Discarded=0.49 cfs 1.514 af Primary=2.71 cfs 2.317 af Secondary=0.00 cfs 0.000 af Outflow=3.20 cfs 3.831 af

Pond B13: Basin 13 Peak Elev=843.86' Storage=2.981 af Inflow=89.20 cfs 12.943 af
Discarded=0.46 cfs 1.355 af Primary=62.05 cfs 11.167 af Secondary=0.00 cfs 0.000 af Outflow=62.52 cfs 12.522 af

Pond B4: Basin 4 Peak Elev=839.49' Storage=126,212 cf Inflow=50.91 cfs 8.821 af
Discarded=0.57 cfs 1.674 af Primary=19.48 cfs 6.886 af Secondary=0.00 cfs 0.000 af Outflow=20.05 cfs 8.559 af

Pond B5: Basin 5 Peak Elev=847.51' Storage=64,298 cf Inflow=21.35 cfs 5.016 af
Discarded=0.39 cfs 1.221 af Primary=7.13 cfs 3.796 af Secondary=0.00 cfs 0.000 af Outflow=7.52 cfs 5.016 af

Pond B6: Basin 6 Peak Elev=851.40' Storage=2.036 af Inflow=37.81 cfs 7.705 af
Discarded=0.38 cfs 1.034 af Primary=23.43 cfs 6.379 af Secondary=0.00 cfs 0.000 af Outflow=23.80 cfs 7.412 af

Pond B7: Basin 7 Peak Elev=842.46' Storage=178,348 cf Inflow=28.12 cfs 14.500 af
Discarded=1.20 cfs 4.392 af Primary=11.90 cfs 9.989 af Secondary=0.00 cfs 0.000 af Outflow=13.10 cfs 14.381 af

Pond B8: Basin 8 Peak Elev=857.57' Storage=104,516 cf Inflow=28.75 cfs 7.533 af
Discarded=0.53 cfs 1.876 af Primary=12.49 cfs 5.657 af Secondary=0.00 cfs 0.000 af Outflow=13.01 cfs 7.533 af

Pond B9: Basin 9 Peak Elev=849.00' Storage=6,676 cf Inflow=5.46 cfs 1.422 af
Outflow=3.56 cfs 1.421 af

Pond Ex SD: Tract #1632 **Ex. 36" SD Outlet** Peak Elev=837.33' Inflow=11.90 cfs 9.989 af
36.0" Round Culvert n=0.012 L=150.0' S=0.0133 '/' Outflow=11.90 cfs 9.989 af

Pond MC Q: SD System Peak Elev=845.96' Storage=0.526 af Inflow=33.79 cfs 6.138 af
Discarded=0.12 cfs 0.372 af Primary=16.26 cfs 2.664 af Secondary=17.22 cfs 2.821 af Outflow=33.60 cfs 5.857 af

Pond SD: 42" HDPE SD Peak Elev=845.86' Inflow=19.61 cfs 9.453 af
42.0" Round Culvert n=0.012 L=840.0' S=0.0062 '/' Outflow=19.61 cfs 9.453 af

Summary for Pond 1P: SD Inlet with Bypass SD

Inflow Area = 108.566 ac, 6.93% Impervious, Inflow Depth = 1.34" for 25 Year event
Inflow = 57.87 cfs @ 9.98 hrs, Volume= 12.093 af
Outflow = 57.87 cfs @ 9.98 hrs, Volume= 12.093 af, Atten= 0%, Lag= 0.0 min
Primary = 57.87 cfs @ 9.98 hrs, Volume= 12.093 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

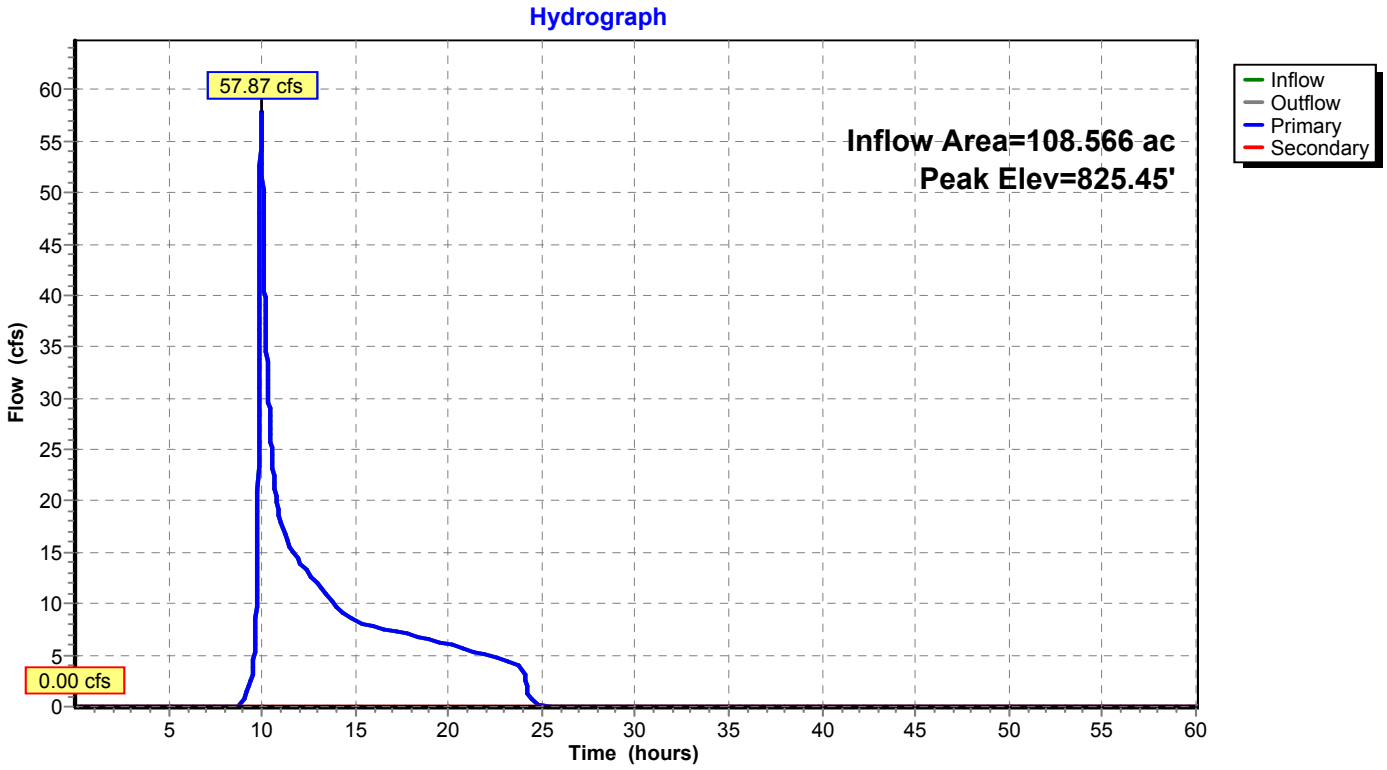
Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 825.45' @ 9.98 hrs
Flood Elev= 826.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	820.00'	**48.0" Round Culvert** L= 990.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 820.00' / 814.11' S= 0.0059 '/' Cc= 0.900 n= 0.012, Flow Area= 12.57 sf
#2	Device 1	824.50'	**78.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	825.90'	**Special & User-Defined** Head (feet) 0.00 0.50 0.67 0.83 Disch. (cfs) 0.000 200.000 450.000 1,200.000

Primary OutFlow Max=57.85 cfs @ 9.98 hrs HW=825.45' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 57.85 cfs of 112.44 cfs potential flow)
└─**2=Orifice/Grate** (Weir Controls 57.85 cfs @ 3.19 fps)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=820.00' TW=0.00' (Dynamic Tailwater)
└─**3=Special & User-Defined** (Controls 0.00 cfs)

Pond 1P: SD Inlet with Bypass SD



Summary for Pond 2P: 60" SD MH

Inflow Area = 21.500 ac, 80.00% Impervious, Inflow Depth = 1.49" for 25 Year event
Inflow = 16.26 cfs @ 9.99 hrs, Volume= 2.664 af
Outflow = 16.26 cfs @ 9.99 hrs, Volume= 2.664 af, Atten= 0%, Lag= 0.0 min
Primary = 16.26 cfs @ 9.99 hrs, Volume= 2.664 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

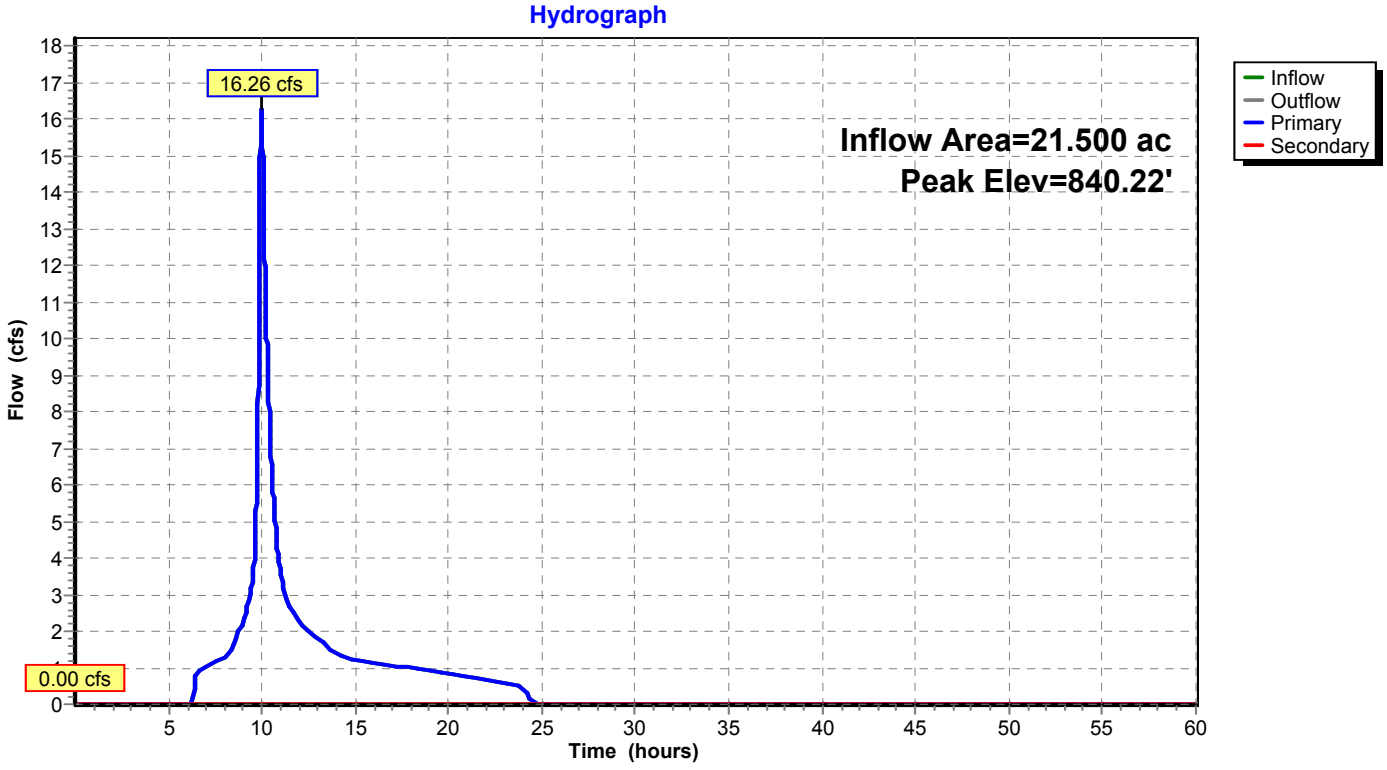
Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 840.22' @ 9.99 hrs
Flood Elev= 845.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	838.50'	**36.0" Round Culvert** L= 500.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 838.50' / 836.50' S= 0.0040 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 7.07 sf
#2	Secondary	844.25'	**69.6" W x 9.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=16.25 cfs @ 9.99 hrs HW=840.22' TW=835.44' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 16.25 cfs @ 5.58 fps)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=838.50' TW=826.50' (Dynamic Tailwater)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 2P: 60" SD MH



Summary for Pond 15P: SD System 42" HDPE

2 - 6 foot long curb openings (one on both sides of Linne Rd)
with 25 foot x 12 inch wide channel drain in Conc C&G

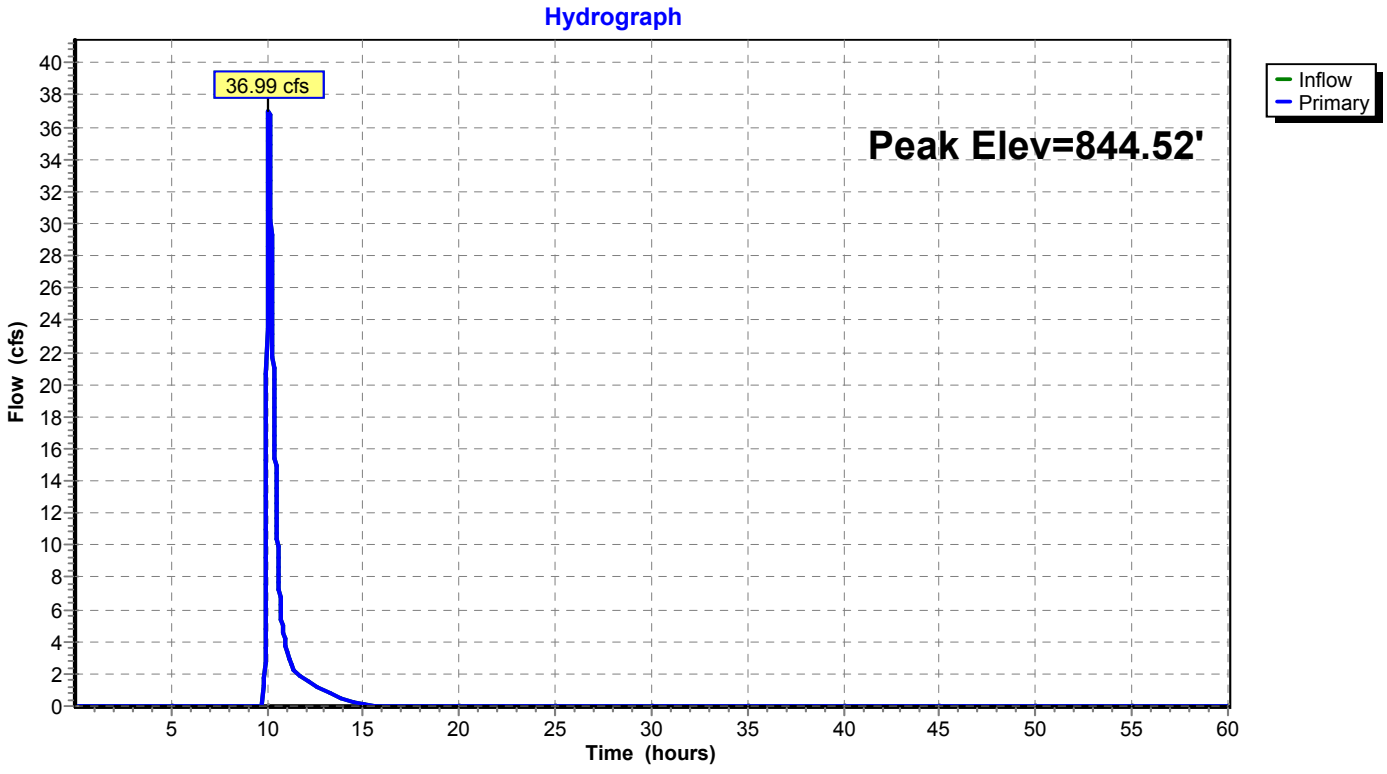
Inflow	=	36.99 cfs @	10.09 hrs, Volume=	1.833 af
Outflow	=	36.99 cfs @	10.09 hrs, Volume=	1.833 af, Atten= 0%, Lag= 0.0 min
Primary	=	36.99 cfs @	10.09 hrs, Volume=	1.833 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 844.52' @ 10.09 hrs
Flood Elev= 845.02'

Device	Routing	Invert	Outlet Devices
#1	Primary	839.75'	**42.0" Round Culvert** L= 1,370.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 839.75' / 833.60' S= 0.0045 '/' Cc= 0.900 n= 0.012, Flow Area= 9.62 sf
#2	Device 1	844.17'	**72.0" W x 9.0" H Vert. Orifice/Grate X 2.00** C= 0.600
#3	Device 1	844.25'	**12.0" x 180.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=36.98 cfs @ 10.09 hrs HW=844.52' TW=836.00' (Dynamic Tailwater)
↑**1=Culvert** (Passes 36.98 cfs of 74.35 cfs potential flow)
↑**2=Orifice/Grate** (Orifice Controls 7.91 cfs @ 1.89 fps)
3=Orifice/Grate (Weir Controls 29.06 cfs @ 1.69 fps)

Pond 15P: SD System 42" HDPE



Summary for Pond 16P: Dbl Conc. Arch Culvert (37x23)

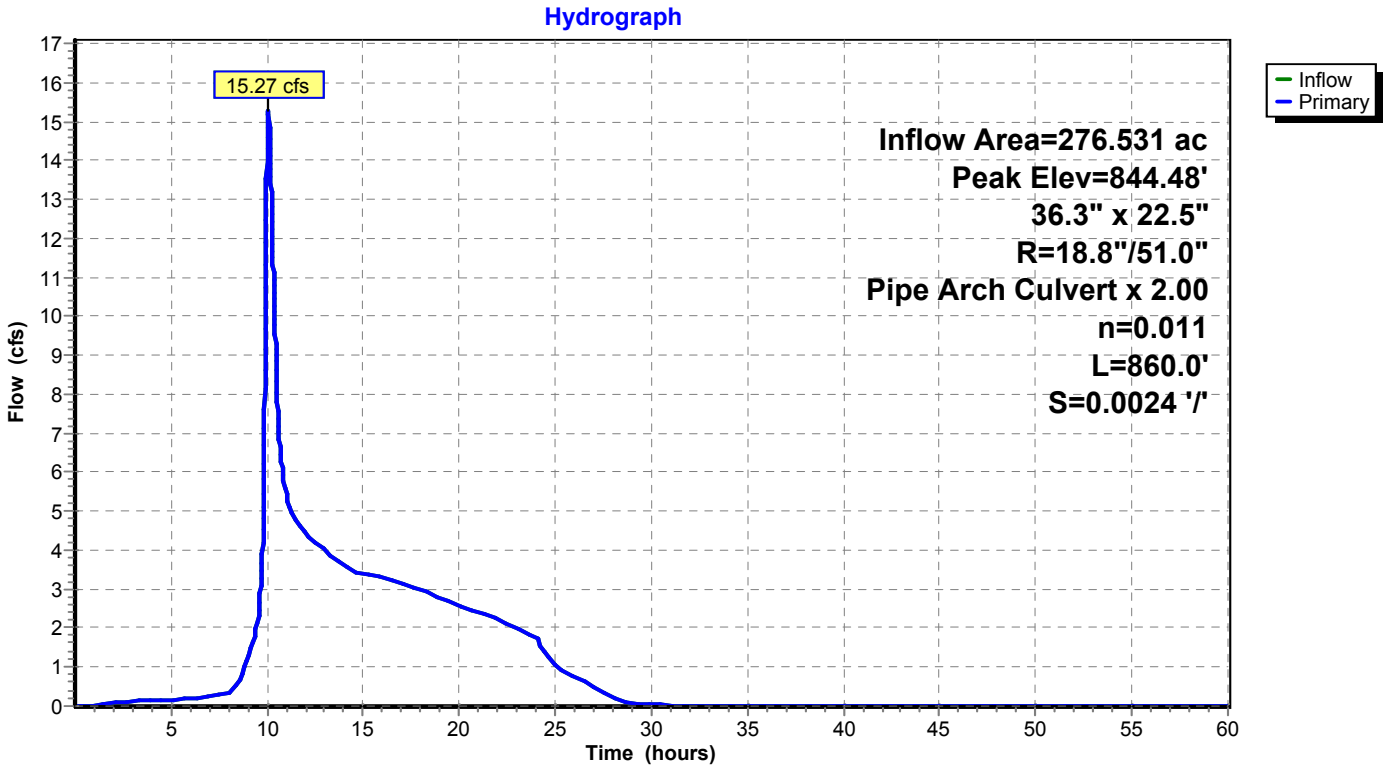
Inflow Area = 276.531 ac, 1.60% Impervious, Inflow Depth = 0.21" for 25 Year event
Inflow = 15.27 cfs @ 10.07 hrs, Volume= 4.839 af
Outflow = 15.27 cfs @ 10.07 hrs, Volume= 4.839 af, Atten= 0%, Lag= 0.0 min
Primary = 15.27 cfs @ 10.07 hrs, Volume= 4.839 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 844.48' @ 10.07 hrs
Flood Elev= 846.02'

Device	Routing	Invert	Outlet Devices
#1	Primary	843.50'	**36.3" W x 22.5" H, R=18.8"/51.0" Pipe Arch RCP_Arch 37x23 X 2.00** L= 860.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 843.50' / 841.40' S= 0.0024 '/' Cc= 0.900 n= 0.011, Flow Area= 4.43 sf

Primary OutFlow Max=15.27 cfs @ 10.07 hrs HW=844.48' TW=0.00' (Dynamic Tailwater)
1=RCP_Arch 37x23 (Barrel Controls 15.27 cfs @ 4.04 fps)

Pond 16P: Dbl Conc. Arch Culvert (37x23)



Summary for Pond 17P: Gran Cielo Dwy

[58] Hint: Peaked 0.54' above defined flood level

Inflow Area = 166.738 ac, 0.91% Impervious, Inflow Depth = 2.22" for 25 Year event
Inflow = 161.34 cfs @ 9.98 hrs, Volume= 30.903 af
Outflow = 161.03 cfs @ 9.99 hrs, Volume= 30.903 af, Atten= 0%, Lag= 0.5 min
Primary = 104.80 cfs @ 9.99 hrs, Volume= 29.304 af
Secondary = 0.01 cfs @ 9.99 hrs, Volume= 0.000 af
Tertiary = 56.21 cfs @ 9.99 hrs, Volume= 1.599 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 855.00' @ 9.99 hrs Surf.Area= 8,086 sf Storage= 11,009 cf
Flood Elev= 854.46' Surf.Area= 6,947 sf Storage= 6,934 cf

Plug-Flow detention time= 1.8 min calculated for 30.898 af (100% of inflow)
Center-of-Mass det. time= 1.8 min (820.1 - 818.2)

Volume	Invert	Avail.Storage	Storage Description
#1	852.84'	22,270 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
852.84	0	0	0
853.14	2,586	388	388
854.14	6,275	4,431	4,818
855.14	8,376	7,326	12,144
856.14	11,876	10,126	22,270

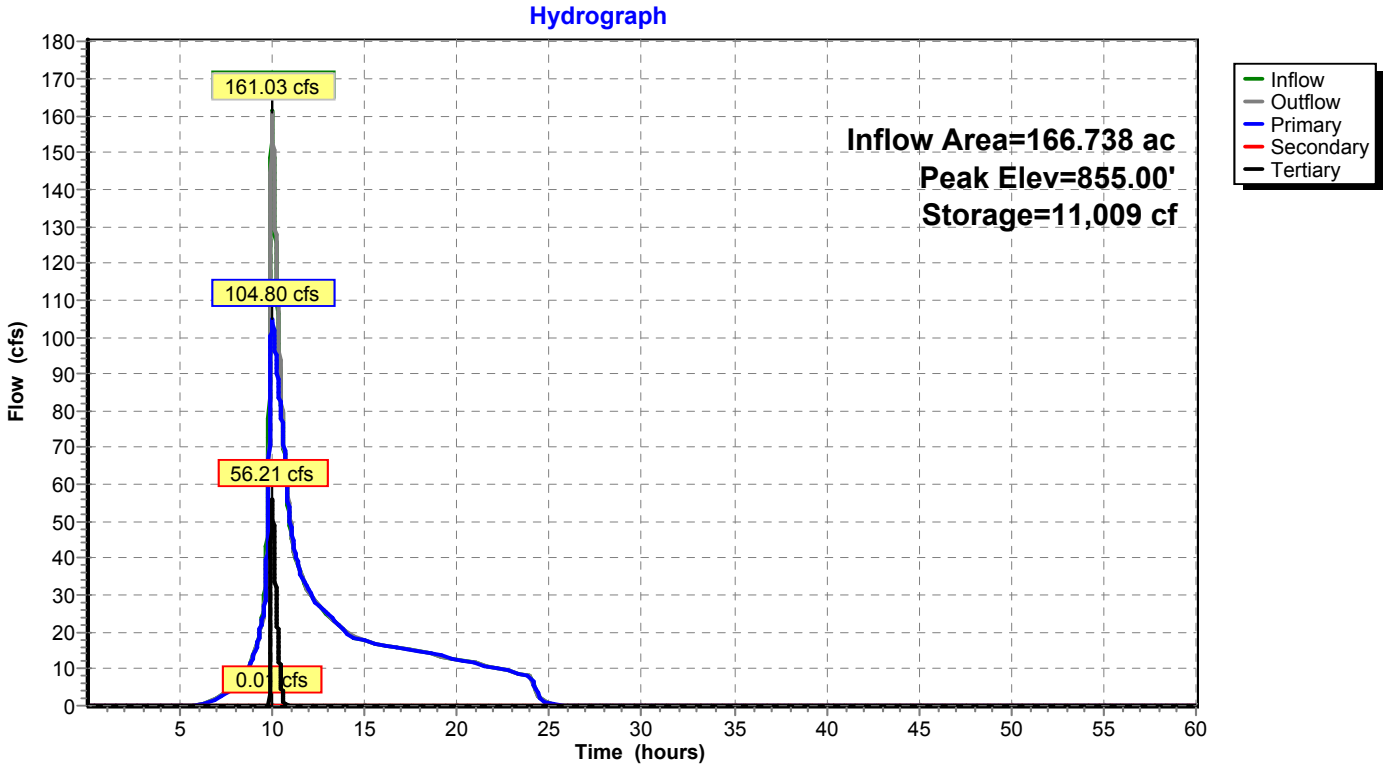
Device	Routing	Invert	Outlet Devices
#1	Primary	852.84'	**30.0" Round Culvert X 6.00** L= 77.0' CMP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 852.84' / 851.76' S= 0.0140 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 4.91 sf
#2	Secondary	854.90'	**Special & User-Defined** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 Disch. (cfs) 0.000 0.010 0.200 0.710 1.580 2.700 4.030 5.690 7.620 9.790 12.320 15.140 18.190 21.460 24.930 28.580 32.420 36.420 40.580 44.900 49.360 53.970
#3	Tertiary	854.40'	**Special & User-Defined** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 2.20 2.30 2.40 2.50 2.60 Disch. (cfs) 0.000 0.080 3.470 10.790 21.890 36.810 55.720 78.890 106.600 138.580 174.620 214.630 258.590 306.440 358.240 413.470 471.810 533.060 597.050 663.650 732.760 804.270 878.100 954.180 1,032.440 1,112.810 1,195.240

Primary OutFlow Max=104.78 cfs @ 9.99 hrs HW=855.00' TW=849.47' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 104.78 cfs @ 5.18 fps)

Secondary OutFlow Max=0.01 cfs @ 9.99 hrs HW=855.00' TW=849.47' (Dynamic Tailwater)
└**2=Special & User-Defined** (Custom Controls 0.01 cfs)

Tertiary OutFlow Max=56.16 cfs @ 9.99 hrs HW=855.00' TW=854.13' (Dynamic Tailwater)
└**3=Special & User-Defined** (Custom Controls 56.16 cfs)

Pond 17P: Gran Cielo Dwy



Summary for Pond 18P: GC-CkD1

Inflow Area = 240.622 ac, 1.05% Impervious, Inflow Depth = 2.19" for 25 Year event
Inflow = 181.92 cfs @ 9.98 hrs, Volume= 43.852 af
Outflow = 175.31 cfs @ 10.02 hrs, Volume= 43.818 af, Atten= 4%, Lag= 2.3 min
Primary = 0.60 cfs @ 9.92 hrs, Volume= 0.025 af
Secondary = 25.90 cfs @ 10.01 hrs, Volume= 0.677 af
Tertiary = 149.04 cfs @ 10.03 hrs, Volume= 43.115 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 849.52' @ 10.03 hrs Surf.Area= 12,369 sf Storage= 13,468 cf
Flood Elev= 850.17' Surf.Area= 18,446 sf Storage= 23,434 cf

Plug-Flow detention time= 1.7 min calculated for 43.810 af (100% of inflow)
Center-of-Mass det. time= 1.2 min (826.1 - 824.9)

Volume	Invert	Avail.Storage	Storage Description
#1	844.56'	70,294 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
844.56	10	0	0
845.00	200	46	46
846.00	600	400	446
847.00	1,500	1,050	1,496
848.00	2,166	1,833	3,329
849.00	7,688	4,927	8,256
850.00	16,694	12,191	20,447
851.00	27,000	21,847	42,294
852.00	29,000	28,000	70,294

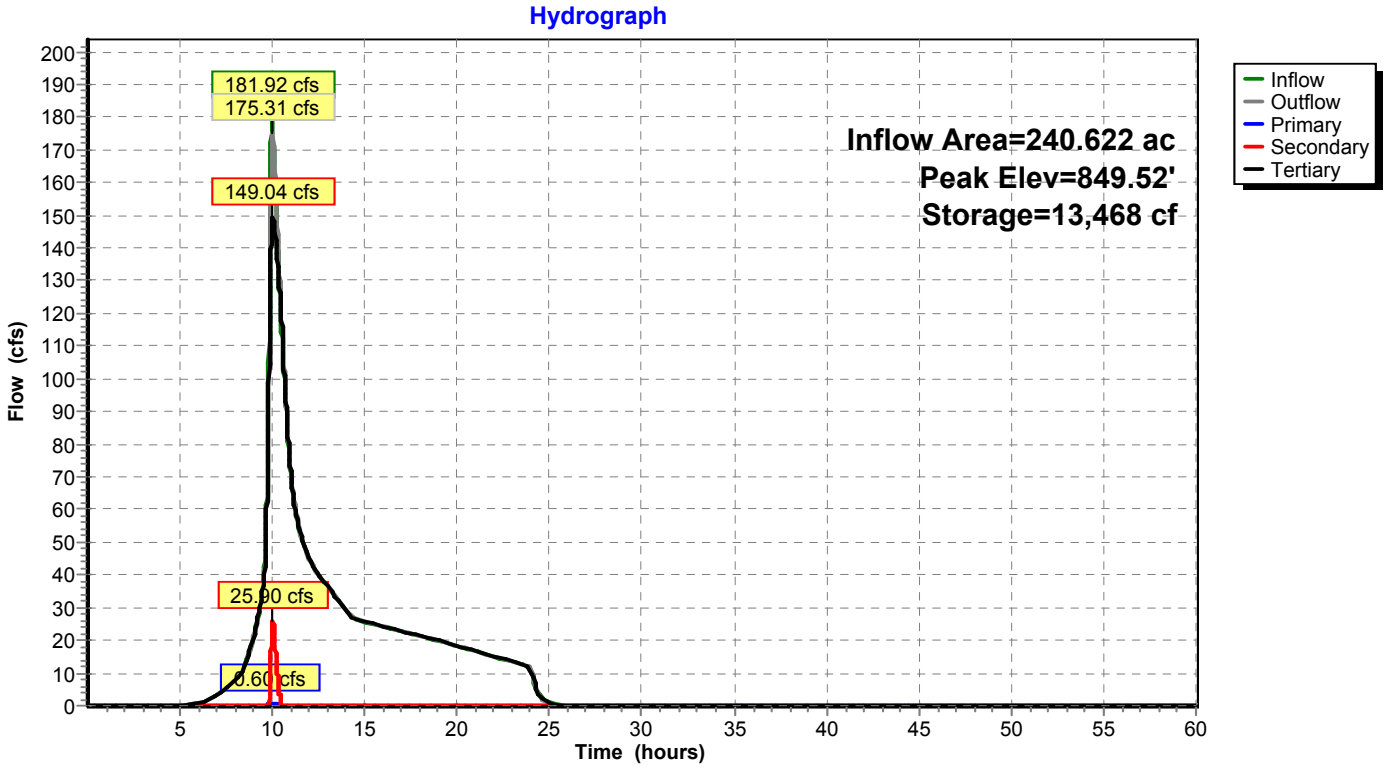
Device	Routing	Invert	Outlet Devices
#1	Primary	847.69'	**6.0" Round Culvert** L= 26.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 847.69' / 847.67' S= 0.0008 '/' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Secondary	848.50'	**9.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59
#3	Tertiary	843.15'	**58.5" W x 36.0" H, R=30.0"/84.0" Pipe Arch RCP_Arch 59x36 X 2.00** L= 960.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 843.15' / 840.75' S= 0.0025 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 11.40 sf
#4	Device 3	847.00'	**78.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Tertiary	850.00'	**Special & User-Defined (CkD1-S)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 Disch. (cfs) 0.000 0.030 0.560 1.900 4.120 7.220 11.180 15.770 20.900 26.530 32.600 39.090 45.970 53.220 60.820 68.750 77.000 85.570 94.430 103.580 113.010

Primary OutFlow Max=0.57 cfs @ 9.92 hrs HW=849.13' TW=848.54' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.57 cfs @ 2.91 fps)

Secondary OutFlow Max=25.42 cfs @ 10.01 hrs HW=849.51' TW=849.05' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 25.42 cfs @ 2.80 fps)

Tertiary OutFlow Max=149.02 cfs @ 10.03 hrs HW=849.52' TW=841.72' (Dynamic Tailwater)
└**3=RCP_Arch 59x36** (Passes 149.02 cfs of 171.50 cfs potential flow)
└**4=Orifice/Grate** (Orifice Controls 149.02 cfs @ 7.64 fps)
└**5=Special & User-Defined (CkD1-S)** (Controls 0.00 cfs)

Pond 18P: GC-CkD1



Summary for Pond 19P: GC-CkD2

[58] Hint: Peaked 0.46' above defined flood level
[80] Warning: Exceeded Pond 18P by 0.65' @ 24.35 hrs (0.02 cfs 0.177 af)
[80] Warning: Exceeded Pond 18P by 0.03' @ 10.55 hrs (0.02 cfs 0.000 af)

Inflow Area =	260.311 ac,	0.99% Impervious,	Inflow Depth =	0.18"	for 25 Year event
Inflow =	45.55 cfs @	10.00 hrs,	Volume=	3.943 af	
Outflow =	39.95 cfs @	10.08 hrs,	Volume=	3.942 af,	Atten= 12%, Lag= 4.6 min
Primary =	1.23 cfs @	10.08 hrs,	Volume=	1.419 af	
Secondary =	33.35 cfs @	10.08 hrs,	Volume=	2.431 af	
Tertiary =	5.36 cfs @	10.08 hrs,	Volume=	0.092 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 849.11' @ 10.08 hrs Surf.Area= 16,679 sf Storage= 20,913 cf
Flood Elev= 848.65' Surf.Area= 11,850 sf Storage= 14,787 cf

Plug-Flow detention time= 51.0 min calculated for 3.942 af (100% of inflow)
Center-of-Mass det. time= 50.7 min (837.8 - 787.2)

Volume	Invert	Avail.Storage	Storage Description
#1	846.00'	46,430 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
846.00	267	0	0
847.00	4,055	2,161	2,161
848.00	8,178	6,117	8,278
849.00	13,828	11,003	19,281
850.00	40,470	27,149	46,430

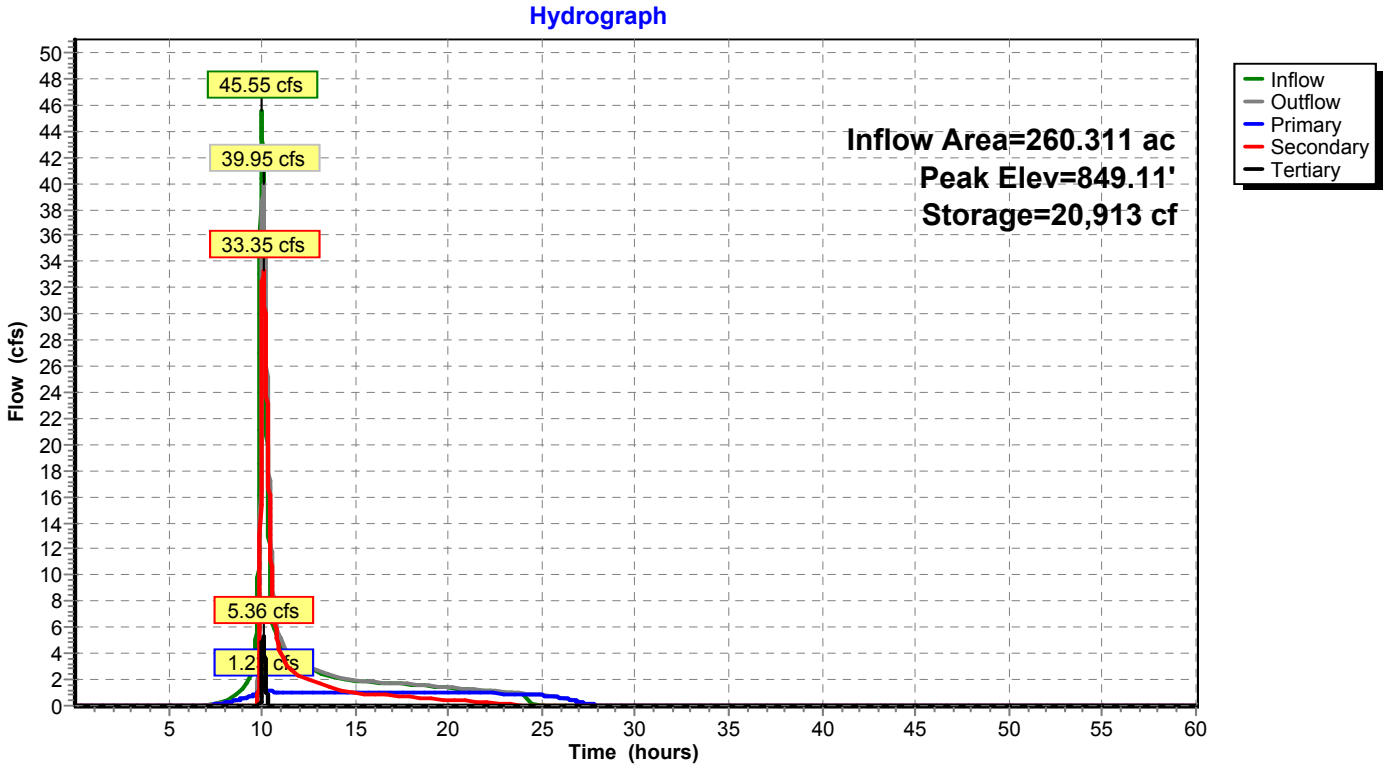
Device	Routing	Invert	Outlet Devices
#1	Primary	846.12'	**6.0" Round Culvert** L= 26.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 846.12' / 845.98' S= 0.0054 '/' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Tertiary	848.70'	**Special & User-Defined (CkD2-S)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 Disch. (cfs) 0.000 0.130 0.970 2.640 5.120 8.550 13.010 18.440 24.620 31.430 38.830 46.770 55.210 64.120
#3	Secondary	847.80'	**Special & User-Defined (CkD2-W)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 2.20 Disch. (cfs) 0.000 0.020 0.480 1.430 2.780 4.430 6.490 8.950 12.010 15.510 19.390 23.590 28.100 32.980 38.270 43.910 49.850 56.080 62.580 69.340 76.350 83.590 91.070

Primary OutFlow Max=1.23 cfs @ 10.08 hrs HW=849.11' TW=845.79' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.23 cfs @ 6.29 fps)

Secondary OutFlow Max=33.34 cfs @ 10.08 hrs HW=849.11' TW=845.79' (Dynamic Tailwater)
└**3=Special & User-Defined (CkD2-W)** (Custom Controls 33.34 cfs)

Tertiary OutFlow Max=5.35 cfs @ 10.08 hrs HW=849.11' TW=0.00' (Dynamic Tailwater)
└**2=Special & User-Defined (CkD2-S)** (Custom Controls 5.35 cfs)

Pond 19P: GC-CkD2



Summary for Pond 20P: GC-CkD3

[58] Hint: Peaked 0.77' above defined flood level

Inflow Area = 274.094 ac, 0.94% Impervious, Inflow Depth = 0.26" for 25 Year event
Inflow = 45.11 cfs @ 10.06 hrs, Volume= 5.938 af
Outflow = 43.97 cfs @ 10.10 hrs, Volume= 5.927 af, Atten= 3%, Lag= 2.6 min
Primary = 5.62 cfs @ 10.10 hrs, Volume= 3.513 af
Secondary = 6.57 cfs @ 10.10 hrs, Volume= 0.672 af
Tertiary = 31.77 cfs @ 10.10 hrs, Volume= 1.741 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 845.79' @ 10.10 hrs Surf.Area= 13,577 sf Storage= 13,254 cf
Flood Elev= 845.02' Surf.Area= 8,229 sf Storage= 4,852 cf

Plug-Flow detention time= 25.0 min calculated for 5.926 af (100% of inflow)
Center-of-Mass det. time= 23.6 min (864.2 - 840.6)

Volume	Invert	Avail.Storage	Storage Description
#1	844.00'	24,632 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
844.00	1,288	0	0
845.00	8,090	4,689	4,689
846.50	18,500	19,943	24,632

Device	Routing	Invert	Outlet Devices
#1	Primary	844.22'	**18.0" Round Culvert** L= 26.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 844.22' / 843.98' S= 0.0092 '/' Cc= 0.900 n= 0.021 Corrugated metal, Flow Area= 1.77 sf
#2	Secondary	845.00'	**Special & User-Defined (CkD3-W)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 Disch. (cfs) 0.000 0.050 0.390 0.970 1.710 2.600 3.780 5.170 6.720 8.570 11.140 14.290 17.880 21.830 26.120 30.880 36.030 41.520 47.330 53.420 59.790
#3	Tertiary	845.10'	**Special & User-Defined (CkD3-S)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 Disch. (cfs) 0.000 0.050 1.930 5.420 10.370 16.490 23.960 32.580 42.550 53.770 66.380 80.510 96.280 113.770 132.840 153.630 175.910 199.510 224.310 250.260

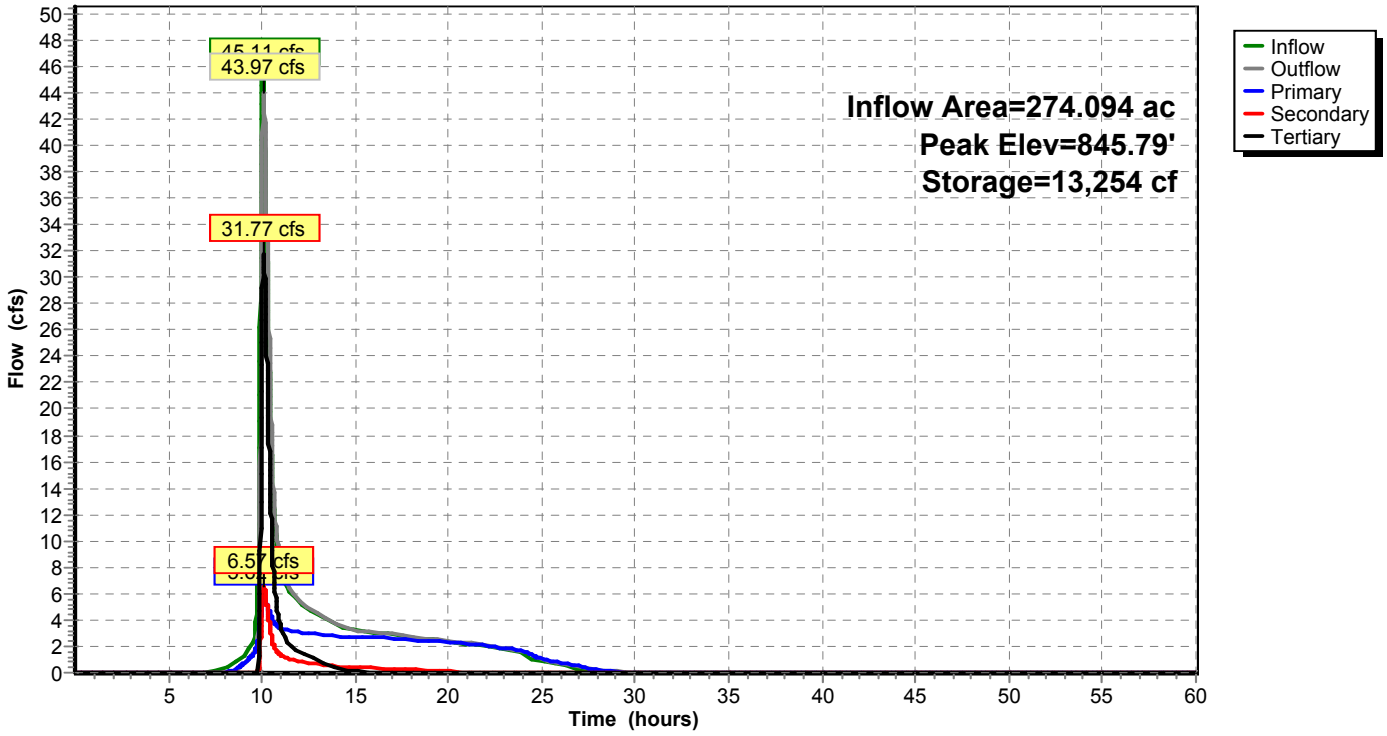
Primary OutFlow Max=5.62 cfs @ 10.10 hrs HW=845.79' TW=844.47' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 5.62 cfs @ 3.78 fps)

Secondary OutFlow Max=6.57 cfs @ 10.10 hrs HW=845.79' TW=844.47' (Dynamic Tailwater)
└**2=Special & User-Defined (CkD3-W)** (Custom Controls 6.57 cfs)

Tertiary OutFlow Max=31.76 cfs @ 10.10 hrs HW=845.79' TW=0.00' (Dynamic Tailwater)
└**3=Special & User-Defined (CkD3-S)** (Custom Controls 31.76 cfs)

Pond 20P: GC-CkD3

Hydrograph



Summary for Pond B1: Basin 1

Inflow Area = 47.388 ac, 67.98% Impervious, Inflow Depth = 3.28" for 25 Year event
Inflow = 93.80 cfs @ 10.04 hrs, Volume= 12.965 af
Outflow = 30.26 cfs @ 10.60 hrs, Volume= 12.581 af, Atten= 68%, Lag= 33.6 min
Discarded = 1.09 cfs @ 10.60 hrs, Volume= 3.116 af
Primary = 29.18 cfs @ 10.60 hrs, Volume= 9.465 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 837.00' @ 10.60 hrs Surf.Area= 1.365 ac Storage= 5.171 af

Plug-Flow detention time= 352.1 min calculated for 12.579 af (97% of inflow)
Center-of-Mass det. time= 332.1 min (1,063.2 - 731.2)

Volume	Invert	Avail.Storage	Storage Description
#1	826.50'	8.466 af	**Custom Stage Data (Prismatic)** Listed below (Recalc) 8.789 af Overall - 0.323 af Embedded = 8.466 af
#2	826.50'	0.129 af	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 0.323 af Overall x 40.0% Voids
		8.595 af	Total Available Storage

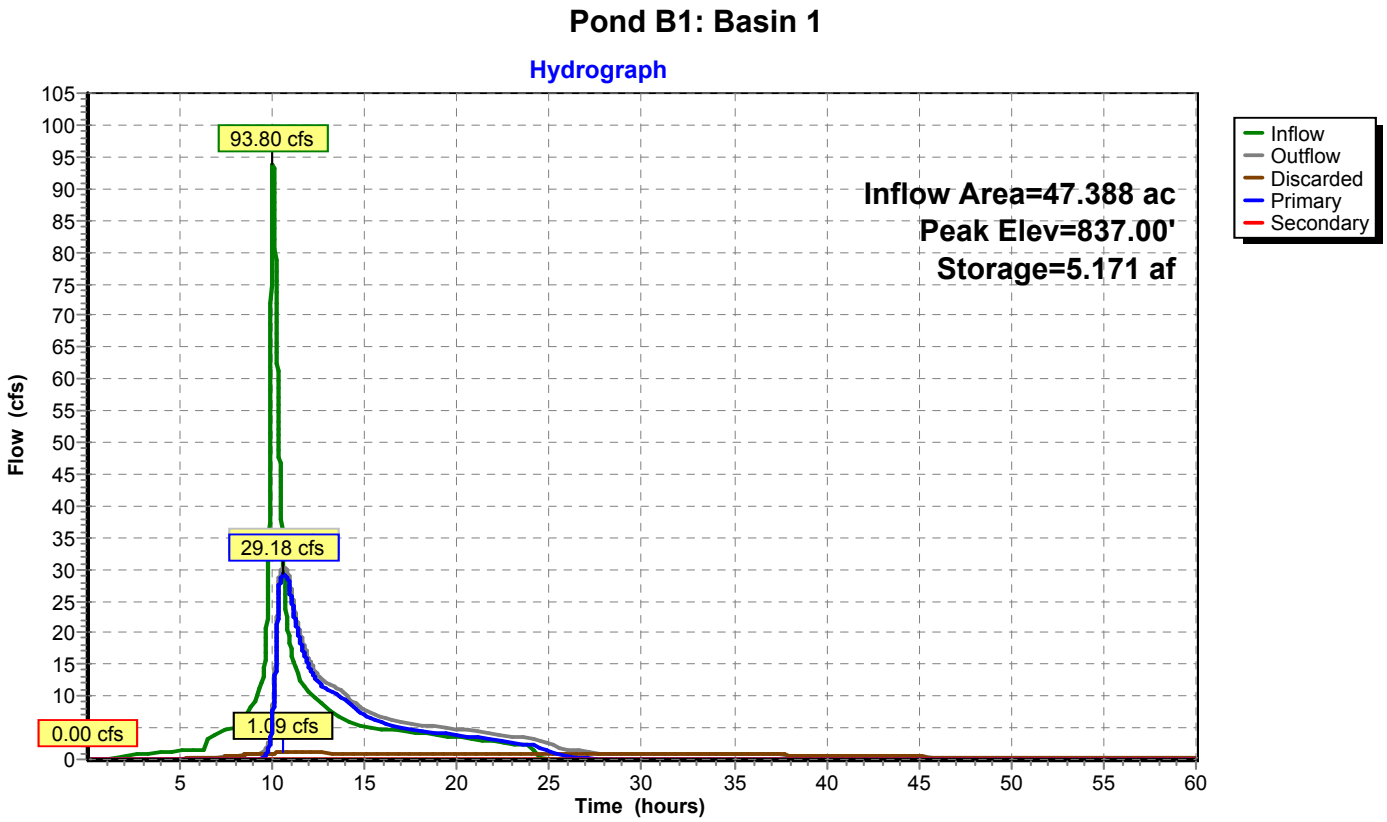
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
826.50	0.081	0.000	0.000
827.00	0.081	0.040	0.040
828.00	0.081	0.081	0.121
829.00	0.081	0.081	0.202
830.00	0.081	0.081	0.283
831.00	0.081	0.081	0.365
832.00	0.203	0.142	0.506
833.00	0.376	0.289	0.796
834.00	1.171	0.774	1.569
835.00	1.234	1.202	2.772
836.00	1.299	1.267	4.038
837.00	1.365	1.332	5.370
838.00	1.432	1.399	6.769
839.00	1.500	1.466	8.235
839.35	1.665	0.554	8.789

Device	Routing	Invert	Outlet Devices
#1	Primary	833.12'	**36.0" Round Culvert** L= 385.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 833.12' / 831.20' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf
#2	Discarded	826.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	834.33'	**16.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	834.33'	**12.0" W x 8.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	835.33'	**30.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	836.17'	**24.0" Horiz. Orifice/Grate** C= 0.600 in 78.0" x 36.0" Grate (16% open area) Limited to weir flow at low heads
#7	Secondary	838.35'	**30.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=1.09 cfs @ 10.60 hrs HW=837.00' (Free Discharge)
└**2=Exfiltration** (Controls 1.09 cfs)

Primary OutFlow Max=29.18 cfs @ 10.60 hrs HW=837.00' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 29.18 cfs of 50.64 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 3.38 cfs @ 7.61 fps)
  └**4=Orifice/Grate** (Orifice Controls 4.90 cfs @ 7.35 fps)
  └**5=Orifice/Grate** (Orifice Controls 7.15 cfs @ 5.72 fps)
  └**6=Orifice/Grate** (Orifice Controls 13.74 cfs @ 4.37 fps)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=826.50' TW=0.00' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)



Summary for Pond B10: Basin 10

Inflow Area = 30.685 ac, 61.94% Impervious, Inflow Depth = 2.80" for 25 Year event
Inflow = 32.90 cfs @ 9.98 hrs, Volume= 7.171 af
Outflow = 7.40 cfs @ 11.45 hrs, Volume= 6.710 af, Atten= 78%, Lag= 87.9 min
Discarded = 0.84 cfs @ 11.45 hrs, Volume= 2.797 af
Primary = 6.57 cfs @ 11.45 hrs, Volume= 3.913 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 817.99' @ 11.45 hrs Surf.Area= 45,453 sf Storage= 139,204 cf

Plug-Flow detention time= 590.2 min calculated for 6.709 af (94% of inflow)
Center-of-Mass det. time= 547.8 min (1,287.4 - 739.6)

Volume	Invert	Avail.Storage	Storage Description
#1	808.50'	230,693 cf	**Custom Stage Data (Conic)** Listed below (Recalc) 244,773 cf Overall - 14,080 cf Embedded = 230,693 cf
#2	808.50'	5,632 cf	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 14,080 cf Overall x 40.0% Voids
		236,325 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
808.50	3,520	0	0	3,520
809.00	3,520	1,760	1,760	3,625
810.00	3,520	3,520	5,280	3,835
811.00	3,520	3,520	8,800	4,046
812.00	3,520	3,520	12,320	4,256
813.00	3,520	3,520	15,840	4,466
814.00	8,931	6,019	21,859	9,884
815.00	17,294	12,884	34,744	18,257
816.00	40,146	27,930	62,673	41,116
817.00	42,792	41,462	104,135	43,859
818.00	45,490	44,134	148,269	46,658
819.00	48,243	46,860	195,129	49,516
820.00	51,058	49,644	244,773	52,440

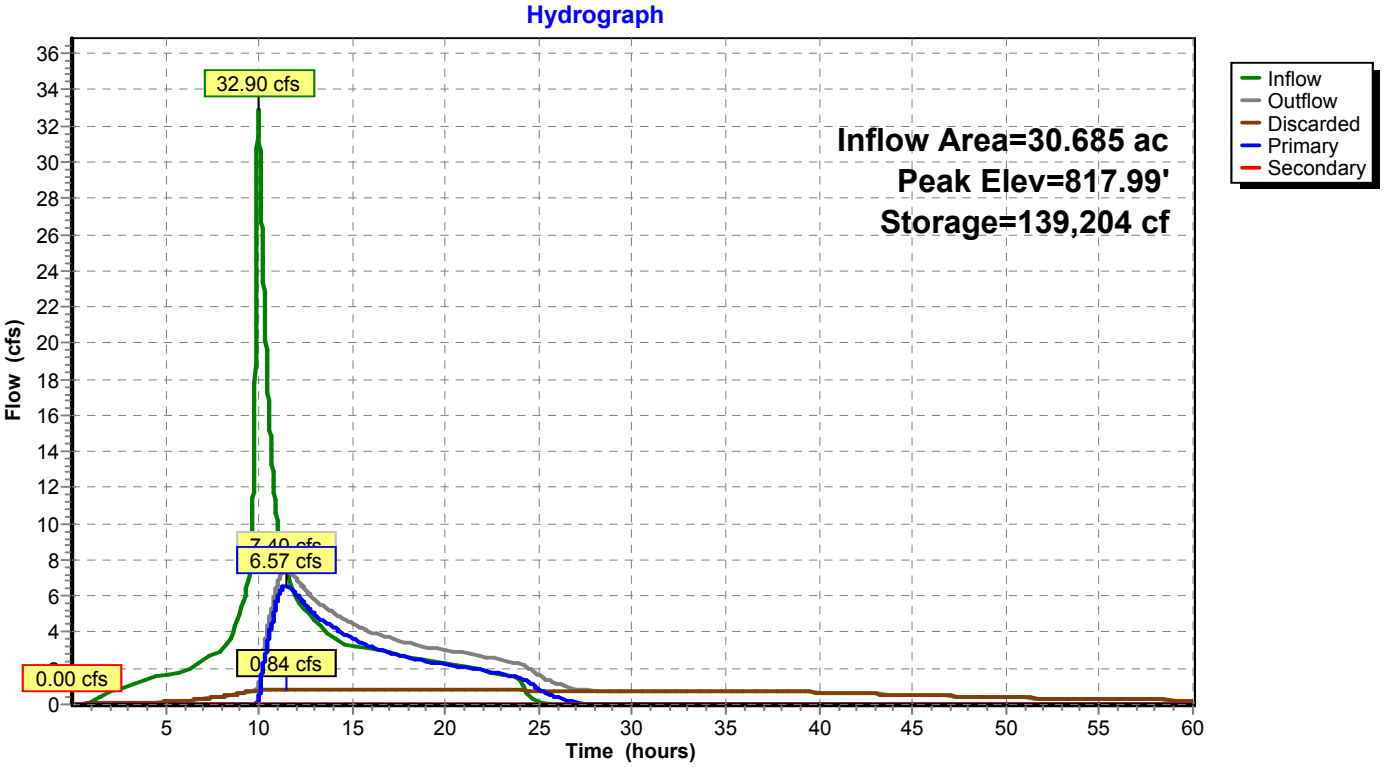
Device	Routing	Invert	Outlet Devices
#1	Primary	816.00'	**30.0" Round Culvert** L= 45.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 816.00' / 815.10' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Discarded	808.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	816.67'	**24.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	817.33'	**15.0" W x 18.0" H Vert. Orifice/Grate** X 2 rows with 8.0" cc spacing C= 0.600
#5	Device 1	817.83'	**60.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	819.00'	**78.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#7	Secondary	819.33'	**36.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.84 cfs @ 11.45 hrs HW=817.99' (Free Discharge)
└**2=Exfiltration** (Controls 0.84 cfs)

Primary OutFlow Max=6.57 cfs @ 11.45 hrs HW=817.99' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 6.57 cfs of 20.07 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 3.44 cfs @ 5.16 fps)
  ├**4=Orifice/Grate** (Orifice Controls 2.13 cfs @ 2.60 fps)
  ├**5=Orifice/Grate** (Orifice Controls 0.99 cfs @ 1.27 fps)
  └**6=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=808.50' TW=0.00' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B10: Basin 10



Summary for Pond B11: Basin 11

Inflow Area = 14.461 ac, 52.00% Impervious, Inflow Depth = 2.64" for 25 Year event
Inflow = 20.25 cfs @ 9.96 hrs, Volume= 3.183 af
Outflow = 5.50 cfs @ 10.55 hrs, Volume= 2.921 af, Atten= 73%, Lag= 35.2 min
Discarded = 0.26 cfs @ 10.55 hrs, Volume= 0.785 af
Primary = 5.24 cfs @ 10.55 hrs, Volume= 2.136 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 833.60' @ 10.55 hrs Surf.Area= 13,196 sf Storage= 51,986 cf

Plug-Flow detention time= 423.5 min calculated for 2.921 af (92% of inflow)
Center-of-Mass det. time= 370.7 min (1,111.8 - 741.1)

Volume	Invert	Avail.Storage	Storage Description
#1	823.50'	83,101 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 97,181 cf Overall - 14,080 cf Embedded = 83,101 cf
#2	823.50'	5,632 cf	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 14,080 cf Overall x 40.0% Voids
		88,733 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
823.50	3,520	0	0
824.00	3,520	1,760	1,760
825.00	3,520	3,520	5,280
826.00	3,520	3,520	8,800
827.00	3,520	3,520	12,320
828.00	3,520	3,520	15,840
829.00	2,800	3,160	19,000
830.00	6,900	4,850	23,850
831.00	8,919	7,910	31,760
832.00	10,515	9,717	41,477
833.00	12,169	11,342	52,819
834.00	13,879	13,024	65,843
835.00	15,655	14,767	80,610
836.00	17,488	16,572	97,181

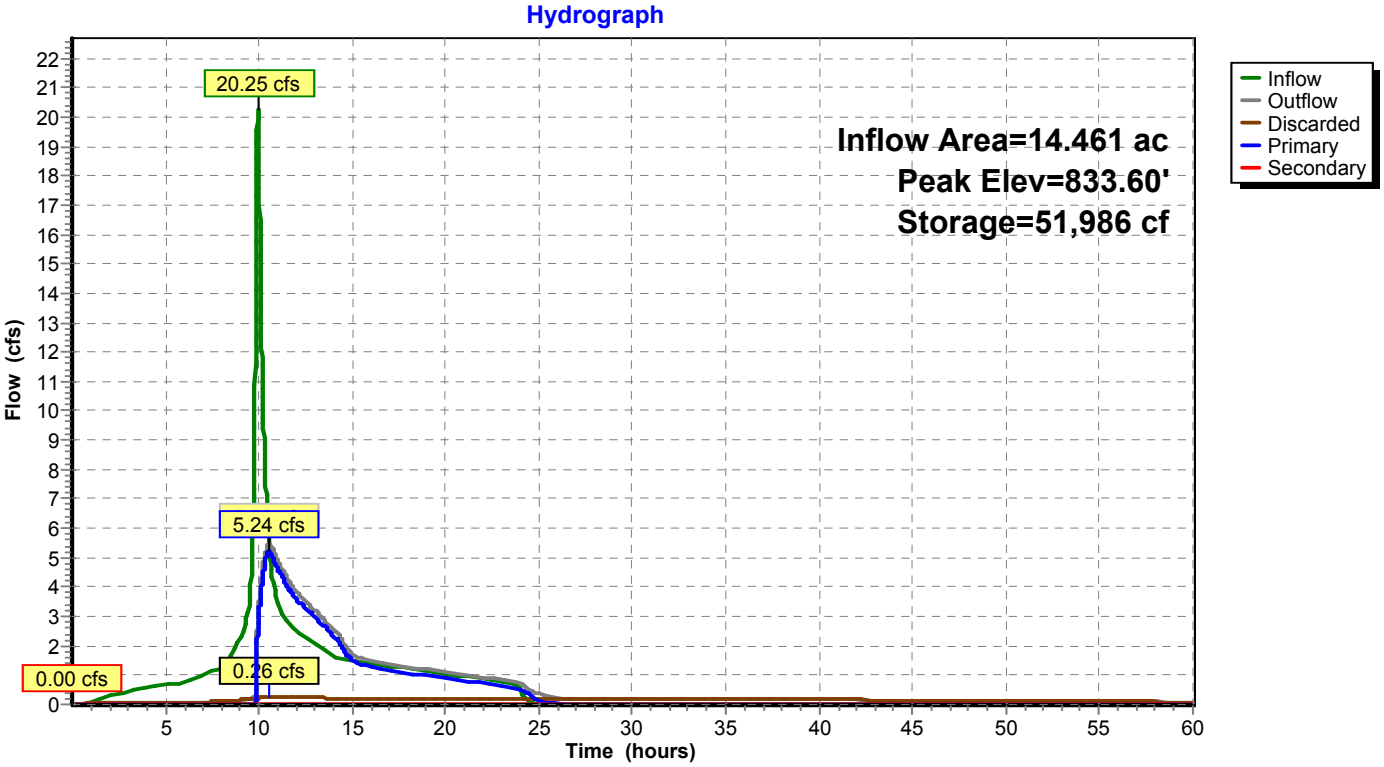
Device	Routing	Invert	Outlet Devices
#1	Primary	831.67'	**24.0" Round Culvert** L= 165.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 831.67' / 820.50' S= 0.0677 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Discarded	823.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	831.67'	**24.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	833.00'	**6.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	833.50'	**27.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	834.50'	**48.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#7	Secondary	834.83'	**16.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.26 cfs @ 10.55 hrs HW=833.60' (Free Discharge)
└**2=Exfiltration** (Controls 0.26 cfs)

Primary OutFlow Max=5.24 cfs @ 10.55 hrs HW=833.60' TW=825.04' (Dynamic Tailwater)
└**1=Culvert** (Passes 5.24 cfs of 14.70 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 4.26 cfs @ 6.39 fps)
  └**4=Orifice/Grate** (Orifice Controls 0.75 cfs @ 2.49 fps)
  └**5=Orifice/Grate** (Orifice Controls 0.23 cfs @ 1.02 fps)
  └**6=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=823.50' TW=820.00' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B11: Basin 11



Summary for Pond B12: Basin 12

Inflow Area = 20.201 ac, 44.06% Impervious, Inflow Depth = 2.44" for 25 Year event
Inflow = 26.91 cfs @ 9.96 hrs, Volume= 4.105 af
Outflow = 3.20 cfs @ 12.16 hrs, Volume= 3.831 af, Atten= 88%, Lag= 131.7 min
Discarded = 0.49 cfs @ 12.16 hrs, Volume= 1.514 af
Primary = 2.71 cfs @ 12.16 hrs, Volume= 2.317 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 838.07' @ 12.16 hrs Surf.Area= 26,220 sf Storage= 78,816 cf

Plug-Flow detention time= 553.8 min calculated for 3.830 af (93% of inflow)
Center-of-Mass det. time= 511.0 min (1,261.2 - 750.2)

Volume	Invert	Avail.Storage	Storage Description
#1	828.50'	160,016 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 174,096 cf Overall - 14,080 cf Embedded = 160,016 cf
#2	828.50'	5,632 cf	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 14,080 cf Overall x 40.0% Voids
		165,648 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
828.50	3,520	0	0
829.00	3,520	1,760	1,760
830.00	3,520	3,520	5,280
831.00	3,520	3,520	8,800
832.00	3,520	3,520	12,320
833.00	3,520	3,520	15,840
834.00	2,600	3,060	18,900
835.00	8,000	5,300	24,200
836.00	20,849	14,425	38,625
837.00	23,415	22,132	60,757
838.00	26,037	24,726	85,483
839.00	28,717	27,377	112,860
840.00	31,383	30,050	142,910
841.00	30,990	31,187	174,096

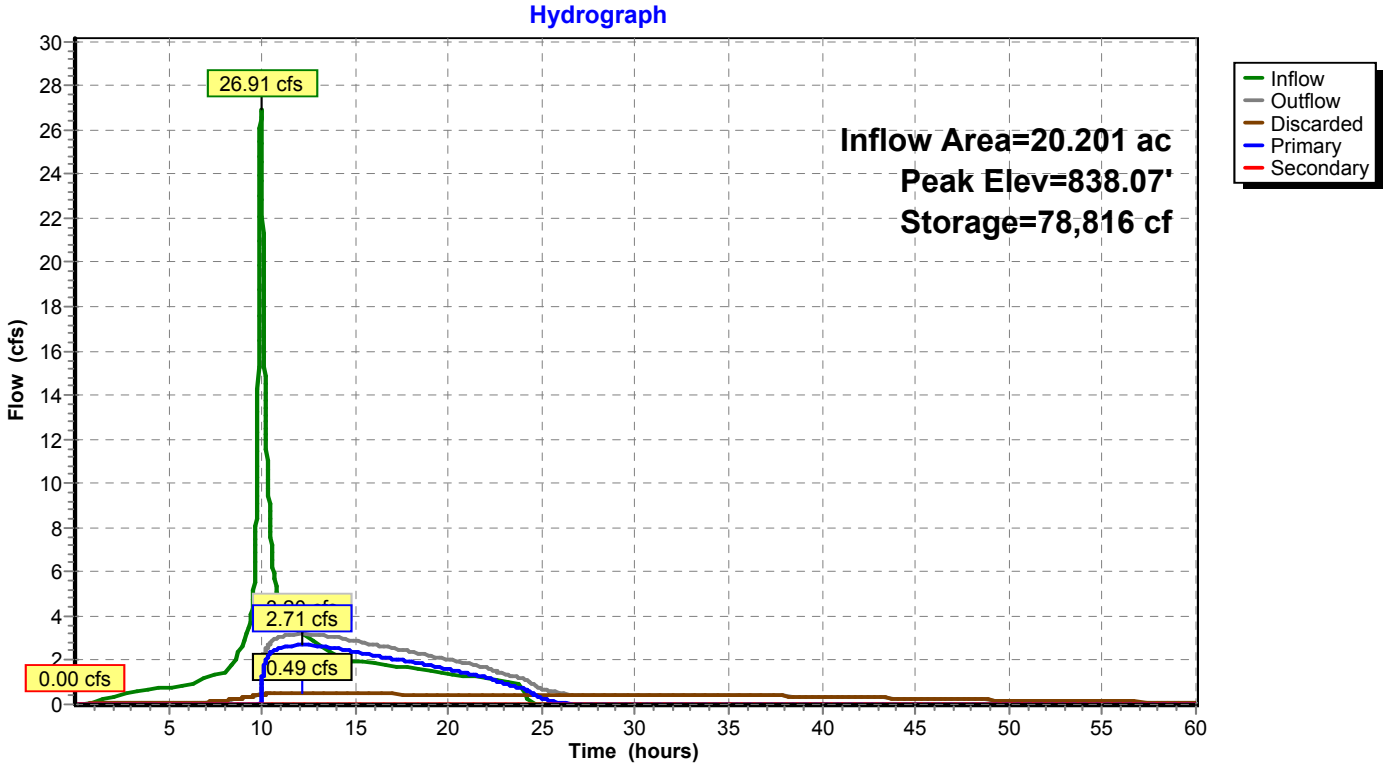
Device	Routing	Invert	Outlet Devices
#1	Primary	836.67'	**30.0" Round Culvert** L= 130.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 836.67' / 832.50' S= 0.0321 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Discarded	828.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	836.67'	**18.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	838.00'	**8.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	838.50'	**24.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	839.50'	**36.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#7	Secondary	840.00'	**18.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.49 cfs @ 12.16 hrs HW=838.07' (Free Discharge)
└**2=Exfiltration** (Controls 0.49 cfs)

Primary OutFlow Max=2.71 cfs @ 12.16 hrs HW=838.07' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 2.71 cfs of 11.37 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 2.67 cfs @ 5.34 fps)
  └**4=Orifice/Grate** (Orifice Controls 0.04 cfs @ 0.84 fps)
  └**5=Orifice/Grate** (Controls 0.00 cfs)
  └**6=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=828.50' TW=0.00' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B12: Basin 12



Summary for Pond B13: Basin 13

Inflow Area = 64.115 ac, 22.11% Impervious, Inflow Depth = 2.42" for 25 Year event
Inflow = 89.20 cfs @ 9.96 hrs, Volume= 12.943 af
Outflow = 62.52 cfs @ 10.09 hrs, Volume= 12.522 af, Atten= 30%, Lag= 7.7 min
Discarded = 0.46 cfs @ 10.09 hrs, Volume= 1.355 af
Primary = 62.05 cfs @ 10.09 hrs, Volume= 11.167 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 843.86' @ 10.09 hrs Surf.Area= 0.549 ac Storage= 2.981 af

Plug-Flow detention time= 223.5 min calculated for 12.520 af (97% of inflow)
Center-of-Mass det. time= 202.7 min (979.2 - 776.5)

Volume	Invert	Avail.Storage	Storage Description
#1	830.50'	4.138 af	**Custom Stage Data (Prismatic)** Listed below (Recalc) 4.461 af Overall - 0.323 af Embedded = 4.138 af
#2	830.50'	0.129 af	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 0.323 af Overall x 40.0% Voids
		4.267 af	Total Available Storage

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
830.50	0.081	0.000	0.000
831.00	0.081	0.040	0.040
832.00	0.081	0.081	0.121
833.00	0.081	0.081	0.202
834.00	0.081	0.081	0.283
835.00	0.081	0.081	0.364
836.00	0.059	0.070	0.433
837.00	0.139	0.099	0.532
838.00	0.287	0.213	0.745
839.00	0.329	0.308	1.053
840.00	0.372	0.350	1.403
841.00	0.416	0.394	1.797
842.00	0.461	0.439	2.236
843.00	0.508	0.484	2.720
844.00	0.555	0.531	3.251
845.00	0.605	0.580	3.831
846.00	0.655	0.630	4.461

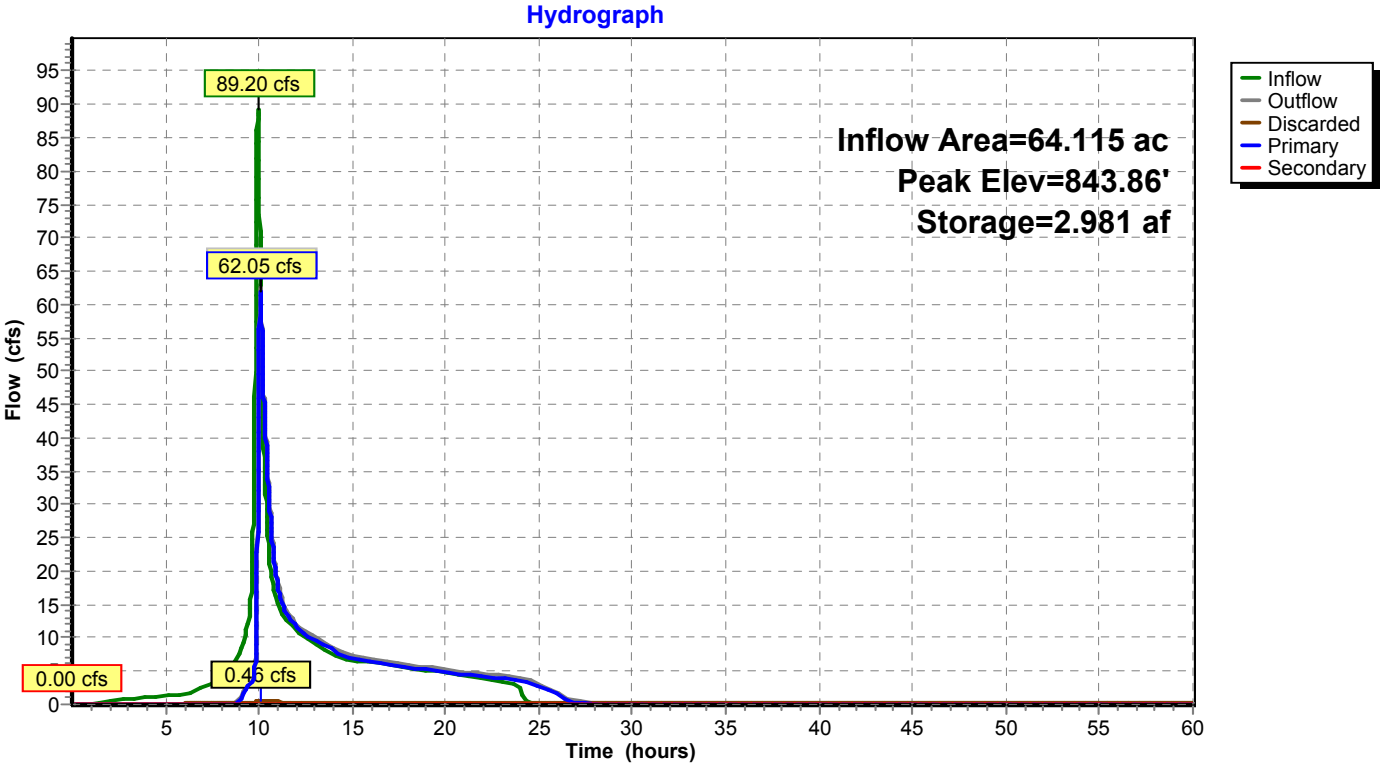
Device	Routing	Invert	Outlet Devices
#1	Primary	834.25'	**48.0" Round Culvert** L= 175.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 834.25' / 832.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 12.57 sf
#2	Discarded	830.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	839.67'	**24.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	841.50'	**15.0" W x 18.0" H Vert. Orifice/Grate** X 2 rows with 8.0" cc spacing C= 0.600
#5	Device 1	842.50'	**60.0" W x 8.0" H Vert. Orifice/Grate** X 2 rows with 8.0" cc spacing C= 0.600
#6	Device 1	843.67'	**78.0" x 36.0" Horiz. Orifice/Grate** X 2 rows C= 0.600 Limited to weir flow at low heads
#7	Secondary	844.67'	**36.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.46 cfs @ 10.09 hrs HW=843.86' (Free Discharge)
└**2=Exfiltration** (Controls 0.46 cfs)

Primary OutFlow Max=62.05 cfs @ 10.09 hrs HW=843.86' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 62.05 cfs of 166.92 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 6.44 cfs @ 9.66 fps)
  └**4=Orifice/Grate** (Orifice Controls 19.85 cfs @ 5.29 fps)
  └**5=Orifice/Grate** (Orifice Controls 25.40 cfs @ 3.81 fps)
  └**6=Orifice/Grate** (Weir Controls 10.35 cfs @ 1.43 fps)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=830.50' TW=0.00' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B13: Basin 13



Summary for Pond B4: Basin 4

Inflow Area = 38.712 ac, 55.38% Impervious, Inflow Depth = 2.73" for 25 Year event
Inflow = 50.91 cfs @ 9.97 hrs, Volume= 8.821 af
Outflow = 20.05 cfs @ 10.46 hrs, Volume= 8.559 af, Atten= 61%, Lag= 29.1 min
Discarded = 0.57 cfs @ 10.46 hrs, Volume= 1.674 af
Primary = 19.48 cfs @ 10.46 hrs, Volume= 6.886 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 839.49' @ 10.46 hrs Surf.Area= 28,324 sf Storage= 126,212 cf

Plug-Flow detention time= 352.0 min calculated for 8.559 af (97% of inflow)
Center-of-Mass det. time= 331.7 min (1,072.0 - 740.3)

Volume	Invert	Avail.Storage	Storage Description
#1	827.50'	218,652 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 232,732 cf Overall - 14,080 cf Embedded = 218,652 cf
#2	827.50'	5,632 cf	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 14,080 cf Overall x 40.0% Voids
		224,284 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
827.50	3,520	0	0
828.00	3,520	1,760	1,760
829.00	3,520	3,520	5,280
830.00	3,520	3,520	8,800
831.00	3,520	3,520	12,320
832.00	3,520	3,520	15,840
833.00	1,064	2,292	18,132
834.00	6,719	3,892	22,024
835.00	16,858	11,789	33,812
836.00	19,297	18,078	51,890
837.00	21,780	20,539	72,428
838.00	24,350	23,065	95,493
839.00	27,007	25,679	121,172
840.00	29,708	28,358	149,529
841.00	32,452	31,080	180,609
842.00	35,196	33,824	214,433
842.50	38,000	18,299	232,732

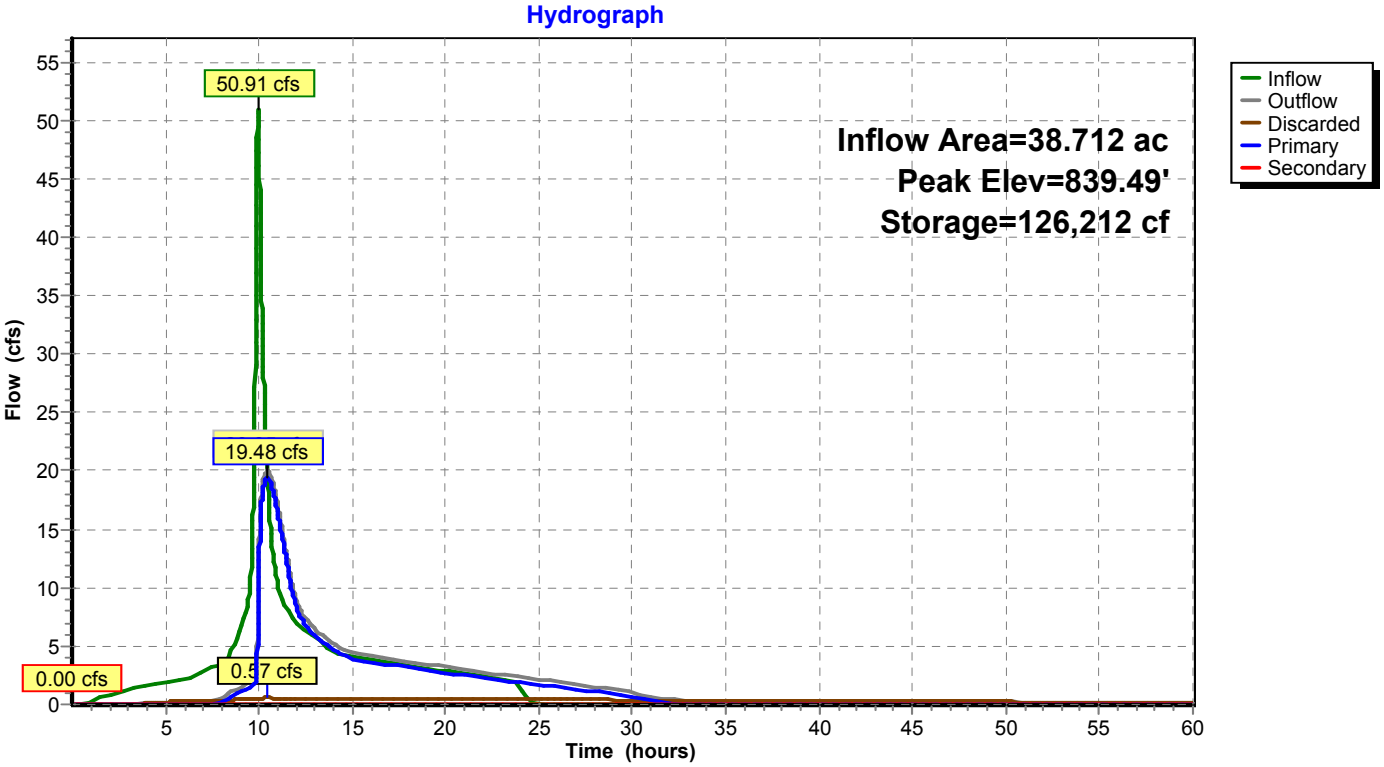
Device	Routing	Invert	Outlet Devices
#1	Primary	835.67'	**30.0" Round Culvert** L= 210.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 835.67' / 834.20' S= 0.0070 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Discarded	827.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	835.67'	**10.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	837.67'	**18.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	838.17'	**42.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	839.75'	**48.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 in 78.0" x 36.0" Grate (62% open area) Limited to weir flow at low heads
#7	Secondary	841.12'	**40.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.57 cfs @ 10.46 hrs HW=839.49' (Free Discharge)
└**2=Exfiltration** (Controls 0.57 cfs)

Primary OutFlow Max=19.48 cfs @ 10.46 hrs HW=839.49' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 19.48 cfs of 37.02 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 2.56 cfs @ 9.20 fps)
  └**4=Orifice/Grate** (Orifice Controls 8.24 cfs @ 5.49 fps)
  └**5=Orifice/Grate** (Orifice Controls 8.69 cfs @ 4.96 fps)
  └**6=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=827.50' TW=0.00' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B4: Basin 4



Summary for Pond B5: Basin 5

Inflow Area = 32.696 ac, 30.34% Impervious, Inflow Depth = 1.84" for 25 Year event
Inflow = 21.35 cfs @ 9.99 hrs, Volume= 5.016 af
Outflow = 7.52 cfs @ 10.91 hrs, Volume= 5.016 af, Atten= 65%, Lag= 55.5 min
Discarded = 0.39 cfs @ 10.91 hrs, Volume= 1.221 af
Primary = 7.13 cfs @ 10.91 hrs, Volume= 3.796 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 847.51' @ 10.91 hrs Surf.Area= 21,282 sf Storage= 64,298 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 301.0 min (1,083.7 - 782.8)

Volume	Invert	Avail.Storage	Storage Description
#1	844.00'	178,542 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
844.00	15,500	0	0
845.00	17,076	16,288	16,288
846.00	18,708	17,892	34,180
847.00	20,397	19,553	53,733
848.00	22,143	21,270	75,003
849.00	23,945	23,044	98,047
850.00	25,804	24,875	122,921
851.00	27,719	26,762	149,683
852.00	30,000	28,860	178,542

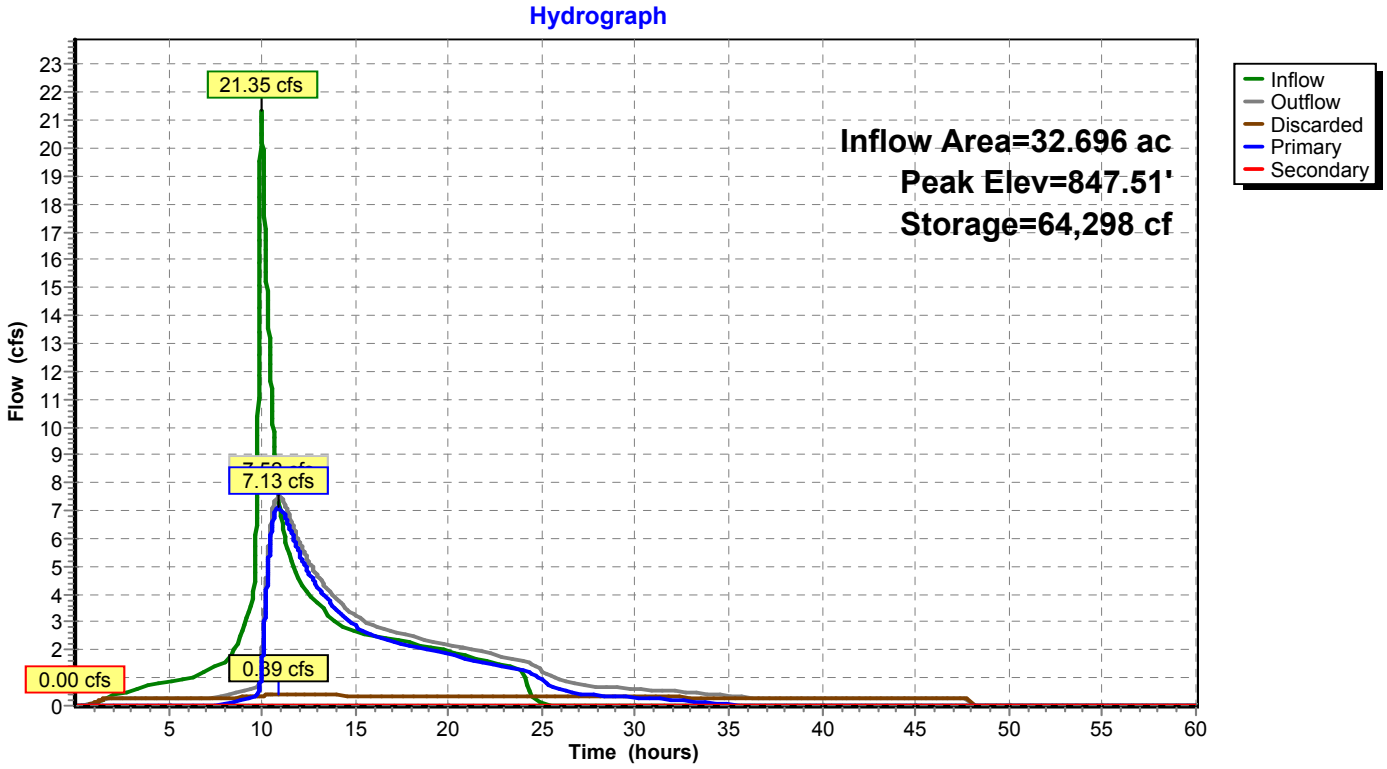
Device	Routing	Invert	Outlet Devices
#1	Primary	844.67'	**30.0" Round Culvert** L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 844.67' / 844.17' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Discarded	844.00'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 800.00'
#3	Device 1	844.67'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	845.67'	**6.0" W x 37.0" H Vert. Orifice/Grate** X 3 rows with 8.0" cc spacing C= 0.600
#5	Device 1	849.75'	**36.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 in 36.0" x 24.0" Grate (100% open area) Limited to weir flow at low heads
#6	Secondary	851.00'	**12.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.39 cfs @ 10.91 hrs HW=847.51' (Free Discharge)
└**2=Exfiltration** (Controls 0.39 cfs)

Primary OutFlow Max=7.13 cfs @ 10.91 hrs HW=847.51' TW=845.86' (Dynamic Tailwater)
└**1=Culvert** (Passes 7.13 cfs of 27.05 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 0.54 cfs @ 6.18 fps)
  ├**4=Orifice/Grate** (Orifice Controls 6.59 cfs @ 3.75 fps)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=844.00' (Free Discharge)
└**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond B5: Basin 5



Summary for Pond B6: Basin 6

Inflow Area = 34.039 ac, 52.56% Impervious, Inflow Depth = 2.72" for 25 Year event
Inflow = 37.81 cfs @ 9.98 hrs, Volume= 7.705 af
Outflow = 23.80 cfs @ 10.32 hrs, Volume= 7.412 af, Atten= 37%, Lag= 20.3 min
Discarded = 0.38 cfs @ 10.32 hrs, Volume= 1.034 af
Primary = 23.43 cfs @ 10.32 hrs, Volume= 6.379 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 851.40' @ 10.32 hrs Surf.Area= 0.450 ac Storage= 2.036 af

Plug-Flow detention time= 262.2 min calculated for 7.411 af (96% of inflow)
Center-of-Mass det. time= 236.8 min (986.9 - 750.1)

Volume	Invert	Avail.Storage	Storage Description
#1	839.50'	3.469 af	**Custom Stage Data (Prismatic)** Listed below (Recalc) 3.792 af Overall - 0.323 af Embedded = 3.469 af
#2	839.50'	0.129 af	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 0.323 af Overall x 40.0% Voids
		3.598 af	Total Available Storage

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
839.50	0.081	0.000	0.000
840.00	0.081	0.040	0.040
841.00	0.081	0.081	0.121
842.00	0.081	0.081	0.202
843.00	0.081	0.081	0.283
844.00	0.081	0.081	0.364
845.00	0.061	0.071	0.435
846.00	0.133	0.097	0.532
847.00	0.260	0.196	0.729
848.00	0.292	0.276	1.005
849.00	0.325	0.309	1.313
850.00	0.360	0.343	1.656
851.00	0.434	0.397	2.053
852.00	0.474	0.454	2.507
854.40	0.597	1.285	3.792

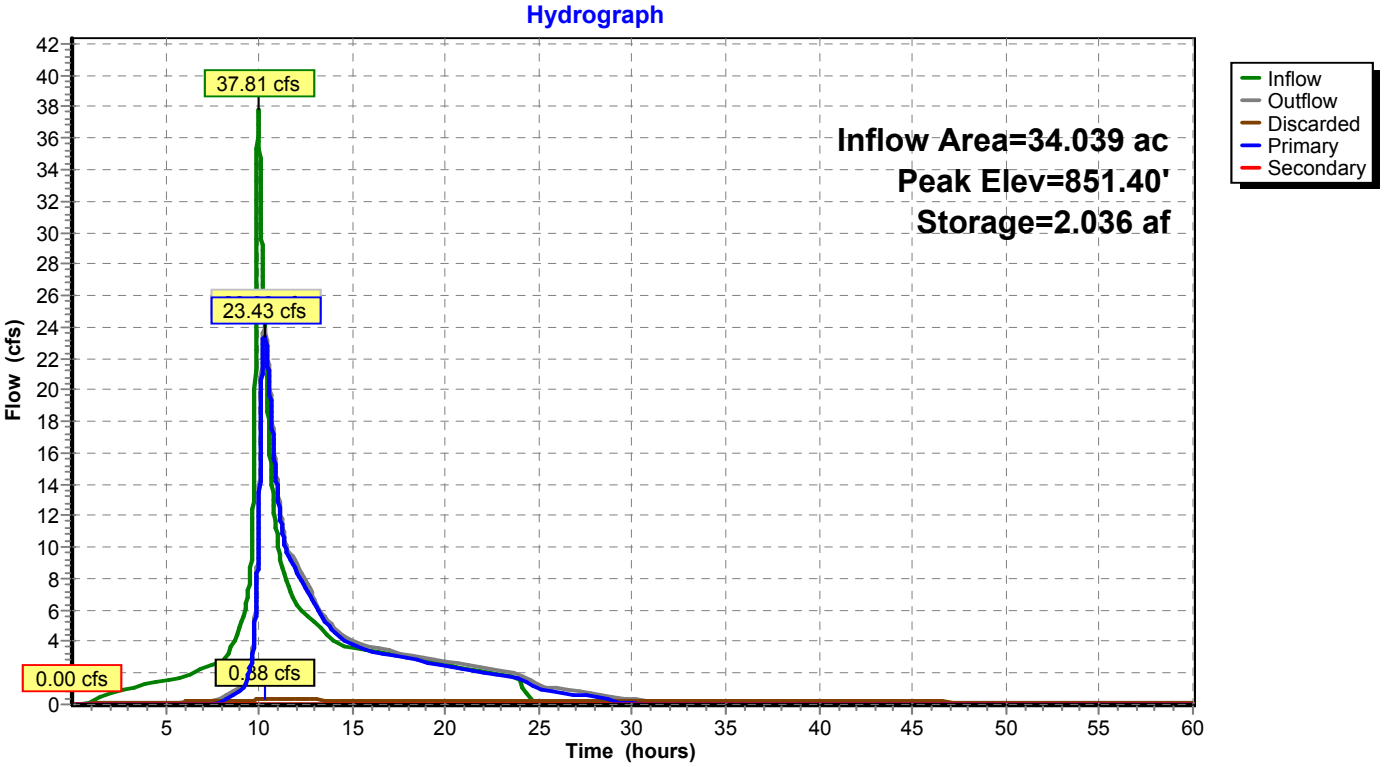
Device	Routing	Invert	Outlet Devices
#1	Primary	843.65'	**24.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 843.65' / 842.90' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Discarded	839.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	847.67'	**9.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	848.75'	**12.0" W x 9.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	849.50'	**18.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	850.67'	**69.6" W x 9.0" H Vert. Orifice/Grate** C= 0.600
#7	Secondary	852.88'	**40.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.38 cfs @ 10.32 hrs HW=851.40' (Free Discharge)
└**2=Exfiltration** (Controls 0.38 cfs)

Primary OutFlow Max=23.43 cfs @ 10.32 hrs HW=851.40' TW=842.50' (Dynamic Tailwater)
└**1=Culvert** (Passes 23.43 cfs of 36.55 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 1.71 cfs @ 9.14 fps)
  └**4=Orifice/Grate** (Orifice Controls 5.44 cfs @ 7.26 fps)
  └**5=Orifice/Grate** (Orifice Controls 4.64 cfs @ 6.18 fps)
  └**6=Orifice/Grate** (Orifice Controls 11.64 cfs @ 2.74 fps)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=839.50' TW=842.50' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B6: Basin 6



Summary for Pond B7: Basin 7

Inflow Area = 108.754 ac, 33.30% Impervious, Inflow Depth = 1.60" for 25 Year event
Inflow = 28.12 cfs @ 10.77 hrs, Volume= 14.500 af
Outflow = 13.10 cfs @ 13.10 hrs, Volume= 14.381 af, Atten= 53%, Lag= 139.9 min
Discarded = 1.20 cfs @ 13.10 hrs, Volume= 4.392 af
Primary = 11.90 cfs @ 13.10 hrs, Volume= 9.989 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 842.46' @ 13.10 hrs Surf.Area= 64,394 sf Storage= 178,348 cf

Plug-Flow detention time= 382.5 min calculated for 14.381 af (99% of inflow)
Center-of-Mass det. time= 369.7 min (1,302.9 - 933.3)

Volume	Invert	Avail.Storage	Storage Description
#1	839.00'	516,122 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
839.00	10,000	0	0
840.00	54,515	32,258	32,258
841.00	58,335	56,425	88,683
842.00	62,211	60,273	148,956
843.00	66,912	64,562	213,517
844.00	71,188	69,050	282,567
845.00	75,535	73,362	355,929
846.00	79,981	77,758	433,687
847.00	84,890	82,436	516,122

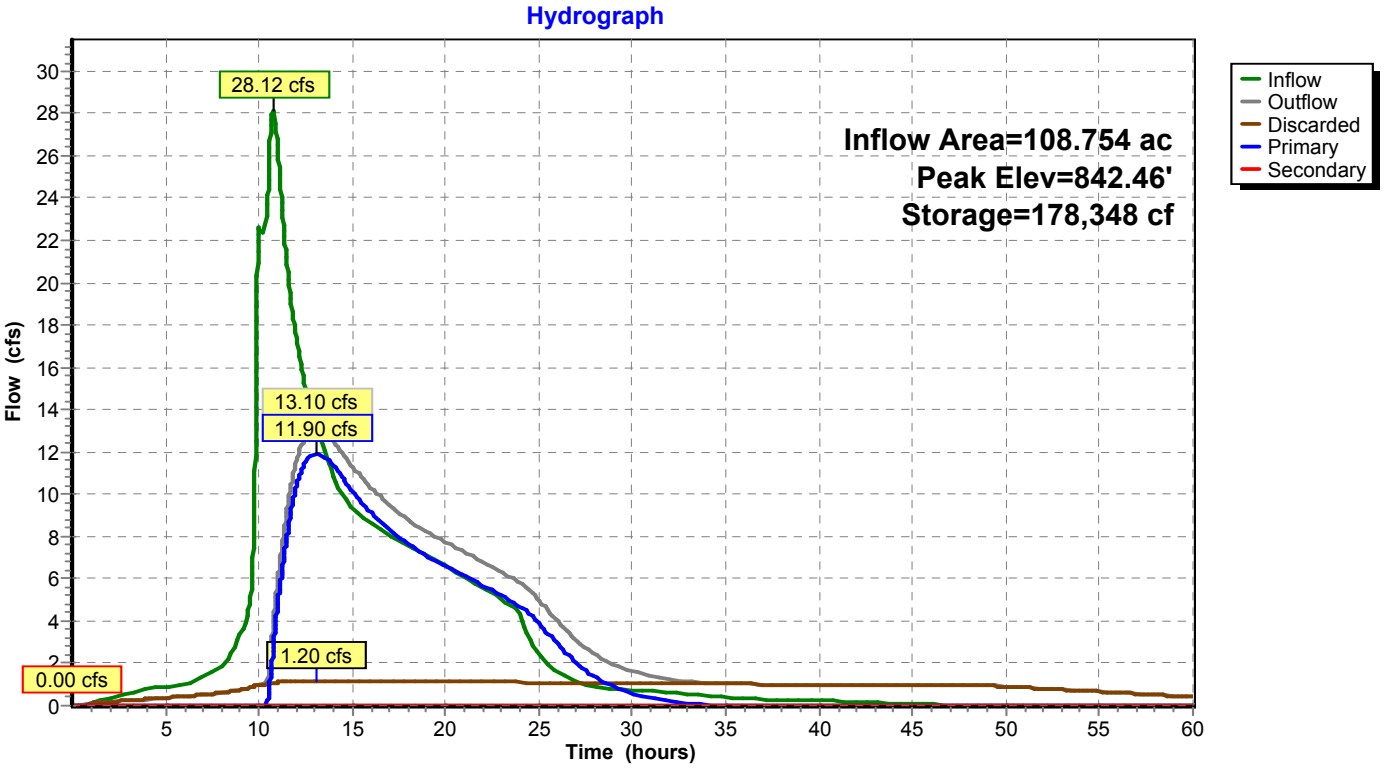
Device	Routing	Invert	Outlet Devices
#1	Primary	836.67'	**36.0" Round Culvert** L= 63.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 836.67' / 836.00' S= 0.0106 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf
#2	Discarded	839.00'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 800.00'
#3	Device 1	840.75'	**26.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	841.25'	**12.0" W x 36.0" H Vert. Orifice/Grate** X 3 rows with 8.0" cc spacing C= 0.600
#5	Device 1	844.50'	**48.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 in 48.0" x 36.0" Grate (100% open area) Limited to weir flow at low heads
#6	Secondary	845.50'	**12.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=1.20 cfs @ 13.10 hrs HW=842.46' (Free Discharge)
└**2=Exfiltration** (Controls 1.20 cfs)

Primary OutFlow Max=11.90 cfs @ 13.10 hrs HW=842.46' TW=837.33' (Dynamic Tailwater)
└**1=Culvert** (Passes 11.90 cfs of 70.53 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 6.30 cfs @ 5.82 fps)
  ├**4=Orifice/Grate** (Orifice Controls 5.60 cfs @ 3.18 fps)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=839.00' (Free Discharge)
└**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond B7: Basin 7



Summary for Pond B8: Basin 8

Inflow Area = 44.689 ac, 35.47% Impervious, Inflow Depth = 2.02" for 25 Year event
Inflow = 28.75 cfs @ 9.99 hrs, Volume= 7.533 af
Outflow = 13.01 cfs @ 10.87 hrs, Volume= 7.533 af, Atten= 55%, Lag= 52.6 min
Discarded = 0.53 cfs @ 10.87 hrs, Volume= 1.876 af
Primary = 12.49 cfs @ 10.87 hrs, Volume= 5.657 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 857.57' @ 10.87 hrs Surf.Area= 28,347 sf Storage= 104,516 cf

Plug-Flow detention time= 429.7 min calculated for 7.531 af (100% of inflow)
Center-of-Mass det. time= 430.0 min (1,208.6 - 778.6)

Volume	Invert	Avail.Storage	Storage Description
#1	853.00'	147,517 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
853.00	17,554	0	0
854.00	19,812	18,683	18,683
855.00	22,126	20,969	39,652
856.00	24,497	23,312	62,964
857.00	26,924	25,711	88,674
858.00	29,407	28,166	116,840
859.00	31,948	30,678	147,517

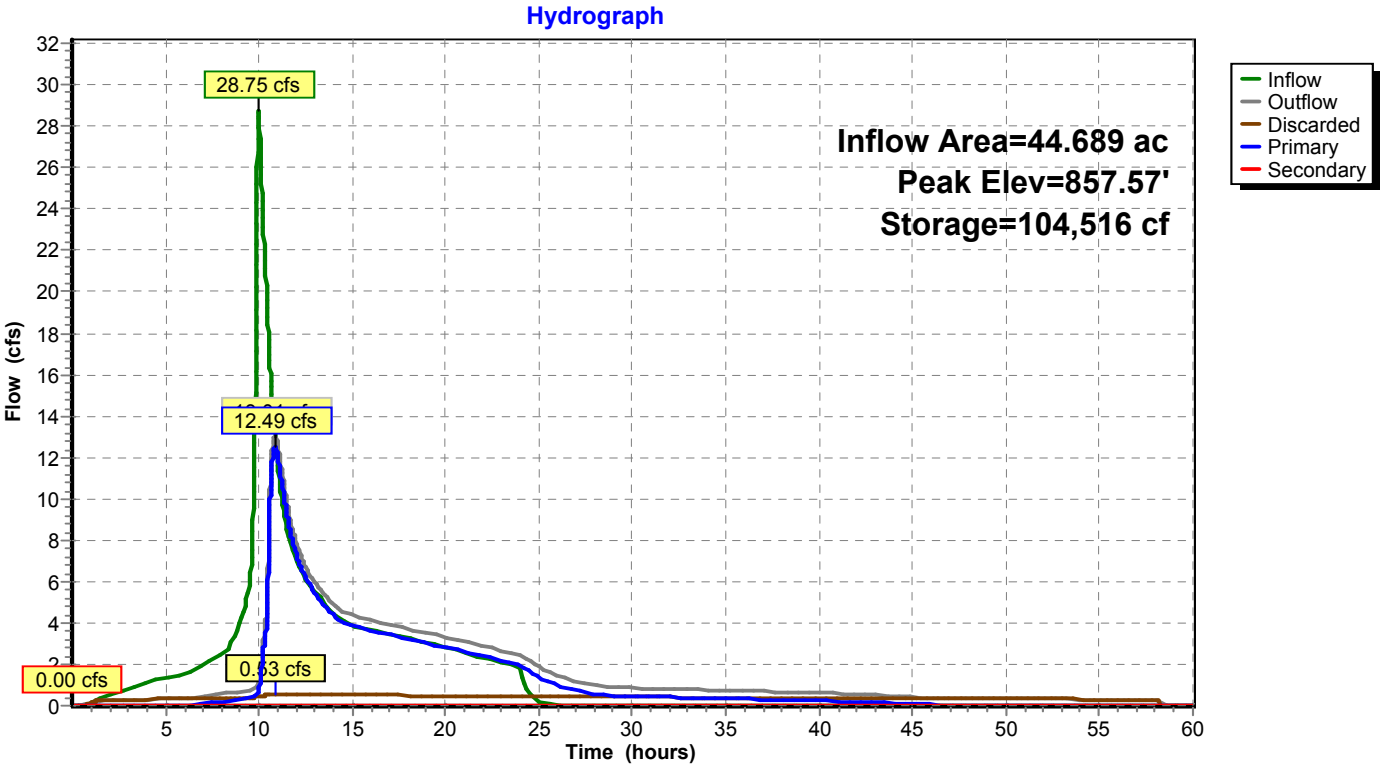
Device	Routing	Invert	Outlet Devices
#1	Primary	853.00'	**30.0" Round Culvert** L= 1,200.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 853.00' / 844.17' S= 0.0074 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Discarded	853.00'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 800.00'
#3	Device 1	853.58'	**2.0" W x 5.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	855.67'	**5.0" W x 12.0" H Vert. Orifice/Grate** X 4 rows with 8.0" cc spacing C= 0.600
#5	Device 1	857.25'	**36.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 in 36.0" x 36.0" Grate (100% open area) Limited to weir flow at low heads
#6	Secondary	858.75'	**16.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.53 cfs @ 10.87 hrs HW=857.57' (Free Discharge)
└**2=Exfiltration** (Controls 0.53 cfs)

Primary OutFlow Max=12.49 cfs @ 10.87 hrs HW=857.57' TW=845.85' (Dynamic Tailwater)
└**1=Culvert** (Passes 12.49 cfs of 39.28 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 0.65 cfs @ 9.37 fps)
  ├**4=Orifice/Grate** (Orifice Controls 4.62 cfs @ 4.32 fps)
  └**5=Orifice/Grate** (Weir Controls 7.21 cfs @ 1.86 fps)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=853.00' (Free Discharge)
└**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond B8: Basin 8



Summary for Pond B9: Basin 9

Inflow Area = 11.446 ac, 17.36% Impervious, Inflow Depth = 1.49" for 25 Year event
Inflow = 5.46 cfs @ 9.99 hrs, Volume= 1.422 af
Outflow = 3.56 cfs @ 10.42 hrs, Volume= 1.421 af, Atten= 35%, Lag= 25.8 min
Primary = 3.56 cfs @ 10.42 hrs, Volume= 1.421 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 849.00' @ 10.42 hrs Surf.Area= 7,411 sf Storage= 6,676 cf

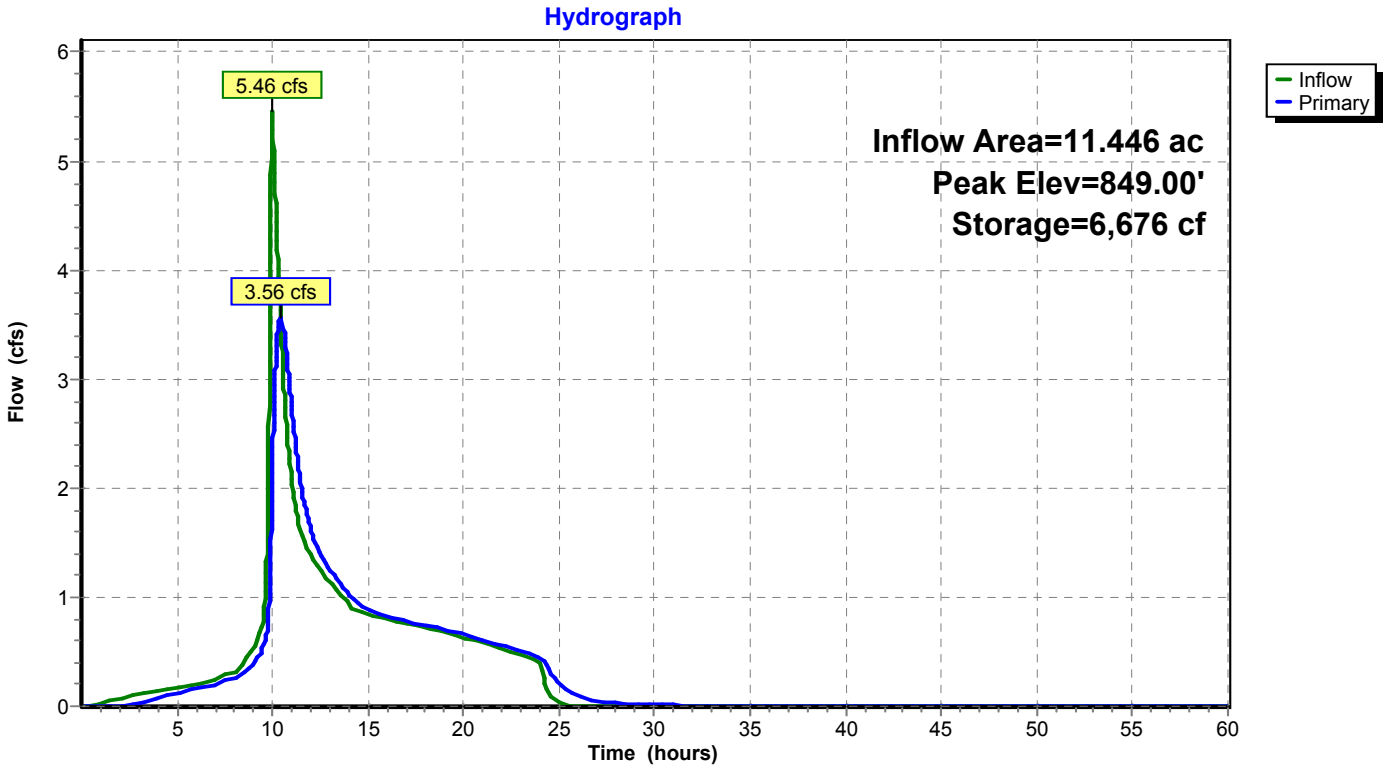
Plug-Flow detention time= 55.5 min calculated for 1.421 af (100% of inflow)
Center-of-Mass det. time= 55.1 min (874.2 - 819.1)

Volume	Invert	Avail.Storage	Storage Description
#1	848.00'	48,750 cf	**30.00'W x 200.00'L x 5.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	848.00'	**18.0" Round Culvert** L= 110.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 848.00' / 847.00' S= 0.0091 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Device 1	848.00'	**15.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=3.56 cfs @ 10.42 hrs HW=849.00' TW=0.00' (Dynamic Tailwater)
↑└─**1=Culvert** (Passes 3.56 cfs of 4.24 cfs potential flow)
↑└─**2=Orifice/Grate** (Orifice Controls 3.56 cfs @ 3.40 fps)

Pond B9: Basin 9



Summary for Pond Ex SD: Tract #1632 Ex. 36" SD Outlet

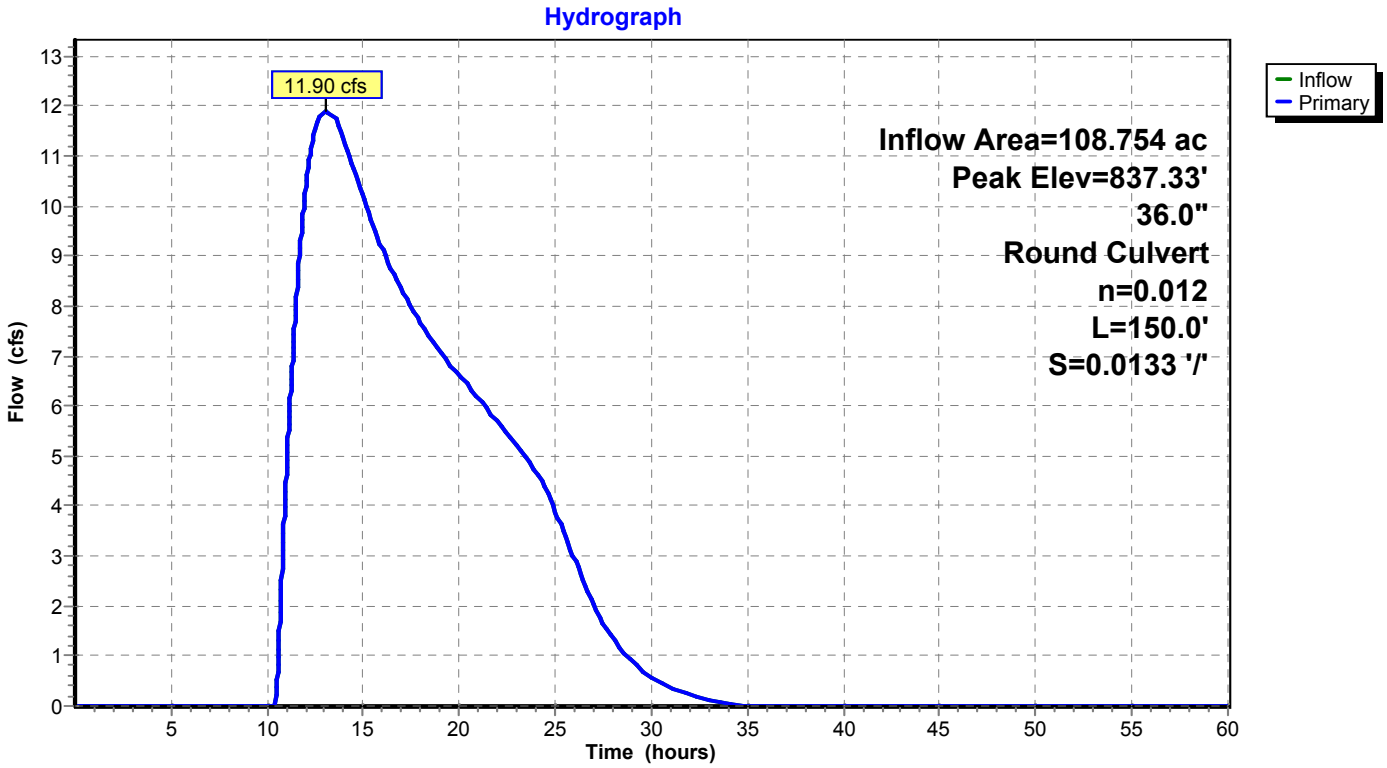
Inflow Area = 108.754 ac, 33.30% Impervious, Inflow Depth = 1.10" for 25 Year event
Inflow = 11.90 cfs @ 13.10 hrs, Volume= 9.989 af
Outflow = 11.90 cfs @ 13.10 hrs, Volume= 9.989 af, Atten= 0%, Lag= 0.0 min
Primary = 11.90 cfs @ 13.10 hrs, Volume= 9.989 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 837.33' @ 13.10 hrs
Flood Elev= 843.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	836.00'	**36.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 836.00' / 834.00' S= 0.0133 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf

Primary OutFlow Max=11.90 cfs @ 13.10 hrs HW=837.33' TW=835.00' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 11.90 cfs @ 3.93 fps)

Pond Ex SD: Tract #1632 Ex. 36" SD Outlet



Summary for Pond MC Q: SD System

[58] Hint: Peaked 0.46' above defined flood level

Inflow Area = 21.500 ac, 80.00% Impervious, Inflow Depth = 3.43" for 25 Year event
Inflow = 33.79 cfs @ 9.97 hrs, Volume= 6.138 af
Outflow = 33.60 cfs @ 9.99 hrs, Volume= 5.857 af, Atten= 1%, Lag= 0.8 min
Discarded = 0.12 cfs @ 9.99 hrs, Volume= 0.372 af
Primary = 16.26 cfs @ 9.99 hrs, Volume= 2.664 af
Secondary = 17.22 cfs @ 9.99 hrs, Volume= 2.821 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 845.96' @ 9.99 hrs Surf.Area= 0.130 ac Storage= 0.526 af
Flood Elev= 845.50' Surf.Area= 0.097 ac Storage= 0.474 af

Plug-Flow detention time= 129.5 min calculated for 5.857 af (95% of inflow)
Center-of-Mass det. time= 98.1 min (819.5 - 721.4)

Volume	Invert	Avail.Storage	Storage Description
#1	839.50'	0.607 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
839.50	0.081	0.000	0.000
840.00	0.081	0.040	0.040
841.00	0.081	0.081	0.121
842.00	0.081	0.081	0.202
843.00	0.081	0.081	0.283
844.00	0.081	0.081	0.364
845.00	0.061	0.071	0.434
846.00	0.133	0.097	0.531
846.50	0.172	0.076	0.607

Device	Routing	Invert	Outlet Devices
#1	Primary	841.50'	**36.0" Round Culvert** L= 585.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 841.50' / 838.50' S= 0.0051 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf
#2	Device 1	845.50'	**48.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Discarded	839.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 750.00'
#4	Secondary	845.50'	**20.0' long (Profile 4) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.77 2.97 3.21

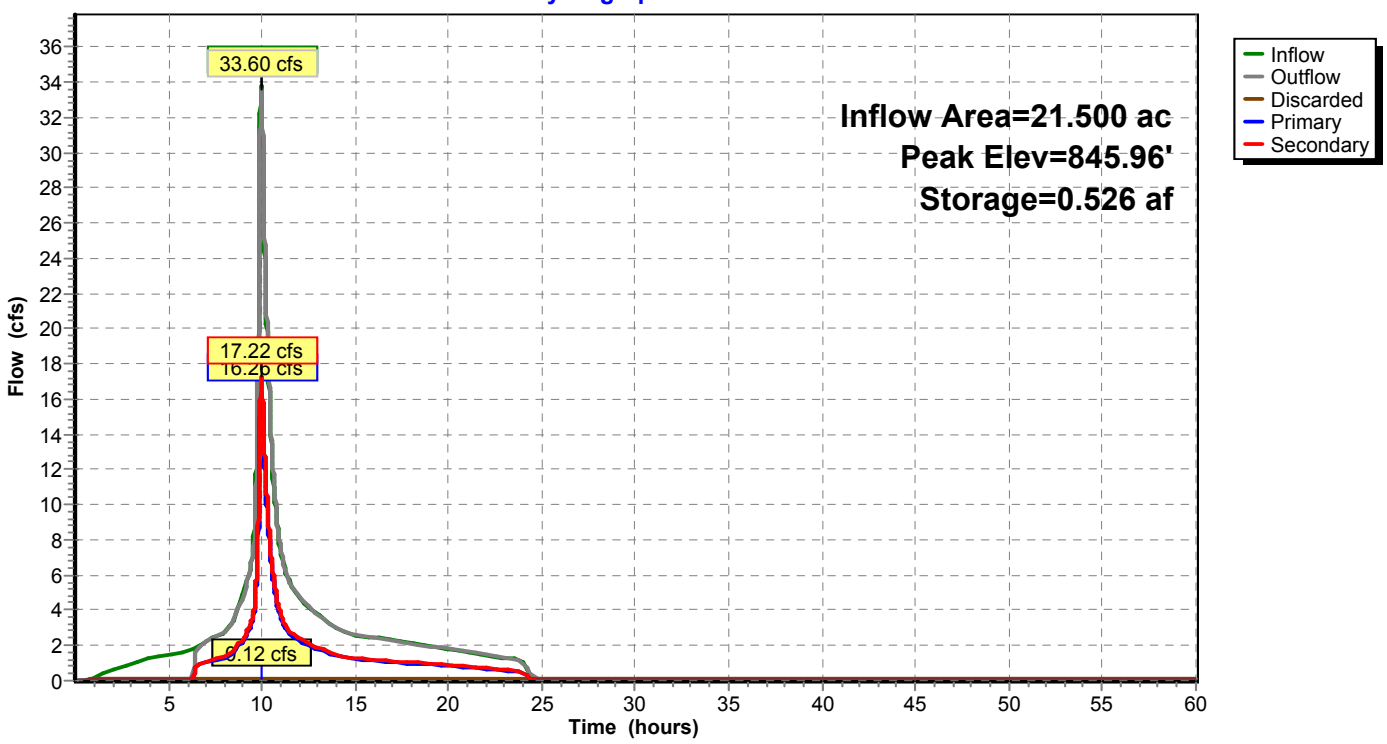
Discarded OutFlow Max=0.12 cfs @ 9.99 hrs HW=845.96' (Free Discharge)
└**3=Exfiltration** (Controls 0.12 cfs)

Primary OutFlow Max=16.25 cfs @ 9.99 hrs HW=845.96' TW=840.22' (Dynamic Tailwater)
└**1=Culvert** (Passes 16.25 cfs of 52.94 cfs potential flow)
└**2=Orifice/Grate** (Weir Controls 16.25 cfs @ 2.21 fps)

Secondary OutFlow Max=17.21 cfs @ 9.99 hrs HW=845.96' TW=835.44' (Dynamic Tailwater)
└**4=Broad-Crested Rectangular Weir** (Weir Controls 17.21 cfs @ 1.88 fps)

Pond MC Q: SD System

Hydrograph



Summary for Pond SD: 42" HDPE SD

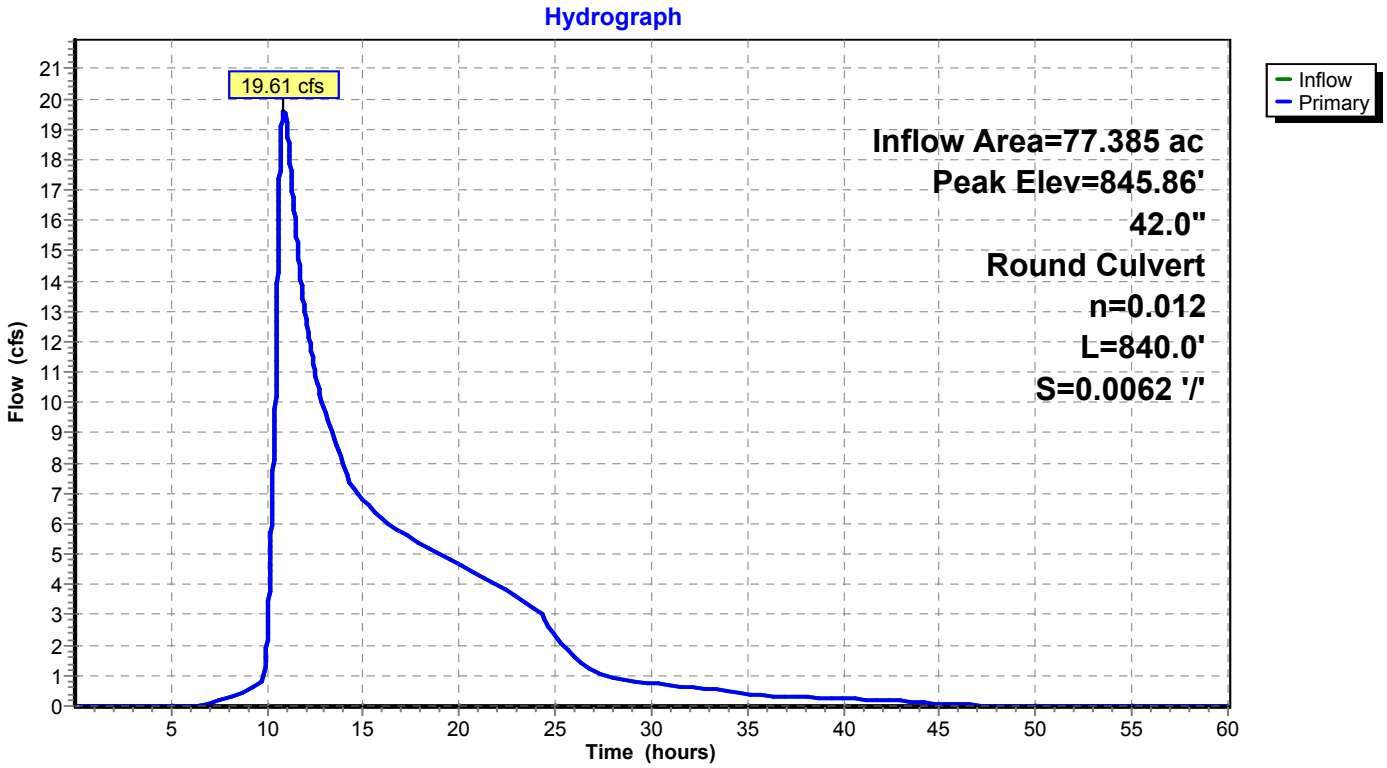
Inflow Area = 77.385 ac, 33.30% Impervious, Inflow Depth = 1.47" for 25 Year event
Inflow = 19.61 cfs @ 10.87 hrs, Volume= 9.453 af
Outflow = 19.61 cfs @ 10.87 hrs, Volume= 9.453 af, Atten= 0%, Lag= 0.0 min
Primary = 19.61 cfs @ 10.87 hrs, Volume= 9.453 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 845.86' @ 10.93 hrs
Flood Elev= 853.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	844.17'	**42.0" Round Culvert** L= 840.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 844.17' / 839.00' S= 0.0062 '/' Cc= 0.900 n= 0.012, Flow Area= 9.62 sf

Primary OutFlow Max=19.57 cfs @ 10.87 hrs HW=845.85' TW=841.43' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 19.57 cfs @ 6.26 fps)

Pond SD: 42" HDPE SD



Time span=0.01-60.00 hrs, dt=0.01 hrs, 6000 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Pond 1P: SD Inlet with Bypass SD Peak Elev=825.62' Inflow=73.26 cfs 14.523 af
Primary=73.26 cfs 14.523 af Secondary=0.00 cfs 0.000 af Outflow=73.26 cfs 14.523 af

Pond 2P: 60" SD MH Peak Elev=840.33' Inflow=18.03 cfs 2.986 af
Primary=18.03 cfs 2.986 af Secondary=0.00 cfs 0.000 af Outflow=18.03 cfs 2.986 af

Pond 15P: SD System 42" HDPE Peak Elev=844.59' Inflow=51.10 cfs 2.683 af
Outflow=51.10 cfs 2.683 af

Pond 16P: Dbl Conc. Arch Culvert (37x23) Peak Elev=844.57' Inflow=17.74 cfs 5.377 af
36.3" x 22.5", R=18.8"/51.0" Pipe Arch Culvert x 2.00 n=0.011 L=860.0' S=0.0024 '/' Outflow=17.74 cfs 5.377 af

Pond 17P: Gran Cielo Dwy Peak Elev=855.09' Storage=11,735 cf Inflow=188.40 cfs 35.620 af
Primary=111.11 cfs 33.164 af Secondary=0.18 cfs 0.002 af Tertiary=76.79 cfs 2.454 af Outflow=188.08 cfs 35.620 af

Pond 18P: GC-CkD1 Peak Elev=849.76' Storage=16,732 cf Inflow=200.71 cfs 49.854 af
Primary=0.59 cfs 0.031 af Secondary=35.96 cfs 1.101 af Tertiary=156.05 cfs 48.688 af Outflow=192.48 cfs 49.820 af

Pond 19P: GC-CkD2 Peak Elev=849.25' Storage=23,653 cf Inflow=58.68 cfs 4.902 af
Primary=1.27 cfs 1.460 af Secondary=41.32 cfs 3.201 af Tertiary=10.96 cfs 0.240 af Outflow=53.55 cfs 4.901 af

Pond 20P: GC-CkD3 Peak Elev=845.88' Storage=14,445 cf Inflow=55.32 cfs 7.106 af
Primary=6.01 cfs 3.774 af Secondary=8.13 cfs 0.878 af Tertiary=40.20 cfs 2.444 af Outflow=54.35 cfs 7.095 af

Pond B1: Basin 1 Peak Elev=837.56' Storage=5.949 af Inflow=115.89 cfs 15.158 af
Discarded=1.12 cfs 3.177 af Primary=35.49 cfs 11.591 af Secondary=0.00 cfs 0.000 af Outflow=36.61 cfs 14.768 af

Pond B10: Basin 10 Peak Elev=818.15' Storage=146,516 cf Inflow=36.90 cfs 8.017 af
Discarded=0.85 cfs 2.841 af Primary=9.72 cfs 4.707 af Secondary=0.00 cfs 0.000 af Outflow=10.57 cfs 7.548 af

Pond B11: Basin 11 Peak Elev=833.87' Storage=55,671 cf Inflow=22.92 cfs 3.580 af
Discarded=0.27 cfs 0.793 af Primary=7.55 cfs 2.524 af Secondary=0.00 cfs 0.000 af Outflow=7.82 cfs 3.317 af

Pond B12: Basin 12 Peak Elev=838.38' Storage=87,046 cf Inflow=30.70 cfs 4.642 af
Discarded=0.51 cfs 1.546 af Primary=3.48 cfs 2.819 af Secondary=0.00 cfs 0.000 af Outflow=3.99 cfs 4.365 af

Pond B13: Basin 13 Peak Elev=844.03' Storage=3.076 af Inflow=102.50 cfs 14.744 af
Discarded=0.47 cfs 1.375 af Primary=84.13 cfs 12.945 af Secondary=0.00 cfs 0.000 af Outflow=84.60 cfs 14.320 af

Pond B4: Basin 4 Peak Elev=839.85' Storage=136,770 cf Inflow=57.43 cfs 9.900 af
Discarded=0.59 cfs 1.698 af Primary=23.63 cfs 7.938 af Secondary=0.00 cfs 0.000 af Outflow=24.21 cfs 9.636 af

Pond B5: Basin 5 Peak Elev=847.79' Storage=70,408 cf Inflow=25.03 cfs 5.762 af
Discarded=0.41 cfs 1.238 af Primary=9.31 cfs 4.524 af Secondary=0.00 cfs 0.000 af Outflow=9.72 cfs 5.762 af

Pond B6: Basin 6 Peak Elev=851.60' Storage=2.127 af Inflow=42.75 cfs 8.660 af
Discarded=0.38 cfs 1.047 af Primary=27.62 cfs 7.319 af Secondary=0.00 cfs 0.000 af Outflow=28.00 cfs 8.366 af

Pond B7: Basin 7 Peak Elev=842.80' Storage=200,494 cf Inflow=38.88 cfs 16.997 af
Discarded=1.23 cfs 4.463 af Primary=16.23 cfs 12.404 af Secondary=0.00 cfs 0.000 af Outflow=17.47 cfs 16.867 af

Pond B8: Basin 8 Peak Elev=857.70' Storage=108,148 cf Inflow=33.51 cfs 8.595 af
Discarded=0.53 cfs 1.899 af Primary=17.63 cfs 6.696 af Secondary=0.00 cfs 0.000 af Outflow=18.16 cfs 8.596 af

Pond B9: Basin 9 Peak Elev=849.15' Storage=7,800 cf Inflow=6.65 cfs 1.667 af
Outflow=4.29 cfs 1.665 af

Pond Ex SD: Tract #1632 **Ex. 36" SD Outlet** Peak Elev=837.58' Inflow=16.23 cfs 12.404 af
36.0" Round Culvert n=0.012 L=150.0' S=0.0133 '/' Outflow=16.23 cfs 12.404 af

Pond MC Q: SD System Peak Elev=845.99' Storage=0.530 af Inflow=37.43 cfs 6.803 af
Discarded=0.12 cfs 0.374 af Primary=18.03 cfs 2.986 af Secondary=19.09 cfs 3.162 af Outflow=37.24 cfs 6.522 af

Pond SD: 42" HDPE SD Peak Elev=846.18' Inflow=26.80 cfs 11.220 af
42.0" Round Culvert n=0.012 L=840.0' S=0.0062 '/' Outflow=26.80 cfs 11.220 af

Summary for Pond 1P: SD Inlet with Bypass SD

Inflow Area = 108.566 ac, 6.93% Impervious, Inflow Depth = 1.61" for 50 Year event
Inflow = 73.26 cfs @ 9.98 hrs, Volume= 14.523 af
Outflow = 73.26 cfs @ 9.98 hrs, Volume= 14.523 af, Atten= 0%, Lag= 0.0 min
Primary = 73.26 cfs @ 9.98 hrs, Volume= 14.523 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

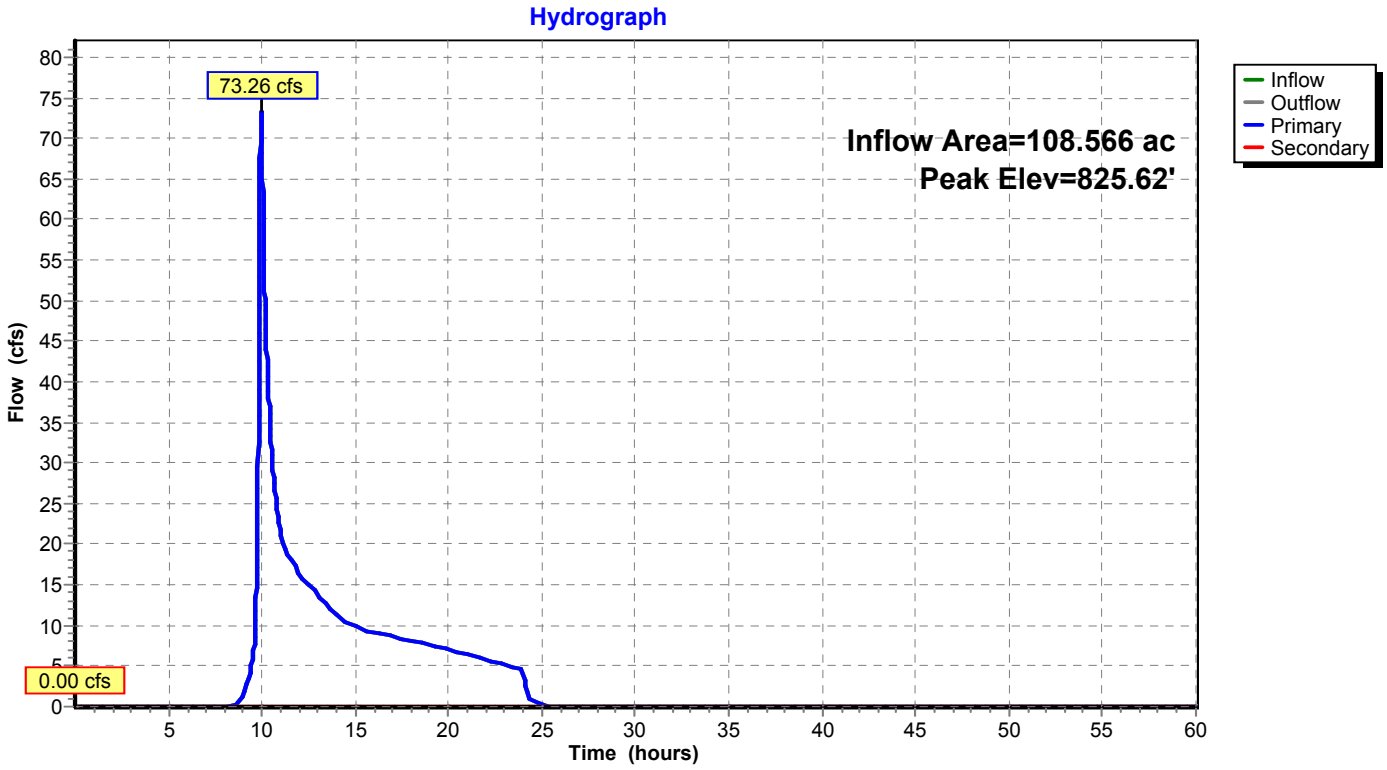
Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 825.62' @ 9.98 hrs
Flood Elev= 826.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	820.00'	**48.0" Round Culvert** L= 990.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 820.00' / 814.11' S= 0.0059 '/' Cc= 0.900 n= 0.012, Flow Area= 12.57 sf
#2	Device 1	824.50'	**78.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	825.90'	**Special & User-Defined** Head (feet) 0.00 0.50 0.67 0.83 Disch. (cfs) 0.000 200.000 450.000 1,200.000

Primary OutFlow Max=73.19 cfs @ 9.98 hrs HW=825.62' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 73.19 cfs of 115.05 cfs potential flow)
└─**2=Orifice/Grate** (Weir Controls 73.19 cfs @ 3.45 fps)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=820.00' TW=0.00' (Dynamic Tailwater)
└─**3=Special & User-Defined** (Controls 0.00 cfs)

Pond 1P: SD Inlet with Bypass SD



Summary for Pond 2P: 60" SD MH

Inflow Area = 21.500 ac, 80.00% Impervious, Inflow Depth = 1.67" for 50 Year event
Inflow = 18.03 cfs @ 9.99 hrs, Volume= 2.986 af
Outflow = 18.03 cfs @ 9.99 hrs, Volume= 2.986 af, Atten= 0%, Lag= 0.0 min
Primary = 18.03 cfs @ 9.99 hrs, Volume= 2.986 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

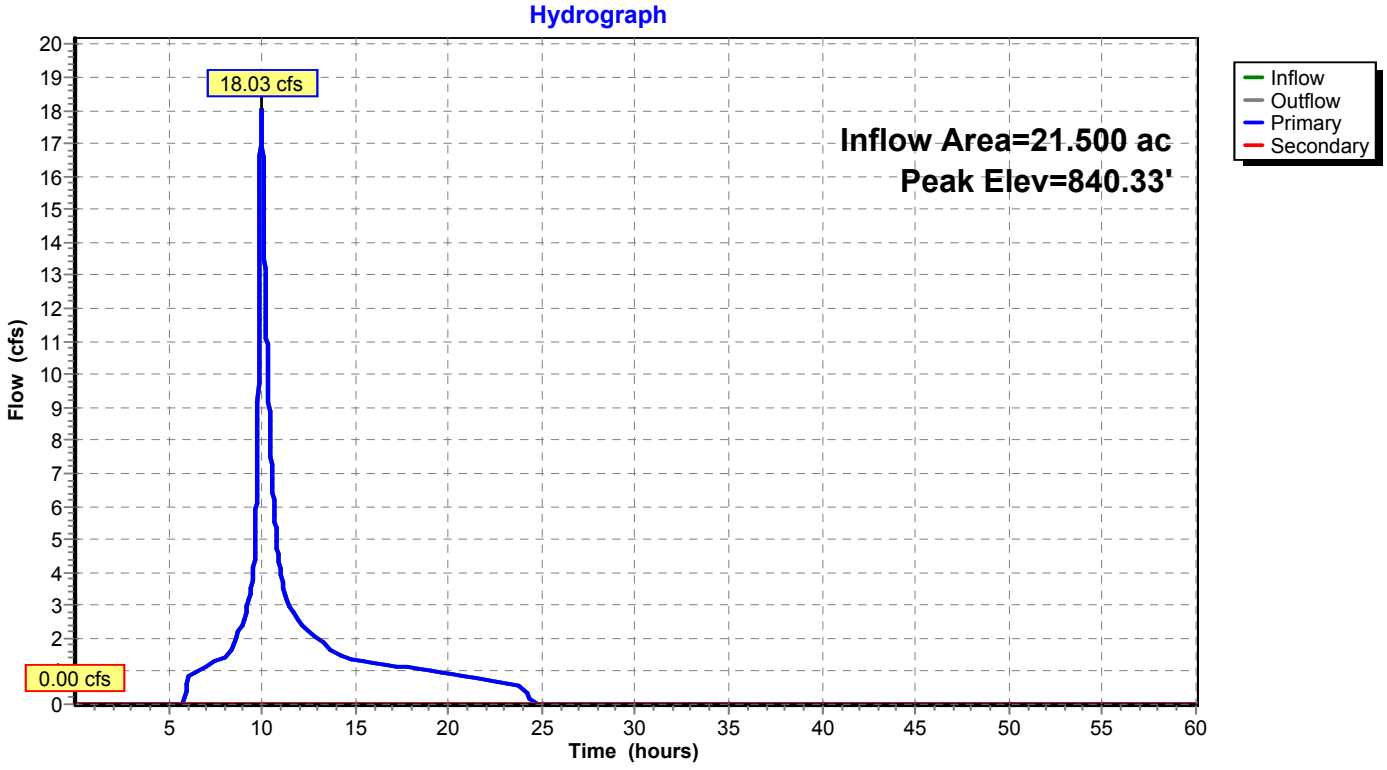
Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 840.33' @ 9.99 hrs
Flood Elev= 845.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	838.50'	**36.0" Round Culvert** L= 500.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 838.50' / 836.50' S= 0.0040 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 7.07 sf
#2	Secondary	844.25'	**69.6" W x 9.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=18.02 cfs @ 9.99 hrs HW=840.33' TW=835.80' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 18.02 cfs @ 5.72 fps)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=838.50' TW=826.50' (Dynamic Tailwater)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 2P: 60" SD MH



Summary for Pond 15P: SD System 42" HDPE

2 - 6 foot long curb openings (one on both sides of Linne Rd)
with 25 foot x 12 inch wide channel drain in Conc C&G

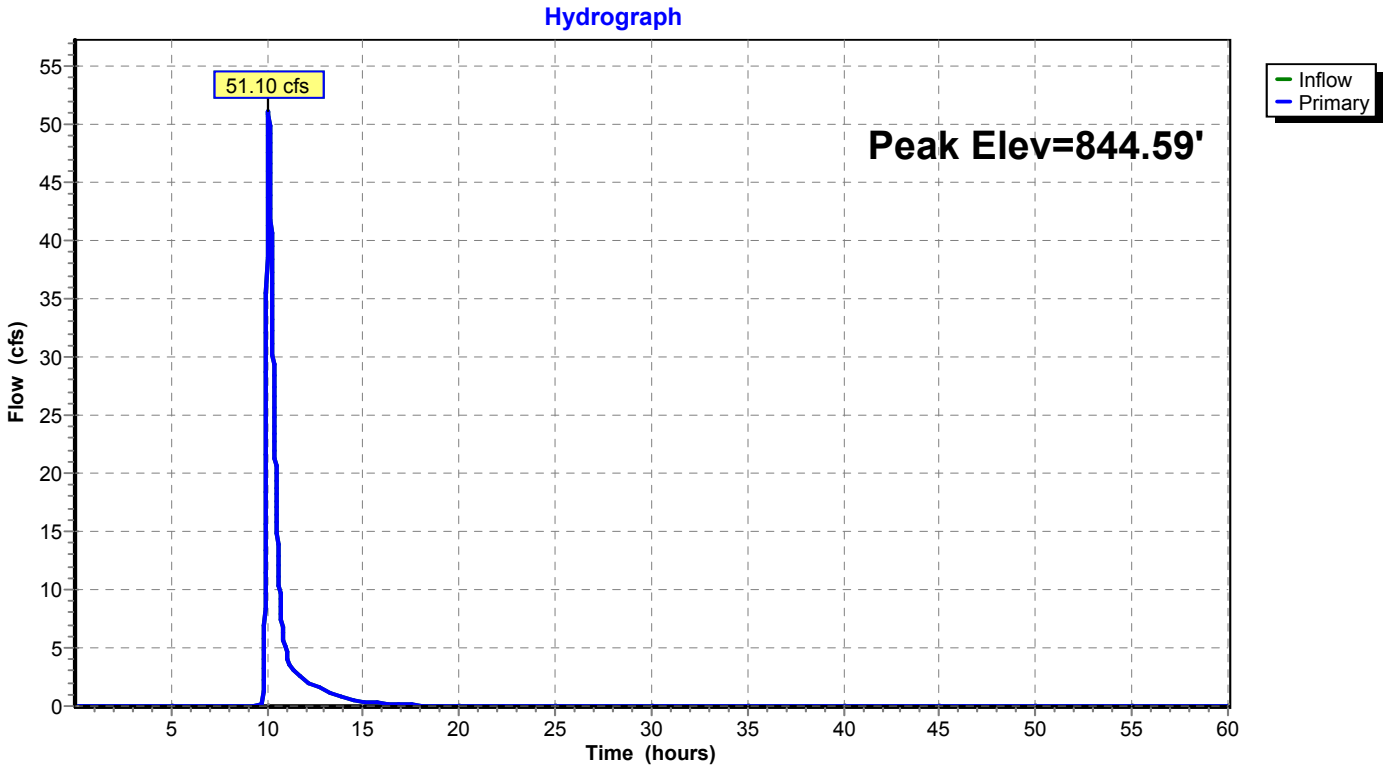
Inflow	=	51.10 cfs @	10.08 hrs, Volume=	2.683 af
Outflow	=	51.10 cfs @	10.08 hrs, Volume=	2.683 af, Atten= 0%, Lag= 0.0 min
Primary	=	51.10 cfs @	10.08 hrs, Volume=	2.683 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 844.59' @ 10.08 hrs
Flood Elev= 845.02'

Device	Routing	Invert	Outlet Devices
#1	Primary	839.75'	**42.0" Round Culvert** L= 1,370.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 839.75' / 833.60' S= 0.0045 '/' Cc= 0.900 n= 0.012, Flow Area= 9.62 sf
#2	Device 1	844.17'	**72.0" W x 9.0" H Vert. Orifice/Grate X 2.00** C= 0.600
#3	Device 1	844.25'	**12.0" x 180.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=51.08 cfs @ 10.08 hrs HW=844.59' TW=836.42' (Dynamic Tailwater)
└**1=Culvert** (Passes 51.08 cfs of 74.69 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 10.33 cfs @ 2.07 fps)
└**3=Orifice/Grate** (Weir Controls 40.75 cfs @ 1.90 fps)

Pond 15P: SD System 42" HDPE



Summary for Pond 16P: Dbl Conc. Arch Culvert (37x23)

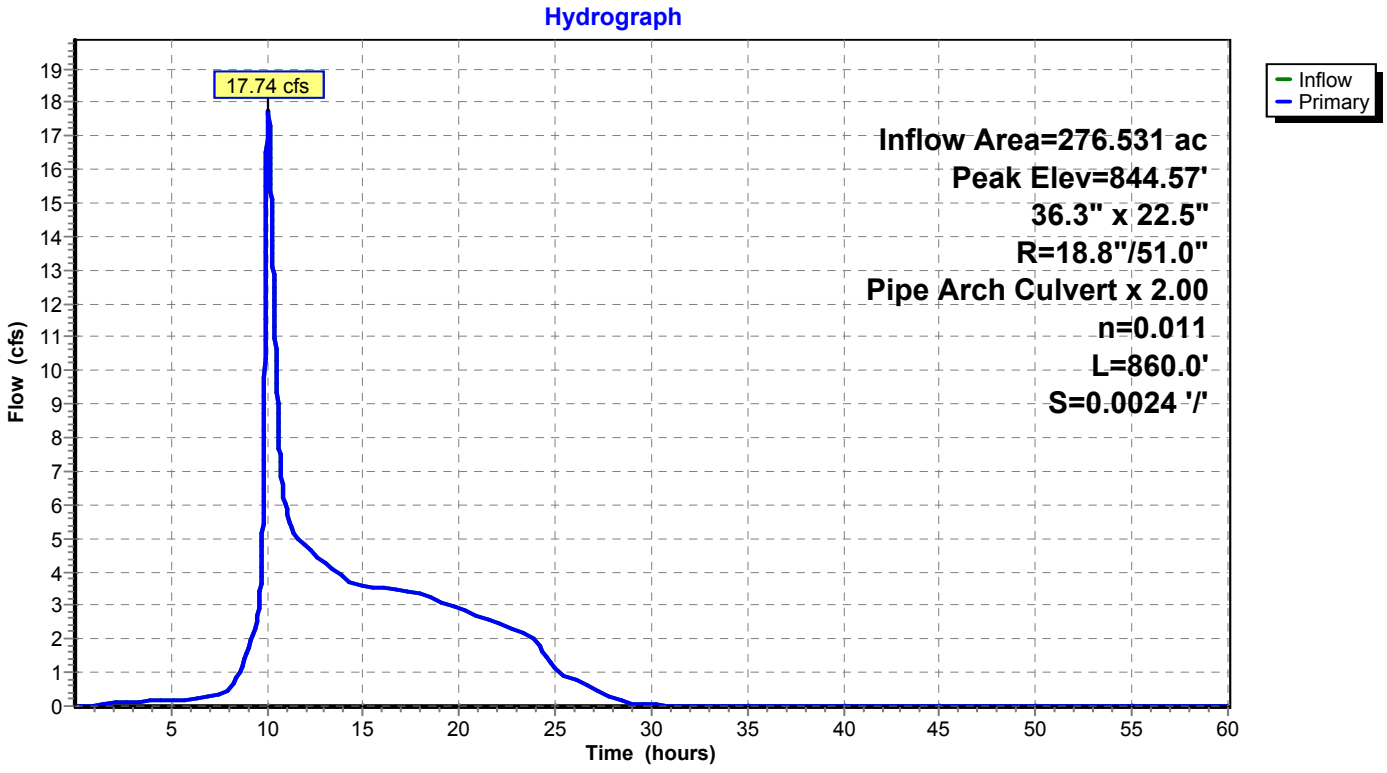
Inflow Area = 276.531 ac, 1.60% Impervious, Inflow Depth = 0.23" for 50 Year event
Inflow = 17.74 cfs @ 10.05 hrs, Volume= 5.377 af
Outflow = 17.74 cfs @ 10.05 hrs, Volume= 5.377 af, Atten= 0%, Lag= 0.0 min
Primary = 17.74 cfs @ 10.05 hrs, Volume= 5.377 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 844.57' @ 10.05 hrs
Flood Elev= 846.02'

Device	Routing	Invert	Outlet Devices
#1	Primary	843.50'	**36.3" W x 22.5" H, R=18.8"/51.0" Pipe Arch RCP_Arch 37x23 X 2.00** L= 860.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 843.50' / 841.40' S= 0.0024 '/' Cc= 0.900 n= 0.011, Flow Area= 4.43 sf

Primary OutFlow Max=17.74 cfs @ 10.05 hrs HW=844.57' TW=0.00' (Dynamic Tailwater)
↳**1=RCP_Arch 37x23** (Barrel Controls 17.74 cfs @ 4.22 fps)

Pond 16P: Dbl Conc. Arch Culvert (37x23)



Summary for Pond 17P: Gran Cielo Dwy

[58] Hint: Peaked 0.63' above defined flood level

Inflow Area = 166.738 ac, 0.91% Impervious, Inflow Depth = 2.56" for 50 Year event
Inflow = 188.40 cfs @ 9.98 hrs, Volume= 35.620 af
Outflow = 188.08 cfs @ 9.99 hrs, Volume= 35.620 af, Atten= 0%, Lag= 0.4 min
Primary = 111.11 cfs @ 9.99 hrs, Volume= 33.164 af
Secondary = 0.18 cfs @ 9.99 hrs, Volume= 0.002 af
Tertiary = 76.79 cfs @ 9.99 hrs, Volume= 2.454 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 855.09' @ 9.99 hrs Surf.Area= 8,273 sf Storage= 11,735 cf
Flood Elev= 854.46' Surf.Area= 6,947 sf Storage= 6,934 cf

Plug-Flow detention time= 1.8 min calculated for 35.614 af (100% of inflow)
Center-of-Mass det. time= 1.8 min (813.8 - 812.0)

Volume	Invert	Avail.Storage	Storage Description
#1	852.84'	22,270 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
852.84	0	0	0
853.14	2,586	388	388
854.14	6,275	4,431	4,818
855.14	8,376	7,326	12,144
856.14	11,876	10,126	22,270

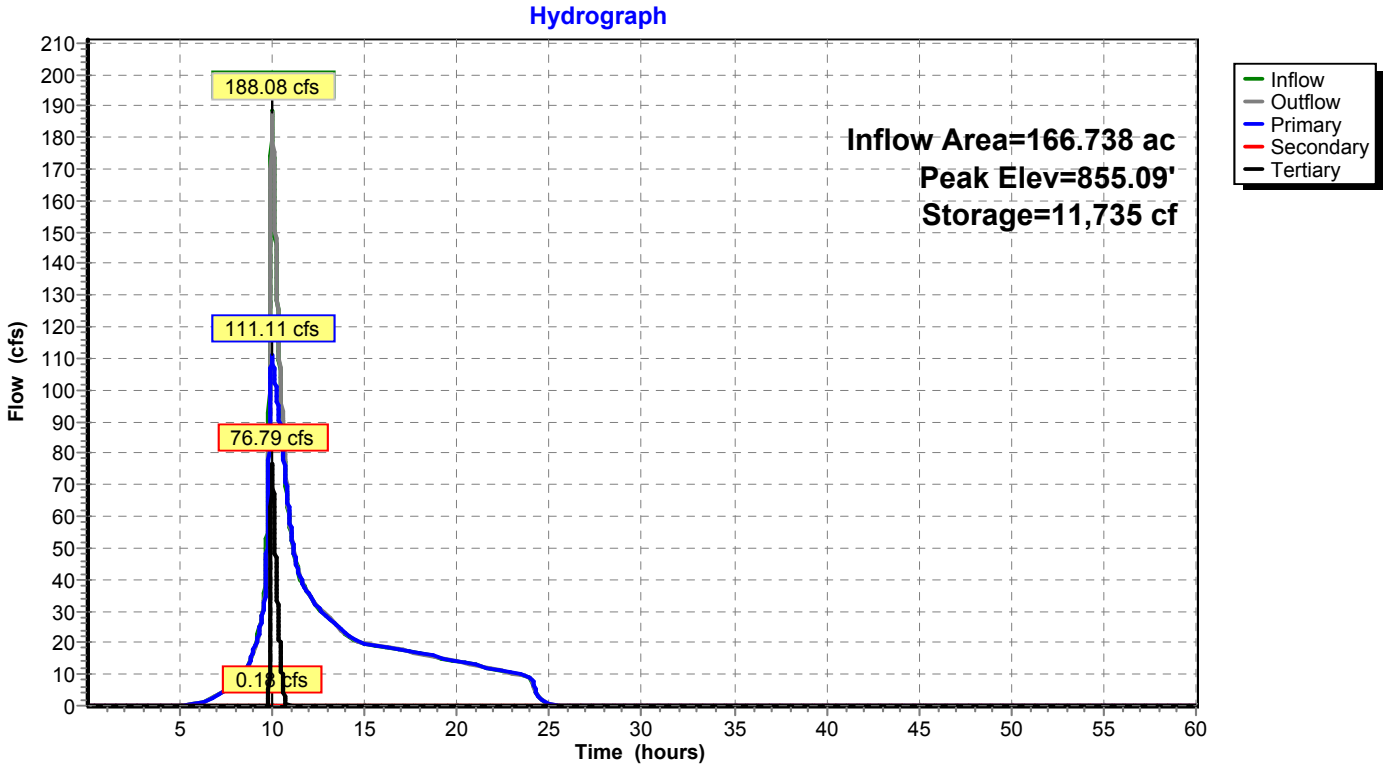
Device	Routing	Invert	Outlet Devices
#1	Primary	852.84'	**30.0" Round Culvert X 6.00** L= 77.0' CMP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 852.84' / 851.76' S= 0.0140 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 4.91 sf
#2	Secondary	854.90'	**Special & User-Defined** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 Disch. (cfs) 0.000 0.010 0.200 0.710 1.580 2.700 4.030 5.690 7.620 9.790 12.320 15.140 18.190 21.460 24.930 28.580 32.420 36.420 40.580 44.900 49.360 53.970
#3	Tertiary	854.40'	**Special & User-Defined** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 2.20 2.30 2.40 2.50 2.60 Disch. (cfs) 0.000 0.080 3.470 10.790 21.890 36.810 55.720 78.890 106.600 138.580 174.620 214.630 258.590 306.440 358.240 413.470 471.810 533.060 597.050 663.650 732.760 804.270 878.100 954.180 1,032.440 1,112.810 1,195.240

Primary OutFlow Max=111.11 cfs @ 9.99 hrs HW=855.09' TW=849.70' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 111.11 cfs @ 5.25 fps)

Secondary OutFlow Max=0.18 cfs @ 9.99 hrs HW=855.09' TW=849.70' (Dynamic Tailwater)
└**2=Special & User-Defined** (Custom Controls 0.18 cfs)

Tertiary OutFlow Max=76.79 cfs @ 9.99 hrs HW=855.09' TW=854.21' (Dynamic Tailwater)
└**3=Special & User-Defined** (Custom Controls 76.79 cfs)

Pond 17P: Gran Cielo Dwy



Summary for Pond 18P: GC-CkD1

Inflow Area = 240.622 ac, 1.05% Impervious, Inflow Depth = 2.49" for 50 Year event
Inflow = 200.71 cfs @ 9.98 hrs, Volume= 49.854 af
Outflow = 192.48 cfs @ 10.03 hrs, Volume= 49.820 af, Atten= 4%, Lag= 2.7 min
Primary = 0.59 cfs @ 9.91 hrs, Volume= 0.031 af
Secondary = 35.96 cfs @ 10.02 hrs, Volume= 1.101 af
Tertiary = 156.05 cfs @ 10.04 hrs, Volume= 48.688 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 849.76' @ 10.04 hrs Surf.Area= 14,552 sf Storage= 16,732 cf
Flood Elev= 850.17' Surf.Area= 18,446 sf Storage= 23,434 cf

Plug-Flow detention time= 1.6 min calculated for 49.820 af (100% of inflow)
Center-of-Mass det. time= 1.1 min (822.2 - 821.1)

Volume	Invert	Avail.Storage	Storage Description
#1	844.56'	70,294 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
844.56	10	0	0
845.00	200	46	46
846.00	600	400	446
847.00	1,500	1,050	1,496
848.00	2,166	1,833	3,329
849.00	7,688	4,927	8,256
850.00	16,694	12,191	20,447
851.00	27,000	21,847	42,294
852.00	29,000	28,000	70,294

Device	Routing	Invert	Outlet Devices
#1	Primary	847.69'	**6.0" Round Culvert** L= 26.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 847.69' / 847.67' S= 0.0008 '/' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Secondary	848.50'	**9.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59
#3	Tertiary	843.15'	**58.5" W x 36.0" H, R=30.0"/84.0" Pipe Arch RCP_Arch 59x36 X 2.00** L= 960.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 843.15' / 840.75' S= 0.0025 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 11.40 sf
#4	Device 3	847.00'	**78.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Tertiary	850.00'	**Special & User-Defined (CkD1-S)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 Disch. (cfs) 0.000 0.030 0.560 1.900 4.120 7.220 11.180 15.770 20.900 26.530 32.600 39.090 45.970 53.220 60.820 68.750 77.000 85.570 94.430 103.580 113.010

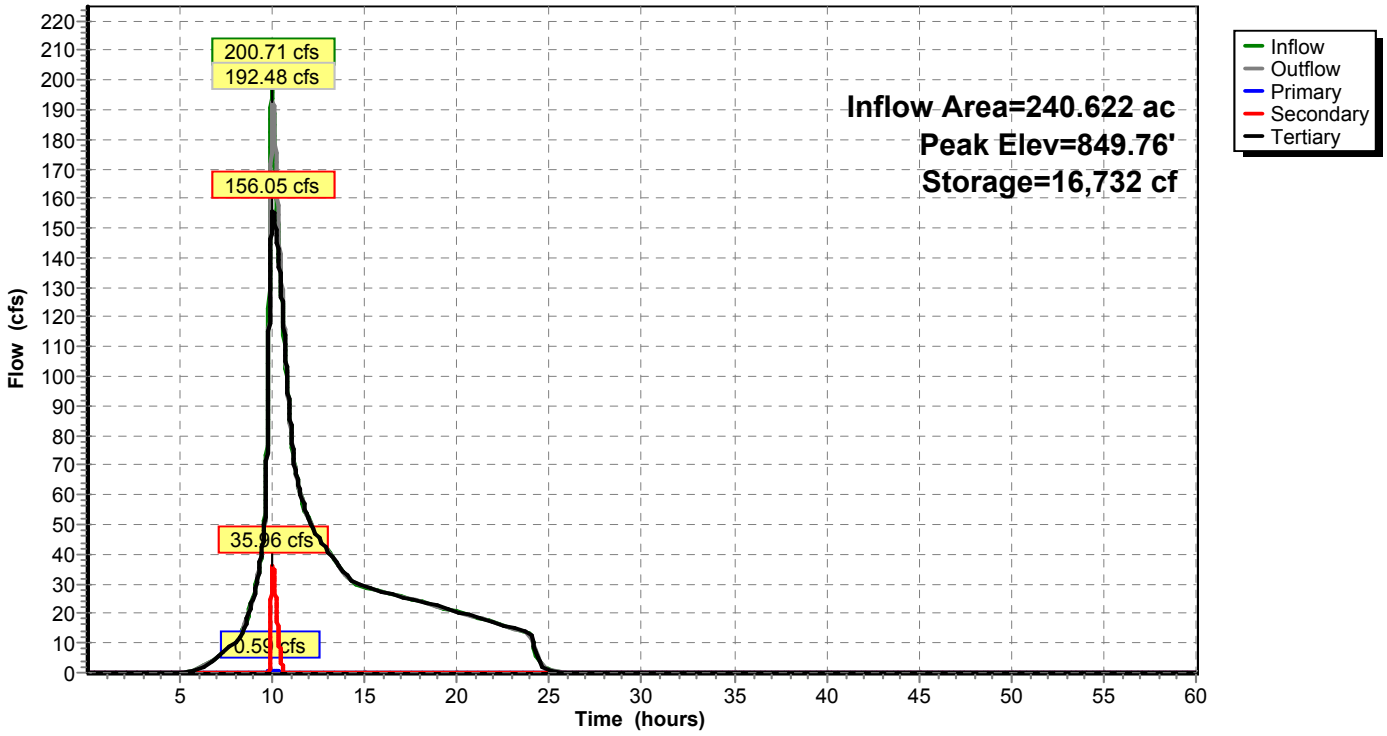
Primary OutFlow Max=0.56 cfs @ 9.91 hrs HW=849.32' TW=848.77' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.56 cfs @ 2.84 fps)

Secondary OutFlow Max=35.58 cfs @ 10.02 hrs HW=849.76' TW=849.22' (Dynamic Tailwater)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 35.58 cfs @ 3.14 fps)

Tertiary OutFlow Max=156.03 cfs @ 10.04 hrs HW=849.76' TW=841.73' (Dynamic Tailwater)
└**3=RCP_Arch 59x36** (Passes 156.03 cfs of 175.07 cfs potential flow)
└**4=Orifice/Grate** (Orifice Controls 156.03 cfs @ 8.00 fps)
└**5=Special & User-Defined (CkD1-S)** (Controls 0.00 cfs)

Pond 18P: GC-CkD1

Hydrograph



Summary for Pond 19P: GC-CkD2

[58] Hint: Peaked 0.60' above defined flood level
[80] Warning: Exceeded Pond 18P by 0.66' @ 24.38 hrs (0.03 cfs 0.195 af)
[80] Warning: Exceeded Pond 18P by 0.02' @ 10.66 hrs (0.00 cfs 0.000 af)

Inflow Area =	260.311 ac,	0.99% Impervious,	Inflow Depth =	0.23"	for 50 Year event
Inflow =	58.68 cfs @	10.01 hrs,	Volume=	4.902 af	
Outflow =	53.55 cfs @	10.07 hrs,	Volume=	4.901 af,	Atten= 9%, Lag= 4.1 min
Primary =	1.27 cfs @	10.07 hrs,	Volume=	1.460 af	
Secondary =	41.32 cfs @	10.07 hrs,	Volume=	3.201 af	
Tertiary =	10.96 cfs @	10.07 hrs,	Volume=	0.240 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 849.25' @ 10.07 hrs Surf.Area= 20,596 sf Storage= 23,653 cf
Flood Elev= 848.65' Surf.Area= 11,850 sf Storage= 14,787 cf

Plug-Flow detention time= 43.1 min calculated for 4.901 af (100% of inflow)
Center-of-Mass det. time= 42.9 min (813.4 - 770.5)

Volume	Invert	Avail.Storage	Storage Description
#1	846.00'	46,430 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
846.00	267	0	0
847.00	4,055	2,161	2,161
848.00	8,178	6,117	8,278
849.00	13,828	11,003	19,281
850.00	40,470	27,149	46,430

Device	Routing	Invert	Outlet Devices
#1	Primary	846.12'	**6.0" Round Culvert** L= 26.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 846.12' / 845.98' S= 0.0054 '/' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Tertiary	848.70'	**Special & User-Defined (CkD2-S)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 Disch. (cfs) 0.000 0.130 0.970 2.640 5.120 8.550 13.010 18.440 24.620 31.430 38.830 46.770 55.210 64.120
#3	Secondary	847.80'	**Special & User-Defined (CkD2-W)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 2.20 Disch. (cfs) 0.000 0.020 0.480 1.430 2.780 4.430 6.490 8.950 12.010 15.510 19.390 23.590 28.100 32.980 38.270 43.910 49.850 56.080 62.580 69.340 76.350 83.590 91.070

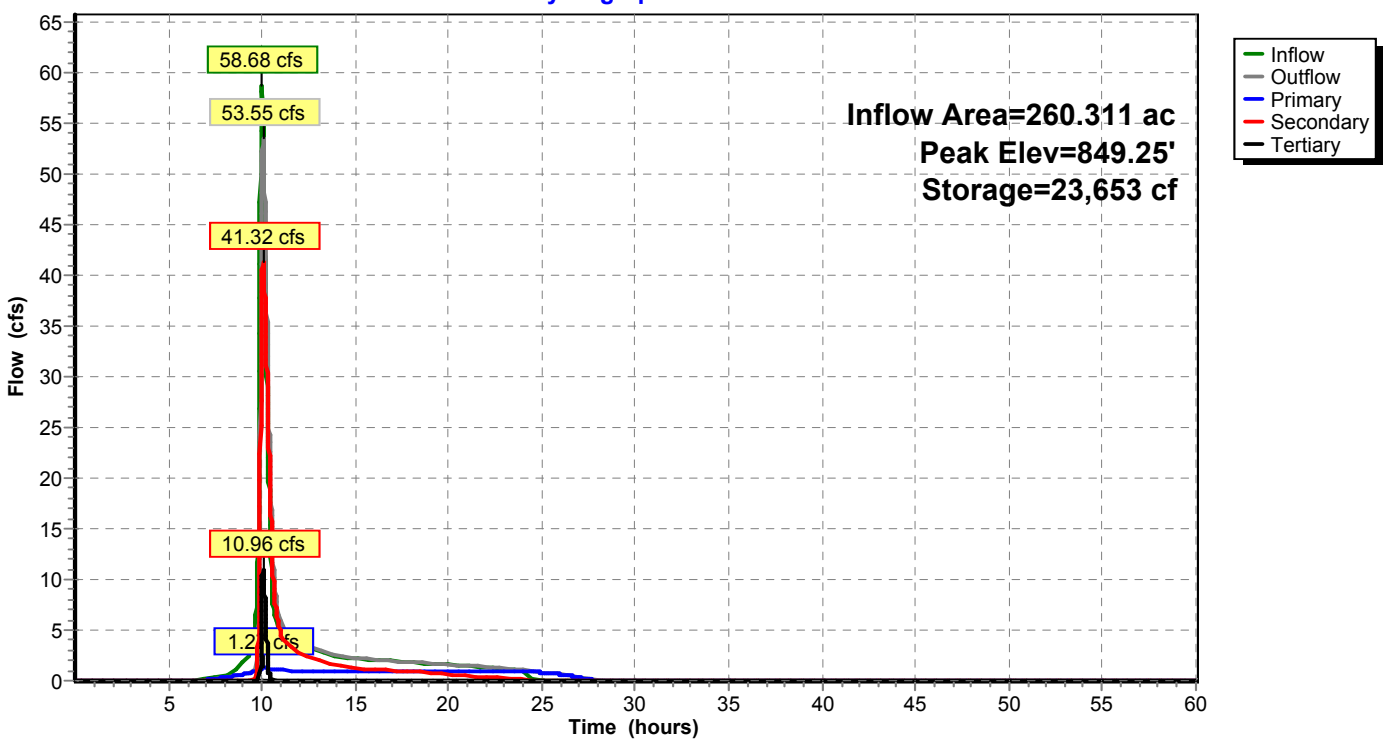
Primary OutFlow Max=1.27 cfs @ 10.07 hrs HW=849.25' TW=845.87' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.27 cfs @ 6.46 fps)

Secondary OutFlow Max=41.31 cfs @ 10.07 hrs HW=849.25' TW=845.87' (Dynamic Tailwater)
└**3=Special & User-Defined (CkD2-W)** (Custom Controls 41.31 cfs)

Tertiary OutFlow Max=10.95 cfs @ 10.07 hrs HW=849.25' TW=0.00' (Dynamic Tailwater)
└**2=Special & User-Defined (CkD2-S)** (Custom Controls 10.95 cfs)

Pond 19P: GC-CkD2

Hydrograph



Summary for Pond 20P: GC-CkD3

[58] Hint: Peaked 0.86' above defined flood level

Inflow Area = 274.094 ac, 0.94% Impervious, Inflow Depth = 0.31" for 50 Year event
Inflow = 55.32 cfs @ 10.05 hrs, Volume= 7.106 af
Outflow = 54.35 cfs @ 10.09 hrs, Volume= 7.095 af, Atten= 2%, Lag= 2.4 min
Primary = 6.01 cfs @ 10.09 hrs, Volume= 3.774 af
Secondary = 8.13 cfs @ 10.09 hrs, Volume= 0.878 af
Tertiary = 40.20 cfs @ 10.09 hrs, Volume= 2.444 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 845.88' @ 10.09 hrs Surf.Area= 14,173 sf Storage= 14,445 cf
Flood Elev= 845.02' Surf.Area= 8,229 sf Storage= 4,852 cf

Plug-Flow detention time= 22.2 min calculated for 7.094 af (100% of inflow)
Center-of-Mass det. time= 21.1 min (846.4 - 825.4)

Volume	Invert	Avail.Storage	Storage Description
#1	844.00'	24,632 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
844.00	1,288	0	0
845.00	8,090	4,689	4,689
846.50	18,500	19,943	24,632

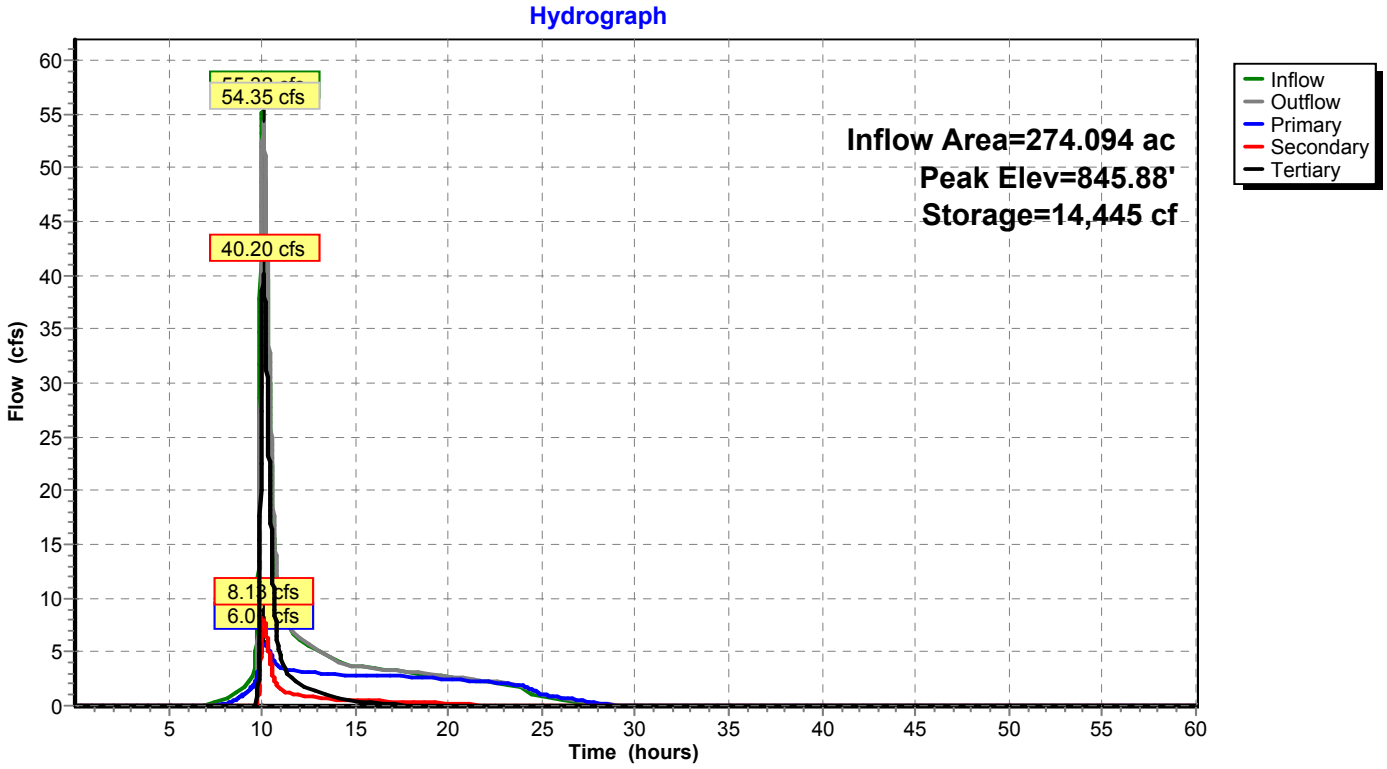
Device	Routing	Invert	Outlet Devices
#1	Primary	844.22'	**18.0" Round Culvert** L= 26.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 844.22' / 843.98' S= 0.0092 '/' Cc= 0.900 n= 0.021 Corrugated metal, Flow Area= 1.77 sf
#2	Secondary	845.00'	**Special & User-Defined (CkD3-W)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 Disch. (cfs) 0.000 0.050 0.390 0.970 1.710 2.600 3.780 5.170 6.720 8.570 11.140 14.290 17.880 21.830 26.120 30.880 36.030 41.520 47.330 53.420 59.790
#3	Tertiary	845.10'	**Special & User-Defined (CkD3-S)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 Disch. (cfs) 0.000 0.050 1.930 5.420 10.370 16.490 23.960 32.580 42.550 53.770 66.380 80.510 96.280 113.770 132.840 153.630 175.910 199.510 224.310 250.260

Primary OutFlow Max=6.01 cfs @ 10.09 hrs HW=845.88' TW=844.56' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 6.01 cfs @ 3.84 fps)

Secondary OutFlow Max=8.13 cfs @ 10.09 hrs HW=845.88' TW=844.56' (Dynamic Tailwater)
└**2=Special & User-Defined (CkD3-W)** (Custom Controls 8.13 cfs)

Tertiary OutFlow Max=40.20 cfs @ 10.09 hrs HW=845.88' TW=0.00' (Dynamic Tailwater)
└**3=Special & User-Defined (CkD3-S)** (Custom Controls 40.20 cfs)

Pond 20P: GC-CkD3



Summary for Pond B1: Basin 1

Inflow Area = 47.388 ac, 67.98% Impervious, Inflow Depth = 3.84" for 50 Year event
Inflow = 115.89 cfs @ 10.03 hrs, Volume= 15.158 af
Outflow = 36.61 cfs @ 10.60 hrs, Volume= 14.768 af, Atten= 68%, Lag= 34.0 min
Discarded = 1.12 cfs @ 10.60 hrs, Volume= 3.177 af
Primary = 35.49 cfs @ 10.60 hrs, Volume= 11.591 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 837.56' @ 10.60 hrs Surf.Area= 1.402 ac Storage= 5.949 af

Plug-Flow detention time= 316.7 min calculated for 14.765 af (97% of inflow)
Center-of-Mass det. time= 299.2 min (1,025.9 - 726.7)

Volume	Invert	Avail.Storage	Storage Description
#1	826.50'	8.466 af	**Custom Stage Data (Prismatic)** Listed below (Recalc) 8.789 af Overall - 0.323 af Embedded = 8.466 af
#2	826.50'	0.129 af	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 0.323 af Overall x 40.0% Voids
		8.595 af	Total Available Storage

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
826.50	0.081	0.000	0.000
827.00	0.081	0.040	0.040
828.00	0.081	0.081	0.121
829.00	0.081	0.081	0.202
830.00	0.081	0.081	0.283
831.00	0.081	0.081	0.365
832.00	0.203	0.142	0.506
833.00	0.376	0.289	0.796
834.00	1.171	0.774	1.569
835.00	1.234	1.202	2.772
836.00	1.299	1.267	4.038
837.00	1.365	1.332	5.370
838.00	1.432	1.399	6.769
839.00	1.500	1.466	8.235
839.35	1.665	0.554	8.789

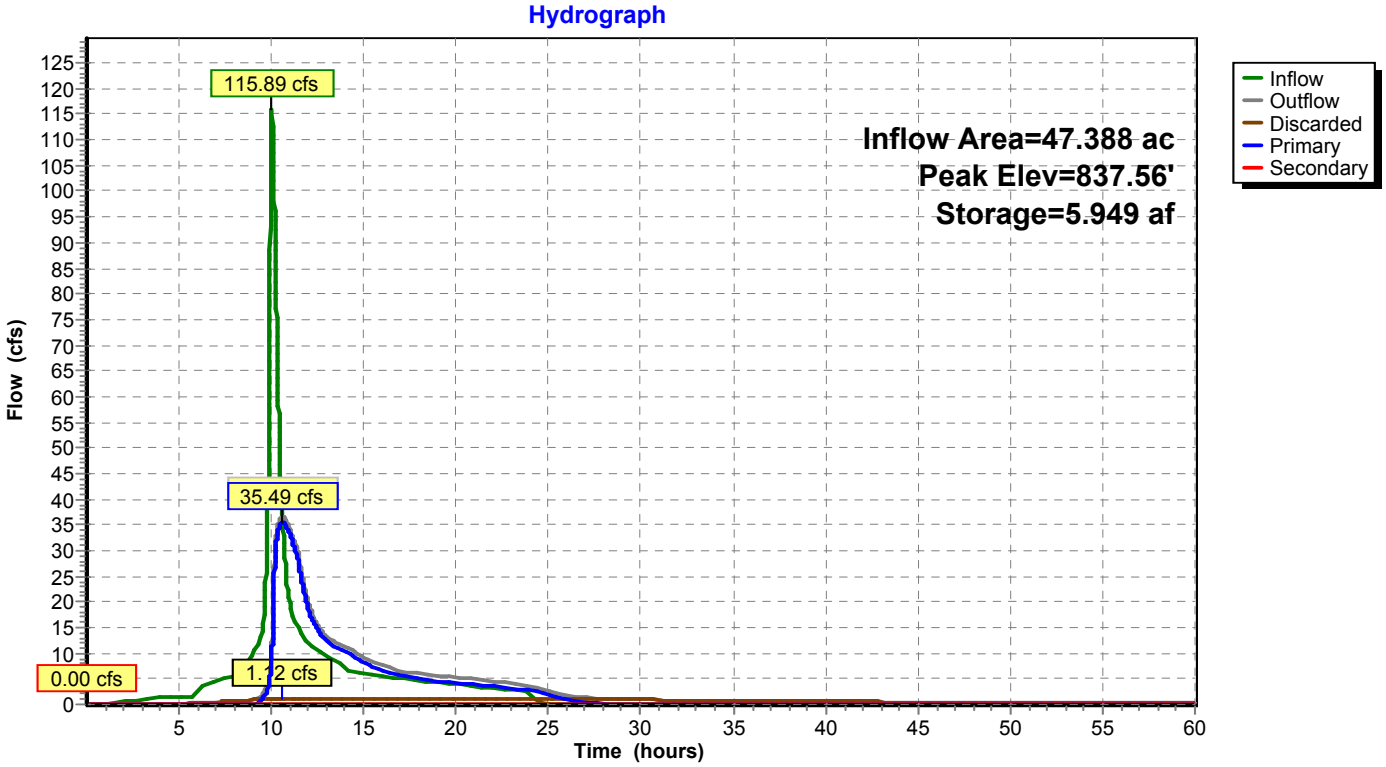
Device	Routing	Invert	Outlet Devices
#1	Primary	833.12'	**36.0" Round Culvert** L= 385.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 833.12' / 831.20' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf
#2	Discarded	826.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	834.33'	**16.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	834.33'	**12.0" W x 8.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	835.33'	**30.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	836.17'	**24.0" Horiz. Orifice/Grate** C= 0.600 in 78.0" x 36.0" Grate (16% open area) Limited to weir flow at low heads
#7	Secondary	838.35'	**30.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=1.12 cfs @ 10.60 hrs HW=837.56' (Free Discharge)
└**2=Exfiltration** (Controls 1.12 cfs)

Primary OutFlow Max=35.49 cfs @ 10.60 hrs HW=837.56' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 35.49 cfs of 52.74 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 3.74 cfs @ 8.42 fps)
  └**4=Orifice/Grate** (Orifice Controls 5.46 cfs @ 8.19 fps)
  └**5=Orifice/Grate** (Orifice Controls 8.46 cfs @ 6.77 fps)
  └**6=Orifice/Grate** (Orifice Controls 17.82 cfs @ 5.67 fps)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=826.50' TW=0.00' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B1: Basin 1



Summary for Pond B10: Basin 10

Inflow Area = 30.685 ac, 61.94% Impervious, Inflow Depth = 3.14" for 50 Year event
Inflow = 36.90 cfs @ 9.98 hrs, Volume= 8.017 af
Outflow = 10.57 cfs @ 11.07 hrs, Volume= 7.548 af, Atten= 71%, Lag= 65.4 min
Discarded = 0.85 cfs @ 11.07 hrs, Volume= 2.841 af
Primary = 9.72 cfs @ 11.07 hrs, Volume= 4.707 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 818.15' @ 11.07 hrs Surf.Area= 45,888 sf Storage= 146,516 cf

Plug-Flow detention time= 542.9 min calculated for 7.548 af (94% of inflow)
Center-of-Mass det. time= 503.8 min (1,242.7 - 739.0)

Volume	Invert	Avail.Storage	Storage Description
#1	808.50'	230,693 cf	**Custom Stage Data (Conic)** Listed below (Recalc) 244,773 cf Overall - 14,080 cf Embedded = 230,693 cf
#2	808.50'	5,632 cf	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 14,080 cf Overall x 40.0% Voids
		236,325 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
808.50	3,520	0	0	3,520
809.00	3,520	1,760	1,760	3,625
810.00	3,520	3,520	5,280	3,835
811.00	3,520	3,520	8,800	4,046
812.00	3,520	3,520	12,320	4,256
813.00	3,520	3,520	15,840	4,466
814.00	8,931	6,019	21,859	9,884
815.00	17,294	12,884	34,744	18,257
816.00	40,146	27,930	62,673	41,116
817.00	42,792	41,462	104,135	43,859
818.00	45,490	44,134	148,269	46,658
819.00	48,243	46,860	195,129	49,516
820.00	51,058	49,644	244,773	52,440

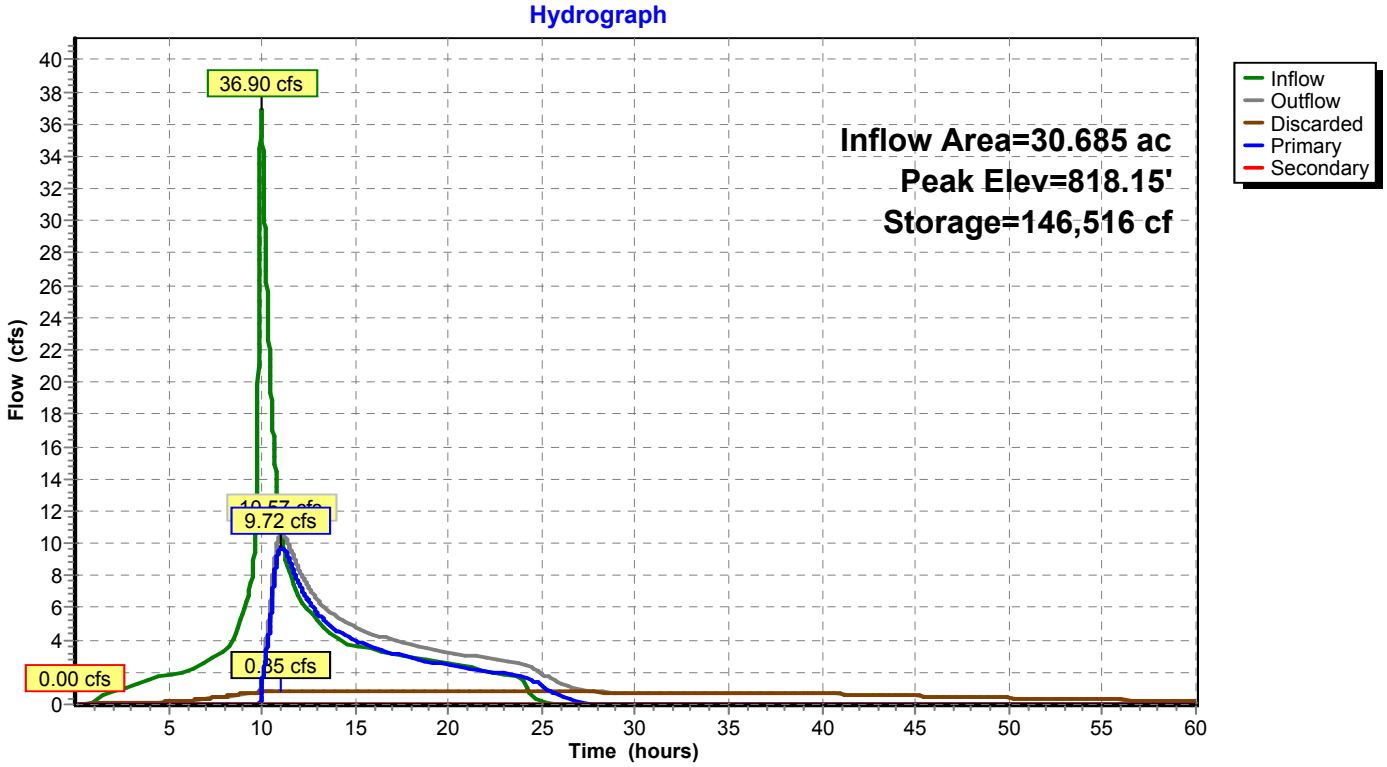
Device	Routing	Invert	Outlet Devices
#1	Primary	816.00'	**30.0" Round Culvert** L= 45.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 816.00' / 815.10' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Discarded	808.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	816.67'	**24.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	817.33'	**15.0" W x 18.0" H Vert. Orifice/Grate** X 2 rows with 8.0" cc spacing C= 0.600
#5	Device 1	817.83'	**60.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	819.00'	**78.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#7	Secondary	819.33'	**36.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.85 cfs @ 11.07 hrs HW=818.15' (Free Discharge)
└**2=Exfiltration** (Controls 0.85 cfs)

Primary OutFlow Max=9.72 cfs @ 11.07 hrs HW=818.15' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 9.72 cfs of 22.37 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 3.67 cfs @ 5.51 fps)
  └**4=Orifice/Grate** (Orifice Controls 3.19 cfs @ 2.64 fps)
  └**5=Orifice/Grate** (Orifice Controls 2.86 cfs @ 1.81 fps)
  └**6=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=808.50' TW=0.00' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B10: Basin 10



Summary for Pond B11: Basin 11

Inflow Area = 14.461 ac, 52.00% Impervious, Inflow Depth = 2.97" for 50 Year event
Inflow = 22.92 cfs @ 9.96 hrs, Volume= 3.580 af
Outflow = 7.82 cfs @ 10.42 hrs, Volume= 3.317 af, Atten= 66%, Lag= 27.6 min
Discarded = 0.27 cfs @ 10.42 hrs, Volume= 0.793 af
Primary = 7.55 cfs @ 10.42 hrs, Volume= 2.524 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 833.87' @ 10.42 hrs Surf.Area= 13,665 sf Storage= 55,671 cf

Plug-Flow detention time= 383.8 min calculated for 3.316 af (93% of inflow)
Center-of-Mass det. time= 336.6 min (1,076.8 - 740.2)

Volume	Invert	Avail.Storage	Storage Description
#1	823.50'	83,101 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 97,181 cf Overall - 14,080 cf Embedded = 83,101 cf
#2	823.50'	5,632 cf	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 14,080 cf Overall x 40.0% Voids
		88,733 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
823.50	3,520	0	0
824.00	3,520	1,760	1,760
825.00	3,520	3,520	5,280
826.00	3,520	3,520	8,800
827.00	3,520	3,520	12,320
828.00	3,520	3,520	15,840
829.00	2,800	3,160	19,000
830.00	6,900	4,850	23,850
831.00	8,919	7,910	31,760
832.00	10,515	9,717	41,477
833.00	12,169	11,342	52,819
834.00	13,879	13,024	65,843
835.00	15,655	14,767	80,610
836.00	17,488	16,572	97,181

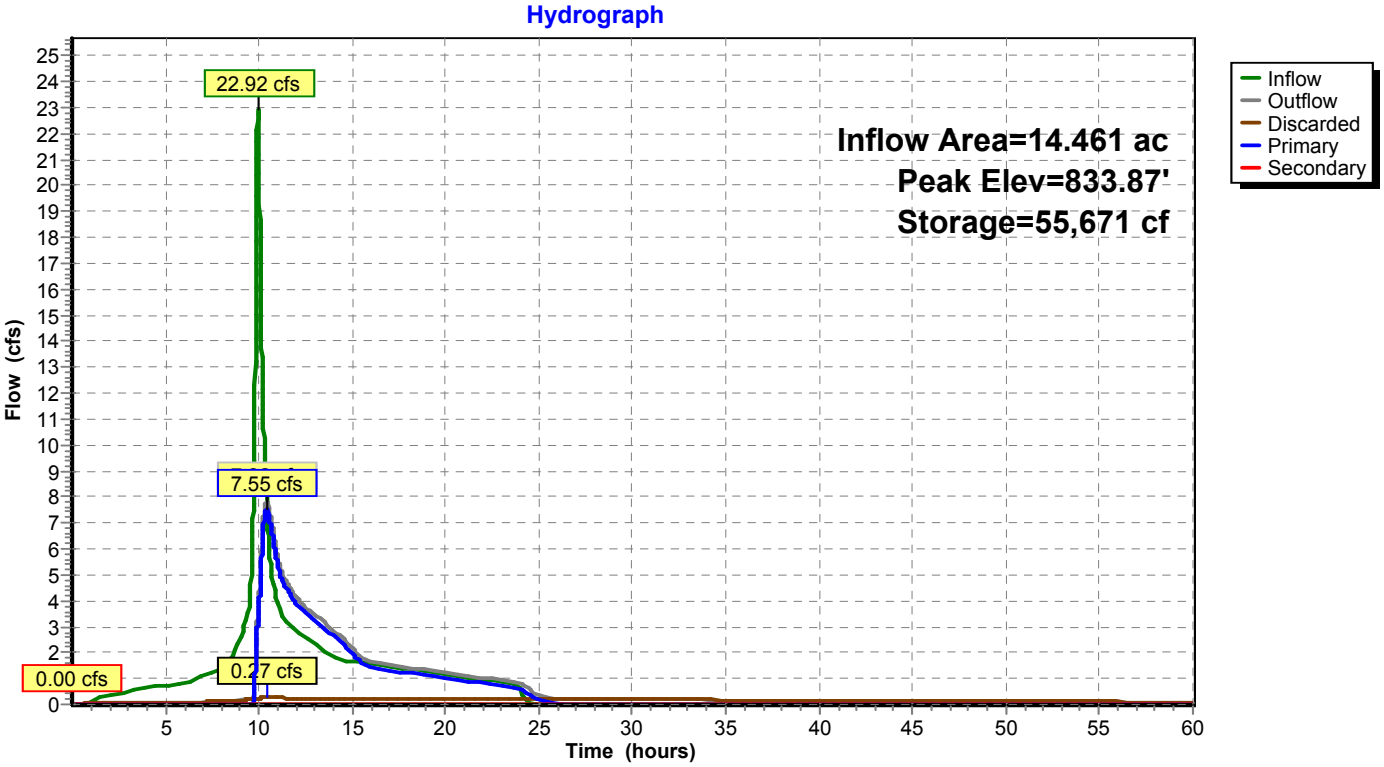
Device	Routing	Invert	Outlet Devices
#1	Primary	831.67'	**24.0" Round Culvert** L= 165.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 831.67' / 820.50' S= 0.0677 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Discarded	823.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	831.67'	**24.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	833.00'	**6.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	833.50'	**27.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	834.50'	**48.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#7	Secondary	834.83'	**16.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.27 cfs @ 10.42 hrs HW=833.87' (Free Discharge)
└**2=Exfiltration** (Controls 0.27 cfs)

Primary OutFlow Max=7.55 cfs @ 10.42 hrs HW=833.87' TW=825.20' (Dynamic Tailwater)
└**1=Culvert** (Passes 7.55 cfs of 16.60 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 4.58 cfs @ 6.87 fps)
  └**4=Orifice/Grate** (Orifice Controls 1.31 cfs @ 3.00 fps)
  └**5=Orifice/Grate** (Orifice Controls 1.66 cfs @ 1.97 fps)
  └**6=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=823.50' TW=820.00' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B11: Basin 11



Summary for Pond B12: Basin 12

Inflow Area = 20.201 ac, 44.06% Impervious, Inflow Depth = 2.76" for 50 Year event
Inflow = 30.70 cfs @ 9.96 hrs, Volume= 4.642 af
Outflow = 3.99 cfs @ 11.75 hrs, Volume= 4.365 af, Atten= 87%, Lag= 107.5 min
Discarded = 0.51 cfs @ 11.75 hrs, Volume= 1.546 af
Primary = 3.48 cfs @ 11.75 hrs, Volume= 2.819 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 838.38' @ 11.75 hrs Surf.Area= 27,048 sf Storage= 87,046 cf

Plug-Flow detention time= 517.4 min calculated for 4.365 af (94% of inflow)
Center-of-Mass det. time= 478.9 min (1,228.1 - 749.2)

Volume	Invert	Avail.Storage	Storage Description
#1	828.50'	160,016 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 174,096 cf Overall - 14,080 cf Embedded = 160,016 cf
#2	828.50'	5,632 cf	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 14,080 cf Overall x 40.0% Voids
		165,648 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
828.50	3,520	0	0
829.00	3,520	1,760	1,760
830.00	3,520	3,520	5,280
831.00	3,520	3,520	8,800
832.00	3,520	3,520	12,320
833.00	3,520	3,520	15,840
834.00	2,600	3,060	18,900
835.00	8,000	5,300	24,200
836.00	20,849	14,425	38,625
837.00	23,415	22,132	60,757
838.00	26,037	24,726	85,483
839.00	28,717	27,377	112,860
840.00	31,383	30,050	142,910
841.00	30,990	31,187	174,096

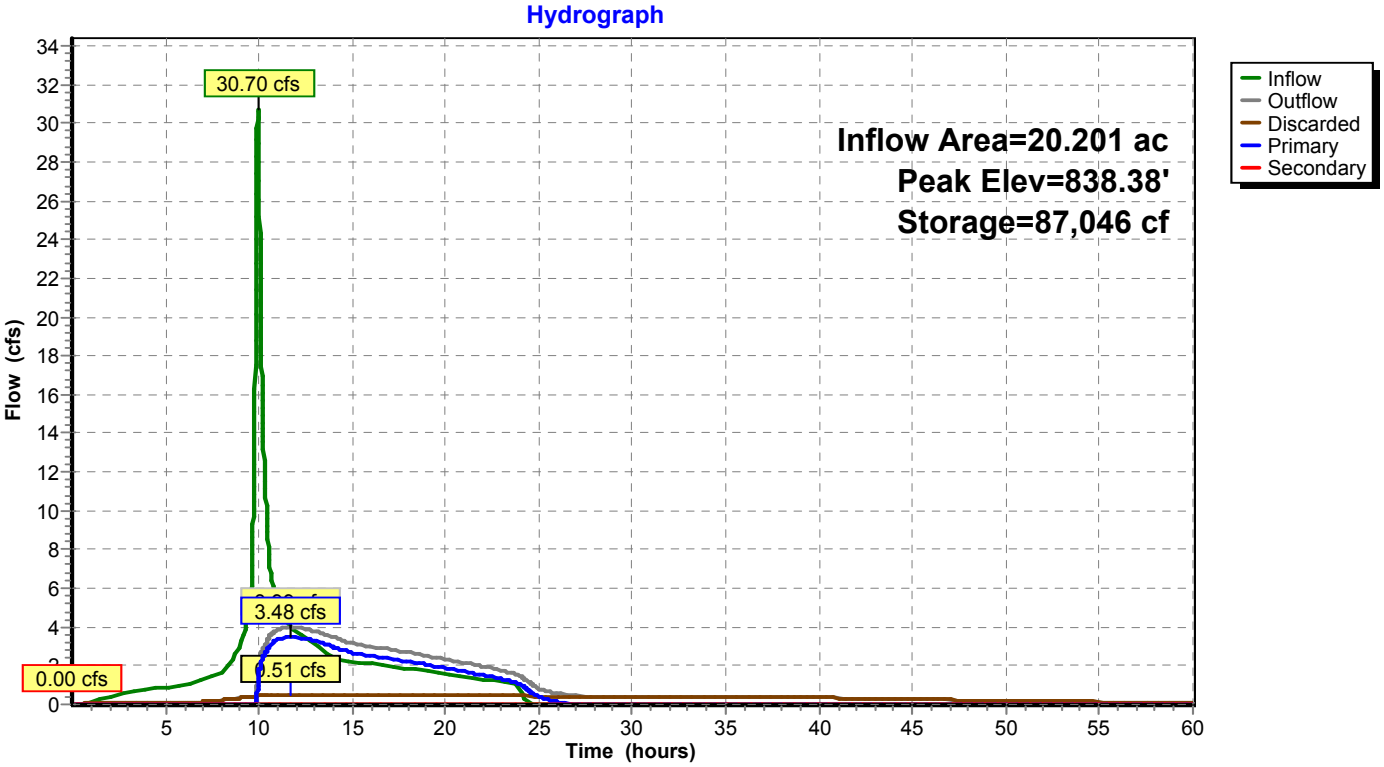
Device	Routing	Invert	Outlet Devices
#1	Primary	836.67'	**30.0" Round Culvert** L= 130.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 836.67' / 832.50' S= 0.0321 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Discarded	828.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	836.67'	**18.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	838.00'	**8.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	838.50'	**24.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	839.50'	**36.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#7	Secondary	840.00'	**18.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.51 cfs @ 11.75 hrs HW=838.38' (Free Discharge)
└**2=Exfiltration** (Controls 0.51 cfs)

Primary OutFlow Max=3.48 cfs @ 11.75 hrs HW=838.38' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 3.48 cfs of 15.89 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 2.99 cfs @ 5.97 fps)
  └**4=Orifice/Grate** (Orifice Controls 0.50 cfs @ 1.97 fps)
  └**5=Orifice/Grate** (Controls 0.00 cfs)
  └**6=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=828.50' TW=0.00' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B12: Basin 12



Summary for Pond B13: Basin 13

Inflow Area = 64.115 ac, 22.11% Impervious, Inflow Depth = 2.76" for 50 Year event
Inflow = 102.50 cfs @ 9.96 hrs, Volume= 14.744 af
Outflow = 84.60 cfs @ 10.04 hrs, Volume= 14.320 af, Atten= 17%, Lag= 4.7 min
Discarded = 0.47 cfs @ 10.04 hrs, Volume= 1.375 af
Primary = 84.13 cfs @ 10.04 hrs, Volume= 12.945 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 844.03' @ 10.04 hrs Surf.Area= 0.557 ac Storage= 3.076 af

Plug-Flow detention time= 202.3 min calculated for 14.317 af (97% of inflow)
Center-of-Mass det. time= 183.9 min (956.9 - 773.1)

Volume	Invert	Avail.Storage	Storage Description
#1	830.50'	4.138 af	**Custom Stage Data (Prismatic)** Listed below (Recalc) 4.461 af Overall - 0.323 af Embedded = 4.138 af
#2	830.50'	0.129 af	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 0.323 af Overall x 40.0% Voids
		4.267 af	Total Available Storage

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
830.50	0.081	0.000	0.000
831.00	0.081	0.040	0.040
832.00	0.081	0.081	0.121
833.00	0.081	0.081	0.202
834.00	0.081	0.081	0.283
835.00	0.081	0.081	0.364
836.00	0.059	0.070	0.433
837.00	0.139	0.099	0.532
838.00	0.287	0.213	0.745
839.00	0.329	0.308	1.053
840.00	0.372	0.350	1.403
841.00	0.416	0.394	1.797
842.00	0.461	0.439	2.236
843.00	0.508	0.484	2.720
844.00	0.555	0.531	3.251
845.00	0.605	0.580	3.831
846.00	0.655	0.630	4.461

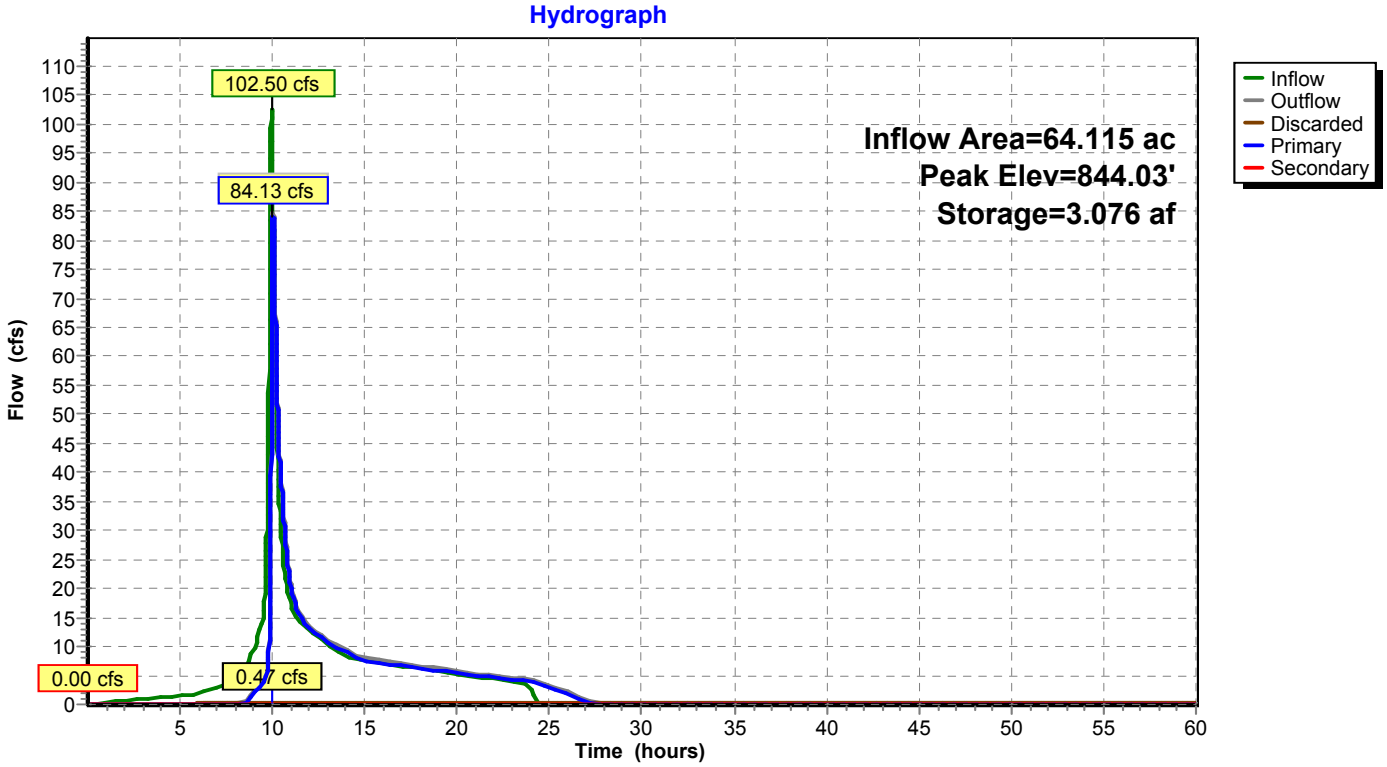
Device	Routing	Invert	Outlet Devices
#1	Primary	834.25'	**48.0" Round Culvert** L= 175.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 834.25' / 832.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 12.57 sf
#2	Discarded	830.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	839.67'	**24.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	841.50'	**15.0" W x 18.0" H Vert. Orifice/Grate** X 2 rows with 8.0" cc spacing C= 0.600
#5	Device 1	842.50'	**60.0" W x 8.0" H Vert. Orifice/Grate** X 2 rows with 8.0" cc spacing C= 0.600
#6	Device 1	843.67'	**78.0" x 36.0" Horiz. Orifice/Grate** X 2 rows C= 0.600 Limited to weir flow at low heads
#7	Secondary	844.67'	**36.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.47 cfs @ 10.04 hrs HW=844.03' (Free Discharge)
└**2=Exfiltration** (Controls 0.47 cfs)

Primary OutFlow Max=84.11 cfs @ 10.04 hrs HW=844.03' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 84.11 cfs of 168.80 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 6.58 cfs @ 9.86 fps)
  └**4=Orifice/Grate** (Orifice Controls 21.31 cfs @ 5.68 fps)
  └**5=Orifice/Grate** (Orifice Controls 29.04 cfs @ 4.36 fps)
  └**6=Orifice/Grate** (Weir Controls 27.19 cfs @ 1.97 fps)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=830.50' TW=0.00' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B13: Basin 13



Summary for Pond B4: Basin 4

Inflow Area = 38.712 ac, 55.38% Impervious, Inflow Depth = 3.07" for 50 Year event
Inflow = 57.43 cfs @ 9.97 hrs, Volume= 9.900 af
Outflow = 24.21 cfs @ 10.42 hrs, Volume= 9.636 af, Atten= 58%, Lag= 26.7 min
Discarded = 0.59 cfs @ 10.42 hrs, Volume= 1.698 af
Primary = 23.63 cfs @ 10.42 hrs, Volume= 7.938 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 839.85' @ 10.42 hrs Surf.Area= 29,313 sf Storage= 136,770 cf

Plug-Flow detention time= 322.9 min calculated for 9.634 af (97% of inflow)
Center-of-Mass det. time= 304.9 min (1,044.3 - 739.4)

Volume	Invert	Avail.Storage	Storage Description
#1	827.50'	218,652 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 232,732 cf Overall - 14,080 cf Embedded = 218,652 cf
#2	827.50'	5,632 cf	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 14,080 cf Overall x 40.0% Voids
		224,284 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
827.50	3,520	0	0
828.00	3,520	1,760	1,760
829.00	3,520	3,520	5,280
830.00	3,520	3,520	8,800
831.00	3,520	3,520	12,320
832.00	3,520	3,520	15,840
833.00	1,064	2,292	18,132
834.00	6,719	3,892	22,024
835.00	16,858	11,789	33,812
836.00	19,297	18,078	51,890
837.00	21,780	20,539	72,428
838.00	24,350	23,065	95,493
839.00	27,007	25,679	121,172
840.00	29,708	28,358	149,529
841.00	32,452	31,080	180,609
842.00	35,196	33,824	214,433
842.50	38,000	18,299	232,732

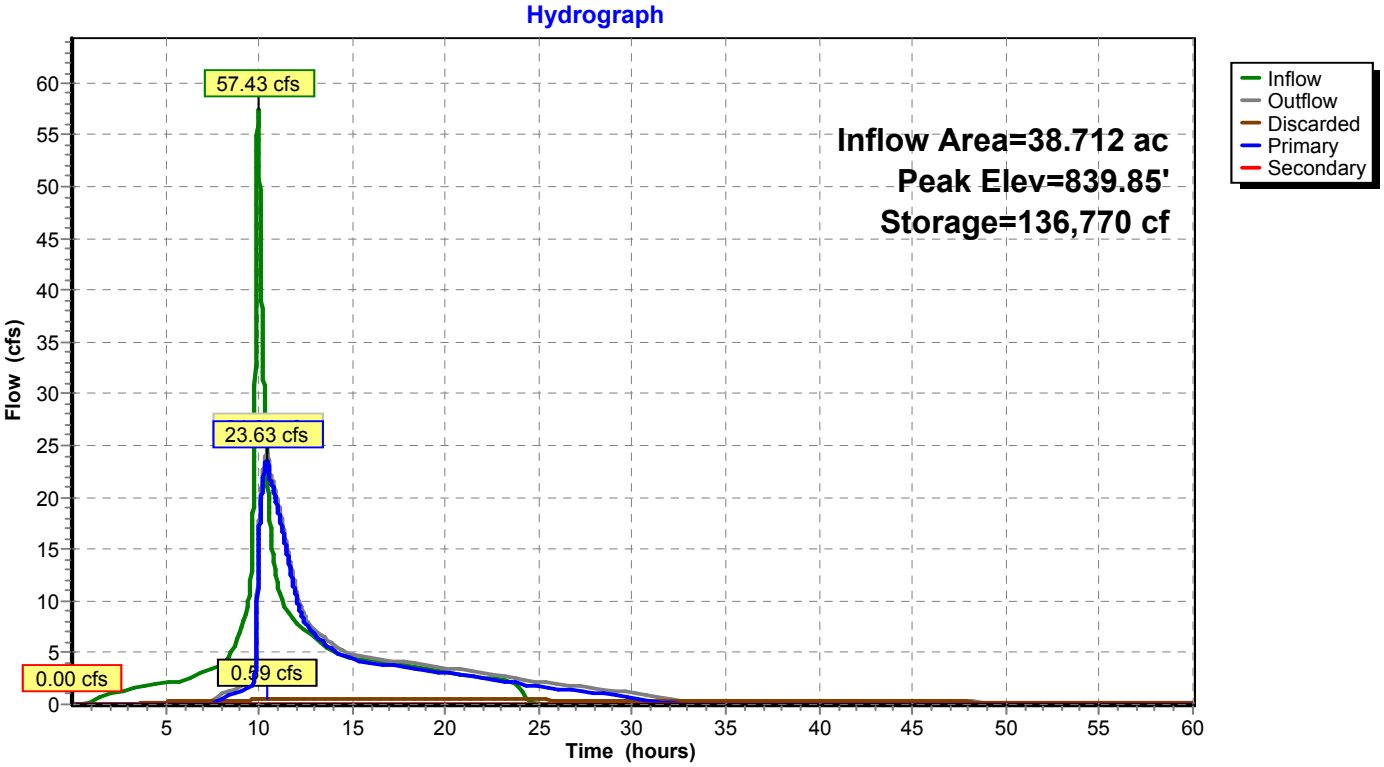
Device	Routing	Invert	Outlet Devices
#1	Primary	835.67'	**30.0" Round Culvert** L= 210.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 835.67' / 834.20' S= 0.0070 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Discarded	827.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	835.67'	**10.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	837.67'	**18.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	838.17'	**42.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	839.75'	**48.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 in 78.0" x 36.0" Grate (62% open area) Limited to weir flow at low heads
#7	Secondary	841.12'	**40.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.59 cfs @ 10.42 hrs HW=839.85' (Free Discharge)
└**2=Exfiltration** (Controls 0.59 cfs)

Primary OutFlow Max=23.63 cfs @ 10.42 hrs HW=839.85' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 23.63 cfs of 39.38 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 2.68 cfs @ 9.65 fps)
  ├**4=Orifice/Grate** (Orifice Controls 9.34 cfs @ 6.22 fps)
  ├**5=Orifice/Grate** (Orifice Controls 10.08 cfs @ 5.76 fps)
  └**6=Orifice/Grate** (Weir Controls 1.53 cfs @ 1.05 fps)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=827.50' TW=0.00' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B4: Basin 4



Summary for Pond B5: Basin 5

Inflow Area = 32.696 ac, 30.34% Impervious, Inflow Depth = 2.11" for 50 Year event
Inflow = 25.03 cfs @ 9.99 hrs, Volume= 5.762 af
Outflow = 9.72 cfs @ 10.80 hrs, Volume= 5.762 af, Atten= 61%, Lag= 49.0 min
Discarded = 0.41 cfs @ 10.80 hrs, Volume= 1.238 af
Primary = 9.31 cfs @ 10.80 hrs, Volume= 4.524 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 847.79' @ 10.80 hrs Surf.Area= 21,778 sf Storage= 70,408 cf

Plug-Flow detention time= 275.3 min calculated for 5.761 af (100% of inflow)
Center-of-Mass det. time= 275.5 min (1,057.9 - 782.5)

Volume	Invert	Avail.Storage	Storage Description
#1	844.00'	178,542 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
844.00	15,500	0	0
845.00	17,076	16,288	16,288
846.00	18,708	17,892	34,180
847.00	20,397	19,553	53,733
848.00	22,143	21,270	75,003
849.00	23,945	23,044	98,047
850.00	25,804	24,875	122,921
851.00	27,719	26,762	149,683
852.00	30,000	28,860	178,542

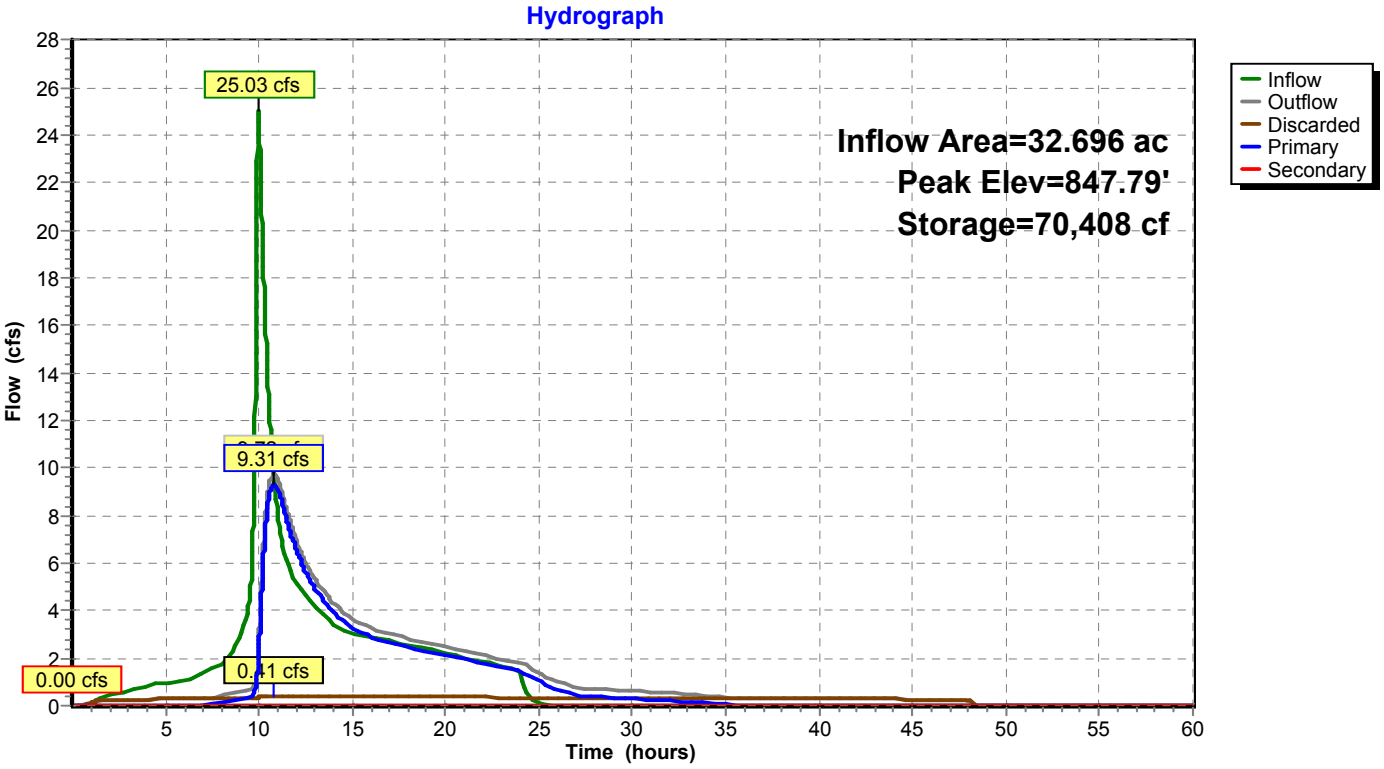
Device	Routing	Invert	Outlet Devices
#1	Primary	844.67'	**30.0" Round Culvert** L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 844.67' / 844.17' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Discarded	844.00'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 800.00'
#3	Device 1	844.67'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	845.67'	**6.0" W x 37.0" H Vert. Orifice/Grate** X 3 rows with 8.0" cc spacing C= 0.600
#5	Device 1	849.75'	**36.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 in 36.0" x 24.0" Grate (100% open area) Limited to weir flow at low heads
#6	Secondary	851.00'	**12.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.41 cfs @ 10.80 hrs HW=847.79' (Free Discharge)
└**2=Exfiltration** (Controls 0.41 cfs)

Primary OutFlow Max=9.31 cfs @ 10.80 hrs HW=847.79' TW=846.17' (Dynamic Tailwater)
└**1=Culvert** (Passes 9.31 cfs of 29.61 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 0.53 cfs @ 6.13 fps)
  ├**4=Orifice/Grate** (Orifice Controls 8.78 cfs @ 4.03 fps)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=844.00' (Free Discharge)
└**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond B5: Basin 5



Summary for Pond B6: Basin 6

Inflow Area = 34.039 ac, 52.56% Impervious, Inflow Depth = 3.05" for 50 Year event
Inflow = 42.75 cfs @ 9.98 hrs, Volume= 8.660 af
Outflow = 28.00 cfs @ 10.29 hrs, Volume= 8.366 af, Atten= 34%, Lag= 18.5 min
Discarded = 0.38 cfs @ 10.29 hrs, Volume= 1.047 af
Primary = 27.62 cfs @ 10.29 hrs, Volume= 7.319 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 851.60' @ 10.29 hrs Surf.Area= 0.458 ac Storage= 2.127 af

Plug-Flow detention time= 239.8 min calculated for 8.364 af (97% of inflow)
Center-of-Mass det. time= 217.0 min (966.0 - 749.0)

Volume	Invert	Avail.Storage	Storage Description
#1	839.50'	3.469 af	**Custom Stage Data (Prismatic)** Listed below (Recalc) 3.792 af Overall - 0.323 af Embedded = 3.469 af
#2	839.50'	0.129 af	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 0.323 af Overall x 40.0% Voids
		3.598 af	Total Available Storage

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
839.50	0.081	0.000	0.000
840.00	0.081	0.040	0.040
841.00	0.081	0.081	0.121
842.00	0.081	0.081	0.202
843.00	0.081	0.081	0.283
844.00	0.081	0.081	0.364
845.00	0.061	0.071	0.435
846.00	0.133	0.097	0.532
847.00	0.260	0.196	0.729
848.00	0.292	0.276	1.005
849.00	0.325	0.309	1.313
850.00	0.360	0.343	1.656
851.00	0.434	0.397	2.053
852.00	0.474	0.454	2.507
854.40	0.597	1.285	3.792

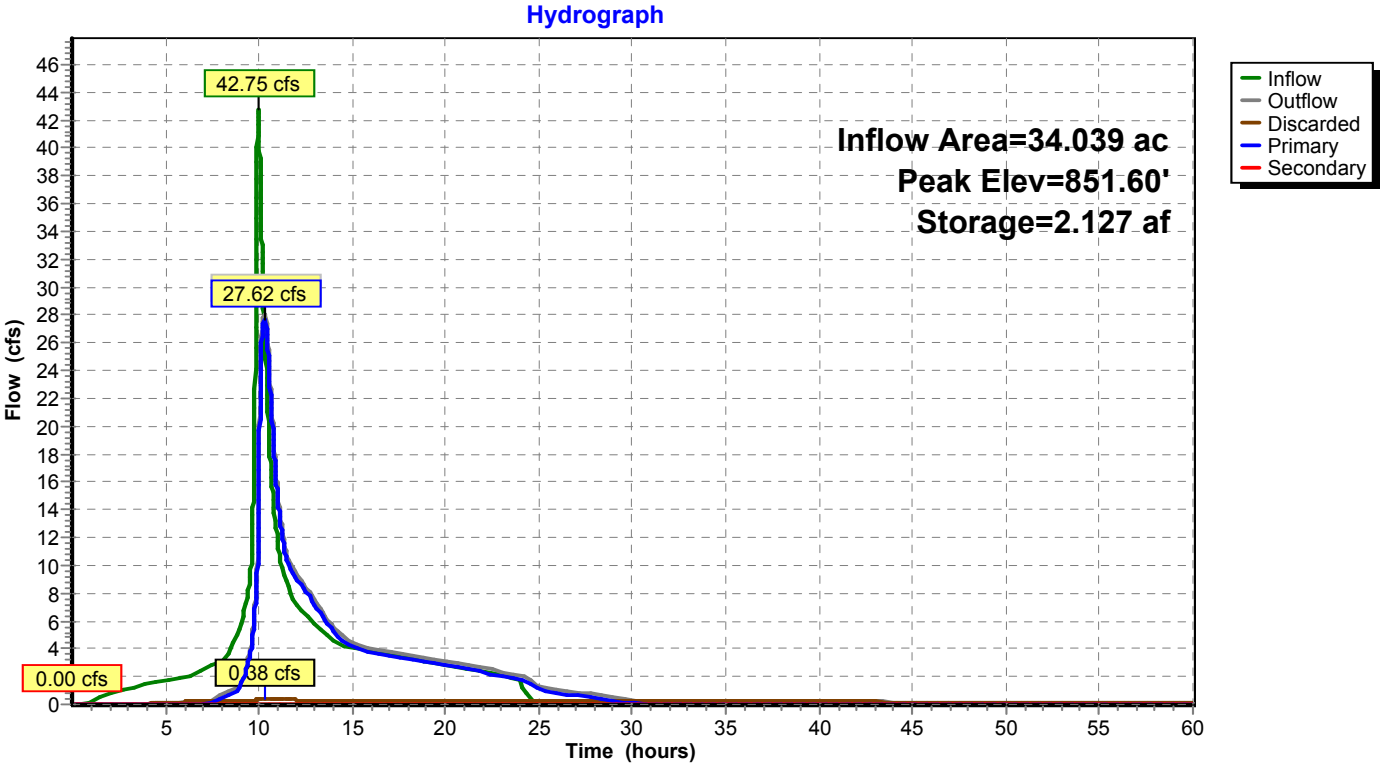
Device	Routing	Invert	Outlet Devices
#1	Primary	843.65'	**24.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 843.65' / 842.90' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Discarded	839.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	847.67'	**9.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	848.75'	**12.0" W x 9.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	849.50'	**18.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	850.67'	**69.6" W x 9.0" H Vert. Orifice/Grate** C= 0.600
#7	Secondary	852.88'	**40.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.38 cfs @ 10.29 hrs HW=851.60' (Free Discharge)
└**2=Exfiltration** (Controls 0.38 cfs)

Primary OutFlow Max=27.62 cfs @ 10.29 hrs HW=851.60' TW=842.50' (Dynamic Tailwater)
└**1=Culvert** (Passes 27.62 cfs of 37.11 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 1.76 cfs @ 9.39 fps)
  └**4=Orifice/Grate** (Orifice Controls 5.68 cfs @ 7.57 fps)
  └**5=Orifice/Grate** (Orifice Controls 4.91 cfs @ 6.54 fps)
  └**6=Orifice/Grate** (Orifice Controls 15.28 cfs @ 3.51 fps)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=839.50' TW=842.50' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B6: Basin 6



Summary for Pond B7: Basin 7

Inflow Area = 108.754 ac, 33.30% Impervious, Inflow Depth = 1.88" for 50 Year event
Inflow = 38.88 cfs @ 10.57 hrs, Volume= 16.997 af
Outflow = 17.47 cfs @ 12.48 hrs, Volume= 16.867 af, Atten= 55%, Lag= 115.1 min
Discarded = 1.23 cfs @ 12.48 hrs, Volume= 4.463 af
Primary = 16.23 cfs @ 12.48 hrs, Volume= 12.404 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 842.80' @ 12.48 hrs Surf.Area= 65,991 sf Storage= 200,494 cf

Plug-Flow detention time= 345.2 min calculated for 16.864 af (99% of inflow)
Center-of-Mass det. time= 333.2 min (1,252.5 - 919.3)

Volume	Invert	Avail.Storage	Storage Description
#1	839.00'	516,122 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
839.00	10,000	0	0
840.00	54,515	32,258	32,258
841.00	58,335	56,425	88,683
842.00	62,211	60,273	148,956
843.00	66,912	64,562	213,517
844.00	71,188	69,050	282,567
845.00	75,535	73,362	355,929
846.00	79,981	77,758	433,687
847.00	84,890	82,436	516,122

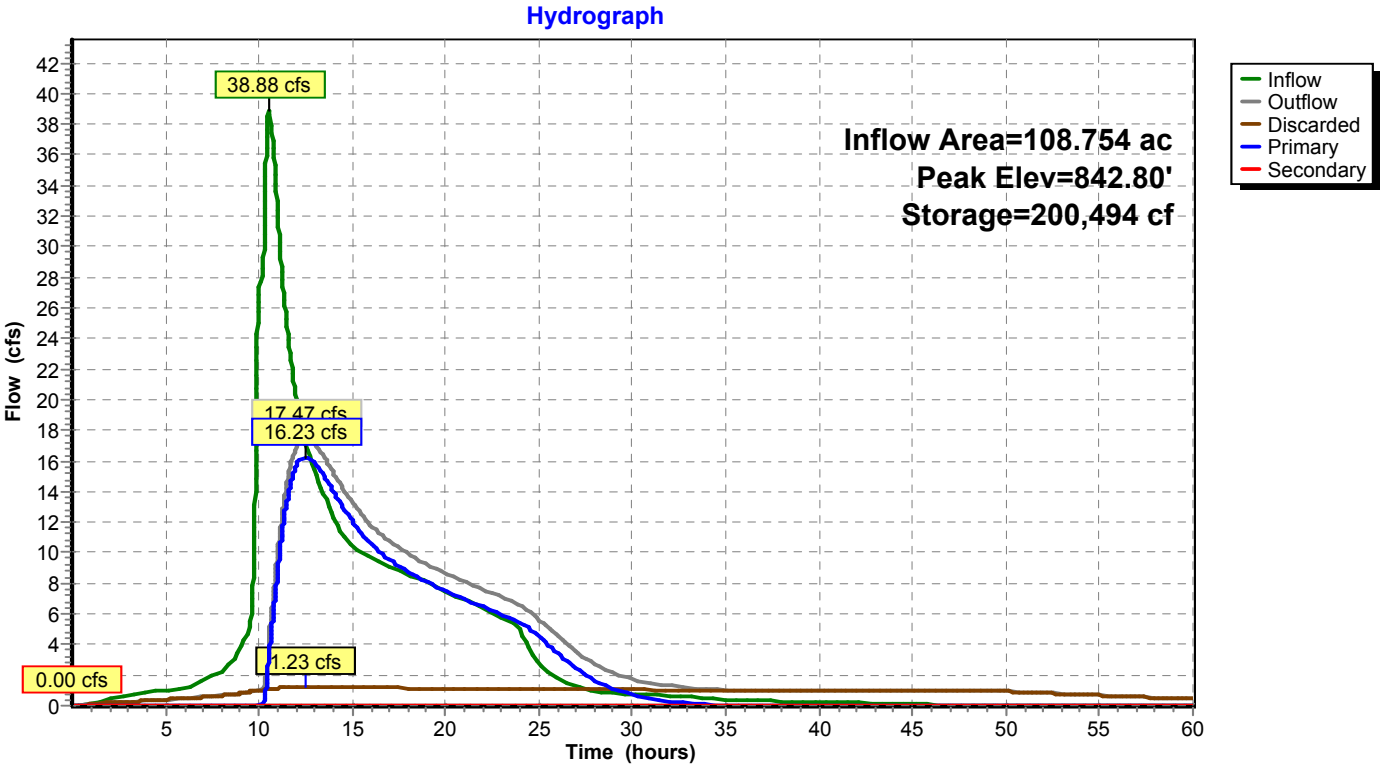
Device	Routing	Invert	Outlet Devices
#1	Primary	836.67'	**36.0" Round Culvert** L= 63.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 836.67' / 836.00' S= 0.0106 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf
#2	Discarded	839.00'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 800.00'
#3	Device 1	840.75'	**26.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	841.25'	**12.0" W x 36.0" H Vert. Orifice/Grate** X 3 rows with 8.0" cc spacing C= 0.600
#5	Device 1	844.50'	**48.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 in 48.0" x 36.0" Grate (100% open area) Limited to weir flow at low heads
#6	Secondary	845.50'	**12.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=1.23 cfs @ 12.48 hrs HW=842.80' (Free Discharge)
└**2=Exfiltration** (Controls 1.23 cfs)

Primary OutFlow Max=16.23 cfs @ 12.48 hrs HW=842.80' TW=837.58' (Dynamic Tailwater)
└**1=Culvert** (Passes 16.23 cfs of 73.27 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 7.00 cfs @ 6.46 fps)
  ├**4=Orifice/Grate** (Orifice Controls 9.23 cfs @ 3.47 fps)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=839.00' (Free Discharge)
└**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond B7: Basin 7



Summary for Pond B8: Basin 8

Inflow Area = 44.689 ac, 35.47% Impervious, Inflow Depth = 2.31" for 50 Year event
Inflow = 33.51 cfs @ 9.99 hrs, Volume= 8.595 af
Outflow = 18.16 cfs @ 10.65 hrs, Volume= 8.596 af, Atten= 46%, Lag= 39.5 min
Discarded = 0.53 cfs @ 10.65 hrs, Volume= 1.899 af
Primary = 17.63 cfs @ 10.65 hrs, Volume= 6.696 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 857.70' @ 10.65 hrs Surf.Area= 28,664 sf Storage= 108,148 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 389.8 min (1,168.0 - 778.2)

Volume	Invert	Avail.Storage	Storage Description
#1	853.00'	147,517 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
853.00	17,554	0	0
854.00	19,812	18,683	18,683
855.00	22,126	20,969	39,652
856.00	24,497	23,312	62,964
857.00	26,924	25,711	88,674
858.00	29,407	28,166	116,840
859.00	31,948	30,678	147,517

Device	Routing	Invert	Outlet Devices
#1	Primary	853.00'	**30.0" Round Culvert** L= 1,200.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 853.00' / 844.17' S= 0.0074 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Discarded	853.00'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 800.00'
#3	Device 1	853.58'	**2.0" W x 5.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	855.67'	**5.0" W x 12.0" H Vert. Orifice/Grate** X 4 rows with 8.0" cc spacing C= 0.600
#5	Device 1	857.25'	**36.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 in 36.0" x 36.0" Grate (100% open area) Limited to weir flow at low heads
#6	Secondary	858.75'	**16.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

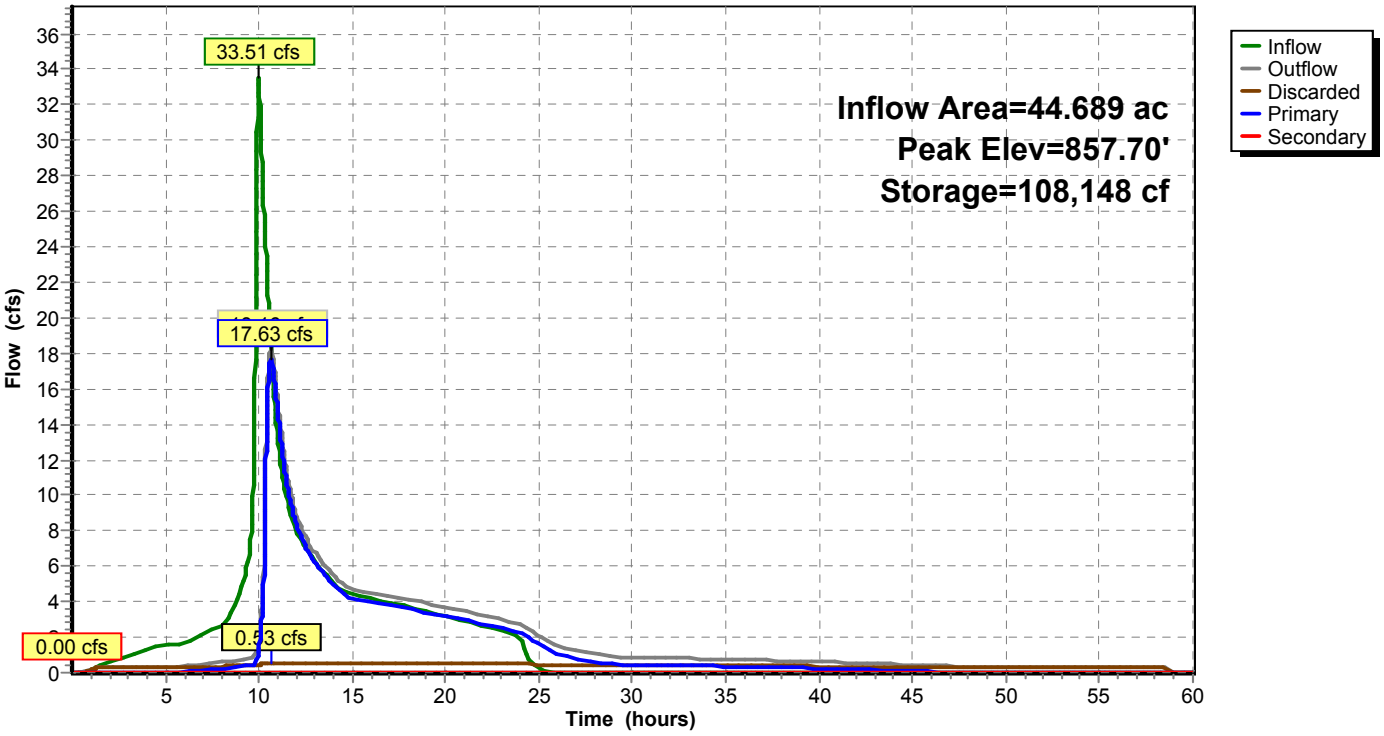
Discarded OutFlow Max=0.53 cfs @ 10.65 hrs HW=857.70' (Free Discharge)
└**2=Exfiltration** (Controls 0.53 cfs)

Primary OutFlow Max=17.63 cfs @ 10.65 hrs HW=857.70' TW=846.16' (Dynamic Tailwater)
└**1=Culvert** (Passes 17.63 cfs of 39.51 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 0.66 cfs @ 9.52 fps)
  ├**4=Orifice/Grate** (Orifice Controls 5.09 cfs @ 4.48 fps)
  └**5=Orifice/Grate** (Weir Controls 11.87 cfs @ 2.20 fps)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=853.00' (Free Discharge)
└**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond B8: Basin 8

Hydrograph



Summary for Pond B9: Basin 9

Inflow Area = 11.446 ac, 17.36% Impervious, Inflow Depth = 1.75" for 50 Year event
Inflow = 6.65 cfs @ 9.99 hrs, Volume= 1.667 af
Outflow = 4.29 cfs @ 10.42 hrs, Volume= 1.665 af, Atten= 35%, Lag= 25.8 min
Primary = 4.29 cfs @ 10.42 hrs, Volume= 1.665 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 849.15' @ 10.42 hrs Surf.Area= 7,629 sf Storage= 7,800 cf

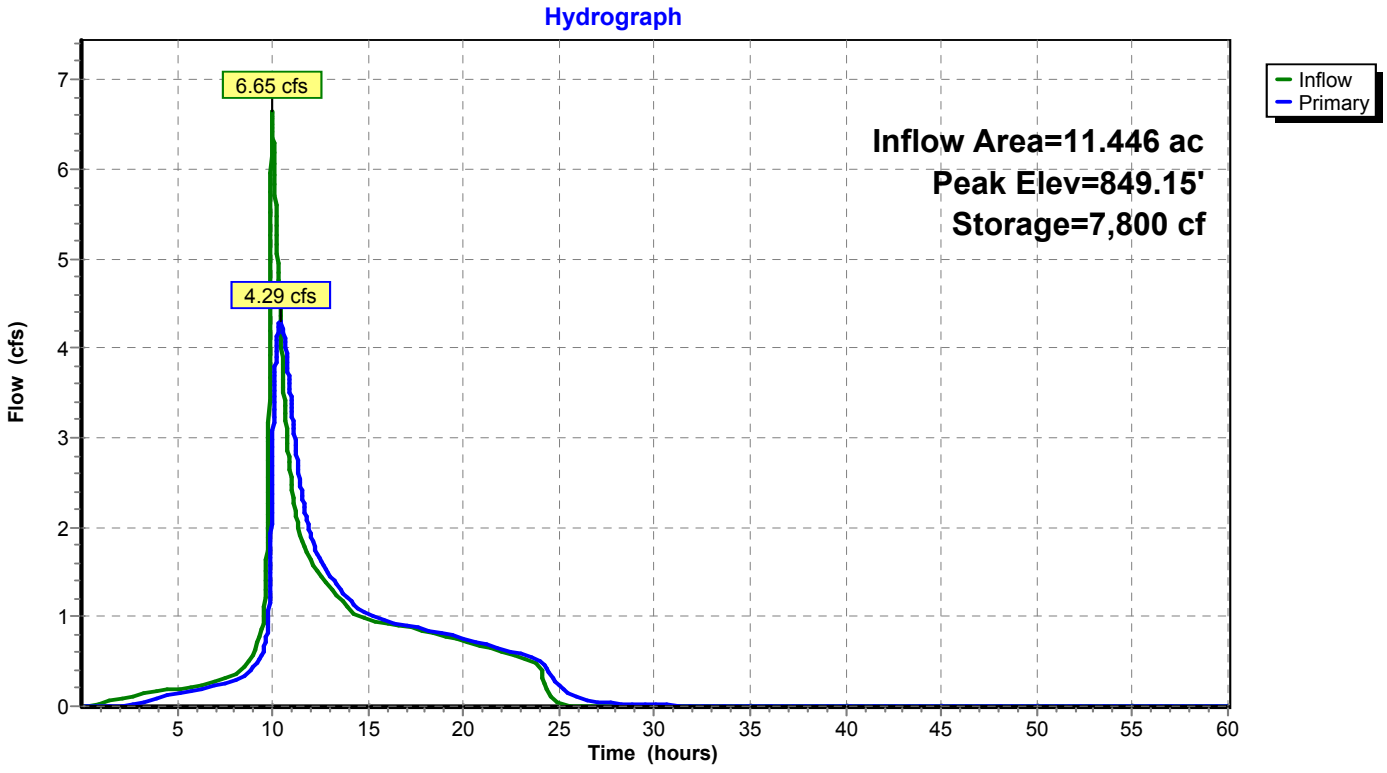
Plug-Flow detention time= 52.0 min calculated for 1.665 af (100% of inflow)
Center-of-Mass det. time= 51.4 min (868.5 - 817.1)

Volume	Invert	Avail.Storage	Storage Description
#1	848.00'	48,750 cf	**30.00'W x 200.00'L x 5.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	848.00'	**18.0" Round Culvert** L= 110.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 848.00' / 847.00' S= 0.0091 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Device 1	848.00'	**15.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=4.29 cfs @ 10.42 hrs HW=849.15' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 4.29 cfs of 5.28 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 4.29 cfs @ 3.64 fps)

Pond B9: Basin 9



Summary for Pond Ex SD: Tract #1632 Ex. 36" SD Outlet

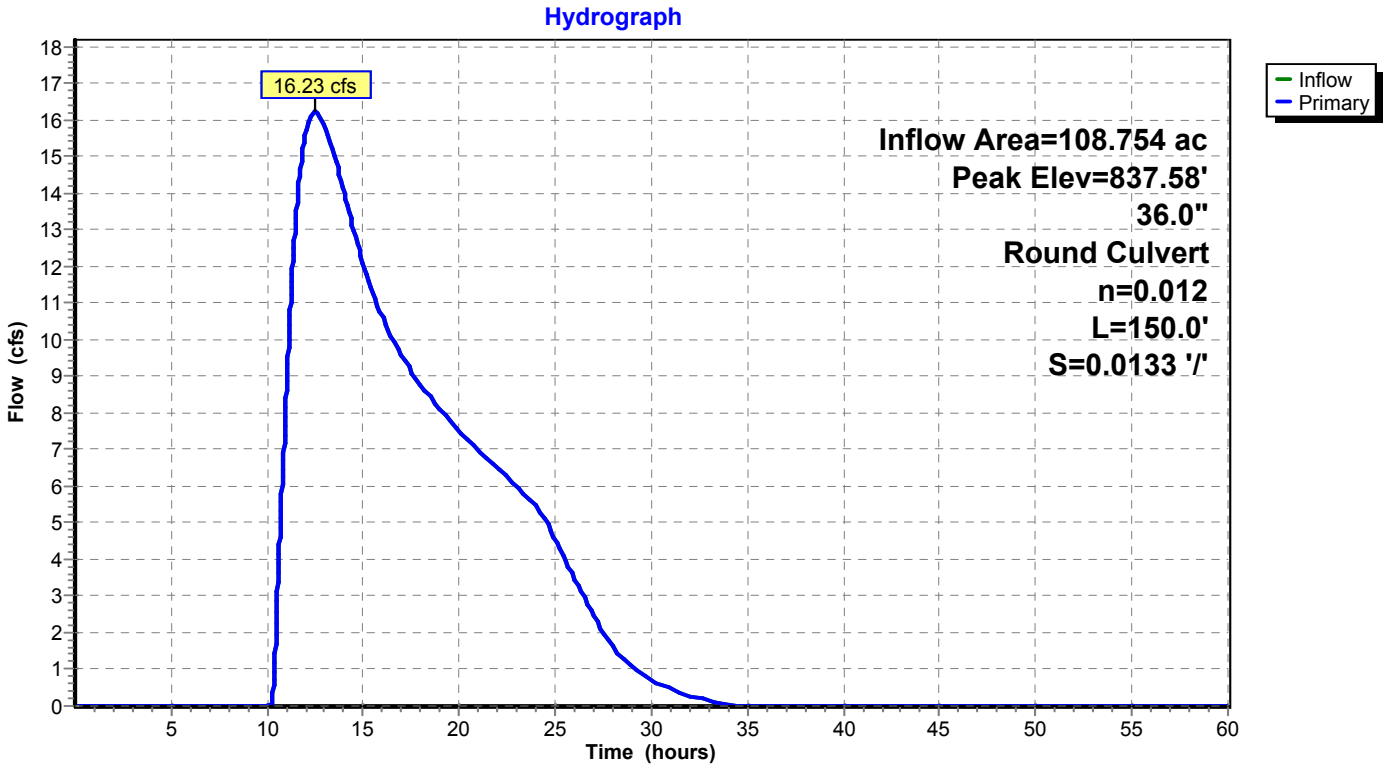
Inflow Area = 108.754 ac, 33.30% Impervious, Inflow Depth = 1.37" for 50 Year event
Inflow = 16.23 cfs @ 12.48 hrs, Volume= 12.404 af
Outflow = 16.23 cfs @ 12.48 hrs, Volume= 12.404 af, Atten= 0%, Lag= 0.0 min
Primary = 16.23 cfs @ 12.48 hrs, Volume= 12.404 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 837.58' @ 12.48 hrs
Flood Elev= 843.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	836.00'	**36.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 836.00' / 834.00' S= 0.0133 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf

Primary OutFlow Max=16.23 cfs @ 12.48 hrs HW=837.58' TW=835.00' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 16.23 cfs @ 4.29 fps)

Pond Ex SD: Tract #1632 Ex. 36" SD Outlet



Summary for Pond MC Q: SD System

[58] Hint: Peaked 0.49' above defined flood level

Inflow Area = 21.500 ac, 80.00% Impervious, Inflow Depth = 3.80" for 50 Year event
Inflow = 37.43 cfs @ 9.97 hrs, Volume= 6.803 af
Outflow = 37.24 cfs @ 9.99 hrs, Volume= 6.522 af, Atten= 1%, Lag= 0.8 min
Discarded = 0.12 cfs @ 9.99 hrs, Volume= 0.374 af
Primary = 18.03 cfs @ 9.99 hrs, Volume= 2.986 af
Secondary = 19.09 cfs @ 9.99 hrs, Volume= 3.162 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 845.99' @ 9.99 hrs Surf.Area= 0.132 ac Storage= 0.530 af
Flood Elev= 845.50' Surf.Area= 0.097 ac Storage= 0.474 af

Plug-Flow detention time= 117.7 min calculated for 6.521 af (96% of inflow)
Center-of-Mass det. time= 89.5 min (809.5 - 720.0)

Volume	Invert	Avail.Storage	Storage Description
#1	839.50'	0.607 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
839.50	0.081	0.000	0.000
840.00	0.081	0.040	0.040
841.00	0.081	0.081	0.121
842.00	0.081	0.081	0.202
843.00	0.081	0.081	0.283
844.00	0.081	0.081	0.364
845.00	0.061	0.071	0.434
846.00	0.133	0.097	0.531
846.50	0.172	0.076	0.607

Device	Routing	Invert	Outlet Devices
#1	Primary	841.50'	**36.0" Round Culvert** L= 585.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 841.50' / 838.50' S= 0.0051 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf
#2	Device 1	845.50'	**48.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Discarded	839.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 750.00'
#4	Secondary	845.50'	**20.0' long (Profile 4) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.77 2.97 3.21

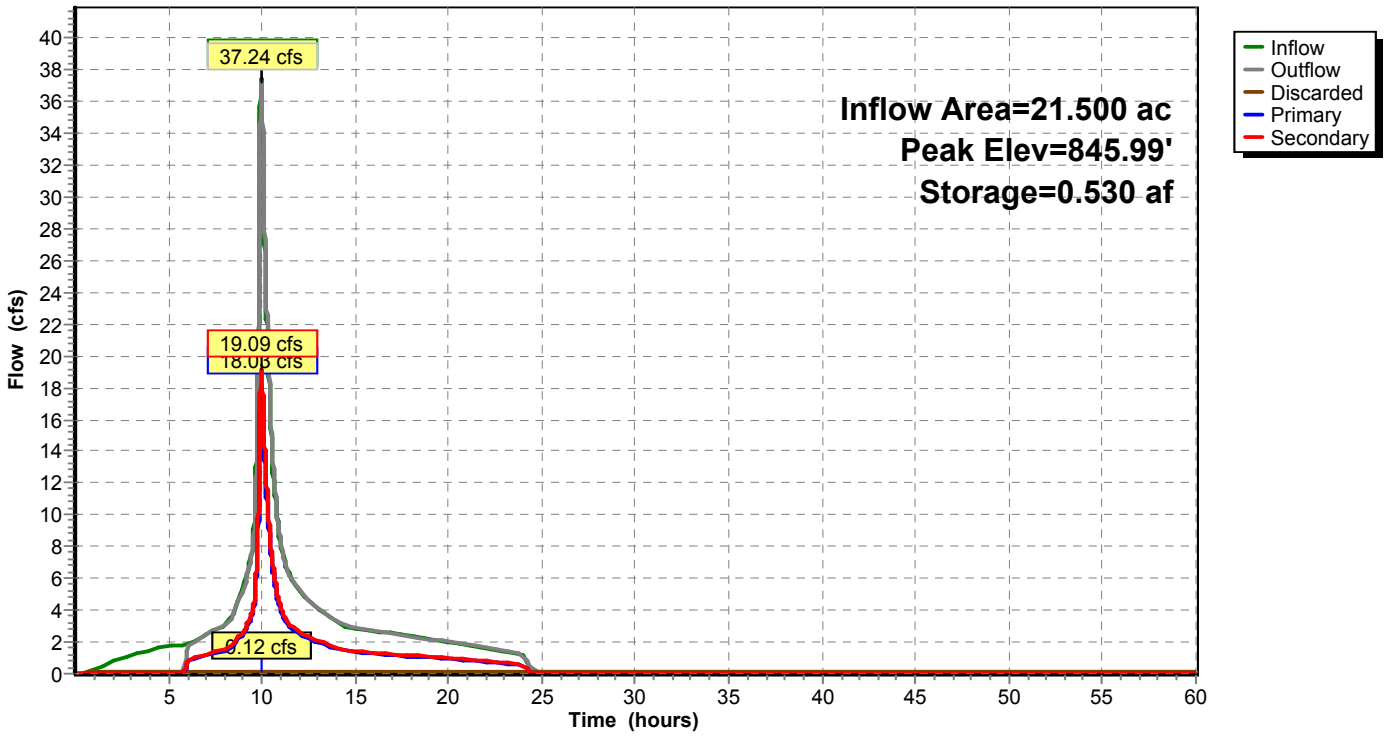
Discarded OutFlow Max=0.12 cfs @ 9.99 hrs HW=845.99' (Free Discharge)
└**3=Exfiltration** (Controls 0.12 cfs)

Primary OutFlow Max=18.02 cfs @ 9.99 hrs HW=845.99' TW=840.33' (Dynamic Tailwater)
└**1=Culvert** (Passes 18.02 cfs of 53.14 cfs potential flow)
└**2=Orifice/Grate** (Weir Controls 18.02 cfs @ 2.29 fps)

Secondary OutFlow Max=19.08 cfs @ 9.99 hrs HW=845.99' TW=835.80' (Dynamic Tailwater)
└**4=Broad-Crested Rectangular Weir** (Weir Controls 19.08 cfs @ 1.94 fps)

Pond MC Q: SD System

Hydrograph



Summary for Pond SD: 42" HDPE SD

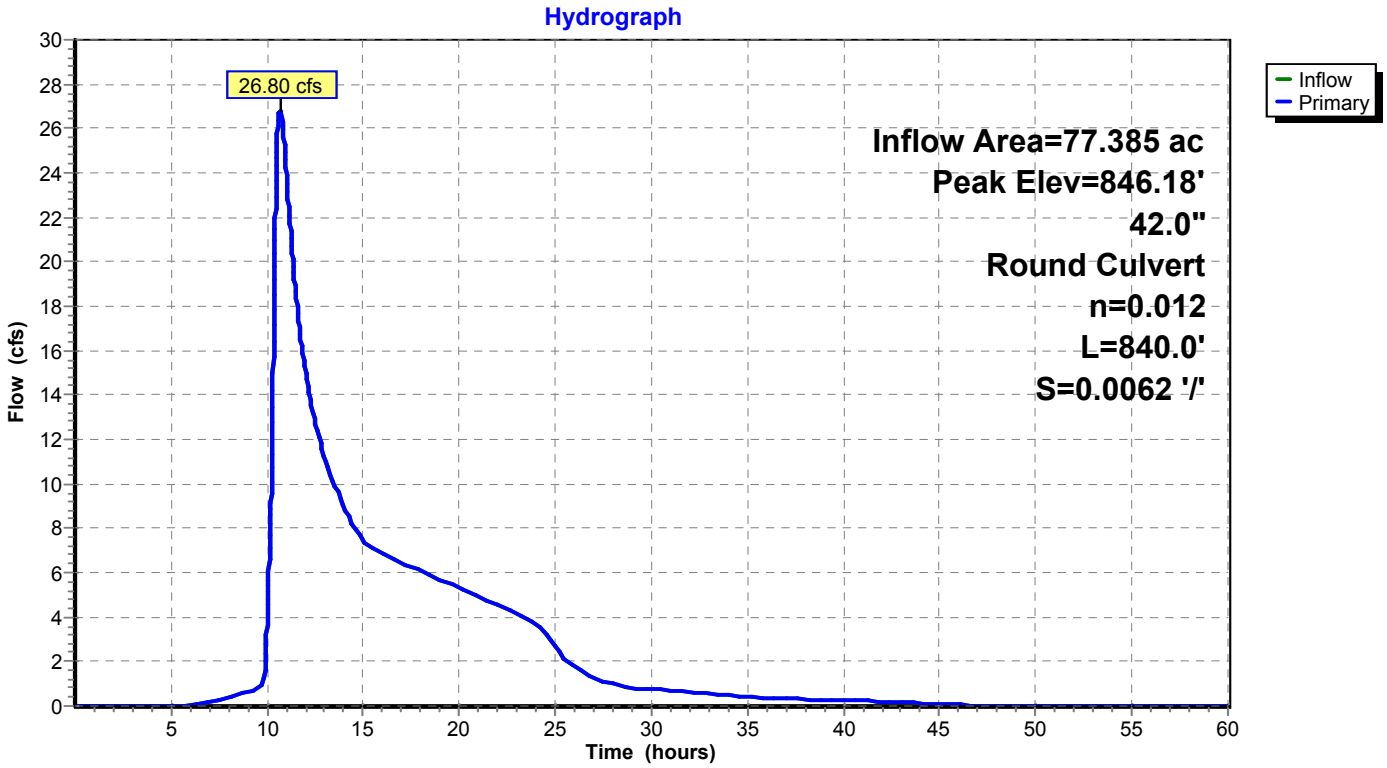
Inflow Area = 77.385 ac, 33.30% Impervious, Inflow Depth = 1.74" for 50 Year event
Inflow = 26.80 cfs @ 10.67 hrs, Volume= 11.220 af
Outflow = 26.80 cfs @ 10.67 hrs, Volume= 11.220 af, Atten= 0%, Lag= 0.0 min
Primary = 26.80 cfs @ 10.67 hrs, Volume= 11.220 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 846.18' @ 10.74 hrs
Flood Elev= 853.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	844.17'	**42.0" Round Culvert** L= 840.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 844.17' / 839.00' S= 0.0062 '/' Cc= 0.900 n= 0.012, Flow Area= 9.62 sf

Primary OutFlow Max=26.74 cfs @ 10.67 hrs HW=846.17' TW=841.60' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 26.74 cfs @ 6.80 fps)

Pond SD: 42" HDPE SD



Time span=0.01-60.00 hrs, dt=0.01 hrs, 6000 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Pond 1P: SD Inlet with Bypass SD Peak Elev=825.82' Inflow=93.81 cfs 17.708 af
Primary=93.81 cfs 17.708 af Secondary=0.00 cfs 0.000 af Outflow=93.81 cfs 17.708 af

Pond 2P: 60" SD MH Peak Elev=840.46' Inflow=20.20 cfs 3.392 af
Primary=20.20 cfs 3.392 af Secondary=0.00 cfs 0.000 af Outflow=20.20 cfs 3.392 af

Pond 15P: SD System 42" HDPE Peak Elev=844.66' Inflow=68.70 cfs 3.916 af
Outflow=68.70 cfs 3.916 af

Pond 16P: Dbl Conc. Arch Culvert (37x23) Peak Elev=844.69' Inflow=20.76 cfs 6.013 af
36.3" x 22.5", R=18.8"/51.0" Pipe Arch Culvert x 2.00 n=0.011 L=860.0' S=0.0024 '/' Outflow=20.76 cfs 6.013 af

Pond 17P: Gran Cielo Dwy Peak Elev=855.19' Storage=12,570 cf Inflow=222.96 cfs 41.649 af
Primary=118.06 cfs 37.935 af Secondary=0.66 cfs 0.009 af Tertiary=103.94 cfs 3.705 af Outflow=222.66 cfs 41.649 af

Pond 18P: GC-CkD1 Peak Elev=850.03' Storage=21,023 cf Inflow=223.80 cfs 57.362 af
Primary=0.62 cfs 0.037 af Secondary=49.36 cfs 1.730 af Tertiary=163.56 cfs 55.561 af Outflow=213.46 cfs 57.328 af

Pond 19P: GC-CkD2 Peak Elev=849.41' Storage=27,160 cf Inflow=76.40 cfs 6.218 af
Primary=1.30 cfs 1.510 af Secondary=50.40 cfs 4.202 af Tertiary=18.98 cfs 0.506 af Outflow=70.68 cfs 6.217 af

Pond 20P: GC-CkD3 Peak Elev=845.96' Storage=15,712 cf Inflow=67.10 cfs 8.618 af
Primary=6.37 cfs 4.056 af Secondary=10.21 cfs 1.141 af Tertiary=49.73 cfs 3.410 af Outflow=66.32 cfs 8.607 af

Pond B1: Basin 1 Peak Elev=838.35' Storage=7.075 af Inflow=143.08 cfs 18.094 af
Discarded=1.18 cfs 3.251 af Primary=42.68 cfs 14.446 af Secondary=0.00 cfs 0.000 af Outflow=43.86 cfs 17.698 af

Pond B10: Basin 10 Peak Elev=818.33' Storage=154,822 cf Inflow=42.03 cfs 9.094 af
Discarded=0.86 cfs 2.890 af Primary=14.28 cfs 5.727 af Secondary=0.00 cfs 0.000 af Outflow=15.14 cfs 8.617 af

Pond B11: Basin 11 Peak Elev=834.16' Storage=59,695 cf Inflow=26.34 cfs 4.086 af
Discarded=0.28 cfs 0.803 af Primary=10.23 cfs 3.020 af Secondary=0.00 cfs 0.000 af Outflow=10.51 cfs 3.823 af

Pond B12: Basin 12 Peak Elev=838.70' Storage=95,925 cf Inflow=35.58 cfs 5.330 af
Discarded=0.53 cfs 1.585 af Primary=5.12 cfs 3.464 af Secondary=0.00 cfs 0.000 af Outflow=5.64 cfs 5.049 af

Pond B13: Basin 13 Peak Elev=844.19' Storage=3.165 af Inflow=119.46 cfs 17.044 af
Discarded=0.48 cfs 1.396 af Primary=108.10 cfs 15.220 af Secondary=0.00 cfs 0.000 af Outflow=108.58 cfs 16.616 af

Pond B4: Basin 4 Peak Elev=840.12' Storage=144,637 cf Inflow=65.77 cfs 11.274 af
Discarded=0.60 cfs 1.723 af Primary=34.06 cfs 9.285 af Secondary=0.00 cfs 0.000 af Outflow=34.66 cfs 11.007 af

Pond B5: Basin 5 Peak Elev=848.15' Storage=78,258 cf Inflow=29.91 cfs 6.733 af
Discarded=0.42 cfs 1.257 af Primary=12.28 cfs 5.476 af Secondary=0.00 cfs 0.000 af Outflow=12.70 cfs 6.733 af

Pond B6: Basin 6 Peak Elev=851.88' Storage=2.255 af Inflow=49.06 cfs 9.876 af
Discarded=0.39 cfs 1.062 af Primary=32.02 cfs 8.518 af Secondary=0.00 cfs 0.000 af Outflow=32.41 cfs 9.581 af

Pond B7: Basin 7 Peak Elev=843.21' Storage=227,792 cf Inflow=53.39 cfs 20.246 af
Discarded=1.28 cfs 4.541 af Primary=22.91 cfs 15.562 af Secondary=0.00 cfs 0.000 af Outflow=24.18 cfs 20.103 af

Pond B8: Basin 8 Peak Elev=857.85' Storage=112,464 cf Inflow=39.82 cfs 9.971 af
Discarded=0.54 cfs 1.926 af Primary=24.66 cfs 8.046 af Secondary=0.00 cfs 0.000 af Outflow=25.20 cfs 9.971 af

Pond B9: Basin 9 Peak Elev=849.37' Storage=9,543 cf Inflow=8.24 cfs 1.988 af
Outflow=5.10 cfs 1.986 af

Pond Ex SD: Tract #1632 **Ex. 36" SD Outlet** Peak Elev=837.94' Inflow=22.91 cfs 15.562 af
36.0" Round Culvert n=0.012 L=150.0' S=0.0133 '/' Outflow=22.91 cfs 15.562 af

Pond MC Q: SD System Peak Elev=846.03' Storage=0.535 af Inflow=42.04 cfs 7.642 af
Discarded=0.12 cfs 0.377 af Primary=20.20 cfs 3.392 af Secondary=21.51 cfs 3.592 af Outflow=41.83 cfs 7.360 af

Pond SD: 42" HDPE SD Peak Elev=846.57' Inflow=36.40 cfs 13.522 af
42.0" Round Culvert n=0.012 L=840.0' S=0.0062 '/' Outflow=36.40 cfs 13.522 af

Summary for Pond 1P: SD Inlet with Bypass SD

Inflow Area = 108.566 ac, 6.93% Impervious, Inflow Depth = 1.96" for 100 Year event
Inflow = 93.81 cfs @ 9.98 hrs, Volume= 17.708 af
Outflow = 93.81 cfs @ 9.98 hrs, Volume= 17.708 af, Atten= 0%, Lag= 0.0 min
Primary = 93.81 cfs @ 9.98 hrs, Volume= 17.708 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

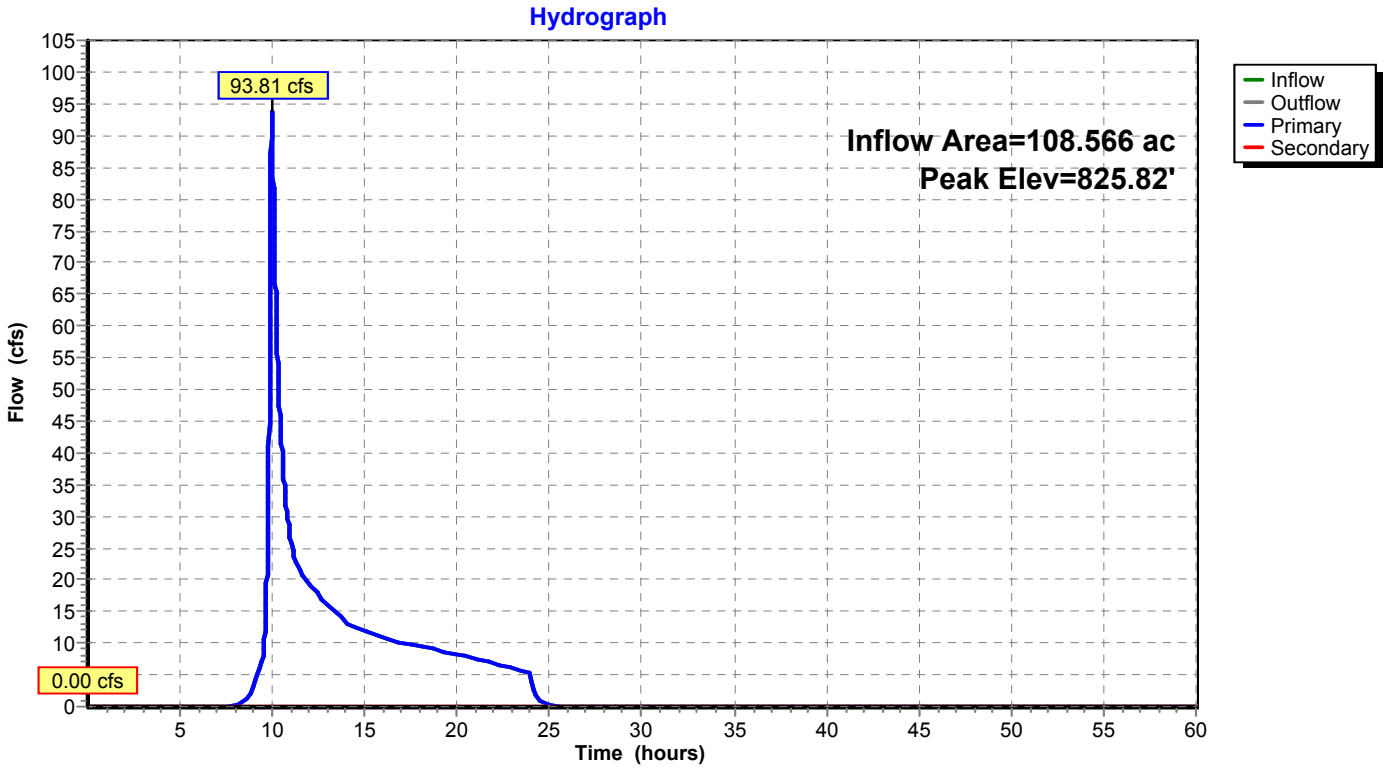
Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 825.82' @ 9.98 hrs
Flood Elev= 826.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	820.00'	**48.0" Round Culvert** L= 990.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 820.00' / 814.11' S= 0.0059 '/' Cc= 0.900 n= 0.012, Flow Area= 12.57 sf
#2	Device 1	824.50'	**78.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	825.90'	**Special & User-Defined** Head (feet) 0.00 0.50 0.67 0.83 Disch. (cfs) 0.000 200.000 450.000 1,200.000

Primary OutFlow Max=93.72 cfs @ 9.98 hrs HW=825.82' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 93.72 cfs of 117.53 cfs potential flow)
└─**2=Orifice/Grate** (Weir Controls 93.72 cfs @ 3.75 fps)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=820.00' TW=0.00' (Dynamic Tailwater)
└─**3=Special & User-Defined** (Controls 0.00 cfs)

Pond 1P: SD Inlet with Bypass SD



Summary for Pond 2P: 60" SD MH

Inflow Area = 21.500 ac, 80.00% Impervious, Inflow Depth = 1.89" for 100 Year event
Inflow = 20.20 cfs @ 9.99 hrs, Volume= 3.392 af
Outflow = 20.20 cfs @ 9.99 hrs, Volume= 3.392 af, Atten= 0%, Lag= 0.0 min
Primary = 20.20 cfs @ 9.99 hrs, Volume= 3.392 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

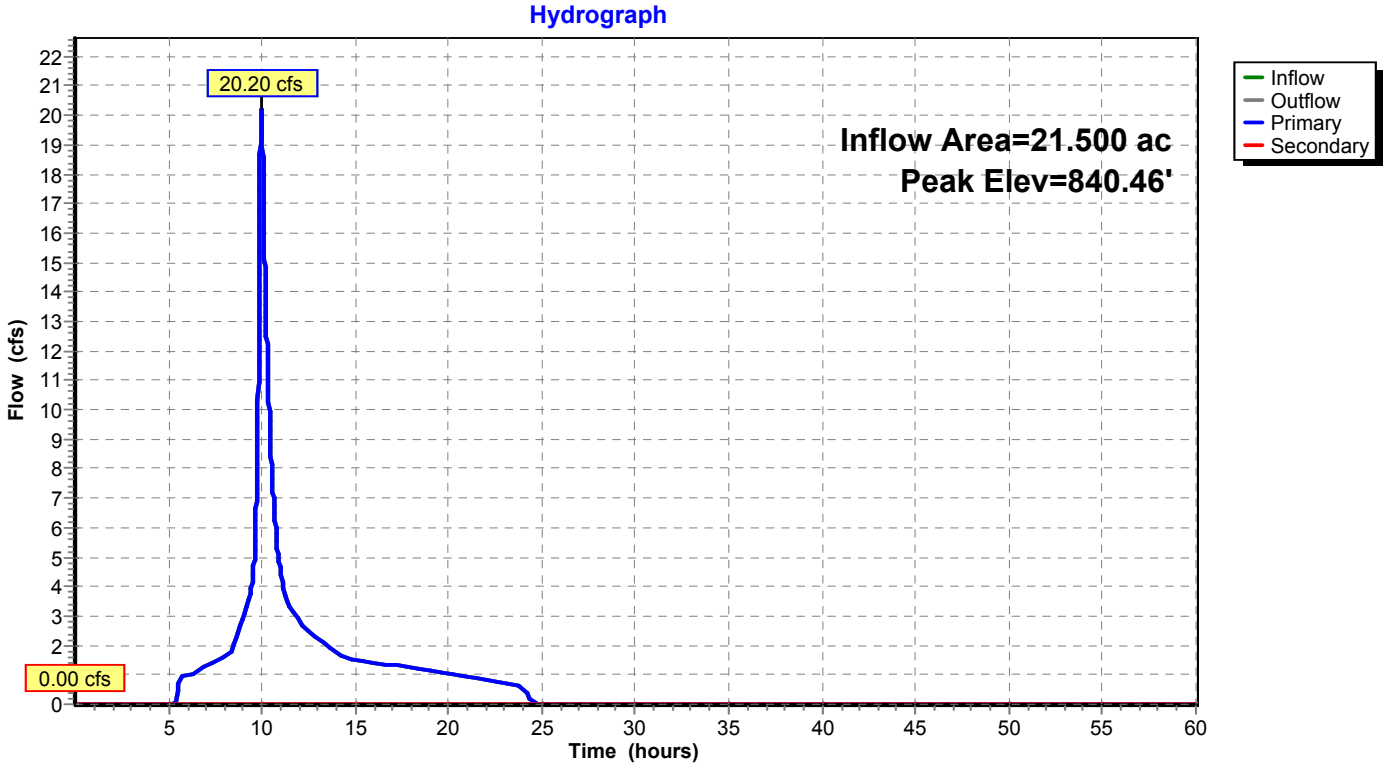
Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 840.46' @ 9.99 hrs
Flood Elev= 845.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	838.50'	**36.0" Round Culvert** L= 500.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 838.50' / 836.50' S= 0.0040 '/' Cc= 0.900 n= 0.012 Corrugated PP, smooth interior, Flow Area= 7.07 sf
#2	Secondary	844.25'	**69.6" W x 9.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=20.18 cfs @ 9.99 hrs HW=840.46' TW=836.26' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 20.18 cfs @ 5.87 fps)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=838.50' TW=826.50' (Dynamic Tailwater)
└**2=Orifice/Grate** (Controls 0.00 cfs)

Pond 2P: 60" SD MH



Summary for Pond 15P: SD System 42" HDPE

2 - 6 foot long curb openings (one on both sides of Linne Rd)
with 25 foot x 12 inch wide channel drain in Conc C&G

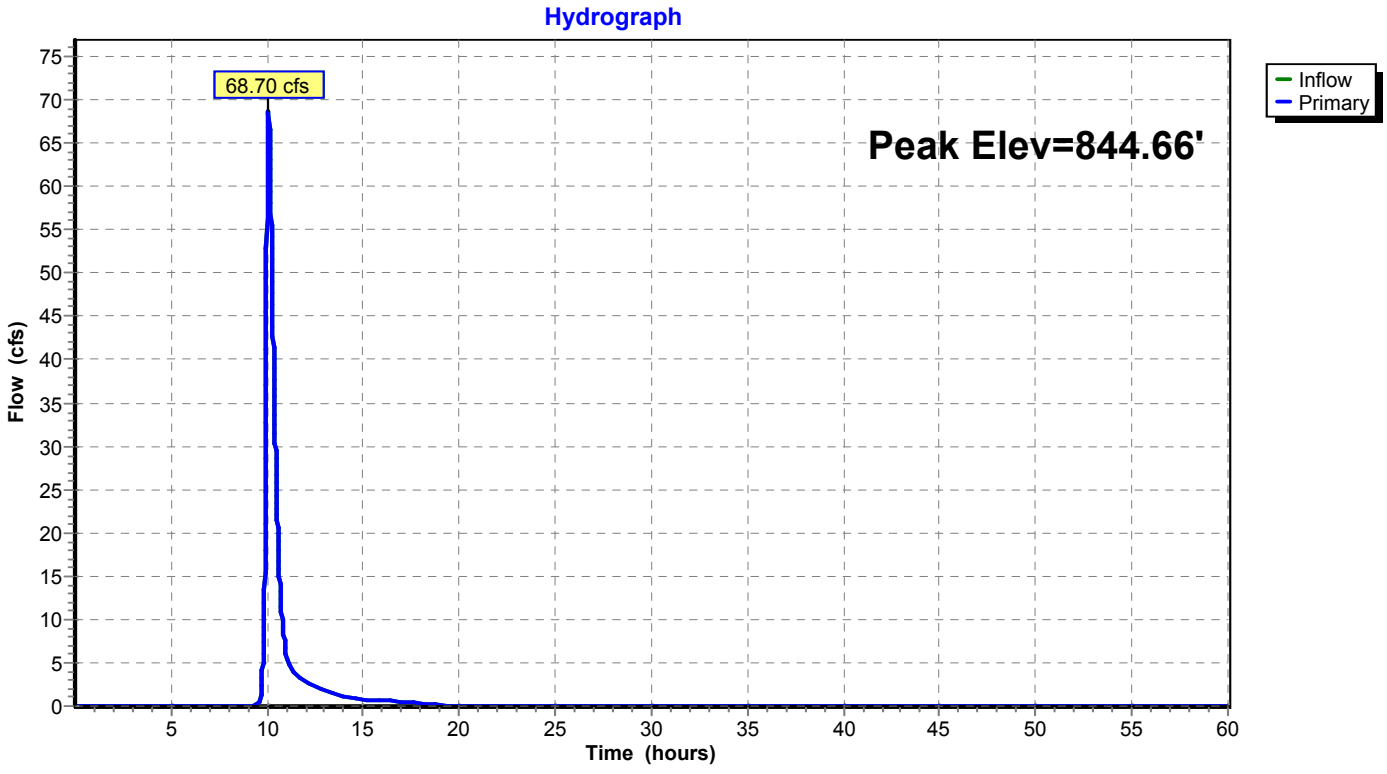
Inflow	=	68.70 cfs @	10.08 hrs, Volume=	3.916 af
Outflow	=	68.70 cfs @	10.08 hrs, Volume=	3.916 af, Atten= 0%, Lag= 0.0 min
Primary	=	68.70 cfs @	10.08 hrs, Volume=	3.916 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 844.66' @ 10.08 hrs
Flood Elev= 845.02'

Device	Routing	Invert	Outlet Devices
#1	Primary	839.75'	**42.0" Round Culvert** L= 1,370.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 839.75' / 833.60' S= 0.0045 '/' Cc= 0.900 n= 0.012, Flow Area= 9.62 sf
#2	Device 1	844.17'	**72.0" W x 9.0" H Vert. Orifice/Grate X 2.00** C= 0.600
#3	Device 1	844.25'	**12.0" x 180.0" Horiz. Orifice/Grate X 2.00** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=68.68 cfs @ 10.08 hrs HW=844.66' TW=836.94' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 68.68 cfs of 75.07 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 13.30 cfs @ 2.25 fps)
—**3=Orifice/Grate** (Weir Controls 55.38 cfs @ 2.10 fps)

Pond 15P: SD System 42" HDPE



Summary for Pond 16P: Dbl Conc. Arch Culvert (37x23)

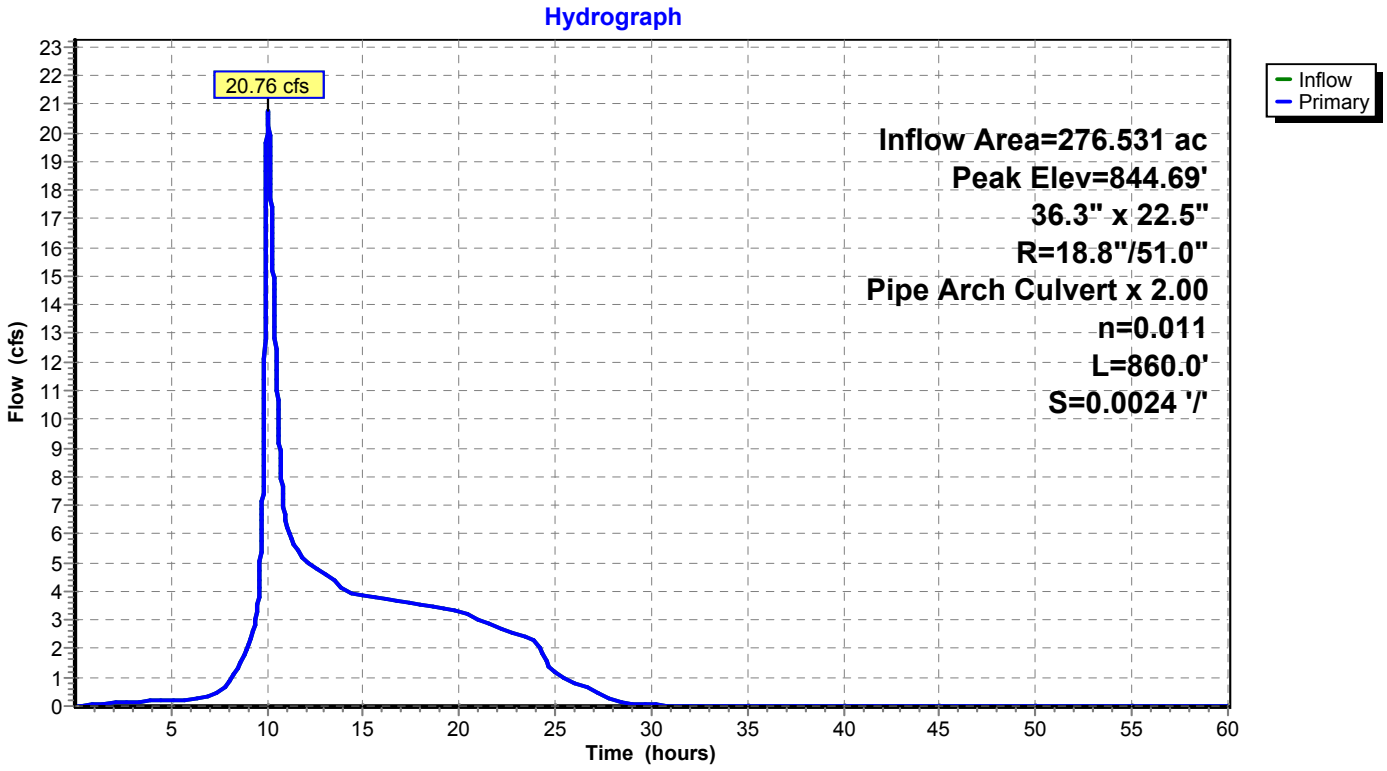
Inflow Area = 276.531 ac, 1.60% Impervious, Inflow Depth = 0.26" for 100 Year event
Inflow = 20.76 cfs @ 10.04 hrs, Volume= 6.013 af
Outflow = 20.76 cfs @ 10.04 hrs, Volume= 6.013 af, Atten= 0%, Lag= 0.0 min
Primary = 20.76 cfs @ 10.04 hrs, Volume= 6.013 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 844.69' @ 10.04 hrs
Flood Elev= 846.02'

Device	Routing	Invert	Outlet Devices
#1	Primary	843.50'	**36.3" W x 22.5" H, R=18.8"/51.0" Pipe Arch RCP_Arch 37x23 X 2.00** L= 860.0' RCP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 843.50' / 841.40' S= 0.0024 '/' Cc= 0.900 n= 0.011, Flow Area= 4.43 sf

Primary OutFlow Max=20.76 cfs @ 10.04 hrs HW=844.69' TW=0.00' (Dynamic Tailwater)
1=RCP_Arch 37x23 (Barrel Controls 20.76 cfs @ 4.40 fps)

Pond 16P: Dbl Conc. Arch Culvert (37x23)



Summary for Pond 17P: Gran Cielo Dwy

[58] Hint: Peaked 0.73' above defined flood level

Inflow Area = 166.738 ac, 0.91% Impervious, Inflow Depth = 3.00" for 100 Year event
Inflow = 222.96 cfs @ 9.98 hrs, Volume= 41.649 af
Outflow = 222.66 cfs @ 9.99 hrs, Volume= 41.649 af, Atten= 0%, Lag= 0.4 min
Primary = 118.06 cfs @ 9.99 hrs, Volume= 37.935 af
Secondary = 0.66 cfs @ 9.99 hrs, Volume= 0.009 af
Tertiary = 103.94 cfs @ 9.99 hrs, Volume= 3.705 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 855.19' @ 9.99 hrs Surf.Area= 8,552 sf Storage= 12,570 cf
Flood Elev= 854.46' Surf.Area= 6,947 sf Storage= 6,934 cf

Plug-Flow detention time= 1.7 min calculated for 41.642 af (100% of inflow)
Center-of-Mass det. time= 1.7 min (806.9 - 805.2)

Volume	Invert	Avail.Storage	Storage Description
#1	852.84'	22,270 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
852.84	0	0	0
853.14	2,586	388	388
854.14	6,275	4,431	4,818
855.14	8,376	7,326	12,144
856.14	11,876	10,126	22,270

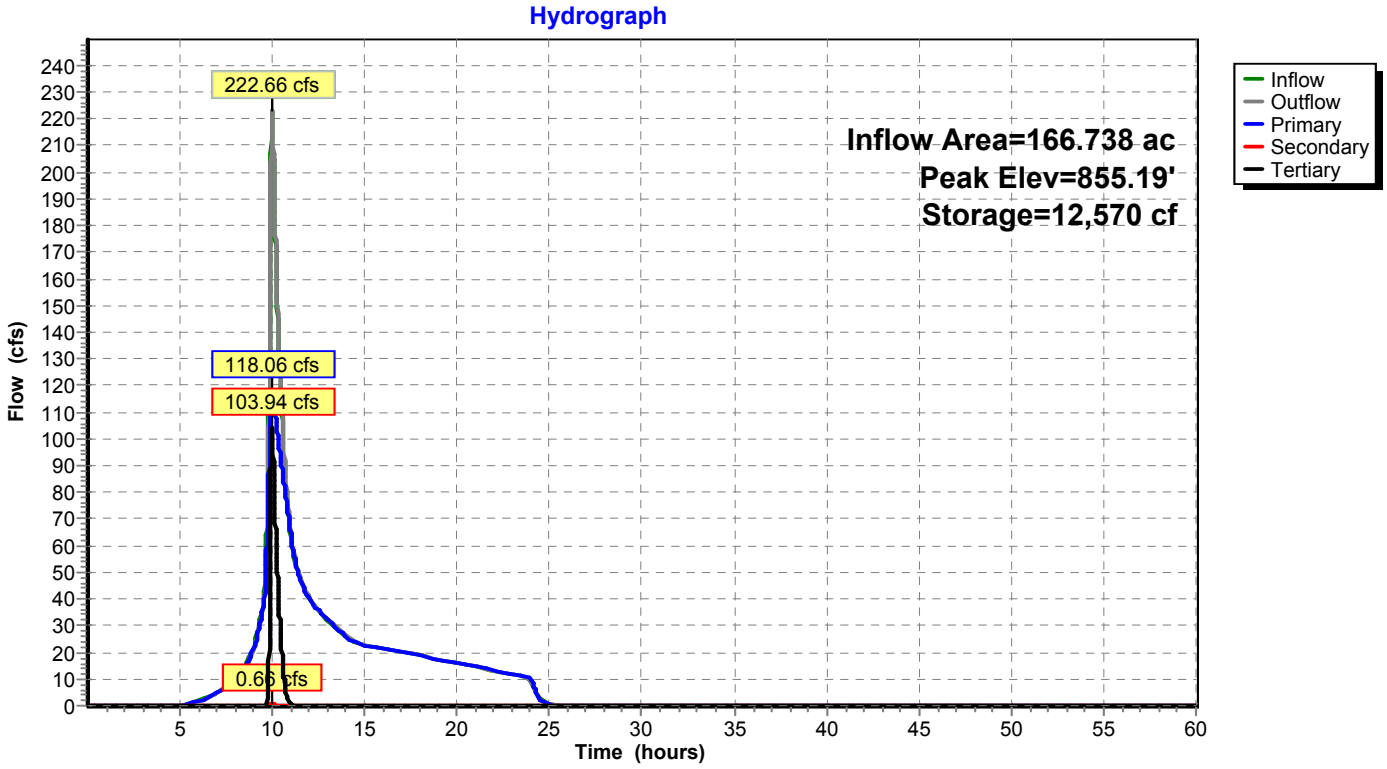
Device	Routing	Invert	Outlet Devices
#1	Primary	852.84'	**30.0" Round Culvert X 6.00** L= 77.0' CMP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 852.84' / 851.76' S= 0.0140 '/' Cc= 0.900 n= 0.025 Corrugated metal, Flow Area= 4.91 sf
#2	Secondary	854.90'	**Special & User-Defined** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 Disch. (cfs) 0.000 0.010 0.200 0.710 1.580 2.700 4.030 5.690 7.620 9.790 12.320 15.140 18.190 21.460 24.930 28.580 32.420 36.420 40.580 44.900 49.360 53.970
#3	Tertiary	854.40'	**Special & User-Defined** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 2.20 2.30 2.40 2.50 2.60 Disch. (cfs) 0.000 0.080 3.470 10.790 21.890 36.810 55.720 78.890 106.600 138.580 174.620 214.630 258.590 306.440 358.240 413.470 471.810 533.060 597.050 663.650 732.760 804.270 878.100 954.180 1,032.440 1,112.810 1,195.240

Primary OutFlow Max=118.05 cfs @ 9.99 hrs HW=855.19' TW=849.96' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 118.05 cfs @ 5.32 fps)

Secondary OutFlow Max=0.66 cfs @ 9.99 hrs HW=855.19' TW=849.96' (Dynamic Tailwater)
└**2=Special & User-Defined** (Custom Controls 0.66 cfs)

Tertiary OutFlow Max=103.87 cfs @ 9.99 hrs HW=855.19' TW=854.30' (Dynamic Tailwater)
└**3=Special & User-Defined** (Custom Controls 103.87 cfs)

Pond 17P: Gran Cielo Dwy



Summary for Pond 18P: GC-CkD1

Inflow Area = 240.622 ac, 1.05% Impervious, Inflow Depth = 2.86" for 100 Year event
Inflow = 223.80 cfs @ 9.98 hrs, Volume= 57.362 af
Outflow = 213.46 cfs @ 10.03 hrs, Volume= 57.328 af, Atten= 5%, Lag= 2.9 min
Primary = 0.62 cfs @ 9.99 hrs, Volume= 0.037 af
Secondary = 49.36 cfs @ 10.03 hrs, Volume= 1.730 af
Tertiary = 163.56 cfs @ 10.04 hrs, Volume= 55.561 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 850.03' @ 10.04 hrs Surf.Area= 17,046 sf Storage= 21,023 cf
Flood Elev= 850.17' Surf.Area= 18,446 sf Storage= 23,434 cf

Plug-Flow detention time= 1.5 min calculated for 57.318 af (100% of inflow)
Center-of-Mass det. time= 1.1 min (818.0 - 816.9)

Volume	Invert	Avail.Storage	Storage Description
#1	844.56'	70,294 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
844.56	10	0	0
845.00	200	46	46
846.00	600	400	446
847.00	1,500	1,050	1,496
848.00	2,166	1,833	3,329
849.00	7,688	4,927	8,256
850.00	16,694	12,191	20,447
851.00	27,000	21,847	42,294
852.00	29,000	28,000	70,294

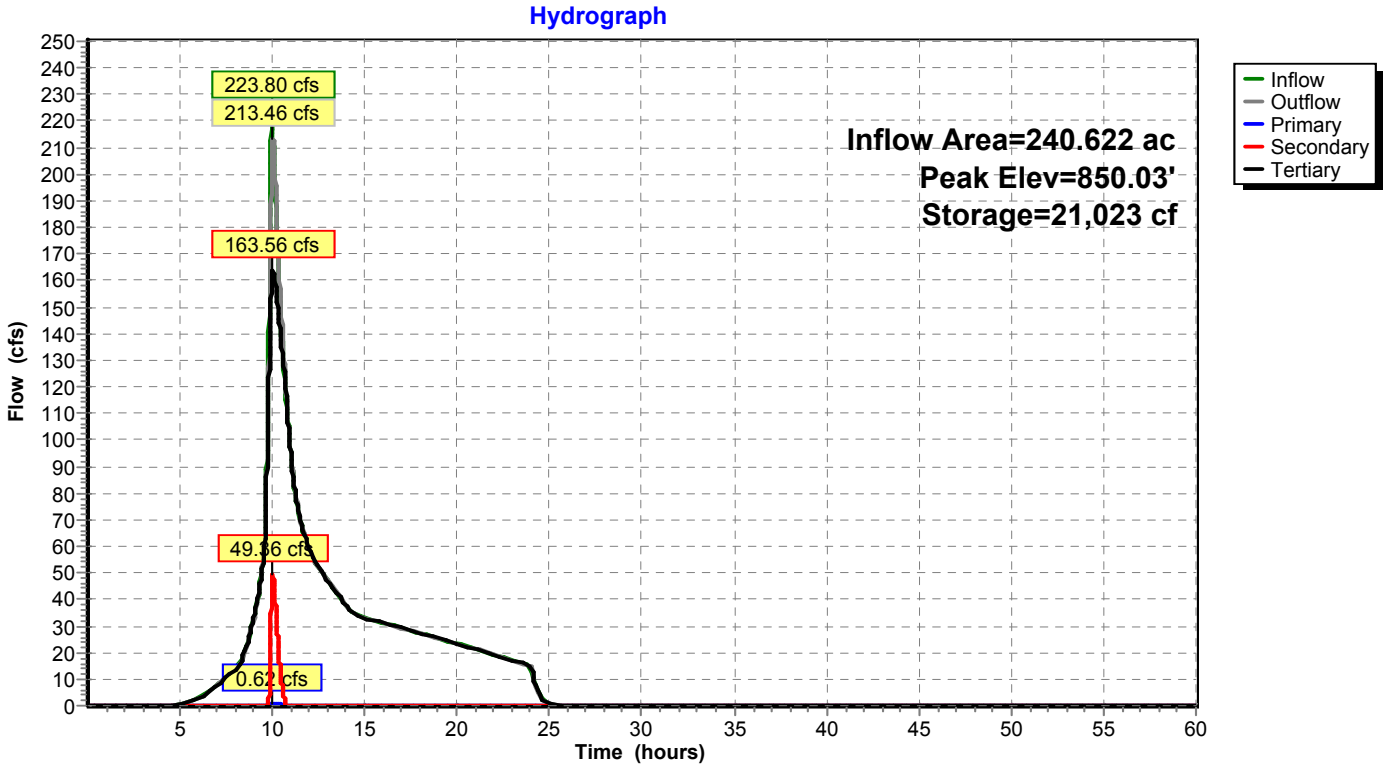
Device	Routing	Invert	Outlet Devices
#1	Primary	847.69'	**6.0" Round Culvert** L= 26.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 847.69' / 847.67' S= 0.0008 '/' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Secondary	848.50'	**9.0' long (Profile 1) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.92 3.37 3.59
#3	Tertiary	843.15'	**58.5" W x 36.0" H, R=30.0"/84.0" Pipe Arch RCP_Arch 59x36 X 2.00** L= 960.0' RCP, rounded edge headwall, Ke= 0.100 Inlet / Outlet Invert= 843.15' / 840.75' S= 0.0025 '/' Cc= 0.900 n= 0.013 Concrete pipe, bends & connections, Flow Area= 11.40 sf
#4	Device 3	847.00'	**78.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Tertiary	850.00'	**Special & User-Defined (CkD1-S)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 Disch. (cfs) 0.000 0.030 0.560 1.900 4.120 7.220 11.180 15.770 20.900 26.530 32.600 39.090 45.970 53.220 60.820 68.750 77.000 85.570 94.430 103.580 113.010

Primary OutFlow Max=0.60 cfs @ 9.99 hrs HW=849.97' TW=849.32' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.60 cfs @ 3.07 fps)

Secondary OutFlow Max=48.99 cfs @ 10.03 hrs HW=850.03' TW=849.38' (Dynamic Tailwater)
└─**2=Broad-Crested Rectangular Weir** (Weir Controls 48.99 cfs @ 3.56 fps)

Tertiary OutFlow Max=163.55 cfs @ 10.04 hrs HW=850.03' TW=841.75' (Dynamic Tailwater)
├─**3=RCP_Arch 59x36** (Passes 163.54 cfs of 178.99 cfs potential flow)
│ └─**4=Orifice/Grate** (Orifice Controls 163.54 cfs @ 8.39 fps)
└─**5=Special & User-Defined (CkD1-S)** (Custom Controls 0.01 cfs)

Pond 18P: GC-CkD1



Summary for Pond 19P: GC-CkD2

[58] Hint: Peaked 0.76' above defined flood level
[80] Warning: Exceeded Pond 18P by 0.68' @ 24.42 hrs (0.04 cfs 0.217 af)
[80] Warning: Exceeded Pond 18P by 0.01' @ 10.78 hrs (0.00 cfs 0.000 af)

Inflow Area =	260.311 ac,	0.99% Impervious,	Inflow Depth =	0.29"	for 100 Year event
Inflow =	76.40 cfs @	10.01 hrs,	Volume=	6.218 af	
Outflow =	70.68 cfs @	10.07 hrs,	Volume=	6.217 af,	Atten= 7%, Lag= 4.1 min
Primary =	1.30 cfs @	10.07 hrs,	Volume=	1.510 af	
Secondary =	50.40 cfs @	10.07 hrs,	Volume=	4.202 af	
Tertiary =	18.98 cfs @	10.07 hrs,	Volume=	0.506 af	

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 849.41' @ 10.07 hrs Surf.Area= 24,720 sf Storage= 27,160 cf
Flood Elev= 848.65' Surf.Area= 11,850 sf Storage= 14,787 cf

Plug-Flow detention time= 35.9 min calculated for 6.216 af (100% of inflow)
Center-of-Mass det. time= 35.9 min (790.1 - 754.2)

Volume	Invert	Avail.Storage	Storage Description
#1	846.00'	46,430 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
846.00	267	0	0
847.00	4,055	2,161	2,161
848.00	8,178	6,117	8,278
849.00	13,828	11,003	19,281
850.00	40,470	27,149	46,430

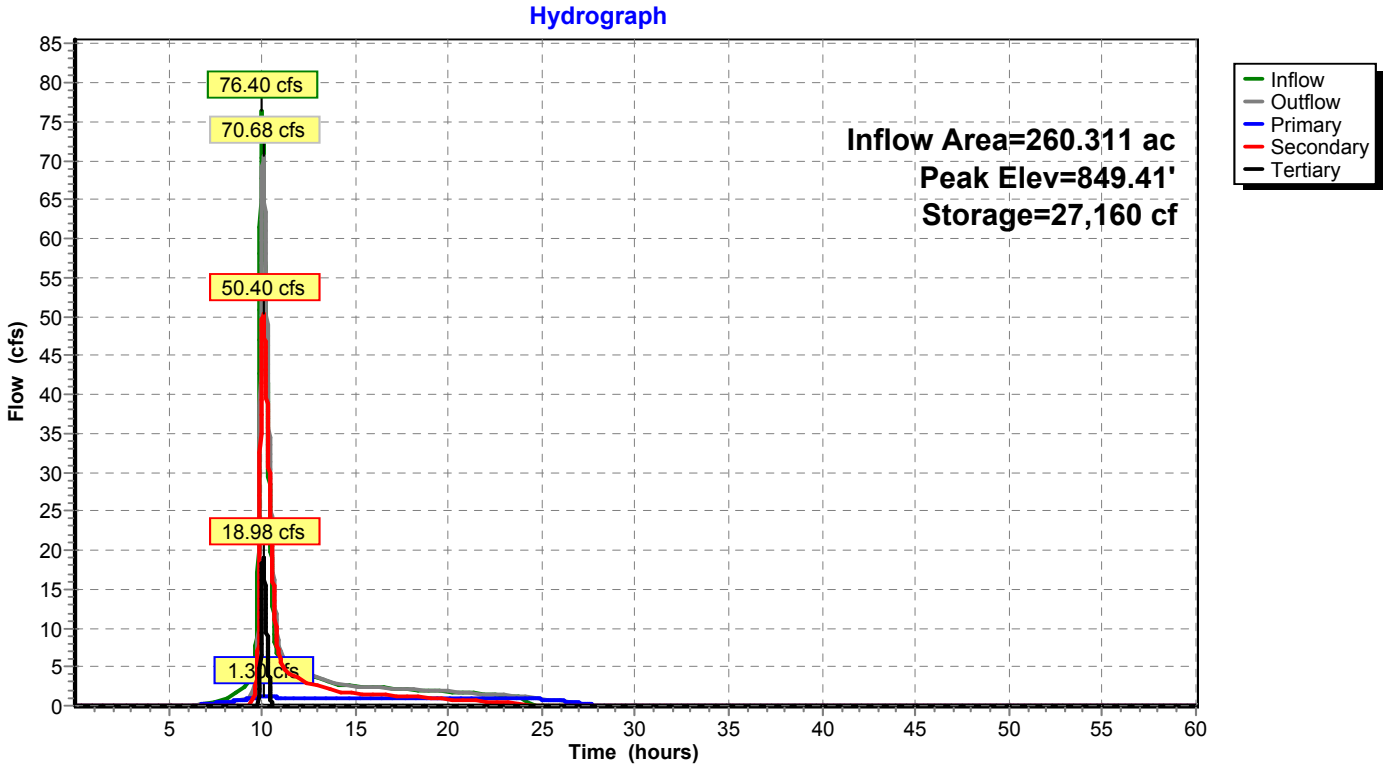
Device	Routing	Invert	Outlet Devices
#1	Primary	846.12'	**6.0" Round Culvert** L= 26.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 846.12' / 845.98' S= 0.0054 '/' Cc= 0.900 n= 0.010, Flow Area= 0.20 sf
#2	Tertiary	848.70'	**Special & User-Defined (CkD2-S)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 Disch. (cfs) 0.000 0.130 0.970 2.640 5.120 8.550 13.010 18.440 24.620 31.430 38.830 46.770 55.210 64.120
#3	Secondary	847.80'	**Special & User-Defined (CkD2-W)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 2.10 2.20 Disch. (cfs) 0.000 0.020 0.480 1.430 2.780 4.430 6.490 8.950 12.010 15.510 19.390 23.590 28.100 32.980 38.270 43.910 49.850 56.080 62.580 69.340 76.350 83.590 91.070

Primary OutFlow Max=1.30 cfs @ 10.07 hrs HW=849.41' TW=845.96' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.30 cfs @ 6.63 fps)

Secondary OutFlow Max=50.38 cfs @ 10.07 hrs HW=849.41' TW=845.96' (Dynamic Tailwater)
└**3=Special & User-Defined (CkD2-W)** (Custom Controls 50.38 cfs)

Tertiary OutFlow Max=18.97 cfs @ 10.07 hrs HW=849.41' TW=0.00' (Dynamic Tailwater)
└**2=Special & User-Defined (CkD2-S)** (Custom Controls 18.97 cfs)

Pond 19P: GC-CkD2



Summary for Pond 20P: GC-CkD3

[58] Hint: Peaked 0.94' above defined flood level

Inflow Area = 274.094 ac, 0.94% Impervious, Inflow Depth = 0.38" for 100 Year event
Inflow = 67.10 cfs @ 10.05 hrs, Volume= 8.618 af
Outflow = 66.32 cfs @ 10.08 hrs, Volume= 8.607 af, Atten= 1%, Lag= 2.1 min
Primary = 6.37 cfs @ 10.08 hrs, Volume= 4.056 af
Secondary = 10.21 cfs @ 10.08 hrs, Volume= 1.141 af
Tertiary = 49.73 cfs @ 10.08 hrs, Volume= 3.410 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 845.96' @ 10.08 hrs Surf.Area= 14,780 sf Storage= 15,712 cf
Flood Elev= 845.02' Surf.Area= 8,229 sf Storage= 4,852 cf

Plug-Flow detention time= 19.5 min calculated for 8.605 af (100% of inflow)
Center-of-Mass det. time= 18.6 min (829.5 - 810.9)

Volume	Invert	Avail.Storage	Storage Description
#1	844.00'	24,632 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
844.00	1,288	0	0
845.00	8,090	4,689	4,689
846.50	18,500	19,943	24,632

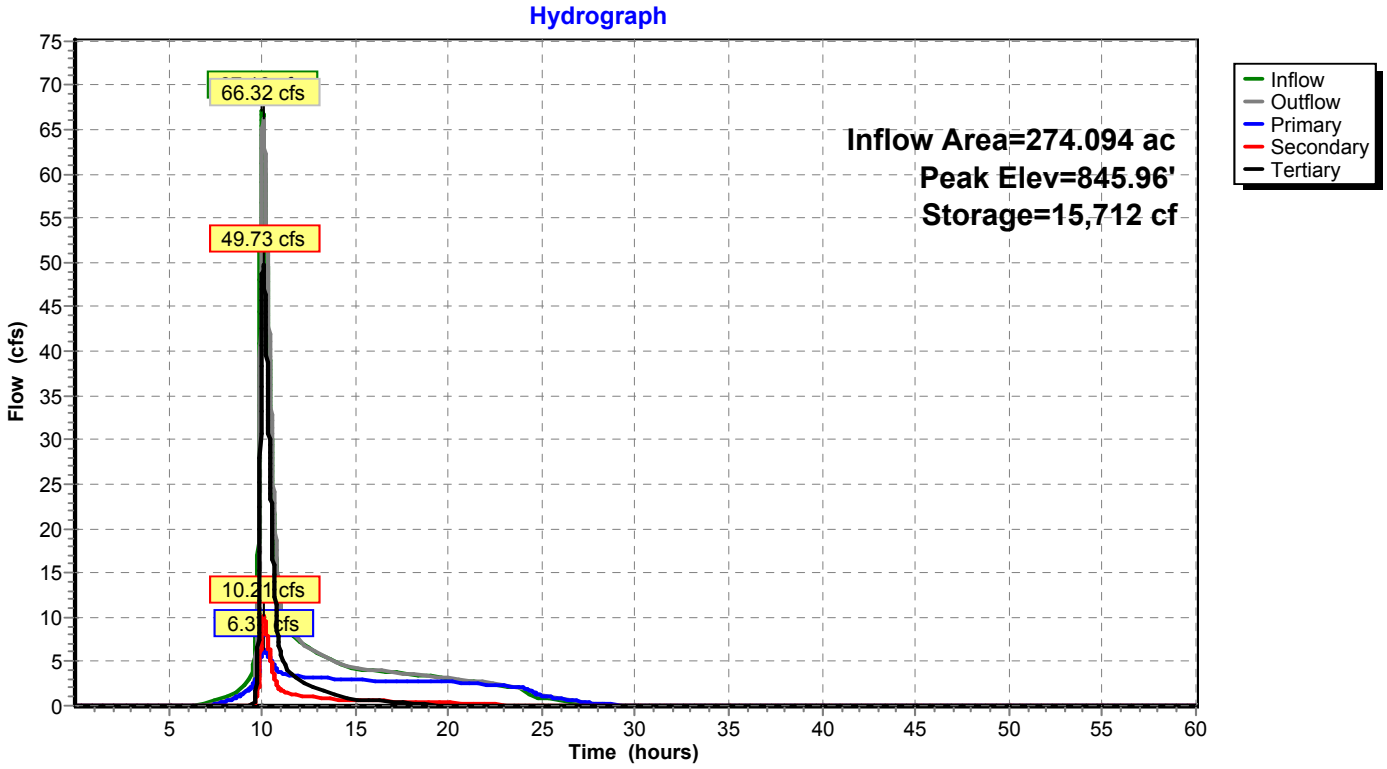
Device	Routing	Invert	Outlet Devices
#1	Primary	844.22'	**18.0" Round Culvert** L= 26.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 844.22' / 843.98' S= 0.0092 '/' Cc= 0.900 n= 0.021 Corrugated metal, Flow Area= 1.77 sf
#2	Secondary	845.00'	**Special & User-Defined (CkD3-W)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 2.00 Disch. (cfs) 0.000 0.050 0.390 0.970 1.710 2.600 3.780 5.170 6.720 8.570 11.140 14.290 17.880 21.830 26.120 30.880 36.030 41.520 47.330 53.420 59.790
#3	Tertiary	845.10'	**Special & User-Defined (CkD3-S)** Head (feet) 0.00 0.10 0.20 0.30 0.40 0.50 0.60 0.70 0.80 0.90 1.00 1.10 1.20 1.30 1.40 1.50 1.60 1.70 1.80 1.90 Disch. (cfs) 0.000 0.050 1.930 5.420 10.370 16.490 23.960 32.580 42.550 53.770 66.380 80.510 96.280 113.770 132.840 153.630 175.910 199.510 224.310 250.260

Primary OutFlow Max=6.37 cfs @ 10.08 hrs HW=845.96' TW=844.68' (Dynamic Tailwater)
↑—**1=Culvert** (Barrel Controls 6.37 cfs @ 3.90 fps)

Secondary OutFlow Max=10.21 cfs @ 10.08 hrs HW=845.96' TW=844.68' (Dynamic Tailwater)
↑—**2=Special & User-Defined (CkD3-W)** (Custom Controls 10.21 cfs)

Tertiary OutFlow Max=49.73 cfs @ 10.08 hrs HW=845.96' TW=0.00' (Dynamic Tailwater)
↑—**3=Special & User-Defined (CkD3-S)** (Custom Controls 49.73 cfs)

Pond 20P: GC-CkD3



Summary for Pond B1: Basin 1

Inflow Area = 47.388 ac, 67.98% Impervious, Inflow Depth = 4.58" for 100 Year event
Inflow = 143.08 cfs @ 10.02 hrs, Volume= 18.094 af
Outflow = 43.86 cfs @ 10.61 hrs, Volume= 17.698 af, Atten= 69%, Lag= 35.3 min
Discarded = 1.18 cfs @ 10.61 hrs, Volume= 3.251 af
Primary = 42.68 cfs @ 10.61 hrs, Volume= 14.446 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 838.35' @ 10.61 hrs Surf.Area= 1.456 ac Storage= 7.075 af

Plug-Flow detention time= 283.5 min calculated for 17.695 af (98% of inflow)
Center-of-Mass det. time= 268.5 min (991.2 - 722.7)

Volume	Invert	Avail.Storage	Storage Description
#1	826.50'	8.466 af	**Custom Stage Data (Prismatic)** Listed below (Recalc) 8.789 af Overall - 0.323 af Embedded = 8.466 af
#2	826.50'	0.129 af	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 0.323 af Overall x 40.0% Voids
		8.595 af	Total Available Storage

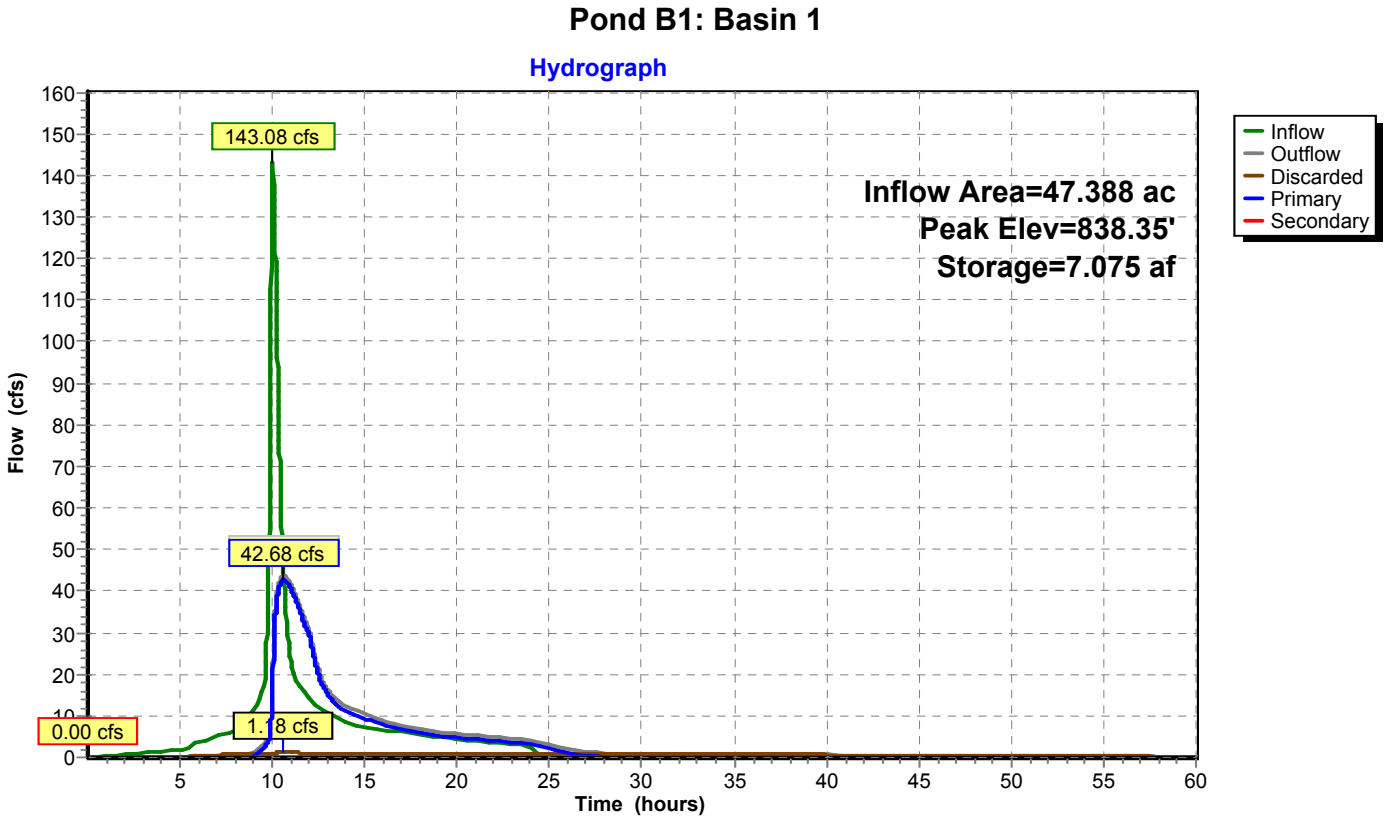
Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
826.50	0.081	0.000	0.000
827.00	0.081	0.040	0.040
828.00	0.081	0.081	0.121
829.00	0.081	0.081	0.202
830.00	0.081	0.081	0.283
831.00	0.081	0.081	0.365
832.00	0.203	0.142	0.506
833.00	0.376	0.289	0.796
834.00	1.171	0.774	1.569
835.00	1.234	1.202	2.772
836.00	1.299	1.267	4.038
837.00	1.365	1.332	5.370
838.00	1.432	1.399	6.769
839.00	1.500	1.466	8.235
839.35	1.665	0.554	8.789

Device	Routing	Invert	Outlet Devices
#1	Primary	833.12'	**36.0" Round Culvert** L= 385.5' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 833.12' / 831.20' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf
#2	Discarded	826.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	834.33'	**16.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	834.33'	**12.0" W x 8.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	835.33'	**30.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	836.17'	**24.0" Horiz. Orifice/Grate** C= 0.600 in 78.0" x 36.0" Grate (16% open area) Limited to weir flow at low heads
#7	Secondary	838.35'	**30.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=1.18 cfs @ 10.61 hrs HW=838.35' (Free Discharge)
└**2=Exfiltration** (Controls 1.18 cfs)

Primary OutFlow Max=42.68 cfs @ 10.61 hrs HW=838.35' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 42.68 cfs of 58.61 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 4.20 cfs @ 9.45 fps)
  └**4=Orifice/Grate** (Orifice Controls 6.16 cfs @ 9.24 fps)
  └**5=Orifice/Grate** (Orifice Controls 10.01 cfs @ 8.01 fps)
  └**6=Orifice/Grate** (Orifice Controls 22.32 cfs @ 7.10 fps)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=826.50' TW=0.00' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)



Summary for Pond B10: Basin 10

Inflow Area = 30.685 ac, 61.94% Impervious, Inflow Depth = 3.56" for 100 Year event
Inflow = 42.03 cfs @ 9.98 hrs, Volume= 9.094 af
Outflow = 15.14 cfs @ 10.82 hrs, Volume= 8.617 af, Atten= 64%, Lag= 50.5 min
Discarded = 0.86 cfs @ 10.82 hrs, Volume= 2.890 af
Primary = 14.28 cfs @ 10.82 hrs, Volume= 5.727 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 818.33' @ 10.82 hrs Surf.Area= 46,380 sf Storage= 154,822 cf

Plug-Flow detention time= 493.0 min calculated for 8.615 af (95% of inflow)
Center-of-Mass det. time= 457.8 min (1,196.1 - 738.2)

Volume	Invert	Avail.Storage	Storage Description
#1	808.50'	230,693 cf	**Custom Stage Data (Conic)** Listed below (Recalc) 244,773 cf Overall - 14,080 cf Embedded = 230,693 cf
#2	808.50'	5,632 cf	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 14,080 cf Overall x 40.0% Voids
		236,325 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
808.50	3,520	0	0	3,520
809.00	3,520	1,760	1,760	3,625
810.00	3,520	3,520	5,280	3,835
811.00	3,520	3,520	8,800	4,046
812.00	3,520	3,520	12,320	4,256
813.00	3,520	3,520	15,840	4,466
814.00	8,931	6,019	21,859	9,884
815.00	17,294	12,884	34,744	18,257
816.00	40,146	27,930	62,673	41,116
817.00	42,792	41,462	104,135	43,859
818.00	45,490	44,134	148,269	46,658
819.00	48,243	46,860	195,129	49,516
820.00	51,058	49,644	244,773	52,440

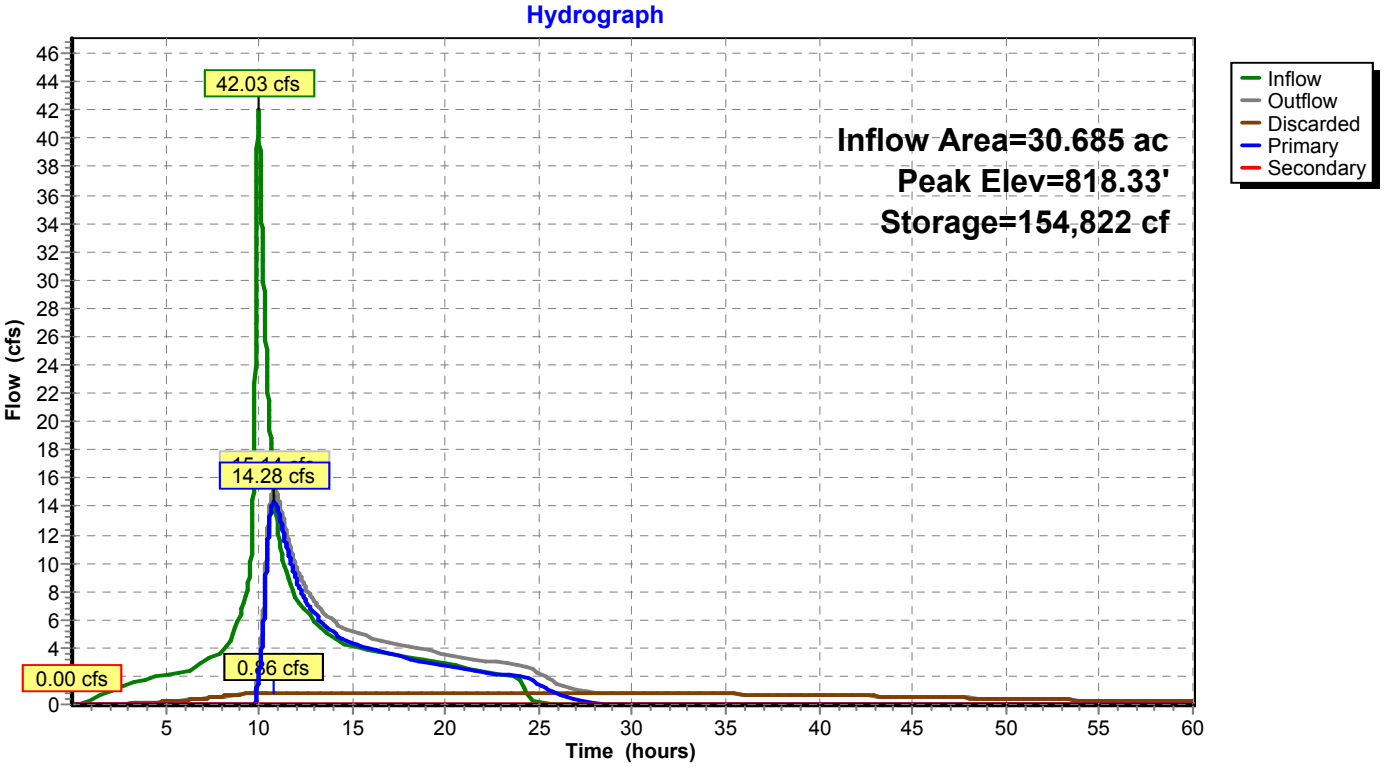
Device	Routing	Invert	Outlet Devices
#1	Primary	816.00'	**30.0" Round Culvert** L= 45.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 816.00' / 815.10' S= 0.0200 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Discarded	808.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	816.67'	**24.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	817.33'	**15.0" W x 18.0" H Vert. Orifice/Grate** X 2 rows with 8.0" cc spacing C= 0.600
#5	Device 1	817.83'	**60.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	819.00'	**78.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#7	Secondary	819.33'	**36.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.86 cfs @ 10.82 hrs HW=818.33' (Free Discharge)
└**2=Exfiltration** (Controls 0.86 cfs)

Primary OutFlow Max=14.28 cfs @ 10.82 hrs HW=818.33' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 14.28 cfs of 24.72 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 3.92 cfs @ 5.87 fps)
  └**4=Orifice/Grate** (Orifice Controls 4.75 cfs @ 2.87 fps)
  └**5=Orifice/Grate** (Orifice Controls 5.62 cfs @ 2.26 fps)
  └**6=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=808.50' TW=0.00' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B10: Basin 10



Summary for Pond B11: Basin 11

Inflow Area = 14.461 ac, 52.00% Impervious, Inflow Depth = 3.39" for 100 Year event
Inflow = 26.34 cfs @ 9.96 hrs, Volume= 4.086 af
Outflow = 10.51 cfs @ 10.34 hrs, Volume= 3.823 af, Atten= 60%, Lag= 22.6 min
Discarded = 0.28 cfs @ 10.34 hrs, Volume= 0.803 af
Primary = 10.23 cfs @ 10.34 hrs, Volume= 3.020 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 834.16' @ 10.34 hrs Surf.Area= 14,170 sf Storage= 59,695 cf

Plug-Flow detention time= 344.1 min calculated for 3.822 af (94% of inflow)
Center-of-Mass det. time= 302.3 min (1,041.3 - 739.1)

Volume	Invert	Avail.Storage	Storage Description
#1	823.50'	83,101 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 97,181 cf Overall - 14,080 cf Embedded = 83,101 cf
#2	823.50'	5,632 cf	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 14,080 cf Overall x 40.0% Voids
		88,733 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
823.50	3,520	0	0
824.00	3,520	1,760	1,760
825.00	3,520	3,520	5,280
826.00	3,520	3,520	8,800
827.00	3,520	3,520	12,320
828.00	3,520	3,520	15,840
829.00	2,800	3,160	19,000
830.00	6,900	4,850	23,850
831.00	8,919	7,910	31,760
832.00	10,515	9,717	41,477
833.00	12,169	11,342	52,819
834.00	13,879	13,024	65,843
835.00	15,655	14,767	80,610
836.00	17,488	16,572	97,181

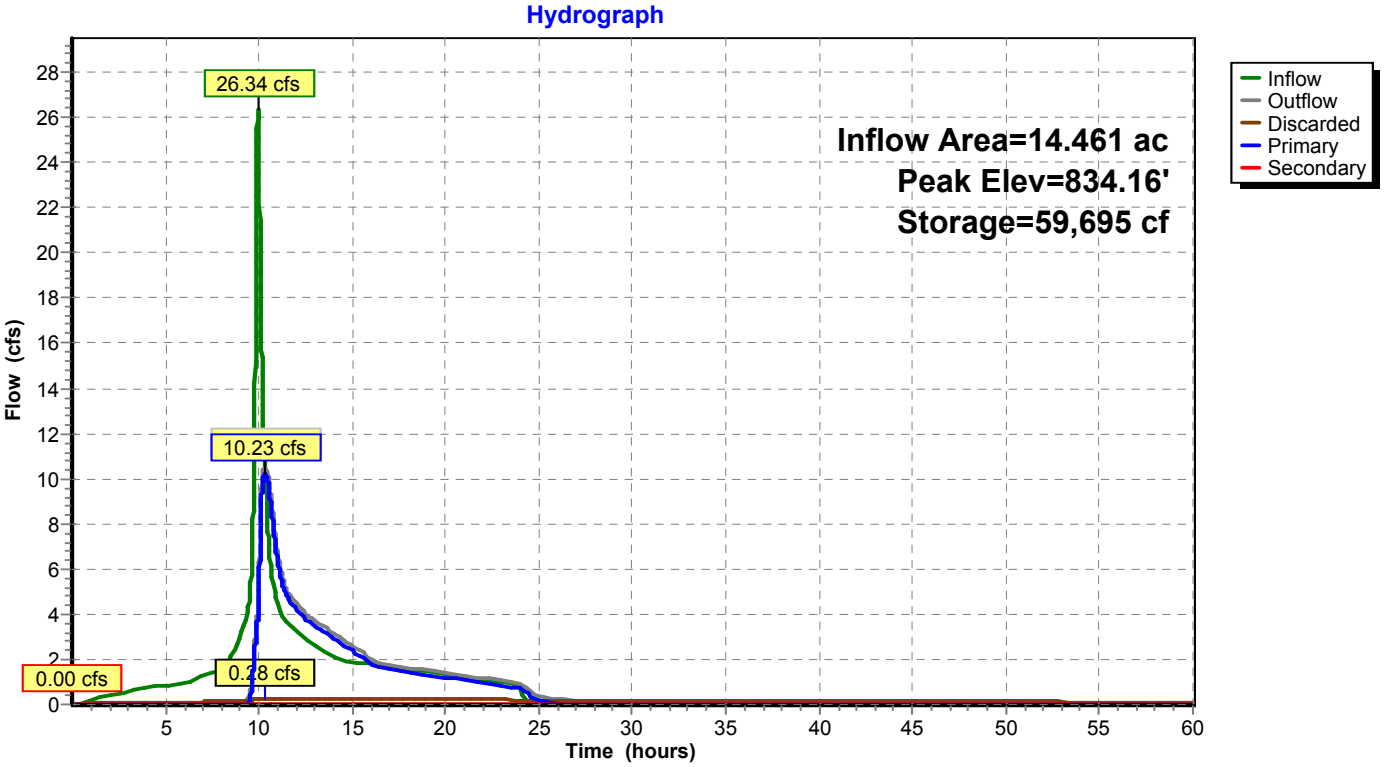
Device	Routing	Invert	Outlet Devices
#1	Primary	831.67'	**24.0" Round Culvert** L= 165.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 831.67' / 820.50' S= 0.0677 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Discarded	823.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	831.67'	**24.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	833.00'	**6.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	833.50'	**27.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	834.50'	**48.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#7	Secondary	834.83'	**16.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.28 cfs @ 10.34 hrs HW=834.16' (Free Discharge)
└**2=Exfiltration** (Controls 0.28 cfs)

Primary OutFlow Max=10.23 cfs @ 10.34 hrs HW=834.16' TW=825.37' (Dynamic Tailwater)
└**1=Culvert** (Passes 10.23 cfs of 18.49 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 4.90 cfs @ 7.34 fps)
  └**4=Orifice/Grate** (Orifice Controls 1.91 cfs @ 3.82 fps)
  └**5=Orifice/Grate** (Orifice Controls 3.43 cfs @ 3.05 fps)
  └**6=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=823.50' TW=820.00' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B11: Basin 11



Summary for Pond B12: Basin 12

Inflow Area = 20.201 ac, 44.06% Impervious, Inflow Depth = 3.17" for 100 Year event
Inflow = 35.58 cfs @ 9.96 hrs, Volume= 5.330 af
Outflow = 5.64 cfs @ 11.06 hrs, Volume= 5.049 af, Atten= 84%, Lag= 65.9 min
Discarded = 0.53 cfs @ 11.06 hrs, Volume= 1.585 af
Primary = 5.12 cfs @ 11.06 hrs, Volume= 3.464 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 838.70' @ 11.06 hrs Surf.Area= 27,914 sf Storage= 95,925 cf

Plug-Flow detention time= 476.3 min calculated for 5.049 af (95% of inflow)
Center-of-Mass det. time= 442.0 min (1,189.9 - 747.9)

Volume	Invert	Avail.Storage	Storage Description
#1	828.50'	160,016 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 174,096 cf Overall - 14,080 cf Embedded = 160,016 cf
#2	828.50'	5,632 cf	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 14,080 cf Overall x 40.0% Voids
		165,648 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
828.50	3,520	0	0
829.00	3,520	1,760	1,760
830.00	3,520	3,520	5,280
831.00	3,520	3,520	8,800
832.00	3,520	3,520	12,320
833.00	3,520	3,520	15,840
834.00	2,600	3,060	18,900
835.00	8,000	5,300	24,200
836.00	20,849	14,425	38,625
837.00	23,415	22,132	60,757
838.00	26,037	24,726	85,483
839.00	28,717	27,377	112,860
840.00	31,383	30,050	142,910
841.00	30,990	31,187	174,096

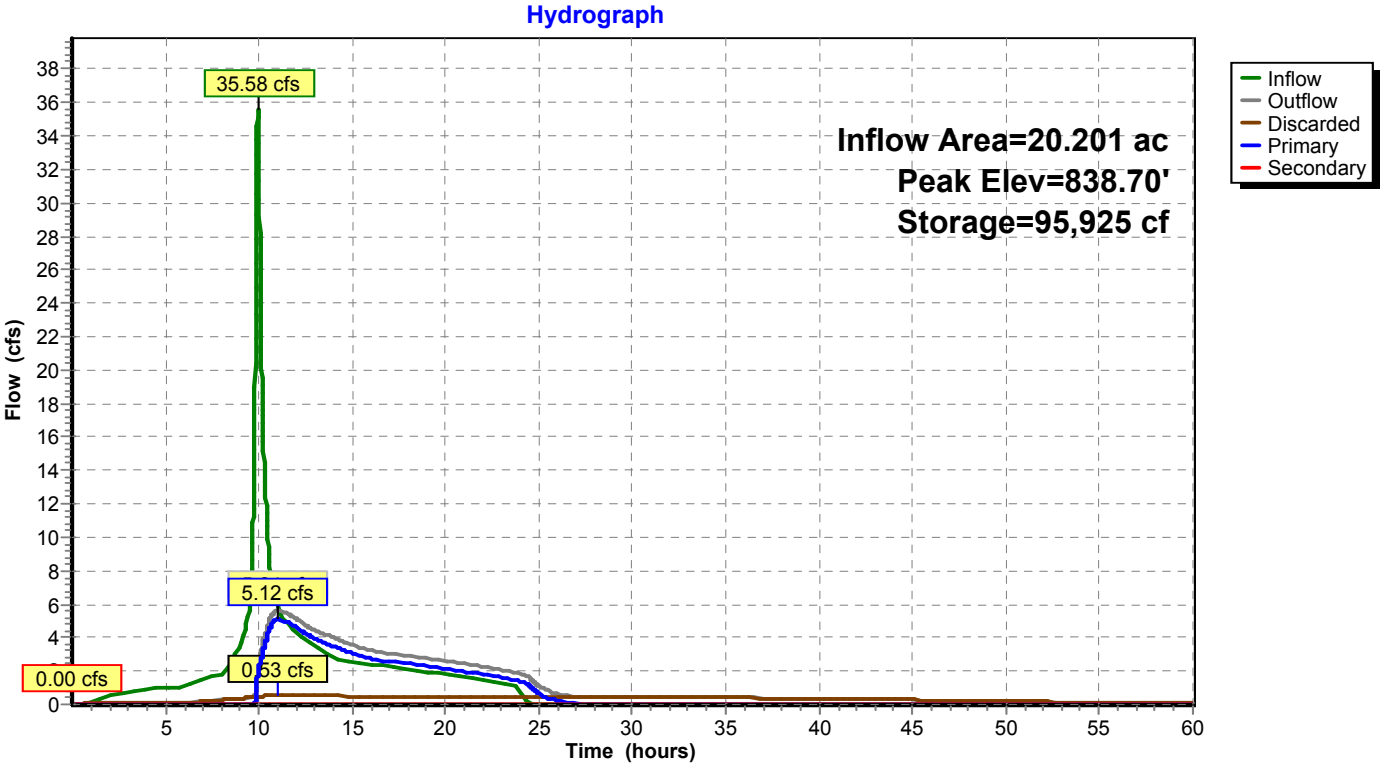
Device	Routing	Invert	Outlet Devices
#1	Primary	836.67'	**30.0" Round Culvert** L= 130.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 836.67' / 832.50' S= 0.0321 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Discarded	828.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	836.67'	**18.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	838.00'	**8.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	838.50'	**24.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	839.50'	**36.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#7	Secondary	840.00'	**18.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.53 cfs @ 11.06 hrs HW=838.70' (Free Discharge)
└**2=Exfiltration** (Controls 0.53 cfs)

Primary OutFlow Max=5.12 cfs @ 11.06 hrs HW=838.70' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 5.12 cfs of 20.71 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 3.29 cfs @ 6.57 fps)
  ├**4=Orifice/Grate** (Orifice Controls 1.25 cfs @ 2.69 fps)
  ├**5=Orifice/Grate** (Orifice Controls 0.58 cfs @ 1.44 fps)
  └**6=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=828.50' TW=0.00' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B12: Basin 12



Summary for Pond B13: Basin 13

Inflow Area = 64.115 ac, 22.11% Impervious, Inflow Depth = 3.19" for 100 Year event
Inflow = 119.46 cfs @ 9.96 hrs, Volume= 17.044 af
Outflow = 108.58 cfs @ 10.01 hrs, Volume= 16.616 af, Atten= 9%, Lag= 3.0 min
Discarded = 0.48 cfs @ 10.01 hrs, Volume= 1.396 af
Primary = 108.10 cfs @ 10.01 hrs, Volume= 15.220 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 844.19' @ 10.01 hrs Surf.Area= 0.565 ac Storage= 3.165 af

Plug-Flow detention time= 181.0 min calculated for 16.613 af (97% of inflow)
Center-of-Mass det. time= 164.8 min (933.9 - 769.1)

Volume	Invert	Avail.Storage	Storage Description
#1	830.50'	4.138 af	**Custom Stage Data (Prismatic)** Listed below (Recalc) 4.461 af Overall - 0.323 af Embedded = 4.138 af
#2	830.50'	0.129 af	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 0.323 af Overall x 40.0% Voids
		4.267 af	Total Available Storage

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
830.50	0.081	0.000	0.000
831.00	0.081	0.040	0.040
832.00	0.081	0.081	0.121
833.00	0.081	0.081	0.202
834.00	0.081	0.081	0.283
835.00	0.081	0.081	0.364
836.00	0.059	0.070	0.433
837.00	0.139	0.099	0.532
838.00	0.287	0.213	0.745
839.00	0.329	0.308	1.053
840.00	0.372	0.350	1.403
841.00	0.416	0.394	1.797
842.00	0.461	0.439	2.236
843.00	0.508	0.484	2.720
844.00	0.555	0.531	3.251
845.00	0.605	0.580	3.831
846.00	0.655	0.630	4.461

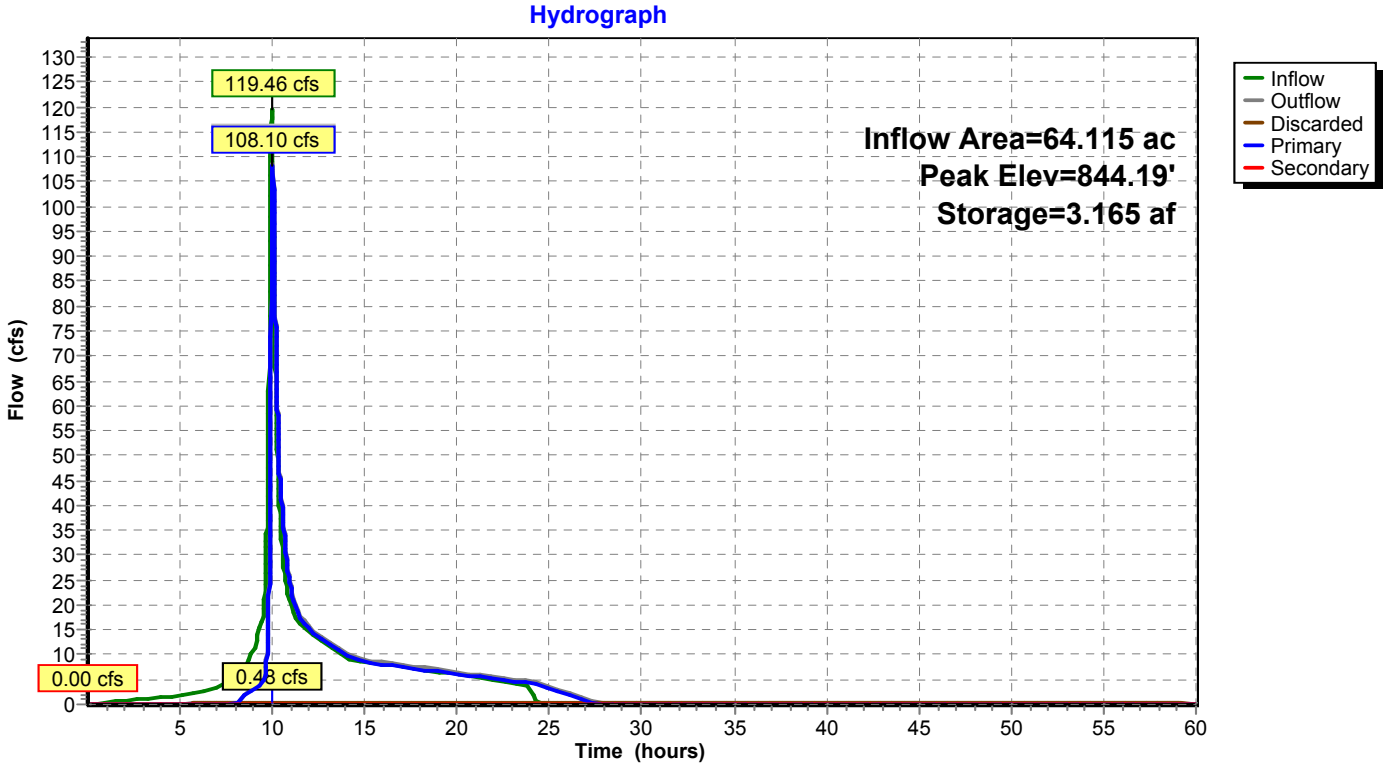
Device	Routing	Invert	Outlet Devices
#1	Primary	834.25'	**48.0" Round Culvert** L= 175.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 834.25' / 832.50' S= 0.0100 '/' Cc= 0.900 n= 0.012, Flow Area= 12.57 sf
#2	Discarded	830.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	839.67'	**24.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	841.50'	**15.0" W x 18.0" H Vert. Orifice/Grate** X 2 rows with 8.0" cc spacing C= 0.600
#5	Device 1	842.50'	**60.0" W x 8.0" H Vert. Orifice/Grate** X 2 rows with 8.0" cc spacing C= 0.600
#6	Device 1	843.67'	**78.0" x 36.0" Horiz. Orifice/Grate** X 2 rows C= 0.600 Limited to weir flow at low heads
#7	Secondary	844.67'	**36.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.48 cfs @ 10.01 hrs HW=844.19' (Free Discharge)
└**2=Exfiltration** (Controls 0.48 cfs)

Primary OutFlow Max=108.04 cfs @ 10.01 hrs HW=844.19' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 108.04 cfs of 170.52 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 6.70 cfs @ 10.05 fps)
  └**4=Orifice/Grate** (Orifice Controls 22.54 cfs @ 6.01 fps)
  └**5=Orifice/Grate** (Orifice Controls 31.88 cfs @ 4.78 fps)
  └**6=Orifice/Grate** (Weir Controls 46.91 cfs @ 2.36 fps)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=830.50' TW=0.00' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B13: Basin 13



Summary for Pond B4: Basin 4

Inflow Area = 38.712 ac, 55.38% Impervious, Inflow Depth = 3.49" for 100 Year event
Inflow = 65.77 cfs @ 9.97 hrs, Volume= 11.274 af
Outflow = 34.66 cfs @ 10.29 hrs, Volume= 11.007 af, Atten= 47%, Lag= 19.2 min
Discarded = 0.60 cfs @ 10.29 hrs, Volume= 1.723 af
Primary = 34.06 cfs @ 10.29 hrs, Volume= 9.285 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 840.12' @ 10.29 hrs Surf.Area= 30,035 sf Storage= 144,637 cf

Plug-Flow detention time= 292.7 min calculated for 11.007 af (98% of inflow)
Center-of-Mass det. time= 276.3 min (1,014.6 - 738.3)

Volume	Invert	Avail.Storage	Storage Description
#1	827.50'	218,652 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc) 232,732 cf Overall - 14,080 cf Embedded = 218,652 cf
#2	827.50'	5,632 cf	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 14,080 cf Overall x 40.0% Voids
		224,284 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
827.50	3,520	0	0
828.00	3,520	1,760	1,760
829.00	3,520	3,520	5,280
830.00	3,520	3,520	8,800
831.00	3,520	3,520	12,320
832.00	3,520	3,520	15,840
833.00	1,064	2,292	18,132
834.00	6,719	3,892	22,024
835.00	16,858	11,789	33,812
836.00	19,297	18,078	51,890
837.00	21,780	20,539	72,428
838.00	24,350	23,065	95,493
839.00	27,007	25,679	121,172
840.00	29,708	28,358	149,529
841.00	32,452	31,080	180,609
842.00	35,196	33,824	214,433
842.50	38,000	18,299	232,732

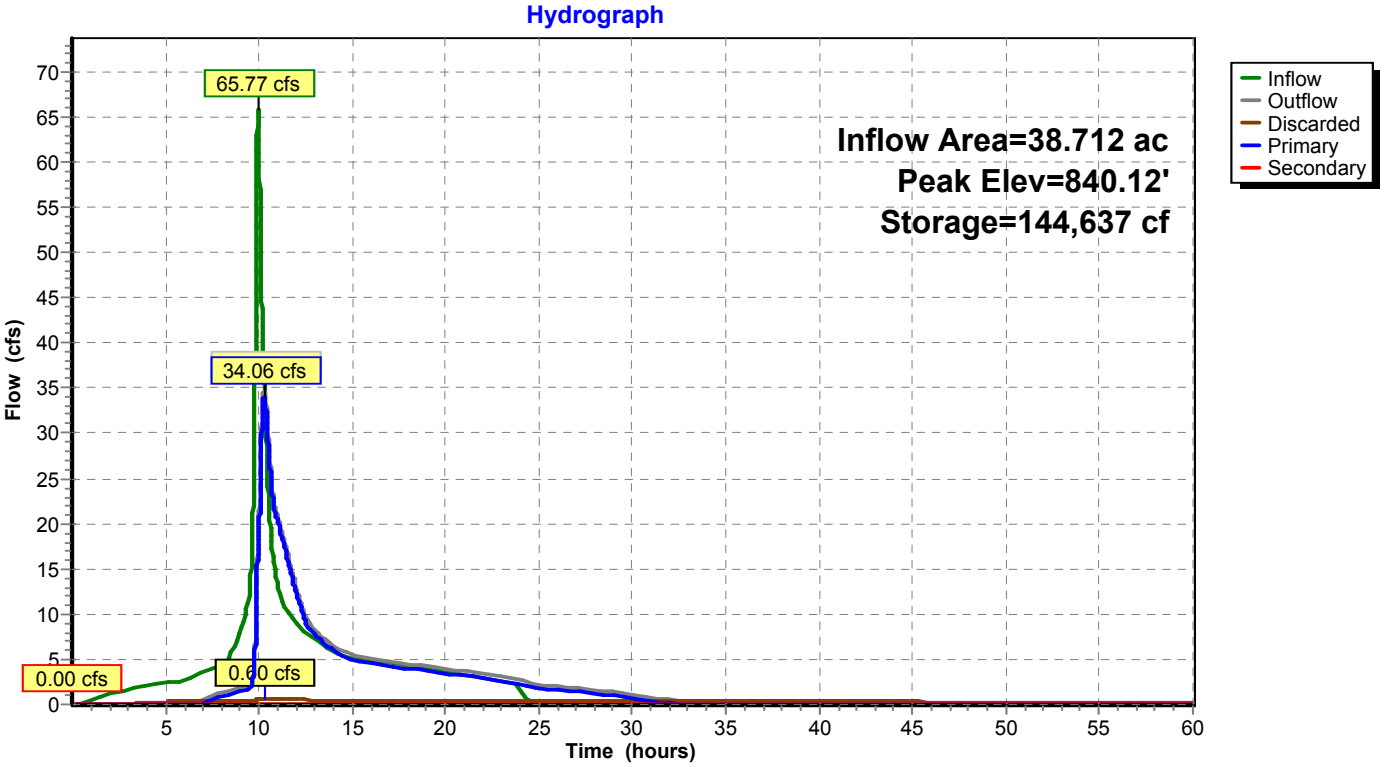
Device	Routing	Invert	Outlet Devices
#1	Primary	835.67'	**30.0" Round Culvert** L= 210.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 835.67' / 834.20' S= 0.0070 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Discarded	827.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	835.67'	**10.0" W x 4.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	837.67'	**18.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	838.17'	**42.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	839.75'	**48.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 in 78.0" x 36.0" Grate (62% open area) Limited to weir flow at low heads
#7	Secondary	841.12'	**40.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.60 cfs @ 10.29 hrs HW=840.12' (Free Discharge)
└**2=Exfiltration** (Controls 0.60 cfs)

Primary OutFlow Max=34.06 cfs @ 10.29 hrs HW=840.12' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 34.06 cfs of 41.00 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 2.77 cfs @ 9.96 fps)
  └**4=Orifice/Grate** (Orifice Controls 10.06 cfs @ 6.70 fps)
  └**5=Orifice/Grate** (Orifice Controls 10.97 cfs @ 6.27 fps)
  └**6=Orifice/Grate** (Weir Controls 10.26 cfs @ 1.99 fps)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=827.50' TW=0.00' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B4: Basin 4



Summary for Pond B5: Basin 5

Inflow Area = 32.696 ac, 30.34% Impervious, Inflow Depth = 2.47" for 100 Year event
Inflow = 29.91 cfs @ 9.99 hrs, Volume= 6.733 af
Outflow = 12.70 cfs @ 10.72 hrs, Volume= 6.733 af, Atten= 58%, Lag= 43.8 min
Discarded = 0.42 cfs @ 10.70 hrs, Volume= 1.257 af
Primary = 12.28 cfs @ 10.72 hrs, Volume= 5.476 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 848.15' @ 10.70 hrs Surf.Area= 22,406 sf Storage= 78,258 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 249.2 min (1,030.9 - 781.7)

Volume	Invert	Avail.Storage	Storage Description
#1	844.00'	178,542 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
844.00	15,500	0	0
845.00	17,076	16,288	16,288
846.00	18,708	17,892	34,180
847.00	20,397	19,553	53,733
848.00	22,143	21,270	75,003
849.00	23,945	23,044	98,047
850.00	25,804	24,875	122,921
851.00	27,719	26,762	149,683
852.00	30,000	28,860	178,542

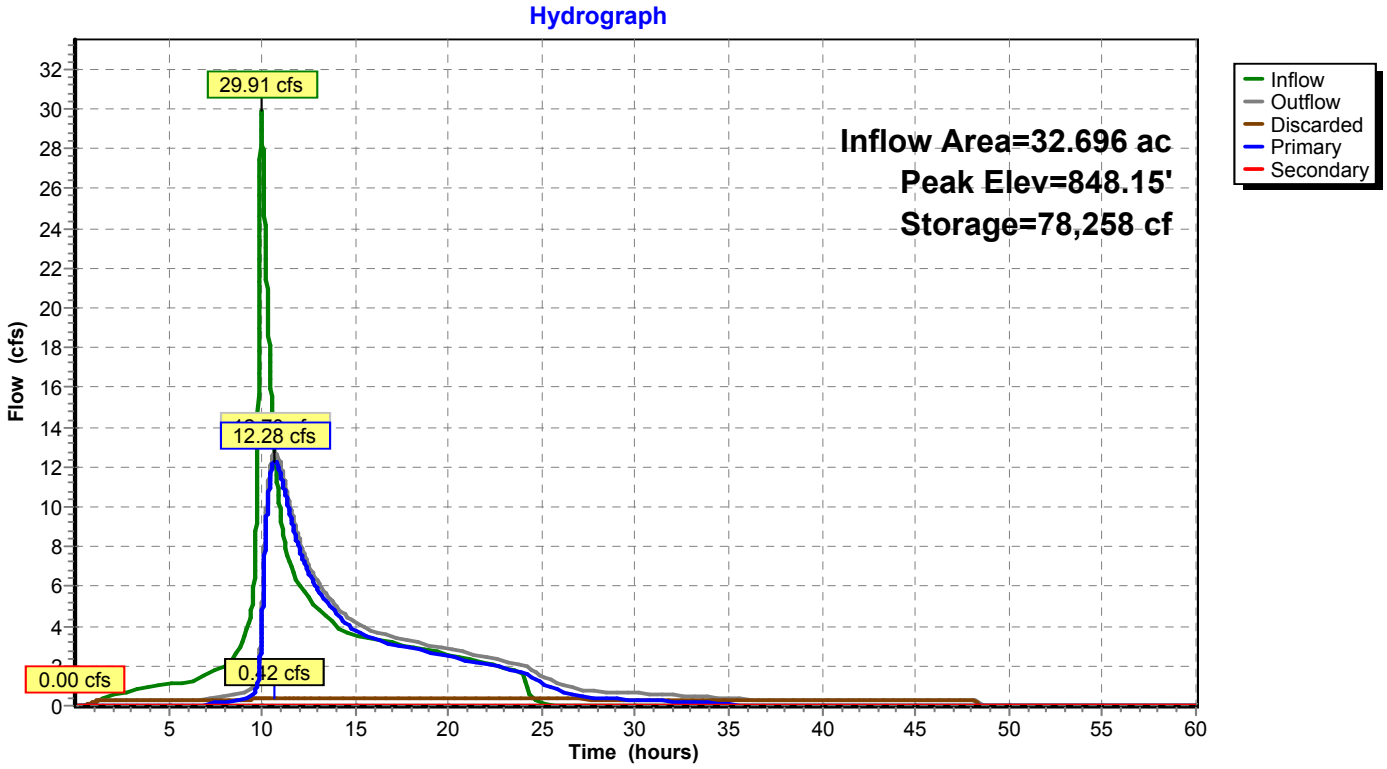
Device	Routing	Invert	Outlet Devices
#1	Primary	844.67'	**30.0" Round Culvert** L= 100.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 844.67' / 844.17' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Discarded	844.00'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 800.00'
#3	Device 1	844.67'	**4.0" Vert. Orifice/Grate** C= 0.600
#4	Device 1	845.67'	**6.0" W x 37.0" H Vert. Orifice/Grate** X 3 rows with 8.0" cc spacing C= 0.600
#5	Device 1	849.75'	**36.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 in 36.0" x 24.0" Grate (100% open area) Limited to weir flow at low heads
#6	Secondary	851.00'	**12.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.42 cfs @ 10.70 hrs HW=848.15' (Free Discharge)
└**2=Exfiltration** (Controls 0.42 cfs)

Primary OutFlow Max=12.28 cfs @ 10.72 hrs HW=848.15' TW=846.55' (Dynamic Tailwater)
└**1=Culvert** (Passes 12.28 cfs of 29.82 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 0.53 cfs @ 6.08 fps)
  ├**4=Orifice/Grate** (Orifice Controls 11.75 cfs @ 4.33 fps)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=844.00' (Free Discharge)
└**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond B5: Basin 5



Summary for Pond B6: Basin 6

Inflow Area = 34.039 ac, 52.56% Impervious, Inflow Depth = 3.48" for 100 Year event
Inflow = 49.06 cfs @ 9.98 hrs, Volume= 9.876 af
Outflow = 32.41 cfs @ 10.28 hrs, Volume= 9.581 af, Atten= 34%, Lag= 18.0 min
Discarded = 0.39 cfs @ 10.28 hrs, Volume= 1.062 af
Primary = 32.02 cfs @ 10.28 hrs, Volume= 8.518 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 851.88' @ 10.28 hrs Surf.Area= 0.469 ac Storage= 2.255 af

Plug-Flow detention time= 217.4 min calculated for 9.581 af (97% of inflow)
Center-of-Mass det. time= 197.0 min (944.6 - 747.6)

Volume	Invert	Avail.Storage	Storage Description
#1	839.50'	3.469 af	**Custom Stage Data (Prismatic)** Listed below (Recalc) 3.792 af Overall - 0.323 af Embedded = 3.469 af
#2	839.50'	0.129 af	**16.00'W x 220.00'L x 4.00'H Prismatoid** Inside #1 0.323 af Overall x 40.0% Voids
		3.598 af	Total Available Storage

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
839.50	0.081	0.000	0.000
840.00	0.081	0.040	0.040
841.00	0.081	0.081	0.121
842.00	0.081	0.081	0.202
843.00	0.081	0.081	0.283
844.00	0.081	0.081	0.364
845.00	0.061	0.071	0.435
846.00	0.133	0.097	0.532
847.00	0.260	0.196	0.729
848.00	0.292	0.276	1.005
849.00	0.325	0.309	1.313
850.00	0.360	0.343	1.656
851.00	0.434	0.397	2.053
852.00	0.474	0.454	2.507
854.40	0.597	1.285	3.792

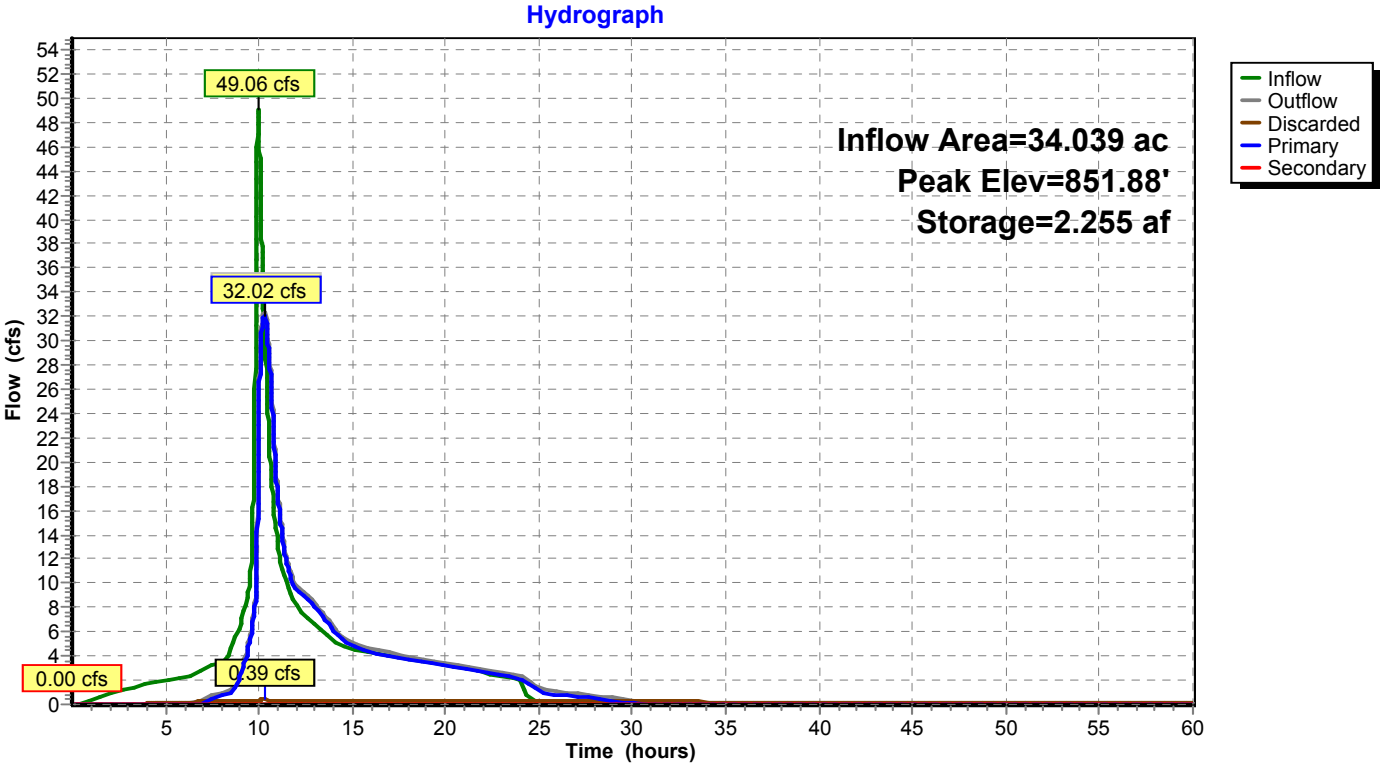
Device	Routing	Invert	Outlet Devices
#1	Primary	843.65'	**24.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 843.65' / 842.90' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 3.14 sf
#2	Discarded	839.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 760.00'
#3	Device 1	847.67'	**9.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	848.75'	**12.0" W x 9.0" H Vert. Orifice/Grate** C= 0.600
#5	Device 1	849.50'	**18.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#6	Device 1	850.67'	**69.6" W x 9.0" H Vert. Orifice/Grate** C= 0.600
#7	Secondary	852.88'	**40.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.39 cfs @ 10.28 hrs HW=851.88' (Free Discharge)
└**2=Exfiltration** (Controls 0.39 cfs)

Primary OutFlow Max=32.02 cfs @ 10.28 hrs HW=851.88' TW=842.50' (Dynamic Tailwater)
└**1=Culvert** (Passes 32.02 cfs of 37.87 cfs potential flow)
  └**3=Orifice/Grate** (Orifice Controls 1.82 cfs @ 9.73 fps)
  └**4=Orifice/Grate** (Orifice Controls 5.99 cfs @ 7.98 fps)
  └**5=Orifice/Grate** (Orifice Controls 5.26 cfs @ 7.02 fps)
  └**6=Orifice/Grate** (Orifice Controls 18.94 cfs @ 4.36 fps)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=839.50' TW=842.50' (Dynamic Tailwater)
└**7=Broad-Crested Rectangular Weir**(Controls 0.00 cfs)

Pond B6: Basin 6



Summary for Pond B7: Basin 7

Inflow Area = 108.754 ac, 33.30% Impervious, Inflow Depth = 2.23" for 100 Year event
Inflow = 53.39 cfs @ 10.42 hrs, Volume= 20.246 af
Outflow = 24.18 cfs @ 11.97 hrs, Volume= 20.103 af, Atten= 55%, Lag= 92.8 min
Discarded = 1.28 cfs @ 11.97 hrs, Volume= 4.541 af
Primary = 22.91 cfs @ 11.97 hrs, Volume= 15.562 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 843.21' @ 11.97 hrs Surf.Area= 67,818 sf Storage= 227,792 cf

Plug-Flow detention time= 307.8 min calculated for 20.103 af (99% of inflow)
Center-of-Mass det. time= 296.5 min (1,201.2 - 904.6)

Volume	Invert	Avail.Storage	Storage Description
#1	839.00'	516,122 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
839.00	10,000	0	0
840.00	54,515	32,258	32,258
841.00	58,335	56,425	88,683
842.00	62,211	60,273	148,956
843.00	66,912	64,562	213,517
844.00	71,188	69,050	282,567
845.00	75,535	73,362	355,929
846.00	79,981	77,758	433,687
847.00	84,890	82,436	516,122

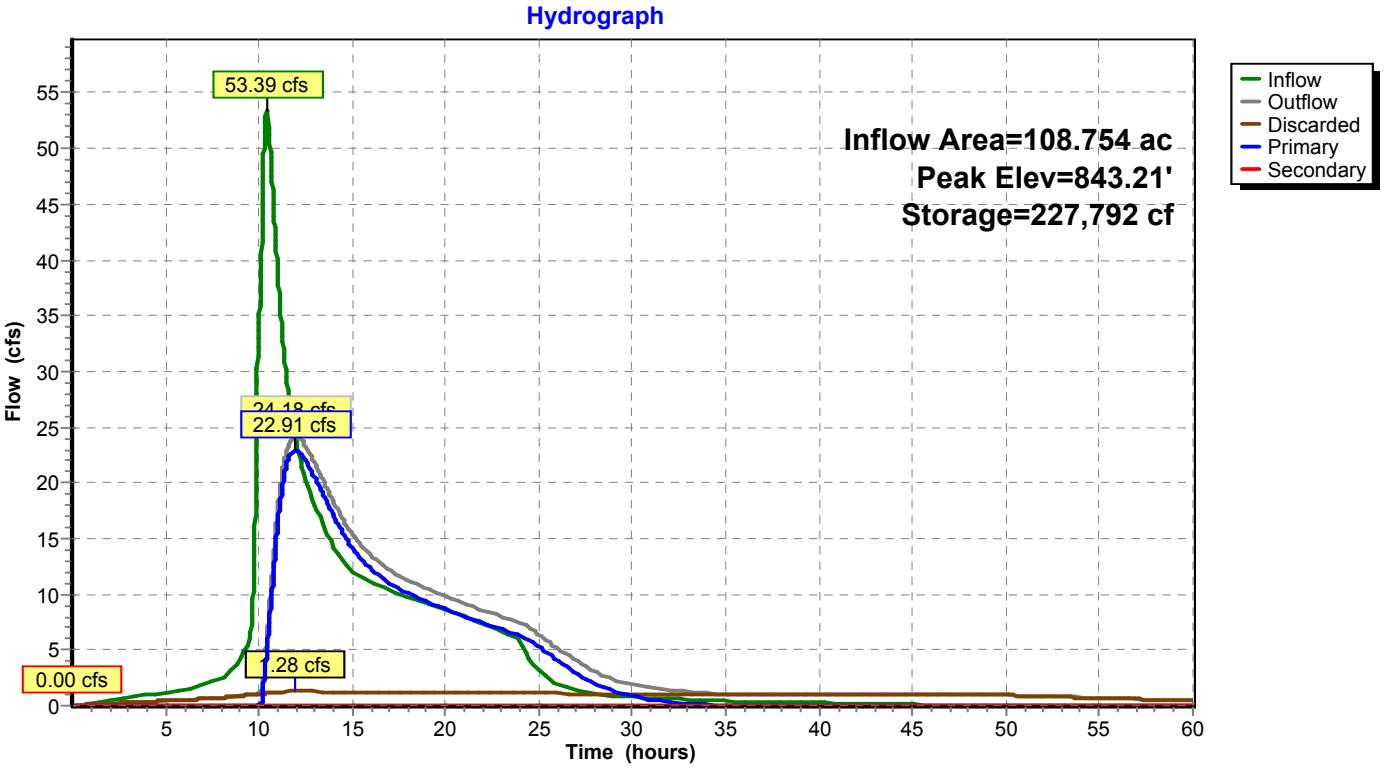
Device	Routing	Invert	Outlet Devices
#1	Primary	836.67'	**36.0" Round Culvert** L= 63.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 836.67' / 836.00' S= 0.0106 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf
#2	Discarded	839.00'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 800.00'
#3	Device 1	840.75'	**26.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	841.25'	**12.0" W x 36.0" H Vert. Orifice/Grate** X 3 rows with 8.0" cc spacing C= 0.600
#5	Device 1	844.50'	**48.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 in 48.0" x 36.0" Grate (100% open area) Limited to weir flow at low heads
#6	Secondary	845.50'	**12.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=1.28 cfs @ 11.97 hrs HW=843.21' (Free Discharge)
└**2=Exfiltration** (Controls 1.28 cfs)

Primary OutFlow Max=22.91 cfs @ 11.97 hrs HW=843.21' TW=837.94' (Dynamic Tailwater)
└**1=Culvert** (Passes 22.91 cfs of 76.42 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 7.75 cfs @ 7.16 fps)
  ├**4=Orifice/Grate** (Orifice Controls 15.15 cfs @ 3.90 fps)
  └**5=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=839.00' (Free Discharge)
└**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond B7: Basin 7



Summary for Pond B8: Basin 8

Inflow Area = 44.689 ac, 35.47% Impervious, Inflow Depth = 2.68" for 100 Year event
Inflow = 39.82 cfs @ 9.99 hrs, Volume= 9.971 af
Outflow = 25.20 cfs @ 10.48 hrs, Volume= 9.971 af, Atten= 37%, Lag= 29.6 min
Discarded = 0.54 cfs @ 10.48 hrs, Volume= 1.926 af
Primary = 24.66 cfs @ 10.48 hrs, Volume= 8.046 af
Secondary = 0.00 cfs @ 0.01 hrs, Volume= 0.000 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 857.85' @ 10.48 hrs Surf.Area= 29,035 sf Storage= 112,464 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 348.4 min (1,125.8 - 777.3)

Volume	Invert	Avail.Storage	Storage Description
#1	853.00'	147,517 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
853.00	17,554	0	0
854.00	19,812	18,683	18,683
855.00	22,126	20,969	39,652
856.00	24,497	23,312	62,964
857.00	26,924	25,711	88,674
858.00	29,407	28,166	116,840
859.00	31,948	30,678	147,517

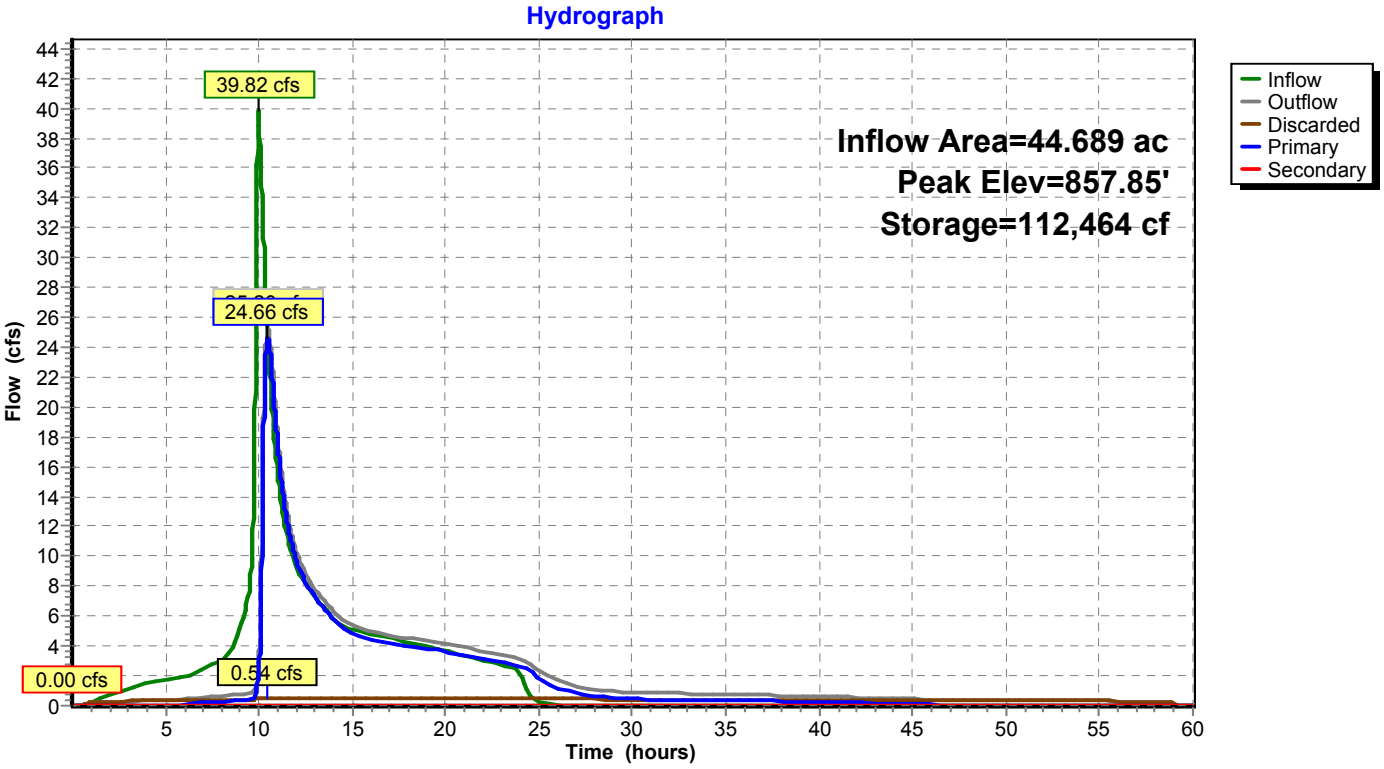
Device	Routing	Invert	Outlet Devices
#1	Primary	853.00'	**30.0" Round Culvert** L= 1,200.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 853.00' / 844.17' S= 0.0074 '/' Cc= 0.900 n= 0.012, Flow Area= 4.91 sf
#2	Discarded	853.00'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 800.00'
#3	Device 1	853.58'	**2.0" W x 5.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	855.67'	**5.0" W x 12.0" H Vert. Orifice/Grate** X 4 rows with 8.0" cc spacing C= 0.600
#5	Device 1	857.25'	**36.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 in 36.0" x 36.0" Grate (100% open area) Limited to weir flow at low heads
#6	Secondary	858.75'	**16.0' long (Profile 5) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.79 2.93 3.06

Discarded OutFlow Max=0.54 cfs @ 10.48 hrs HW=857.85' (Free Discharge)
└**2=Exfiltration** (Controls 0.54 cfs)

Primary OutFlow Max=24.66 cfs @ 10.48 hrs HW=857.85' TW=846.54' (Dynamic Tailwater)
└**1=Culvert** (Passes 24.66 cfs of 39.78 cfs potential flow)
  ├**3=Orifice/Grate** (Orifice Controls 0.67 cfs @ 9.70 fps)
  ├**4=Orifice/Grate** (Orifice Controls 5.73 cfs @ 4.55 fps)
  └**5=Orifice/Grate** (Weir Controls 18.25 cfs @ 2.53 fps)

Secondary OutFlow Max=0.00 cfs @ 0.01 hrs HW=853.00' (Free Discharge)
└**6=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond B8: Basin 8



Summary for Pond B9: Basin 9

Inflow Area = 11.446 ac, 17.36% Impervious, Inflow Depth = 2.08" for 100 Year event
Inflow = 8.24 cfs @ 9.99 hrs, Volume= 1.988 af
Outflow = 5.10 cfs @ 10.45 hrs, Volume= 1.986 af, Atten= 38%, Lag= 27.5 min
Primary = 5.10 cfs @ 10.45 hrs, Volume= 1.986 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 849.37' @ 10.45 hrs Surf.Area= 7,958 sf Storage= 9,543 cf

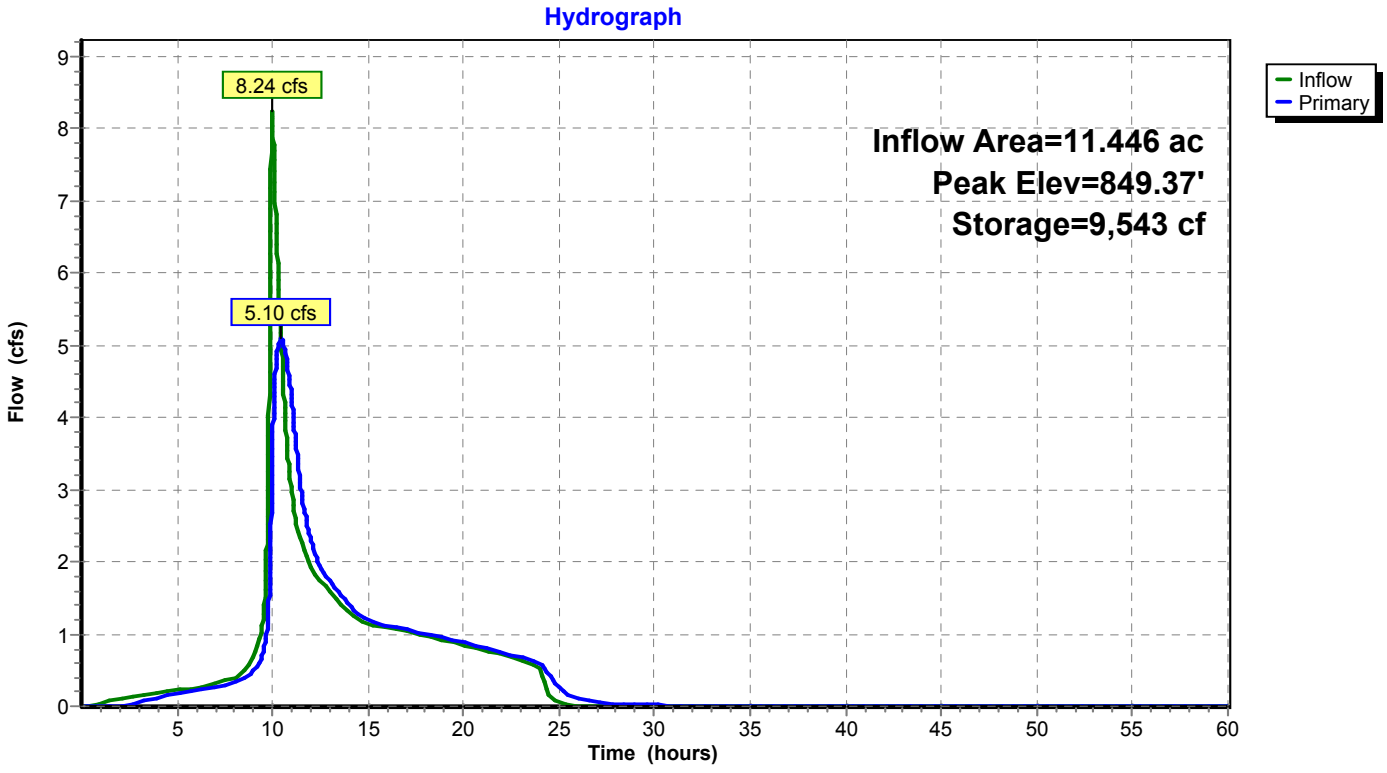
Plug-Flow detention time= 48.2 min calculated for 1.986 af (100% of inflow)
Center-of-Mass det. time= 47.9 min (862.3 - 814.3)

Volume	Invert	Avail.Storage	Storage Description
#1	848.00'	48,750 cf	**30.00'W x 200.00'L x 5.00'H Prismatoid Z=3.0**

Device	Routing	Invert	Outlet Devices
#1	Primary	848.00'	**18.0" Round Culvert** L= 110.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 848.00' / 847.00' S= 0.0091 '/' Cc= 0.900 n= 0.012, Flow Area= 1.77 sf
#2	Device 1	848.00'	**15.0" Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=5.10 cfs @ 10.45 hrs HW=849.37' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 5.10 cfs of 6.74 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 5.10 cfs @ 4.16 fps)

Pond B9: Basin 9



Summary for Pond Ex SD: Tract #1632 Ex. 36" SD Outlet

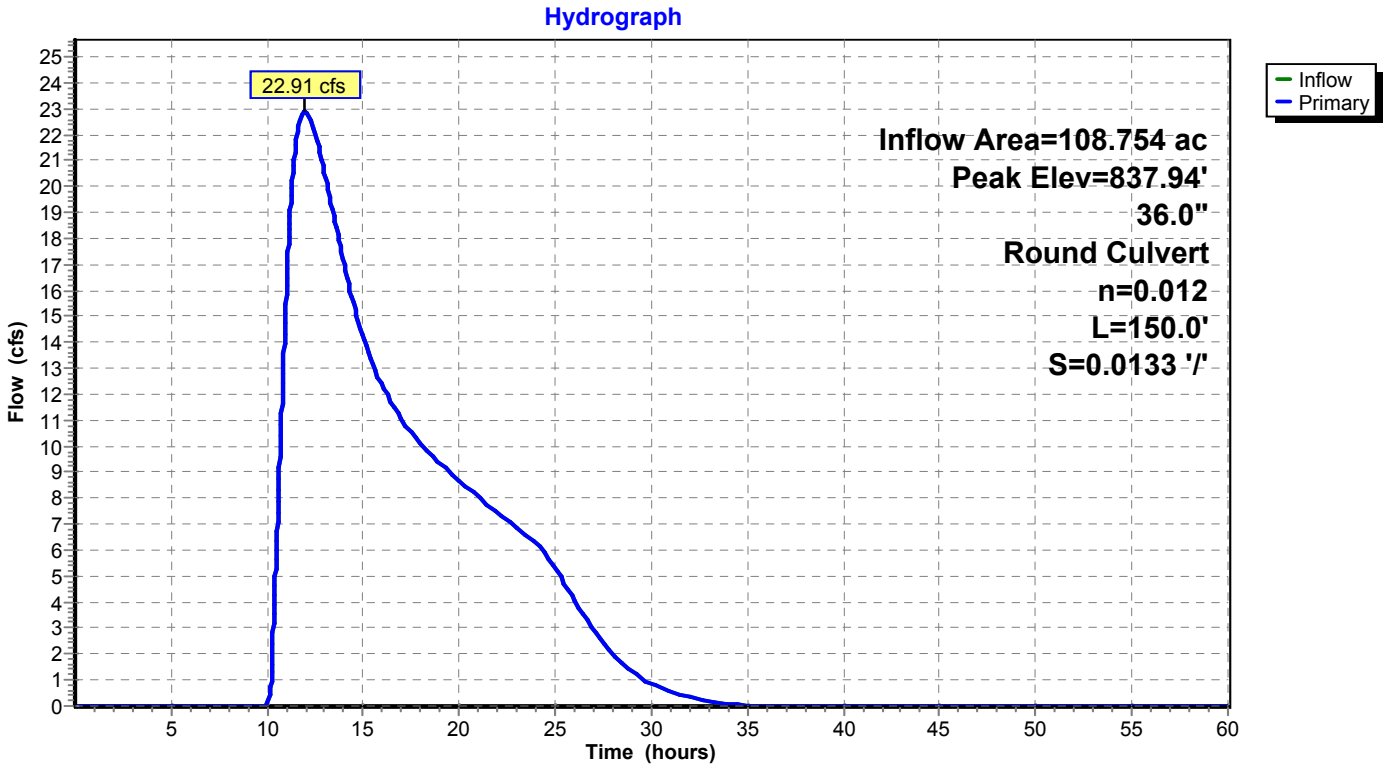
Inflow Area = 108.754 ac, 33.30% Impervious, Inflow Depth = 1.72" for 100 Year event
Inflow = 22.91 cfs @ 11.97 hrs, Volume= 15.562 af
Outflow = 22.91 cfs @ 11.97 hrs, Volume= 15.562 af, Atten= 0%, Lag= 0.0 min
Primary = 22.91 cfs @ 11.97 hrs, Volume= 15.562 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 837.94' @ 11.97 hrs
Flood Elev= 843.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	836.00'	**36.0" Round Culvert** L= 150.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 836.00' / 834.00' S= 0.0133 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf

Primary OutFlow Max=22.91 cfs @ 11.97 hrs HW=837.94' TW=835.00' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 22.91 cfs @ 4.74 fps)

Pond Ex SD: Tract #1632 Ex. 36" SD Outlet



Summary for Pond MC Q: SD System

[58] Hint: Peaked 0.53' above defined flood level

Inflow Area = 21.500 ac, 80.00% Impervious, Inflow Depth = 4.27" for 100 Year event
Inflow = 42.04 cfs @ 9.97 hrs, Volume= 7.642 af
Outflow = 41.83 cfs @ 9.99 hrs, Volume= 7.360 af, Atten= 0%, Lag= 0.8 min
Discarded = 0.12 cfs @ 9.99 hrs, Volume= 0.377 af
Primary = 20.20 cfs @ 9.99 hrs, Volume= 3.392 af
Secondary = 21.51 cfs @ 9.99 hrs, Volume= 3.592 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 846.03' @ 9.99 hrs Surf.Area= 0.135 ac Storage= 0.535 af
Flood Elev= 845.50' Surf.Area= 0.097 ac Storage= 0.474 af

Plug-Flow detention time= 106.0 min calculated for 7.359 af (96% of inflow)
Center-of-Mass det. time= 80.6 min (799.1 - 718.5)

Volume	Invert	Avail.Storage	Storage Description
#1	839.50'	0.607 af	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Inc.Store (acre-feet)	Cum.Store (acre-feet)
839.50	0.081	0.000	0.000
840.00	0.081	0.040	0.040
841.00	0.081	0.081	0.121
842.00	0.081	0.081	0.202
843.00	0.081	0.081	0.283
844.00	0.081	0.081	0.364
845.00	0.061	0.071	0.434
846.00	0.133	0.097	0.531
846.50	0.172	0.076	0.607

Device	Routing	Invert	Outlet Devices
#1	Primary	841.50'	**36.0" Round Culvert** L= 585.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 841.50' / 838.50' S= 0.0051 '/' Cc= 0.900 n= 0.012, Flow Area= 7.07 sf
#2	Device 1	845.50'	**48.0" x 48.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Discarded	839.50'	**0.750 in/hr Exfiltration over Surface area** Conductivity to Groundwater Elevation = 750.00'
#4	Secondary	845.50'	**20.0' long (Profile 4) Broad-Crested Rectangular Weir** Head (feet) 0.49 0.98 1.48 Coef. (English) 2.77 2.97 3.21

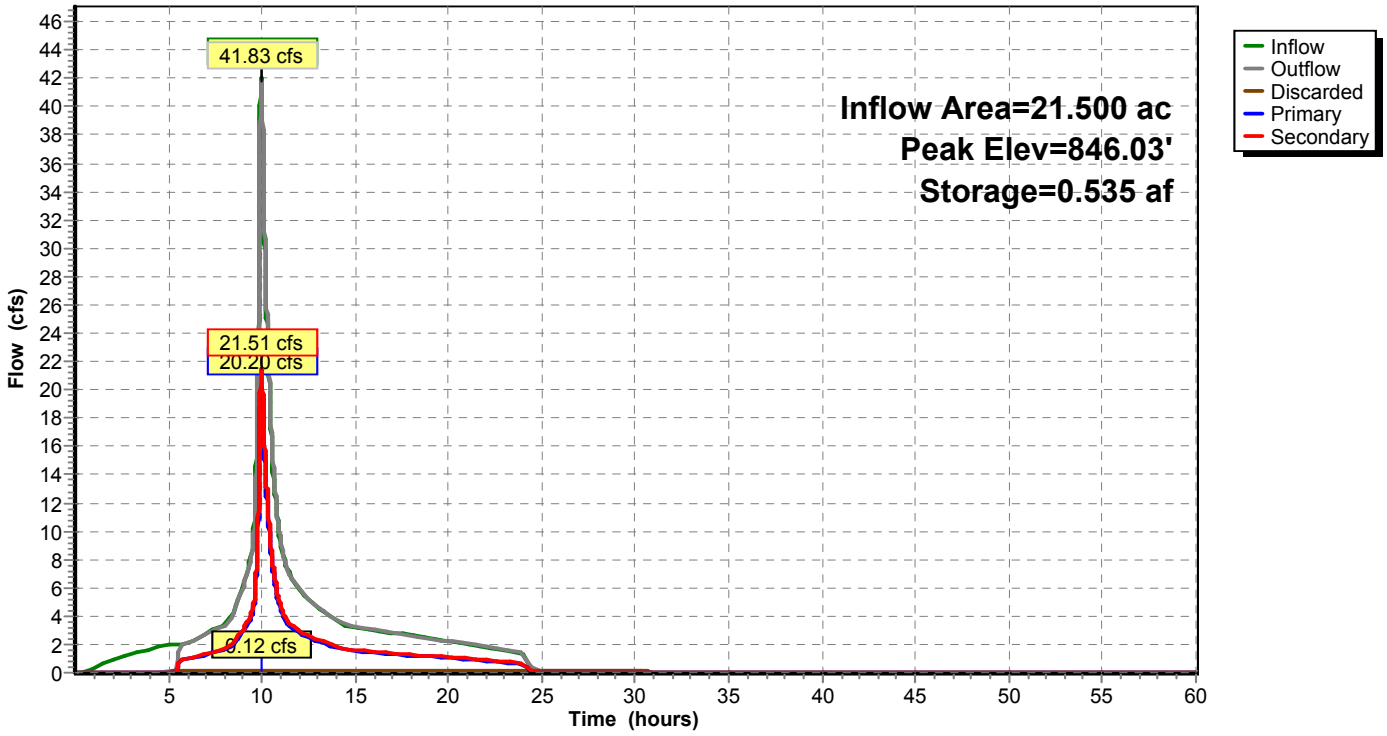
Discarded OutFlow Max=0.12 cfs @ 9.99 hrs HW=846.03' (Free Discharge)
└**3=Exfiltration** (Controls 0.12 cfs)

Primary OutFlow Max=20.18 cfs @ 9.99 hrs HW=846.03' TW=840.46' (Dynamic Tailwater)
└**1=Culvert** (Passes 20.18 cfs of 53.36 cfs potential flow)
└**2=Orifice/Grate** (Weir Controls 20.18 cfs @ 2.38 fps)

Secondary OutFlow Max=21.50 cfs @ 9.99 hrs HW=846.03' TW=836.26' (Dynamic Tailwater)
└**4=Broad-Crested Rectangular Weir** (Weir Controls 21.50 cfs @ 2.03 fps)

Pond MC Q: SD System

Hydrograph



Summary for Pond SD: 42" HDPE SD

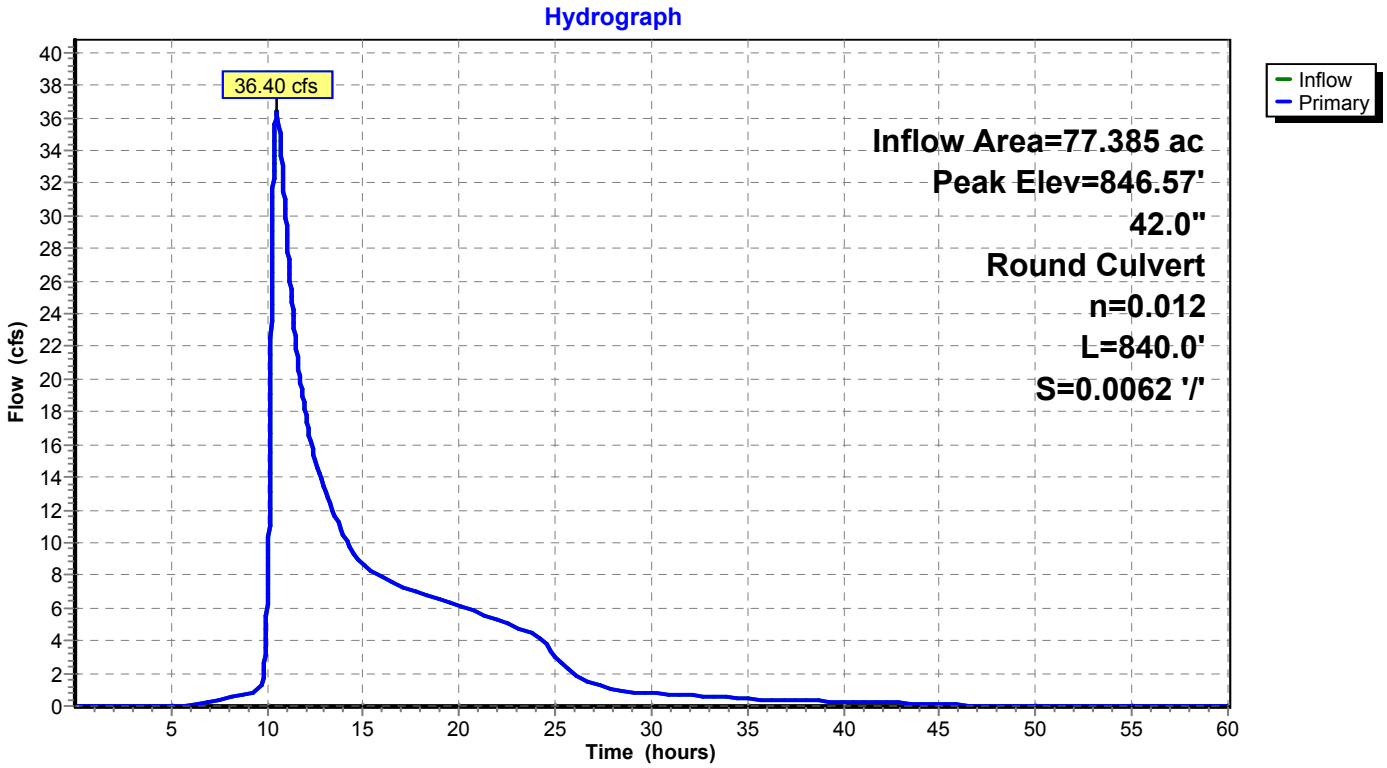
Inflow Area = 77.385 ac, 33.30% Impervious, Inflow Depth = 2.10" for 100 Year event
Inflow = 36.40 cfs @ 10.52 hrs, Volume= 13.522 af
Outflow = 36.40 cfs @ 10.52 hrs, Volume= 13.522 af, Atten= 0%, Lag= 0.0 min
Primary = 36.40 cfs @ 10.52 hrs, Volume= 13.522 af

Routing by Dyn-Stor-Ind method, Time Span= 0.01-60.00 hrs, dt= 0.01 hrs
Peak Elev= 846.57' @ 10.60 hrs
Flood Elev= 853.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	844.17'	**42.0" Round Culvert** L= 840.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 844.17' / 839.00' S= 0.0062 '/' Cc= 0.900 n= 0.012, Flow Area= 9.62 sf

Primary OutFlow Max=36.30 cfs @ 10.52 hrs HW=846.56' TW=841.86' (Dynamic Tailwater)
└**1=Culvert** (Outlet Controls 36.30 cfs @ 7.32 fps)

Pond SD: 42" HDPE SD



HYDRAULIC ANALYSIS
OF
TURTLE CREEK THROUGH OLSEN PROPERTY

Prepared for
Olsen 212, LLC

Submitted by

WALLACE GROUP

July 19, 2019

Reso A - Exhibit C2 (EIR Technical Appendix)

CERTIFICATION

Preparation of this report included efforts by the following persons:
In accordance with the provisions of Section 6700 of the Business and Professions Code of the State of California, this report was prepared by or under the direction of the following Civil Engineer, licensed in the State of California:

ENGINEER IN RESPONSIBLE CHARGE:

Byron J. Glenn, PE C51519 Date
Senior Civil Engineer

HYDRAULIC ANALYSIS
OF
TURTLE CREEK THROUGH OLSEN PROPERTY
VINEDO SPECIFIC PLAN AND VESTING TENTATIVE TRACT MAPS

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HYDRAULIC ANALYSIS
TURTLE CREEK THROUGH OLSEN PROPERTY
VINEDO SPECIFIC PLAN & VESTING TENTATIVE TRACT MAPS

INTRODUCTION

The purpose of this report is to present a hydraulic analysis of Turtle Creek within the Olsen property, as support for the corresponding Vinedo Specific Plan (SP) and Vesting Tentative Tract Maps (VTTM). Turtle Creek is referred to as "Unnamed Creek No. 1"[1] within the San Luis Obispo County Flood Insurance Study (FIS). The purpose of this analysis is to determine the creek's flow characteristics for both the undeveloped and developed conditions for the Vinedo Tentative Map configuration. These characteristics will include water surface elevations, velocity and top width at the project boundaries and within the creek through the Olsen Ranch property. Water surface elevations and velocities at the property's boundaries should not significantly change from the undeveloped to the developed condition.

BACKGROUND

Olsen Ranch lies within the proposed Vinedo Specific Plan area located in the southeastern portion of the City of Paso Robles. Vinedo encompasses an area of approximately 355 acres. The watershed within this area drains from the east and the northeast westward toward the Salinas River (Figure 1).

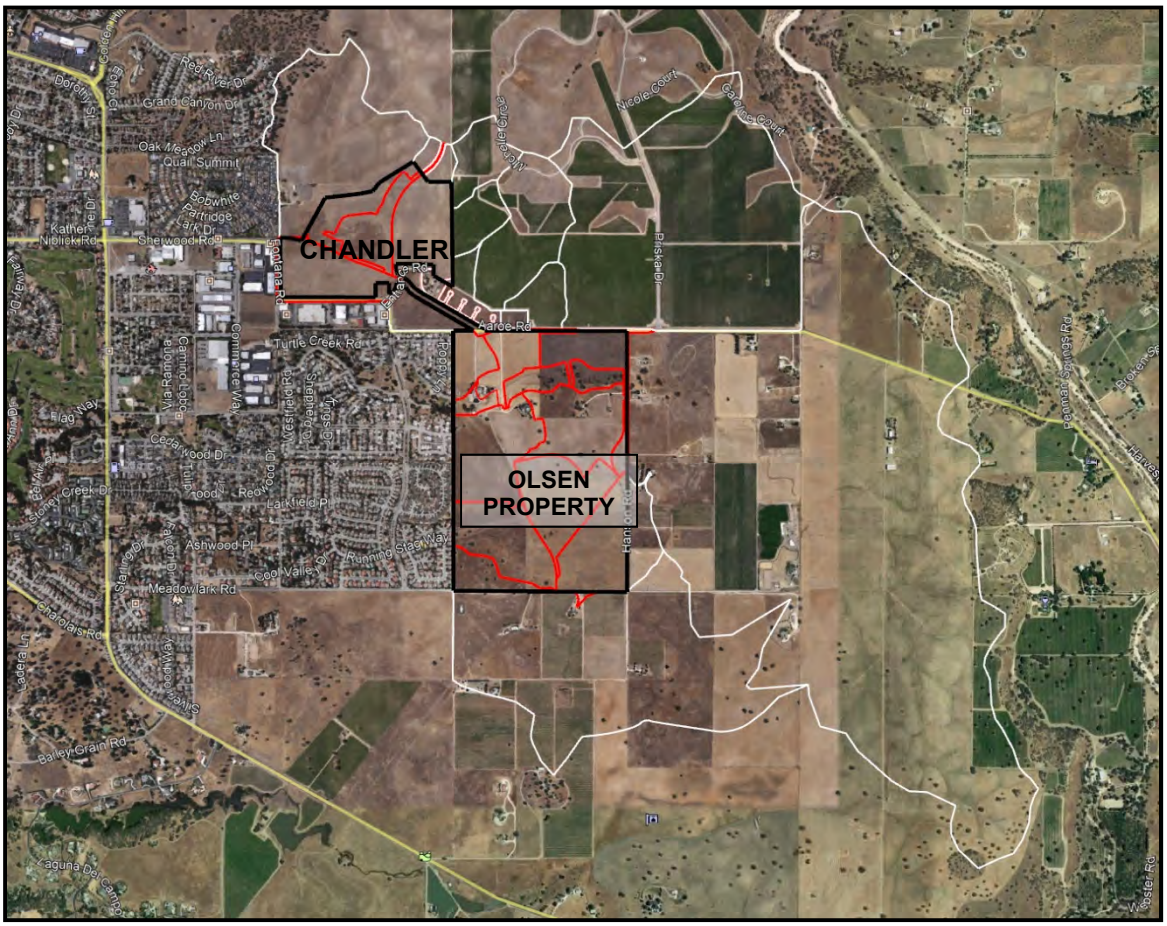


Figure 1 – Vicinity Map

[1] FEMA FLOOD INSURANCE STUDY REVISED: MAY 16, 2017 FLOOD INSURANCE STUDY NUMBER 06079CV001C Version Number 2.3.2.2

Olsen Ranch is located north of Meadowlark Road, west of Hanson Road, south of Linne Road and east of existing residential subdivisions. The project's primary access is at Linne Road, Meadowlark Road and Hanson Road. The property has been in agricultural use with three residential structures for many years. The property is bounded to the north by Vineyards, the Our Town subdivision to the northwest and existing residential subdivisions to the west (Figure 2).

Turtle Creek flows east to west through the northern portion of Olsen Ranch and conveys stormwater drainage from approximately two square miles. This analysis will study the river reach extending just upstream of Hanson Road on the east and terminating at the western boundary of Olsen Ranch. This analysis utilizes the stormwater flow rates as determined within the **Preliminary Drainage Report for Olsen-Chandler Ranch Specific Plan and Vesting Tentative Tract Map**, prepared by Wallace Group, January 31, 2019. Since the time of the Preliminary Drainage Report submittal, the name of the Specific Plan Area has been changed from Olsen-Chandler Ranch to Vinedo.

Figure 2 – Project Location Map

EXISTING SITE CONDITIONS

The Olsen Parcel consists of approximately 242.5 acres with rolling hills transitioning to a flatter area along the northern quarter of the property south of Linne Road. Vegetation on this portion of the project currently consists of scattered oak tree clusters and annual grasses. A natural drainage known as Turtle Creek ("Unnamed Creek No. 1) is located at the base of the hilly terrain and a broad plain exists northward to Linne Road. A large PG&E electrical easement crosses the southeast portion of the site from the southwest to the northeast.

Turtle Creek is a shallow drainage way with a wide flood plain area and transitions into a defined channel at the western boundary of Olsen Ranch. Flows are conveyed to the west ultimately discharging into the Salinas River.

PROPOSED SITE CONDITIONS

The proposed developed condition of the Vinedo Specific Plan will consist of approximately 1,233 dwelling units, consisting of 586 Low, 479 Medium and 168 High Density Residential units. A portion of Olsen Ranch will be a large recreation center with commercial areas, parks and open space areas.

DRAINAGE AREA DESCRIPTION

Turtle Creek drains an area of approximately two square miles. Two large watersheds contribute flows to the Creek and include the Northern and Central watersheds. The Northern Watershed encompasses approximately 537 acres including South Chandler Ranch. The Central Watershed encompasses approximately 863 acres including the northern two thirds of Olsen Ranch (see Figure 3).

The eastern portion of the Northern Watershed consists mostly of the Gran Cielo Vineyard development with some undeveloped property. According to the Drainage Study prepared for the Gran Cielo

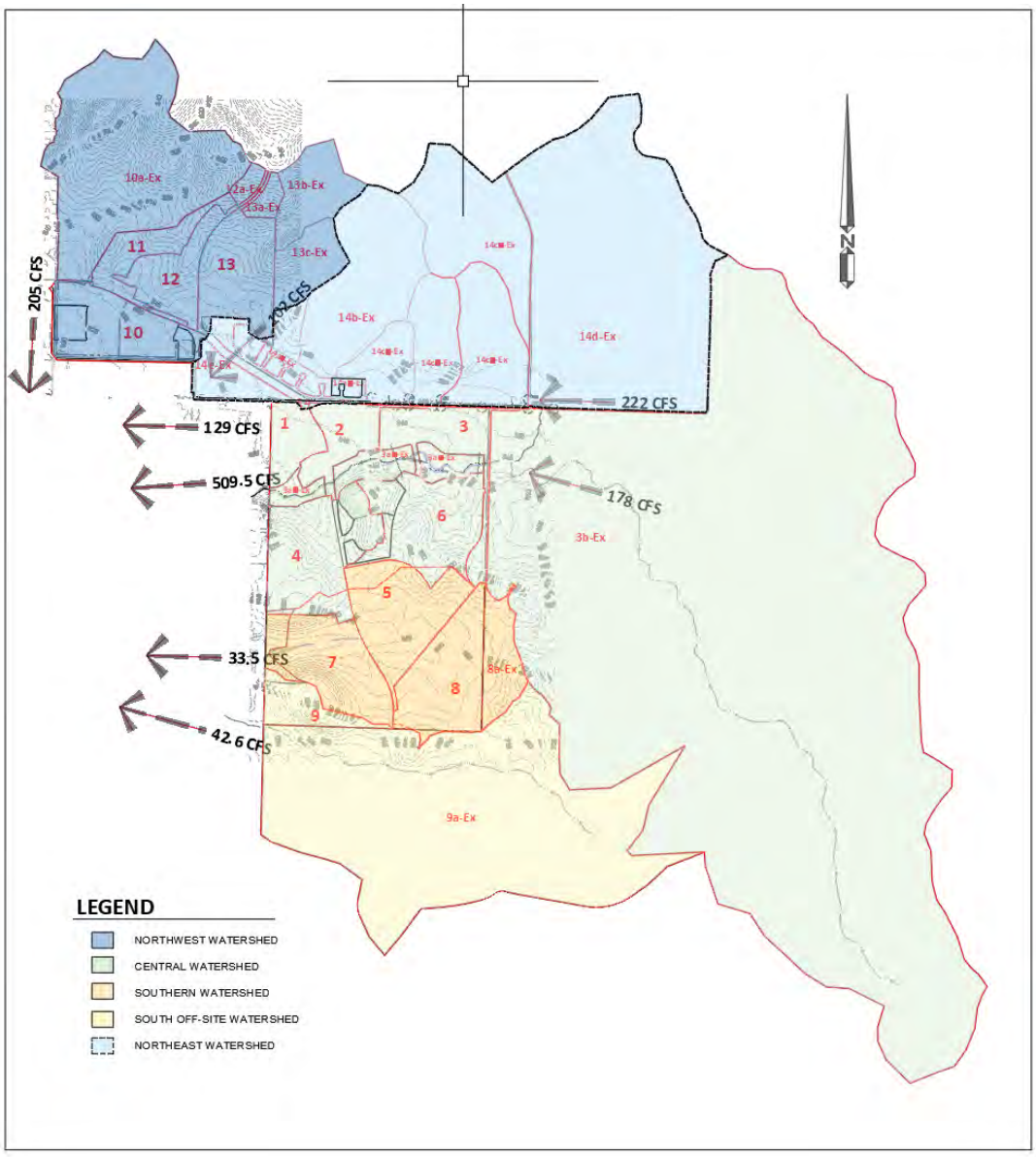


Figure 3 – Proposed Watershed Description

development entitled "**Tract No. 2526 Grading and Drainage Report Summary**", prepared by Vaughan Surveys, Inc, August 2003;

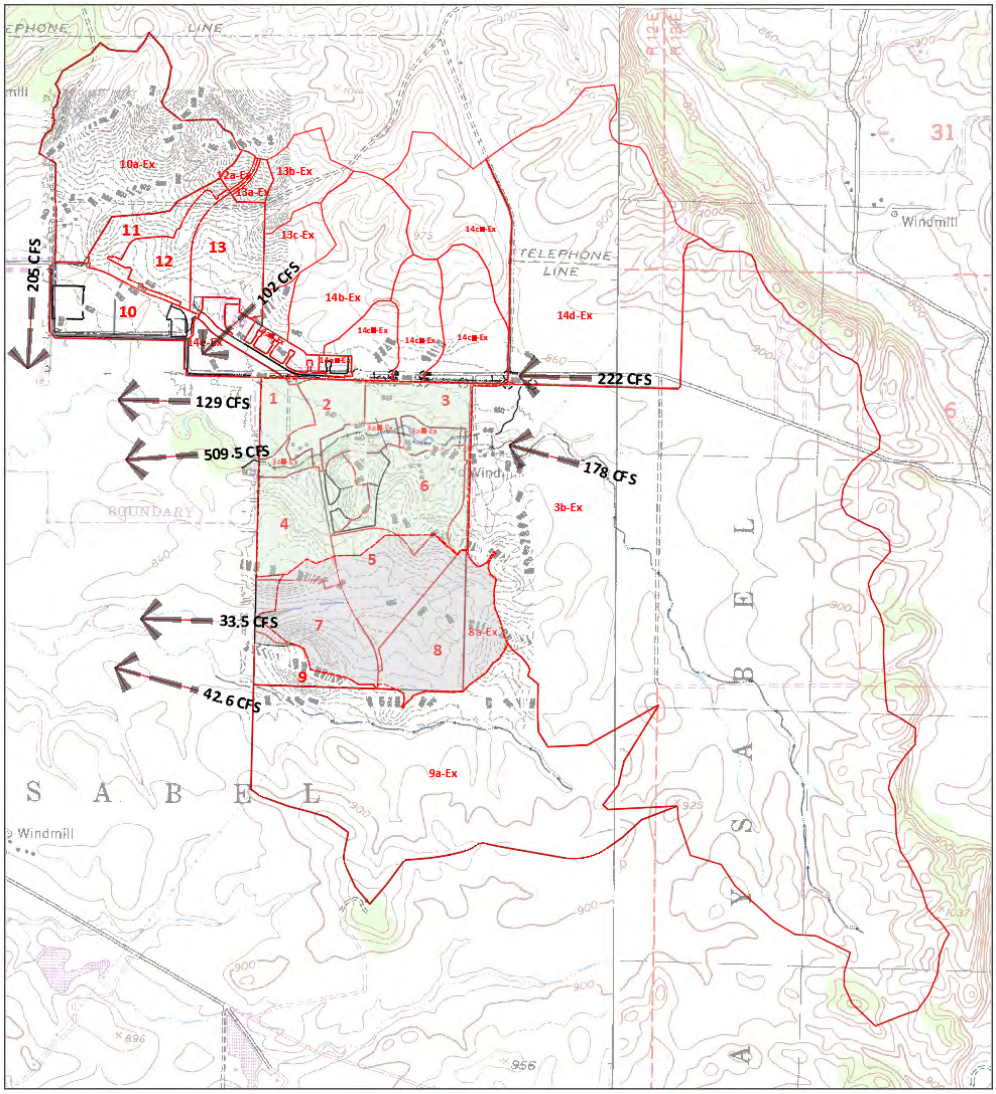


Figure 4 – Existing Watershed Areas

"Existing stormwater runoff currently flows along and over Linne Road to other properties south of Linne Road. The basin is designed to preserve existing flow patterns within the watershed in accordance with County Section 11-351.1500".

Stormwater runoff generated within the Easterly Sub-watershed of the Northern Watershed will, therefore, overtop Linne Road and flow into the Central Watershed as it has historically from major storm events. The report shows that stormwater runoff within the Gran Cielo development sheet flows overland and is routed through onsite roadways and culverts along Priska Drive (Gran Cielo entry) to Linne Road. Flows are then intercepted by small rectangular detention areas along the northern side of Linne Road.

Per the **Preliminary Drainage Report for Olsen-Chandler Ranch Specific Plan and Vesting Tentative Tract Map,** stormwater runoff along Linne Road is split with a large percentage of the flow spilling over the Linne Road centerline and to the south for all storm events and follows historic drainage paths

discharging into Turtle Creek along the northern portion of Olsen Ranch. The Central Watershed encompasses approximately 864 acres including the northern portion of Olsen Ranch. Stormwater runoff from this area is conveyed within Turtle Creek across the Olsen parcel to the western boundary, south of Parkview Drive.

FLOOD HAZARD

The portion of Turtle Creek located at the western edge of Olsen Ranch is within a FEMA Flood Hazard Zone A as shown on the **Flood Insurance Rate Map (FIRM) Panel No. 06079C0607G**, effective date November 16, 2012 (Figure 5). **The Flood Insurance Study (FIS) for San Luis Obispo County** including Unnamed Creek No. 1 (Turtle Creek) was revalidated in 2017.

The proposed land plan proposes lots that will be impacted by this current mapped flood zone, therefore modification of the Zone A area will be required. An application for a Letter of Map Revision (LOMR) will be submitted to FEMA to modify the creek's current flood zone for the existing un-development condition. Upon FEMA approval of this LOMR a Conditional Letter of Map Revision (CLOMR) will be submitted to FEMA which outlines the proposed land plan and development grading. Once the CLOMR has been accepted by FEMA and the grading completed and certified, a second LOMR will be submitted to FEMA for the final map revision.

Figure 5 – FEMA Floodplain Map

HYDRAULIC METHODOLOGY AND CRITERIA

A Geo HECRAS computer model was utilized to analyze the flow within the Un-Named Creek No.1 upstream of the Olsen Ranch western boundary. Geo HECRAS was created by CivilGEO, an engineering and environmental software developer, to use a GIS platform eliminating manual input of variables by automating the collection of data from disparate sources like GIS, CAD, and survey data.

Geo HECRAS is an AutoCAD compatible interactive 2D/3D graphical user interface data wrapper to the US Army Corps of Engineers HEC-RAS computer program. HEC-RAS was developed by the Army Corps of Engineers and is a program that models the hydraulics of water flow through natural rivers and other channels. The program is one dimensional, meaning that there is no direct modeling of the hydraulic effect of cross section shape changes, bends ad other two and three-dimensional aspects of flow.

The program allows the user to develop terrain models and compute water surface profiles for steady and unsteady flow models. An engineer can define bridges, culvert roadway crossings, FEMA floodplain encroachments, inline reservoir structures and other features in the HEC-RAS model. Complete HEC-RAS reporting is provided, including cross section plots, cross section tables, profile plots, profile tables, time series graphs, and more. Because the report data is derived directly from the HEC-RAS model.

Geo HECRAS was utilized to determine the limits of the 100-year flood plain for both the existing and proposed conditions. The development must not adversely impact the properties upstream or downstream, and therefore, the computed water surface elevations within Turtle Creek upstream of Hanson Road for the proposed developed conditions should not be significantly different from the water surface elevations computed for the existing condition. The proposed model incudes the effects of proposed grading along the creek as well as the proposed stream crossings and improvements to Hanson Road.

Hydraulic Analysis on Turtle Creek

The Geo HECRAS model requires input variables such as creek cross sectional geometry, cross section reach lengths, description of roadway crossings and type of structure, Manning's roughness coefficients, boundary conditions such as the starting water surface elevation and flow rates. Cross sectional geometry was taken directly from the digital terrain model developed from the latest aerial topography and proposed grading plan for Olsen Ranch through the AutoCAD Civil 3D interface.

Cross sections were spaced approximately 100 feet apart and perpendicular to the Creek's flowline. The overbank stations were placed at areas defining the ordinary high-water mark, or that water surface elevation established within the creek for the mean annual storm event. The existing analysis utilized cross sections created from the latest aerial topography created in October 2018. The proposed analysis utilized the same cross section locations digitized over the proposed grading plan. The proposed analysis also has modified cross section locations at proposed roadway crossings that define the bridge elements such as crossing type (bridge, culvert) size and area of opening.

Roadway crossings have been placed into the model at the proposed Niblick Road and a second arterial Road Bridge (Road XX) crossing. The crossing at Hanson Road has also been included as an improved facility to be constructed with the improvements to Hanson Road. The crossings were designed to accommodate a structure and opening that will not impact the limits of the resource agencies ordinary

high-water mark and wetland delineations. Permits from these agencies will not be required because these facilities will not impact the jurisdictional delineations.

The crossing at Niblick Road will consist of a 6-foot high by 20-foot wide reinforced concrete box culvert (RCB). The box culvert will be buried approximately two feet underneath the channel flowline to create a more natural channel bottom. The crossing at Road XX will be a 90-foot clear span bridge with near vertical abutments which will span over the existing creek ordinary high-water mark and delineated wetland areas. The existing triple reinforced concrete pipe culvert crossing (one 18-inch and two 42-inch RCP) at Hanson Road will be replaced by double, 2-foot high by 8-foot wide RCB.

Roughness coefficients were estimated for the overbank or flood plain areas as well as the channel area. A value of .04 was used for the overbank areas and a value of 0.03 was used for the main channel.

The starting water surface elevation at the western boundary was taken from the Flood Insurance Study for San Luis Obispo County, Unnamed Creek No. 1, renamed to Turtle Creek. The starting water surface elevation is 485.0 feet. The flowrates used were determined from the **Preliminary Drainage Report for Olsen-Chandler Ranch Specific Plan and Vesting Tentative Tract Map** as noted above. Levees were added to specific cross sections along the edge of the proposed Parkview Lane to prohibit the program from utilizing the roadway as part of the overall conveyance of the creek. The results show that the water surface elevations will not impede on the roadway except for that portion of Parkview Lane west of Niblick Drive. This portion of Parkview Lane will have minimal inundation from the 100-year storm event. Final design plans have the potential to raise the roadway section 0.5-fee to 1-foot to prevent any inundation of the roadway.

Hydraulic Modeling Results

The results of the analysis show that the estimated flowrate within the channel can be conveyed within the natural creek without inundating the proposed development. The results of the HEC-RAS analysis are outlined in Table 1.

TABLE 1: HEC RAS RESULTS EXISTING vs PROPOSED CONDITIONS

Cross Section	Discharge	Existing WSEL	Proposed WSEL	Existing Velocity	Proposed Velocity	Existing Top Width	Proposed Top Width
22304	265	847.08	846.99	1.05	2.85	328.86	137.63
22303	265	847.00	846.95	2.09	2.35	157.13	151.99
22302	265	846.97	846.91	1.67	2.15	209.49	207.2
Culvert							
22301	265	845.80	845.67	3.70	3.56	130.30	138.78
22300	265	845.67	845.15	3.13	5.93	166.47	109.42
22299	265	845.45	844.66	4.20	3.40	182.70	154.03
22298	265	844.42	841.58	4.92	1.63	382.60	309.48
22297	265	844.19	844.19	2.90	2.87	254.10	255.10
22296	265	843.82	843.81	3.11	3.14	203.49	202.63
22295	265	843.27	834.37	3.58	2.89	182.39	198.24
22294	265	843.04	842.68	1.87	4.26	298.59	234.38
22293	265	842.81	842.50	2.62	1.83	196.69	280.22
22290	265	842.21	841.92	2.42	1.69	184.91	192.29

22289	434	841.50	841.58	3.15	3.92	175.86	177.14
22288	434	841.26	841.35	3.42	3.32	194.50	199.03
22287	434	840.46	840.53	4.94	6.00	142.94	153.32
22286	434	839.79	839.84	3.32	3.50	154.02	159.35
22285	434	839.52	839.57	3.57	3.68	167.07	170.76
22284	434	839.32	839.38	2.95	2.98	253.25	229.79
22283	434	839.13	839.19	2.37	2.39	271.43	266.89
22282	434	838.71	838.74	3.46	3.79	205.00	226.43
22278	434	836.58	836.71	3.96	3.71	111.15	115.66
22277	434	835.92	835.78	6.49	7.04	136.34	75.61
22276	508	834.87	835.14	8.52	6.21	142.25	194.64
22275	508	833.59	834.42	7.05	4.17	79.61	109.04
22274	508	833.66	834.42	2.31	2.53	337.72	227.74
22273	508	833.11	834.35	5.85	3.43	191.48	198.32
22272	508	833.14	834.05	1.73	2.75	264.45	80.99
22271	508	832.61	833.11	5.96	7.19	117.80	60.05
22269	508		832.33		8.57		72.25

CONCLUSION AND RECOMMENDATIONS

Summary

The proposed Vinedo Specific Plan covers an area of approximately 355 acres in the City of Paso Robles, California. The proposed development will result in the construction of approximately 1,233 residential units. Roadway and utility infrastructure will be constructed to support the development. The overall drainage area from the SP impacting the existing City infrastructure is approximately 2.8 square miles. Stormwater runoff from the project area will be conveyed to four distinct areas.

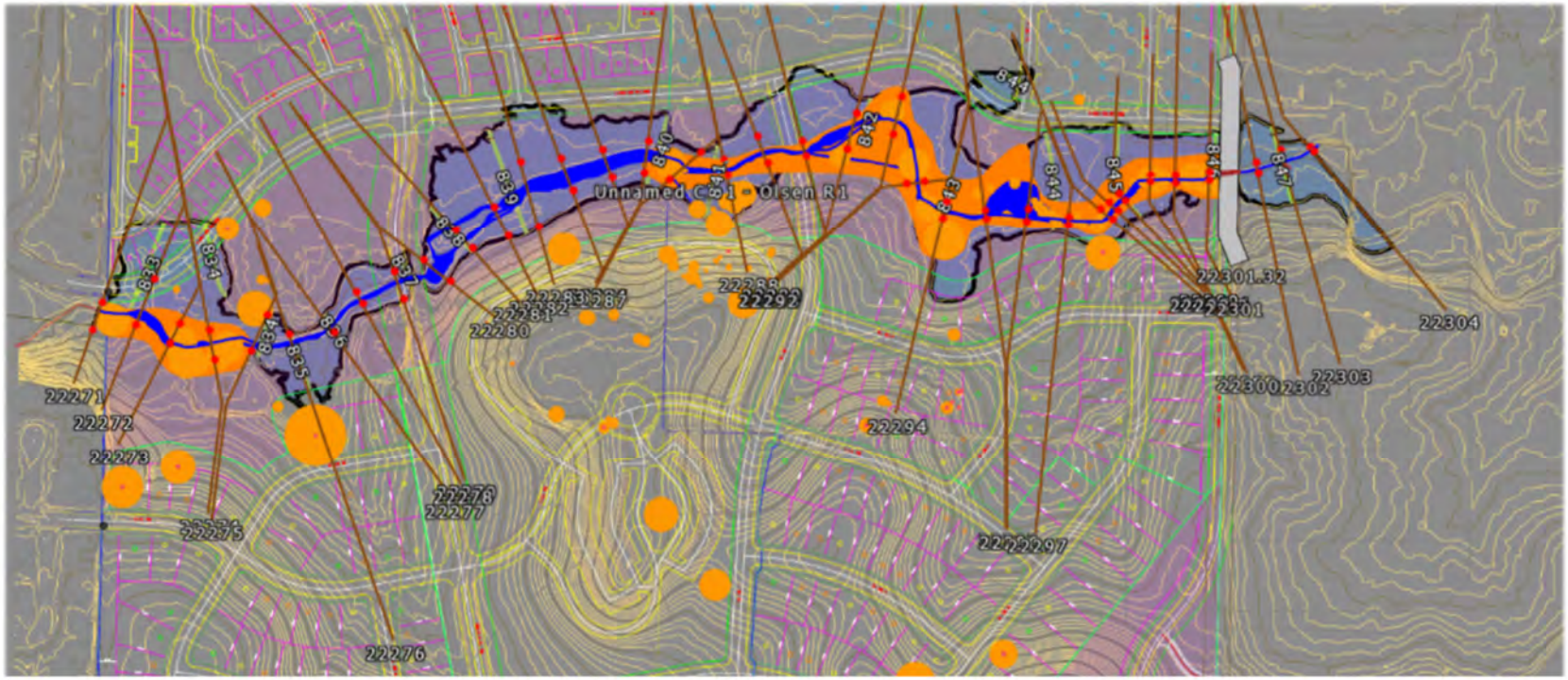
The Northern Easterly Sub-watershed will discharge historic flow rates to Linne Road, where flows will overtop the roadway and flow into Turtle Creek through the Central Watershed. For the proposed developed condition, stormwater runoff will be intercepted by storm drain systems prior to flows overtopping Linne Road and will be conveyed to Turtle Creek. A small amount of flow from the Easterly Sub-watershed will combine with flows from the Northern Westerly Sub-watershed and discharge at the intersections of Linne Road and Airport Road and Linne Road and Fontana Road.

Turtle Creek conveys stormwater flows from the Central Watershed through Olsen Ranch. The calculated water surface elevations within Turtle Creek Developed flows will be detained to historic levels for the 2- through the 100-year event before discharging into Turtle Creek or offsite into the City's stormwater conveyance system.

The proposed development's grading and roadway crossings have been designed to allow the creek to follow its natural defined course without creating adverse conditions upstream of Olsen Ranch. The creek's floodplain that lies outside of any jurisdictional limits should be regularly maintained to ensure the roughness coefficients assumed within this analysis remain effective. Overgrowth of the overbank areas may have a potential to increase water surface elevations and therefore minor flooding.

Existing Conditions Plan and Results:

Existing Conditions Plan:

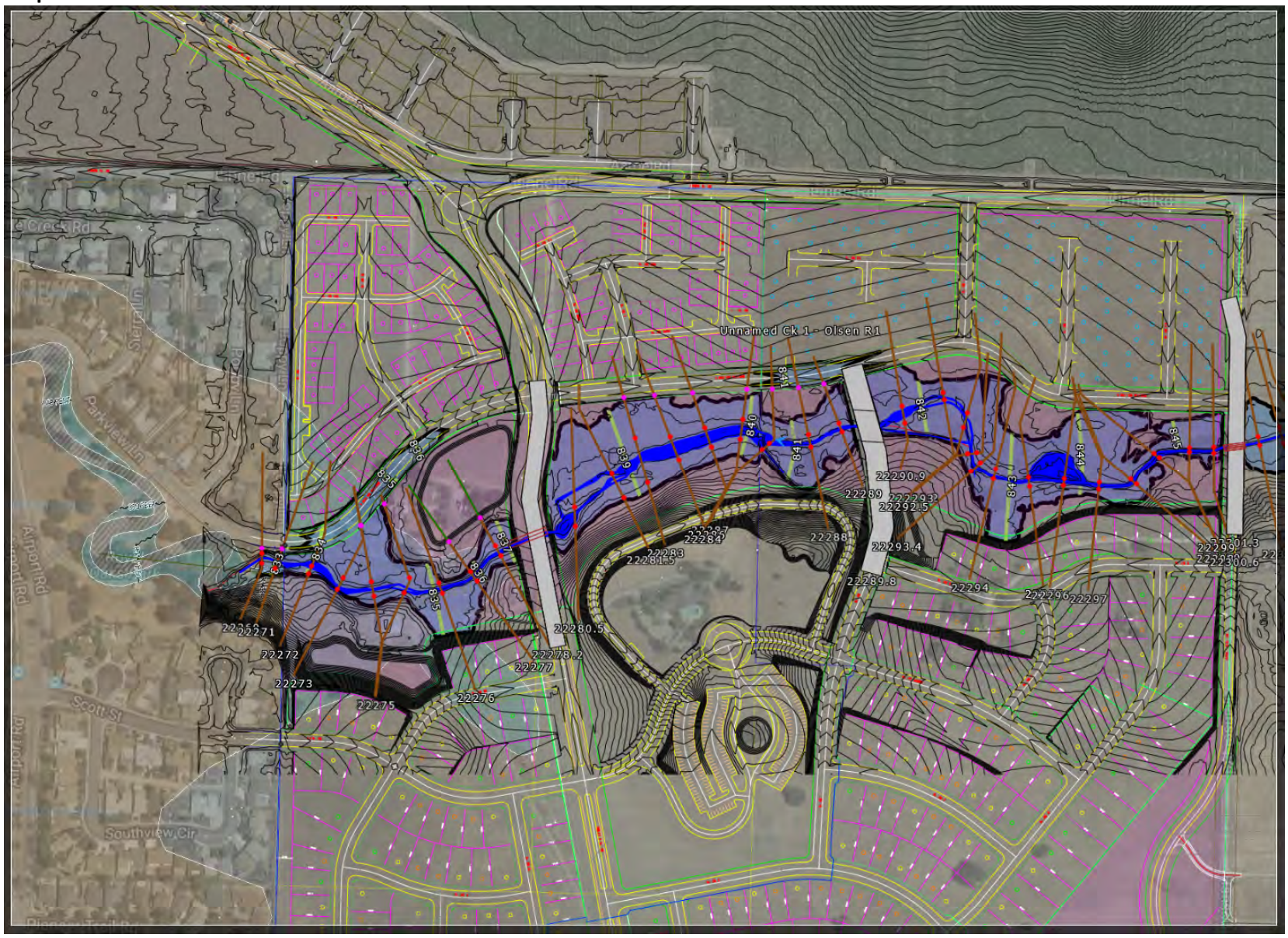


HEC RAS: 100 Year Event Existing Conditions Results

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Olsen R1	22304	100 Yr	265.00	843.58	847.08	845.68	847.08	0.000170	1.05	384.79	328.86	0.12
Olsen R1	22303	100 Yr	265.00	843.94	847.00		847.05	0.001050	2.09	161.49	157.13	0.27
Olsen R1	22302	100 Yr	265.00	843.44	846.97	845.96	846.99	0.000646	1.67	238.22	209.49	0.19
Olsen R1	22301.32		Culvert									
Olsen R1	22301	100 Yr	265.00	842.35	845.80		845.93	0.002075	3.70	128.50	130.30	0.44
Olsen R1	22300	100 Yr	265.00	841.63	845.67		845.76	0.001923	3.13	145.40	166.47	0.38
Olsen R1	22299	100 Yr	265.00	841.98	845.45	845.27	845.61	0.003007	4.20	130.42	182.70	0.49
Olsen R1	22298.4	100 Yr	265.00	842.85	844.99	844.99	845.21	0.007555	4.92	108.83	232.86	0.74
Olsen R1	22298.2	100 Yr	265.00	842.90	844.48	843.84	844.51	0.002103	1.69	188.11	275.04	0.35
Olsen R1	22298	100 Yr	265.00	842.76	844.42		844.45	0.002027	1.37	218.90	382.60	0.33
Olsen R1	22297	100 Yr	265.00	842.18	844.19		844.25	0.002604	2.90	176.52	254.10	0.43
Olsen R1	22296	100 Yr	265.00	841.68	843.82		843.89	0.005119	3.11	136.55	203.49	0.57
Olsen R1	22295	100 Yr	265.00	841.36	843.27		843.37	0.005852	3.58	120.09	182.39	0.62
Olsen R1	22294	100 Yr	265.00	841.06	843.04		843.08	0.001553	1.87	196.47	298.59	0.32
Olsen R1	22293	100 Yr	265.00	840.26	842.81		842.88	0.003224	2.62	132.42	196.69	0.43
Olsen R1	22292	100 Yr	265.00	841.27	842.21		842.29	0.003965	2.46	123.46	179.35	0.49
Olsen R1	22291	100 Yr	265.00	839.98	841.91		841.97	0.001908	2.18	135.29	146.34	0.36
Olsen R1	22290	100 Yr	434.00	839.00	841.73		841.79	0.001182	2.42	219.98	184.91	0.33
Olsen R1	22289	100 Yr	434.00	839.30	841.50		841.62	0.002383	3.15	169.90	175.86	0.45
Olsen R1	22288	100 Yr	434.00	838.75	841.26		841.38	0.002547	3.42	177.58	194.50	0.48
Olsen R1	22287	100 Yr	434.00	837.97	840.46	840.46	840.81	0.013059	4.94	95.02	142.94	0.96
Olsen R1	22286	100 Yr	434.00	836.59	839.79	839.14	839.95	0.002402	3.32	146.22	154.02	0.46
Olsen R1	22285	100 Yr	434.00	837.03	839.52		839.70	0.002816	3.57	142.47	167.07	0.50
Olsen R1	22284	100 Yr	434.00	837.22	839.32		839.43	0.002192	2.95	186.53	253.25	0.43
Olsen R1	22283	100 Yr	434.00	837.70	839.13		839.21	0.002272	2.37	203.29	271.43	0.42
Olsen R1	22282	100 Yr	434.00	837.34	838.71		838.86	0.005100	3.46	146.56	205.00	0.62
Olsen R1	22281	100 Yr	434.00	834.87	838.02	838.02	838.35	0.004549	4.86	119.70	297.00	0.74
Olsen R1	22280	100 Yr	434.00	833.65	837.22	835.88	837.36	0.000962	2.98	145.54	70.36	0.37
Olsen R1	22279	100 Yr	508.00	833.83	836.58	836.49	837.10	0.007165	5.83	87.58	77.37	0.92
Olsen R1	22278	100 Yr	508.00	833.18	836.58		836.76	0.001220	3.96	175.17	111.15	0.43
Olsen R1	22277	100 Yr	508.00	832.32	835.92	835.92	836.51	0.004185	6.49	104.07	136.34	0.77
Olsen R1	22276	100 Yr	508.00	832.38	834.87	835.25	835.83	0.012421	8.52	86.01	142.25	1.24
Olsen R1	22275	100 Yr	508.00	832.16	833.59	833.77	834.36	0.016118	7.05	72.04	79.61	1.31
Olsen R1	22274	100 Yr	508.00	831.23	833.66	833.09	833.72	0.001515	2.31	288.69	337.72	0.41
Olsen R1	22273	100 Yr	508.00	831.05	833.11	833.11	833.43	0.008175	5.85	128.21	191.48	0.96
Olsen R1	22272	100 Yr	508.00	830.46	833.14	832.00	833.18	0.000345	1.73	364.62	264.45	0.22
Olsen R1	22271	100 Yr	508.00	830.12	832.61	832.61	833.03	0.008942	5.96	103.94	117.80	1.00

Reso A - Exhibit C2 (EIR Technical Appendix)

Proposed Conditions Plan:



HEC RAS: 100 Year Event Proposed Conditions Results:

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Olsen R1	22305	100 Yr	265.00	843.39	847.09	845.73	847.10	0.000292	1.26	375.19	333.09	0.15
Olsen R1	22304	100 Yr	265.00	843.35	846.99		847.09	0.001417	2.85	135.09	137.63	0.35
Olsen R1	22303	100 Yr	265.00	843.98	846.95		847.02	0.001150	2.35	153.29	151.99	0.31
Olsen R1	22302	100 Yr	265.00	843.43	846.91	846.03	846.95	0.000695	2.15	226.73	207.20	0.25
Olsen R1	22301.3		Culvert									
Olsen R1	22300.6	100 Yr	265.00	842.03	845.67		845.79	0.002703	3.56	123.17	138.78	0.42
Olsen R1	22300	100 Yr	265.00	841.63	845.15	845.15	845.51	0.008030	5.93	78.42	109.42	0.70
Olsen R1	22299	100 Yr	265.00	841.80	844.66	844.28	844.75	0.003645	3.40	130.28	154.03	0.46
Olsen R1	22298	100 Yr	265.00	842.78	844.45		844.47	0.001938	1.63	215.32	309.48	0.32
Olsen R1	22297	100 Yr	265.00	842.18	844.19		844.25	0.002680	2.87	175.36	255.10	0.44
Olsen R1	22296	100 Yr	265.00	841.77	843.81		843.88	0.005280	3.14	135.08	202.63	0.58
Olsen R1	22295	100 Yr	265.00	841.36	843.37		843.44	0.003865	2.89	141.04	198.24	0.51
Olsen R1	22294	100 Yr	265.00	841.08	842.68		842.83	0.010953	4.26	102.03	234.38	0.83
Olsen R1	22293.4	100 Yr	265.00	839.04	842.52		842.60	0.001935	2.83	168.01	303.67	0.39
Olsen R1	22293	100 Yr	265.00	840.20	842.50		842.53	0.001403	1.83	214.55	280.22	0.31
Olsen R1	22292.5	100 Yr	265.00	840.50	842.35		842.39	0.001221	2.03	190.64	210.14	0.30
Olsen R1	22292.2	100 Yr	265.00	840.67	842.09		842.18	0.004817	3.32	123.53	182.48	0.57
Olsen R1	22290.9	100 Yr	265.00	840.38	841.92	841.17	841.95	0.000853	1.69	208.75	192.29	0.25
Olsen R1	22289.8		Bridge									
Olsen R1	22289	100 Yr	434.00	839.30	841.58	841.19	841.72	0.002818	3.92	181.88	177.14	0.49
Olsen R1	22288	100 Yr	434.00	838.75	841.35	840.93	841.45	0.002487	3.32	193.73	199.03	0.45
Olsen R1	22287	100 Yr	434.00	837.98	840.53	840.53	840.88	0.010912	6.00	112.03	153.32	0.90
Olsen R1	22286	100 Yr	434.00	836.56	839.84	839.14	840.02	0.002341	3.50	155.24	159.35	0.44
Olsen R1	22285	100 Yr	434.00	837.05	839.57	839.05	839.76	0.002875	3.68	151.54	170.76	0.48
Olsen R1	22284	100 Yr	434.00	837.22	839.38	838.95	839.49	0.002196	2.98	199.37	229.79	0.41
Olsen R1	22283	100 Yr	434.00	837.68	839.19	838.74	839.26	0.002180	2.39	218.71	266.89	0.39
Olsen R1	22281.5	100 Yr	434.00	837.35	838.74		838.90	0.006657	3.79	151.53	226.43	0.67
Olsen R1	22280.5	100 Yr	434.00	834.70	838.73	836.42	838.76	0.000224	1.63	428.71	339.99	0.15
Olsen R1	22279.2		Culvert									
Olsen R1	22278	100 Yr	508.00	833.19	836.71	835.81	836.87	0.001642	3.71	191.46	115.66	0.39
Olsen R1	22277	100 Yr	508.00	832.32	835.78	835.78	836.49	0.008820	7.04	85.36	75.61	0.86
Olsen R1	22276	100 Yr	508.00	832.38	835.14	835.20	835.57	0.007998	6.21	130.77	194.64	0.81
Olsen R1	22275	100 Yr	508.00	832.16	834.42	833.86	834.64	0.003389	4.17	148.47	109.04	0.53
Olsen R1	22274	100 Yr	508.00	831.26	834.35	833.69	834.41	0.001120	2.53	300.24	227.74	0.31
Olsen R1	22273	100 Yr	508.00	831.06	834.16	833.75	834.27	0.002065	3.43	229.11	198.32	0.42
Olsen R1	22272	100 Yr	508.00	830.45	834.05	832.20	834.14	0.000859	2.75	220.56	80.99	0.28
Olsen R1	22271	100 Yr	508.00	830.13	833.11	833.11	833.87	0.009617	7.19	79.21	60.05	0.89
Olsen R1	22269	100 Yr	508.00	829.69	832.33	832.59	833.28	0.017268	8.57	75.19	72.25	1.16

APPENDICES

A. Existing & Developed Watershed Mapping
B. Flood Insurance Rate Map with 100-Year Flood Boundary
C. Soils Survey Map & Soils Index
D. City of Paso Robles Rainfall Data
E. Runoff Curve Number Data
F. Time of Concentration Calculations
G. 2, 5, 10, 50 & 100-Year Storm Event Peak Flow Summary for Existing and Proposed Conditions
H. Existing Hydrograph Analysis
I. Proposed Hydrograph Modeling with Detention Basin Sizing

Reso A - Exhibit C2 (EIR Technical Appendix)

500 ft

Unnamed Ck 1 - Olsen

841
839
840
148
839
836
835
834
837
836
835
842
843
844
845
22290.9
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22281.5
2289.8
22294
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22301.3
22303
22304
22302
22280.5
22278.2
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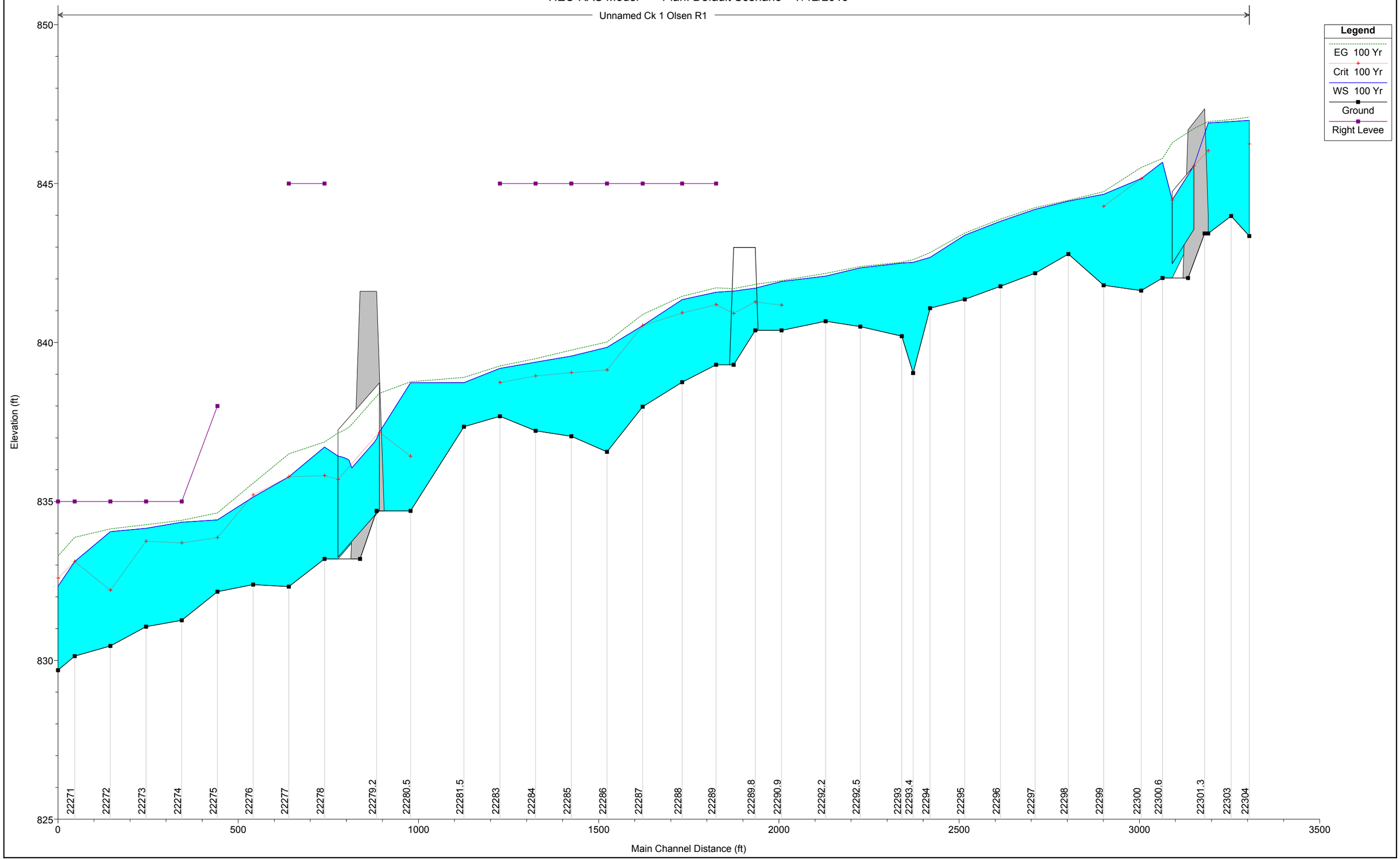
Reso A - Exhibit C2 (EIR Technical Appendix)

HEC-RAS Model Plan: Default Scenario 7/12/2019



Reso A - Exhibit C2 (EIR Technical Appendix)

HEC-RAS Plan: Default Scenario River: Unnamed Ck 1 Reach: Olsen R1 Profile: 100 Yr

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Olsen R1	22304	100 Yr	265.00	843.35	846.99	846.25	847.09	0.001417	2.85	135.09	137.63	0.35
Olsen R1	22303	100 Yr	265.00	843.98	846.95		847.02	0.001150	2.35	153.29	151.99	0.31
Olsen R1	22302	100 Yr	265.00	843.43	846.91	846.03	846.95	0.000695	2.15	226.73	207.20	0.25
Olsen R1	22301.3		Culvert									
Olsen R1	22300.6	100 Yr	265.00	842.03	845.67		845.79	0.002703	3.56	123.17	138.78	0.42
Olsen R1	22300	100 Yr	265.00	841.63	845.15	845.15	845.51	0.008030	5.93	78.42	109.42	0.70
Olsen R1	22299	100 Yr	265.00	841.80	844.66	844.28	844.75	0.003645	3.40	130.28	154.03	0.46
Olsen R1	22298	100 Yr	265.00	842.78	844.45		844.47	0.001938	1.63	215.32	309.48	0.32
Olsen R1	22297	100 Yr	265.00	842.18	844.19		844.25	0.002680	2.87	175.36	255.10	0.44
Olsen R1	22296	100 Yr	265.00	841.77	843.81		843.88	0.005280	3.14	135.08	202.63	0.58
Olsen R1	22295	100 Yr	265.00	841.36	843.37		843.44	0.003865	2.89	141.04	198.24	0.51
Olsen R1	22294	100 Yr	265.00	841.08	842.68		842.83	0.010953	4.26	102.03	234.38	0.83
Olsen R1	22293.4	100 Yr	265.00	839.04	842.52		842.60	0.001935	2.83	168.01	303.67	0.39
Olsen R1	22293	100 Yr	265.00	840.20	842.50		842.53	0.001403	1.83	214.55	280.22	0.31
Olsen R1	22292.5	100 Yr	265.00	840.50	842.35		842.39	0.001221	2.03	190.64	210.14	0.30
Olsen R1	22292.2	100 Yr	265.00	840.67	842.09		842.18	0.004817	3.32	123.53	182.48	0.57
Olsen R1	22290.9	100 Yr	265.00	840.38	841.92	841.17	841.95	0.000853	1.69	208.75	192.29	0.25
Olsen R1	22289.8		Bridge									
Olsen R1	22289	100 Yr	434.00	839.30	841.58	841.19	841.72	0.002818	3.92	181.88	177.14	0.49
Olsen R1	22288	100 Yr	434.00	838.75	841.35	840.93	841.45	0.002487	3.32	193.73	199.03	0.45
Olsen R1	22287	100 Yr	434.00	837.98	840.53	840.53	840.88	0.010912	6.00	112.03	153.32	0.90
Olsen R1	22286	100 Yr	434.00	836.56	839.84	839.14	840.02	0.002341	3.50	155.24	159.35	0.44
Olsen R1	22285	100 Yr	434.00	837.05	839.57	839.05	839.76	0.002875	3.68	151.54	170.76	0.48
Olsen R1	22284	100 Yr	434.00	837.22	839.38	838.95	839.49	0.002196	2.98	199.37	229.79	0.41
Olsen R1	22283	100 Yr	434.00	837.68	839.19	838.74	839.26	0.002180	2.39	218.71	266.89	0.39
Olsen R1	22281.5	100 Yr	434.00	837.35	838.74		838.90	0.006657	3.79	151.53	226.43	0.67
Olsen R1	22280.5	100 Yr	434.00	834.70	838.73	836.42	838.76	0.000224	1.63	428.71	339.99	0.15
Olsen R1	22279.2		Culvert									
Olsen R1	22278	100 Yr	508.00	833.19	836.71	835.81	836.87	0.001642	3.71	191.46	115.66	0.39
Olsen R1	22277	100 Yr	508.00	832.32	835.78	835.78	836.49	0.008820	7.04	85.36	75.61	0.86
Olsen R1	22276	100 Yr	508.00	832.38	835.14	835.20	835.57	0.007998	6.21	130.77	194.64	0.81
Olsen R1	22275	100 Yr	508.00	832.16	834.42	833.86	834.64	0.003389	4.17	148.47	109.04	0.53
Olsen R1	22274	100 Yr	508.00	831.26	834.35	833.69	834.41	0.001120	2.53	300.24	227.74	0.31
Olsen R1	22273	100 Yr	508.00	831.06	834.16	833.75	834.27	0.002065	3.43	229.11	198.32	0.42
Olsen R1	22272	100 Yr	508.00	830.45	834.05	832.20	834.14	0.000859	2.75	220.56	80.99	0.28
Olsen R1	22271	100 Yr	508.00	830.13	833.11	833.11	833.87	0.009617	7.19	79.21	60.05	0.89
Olsen R1	22269	100 Yr	508.00	829.69	832.33	832.59	833.28	0.017268	8.57	75.19	72.25	1.16

Reso A - Exhibit C2 (EIR Technical Appendix)

HEC-RAS Plan: Default Scenario River: Unnamed Ck 1 Reach: Olsen R1 Profile: 100 Yr

Reach	River Sta	Profile	E.G. Elev	W.S. Elev	Vel Head	Frctn Loss	C & E Loss	Q Left	Q Channel	Q Right	Top Width
			(ft)	(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(ft)
Olsen R1	22304	100 Yr	847.09	846.99	0.10	0.06	0.01	55.44	197.98	11.59	137.63
Olsen R1	22303	100 Yr	847.02	846.95	0.07	0.06	0.01	61.01	195.09	8.90	151.99
Olsen R1	22302	100 Yr	846.95	846.91	0.04			59.05	126.93	79.02	207.20
Olsen R1	22301.3		Culvert								
Olsen R1	22300.6	100 Yr	845.79	845.67	0.12	0.26	0.02	2.57	130.33	132.10	138.78
Olsen R1	22300	100 Yr	845.51	845.15	0.35	0.52	0.08	2.24	158.96	103.81	109.42
Olsen R1	22299	100 Yr	844.75	844.66	0.08	0.26	0.02	0.03	68.63	196.34	154.03
Olsen R1	22298	100 Yr	844.47	844.45	0.02	0.22	0.00	3.91	28.88	232.20	309.48
Olsen R1	22297	100 Yr	844.25	844.19	0.05	0.36	0.00	7.71	76.82	180.47	255.10
Olsen R1	22296	100 Yr	843.88	843.81	0.07	0.44	0.00	20.37	52.71	191.92	202.63
Olsen R1	22295	100 Yr	843.44	843.37	0.07	0.60	0.01	19.30	75.47	170.22	198.24
Olsen R1	22294	100 Yr	842.83	842.68	0.15	0.20	0.02	42.81	100.11	122.08	234.38
Olsen R1	22293.4	100 Yr	842.60	842.52	0.08	0.06	0.02	6.00	167.37	91.63	303.67
Olsen R1	22293	100 Yr	842.53	842.50	0.03	0.13	0.00	5.88	52.45	206.68	280.22
Olsen R1	22292.5	100 Yr	842.39	842.35	0.04	0.21	0.00	48.46	120.23	96.31	210.14
Olsen R1	22292.2	100 Yr	842.18	842.09	0.09	0.21	0.02	138.32	70.71	55.96	182.48
Olsen R1	22290.9	100 Yr	841.95	841.92	0.03	0.11	0.01	34.55	112.32	118.13	192.29
Olsen R1	22289.8		Bridge								
Olsen R1	22289	100 Yr	841.72	841.58	0.14	0.26	0.01	89.59	199.68	144.73	177.14
Olsen R1	22288	100 Yr	841.45	841.35	0.11	0.55	0.02	211.47	200.51	22.02	199.03
Olsen R1	22287	100 Yr	840.88	840.53	0.35	0.41	0.05	44.90	224.76	164.34	153.32
Olsen R1	22286	100 Yr	840.02	839.84	0.17	0.25	0.00	32.39	384.63	16.98	159.35
Olsen R1	22285	100 Yr	839.76	839.57	0.19	0.25	0.02	18.79	379.19	36.02	170.76
Olsen R1	22284	100 Yr	839.49	839.38	0.11	0.22	0.01	29.54	330.82	73.64	229.79
Olsen R1	22283	100 Yr	839.26	839.19	0.08	0.35	0.01	18.20	359.71	56.09	266.89
Olsen R1	22281.5	100 Yr	838.90	838.74	0.17	0.10	0.04	1.11	287.41	145.49	226.43
Olsen R1	22280.5	100 Yr	838.76	838.73	0.03			37.69	313.48	82.83	339.99
Olsen R1	22279.2		Culvert								
Olsen R1	22278	100 Yr	836.87	836.71	0.16	0.32	0.06	42.07	330.01	135.92	115.66
Olsen R1	22277	100 Yr	836.49	835.78	0.72	0.75	0.11	29.95	471.79	6.26	75.61
Olsen R1	22276	100 Yr	835.57	835.14	0.44	0.84	0.08	146.68	350.86	10.46	194.64
Olsen R1	22275	100 Yr	834.64	834.42	0.22	0.18	0.05	5.86	368.53	133.61	109.04
Olsen R1	22274	100 Yr	834.41	834.35	0.06	0.13	0.01	37.80	216.28	253.92	227.74
Olsen R1	22273	100 Yr	834.27	834.16	0.11	0.12	0.01	0.57	257.85	249.58	198.32
Olsen R1	22272	100 Yr	834.14	834.05	0.09	0.20	0.07	4.55	185.08	318.37	80.99
Olsen R1	22271	100 Yr	833.87	833.11	0.76	0.43	0.05	29.57	476.68	1.76	60.05
Olsen R1	22269	100 Yr	833.28	832.33	0.96	0.57	0.02	99.22	407.96	0.82	72.25

Reso A - Exhibit C2 (EIR Technical Appendix)

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22289.8 Profile: 100 Yr

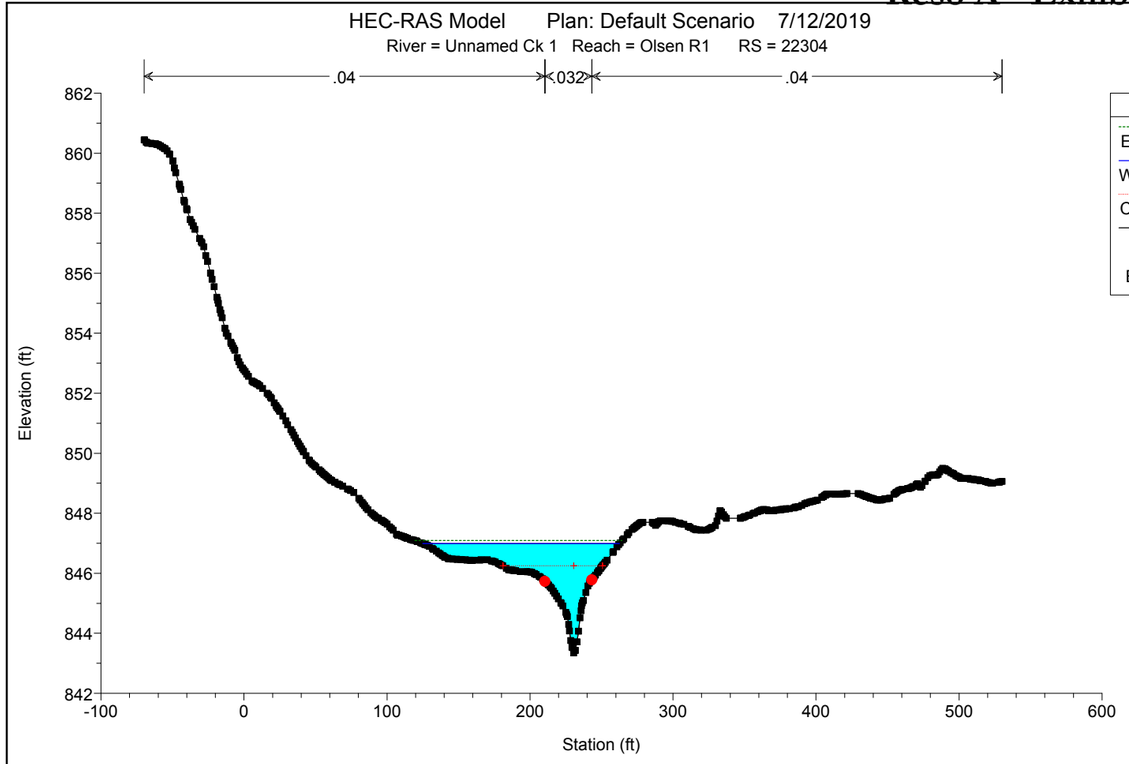
E.G. US. (ft)	841.95	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	841.92	E.G. Elev (ft)	841.83	841.70
Q Total (cfs)	265.00	W.S. Elev (ft)	841.71	841.62
Q Bridge (cfs)	264.15	Crit W.S. (ft)	841.28	840.91
Q Weir (cfs)	0.85	Max Chl Dpth (ft)	1.33	2.32
Weir Sta Lft (ft)	591.56	Vel Total (ft/s)	2.65	2.00
Weir Sta Rgt (ft)	602.13	Flow Area (sq ft)	99.57	131.75
Weir Submerg	0.00	Froude # Chl	0.42	0.26
Weir Max Depth (ft)	0.18	Specif Force (cu ft)	78.12	122.78
Min El Weir Flow (ft)	841.87	Hydr Depth (ft)	1.11	1.46
Min El Prs (ft)	842.99	W.P. Total (ft)	90.04	90.08
Delta EG (ft)	0.23	Conv. Total (cfs)	4557.3	7315.0
Delta WS (ft)	0.34	Top Width (ft)	90.00	90.00
BR Open Area (sq ft)	214.67	Frctn Loss (ft)	0.12	0.06
BR Open Vel (ft/s)	2.65	C & E Loss (ft)	0.01	0.01
Coef of Q		Shear Total (lb/sq ft)	0.23	0.12
Br Sel Method	Energy/Weir	Power Total (lb/ft s)	312.62	761.16

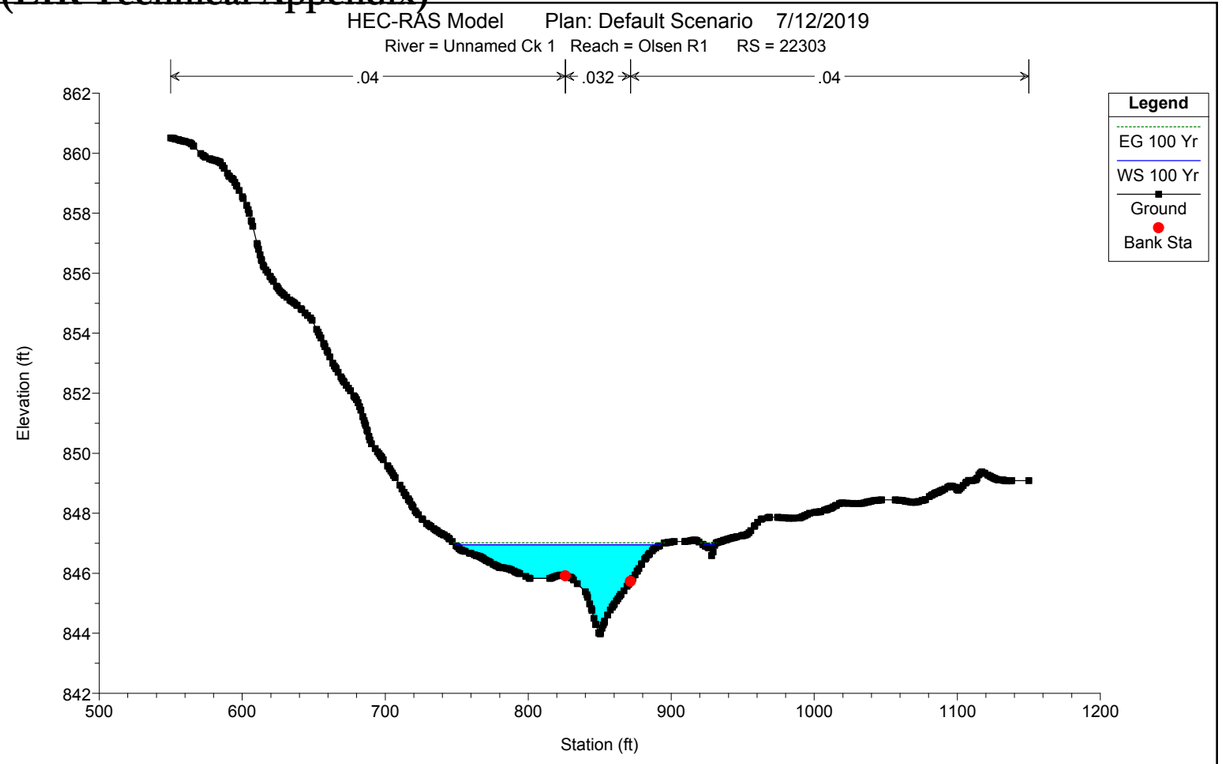
Reso A - Exhibit C2 (EIR Technical Appendix)

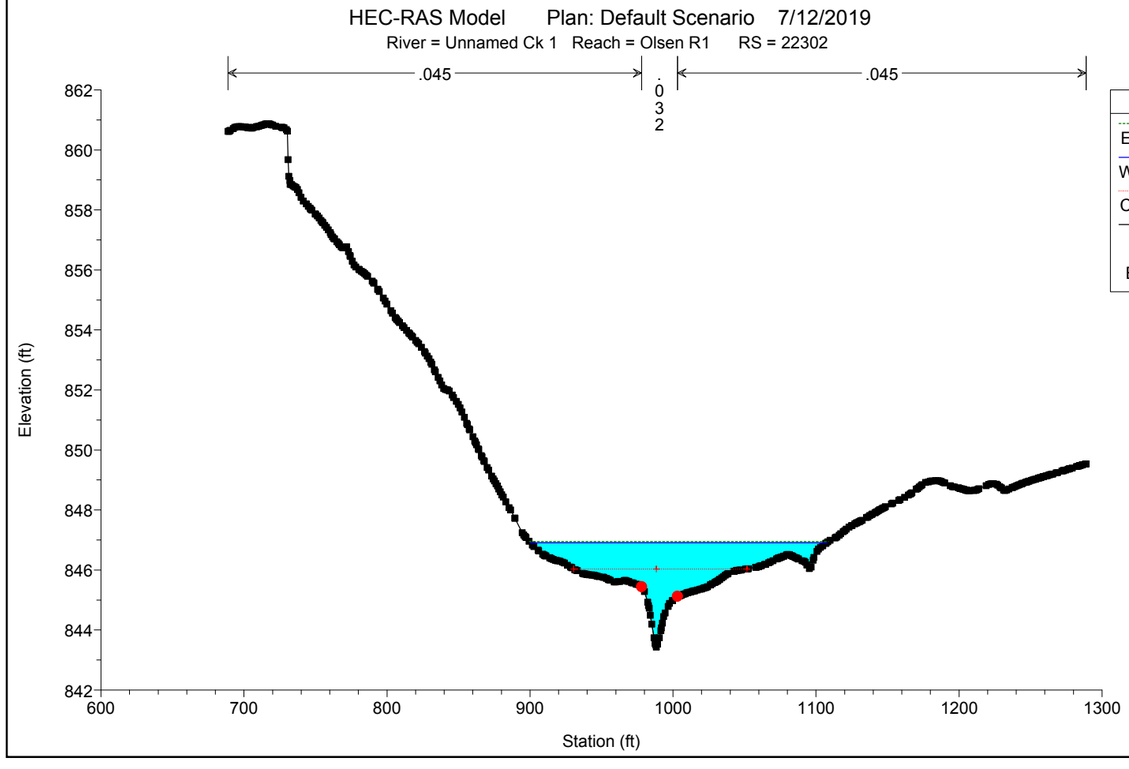
Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22301.3 Culv Group: Culvert #1 Profile: 100 Yr

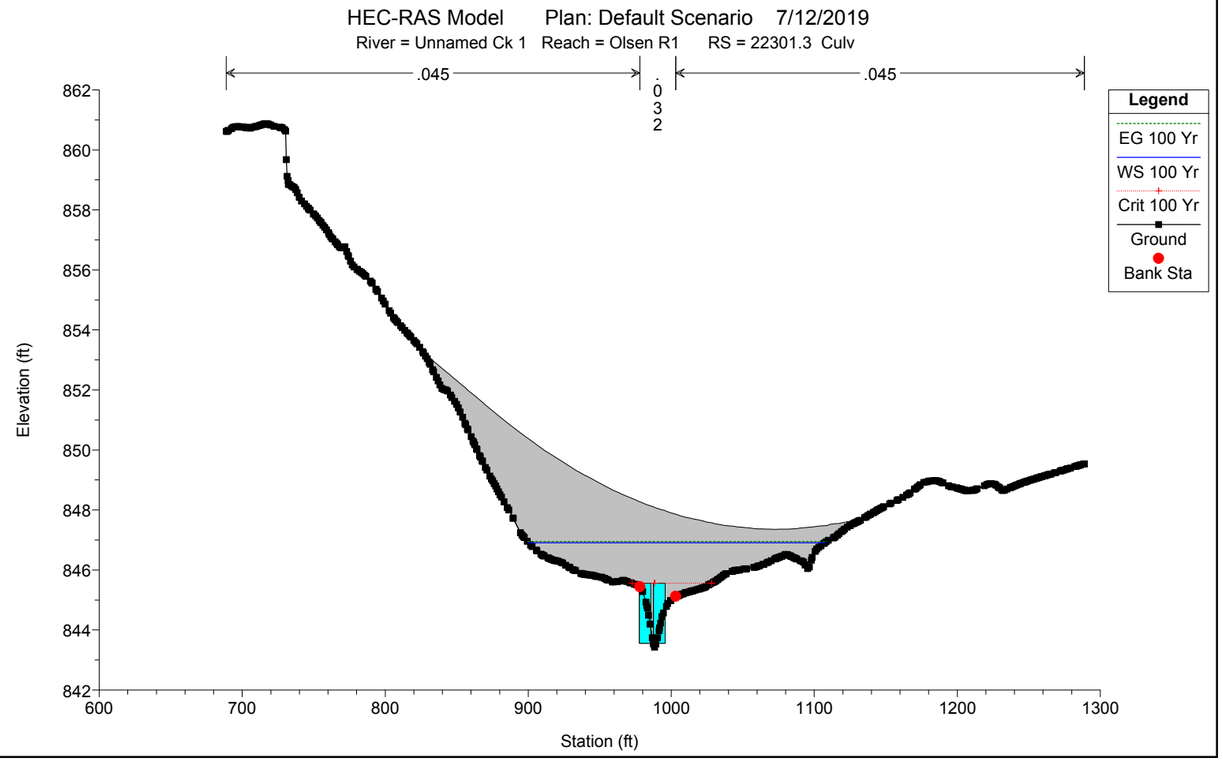
Q Culv Group (cfs)	135.15	Culv Full Len (ft)	60.00
# Barrels	1	Culv Vel US (ft/s)	8.45
Q Barrel (cfs)	135.15	Culv Vel DS (ft/s)	8.45
E.G. US. (ft)	846.95	Culv Inv El Up (ft)	843.56
W.S. US. (ft)	846.91	Culv Inv El Dn (ft)	842.48
E.G. DS (ft)	845.79	Culv Frctn Ls (ft)	0.45
W.S. DS (ft)	845.67	Culv Exit Loss (ft)	0.50
Delta EG (ft)	1.16	Culv Entr Loss (ft)	0.22
Delta WS (ft)	1.24	Q Weir (cfs)	
E.G. IC (ft)	848.00	Weir Sta Lft (ft)	
E.G. OC (ft)	846.95	Weir Sta Rgt (ft)	
Culvert Control	Outlet	Weir Submerg	
Culv WS Inlet (ft)	845.56	Weir Max Depth (ft)	
Culv WS Outlet (ft)	844.48	Weir Avg Depth (ft)	
Culv Nml Depth (ft)	1.18	Weir Flow Area (sq ft)	
Culv Crt Depth (ft)	2.00	Min El Weir Flow (ft)	847.36

Reso A - Exhibit C2 (EIR Technical Appendix)









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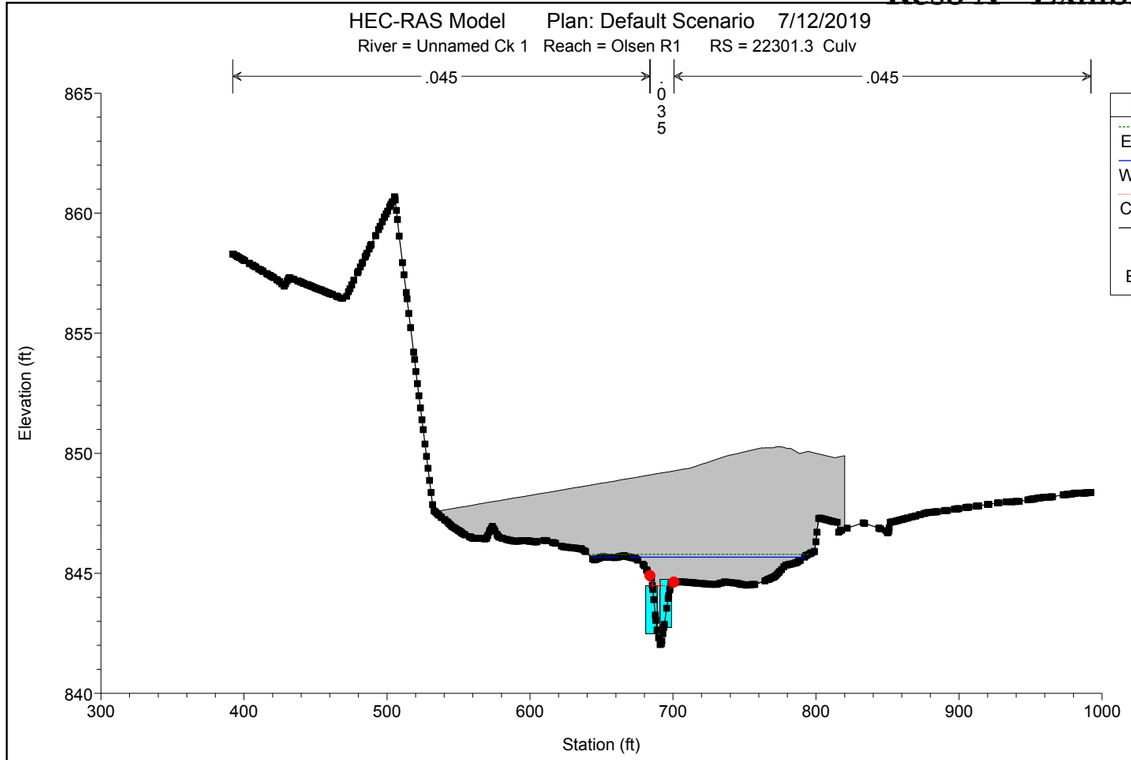

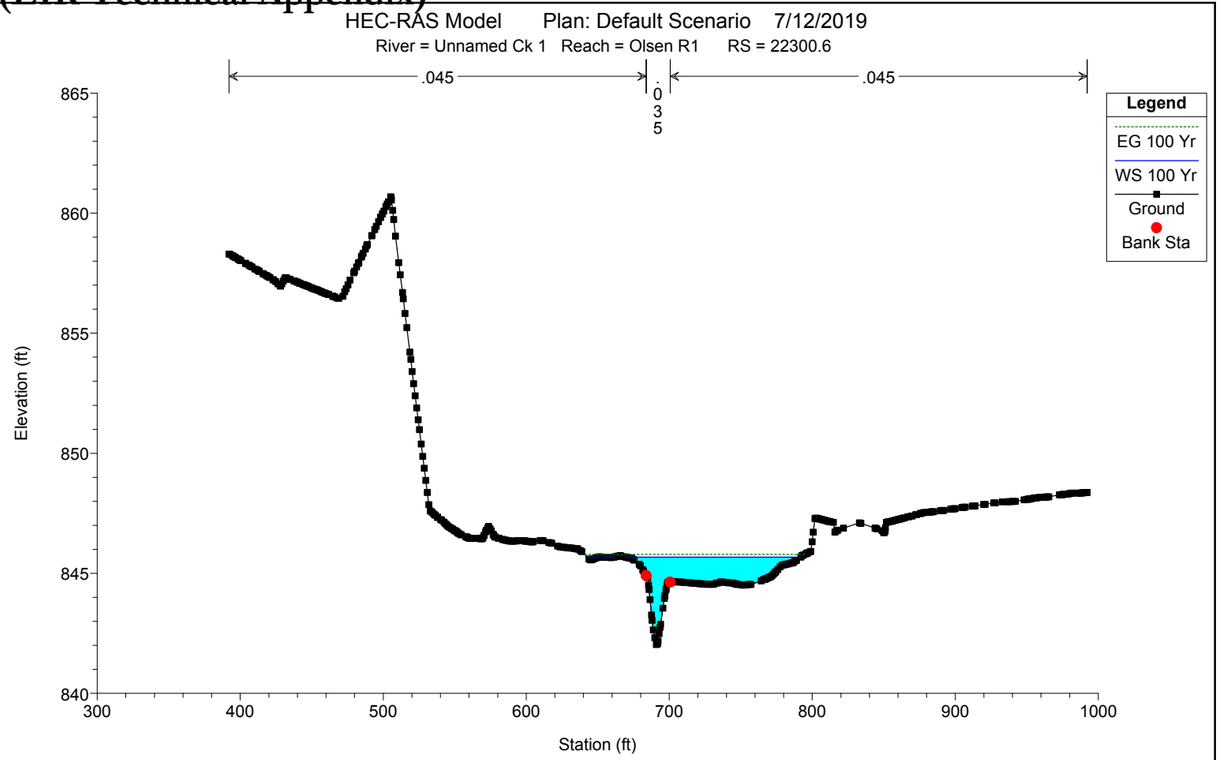

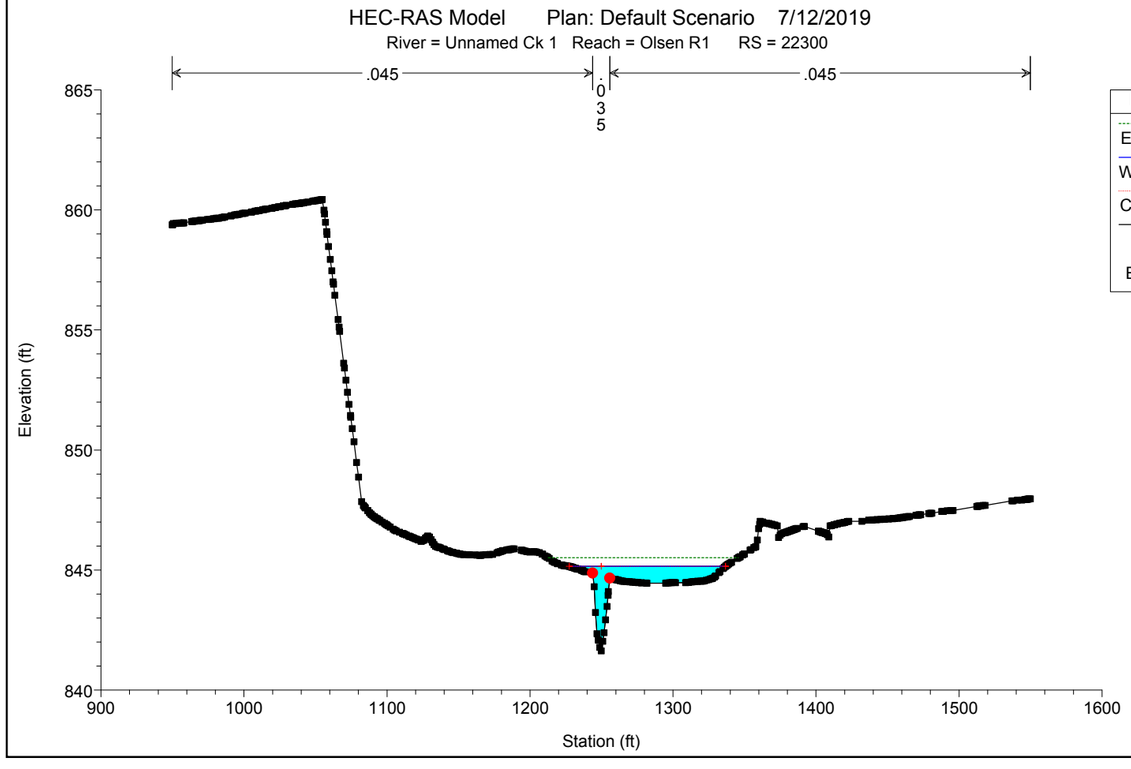

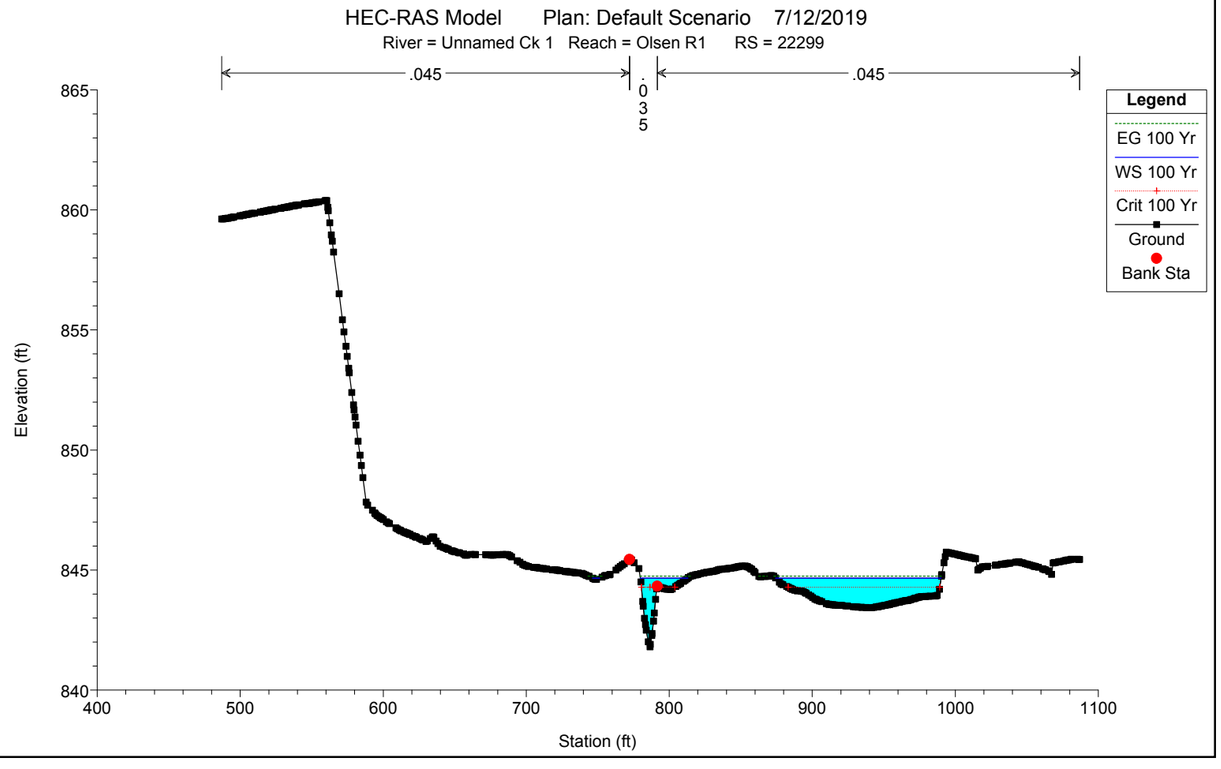

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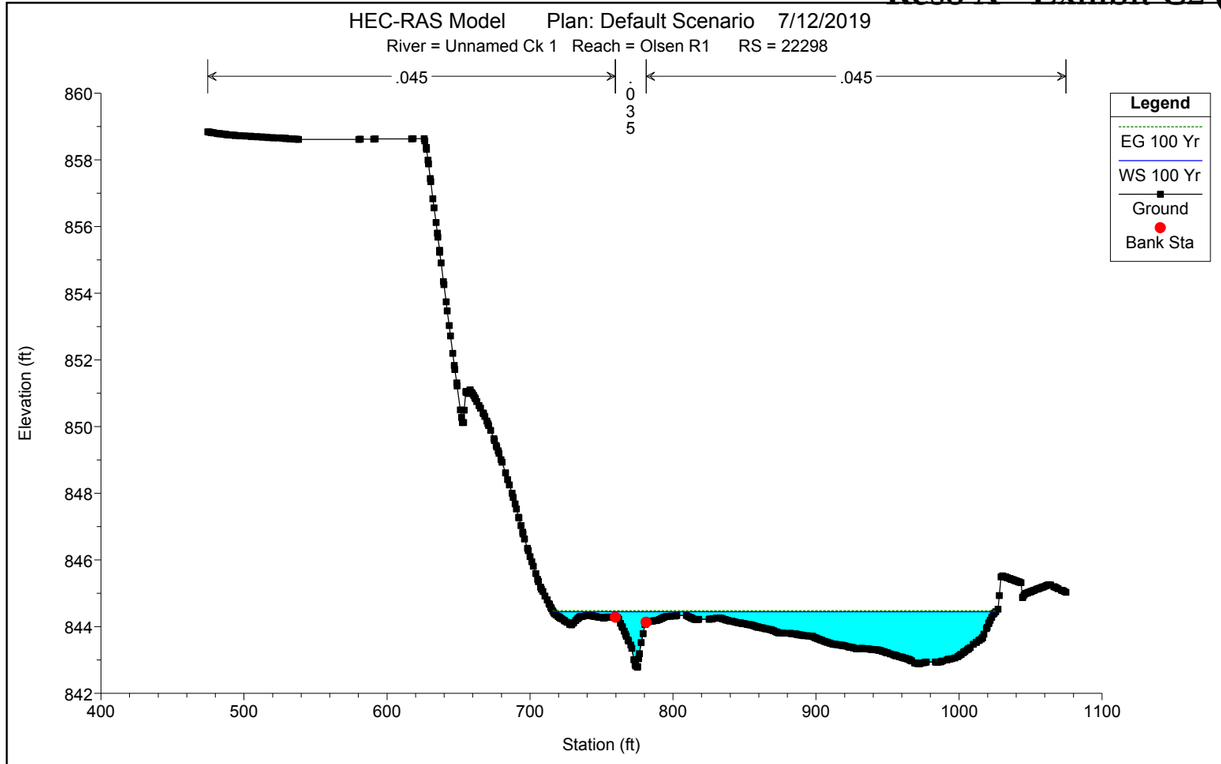

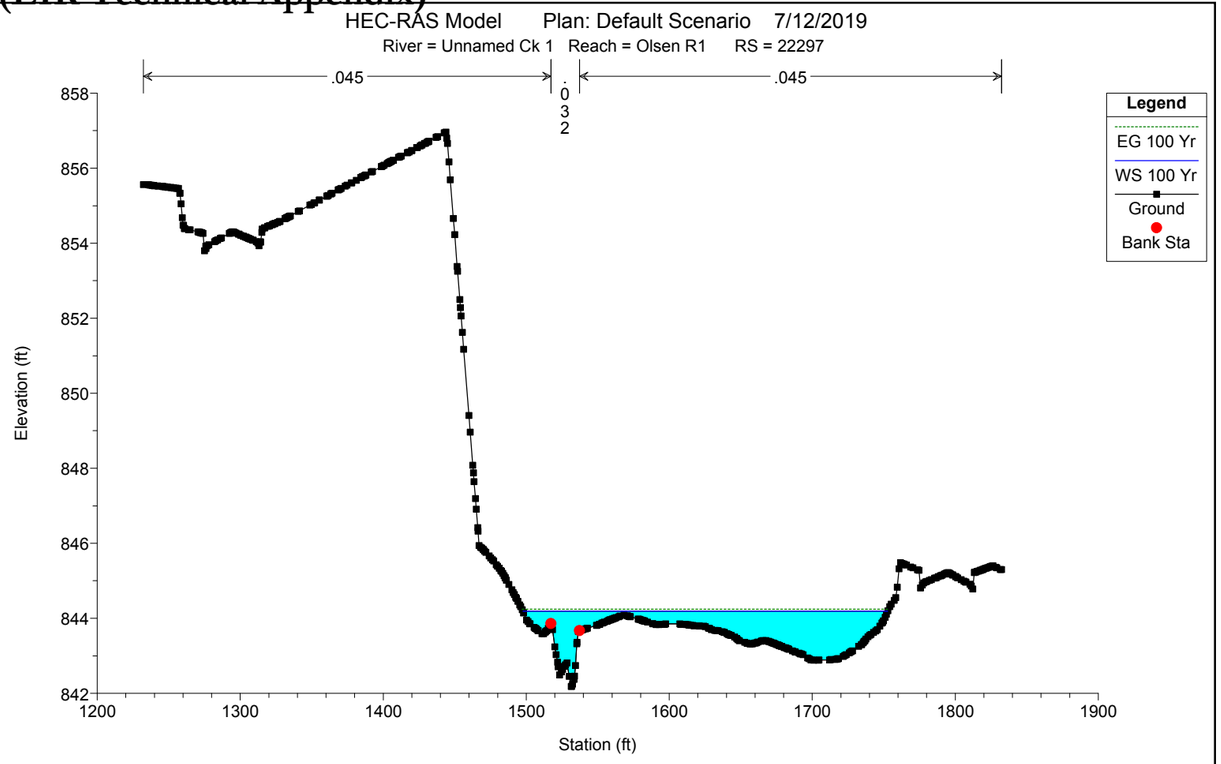

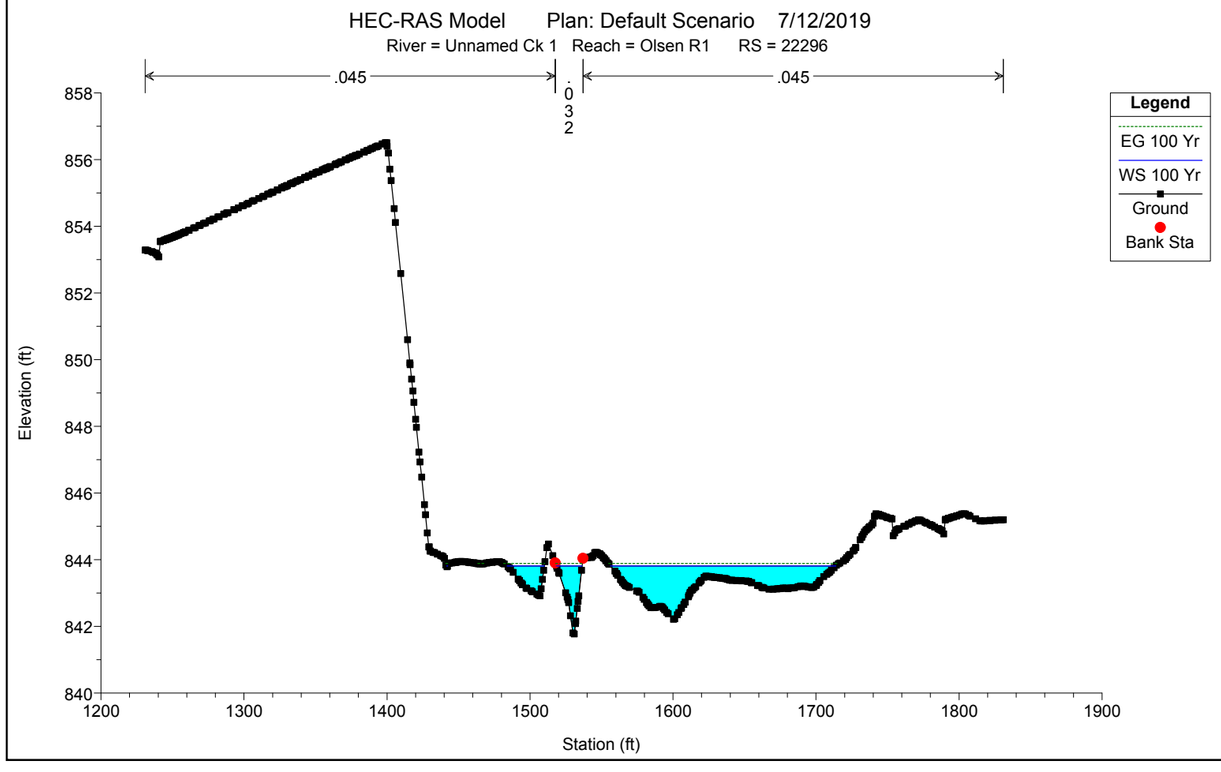

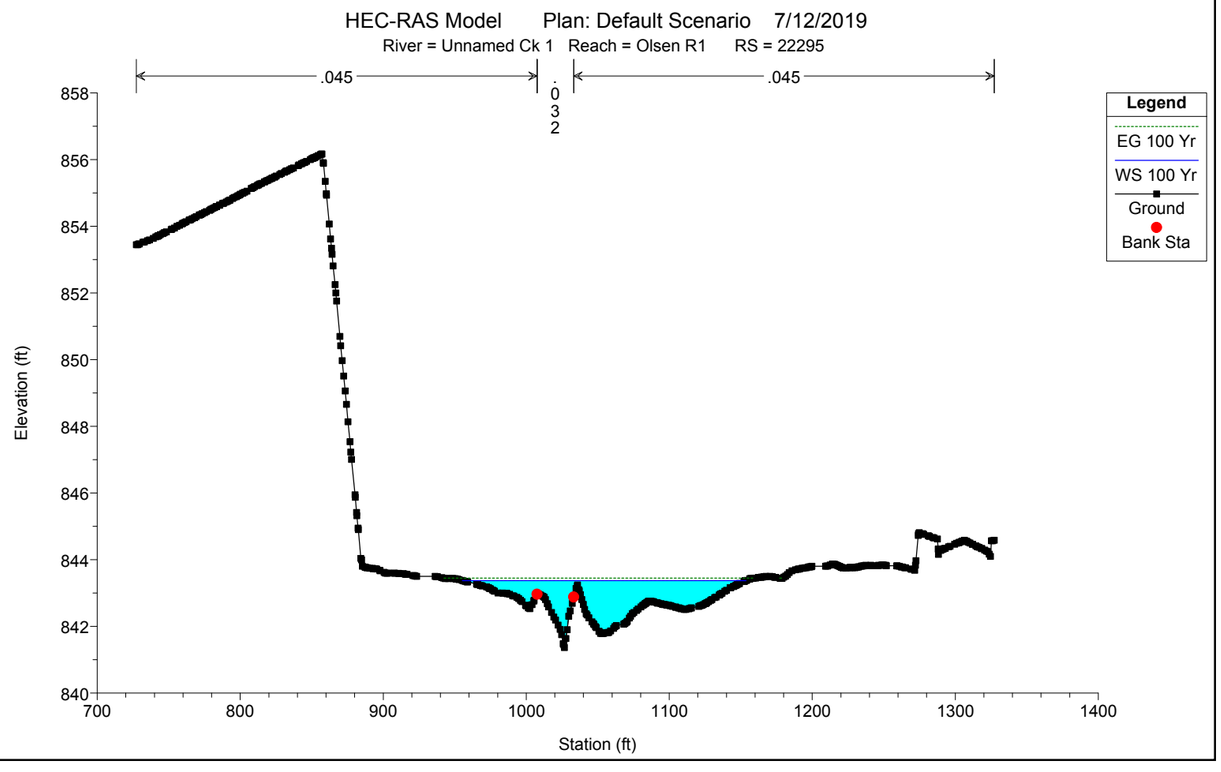

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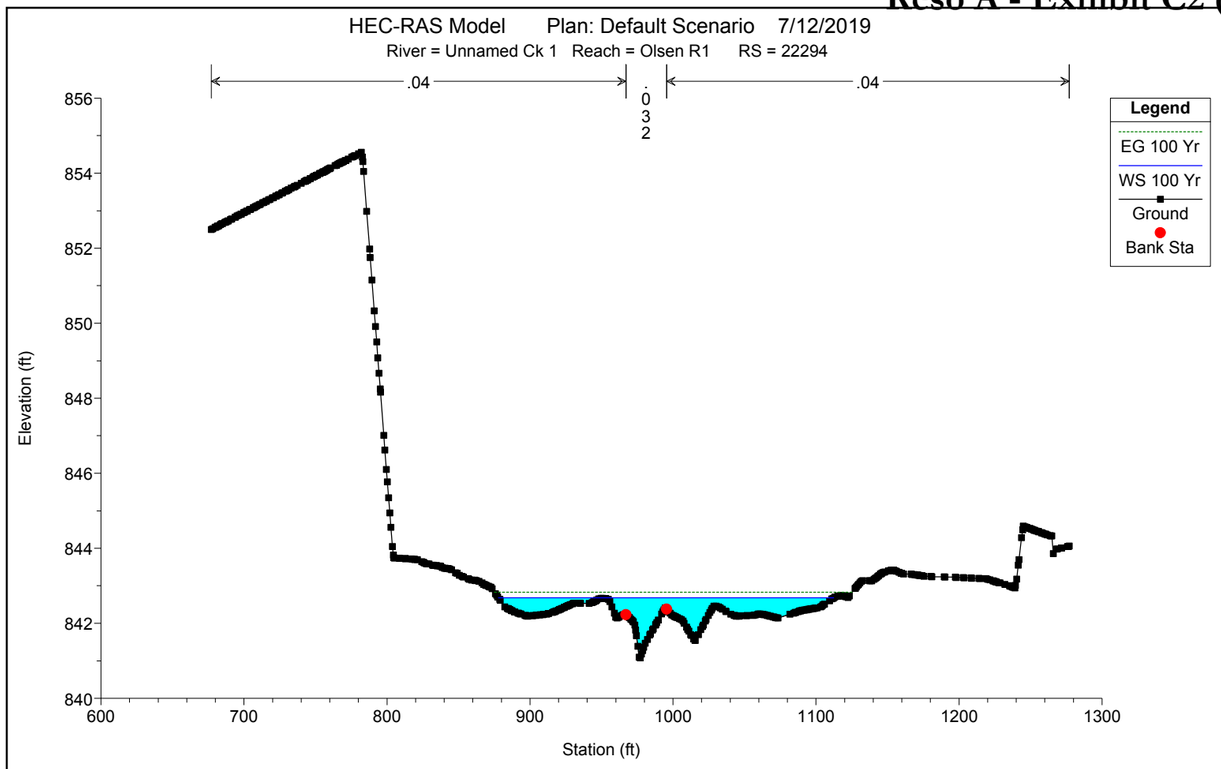

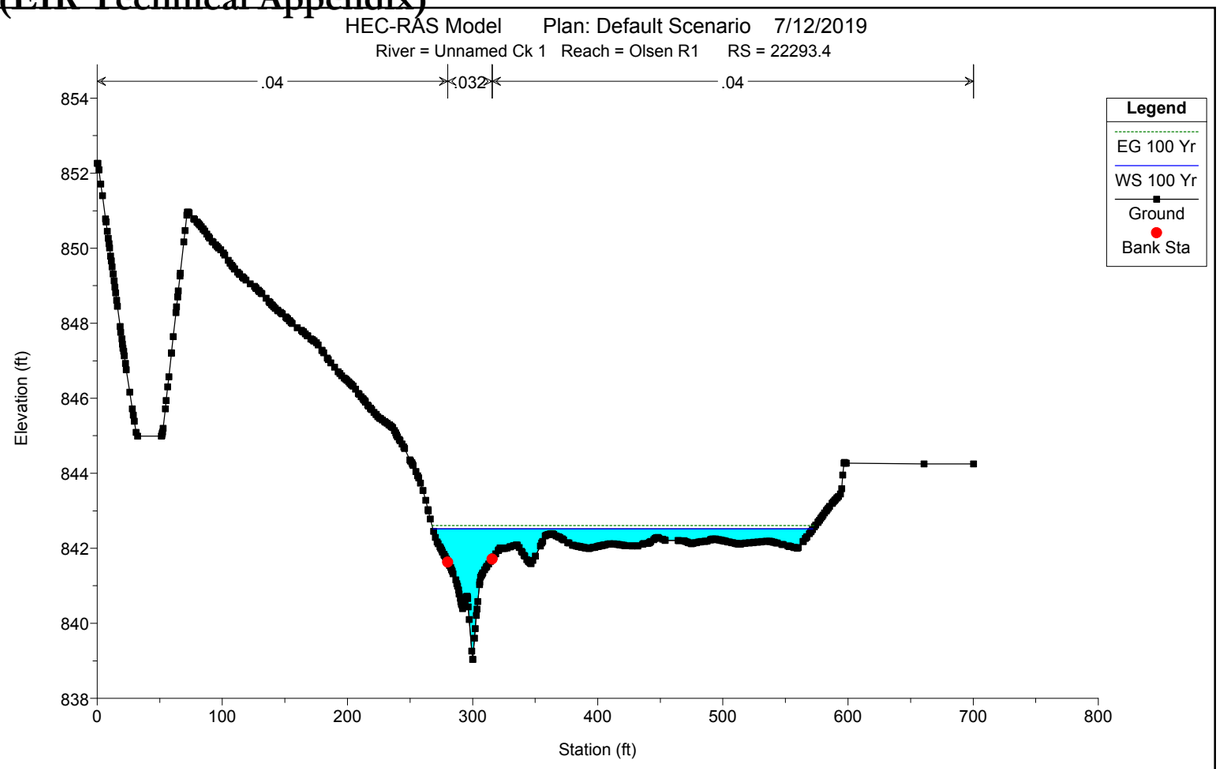

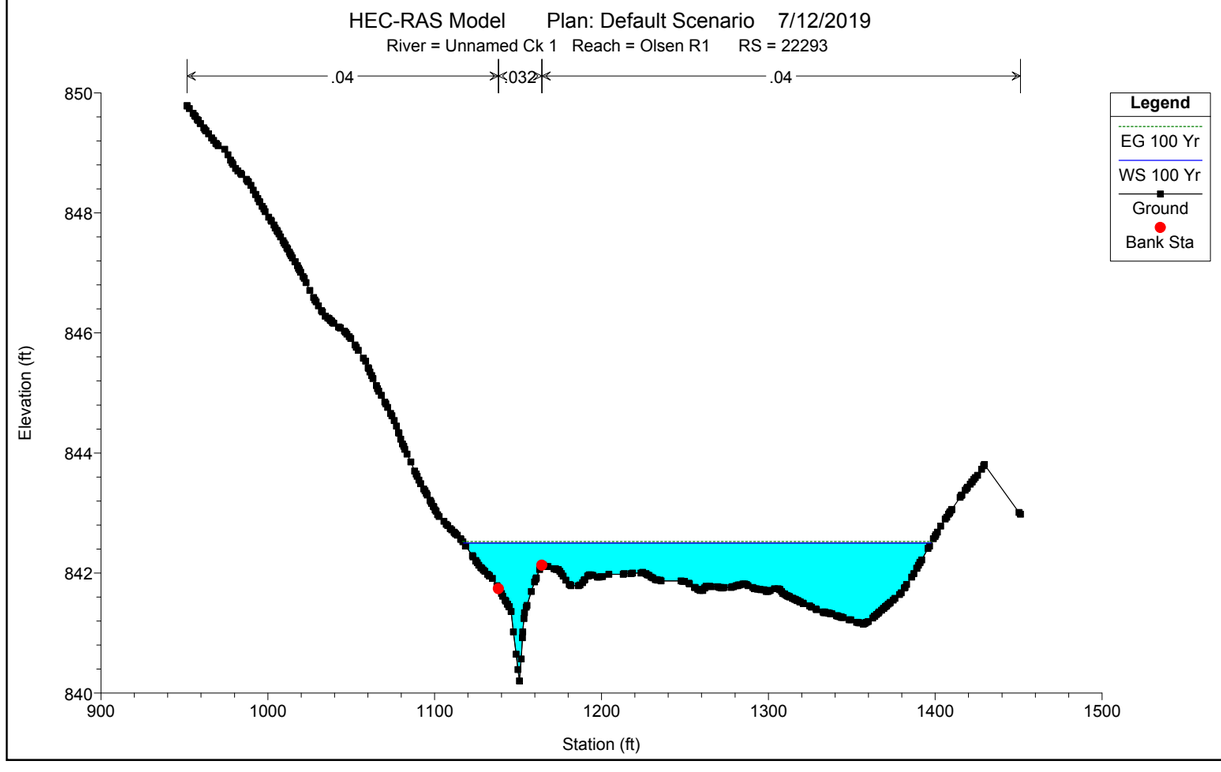

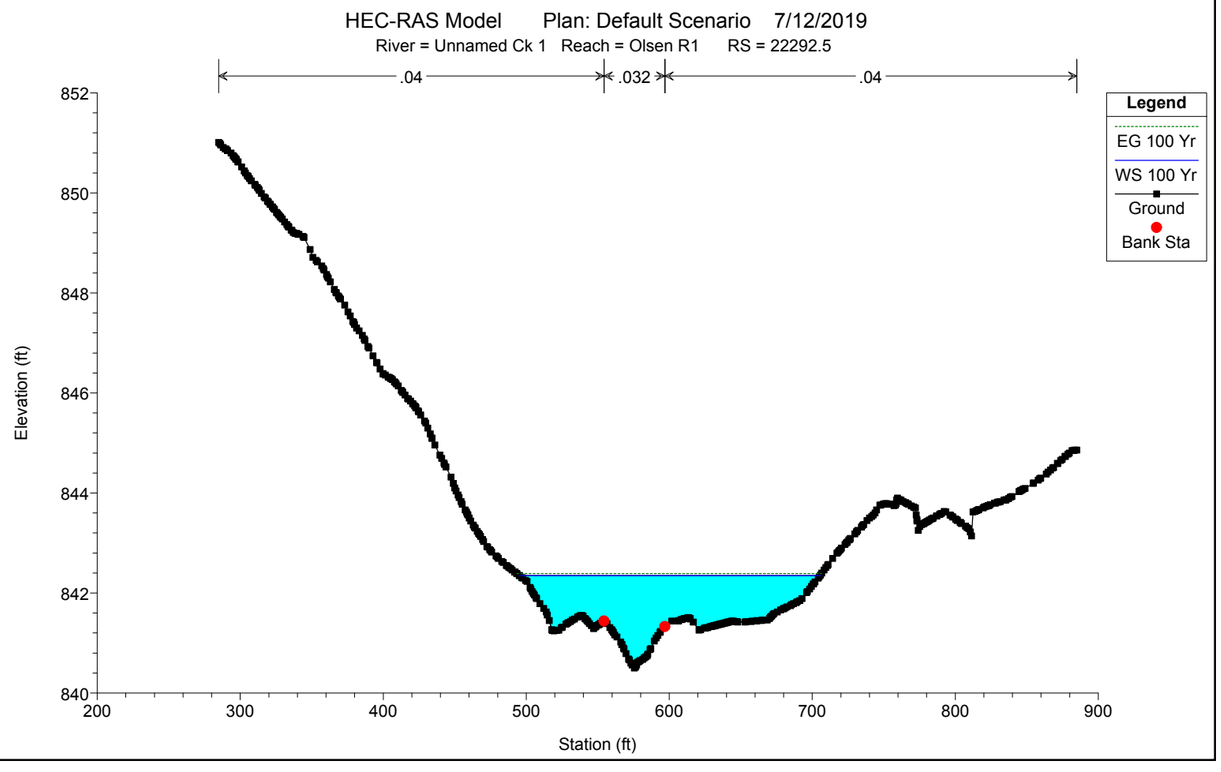

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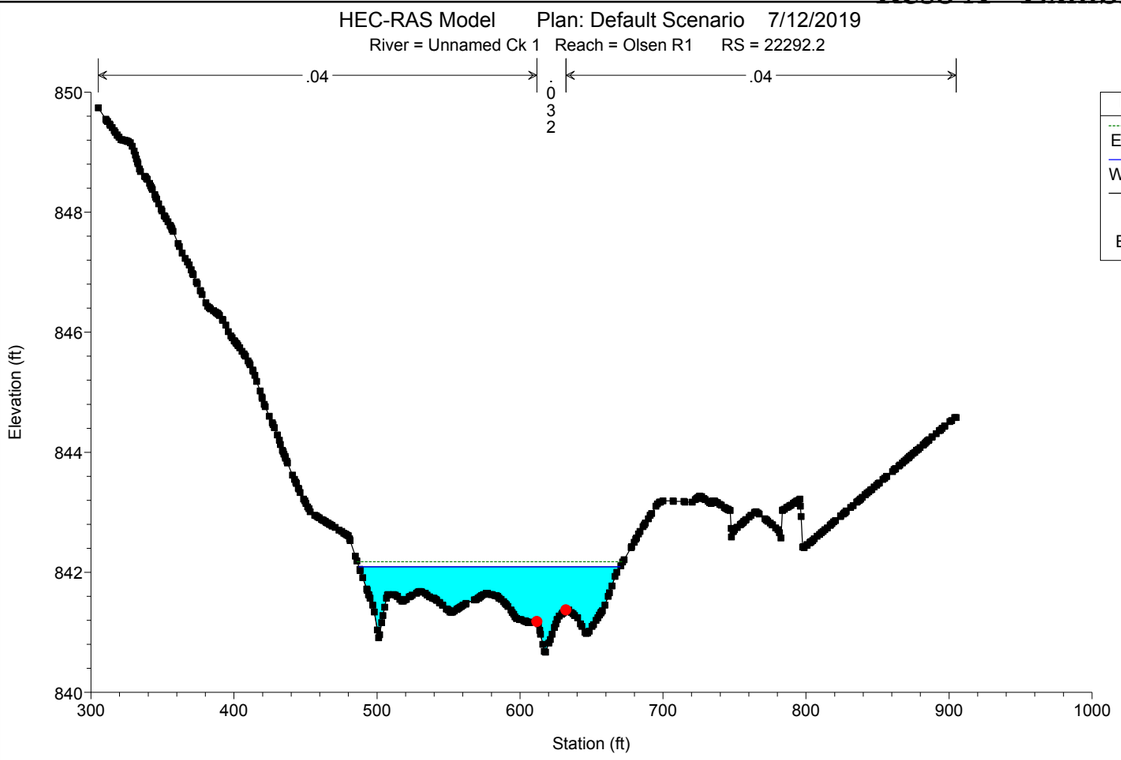

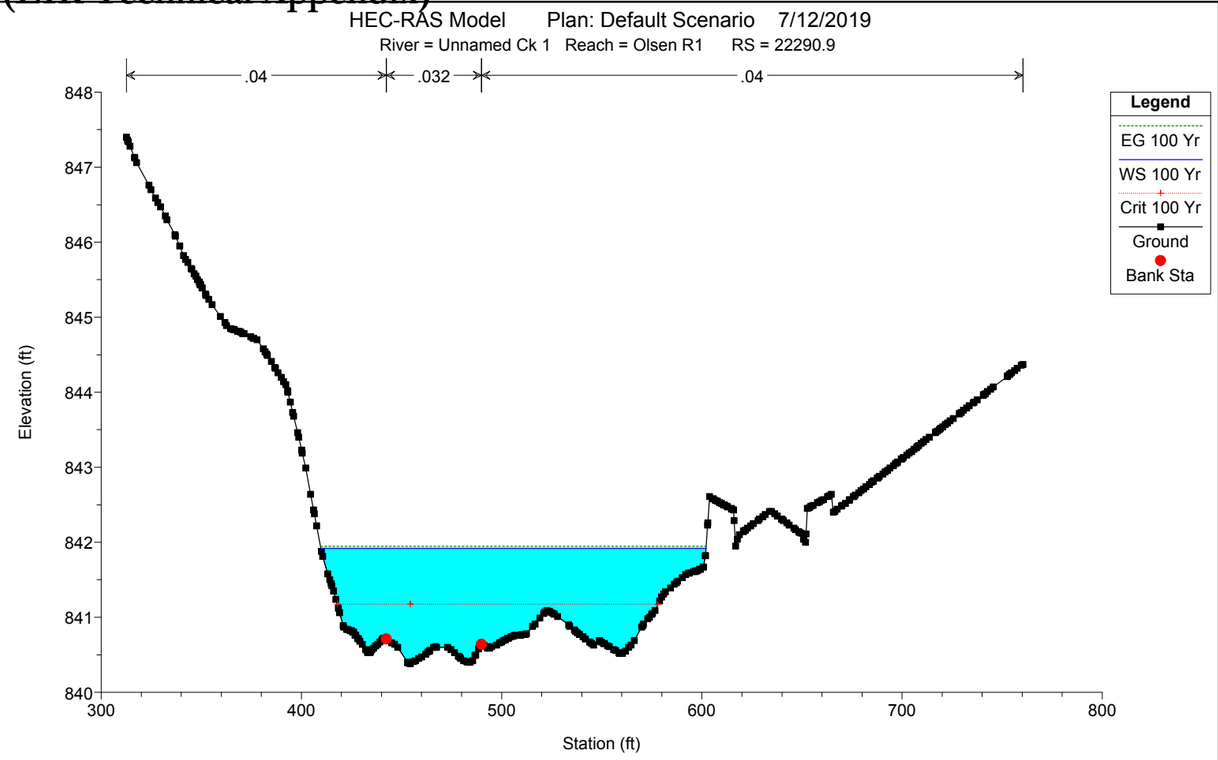

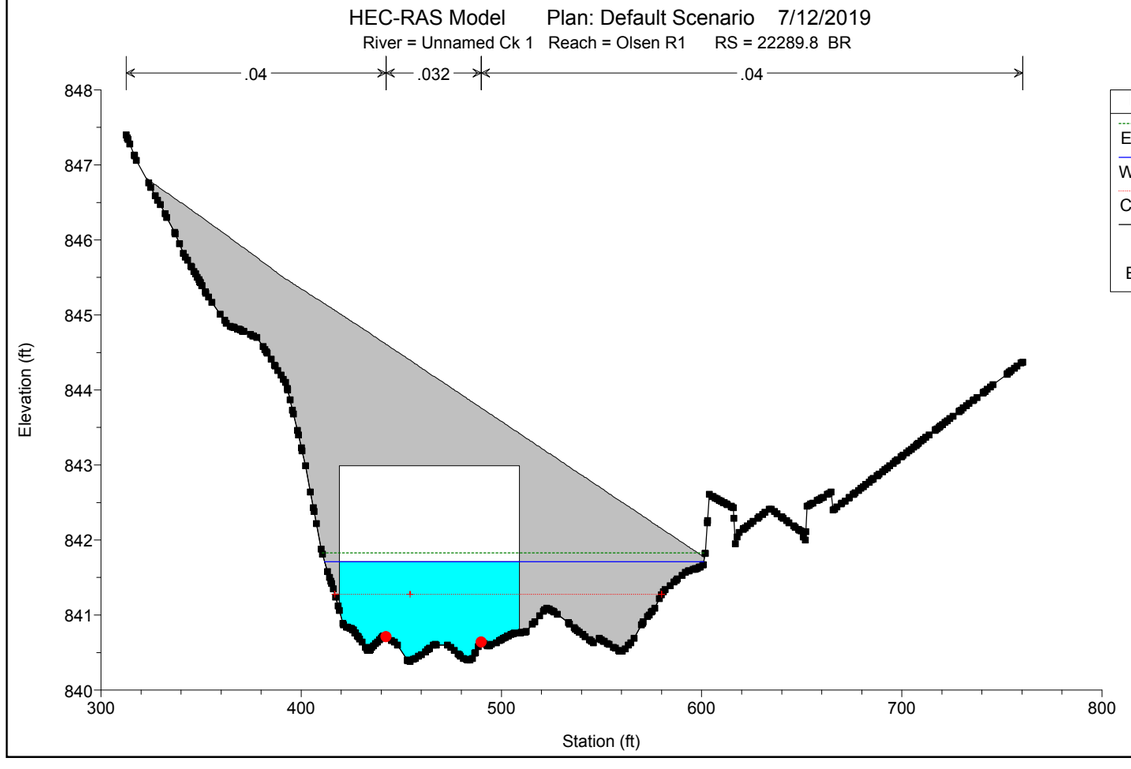

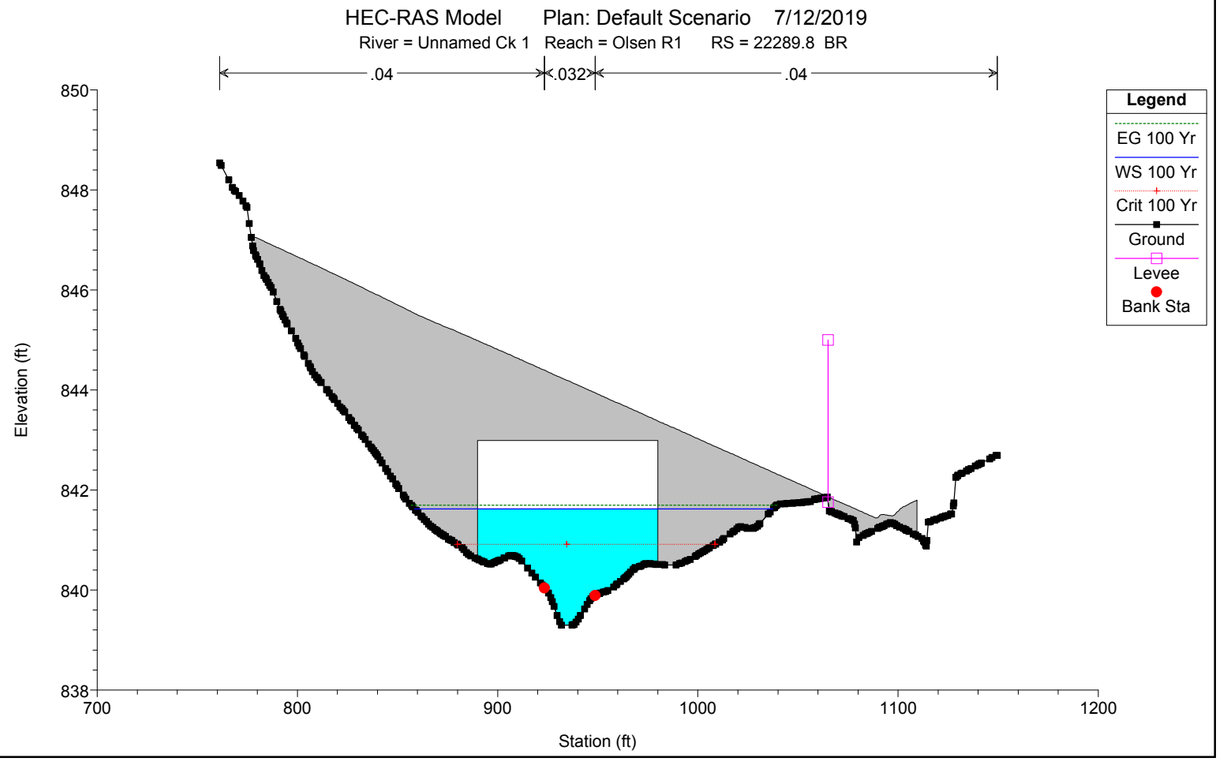

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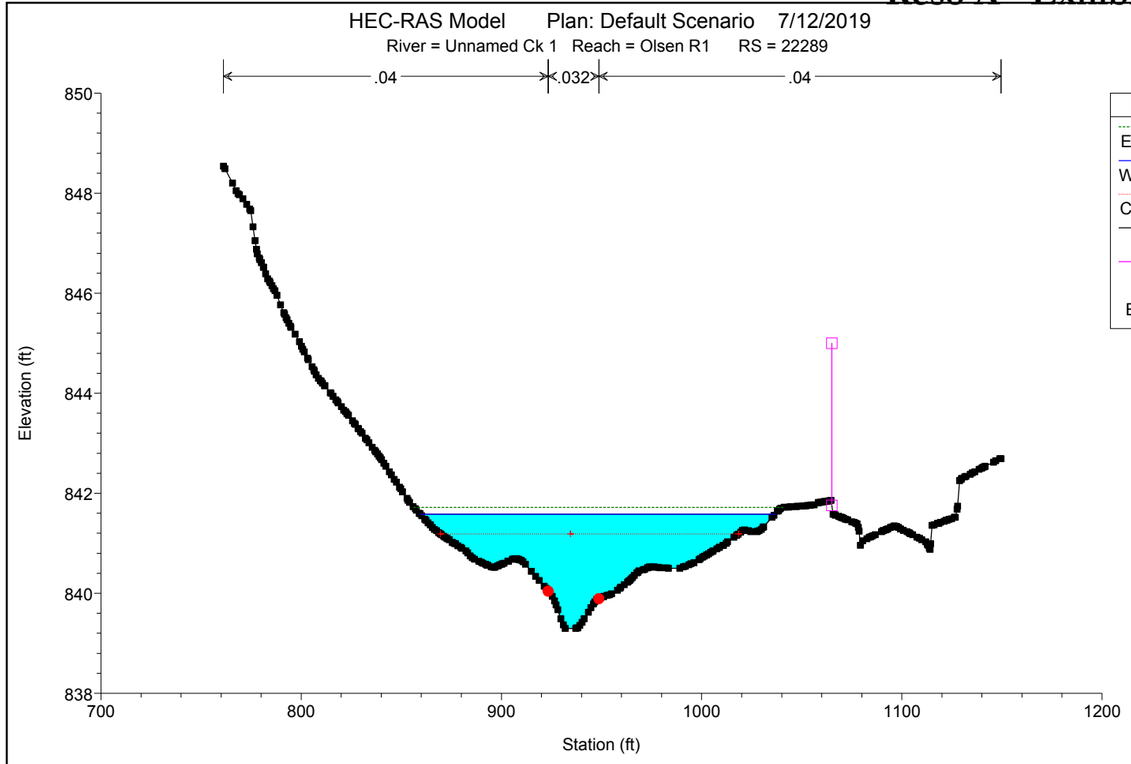

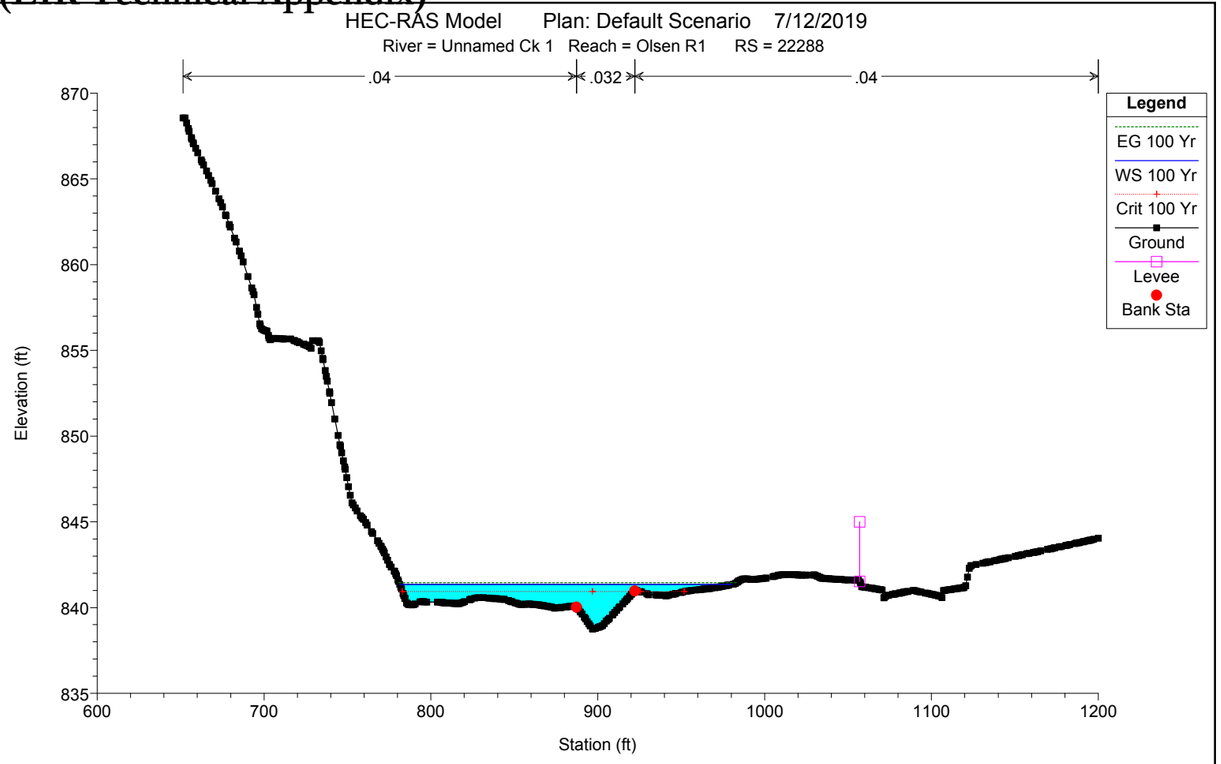

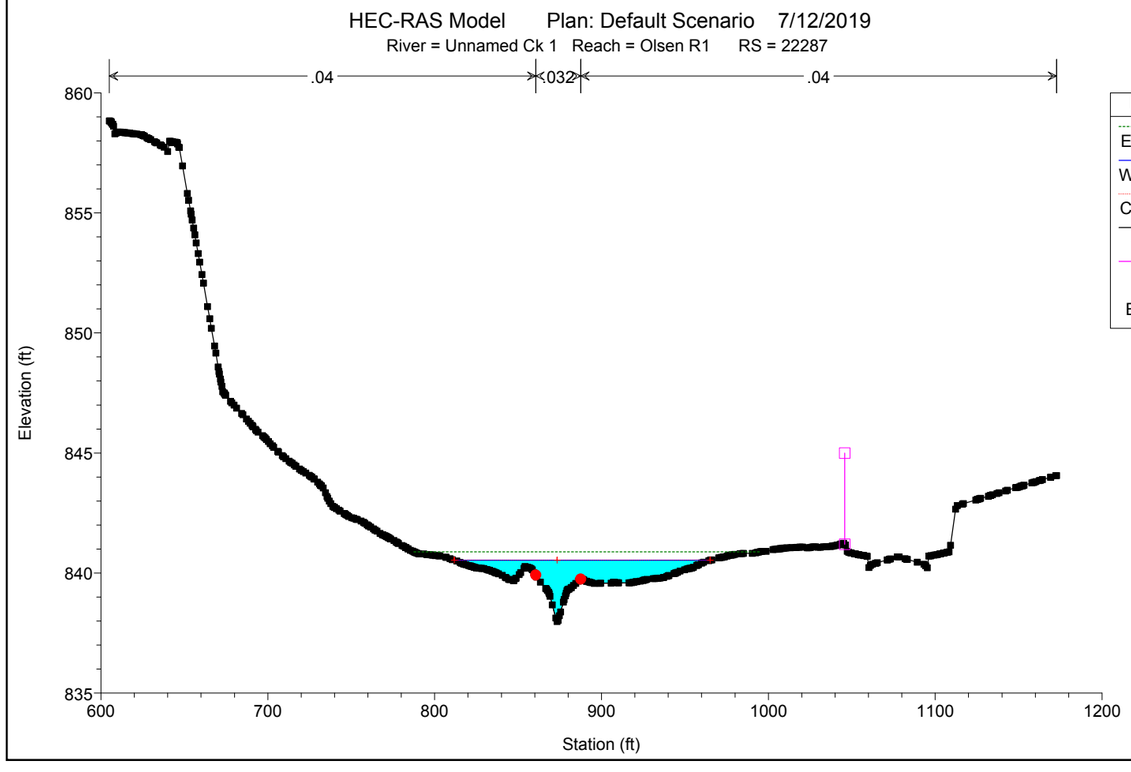

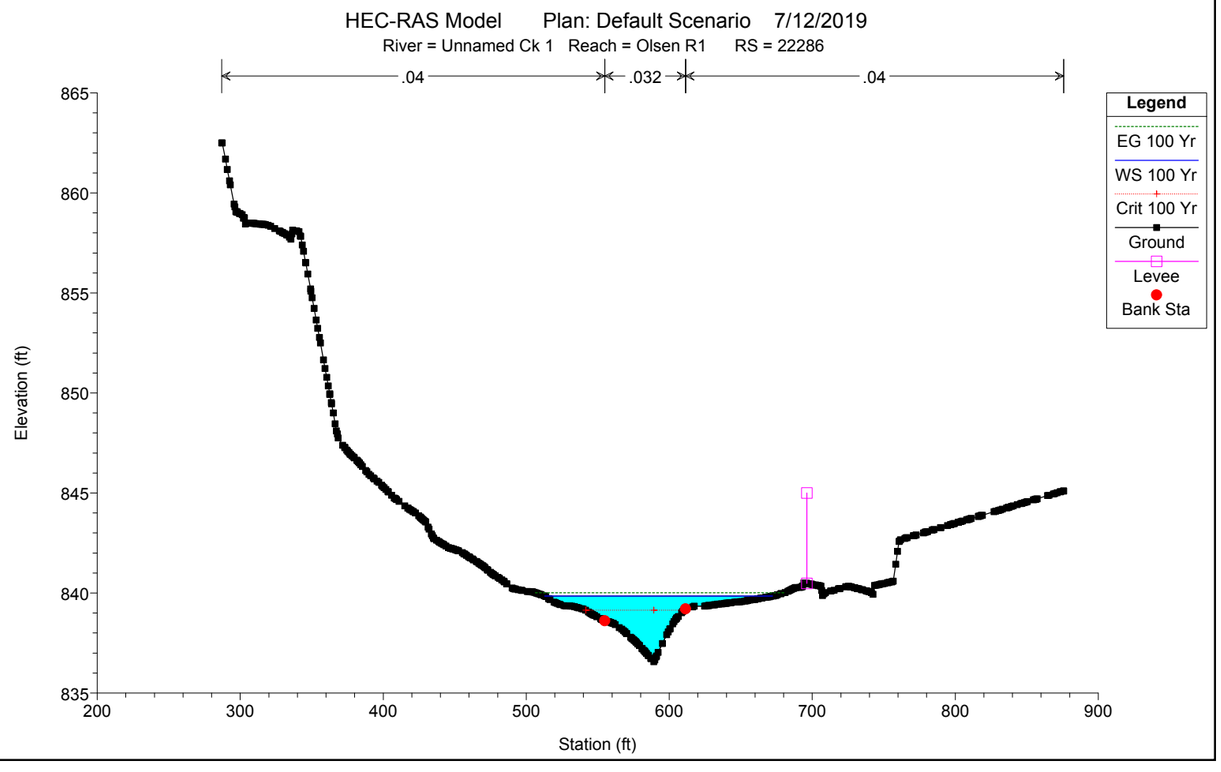

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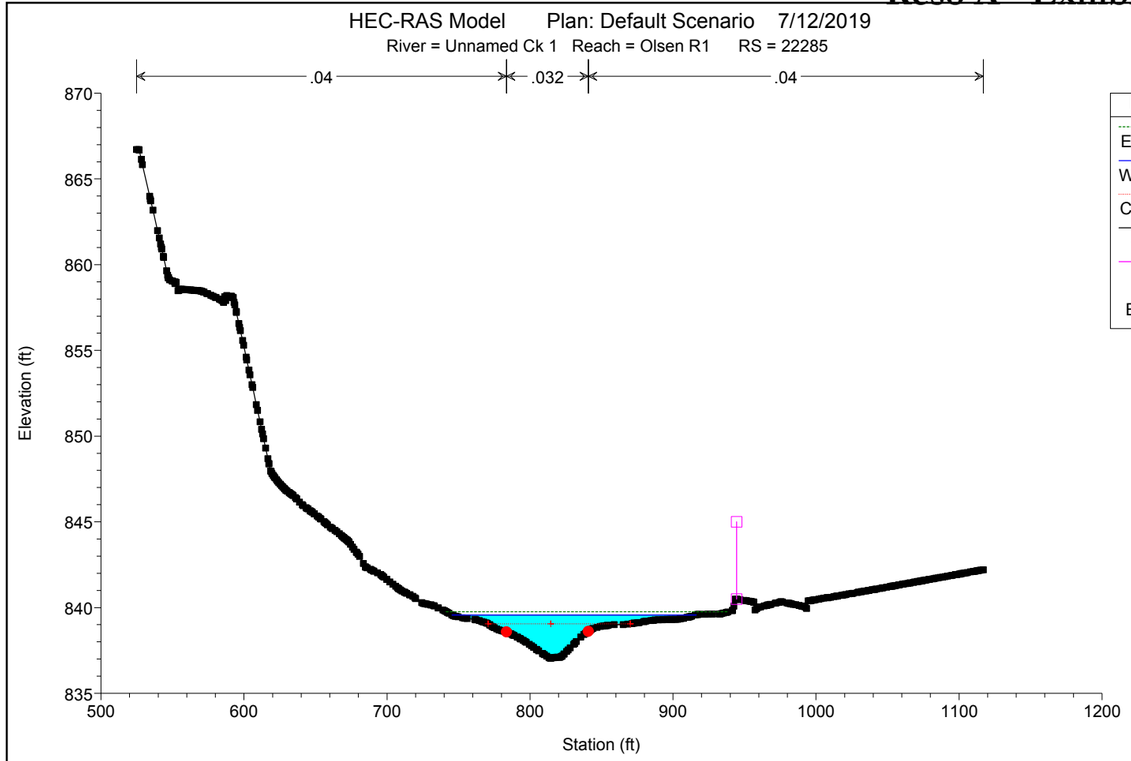

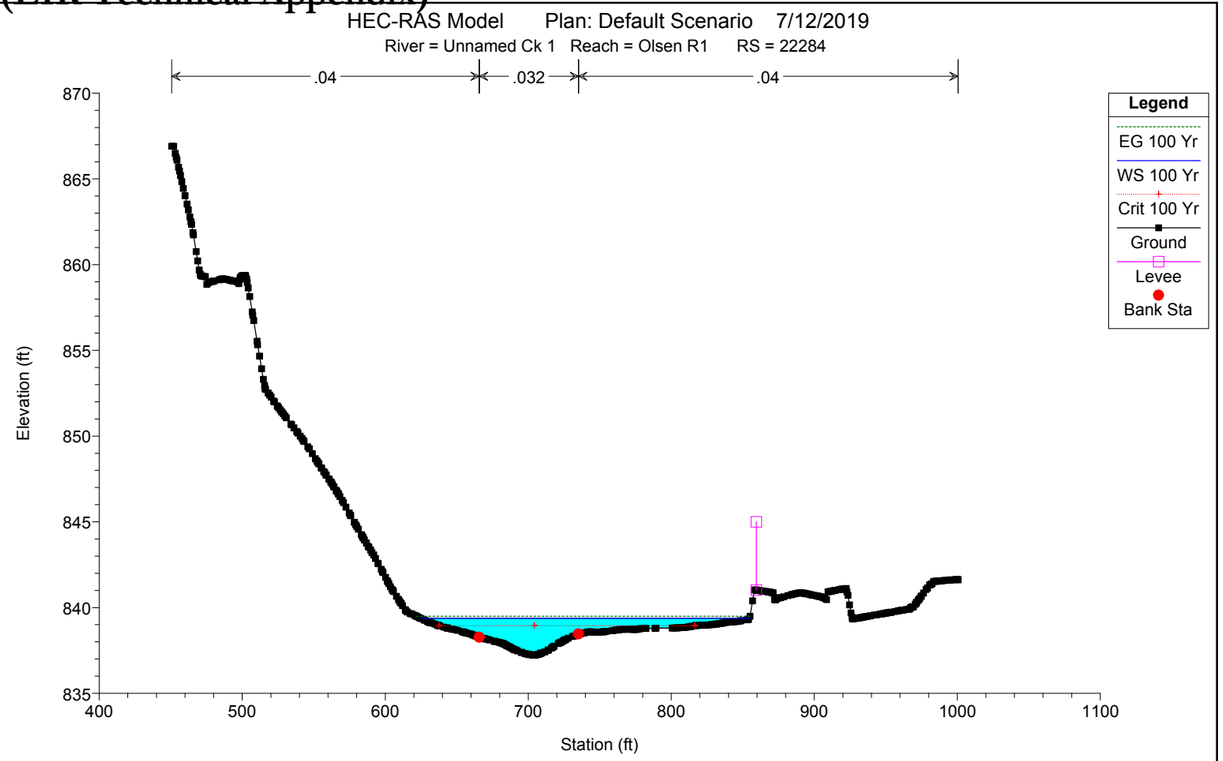

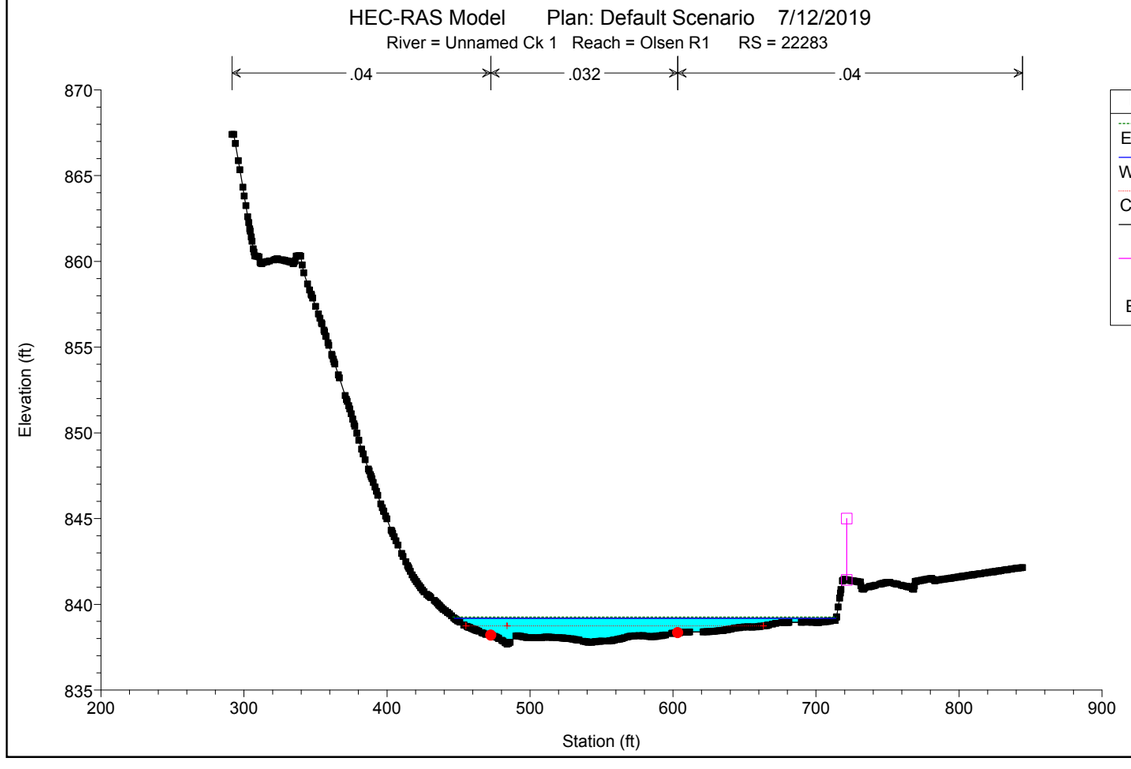

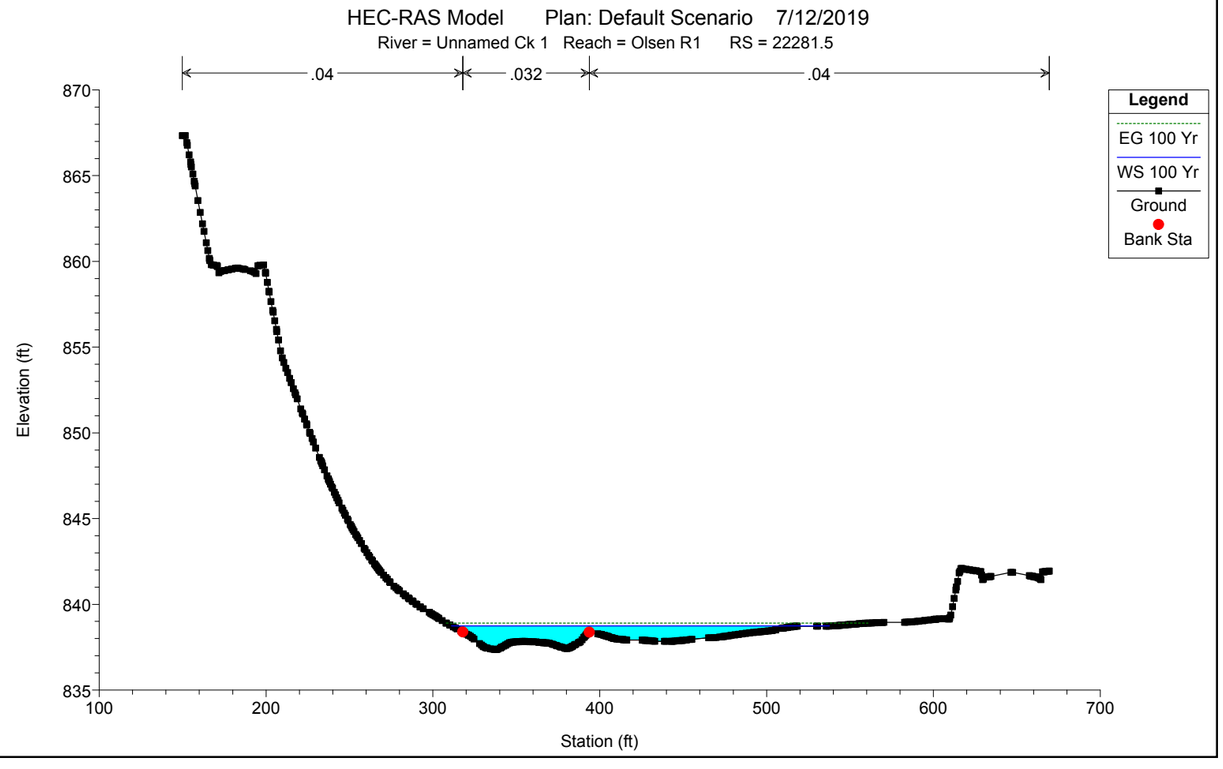

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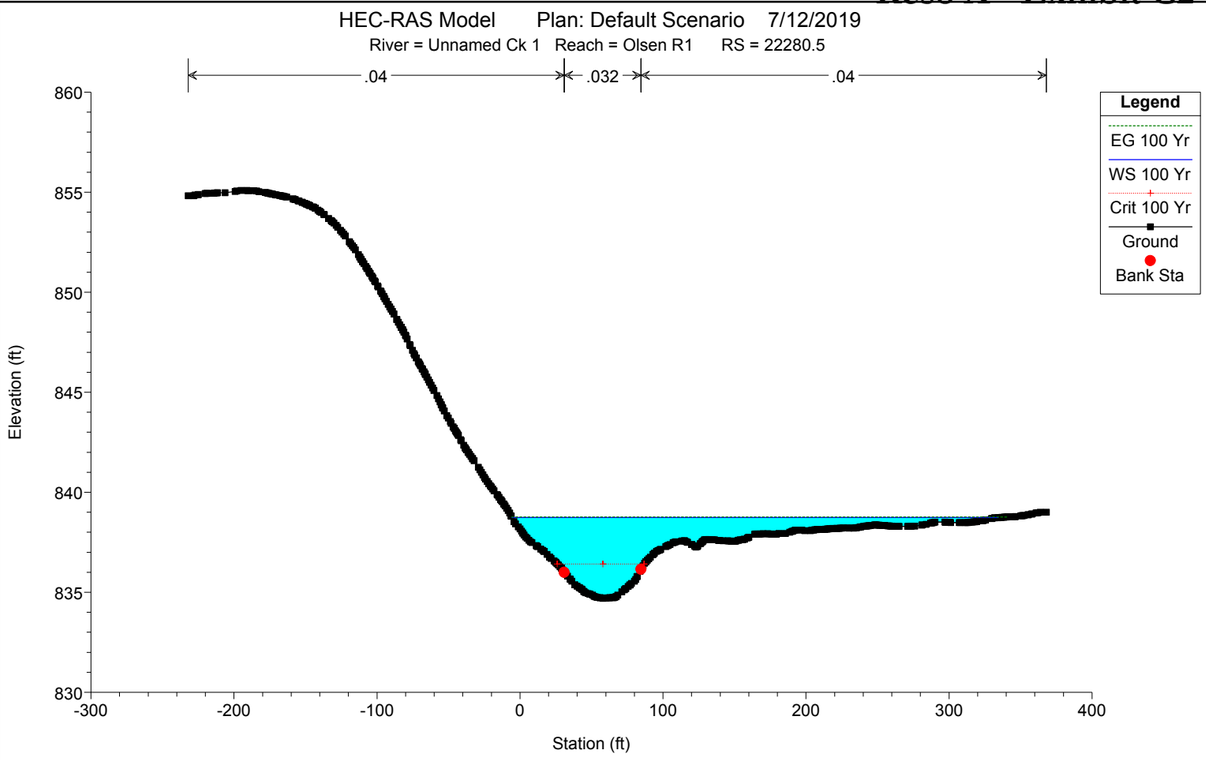
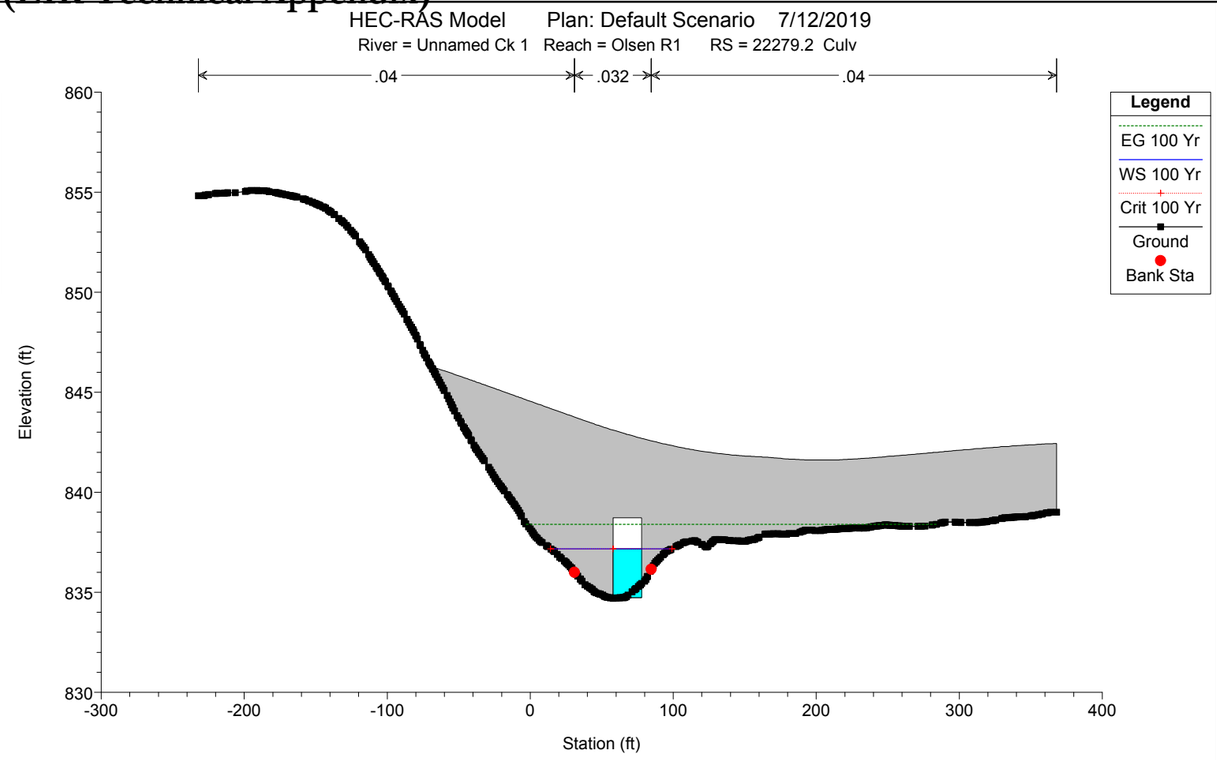
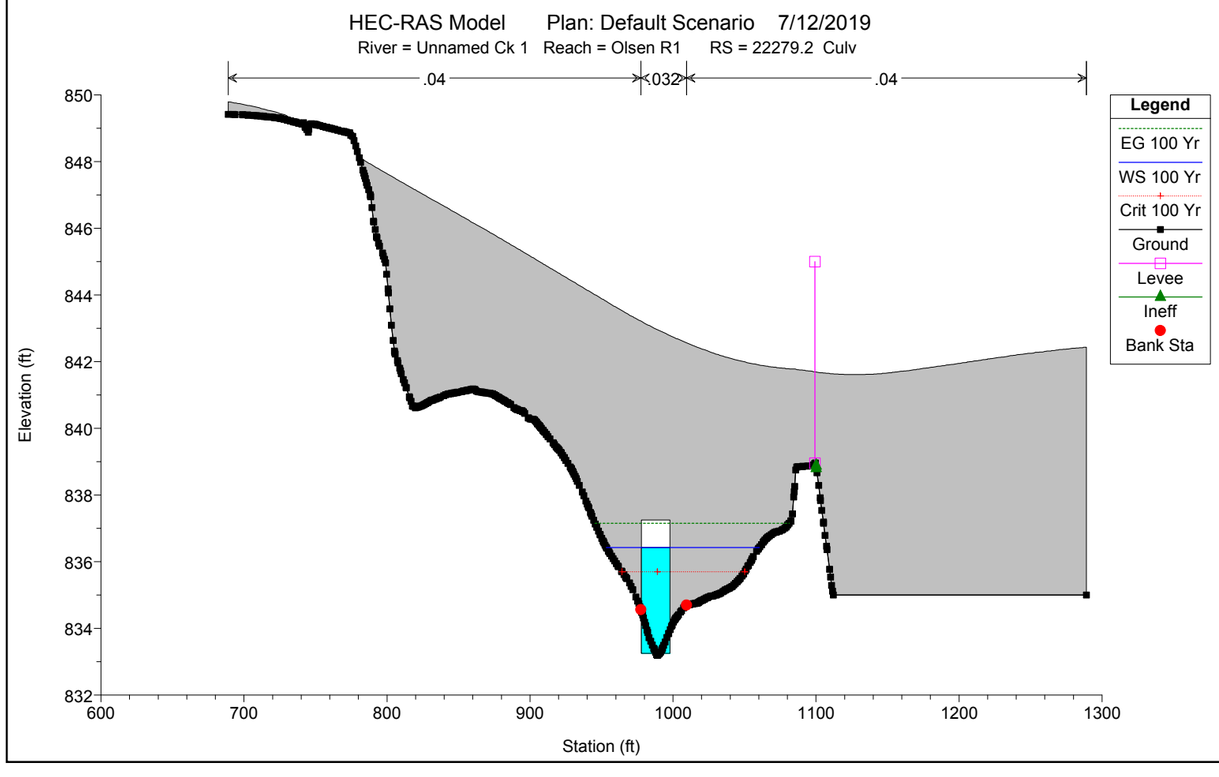
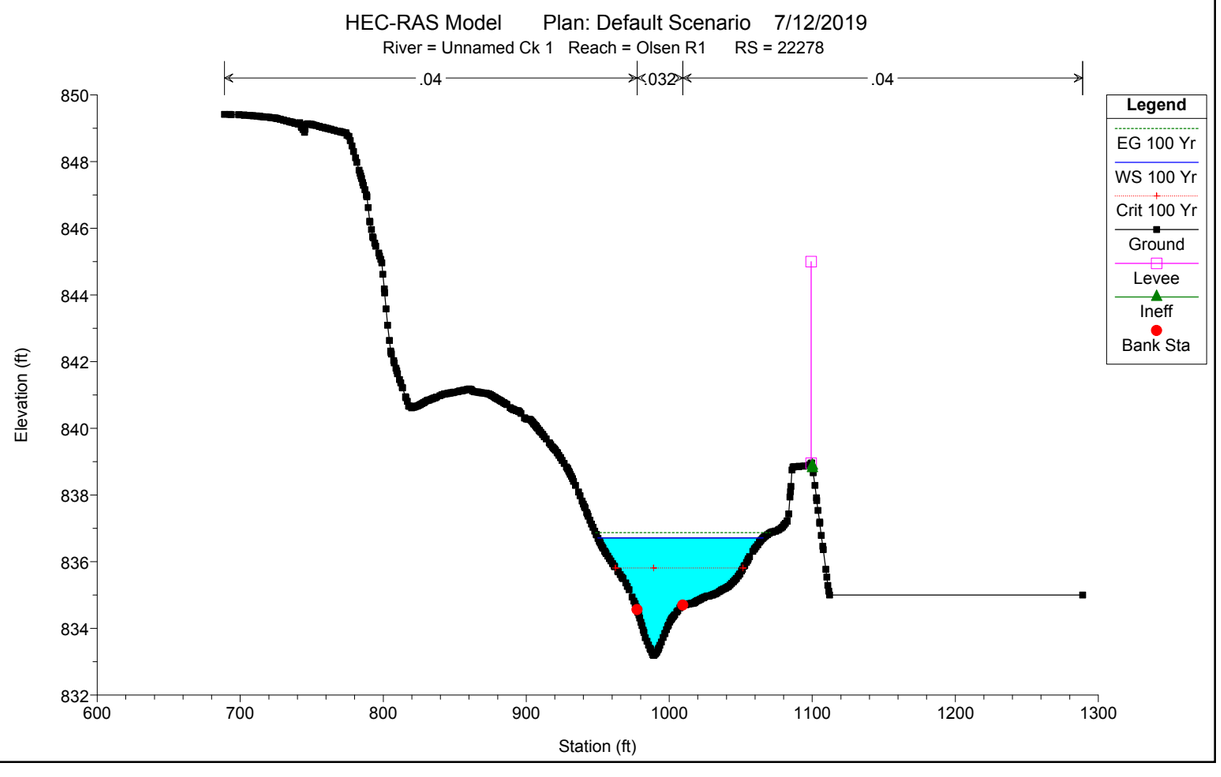
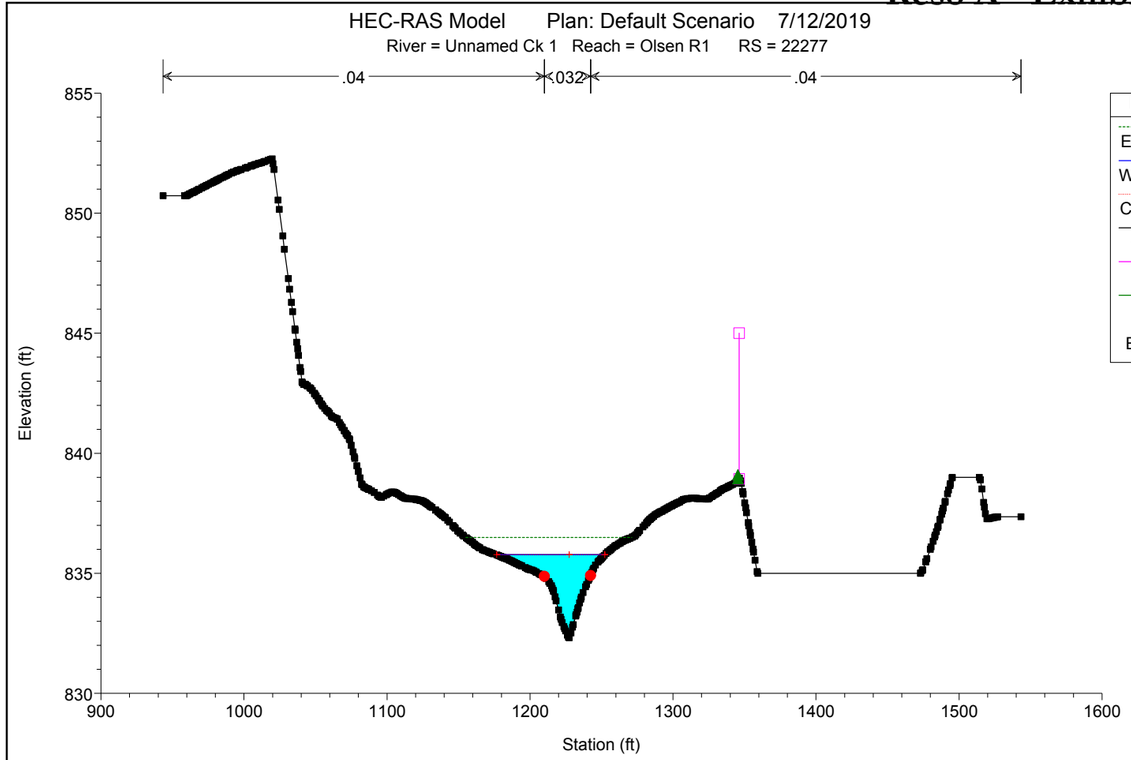


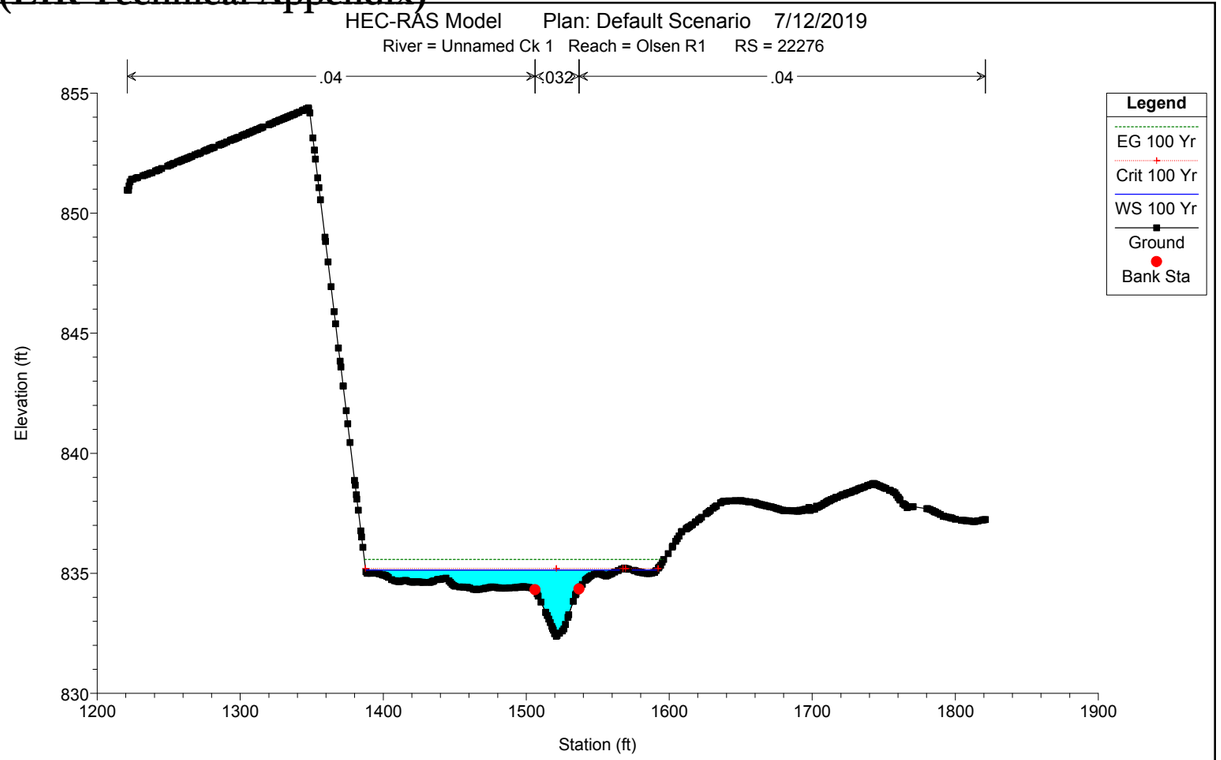


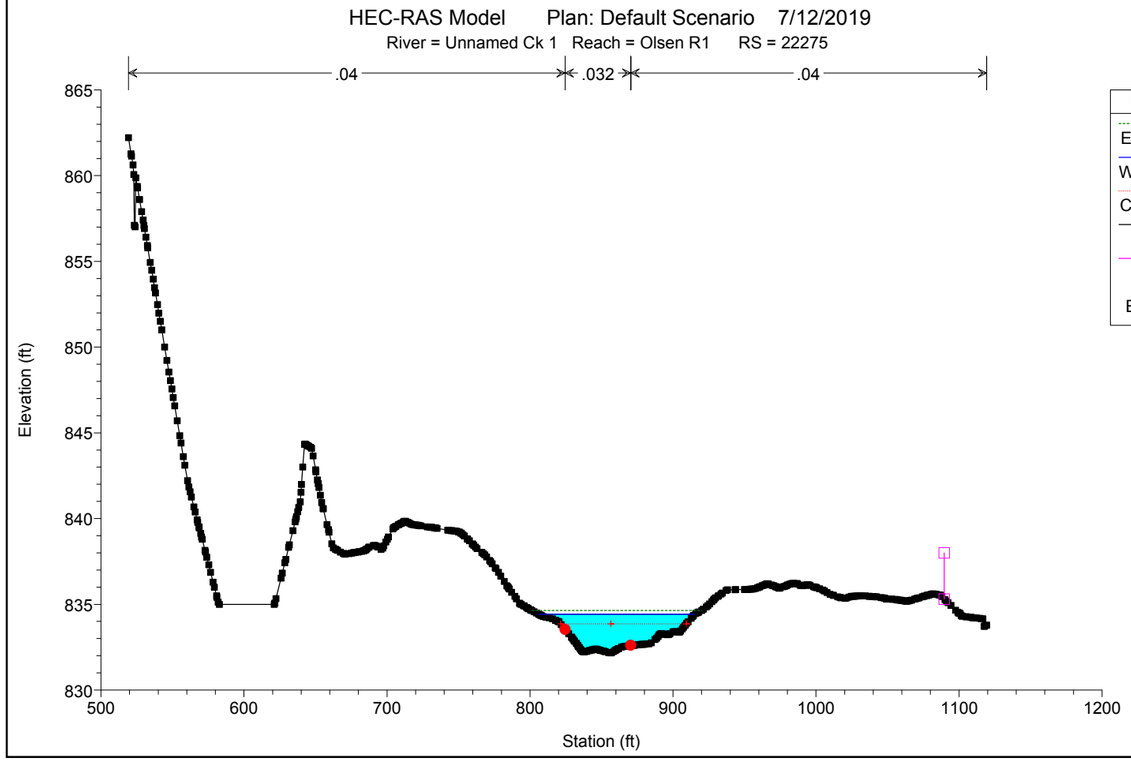


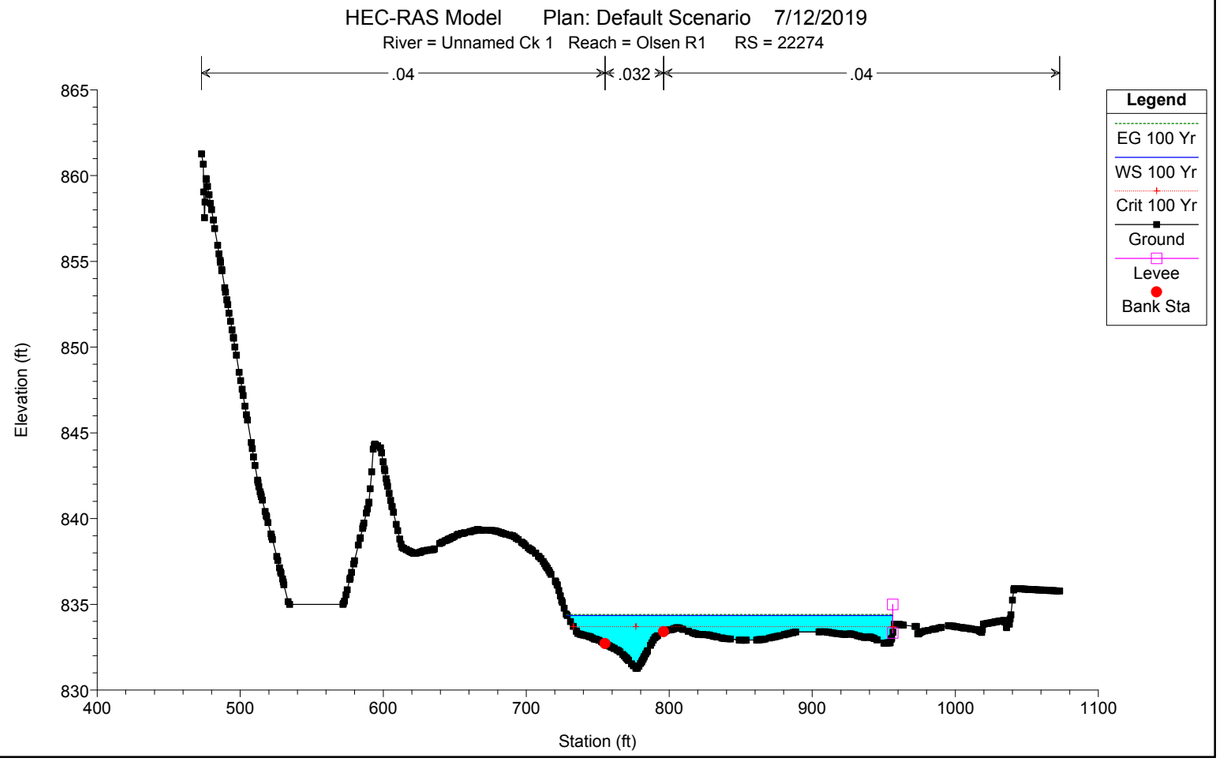


Reso A - Exhibit C2 (EIR Technical Appendix)

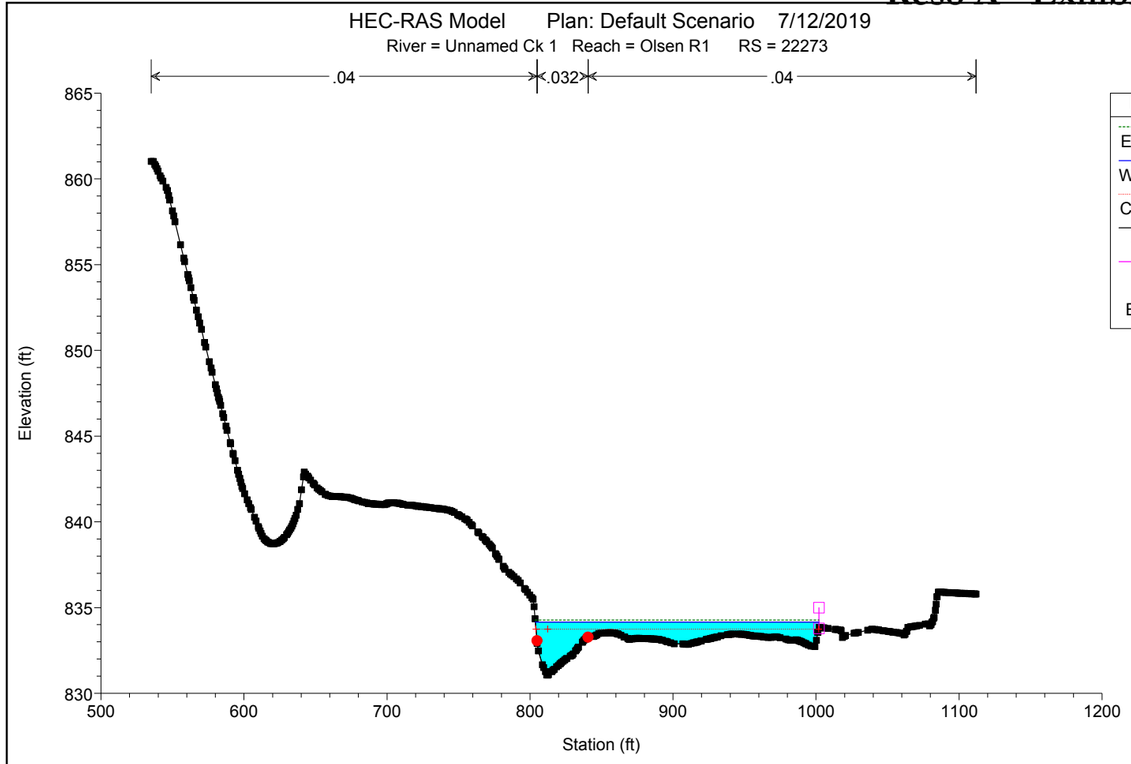


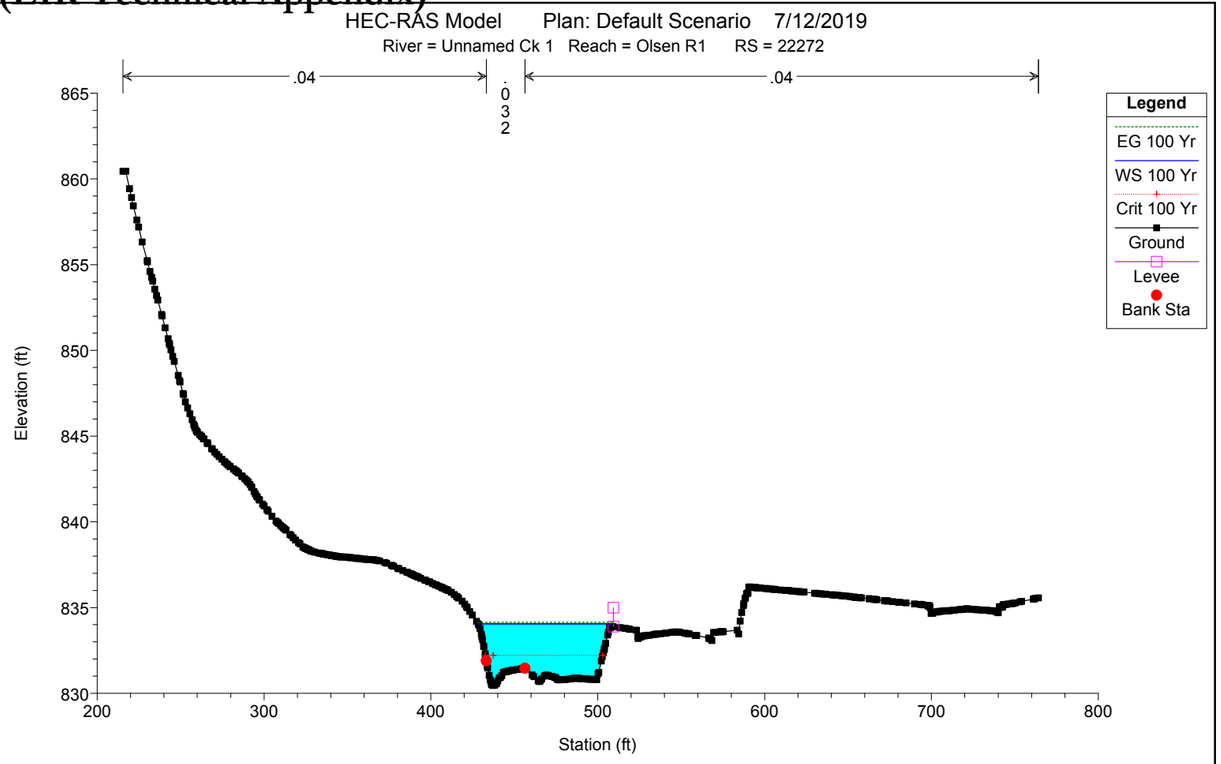


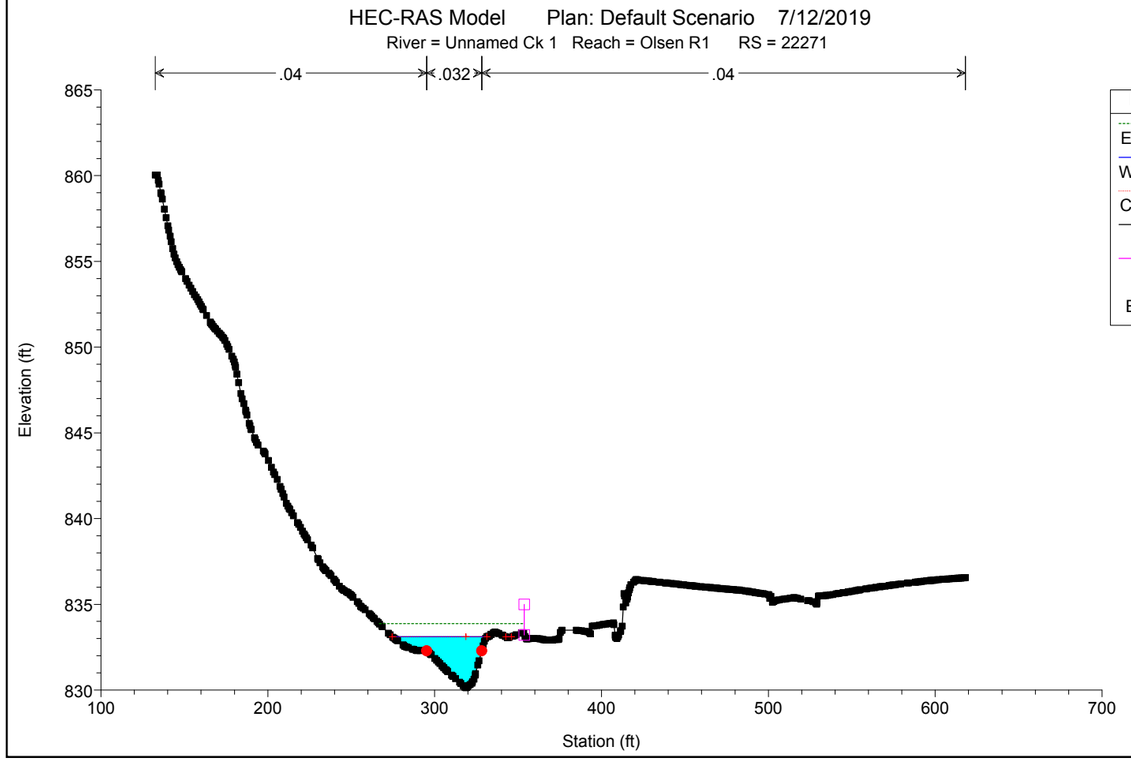


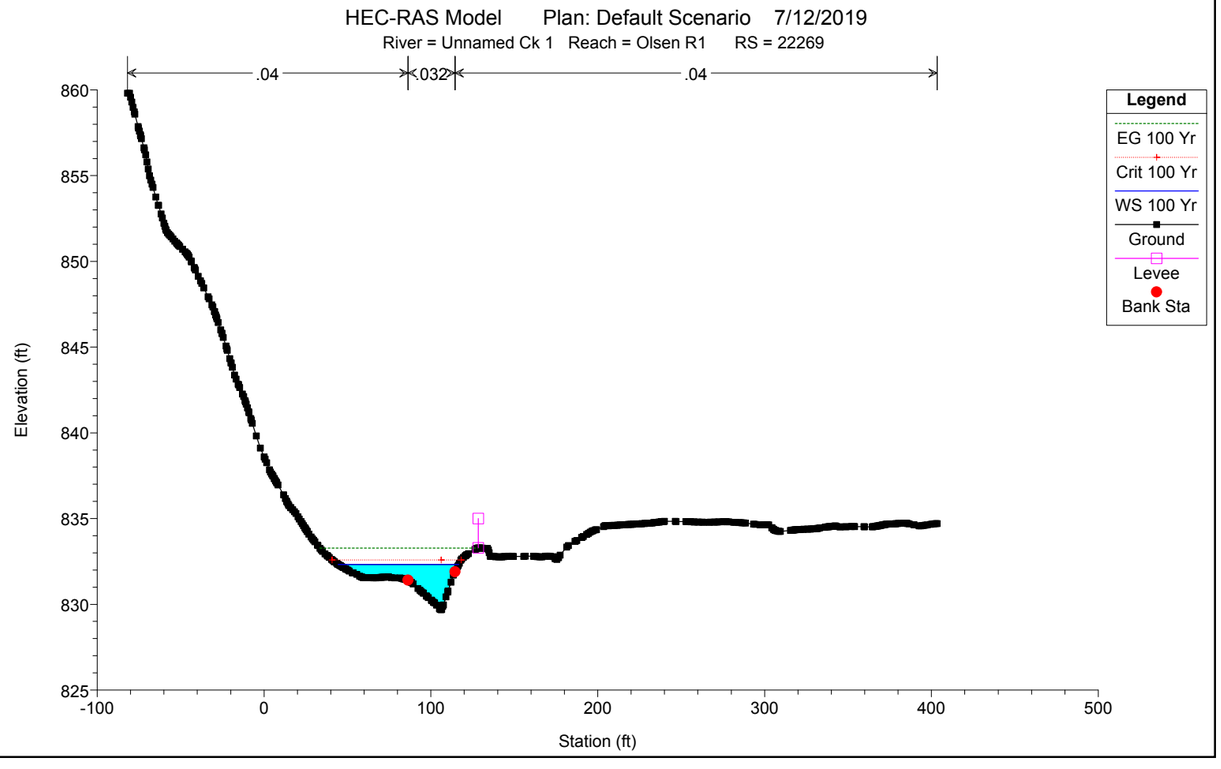


Reso A - Exhibit C2 (EIR Technical Appendix)









Reso A - Exhibit C2 (EIR Technical Appendix)

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22304 Profile: 100 Yr

E.G. Elev (ft)	847.09	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.10	Wt. n-Val.	0.040	0.032	0.040
W.S. Elev (ft)	846.99	Reach Len. (ft)	51.15	50.26	50.43
Crit W.S. (ft)	846.25	Flow Area (sq ft)	53.90	69.56	11.62
E.G. Slope (ft/ft)	0.001417	Area (sq ft)	53.90	69.56	11.62
Q Total (cfs)	265.00	Flow (cfs)	55.44	197.98	11.59
Top Width (ft)	137.63	Top Width (ft)	85.43	32.94	19.26
Vel Total (ft/s)	1.96	Avg. Vel. (ft/s)	1.03	2.85	1.00
Max Chl Dpth (ft)	3.64	Hydr. Depth (ft)	0.63	2.11	0.60
Conv. Total (cfs)	7040.4	Conv. (cfs)	1472.8	5259.8	307.9
Length Wtd. (ft)	50.46	Wetted Per. (ft)	85.45	33.48	19.30
Min Ch El (ft)	843.35	Shear (lb/sq ft)	0.06	0.18	0.05
Alpha	1.64	Stream Power (lb/ft s)	530.15	0.00	0.00
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	1.86	5.68	5.27
C & E Loss (ft)	0.01	Cum SA (acres)	3.23	2.92	8.22

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22303 Profile: 100 Yr

E.G. Elev (ft)	847.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.040	0.032	0.040
W.S. Elev (ft)	846.95	Reach Len. (ft)	68.54	63.52	64.21
Crit W.S. (ft)		Flow Area (sq ft)	58.30	83.18	11.82
E.G. Slope (ft/ft)	0.001150	Area (sq ft)	58.30	83.18	11.82
Q Total (cfs)	265.00	Flow (cfs)	61.01	195.09	8.90
Top Width (ft)	151.99	Top Width (ft)	76.99	45.58	29.42
Vel Total (ft/s)	1.73	Avg. Vel. (ft/s)	1.05	2.35	0.75
Max Chl Dpth (ft)	2.97	Hydr. Depth (ft)	0.76	1.82	0.40
Conv. Total (cfs)	7812.9	Conv. (cfs)	1798.8	5751.7	262.5
Length Wtd. (ft)	64.77	Wetted Per. (ft)	77.01	45.77	29.51
Min Ch El (ft)	843.98	Shear (lb/sq ft)	0.05	0.13	0.03
Alpha	1.45	Stream Power (lb/ft s)	1150.00	0.00	0.00
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	1.79	5.59	5.26
C & E Loss (ft)	0.01	Cum SA (acres)	3.13	2.88	8.19

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22302 Profile: 100 Yr

E.G. Elev (ft)	846.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.045	0.032	0.045
W.S. Elev (ft)	846.91	Reach Len. (ft)	131.30	126.90	130.64
Crit W.S. (ft)	846.03	Flow Area (sq ft)	71.67	59.11	95.96
E.G. Slope (ft/ft)	0.000695	Area (sq ft)	71.67	59.11	95.96
Q Total (cfs)	265.00	Flow (cfs)	59.05	126.93	79.02
Top Width (ft)	207.20	Top Width (ft)	77.84	25.09	104.27
Vel Total (ft/s)	1.17	Avg. Vel. (ft/s)	0.82	2.15	0.82
Max Chl Dpth (ft)	3.48	Hydr. Depth (ft)	0.92	2.36	0.92
Conv. Total (cfs)	10048.9	Conv. (cfs)	2239.1	4813.3	2996.4
Length Wtd. (ft)	126.90	Wetted Per. (ft)	77.87	25.45	104.34
Min Ch El (ft)	843.43	Shear (lb/sq ft)	0.04	0.10	0.04
Alpha	1.88	Stream Power (lb/ft s)	1288.86	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	1.69	5.49	5.18
C & E Loss (ft)		Cum SA (acres)	3.01	2.82	8.10

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22300.6 Profile: 100 Yr

E.G. Elev (ft)	845.79	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.	0.045	0.035	0.045
W.S. Elev (ft)	845.67	Reach Len. (ft)	59.20	59.20	59.20
Crit W.S. (ft)		Flow Area (sq ft)	4.13	36.64	82.40
E.G. Slope (ft/ft)	0.002703	Area (sq ft)	4.13	36.64	82.40
Q Total (cfs)	265.00	Flow (cfs)	2.57	130.33	132.10
Top Width (ft)	138.78	Top Width (ft)	30.73	16.78	91.27
Vel Total (ft/s)	2.15	Avg. Vel. (ft/s)	0.62	3.56	1.60

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22300.6 Profile: 100 Yr (Continued)

Max Chl Dpth (ft)	3.64	Hydr. Depth (ft)	0.13	2.18	0.90
Conv. Total (cfs)	5097.6	Conv. (cfs)	49.5	2507.0	2541.1
Length Wtd. (ft)	59.20	Wetted Per. (ft)	30.76	17.91	91.30
Min Ch El (ft)	842.03	Shear (lb/sq ft)	0.02	0.35	0.15
Alpha	1.62	Stream Power (lb/ft s)	992.19	0.00	0.00
Frctn Loss (ft)	0.26	Cum Volume (acre-ft)	1.69	5.20	5.18
C & E Loss (ft)	0.02	Cum SA (acres)	2.85	2.76	7.80

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22300 Profile: 100 Yr

E.G. Elev (ft)	845.51	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.35	Wt. n-Val.	0.045	0.035	0.045
W.S. Elev (ft)	845.15	Reach Len. (ft)	87.83	104.13	98.39
Crit W.S. (ft)	845.15	Flow Area (sq ft)	2.59	26.82	49.01
E.G. Slope (ft/ft)	0.008030	Area (sq ft)	2.59	26.82	49.01
Q Total (cfs)	265.00	Flow (cfs)	2.24	158.96	103.81
Top Width (ft)	109.42	Top Width (ft)	16.48	12.02	80.92
Vel Total (ft/s)	3.38	Avg. Vel. (ft/s)	0.86	5.93	2.12
Max Chl Dpth (ft)	3.52	Hydr. Depth (ft)	0.16	2.23	0.61
Conv. Total (cfs)	2957.3	Conv. (cfs)	24.9	1773.9	1158.4
Length Wtd. (ft)	100.81	Wetted Per. (ft)	16.49	13.79	80.93
Min Ch El (ft)	841.63	Shear (lb/sq ft)	0.08	0.97	0.30
Alpha	2.00	Stream Power (lb/ft s)	1549.81	0.00	0.00
Frctn Loss (ft)	0.52	Cum Volume (acre-ft)	1.68	5.16	5.09
C & E Loss (ft)	0.08	Cum SA (acres)	2.81	2.74	7.69

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22299 Profile: 100 Yr

E.G. Elev (ft)	844.75	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.045	0.035	0.045
W.S. Elev (ft)	844.66	Reach Len. (ft)	97.93	97.87	99.31
Crit W.S. (ft)	844.28	Flow Area (sq ft)	0.16	20.19	109.93
E.G. Slope (ft/ft)	0.003645	Area (sq ft)	0.16	20.19	109.93
Q Total (cfs)	265.00	Flow (cfs)	0.03	68.63	196.34
Top Width (ft)	154.03	Top Width (ft)	5.04	11.94	137.05
Vel Total (ft/s)	2.03	Avg. Vel. (ft/s)	0.20	3.40	1.79
Max Chl Dpth (ft)	2.86	Hydr. Depth (ft)	0.03	1.69	0.80
Conv. Total (cfs)	4389.6	Conv. (cfs)	0.6	1136.8	3252.3
Length Wtd. (ft)	99.03	Wetted Per. (ft)	5.04	13.21	137.20
Min Ch El (ft)	841.80	Shear (lb/sq ft)	0.01	0.35	0.18
Alpha	1.29	Stream Power (lb/ft s)	1086.99	0.00	0.00
Frctn Loss (ft)	0.26	Cum Volume (acre-ft)	1.68	5.11	4.91
C & E Loss (ft)	0.02	Cum SA (acres)	2.79	2.71	7.44

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22298 Profile: 100 Yr

E.G. Elev (ft)	844.47	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.02	Wt. n-Val.	0.045	0.035	0.045
W.S. Elev (ft)	844.45	Reach Len. (ft)	111.75	92.13	99.01
Crit W.S. (ft)		Flow Area (sq ft)	8.19	17.72	189.41
E.G. Slope (ft/ft)	0.001938	Area (sq ft)	8.19	17.72	189.41
Q Total (cfs)	265.00	Flow (cfs)	3.91	28.88	232.20
Top Width (ft)	309.48	Top Width (ft)	43.46	21.51	244.52
Vel Total (ft/s)	1.23	Avg. Vel. (ft/s)	0.48	1.63	1.23
Max Chl Dpth (ft)	1.67	Hydr. Depth (ft)	0.19	0.82	0.77
Conv. Total (cfs)	6019.2	Conv. (cfs)	88.9	656.1	5274.2
Length Wtd. (ft)	97.92	Wetted Per. (ft)	43.47	21.77	244.58
Min Ch El (ft)	842.78	Shear (lb/sq ft)	0.02	0.10	0.09
Alpha	1.06	Stream Power (lb/ft s)	1074.77	0.00	0.00
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	1.67	5.06	4.57
C & E Loss (ft)	0.00	Cum SA (acres)	2.74	2.68	7.00

Reso A - Exhibit C2 (EIR Technical Appendix)

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22297 Profile: 100 Yr

E.G. Elev (ft)	844.25	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.05	Wt. n-Val.	0.045	0.032	0.045
W.S. Elev (ft)	844.19	Reach Len. (ft)	99.38	96.13	99.44
Crit W.S. (ft)		Flow Area (sq ft)	8.13	26.79	140.44
E.G. Slope (ft/ft)	0.002680	Area (sq ft)	8.13	26.79	140.44
Q Total (cfs)	265.00	Flow (cfs)	7.71	76.82	180.47
Top Width (ft)	255.10	Top Width (ft)	19.64	20.04	215.42
Vel Total (ft/s)	1.51	Avg. Vel. (ft/s)	0.95	2.87	1.29
Max Chl Dpth (ft)	2.01	Hydr. Depth (ft)	0.41	1.34	0.65
Conv. Total (cfs)	5119.0	Conv. (cfs)	149.0	1483.9	3486.2
Length Wtd. (ft)	98.63	Wetted Per. (ft)	19.66	20.56	215.47
Min Ch El (ft)	842.18	Shear (lb/sq ft)	0.07	0.22	0.11
Alpha	1.55	Stream Power (lb/ft s)	1832.29	0.00	0.00
Frctn Loss (ft)	0.36	Cum Volume (acre-ft)	1.65	5.02	4.19
C & E Loss (ft)	0.00	Cum SA (acres)	2.66	2.63	6.48

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22296 Profile: 100 Yr

E.G. Elev (ft)	843.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.045	0.032	0.045
W.S. Elev (ft)	843.81	Reach Len. (ft)	94.62	99.01	98.23
Crit W.S. (ft)		Flow Area (sq ft)	13.36	16.76	104.96
E.G. Slope (ft/ft)	0.005280	Area (sq ft)	13.36	16.76	104.96
Q Total (cfs)	265.00	Flow (cfs)	20.37	52.71	191.92
Top Width (ft)	202.63	Top Width (ft)	26.91	18.06	157.66
Vel Total (ft/s)	1.96	Avg. Vel. (ft/s)	1.53	3.14	1.83
Max Chl Dpth (ft)	2.04	Hydr. Depth (ft)	0.50	0.93	0.67
Conv. Total (cfs)	3647.0	Conv. (cfs)	280.3	725.4	2641.2
Length Wtd. (ft)	98.15	Wetted Per. (ft)	27.05	18.63	157.76
Min Ch El (ft)	841.77	Shear (lb/sq ft)	0.16	0.30	0.22
Alpha	1.19	Stream Power (lb/ft s)	1830.97	0.00	0.00
Frctn Loss (ft)	0.44	Cum Volume (acre-ft)	1.63	4.97	3.91
C & E Loss (ft)	0.00	Cum SA (acres)	2.60	2.59	6.06

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22295 Profile: 100 Yr

E.G. Elev (ft)	843.44	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.07	Wt. n-Val.	0.045	0.032	0.045
W.S. Elev (ft)	843.37	Reach Len. (ft)	103.94	96.19	100.33
Crit W.S. (ft)		Flow Area (sq ft)	18.67	26.09	96.28
E.G. Slope (ft/ft)	0.003865	Area (sq ft)	18.67	26.09	96.28
Q Total (cfs)	265.00	Flow (cfs)	19.30	75.47	170.22
Top Width (ft)	198.24	Top Width (ft)	52.19	25.72	120.33
Vel Total (ft/s)	1.88	Avg. Vel. (ft/s)	1.03	2.89	1.77
Max Chl Dpth (ft)	2.01	Hydr. Depth (ft)	0.36	1.01	0.80
Conv. Total (cfs)	4262.3	Conv. (cfs)	310.5	1213.9	2737.9
Length Wtd. (ft)	99.38	Wetted Per. (ft)	52.22	26.01	120.47
Min Ch El (ft)	841.36	Shear (lb/sq ft)	0.09	0.24	0.19
Alpha	1.27	Stream Power (lb/ft s)	1327.30	0.00	0.00
Frctn Loss (ft)	0.60	Cum Volume (acre-ft)	1.59	4.92	3.69
C & E Loss (ft)	0.01	Cum SA (acres)	2.52	2.54	5.74

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22294 Profile: 100 Yr

E.G. Elev (ft)	842.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.15	Wt. n-Val.	0.040	0.032	0.040
W.S. Elev (ft)	842.68	Reach Len. (ft)	64.90	47.28	57.16
Crit W.S. (ft)		Flow Area (sq ft)	25.43	23.50	53.10
E.G. Slope (ft/ft)	0.010953	Area (sq ft)	25.43	23.50	53.10
Q Total (cfs)	265.00	Flow (cfs)	42.81	100.11	122.08
Top Width (ft)	234.38	Top Width (ft)	89.19	28.46	116.73
Vel Total (ft/s)	2.60	Avg. Vel. (ft/s)	1.68	4.26	2.30

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22294 Profile: 100 Yr (Continued)

Max Chl Dpth (ft)	1.60	Hydr. Depth (ft)	0.29	0.83	0.45
Conv. Total (cfs)	2532.0	Conv. (cfs)	409.1	956.5	1166.4
Length Wtd. (ft)	52.89	Wetted Per. (ft)	89.23	28.64	116.79
Min Ch El (ft)	841.08	Shear (lb/sq ft)	0.19	0.56	0.31
Alpha	1.45	Stream Power (lb/ft s)	1277.10	0.00	0.00
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	1.54	4.86	3.51
C & E Loss (ft)	0.02	Cum SA (acres)	2.35	2.48	5.47

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22293.4 Profile: 100 Yr

E.G. Elev (ft)	842.60	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.040	0.032	0.040
W.S. Elev (ft)	842.52	Reach Len. (ft)	51.31	31.14	40.45
Crit W.S. (ft)		Flow Area (sq ft)	5.88	59.12	103.01
E.G. Slope (ft/ft)	0.001935	Area (sq ft)	5.88	59.12	103.01
Q Total (cfs)	265.00	Flow (cfs)	6.00	167.37	91.63
Top Width (ft)	303.67	Top Width (ft)	11.88	35.40	256.39
Vel Total (ft/s)	1.58	Avg. Vel. (ft/s)	1.02	2.83	0.89
Max Chl Dpth (ft)	3.48	Hydr. Depth (ft)	0.50	1.67	0.40
Conv. Total (cfs)	6024.6	Conv. (cfs)	136.5	3805.0	2083.1
Length Wtd. (ft)	36.83	Wetted Per. (ft)	11.92	36.22	256.46
Min Ch El (ft)	839.04	Shear (lb/sq ft)	0.06	0.20	0.05
Alpha	2.15	Stream Power (lb/ft s)	700.37	0.00	0.00
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	1.52	4.82	3.41
C & E Loss (ft)	0.02	Cum SA (acres)	2.27	2.45	5.23

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22293 Profile: 100 Yr

E.G. Elev (ft)	842.53	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.	0.040	0.032	0.040
W.S. Elev (ft)	842.50	Reach Len. (ft)	73.65	115.12	101.71
Crit W.S. (ft)		Flow Area (sq ft)	8.00	28.62	177.92
E.G. Slope (ft/ft)	0.001403	Area (sq ft)	8.00	28.62	177.92
Q Total (cfs)	265.00	Flow (cfs)	5.88	52.45	206.68
Top Width (ft)	280.22	Top Width (ft)	20.87	26.09	233.26
Vel Total (ft/s)	1.24	Avg. Vel. (ft/s)	0.73	1.83	1.16
Max Chl Dpth (ft)	2.30	Hydr. Depth (ft)	0.38	1.10	0.76
Conv. Total (cfs)	7073.8	Conv. (cfs)	156.9	1400.0	5516.9
Length Wtd. (ft)	103.20	Wetted Per. (ft)	20.89	26.47	233.31
Min Ch El (ft)	840.20	Shear (lb/sq ft)	0.03	0.09	0.07
Alpha	1.13	Stream Power (lb/ft s)	1451.09	0.00	0.00
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	1.51	4.79	3.28
C & E Loss (ft)	0.00	Cum SA (acres)	2.25	2.42	5.00

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22292.5 Profile: 100 Yr

E.G. Elev (ft)	842.39	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.04	Wt. n-Val.	0.040	0.032	0.040
W.S. Elev (ft)	842.35	Reach Len. (ft)	106.00	96.13	80.38
Crit W.S. (ft)		Flow Area (sq ft)	44.88	59.36	86.39
E.G. Slope (ft/ft)	0.001221	Area (sq ft)	44.88	59.36	86.39
Q Total (cfs)	265.00	Flow (cfs)	48.46	120.23	96.31
Top Width (ft)	210.14	Top Width (ft)	59.11	42.52	108.51
Vel Total (ft/s)	1.39	Avg. Vel. (ft/s)	1.08	2.03	1.11
Max Chl Dpth (ft)	1.85	Hydr. Depth (ft)	0.76	1.40	0.80
Conv. Total (cfs)	7584.3	Conv. (cfs)	1386.9	3440.9	2756.5
Length Wtd. (ft)	95.08	Wetted Per. (ft)	59.15	42.56	108.54
Min Ch El (ft)	840.50	Shear (lb/sq ft)	0.06	0.11	0.06
Alpha	1.31	Stream Power (lb/ft s)	884.99	0.00	0.00
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)	1.46	4.67	2.97
C & E Loss (ft)	0.00	Cum SA (acres)	2.19	2.33	4.60

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Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22292.2 Profile: 100 Yr

E.G. Elev (ft)	842.18	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.040	0.032	0.040
W.S. Elev (ft)	842.09	Reach Len. (ft)	129.43	122.31	125.92
Crit W.S. (ft)		Flow Area (sq ft)	75.14	21.29	27.10
E.G. Slope (ft/ft)	0.004817	Area (sq ft)	75.14	21.29	27.10
Q Total (cfs)	265.00	Flow (cfs)	138.32	70.71	55.96
Top Width (ft)	182.48	Top Width (ft)	124.43	20.30	37.76
Vel Total (ft/s)	2.15	Avg. Vel. (ft/s)	1.84	3.32	2.07
Max Chl Dpth (ft)	1.42	Hydr. Depth (ft)	0.60	1.05	0.72
Conv. Total (cfs)	3818.3	Conv. (cfs)	1993.1	1018.9	806.4
Length Wtd. (ft)	125.82	Wetted Per. (ft)	124.54	20.35	37.79
Min Ch El (ft)	840.67	Shear (lb/sq ft)	0.18	0.31	0.22
Alpha	1.22	Stream Power (lb/ft s)	905.05	0.00	0.00
Frctn Loss (ft)	0.21	Cum Volume (acre-ft)	1.32	4.58	2.87
C & E Loss (ft)	0.02	Cum SA (acres)	1.96	2.26	4.46

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22290.9 Profile: 100 Yr

E.G. Elev (ft)	841.95	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.	0.040	0.032	0.040
W.S. Elev (ft)	841.92	Reach Len. (ft)	73.00	73.00	73.00
Crit W.S. (ft)	841.17	Flow Area (sq ft)	32.18	66.39	110.18
E.G. Slope (ft/ft)	0.000853	Area (sq ft)	32.18	66.39	110.18
Q Total (cfs)	265.00	Flow (cfs)	34.55	112.32	118.13
Top Width (ft)	192.29	Top Width (ft)	32.63	47.61	112.06
Vel Total (ft/s)	1.27	Avg. Vel. (ft/s)	1.07	1.69	1.07
Max Chl Dpth (ft)	1.54	Hydr. Depth (ft)	0.99	1.39	0.98
Conv. Total (cfs)	9075.1	Conv. (cfs)	1183.1	3846.5	4045.5
Length Wtd. (ft)	73.00	Wetted Per. (ft)	32.69	47.63	112.12
Min Ch El (ft)	840.38	Shear (lb/sq ft)	0.05	0.07	0.05
Alpha	1.16	Stream Power (lb/ft s)	760.45	0.00	0.00
Frctn Loss (ft)	0.11	Cum Volume (acre-ft)	1.16	4.46	2.67
C & E Loss (ft)	0.01	Cum SA (acres)	1.73	2.17	4.25

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22289.8 BR U Profile: 100 Yr

E.G. Elev (ft)	841.83	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.12	Wt. n-Val.	0.040	0.032	0.040
W.S. Elev (ft)	841.71	Reach Len. (ft)	60.00	60.00	60.00
Crit W.S. (ft)	841.28	Flow Area (sq ft)	23.28	56.53	19.75
E.G. Slope (ft/ft)	0.003381	Area (sq ft)	23.28	56.53	19.75
Q Total (cfs)	265.00	Flow (cfs)	50.01	170.56	43.58
Top Width (ft)	90.00	Top Width (ft)	23.35	47.61	19.04
Vel Total (ft/s)	2.65	Avg. Vel. (ft/s)	2.15	3.02	2.21
Max Chl Dpth (ft)	1.33	Hydr. Depth (ft)	1.00	1.19	1.04
Conv. Total (cfs)	4557.3	Conv. (cfs)	862.8	2942.6	751.9
Length Wtd. (ft)	60.00	Wetted Per. (ft)	23.37	47.63	19.04
Min Ch El (ft)	840.38	Shear (lb/sq ft)	0.21	0.25	0.22
Alpha	1.07	Stream Power (lb/ft s)	760.45	0.00	0.00
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	1.11	4.36	2.56
C & E Loss (ft)	0.01	Cum SA (acres)	1.68	2.09	4.14

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22289.8 BR D Profile: 100 Yr

E.G. Elev (ft)	841.70	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.040	0.032	0.040
W.S. Elev (ft)	841.62	Reach Len. (ft)	48.50	48.50	48.50
Crit W.S. (ft)	840.91	Flow Area (sq ft)	37.25	51.84	42.67
E.G. Slope (ft/ft)	0.001312	Area (sq ft)	37.25	51.84	42.67
Q Total (cfs)	265.00	Flow (cfs)	53.70	140.11	70.35
Top Width (ft)	90.00	Top Width (ft)	33.41	25.28	31.31
Vel Total (ft/s)	2.00	Avg. Vel. (ft/s)	1.44	2.70	1.65

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22289.8 BR D Profile: 100 Yr (Continued)

Max Chl Dpth (ft)	2.32	Hydr. Depth (ft)	1.11	2.05	1.36
Conv. Total (cfs)	7315.0	Conv. (cfs)	1487.0	3879.9	1948.1
Length Wtd. (ft)	48.50	Wetted Per. (ft)	33.43	25.33	31.32
Min Ch El (ft)	839.30	Shear (lb/sq ft)	0.09	0.17	0.11
Alpha	1.25	Stream Power (lb/ft s)	1149.53	0.00	1064.99
Frctn Loss (ft)	0.06	Cum Volume (acre-ft)	1.07	4.28	2.52
C & E Loss (ft)	0.01	Cum SA (acres)	1.64	2.04	4.10

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22289 Profile: 100 Yr

E.G. Elev (ft)	841.72	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.14	Wt. n-Val.	0.040	0.032	0.040
W.S. Elev (ft)	841.58	Reach Len. (ft)	98.59	94.26	99.28
Crit W.S. (ft)	841.19	Flow Area (sq ft)	52.10	50.89	78.90
E.G. Slope (ft/ft)	0.002818	Area (sq ft)	52.10	50.89	78.90
Q Total (cfs)	434.00	Flow (cfs)	89.59	199.68	144.73
Top Width (ft)	177.14	Top Width (ft)	63.94	25.28	87.92
Vel Total (ft/s)	2.39	Avg. Vel. (ft/s)	1.72	3.92	1.83
Max Chl Dpth (ft)	2.28	Hydr. Depth (ft)	0.81	2.01	0.90
Conv. Total (cfs)	8175.8	Conv. (cfs)	1687.7	3761.6	2726.4
Length Wtd. (ft)	96.73	Wetted Per. (ft)	63.97	25.33	87.95
Min Ch El (ft)	839.30	Shear (lb/sq ft)	0.14	0.35	0.16
Alpha	1.55	Stream Power (lb/ft s)	1149.53	0.00	1064.99
Frctn Loss (ft)	0.26	Cum Volume (acre-ft)	1.02	4.23	2.45
C & E Loss (ft)	0.01	Cum SA (acres)	1.59	2.01	4.04

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22288 Profile: 100 Yr

E.G. Elev (ft)	841.45	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.	0.040	0.032	0.040
W.S. Elev (ft)	841.35	Reach Len. (ft)	134.48	109.68	122.71
Crit W.S. (ft)	840.93	Flow Area (sq ft)	110.85	60.46	22.41
E.G. Slope (ft/ft)	0.002487	Area (sq ft)	110.85	60.46	22.41
Q Total (cfs)	434.00	Flow (cfs)	211.47	200.51	22.02
Top Width (ft)	199.03	Top Width (ft)	105.92	35.09	58.02
Vel Total (ft/s)	2.24	Avg. Vel. (ft/s)	1.91	3.32	0.98
Max Chl Dpth (ft)	2.60	Hydr. Depth (ft)	1.05	1.72	0.39
Conv. Total (cfs)	8702.3	Conv. (cfs)	4240.2	4020.5	441.6
Length Wtd. (ft)	119.80	Wetted Per. (ft)	106.08	35.29	58.04
Min Ch El (ft)	838.75	Shear (lb/sq ft)	0.16	0.27	0.06
Alpha	1.38	Stream Power (lb/ft s)	1200.00	0.00	1056.91
Frctn Loss (ft)	0.55	Cum Volume (acre-ft)	0.84	4.10	2.33
C & E Loss (ft)	0.02	Cum SA (acres)	1.40	1.95	3.87

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22287 Profile: 100 Yr

E.G. Elev (ft)	840.88	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.35	Wt. n-Val.	0.040	0.032	0.040
W.S. Elev (ft)	840.53	Reach Len. (ft)	68.14	99.00	83.63
Crit W.S. (ft)	840.53	Flow Area (sq ft)	20.59	37.49	53.95
E.G. Slope (ft/ft)	0.010912	Area (sq ft)	20.59	37.49	53.95
Q Total (cfs)	434.00	Flow (cfs)	44.90	224.76	164.34
Top Width (ft)	153.32	Top Width (ft)	48.82	26.94	77.56
Vel Total (ft/s)	3.87	Avg. Vel. (ft/s)	2.18	6.00	3.05
Max Chl Dpth (ft)	2.55	Hydr. Depth (ft)	0.42	1.39	0.70
Conv. Total (cfs)	4154.7	Conv. (cfs)	429.9	2151.6	1573.2
Length Wtd. (ft)	93.04	Wetted Per. (ft)	48.87	27.28	77.58
Min Ch El (ft)	837.98	Shear (lb/sq ft)	0.29	0.94	0.47
Alpha	1.51	Stream Power (lb/ft s)	1172.68	0.00	1045.79
Frctn Loss (ft)	0.41	Cum Volume (acre-ft)	0.63	3.98	2.23
C & E Loss (ft)	0.05	Cum SA (acres)	1.16	1.87	3.68

Reso A - Exhibit C2 (EIR Technical Appendix)

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22286 Profile: 100 Yr

E.G. Elev (ft)	840.02	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.17	Wt. n-Val.	0.040	0.032	0.040
W.S. Elev (ft)	839.84	Reach Len. (ft)	83.96	99.01	99.01
Crit W.S. (ft)	839.14	Flow Area (sq ft)	25.28	110.05	19.91
E.G. Slope (ft/ft)	0.002341	Area (sq ft)	25.28	110.05	19.91
Q Total (cfs)	434.00	Flow (cfs)	32.39	384.63	16.98
Top Width (ft)	159.35	Top Width (ft)	41.98	56.48	60.89
Vel Total (ft/s)	2.80	Avg. Vel. (ft/s)	1.28	3.50	0.85
Max Chl Dpth (ft)	3.28	Hydr. Depth (ft)	0.60	1.95	0.33
Conv. Total (cfs)	8969.7	Conv. (cfs)	669.3	7949.4	351.0
Length Wtd. (ft)	98.12	Wetted Per. (ft)	42.00	56.72	60.90
Min Ch El (ft)	836.56	Shear (lb/sq ft)	0.09	0.28	0.05
Alpha	1.40	Stream Power (lb/ft s)	875.83	0.00	696.16
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)	0.60	3.81	2.15
C & E Loss (ft)	0.00	Cum SA (acres)	1.09	1.77	3.55

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22285 Profile: 100 Yr

E.G. Elev (ft)	839.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.19	Wt. n-Val.	0.040	0.032	0.040
W.S. Elev (ft)	839.57	Reach Len. (ft)	96.26	99.01	98.20
Crit W.S. (ft)	839.05	Flow Area (sq ft)	16.50	103.03	32.01
E.G. Slope (ft/ft)	0.002875	Area (sq ft)	16.50	103.03	32.01
Q Total (cfs)	434.00	Flow (cfs)	18.79	379.19	36.02
Top Width (ft)	170.76	Top Width (ft)	38.15	57.23	75.38
Vel Total (ft/s)	2.86	Avg. Vel. (ft/s)	1.14	3.68	1.13
Max Chl Dpth (ft)	2.52	Hydr. Depth (ft)	0.43	1.80	0.42
Conv. Total (cfs)	8093.6	Conv. (cfs)	350.4	7071.4	671.8
Length Wtd. (ft)	98.75	Wetted Per. (ft)	38.17	57.33	75.39
Min Ch El (ft)	837.05	Shear (lb/sq ft)	0.08	0.32	0.08
Alpha	1.46	Stream Power (lb/ft s)	1116.92	0.00	944.47
Frctn Loss (ft)	0.25	Cum Volume (acre-ft)	0.56	3.57	2.10
C & E Loss (ft)	0.02	Cum SA (acres)	1.01	1.64	3.39

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22284 Profile: 100 Yr

E.G. Elev (ft)	839.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.	0.040	0.032	0.040
W.S. Elev (ft)	839.38	Reach Len. (ft)	109.35	99.01	99.01
Crit W.S. (ft)	838.95	Flow Area (sq ft)	24.19	111.16	64.02
E.G. Slope (ft/ft)	0.002196	Area (sq ft)	24.19	111.16	64.02
Q Total (cfs)	434.00	Flow (cfs)	29.54	330.82	73.64
Top Width (ft)	229.79	Top Width (ft)	41.17	69.45	119.17
Vel Total (ft/s)	2.18	Avg. Vel. (ft/s)	1.22	2.98	1.15
Max Chl Dpth (ft)	2.16	Hydr. Depth (ft)	0.59	1.60	0.54
Conv. Total (cfs)	9261.2	Conv. (cfs)	630.3	7059.5	1571.5
Length Wtd. (ft)	99.58	Wetted Per. (ft)	41.19	69.49	119.18
Min Ch El (ft)	837.22	Shear (lb/sq ft)	0.08	0.22	0.07
Alpha	1.49	Stream Power (lb/ft s)	1000.63	0.00	859.43
Frctn Loss (ft)	0.22	Cum Volume (acre-ft)	0.51	3.33	1.99
C & E Loss (ft)	0.01	Cum SA (acres)	0.92	1.50	3.17

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22283 Profile: 100 Yr

E.G. Elev (ft)	839.26	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.08	Wt. n-Val.	0.040	0.032	0.040
W.S. Elev (ft)	839.19	Reach Len. (ft)	75.56	99.60	101.97
Crit W.S. (ft)	838.74	Flow Area (sq ft)	15.02	150.81	52.88
E.G. Slope (ft/ft)	0.002180	Area (sq ft)	15.02	150.81	52.88
Q Total (cfs)	434.00	Flow (cfs)	18.20	359.71	56.09
Top Width (ft)	266.89	Top Width (ft)	25.69	130.66	110.54
Vel Total (ft/s)	1.98	Avg. Vel. (ft/s)	1.21	2.39	1.06

Reso A - Exhibit C2 (EIR Technical Appendix)

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22283 Profile: 100 Yr (Continued)

Max Chl Dpth (ft)	1.51	Hydr. Depth (ft)	0.58	1.15	0.48
Conv. Total (cfs)	9295.4	Conv. (cfs)	389.8	7704.2	1201.4
Length Wtd. (ft)	99.62	Wetted Per. (ft)	25.71	130.70	110.56
Min Ch El (ft)	837.68	Shear (lb/sq ft)	0.08	0.16	0.07
Alpha	1.25	Stream Power (lb/ft s)	844.31	0.00	721.52
Frctn Loss (ft)	0.35	Cum Volume (acre-ft)	0.46	3.03	1.85
C & E Loss (ft)	0.01	Cum SA (acres)	0.84	1.27	2.91

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22281.5 Profile: 100 Yr

E.G. Elev (ft)	838.90	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.17	Wt. n-Val.	0.040	0.032	0.040
W.S. Elev (ft)	838.74	Reach Len. (ft)	163.98	148.41	149.25
Crit W.S. (ft)		Flow Area (sq ft)	1.18	75.91	74.44
E.G. Slope (ft/ft)	0.006657	Area (sq ft)	1.18	75.91	74.44
Q Total (cfs)	434.00	Flow (cfs)	1.11	287.41	145.49
Top Width (ft)	226.43	Top Width (ft)	6.79	75.90	143.74
Vel Total (ft/s)	2.86	Avg. Vel. (ft/s)	0.94	3.79	1.95
Max Chl Dpth (ft)	1.39	Hydr. Depth (ft)	0.17	1.00	0.52
Conv. Total (cfs)	5319.2	Conv. (cfs)	13.6	3522.5	1783.1
Length Wtd. (ft)	149.33	Wetted Per. (ft)	6.80	75.99	143.76
Min Ch El (ft)	837.35	Shear (lb/sq ft)	0.07	0.42	0.22
Alpha	1.31	Stream Power (lb/ft s)	669.49	0.00	0.00
Frctn Loss (ft)	0.10	Cum Volume (acre-ft)	0.45	2.77	1.71
C & E Loss (ft)	0.04	Cum SA (acres)	0.81	1.04	2.61

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22280.5 Profile: 100 Yr

E.G. Elev (ft)	838.76	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.03	Wt. n-Val.	0.040	0.032	0.040
W.S. Elev (ft)	838.73	Reach Len. (ft)	222.97	238.55	246.39
Crit W.S. (ft)	836.42	Flow Area (sq ft)	52.98	192.66	183.07
E.G. Slope (ft/ft)	0.000224	Area (sq ft)	52.98	192.66	183.07
Q Total (cfs)	434.00	Flow (cfs)	37.69	313.48	82.83
Top Width (ft)	339.99	Top Width (ft)	36.55	53.75	249.69
Vel Total (ft/s)	1.01	Avg. Vel. (ft/s)	0.71	1.63	0.45
Max Chl Dpth (ft)	4.03	Hydr. Depth (ft)	1.45	3.58	0.73
Conv. Total (cfs)	28969.1	Conv. (cfs)	2515.8	20924.8	5528.5
Length Wtd. (ft)	238.55	Wetted Per. (ft)	36.67	53.86	249.78
Min Ch El (ft)	834.70	Shear (lb/sq ft)	0.02	0.05	0.01
Alpha	1.95	Stream Power (lb/ft s)	368.00	0.00	0.00
Frctn Loss (ft)		Cum Volume (acre-ft)	0.35	2.31	1.26
C & E Loss (ft)		Cum SA (acres)	0.73	0.82	1.94

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22278 Profile: 100 Yr

E.G. Elev (ft)	836.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.16	Wt. n-Val.	0.040	0.032	0.040
W.S. Elev (ft)	836.71	Reach Len. (ft)	98.13	99.01	98.52
Crit W.S. (ft)	835.81	Flow Area (sq ft)	27.79	88.96	74.71
E.G. Slope (ft/ft)	0.001642	Area (sq ft)	27.79	88.96	74.71
Q Total (cfs)	508.00	Flow (cfs)	42.07	330.01	135.92
Top Width (ft)	115.66	Top Width (ft)	27.48	31.99	56.19
Vel Total (ft/s)	2.65	Avg. Vel. (ft/s)	1.51	3.71	1.82
Max Chl Dpth (ft)	3.52	Hydr. Depth (ft)	1.01	2.78	1.33
Conv. Total (cfs)	12534.7	Conv. (cfs)	1038.1	8142.9	3353.7
Length Wtd. (ft)	98.88	Wetted Per. (ft)	27.57	32.14	56.24
Min Ch El (ft)	833.19	Shear (lb/sq ft)	0.10	0.28	0.14
Alpha	1.42	Stream Power (lb/ft s)	1289.01	0.00	1099.27
Frctn Loss (ft)	0.32	Cum Volume (acre-ft)	0.35	1.24	1.26
C & E Loss (ft)	0.06	Cum SA (acres)	0.57	0.58	1.07

Reso A - Exhibit C2 (EIR Technical Appendix)

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22277 Profile: 100 Yr

E.G. Elev (ft)	836.49	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.72	Wt. n-Val.	0.040	0.032	0.040
W.S. Elev (ft)	835.78	Reach Len. (ft)	104.63	99.01	97.83
Crit W.S. (ft)	835.78	Flow Area (sq ft)	14.79	67.00	3.56
E.G. Slope (ft/ft)	0.008820	Area (sq ft)	14.79	67.00	3.56
Q Total (cfs)	508.00	Flow (cfs)	29.95	471.79	6.26
Top Width (ft)	75.61	Top Width (ft)	33.46	32.21	9.95
Vel Total (ft/s)	5.95	Avg. Vel. (ft/s)	2.02	7.04	1.76
Max Chl Dpth (ft)	3.46	Hydr. Depth (ft)	0.44	2.08	0.36
Conv. Total (cfs)	5409.1	Conv. (cfs)	318.9	5023.6	66.6
Length Wtd. (ft)	99.97	Wetted Per. (ft)	33.47	32.66	9.99
Min Ch El (ft)	832.32	Shear (lb/sq ft)	0.24	1.13	0.20
Alpha	1.31	Stream Power (lb/ft s)	1543.37	0.00	1346.16
Frctn Loss (ft)	0.75	Cum Volume (acre-ft)	0.30	1.06	1.18
C & E Loss (ft)	0.11	Cum SA (acres)	0.50	0.51	1.00

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22276 Profile: 100 Yr

E.G. Elev (ft)	835.57	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.44	Wt. n-Val.	0.040	0.032	0.040
W.S. Elev (ft)	835.14	Reach Len. (ft)	109.88	99.00	83.63
Crit W.S. (ft)	835.20	Flow Area (sq ft)	65.56	56.53	8.69
E.G. Slope (ft/ft)	0.007998	Area (sq ft)	65.56	56.53	8.69
Q Total (cfs)	508.00	Flow (cfs)	146.68	350.86	10.46
Top Width (ft)	194.64	Top Width (ft)	118.56	30.66	45.43
Vel Total (ft/s)	3.88	Avg. Vel. (ft/s)	2.24	6.21	1.20
Max Chl Dpth (ft)	2.76	Hydr. Depth (ft)	0.55	1.84	0.19
Conv. Total (cfs)	5680.4	Conv. (cfs)	1640.2	3923.3	116.9
Length Wtd. (ft)	98.53	Wetted Per. (ft)	118.60	30.93	45.46
Min Ch El (ft)	832.38	Shear (lb/sq ft)	0.28	0.91	0.10
Alpha	1.86	Stream Power (lb/ft s)	1821.01	0.00	0.00
Frctn Loss (ft)	0.84	Cum Volume (acre-ft)	0.20	0.92	1.16
C & E Loss (ft)	0.08	Cum SA (acres)	0.31	0.44	0.94

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22275 Profile: 100 Yr

E.G. Elev (ft)	834.64	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.22	Wt. n-Val.	0.040	0.032	0.040
W.S. Elev (ft)	834.42	Reach Len. (ft)	84.84	99.01	105.74
Crit W.S. (ft)	833.86	Flow Area (sq ft)	5.83	88.30	54.33
E.G. Slope (ft/ft)	0.003389	Area (sq ft)	5.83	88.30	54.33
Q Total (cfs)	508.00	Flow (cfs)	5.86	368.53	133.61
Top Width (ft)	109.04	Top Width (ft)	18.37	45.94	44.73
Vel Total (ft/s)	3.42	Avg. Vel. (ft/s)	1.01	4.17	2.46
Max Chl Dpth (ft)	2.26	Hydr. Depth (ft)	0.32	1.92	1.21
Conv. Total (cfs)	8726.7	Conv. (cfs)	100.7	6330.9	2295.2
Length Wtd. (ft)	100.97	Wetted Per. (ft)	18.40	46.02	44.81
Min Ch El (ft)	832.16	Shear (lb/sq ft)	0.07	0.41	0.26
Alpha	1.22	Stream Power (lb/ft s)	1119.24	0.00	1089.72
Frctn Loss (ft)	0.18	Cum Volume (acre-ft)	0.11	0.75	1.10
C & E Loss (ft)	0.05	Cum SA (acres)	0.14	0.35	0.85

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22274 Profile: 100 Yr

E.G. Elev (ft)	834.41	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.06	Wt. n-Val.	0.040	0.032	0.040
W.S. Elev (ft)	834.35	Reach Len. (ft)	107.84	99.01	79.40
Crit W.S. (ft)	833.69	Flow Area (sq ft)	28.83	85.54	185.88
E.G. Slope (ft/ft)	0.001120	Area (sq ft)	28.83	85.54	185.88
Q Total (cfs)	508.00	Flow (cfs)	37.80	216.28	253.92
Top Width (ft)	227.74	Top Width (ft)	26.53	41.01	160.20
Vel Total (ft/s)	1.69	Avg. Vel. (ft/s)	1.31	2.53	1.37

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22274 Profile: 100 Yr (Continued)

Max Chl Dpth (ft)	3.09	Hydr. Depth (ft)	1.09	2.09	1.16
Conv. Total (cfs)	15180.9	Conv. (cfs)	1129.6	6463.2	7588.1
Length Wtd. (ft)	89.63	Wetted Per. (ft)	26.62	41.21	161.35
Min Ch El (ft)	831.26	Shear (lb/sq ft)	0.08	0.15	0.08
Alpha	1.32	Stream Power (lb/ft s)	1072.94	0.00	956.26
Frctn Loss (ft)	0.13	Cum Volume (acre-ft)	0.08	0.56	0.81
C & E Loss (ft)	0.01	Cum SA (acres)	0.10	0.25	0.60

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22273 Profile: 100 Yr

E.G. Elev (ft)	834.27	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.11	Wt. n-Val.	0.040	0.032	0.040
W.S. Elev (ft)	834.16	Reach Len. (ft)	95.47	99.01	97.21
Crit W.S. (ft)	833.75	Flow Area (sq ft)	0.63	75.14	153.34
E.G. Slope (ft/ft)	0.002065	Area (sq ft)	0.63	75.14	153.34
Q Total (cfs)	508.00	Flow (cfs)	0.57	257.85	249.58
Top Width (ft)	198.32	Top Width (ft)	1.15	35.80	161.37
Vel Total (ft/s)	2.22	Avg. Vel. (ft/s)	0.91	3.43	1.63
Max Chl Dpth (ft)	3.10	Hydr. Depth (ft)	0.55	2.10	0.95
Conv. Total (cfs)	11178.0	Conv. (cfs)	12.6	5673.6	5491.8
Length Wtd. (ft)	97.99	Wetted Per. (ft)	1.59	36.24	161.97
Min Ch El (ft)	831.06	Shear (lb/sq ft)	0.05	0.27	0.12
Alpha	1.48	Stream Power (lb/ft s)	1111.81	0.00	1002.06
Frctn Loss (ft)	0.12	Cum Volume (acre-ft)	0.04	0.37	0.50
C & E Loss (ft)	0.01	Cum SA (acres)	0.06	0.16	0.31

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22272 Profile: 100 Yr

E.G. Elev (ft)	834.14	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.09	Wt. n-Val.	0.040	0.032	0.040
W.S. Elev (ft)	834.05	Reach Len. (ft)	95.60	99.01	95.11
Crit W.S. (ft)	832.20	Flow Area (sq ft)	4.62	67.37	148.57
E.G. Slope (ft/ft)	0.000859	Area (sq ft)	4.62	67.37	148.57
Q Total (cfs)	508.00	Flow (cfs)	4.55	185.08	318.37
Top Width (ft)	80.99	Top Width (ft)	4.88	23.12	52.99
Vel Total (ft/s)	2.30	Avg. Vel. (ft/s)	0.99	2.75	2.14
Max Chl Dpth (ft)	3.60	Hydr. Depth (ft)	0.95	2.91	2.80
Conv. Total (cfs)	17332.4	Conv. (cfs)	155.2	6314.8	10862.4
Length Wtd. (ft)	97.67	Wetted Per. (ft)	5.36	23.49	53.81
Min Ch El (ft)	830.45	Shear (lb/sq ft)	0.05	0.15	0.15
Alpha	1.06	Stream Power (lb/ft s)	764.07	0.00	509.37
Frctn Loss (ft)	0.20	Cum Volume (acre-ft)	0.04	0.21	0.16
C & E Loss (ft)	0.07	Cum SA (acres)	0.06	0.10	0.07

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22271 Profile: 100 Yr

E.G. Elev (ft)	833.87	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.76	Wt. n-Val.	0.040	0.032	0.040
W.S. Elev (ft)	833.11	Reach Len. (ft)	40.26	46.25	50.16
Crit W.S. (ft)	833.11	Flow Area (sq ft)	11.82	66.27	1.12
E.G. Slope (ft/ft)	0.009617	Area (sq ft)	11.82	66.27	1.12
Q Total (cfs)	508.00	Flow (cfs)	29.57	476.68	1.76
Top Width (ft)	60.05	Top Width (ft)	20.74	32.96	6.35
Vel Total (ft/s)	6.41	Avg. Vel. (ft/s)	2.50	7.19	1.57
Max Chl Dpth (ft)	2.98	Hydr. Depth (ft)	0.57	2.01	0.18
Conv. Total (cfs)	5180.2	Conv. (cfs)	301.5	4860.8	17.9
Length Wtd. (ft)	45.50	Wetted Per. (ft)	20.76	33.38	6.48
Min Ch El (ft)	830.13	Shear (lb/sq ft)	0.34	1.19	0.10
Alpha	1.19	Stream Power (lb/ft s)	618.17	0.00	353.75
Frctn Loss (ft)	0.43	Cum Volume (acre-ft)	0.02	0.06	0.00
C & E Loss (ft)	0.05	Cum SA (acres)	0.03	0.03	0.00

Reso A - Exhibit C2 (EIR Technical Appendix)

Plan: Default Scenario Unnamed Ck 1 Olsen R1 RS: 22269 Profile: 100 Yr

E.G. Elev (ft)	833.28	Element	Left OB	Channel	Right OB
Vel Head (ft)	0.96	Wt. n-Val.	0.040	0.032	0.040
W.S. Elev (ft)	832.33	Reach Len. (ft)			
Crit W.S. (ft)	832.59	Flow Area (sq ft)	27.14	47.58	0.48
E.G. Slope (ft/ft)	0.017268	Area (sq ft)	27.14	47.58	0.48
Q Total (cfs)	508.00	Flow (cfs)	99.22	407.96	0.82
Top Width (ft)	72.25	Top Width (ft)	41.84	28.18	2.22
Vel Total (ft/s)	6.76	Avg. Vel. (ft/s)	3.66	8.57	1.73
Max Chl Dpth (ft)	2.64	Hydr. Depth (ft)	0.65	1.69	0.21
Conv. Total (cfs)	3865.9	Conv. (cfs)	755.1	3104.5	6.3
Length Wtd. (ft)		Wetted Per. (ft)	41.87	28.56	2.26
Min Ch El (ft)	829.69	Shear (lb/sq ft)	0.70	1.80	0.23
Alpha	1.35	Stream Power (lb/ft s)	403.36	0.00	128.42
Frctn Loss (ft)	0.57	Cum Volume (acre-ft)			
C & E Loss (ft)	0.02	Cum SA (acres)			

Appendix F.3

Stormwater Control Plan

Stormwater Control Plan

for

Olsen-Chandler Ranch Tentative Tract Map & Specific Plan

February 5, 2019

OLSEN 212
Danny Brose

prepared by:

Wallace Group
612 Clarion Court
San Luis Obispo, CA 93401
805-544-4011

Reso A - Exhibit C2 (EIR Technical Appendix)

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Attachments

Stormwater Control Plan Exhibits
Stormwater Control Measures Sizing Calculator Results

Reso A - Exhibit C2 (EIR Technical Appendix)

I. Project Data

Table 1 - Project Data

Project Name/Number	Olsen-Chandler Ranch Tentative Tract Map No.
Application Submittal Date	12/2018
Project Location	3045 Linne Road, Paso Robles
Project Phase No.	All
Project Type and Description	Residential Subdivision
Total Project Site Area (acres)	14,955,629 SF (343 Acres)
Total New Impervious Surface Area	7,197,942 SF (165 Acres)
Total Replaced Impervious Surface Area	269,636 SF (6.2 Acres)
Total Pre-Project Impervious Surface Area	269,636 SF (6.2 Acres)
Total Post-Project Impervious Surface Area	7,467,578 SF (171.4 Acres)
Net Impervious Area	7,467,578 SF (171.4 Acres)
Watershed Management Zone	1
Design Storm Frequency and Depth	95th Percentile (1.4 inches)
Urban Sustainability Area	NA

II. Setting

II.A. Project Location and Description

The proposed Olsen-Chandler Ranch Project is situated east Highway 101 at the end of Niblick Road and drains toward the Salinas River. Access to the site is taken from Spring Street at the south end of the City of Paso Robles. The existing site is rural, non-grazed grasses that generally drain from east to west. The surrounding terrain to the north is as steep as 16% slope, and cropped in Vineyard Wine Grapes with grass covered rows between the vines. The proposed project landuse types are ranging from large lot residential single family homes and townhomes, to a high density apartment complex.

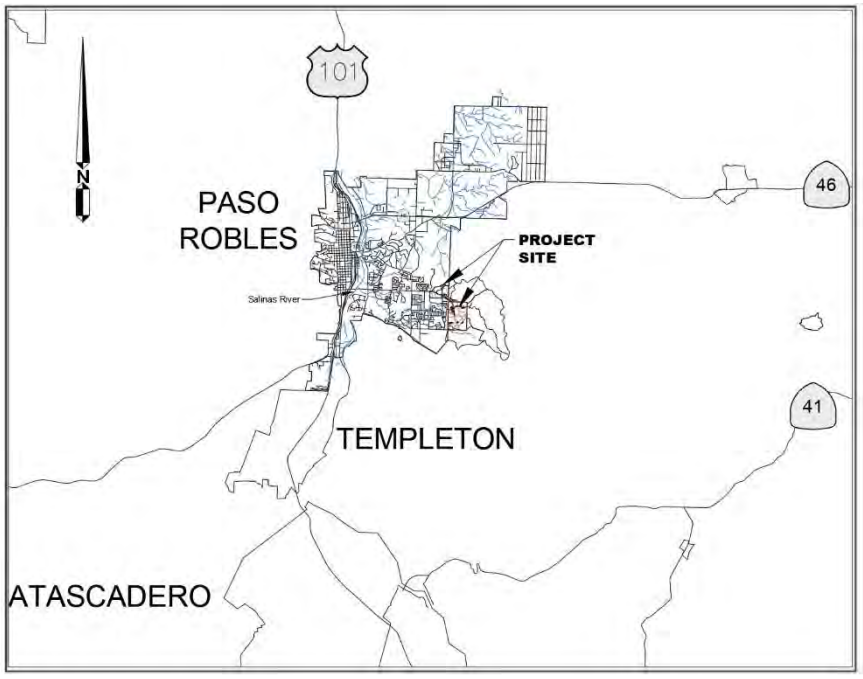


Figure 1 - Vicinity Map

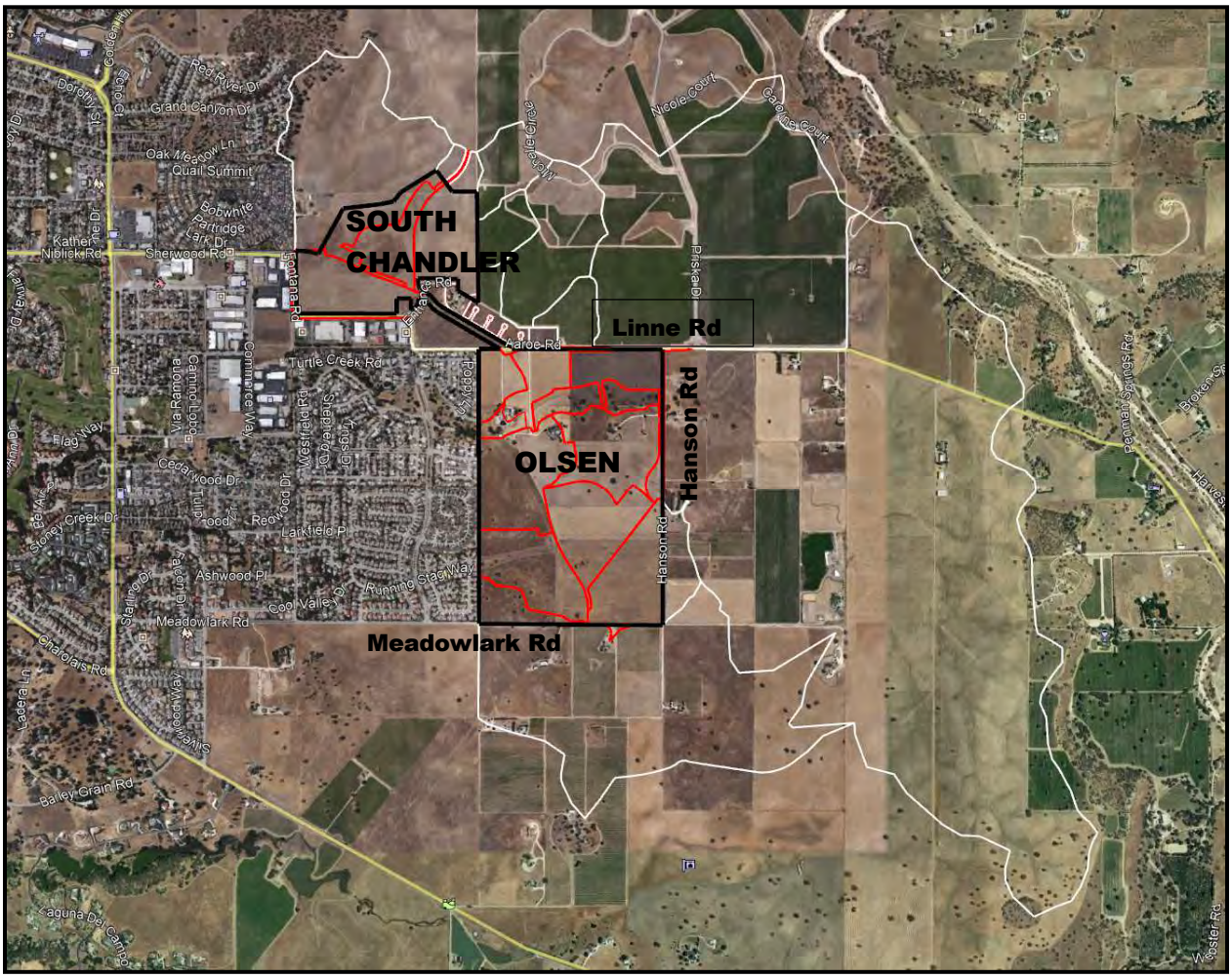


Figure 2 – Project Location Map

II.B. Existing Site Features and Conditions

The existing site has paved perimeter roads including Linne, Hansen and Fontana Roads. There are 5 major watersheds tributary to the project and historic flows tend east toward the Salinas River. There is a broad channel within the Northern subarea of the Olsen property that conveys upstream run-on from off-site during the rainy season. A drainage pond exists in the Southern subarea of the Olsen property, which flows into a Storm Drain System within Tract No. 1632 and drains west to the Salinas River. On the Chandler property there are a pair of CMP standpipe structures with grated tops and large side openings near the existing asphalt dike at the southwestern corner of the site at the intersection of Fontana and Linne Roads.

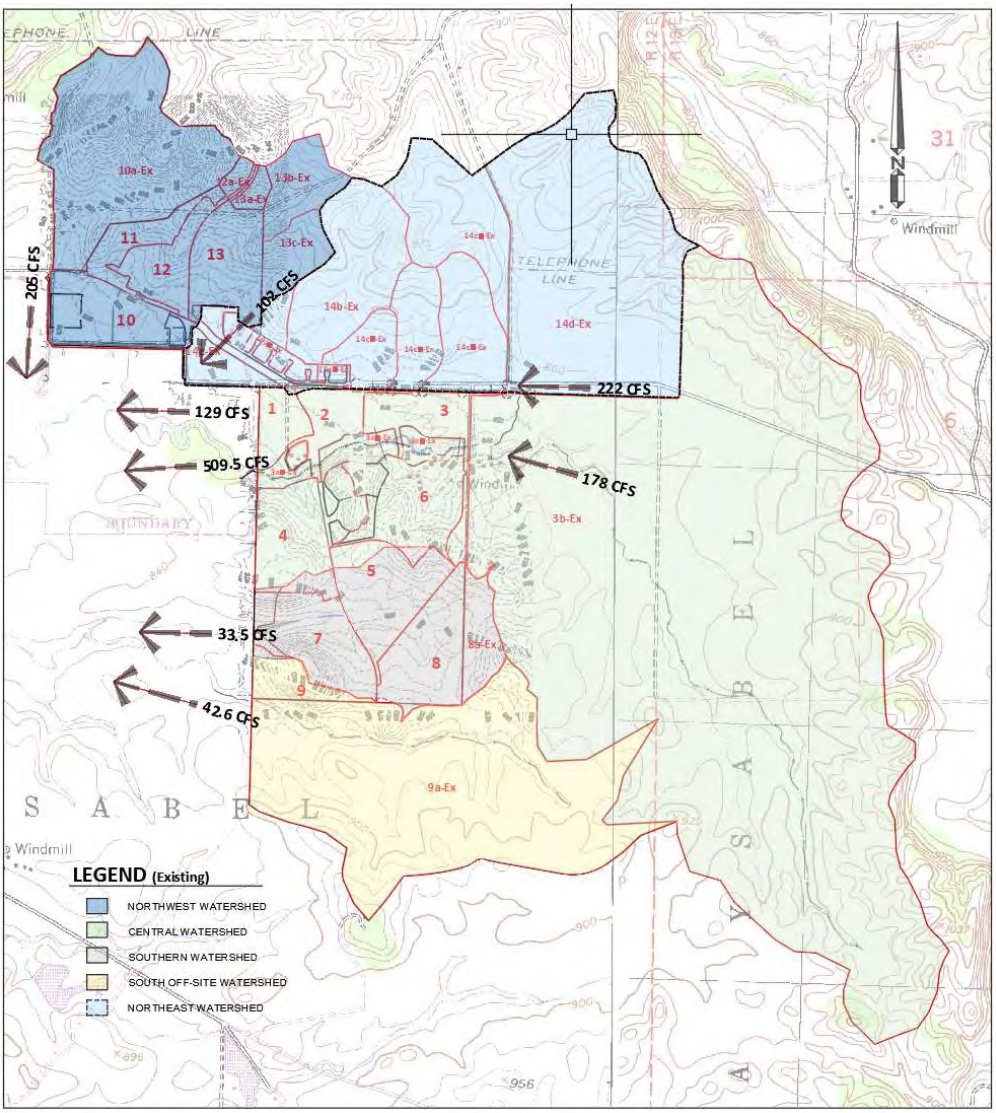


Figure 3 – Olsen-Chandler Ranch Project Site Existing Tributary Areas

Earth Strata Geotechnical Services, Inc. prepared a geotechnical report dated November 20, 2018 for the project, which included infiltration testing. Based on the report, the general subsurface profile consists of layered sandy soils with silts and clay lenses in underlying strata. The NRCS web soil data identifies the soils as Hydrologic Soil Group B and C, which is associated with good/fair infiltration rates. The design infiltration rate used for calculations is the City's Standard equal to 0.75 inches/hour.

II.C. Opportunities and Constraints for Stormwater Control

Considerations for stormwater treatment facilities are integrated into the project planning process through this Stormwater Control Plan document. Open space areas throughout the property are identified with bio-retention swales and reserved for stormwater treatment. The peak flow detention basins have significant surface area at their respective outlet elevations, and the basin bottoms are being utilized for bio-retention/infiltration areas. The conventional storm drain system will carry the water quality storm event (1.4 inch of Precipitation) for a varying number of developed lots directly to the detention basin. This 95th percentile rainfall event will be direct runoff from impervious areas (Roofs, flatwork, sidewalks & streets) to an area of storage and infiltration below the outfall of each detention basin. This network of bio-retention swales are very well distributed within the project boundary, and with the addition of structural control

measures for the lots and streets (landscape area bio-retention and pervious paver driveways) further away from each detention pond the goal is to spread out Structural Control Measures (SCMs) providing on-site retention.

Figure 4 represents the areas available for infiltration/retention within the 13 detention basin bottoms, and additional areas highlighted for small SCMs peppered within the upper reaches of each DMA/sub-catchment delineated on the map (outlined red).

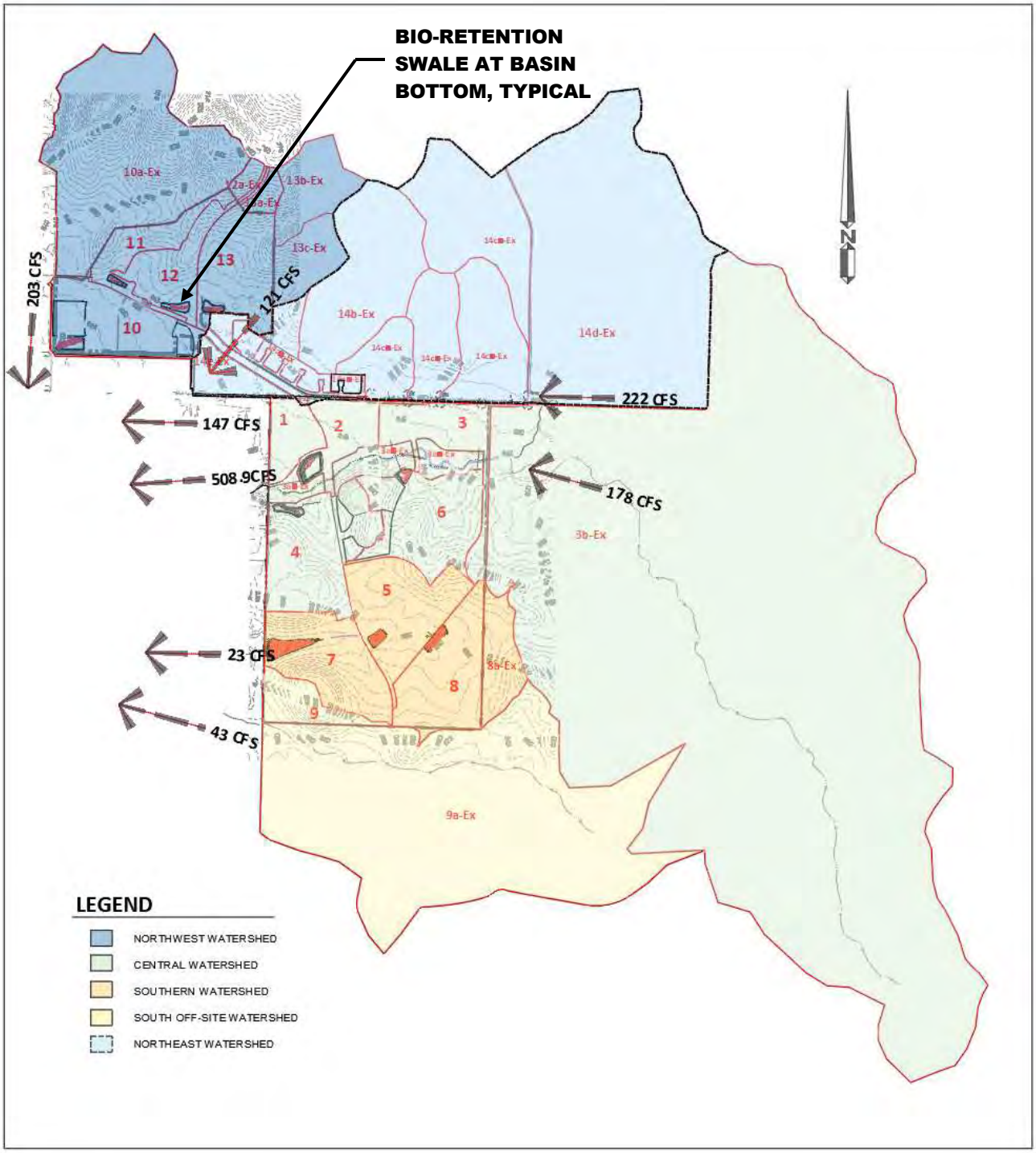


Figure 4 – Olsen-Chandler Ranch Project Site Infiltration/Retention Area Map

III. Low Impact Development Design Strategies

III.A. Optimization of Site Layout

The proposed project will increase the impervious area on the property by more than 22,500 SF. Post Construction Requirements (PCRs) 1-4 are planned for this subdivision. PR4 – Peak Flow Management criteria are meet and can be reviewed per the Preliminary Drainage Report for Tentative Tract Map and Specific Plan prepared by Wallace Group dated 1/31/2019. The strategy to manage the increase in the runoff for the 95th percentile storm event is to provide a series of bio-retention landscape areas and pervious driveways, which will cut off flow for water quality treatment and retention. Bio-retention swales will be implemented in the detention basin bottoms taking advantage of these vegetated open areas as much as possible. The project will hold the minimum setback from the "No-name Creek #1" (aka: Turtle Creek) flowline for grading design per PR#1 – site design performance requirement.

III.B. Stormwater Control Measures

The proposed stormwater Structural Control Measures (SCMs) will consist of bio-retention landscape infiltration areas located strategically throughout of the site, pervious paver driveways as required and bio-retention swales in the bottoms of the proposed detention basins. The subdivision stormwater control plan design has the capacity to store and retain on site the 95th percentile storm event in a well distributed manner. The calculations using the City's required Excel spreadsheet – PR PCSW Sizing-Calculator-XLS can be found in Appendix B.

IV. Documentation of Drainage Design

IV.A. Descriptions of each Drainage Management Area shown in the table below shows a sample of the way the sub-catchments developed to size each detention basin is further broken down to calculate the Low Impact Development (LID) SCMs that were considered in the design of the Stormwater Quality features recommended for this project site. The sub-catchment being used as an example is in the southeasterly corner of the Olsen property. Subcat 8 – has a lot layout as shown below:

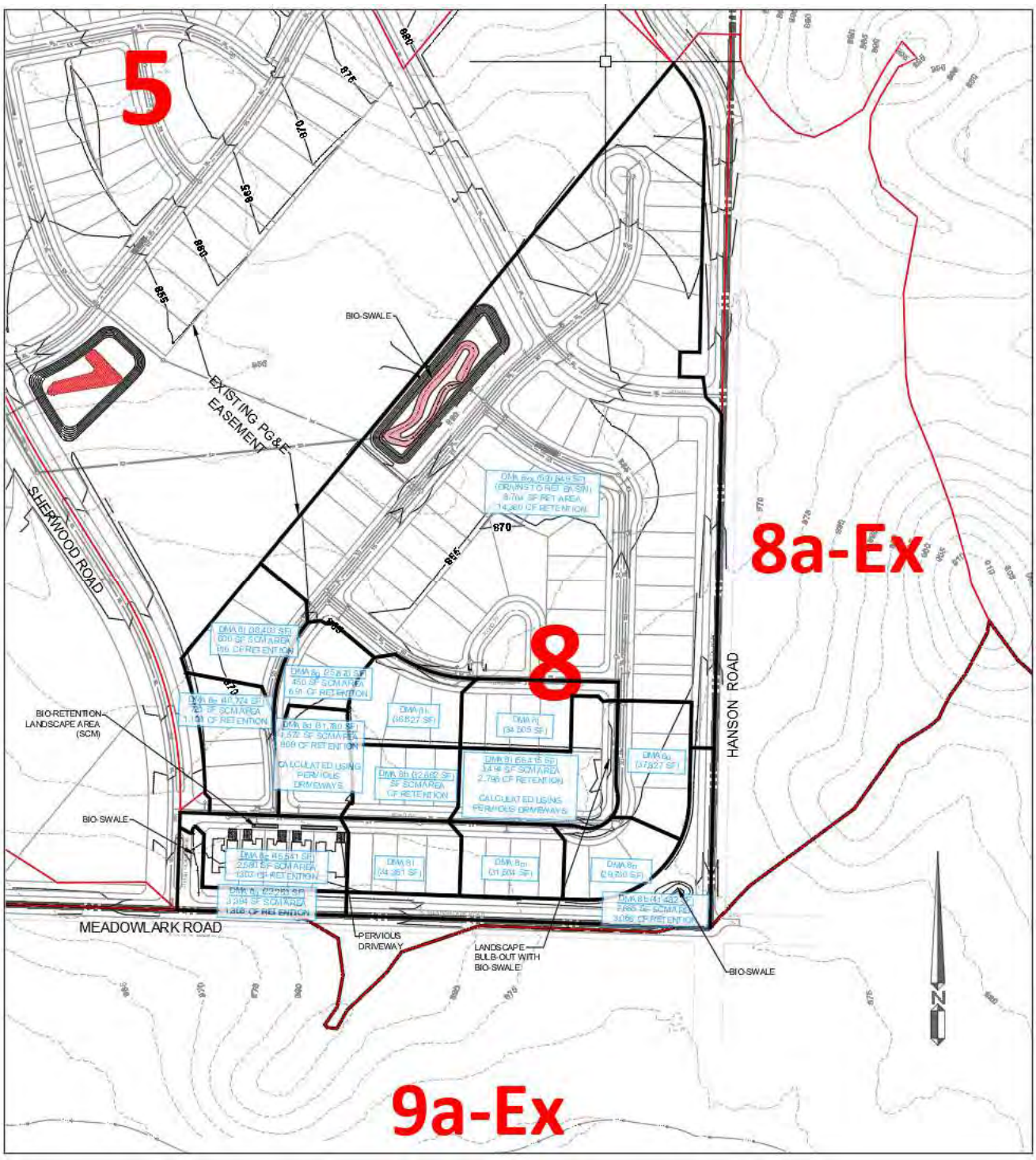


Figure 5 – Olsen-Chandler Ranch Sub-catchment 8 with Tentative Lot Layout

Table 2 - Drainage Management Areas					
Name	DMA Type	Area (SF)	Surface Type	New, or Replaced	Connection
DMA 8a	Drains to SCM	22,253	Asphalt	New	Surface runoff to Standard Curb & Gutter (C&G)
DMA 8b	Drains to SCM	41,482	Asphalt	New + Replaced	Surface runoff to Standard Curb & Gutter (C&G)
DMA 8d	Drains to SCM	31,780	Roofs & PCC. Flatwork	New	Surface flow to Pervious Driveway
DMA 8xx	Drains to SCM	690,649	Roofs, pavement & landscaping	New	Runoff from lots to SD system with outlet to basin bio-retention swale

DMA 8a: SCM capacity totaling 1,358 cubic feet (CF), flows overland to bio-retention/infiltration swale with a surface area of 3,394 square feet (SF). Includes existing asphalt area that will be new asphalt.
DMA 8b: SCM capacity totaling 3,066 CF, flows overland to bio-retention/infiltration pond SCM with a surface area of 7,665 SF. Includes existing asphalt area that will be removed and replaced with new asphalt.
DMA 8d, SCM capacity totaling 869 CF, flows overland through pervious pavers and into a bio-retention/infiltration SCM. Includes proposed asphalt area in addition to roofs and flatwork.
DMA 8xx, SCM capacity totaling 14,360 CF, 95th percentile storm flow drains to bio-swale in detention basin bottom. Consists of vegetated bio-retention swale with a 4 foot deep open graded gravel backfill below 18 inches of Bio-Soil Media.

IV.B. Descriptions of Structural Control Measures (SCM)

Table 3 - Structural Control Measures Summarized for DMA 8				
Name	SCM Type	[1]Min. Required1 Storage Vol. (ft^3)	Infilt. Rate (in/hr)	Surface Area (sf)
Bio-Retention Landscape Area	Infiltration	11,880	0.75	12,544
Pervious Paver Driveways	Infiltration	1,740	0.75	3,144
Vegetated Bio-Retention Swale	Reduce Sedimentation and Infiltration	18,784	0.75	19,763

1 – Based on Central Coast Region Stormwater Control Measure Sizing Calculator

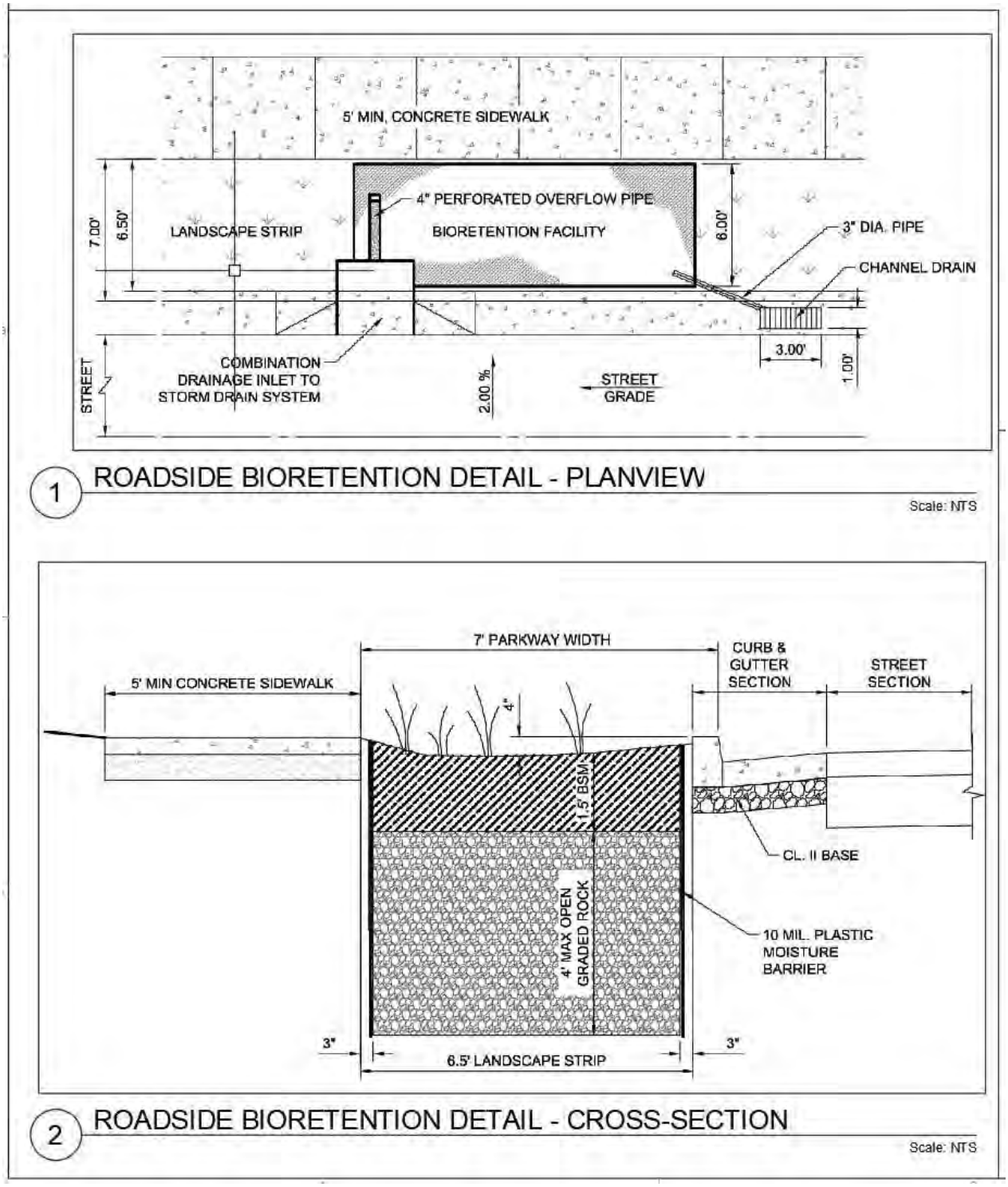


Figure 6 – Bio-retention Landscape Area Detail

A Stormwater Control Plan layout for all proposed landuse catagories are provided in Appendix A. Appendix B is output from the City of Paso Robles.

The use of permeable paver street sections in low volume traffic areas are placed to drain to a pervious paver section, which is designed to capture small storm event surface runoff and allow it to percolate between the pavers. The pervious pavers overlie a variable depth layer of angular open graded rock material which holds the runoff from small storm events. The base rock below the pavement filters the water as it is slowly released into the soil.

The finished paver surface together with the underlying layers of aggregate rock shown in Figure 7 are known as the Paver Profile or "PP". Infiltration to the soil below relies on the ability for water to move through tiny gaps in the material. Pervious pavers must be kept free of silt and debris to work properly. Sweeping or vacuuming should occur prior to rainy season, monthly during the rainy season and after major storm events (>1.4" in 24 hours). Inspections shall be performed on a regular basis during the rainy season to determine if the frequency of sweeping is adequate.

Inspect:

- Surface accumulation of sediment and debris from landscaping and trash
- Visual contaminants and non-stormwater pollutants (i.e. chemical spills, oil)
- Surface clogging of Paver Profile section
- Overflow clogging of the downstream overflow outlet
- Deterioration or roughening/crumbling of the PP finish surface
- Evidence of ponding on the surface suggesting PP section is clogged below grade
- Settling of PP due to heavy truck or equipment loading.

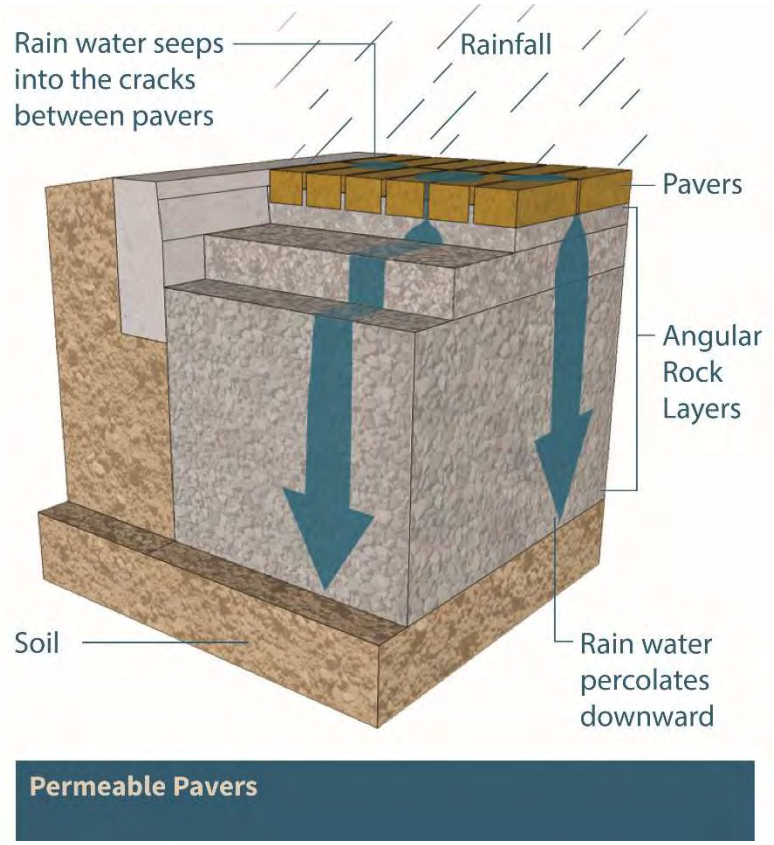


FIGURE 7 – PERMEABLE PAVER SECTION DETAIL

Table 4 describes the parameters of the hydrologic model prepared in HydroCAD.

Table 4 - Hydrograph Method	
Parameter	Criteria
Hydrograph Analysis Method	Santa Barbara Unit Hydrograph
Pond Routing Method	Dynamic Storage Indication
Infiltration Rate	0.75 in/hr
Rainfall Distribution	NRCS Type I – 24 Hour Duration
95th Percentile Precipitation Depth	1.4 inches
Time of Concentration	10 minute (minimum)
Time Increment	0.1 hour

The project site is in Watershed Management Zone 1.

V. Source Control Measures

V.A. Site activities and potential sources of pollutants

The proposed site grading & drainage concept will consist of Arterial Roadways, residences, utilities, Low Impact Development techniques of treating the runoff that falls on the project site during the 95th percentile storm event. The site will be used for maintenance and/or repair of Construction vehicles, storage of construction materials and ultimately a final product that has the stormwater features that provide an enhanced system for maintaining water quality. Table 5 summarizes four likely sources of contaminants that may cause an issue with stormwater quality while the project may be under construction and after the homes have transferred ownership.

The following list of Best Management Practices (BMPs) are recommendations on how to best treat the potential for a stormwater quality issue by slowing the migration of these contaminants during the life of the project.

Table 5- Source Control Measures		
Potential source of runoff pollutants	Permanent source control BMPs	Operational source control BMPs
Landscape	Final landscaping plans will accomplish the following: Preserve existing native trees, shrubs and ground cover to the maximum extent possible. Design landscaping to minimize over-irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. To provide successful establishment, select plants appropriate to site conditions.	Maintain landscaping using minimum or no pesticides Dispose of grass clippings, leaves, sticks, or other collected vegetation as garbage or by composting. Do not dispose of collected vegetation into waterways or storm drainage systems. Use mulch or other erosion control measures on exposed soils
Refuse Areas	Signs posted on or near dumpsters with the words "Do not dump hazardous material here" or similar. Outdoor dumpsters to be covered and graded to landscape areas	Adequate number of receptacles to be provided. Inspect receptacles regularly; repair or replace leaky dumpsters, keep dumpsters covered, collect litter daily and clean up spills immediately. Keep spill control materials available onsite.
Outdoor storage of equipment	Maintenance and Construction vehicles to parked/stored onsite. Storage area should be paved and sufficiently impervious to contain leaks and spills Parking area directed to gravel infiltration swale for infiltration before discharging from the site.	Clean up spills or leaks immediately. Keep spill control materials available onsite. Inspect vehicles & equipment being stored onsite to identify spills and leaks. Address appropriately to reduce future spills and leaks.
Parking areas		Sweep parking areas regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect wash water containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.

VI. Stormwater Peak Flow and Water Quality Facilities Maintenance

VI.A. Ownership and Responsibility for Maintenance in Perpetuity

OLSEN 212, LLC shall accept responsibility for operation and maintenance of facilities as outlined in the Operations and Maintenance Plan to be submitted prior to Public Improvement Plan approval.

VI.B. Summary of Maintenance Requirements for Each Stormwater Device

Table 6 - Maintenance Requirements

INSPECTION ITEM	FREQUENCY	MAINTENANCE
Inspect the bio-retention landscape area & swale for litter, debris, leaves, dead vegetation and anything else that might interfere with flow and infiltration.	Monthly	Remove debris and other items from gravel swale area
Determine whether bio-retention swale area is draining correctly. Look for standing water which indicates poor infiltration and may lead to vector issues. Stormwater should drain from bio-retention swale within 48 hours of storm event.	After Storm Event	Determine cause of poor infiltration, remove and clean cobbles/gravel, remove silt from bottom, replace/remediate contaminated soils
Inspect discharge locations from the facility. Look for gullies, washouts, evidence of uncontrolled surface water flow or erosion to the existing slope.	Annually, After Storm Event	Repair bank by excavating washouts and replacing soil in its original condition, properly compacted. Replace rock slope protection or other erosion control device to mitigate future erosion
Inspect for growth of trees or invasive plants in the bio-retention swale.	Annually	Remove invasive plants and other vegetation from the gravel swale area
Inspect gravel swale for potential contaminants from spills or illicit discharge	Annually, After Storm Event	Remove and clean/replace cobble, gravel, and soils as needed, report hazardous discharges or spills

VII. Certifications

The preliminary design of stormwater treatment facilities and other stormwater pollution control measures in this plan are in accordance with the current edition of the City of Paso Robles' Stormwater Technical Guide.

Debra Tumler, PE 55205 (QSD/QSP)
Senior Civil Engineer

02/05/2019
Date

Attachments

Stormwater Control Plan Exhibits
Stormwater Control Measures Sizing Calculator Results

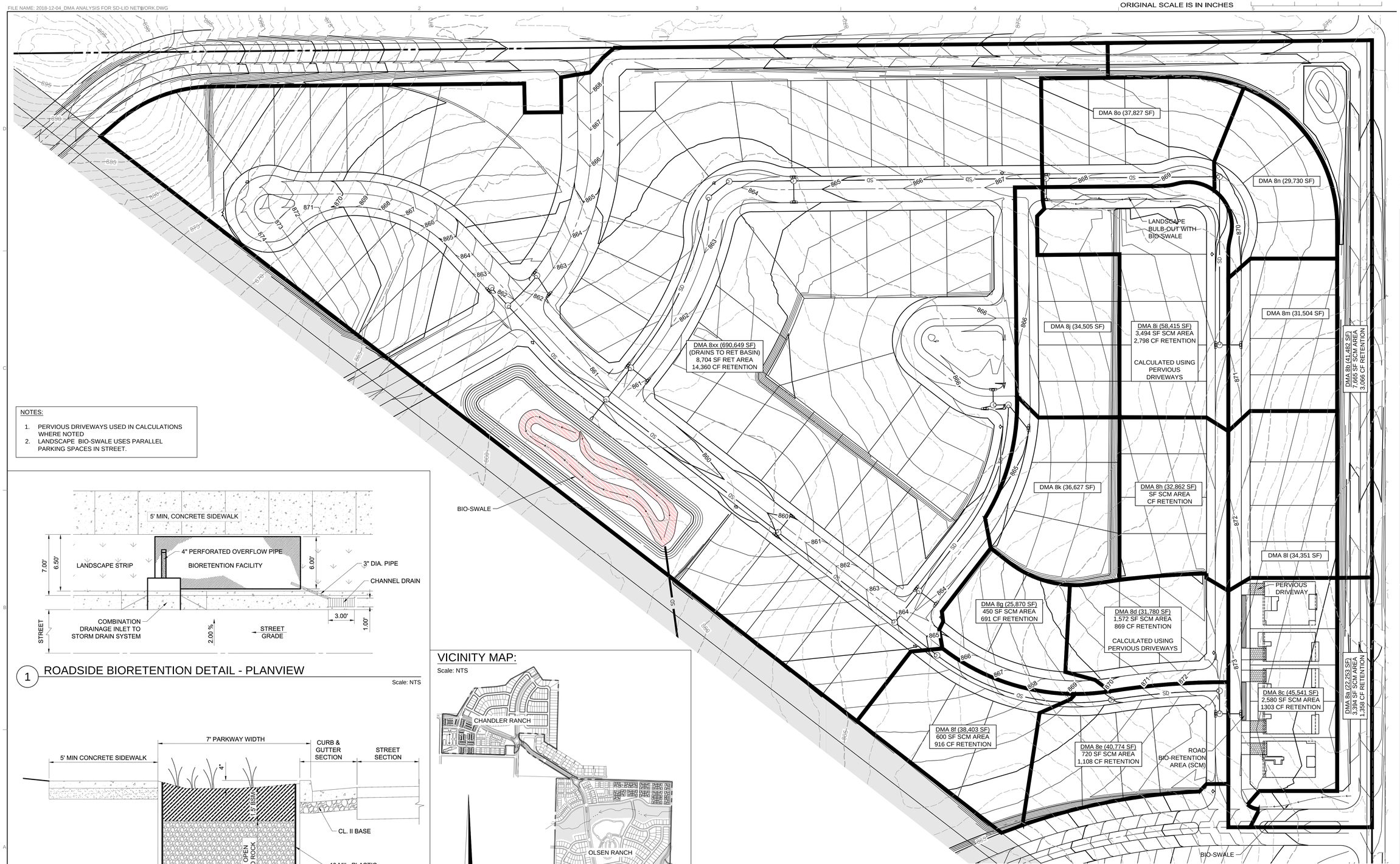
Reso A - Exhibit C2 (EIR Technical Appendix)

Stormwater Control Plan Exhibits

Reso A - Exhibit C2 (EIR Technical Appendix)

FILE NAME: 2018-12-04_DMA ANALYSIS FOR SD-LID NETWORK.DWG

FOR REDUCED PLANS
ORIGINAL SCALE IS IN INCHES
0 1 2 3
5

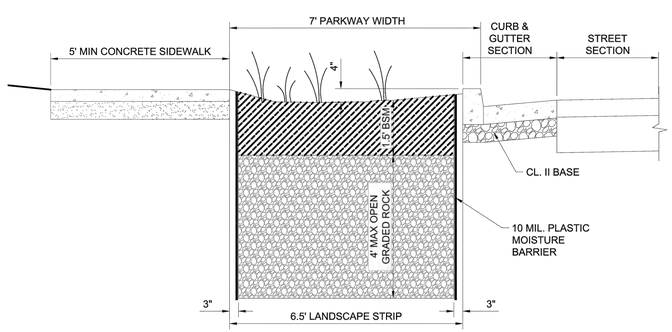


NOTES:

1. PERVIOUS DRIVEWAYS USED IN CALCULATIONS WHERE NOTED
2. LANDSCAPE BIO-SWALE USES PARALLEL PARKING SPACES IN STREET.

1 ROADSIDE BIORETENTION DETAIL - PLANVIEW

Scale: NTS

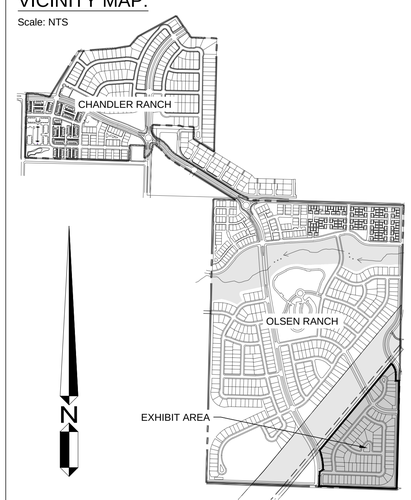


2 ROADSIDE BIORETENTION DETAIL - CROSS-SECTION

Scale: NTS

VICINITY MAP:

Scale: NTS



LOW IMPACT DEVELOPMENT TEMPLATE FOR SUB-CATCHMENT/DMA 8 LARGE LOT SINGLE-FAMILY RESIDENTIAL

GRAPHIC SCALE
0 30 60 120
(IN FEET)
1 IN = 60 FT

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DATE SIGNED

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TRACT xxxx, OLSEN RANCH
PRELIMINARY STORM WATER CONTROL PLAN
DRAINAGE MANAGEMENT AREA (DMA) 8

JOB #:	1465-0001
DESIGNERS:	DRT
DRAWN BY:	ZKP
DATE:	12-11-2018

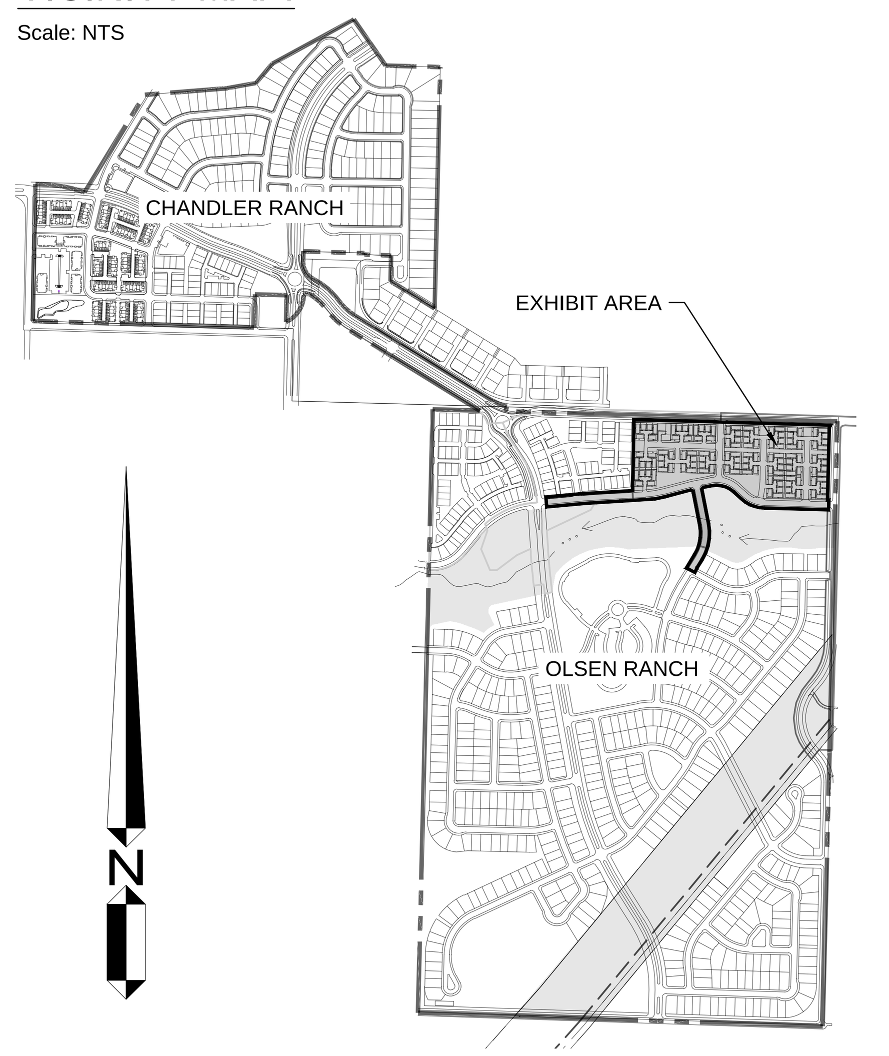
DRAWING NO.
1
OF 1 SHEET

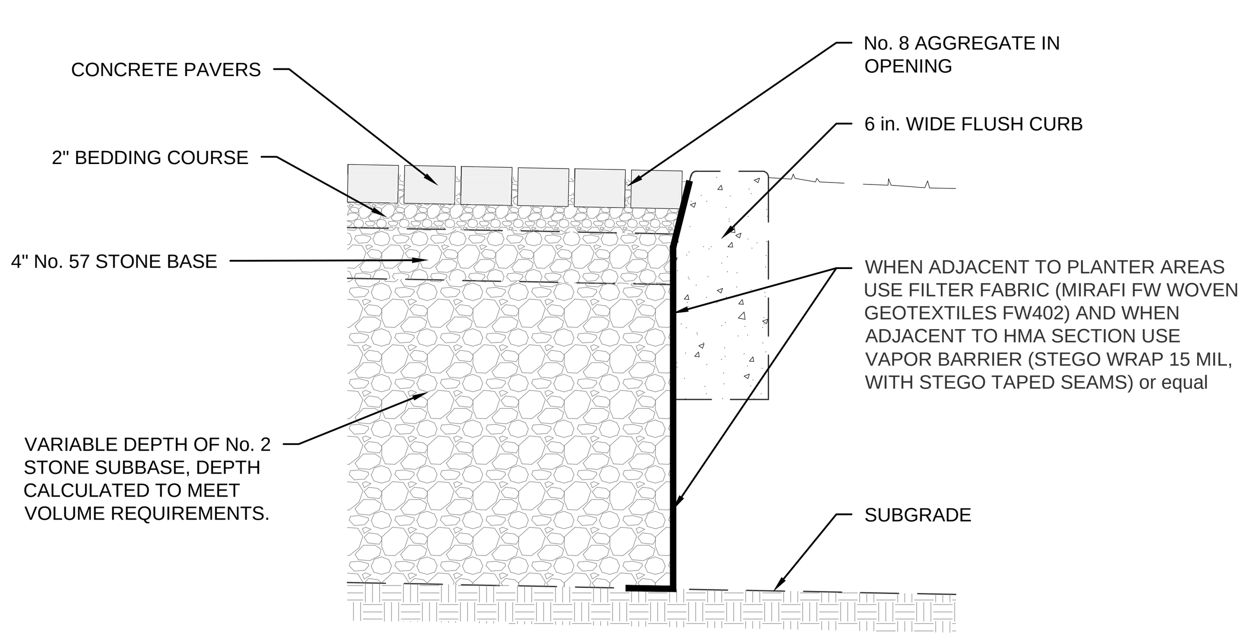
FILE NAME: 2018-12-04_DMA ANALYSIS FOR SD-LID NETWORK.DWG

FOR REDUCED PLANS
ORIGINAL SCALE IS IN INCHES
0 1 2 3

VICINITY MAP:

Scale: NTS





(A) PERMEABLE PAVER CROSS SECTION

NTS

LOW IMPACT DEVELOPMENT TEMPLATE FOR SUB-CATCHMENT/DMA 3 MOTORCOURT 6-PACK RESIDENTIAL LOTS

GRAPHIC SCALE

0 40 80 160

(IN FEET)
1 IN = 80 FT

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TRACT xxxx, OLSEN RANCH
PRELIMINARY STORM WATER CONTROL PLAN
DRAINAGE MANAGEMENT AREA (DMA) 3

JOB #:	1465-0001
DESIGNERS:	DRT
DRAWN BY:	ZKP
DATE:	12-13-2018

DRAWING NO.

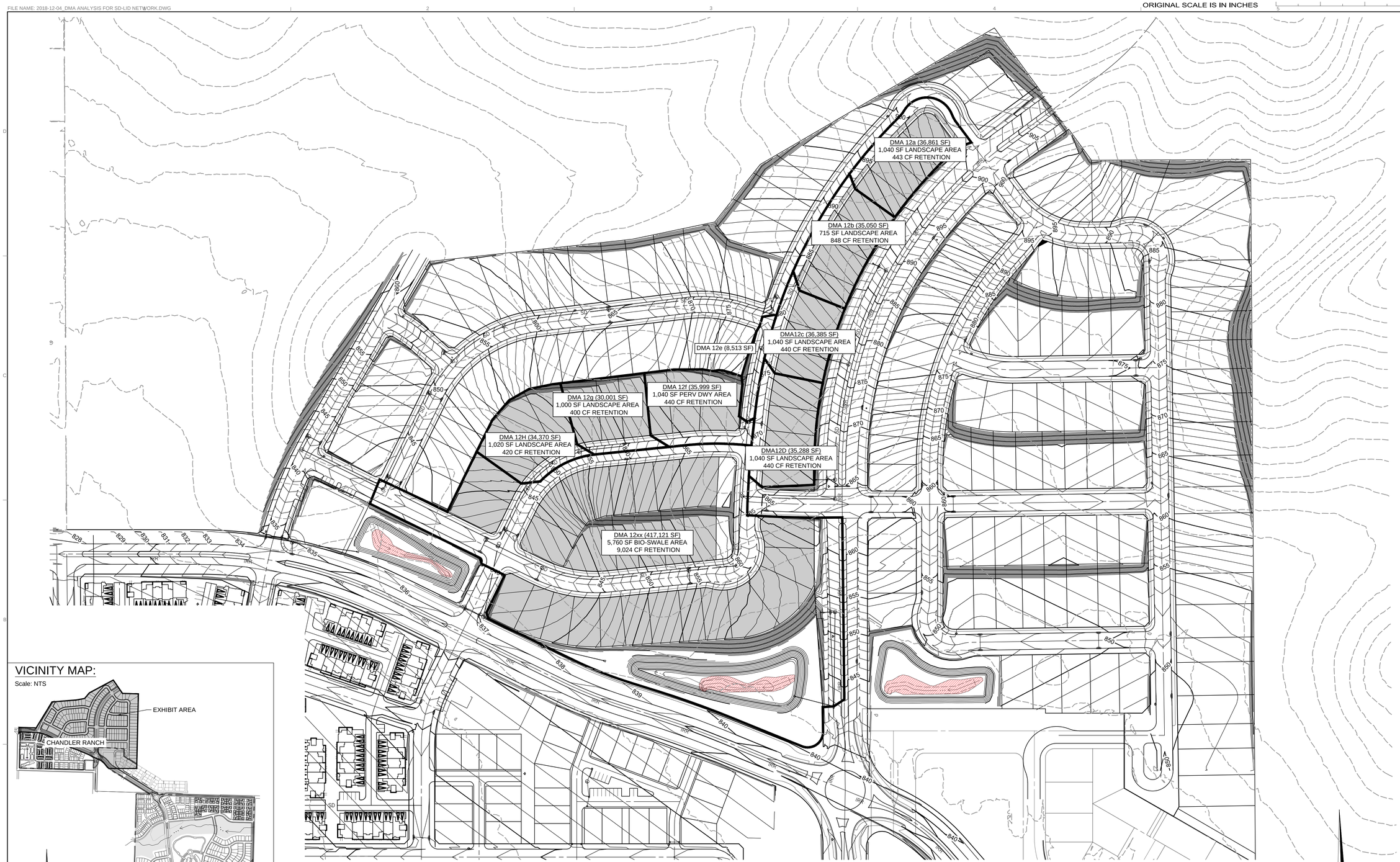
2

OF 2 SHEET

Reso A - Exhibit C2 (EIR Technical Appendix)

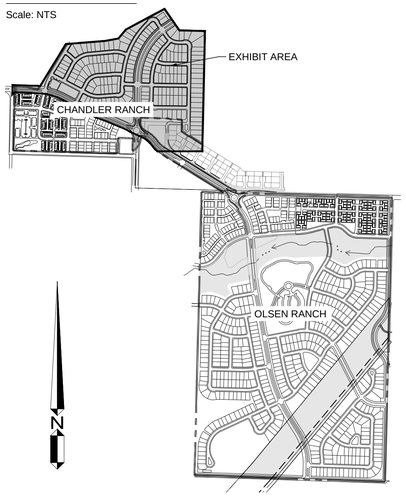
FILE NAME: 2018-12-04_DMA ANALYSIS FOR SD-LID NETWORK.DWG

FOR REDUCED PLANS
ORIGINAL SCALE IS IN INCHES
0 1 2 3



VICINITY MAP:

Scale: NTS



GRAPHIC SCALE

0 50 100 200

(IN FEET)

1 IN = 100 FT

LOW IMPACT DEVELOPMENT TEMPLATE FOR SUB-CATCHMENT/DMA 12 SINGLE FAMILY RESIDENTIAL LOTS

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TRACT xxxx, CHANDLER RANCH
PRELIMINARY STORM WATER CONTROL PLAN
DRAINAGE MANAGEMENT AREA (DMA) 12

JOB #:	1465-0001
DESIGNERS:	DRT
DRAWN BY:	ZKP
DATE:	12-13-2018

DRAWING NO.
3
OF 3 SHEET

Stormwater Control Measures Sizing Calculator Results

Reso A - Exhibit C2 (EIR Technical Appendix)

Reso A - Exhibit C2 (EIR Technical Appendix)

Central Coast Region Stormwater Control Measure Sizing Calculator

Sub-catchment 8
WALLACE GROUP Job No.: 1465.01
Date: 2/5/2019

Version: 7/2/2018

1. Project Information

Project name:	Olsen-Chandler Ranch
Project location:	N. of Meadowlark, West of Hansen Rd
Tier 2/Tier 3:	Tier 3 - Retention
Design rainfall depth (in):	1.4
Total project area (ft2):	1020734.743
Total DMA area (ft2):	1020734.743
Total new impervious area (ft2):	618462.452
Total replaced impervious within a USA (ft2):	
Total replaced impervious not in a USA (ft2):	
Total pervious/landscape area (ft2):	402272.2914
Total SCM area (ft2):	34771.21

Check Total DMA and SCM areas to ensure they match total project area

2. DMA Characterization

Name	DMA Type	Area (ft2)	Surface Type	New, Replaced?	Connection
8a: Local Road Frontage	Drains to SCM	11084.6	Concrete or asphalt	New	8a Bio Ret Area
8a: LA (BioSw)	Drains to SCM	11184.12	Landscape	New	8a Bio Ret Area
8c1: Lot Imperv (FY)	Drains to SCM	3897.328	Roof	New	8c1 Pervious 2-DWYs
8c1: Street	Drains to SCM	4434.39	Concrete or asphalt	New	8c Bio Ret LA
8c1: LA (Lot/Strip)	Drains to SCM	7026.744	Landscape	New	8c Bio Ret LA
8c1: Pervious DWYs	Drains to SCM	768	Unit pavers set in sand	New	8c Bio Ret LA
8c1: Lot Imperv (BY)	Drains to SCM	3897.328	Roof	New	8c Bio Ret LA
8c2: Lot Imperv (FY)	Drains to SCM	5340	Roof	New	8c2 Pervious 3-DWYs
8c2: Lot Imperv (BY)	Drains to SCM	5340	Roof	New	8c Bio Ret LA
8c2: Street	Drains to SCM	4083	Concrete or asphalt	New	8c Bio Ret LA
8c2: LA (Lot/Strip)	Drains to SCM	9588	Landscape	New	8c Bio Ret LA
8c2: Pervious DWYs	Drains to SCM	1152	Unit pavers set in sand	New	8c Bio Ret LA
8b: Local Road Frontage	Drains to SCM	22769.34	Concrete or asphalt	New	8b Bio Ret Area
8b: LA	Drains to SCM	37240	Landscape	New	8b Bio Ret Area
8d: Lot Imperv (FY)	Drains to SCM	6100.0088	Roof	New	8d Pervious 3-DWYs
8d: Lot Imperv (BY)	Drains to SCM	6100.0088	Roof	New	8d Bio Ret LA
8d: Street	Drains to SCM	7068	Concrete or asphalt	New	8d Bio Ret LA
8d: LA (Lot/Strip)	Drains to SCM	1692	Landscape	New	8d Bio Ret LA
8d: Pervious DWYs	Drains to SCM	420	Unit pavers set in sand	New	8d Bio Ret LA
8e: Lot Imperv (FY)	Drains to SCM	8046.2948	Roof	New	8e Bio Ret LA
8e: Lot Imperv (BY)	Drains to SCM	8046.2948	Roof	New	8e Bio Ret LA
8e: Street	Drains to SCM	10086.73	Concrete or asphalt	New	8e Bio Ret LA
8e: LA (Lot/Strip)	Drains to SCM	14994.5304	Landscape	New	8e Bio Ret LA
8e: Pervious DWYs	Drains to SCM	1536	Concrete or asphalt	New	8e Bio Ret LA
8f: Lot Imperv (FY)	Drains to SCM	8822.1779	Roof	New	8f Bio Ret LA
8f: Lot Imperv (BY)	Drains to SCM	8822.1779	Roof	New	8f Bio Ret LA
8f: Street	Drains to SCM	4814	Concrete or asphalt	New	8f Bio Ret LA
8f: LA (Lot/Strip)	Drains to SCM	1200	Landscape	New	8f Bio Ret LA
8f: Pervious DWYs	Drains to SCM	1152	Concrete or asphalt	New	8f Bio Ret LA
8g: Lot Imperv (FY)	Drains to SCM	5523.63	Roof	New	8g Bio Ret LA
8g: Lot Imperv (BY)	Drains to SCM	5523.63	Roof	New	8g Bio Ret LA
8g: Street	Drains to SCM	5491	Concrete or asphalt	New	8g Bio Ret LA
8g: LA (Lot/Strip)	Drains to SCM	9331.74	Landscape	New	8g Bio Ret LA
8g: Pervious DWYs	Drains to SCM	768	Concrete or asphalt	New	8g Bio Ret LA
8h: Lot Imperv (FY)	Drains to SCM	6832.5491	Roof	New	8i Bio Ret Area
8h: Lot Imperv (BY)	Drains to SCM	6832.5491	Roof	New	8i Bio Ret Area
8h: Street	Drains to SCM	5291	Concrete or asphalt	New	8i Bio Ret Area
8h: LA (Lot/Strip)	Drains to SCM	12333.6918	Landscape	New	8i Bio Ret Area
8h: Pervious DWYs	Drains to SCM	1536	Concrete or asphalt	New	8i Bio Ret Area
8i: Lot Imperv (FY)	Drains to SCM	10942.16	Roof	New	8i Bio Ret Area
8i: Lot Imperv (BY)	Drains to SCM	10942.16	Roof	New	8i Pervious 6-Dwys
8i: Street	Drains to SCM	13360	Concrete or asphalt	New	8i Bio Ret Area
8i: LA (Lot/Strip)	Drains to SCM	20899.68	Landscape	New	8i Bio Ret Area
8i: Pervious DWYs	Drains to SCM	2304	Unit pavers set in sand	New	8i Bio Ret Area
8i: LA	Drains to SCM	0	Landscape	New	8i Bio Ret Area
8xx: Lot Imperv	Drains to SCM	236539.9848	Roof	New	8xx Basin BioRet Area
8xx: Street	Drains to SCM	177440.11	Concrete or asphalt	New	8xx Basin BioRet Area
8xx: LA (Lot/Strip)	Drains to SCM	272137.7852	Landscape	New	8xx Basin BioRet Area

Reso A - Exhibit C2 (EIR Technical Appendix)

Sub-catchment 8

WALLACE GROUP Job No.: 1465.01
Date: 2/5/2019

DMA Summary Area	
Total assigned DMA area (ft2):	1020734.743
New impervious area (ft2):	618462.452
Replaced impervious within a USA (ft2):	0
Replaced impervious not in a USA (ft2):	0
Total pervious/landscape area (ft2):	402272.2914

3. SCM Characterization

Name	SCM Type	Safety Factor	SCM Soil Type	Infilt. Rate (in/hr)	Area (ft2)	Flow Control Orifice?	Reservoir Depth (in)
8a Bio Ret Area	Bioretention	1	HSG A/B	0.75	3394.21	Yes	6
8c Bio Ret LA	Bioretention	1	HSG A/B	0.75	**660**	Yes	6
8c1 Pervious 2-DWYs	Direct Infiltration	2	HSG A/B	0.75	768		
8c2 Pervious 3-DWYs	Direct Infiltration	2	HSG A/B	0.75	1152		
8b Bio Ret Area	Bioretention	1	HSG A/B	0.75	7665	Yes	6
8d Pervious 3-DWys	Direct Infiltration	2	HSG A/B	0.75	1152		
8d Bio Ret LA	Bioretention	1	HSG A/B	0.75	**420**	Yes	6
8e Pervious 4-DWYs	Direct Infiltration	2	HSG A/B	0.75	1536		
8e Bio Ret LA	Bioretention	1	HSG A/B	0.75	**720**	Yes	6
8f Pervious 3-DWys	Direct Infiltration	2	HSG A/B	0.75	1152		
8f Bio Ret LA	Bioretention	1	HSG A/B	0.75	**600**	Yes	6
8g Bio Ret LA	Bioretention	1	HSG A/B	0.75	**450**	Yes	6
8g Pervious 2-DWYs	Direct Infiltration	2	HSG A/B	0.75	768		
8h Pervious 4-DWys	Direct Infiltration	2	HSG A/B	0.75	1536		
8h Bio Ret LA	Bioretention	1	HSG A/B	0.75	600	Yes	6
8i Bio Ret Area	Bioretention	1	HSG A/B	0.75	**1190**	Yes	6
8i Pervious 6-Dwys	Direct Infiltration	2	HSG A/B	0.75	2304		
8xx Basin BioRet Area	Bioretention	1	HSG A/B	0.75	**8704**	Yes	14

4. Run SBUH Model

5. SCM Minimum Sizing Requirements

SCM Name	Min. Required Storage Vol. (ft3)	Depth Below Underdrain (ft)	Drain Time (hours)	Orifice Diameter (in)
8a Bio Ret Area	1358	1.00	0.0	0.26
8c Bio Ret LA	535	2.03	12.9	0.33
8c1 Pervious 2-DWYs	307	1.00	1.5	
8c2 Pervious 3-DWYs	461	1.00	0.3	
8b Bio Ret Area	3066	1.00	0.0	0.37
8d Pervious 3-DWys	461	1.00	2.1	
8d Bio Ret LA	408	2.43	15.5	0.28
8e Bio Ret LA	1108	3.85	24.6	0.40
8f Bio Ret LA	916	3.82	24.4	0.37
8g Bio Ret LA	691	3.84	24.6	0.32
8i Bio Ret Area	1876	3.94	25.2	0.52
8i Pervious 6-Dwys	922	1.00	0.6	
8xx Basin BioRet Area	14360	4.12	22.0	1.56

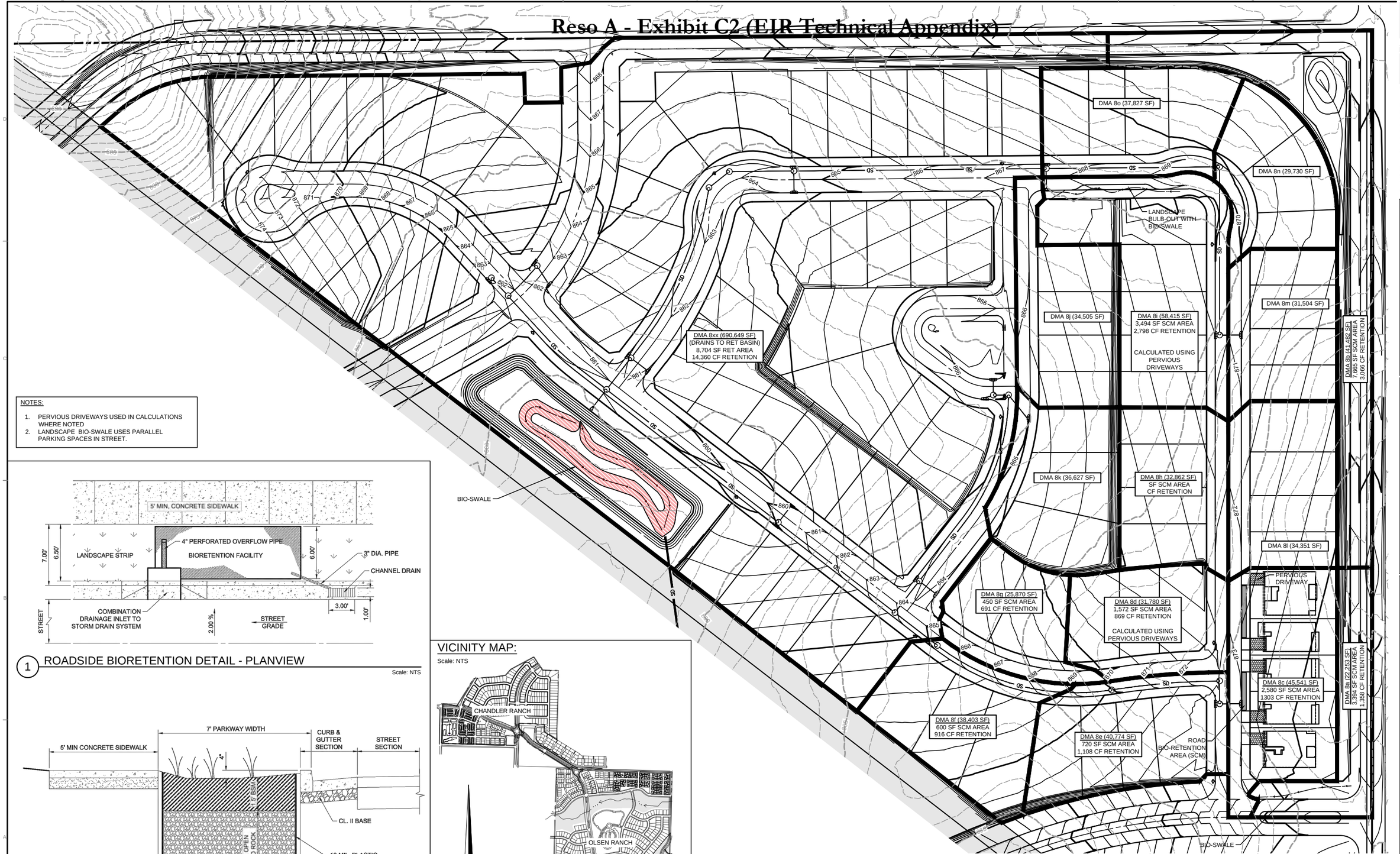
6. Self-Retaining Area Sizing Checks

Self-Retaining DMA Name	Self-Retaining DMA Area (ft2)	Tributary DMA Name(s)	Eff. Tributary DMA Area (ft2)	Effective Tributary / SRA Area Ratio

FILE NAME: 2018-12-04_DMA ANALYSIS FOR SD-LID NETWORK.DWG

ORIGINAL SCALE IS IN INCHES

Reso A - Exhibit C2 (EIR Technical Appendix)

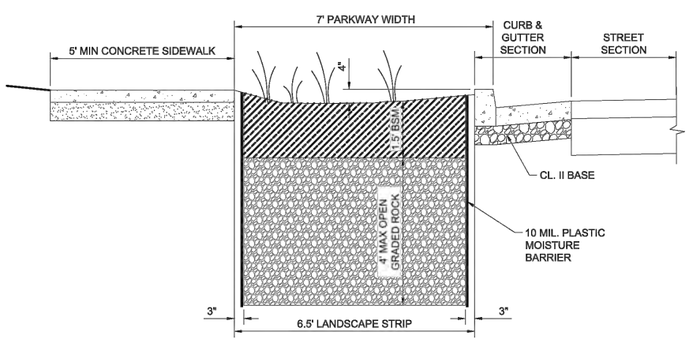


NOTES:

1. PERVIOUS DRIVEWAYS USED IN CALCULATIONS WHERE NOTED
2. LANDSCAPE BIO-SWALE USES PARALLEL PARKING SPACES IN STREET.

1 ROADSIDE BIORETENTION DETAIL - PLANVIEW

Scale: NTS

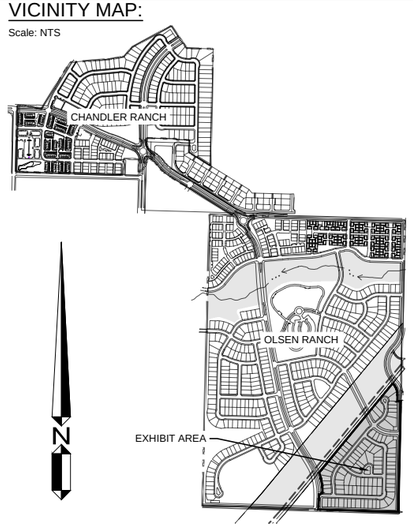


2 ROADSIDE BIORETENTION DETAIL - CROSS-SECTION

Scale: NTS

VICINITY MAP:

Scale: NTS



LOW IMPACT DEVELOPMENT TEMPLATE FOR SUB-CATCHMENT/DMA 8 LARGE LOT SINGLE-FAMILY RESIDENTIAL

GRAPHIC SCALE

0 30 60 120

(IN FEET)

1 IN = 60 FT

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TRACT xxxx, OLSEN RANCH
PRELIMINARY STORM WATER CONTROL PLAN
DRAINAGE MANAGEMENT AREA (DMA) 8

JOB #:	1465-0001
DESIGNERS:	DRT
DRAWN BY:	ZKP
DATE:	12-11-2018

DRAWING NO.

1

OF 1 SHEET

Reso A - Exhibit C2 (EIR Technical Appendix)

Central Coast Region Stormwater Control Measure Sizing Calculator

Sub-catchment 3
WALLACE GROUP Job No.: 1465.01
Date: 2/5/2019

Version: 7/2/2018

1. Project Information

Project name:	Olsen/Chandler
Project location:	N. of Meadowlark, West of Hansen Rd
Tier 2/Tier 3:	Tier 3 - Retention
Design rainfall depth (in):	1.4
Total project area (ft2):	553594.38
Total DMA area (ft2):	553594.38
Total new impervious area (ft2):	368324.184
Total replaced impervious within a USA (ft2):	
Total replaced impervious not in a USA (ft2):	
Total pervious/landscape area (ft2):	185270.196
Total SCM area (ft2):	55934

Check Total DMA and SCM areas to ensure they match total project area

2. DMA Characterization

Name	DMA Type	Area (ft2)	Surface Type	New, Replaced?	Connection
3a: Imperv	Drains to SCM	43504.784	Roof	New	3a Swale
3a: Pervious	Drains to SCM	10876.196	Landscape	New	3a Swale
3a: DWY	Drains to SCM	14488	Concrete or asphalt	New	3a Swale
3a: Swale	Drains to SCM	3064	Landscape	New	3a Swale
3b: Imperv	Drains to SCM	51690.4	Roof	New	3b Swale
3b: Pervious/ LA	Drains to SCM	21744.6	Landscape	New	3b Swale
3b: DWY	Drains to SCM	24636	Concrete or asphalt	New	3b Swale
3b: Swale	Drains to SCM	7220	Landscape	New	3b Swale
3c: Imperv	Drains to SCM	48087.2	Roof	New	3c Swale
3c: Pervious/ LA	Drains to SCM	50489.2	Landscape	New	3c Swale
3c: DWY	Drains to SCM	21612	Concrete or asphalt	New	3c Swale
3c: Swale	Drains to SCM	5718	Landscape	New	3c Swale
3d: Imperv	Drains to SCM	57238.4	Roof	New	3d Swale
3d: Pervious/ LA	Drains to SCM	24694.6	Landscape	New	3d Swale
3d: DWY	Drains to SCM	20941	Concrete or asphalt	New	3d Swale
3d: Swale	Drains to SCM	7663	Landscape	New	3d Swale
3e: Imperv	Drains to SCM	86126.4	Roof	New	3e Pervious DWY
3e: Pervious/ LA	Drains to SCM	21531.6	Landscape	New	3e Pervious DWY
3e: DWY	Drains to SCM	32269	Unit pavers set in sand	New	3e Pervious DWY

DMA Summary Area

Total assigned DMA area (ft2):	553594.38
New impervious area (ft2):	368324.184
Replaced impervious within a USA (ft2):	0
Replaced impervious not in a USA (ft2):	0
Total pervious/landscape area (ft2):	185270.196

3. SCM Characterization

						Flow Control	Reservoir
Name	SCM Type	Safety Factor	SCM Soil Type	Infilt. Rate (in/hr)	Area (ft2)	Orifice?	Depth (in)
3a Swale	Bioretention	1	HSG A/B	0.75	3064	No	
3b Swale	Bioretention	1	HSG A/B	0.75	7220	No	
3c Swale	Bioretention	1	HSG A/B	0.75	5718	No	
3d Swale	Bioretention	1	HSG A/B	0.75	7663	No	
3e Pervious DWY	Direct Infiltration	2	HSG A/B	0.75	32269		

4. Run SBUH Model

5. SCM Minimum Sizing Requirements

SCM Name	Min. Required Storage Vol. (ft3)	Depth Below Underdrain (ft)	Drain Time (hours)	Orifice Diameter (in)
3a Swale	2733	2.23	12.7	
3b Swale	2888	1.00	0.9	
3c Swale	2601	1.14	3.4	
3d Swale	3065	1.00	0.4	
3e Pervious DWY	12908	1.00	0.0	

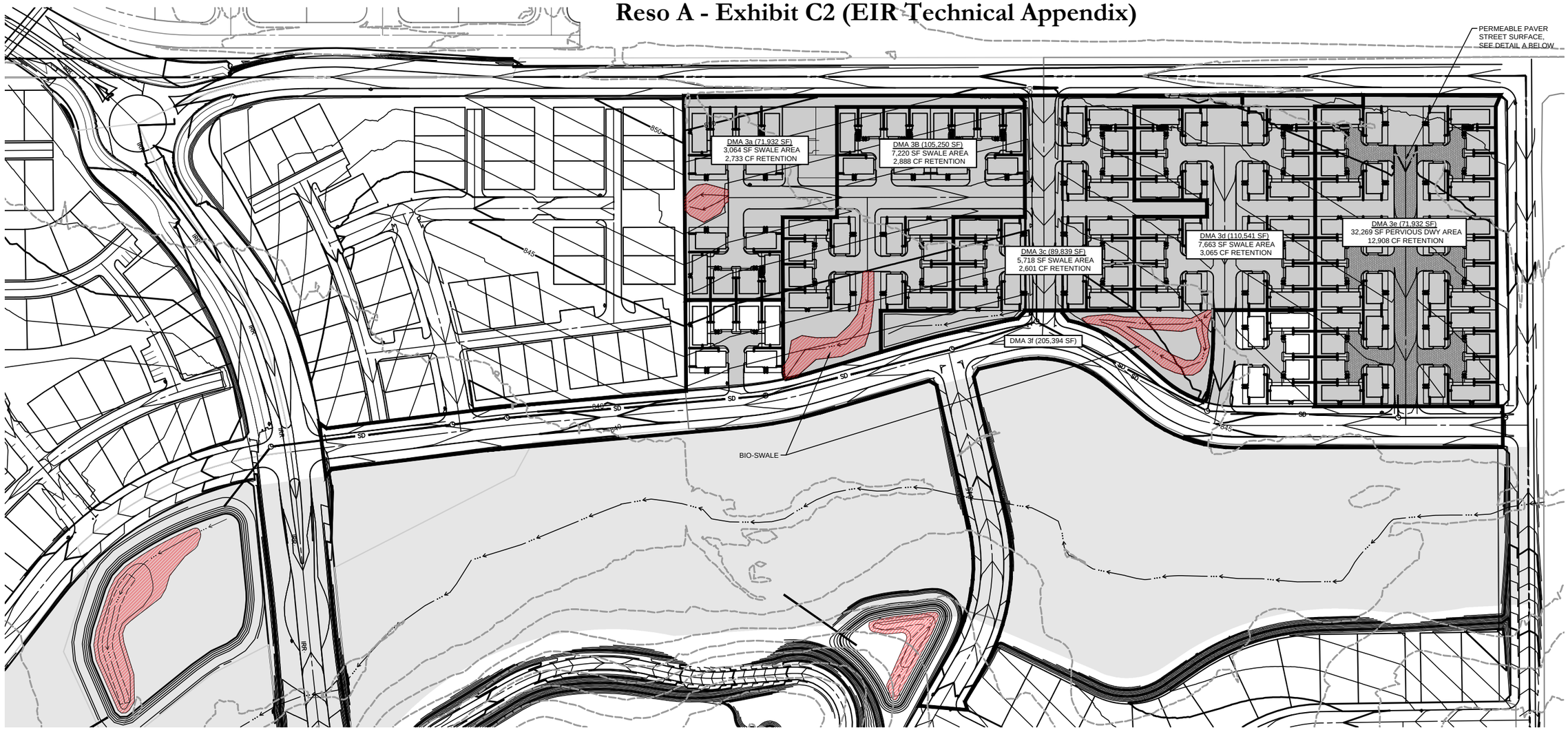
6. Self-Retaining Area Sizing Checks

Self-Retaining DMA Name	Self-Retaining DMA Area (ft2)	Tributary DMA Name(s)	Eff. Tributary DMA Area (ft2)	Effective Tributary / SRA Area Ratio

FILE NAME: 2018-12-04_DMA ANALYSIS FOR SD-LID NETWORK.DWG

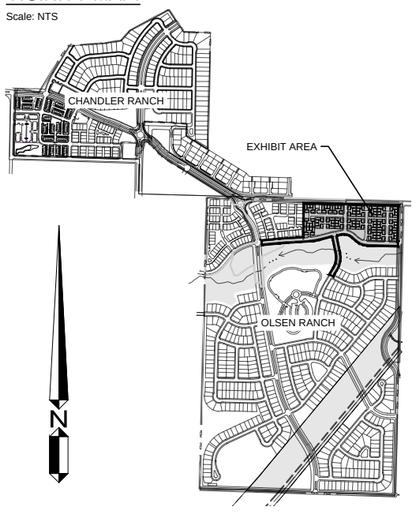
FOR REDUCED PLANS
ORIGINAL SCALE IS IN INCHES
0 1 2 3

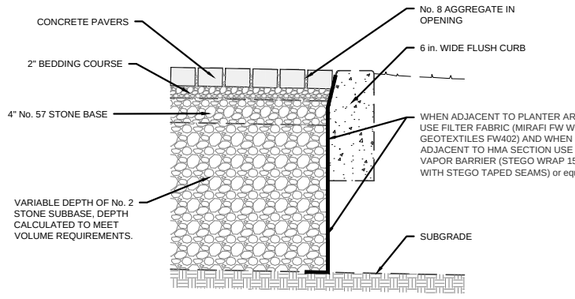
Reso A - Exhibit C2 (EIR Technical Appendix)



VICINITY MAP:

Scale: NTS





A PERMEABLE PAVER CROSS SECTION

NTS

LOW IMPACT DEVELOPMENT TEMPLATE FOR SUB-CATCHMENT/DMA 3 MOTORCOURT 6-PACK RESIDENTIAL LOTS

N

GRAPHIC SCALE
0 40 80 160
(IN FEET)
1 IN = 80 FT

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REGISTERED PROFESSIONAL ENGINEER
DEBRA R. TUMLER
No. 55205
FOR PLAN REVIEW ONLY
NOT FOR CONSTRUCTION
CIVIL
STATE OF CALIFORNIA

SIGNATURE

DATE SIGNED

These plans and specifications, and the ideas and designs incorporated herein, are instruments of service prepared for the construction of work shown hereon and shall not be used in whole or in part for any other project without written authority of Wallace Group, a California Corporation.

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TRACT xxxx, OLSEN RANCH
PRELIMINARY STORM WATER CONTROL PLAN
DRAINAGE MANAGEMENT AREA (DMA) 3

JOB #: 1465-0001
DESIGNERS: DRT
DRAWN BY: ZKP
DATE: 12-13-2018

DRAWING NO.
2
OF 2 SHEET

Reso A - Exhibit C2 (EIR Technical Appendix)

Central Coast Region Stormwater Control Measure Sizing Calculator

Sub-catchment 12
WALLACE GROUP Job No.: 1465.01
Date: 2/6/2019

Version: 7/2/2018

1. Project Information

Project name:	Olsen/Chandler
Project location:	N. of Meadowlark, West of Hansen Rd
Tier 2/Tier 3:	Tier 3 - Retention
Design rainfall depth (in):	1.4
Total project area (ft2):	489032
Total DMA area (ft2):	489032
Total new impervious area (ft2):	374810.9784
Total replaced impervious within a USA (ft2):	
Total replaced impervious not in a USA (ft2):	
Total pervious/landscape area (ft2):	114221.0216
Total SCM area (ft2):	8219

2. DMA Characterization

Name	DMA Type	Area (ft2)	Surface Type	New, Replaced?	Connection
12a: Lot Impv	Drains to SCM	14600.92	Roof	New	12a Bio Ret Area
12a: LA (Lot/Strip)	Drains to SCM	12893.58	Landscape	New	12a Bio Ret Area
12a: Street	Drains to SCM	9366.5	Concrete or asphalt	New	12a Bio Ret Area
12b: Street	Drains to SCM	6046.5	Concrete or asphalt	New	12b Bio Ret LA
12b: LA (Lot/Strip)	Drains to SCM	13157.9	Landscape	New	12b Pervious 2-DWYs
12b: Pervious DWYs	Drains to SCM	792	Unit pavers set in sand	New	12b Pervious 2-DWYs
12b: Lot Imperv	Drains to SCM	15053.6	Roof	New	12b Bio Ret LA
12xx: Lot Imperv	Drains to SCM	108345.4384	Roof	New	12xx Basin BioRet Area
12xx: Street	Drains to SCM	221398.02	Concrete or asphalt	New	12xx Basin BioRet Area
12xx: LA (Lot/Strip)	Drains to SCM	87377.5416	Landscape	New	12xx Basin BioRet Area

DMA Summary Area	
Total assigned DMA area (ft2):	489032
New impervious area (ft2):	374810.9784
Replaced impervious within a USA (ft2):	0
Replaced impervious not in a USA (ft2):	0
Total pervious/landscape area (ft2):	114221.0216

3. SCM Characterization

						Flow Control	Reservoir
Name	SCM Type	Safety Factor	SCM Soil Type	Infilt. Rate (in/hr)	Area (ft2)	Orifice?	Depth (in)
12a Bio Ret Area	Bioretention	1	HSG A/B	0.75	**1040**	Yes	6
12b Bio Ret LA	Bioretention	1	HSG A/B	0.75	**715**	Yes	6
12b Pervious 2-DWYs	Direct Infiltration	2	HSG A/B	0.75	704		
12xx Basin BioRet Area	Bioretention	1	HSG A/B	0.75	**5760**	Yes	18

4. Run SBUH Model

5. SCM Minimum Sizing Requirements

SCM Name	Min. Required Storage Vol. (ft3)	Depth Below Underdrain (ft)	Drain Time (hours)	Orifice Diameter (in)
12a Bio Ret Area	443	1.07	6.6	0.37
12b Bio Ret LA	566	1.98	12.5	0.35
12b Pervious 2-DWYs	282	1.00	0.0	
12xx Basin BioRet Area	9024	3.92	20.9	1.38

6. Self-Retaining Area Sizing Checks

Self-Retaining DMA Name	Self-Retaining DMA Area (ft2)	Tributary DMA Name(s)	Eff. Tributary DMA Area (ft2)	Effective Tributary / SRA Area Ratio

FILE NAME: 2018-12-04_DMA ANALYSIS FOR SD-LID NETWORK.DWG

FOR REDUCED PLANS
ORIGINAL SCALE IS IN INCHES
0 1 2 3

Reso A - Exhibit C2 (EIR Technical Appendix)

DMA 12a (36,861 SF)
1,040 SF LANDSCAPE AREA
443 CF RETENTION

DMA 12b (35,050 SF)
715 SF LANDSCAPE AREA
848 CF RETENTION

DMA12c (36,385 SF)
1,040 SF LANDSCAPE AREA
440 CF RETENTION

DMA 12e (8,513 SF)

DMA 12f (35,999 SF)
1,040 SF PERV DWY AREA
440 CF RETENTION

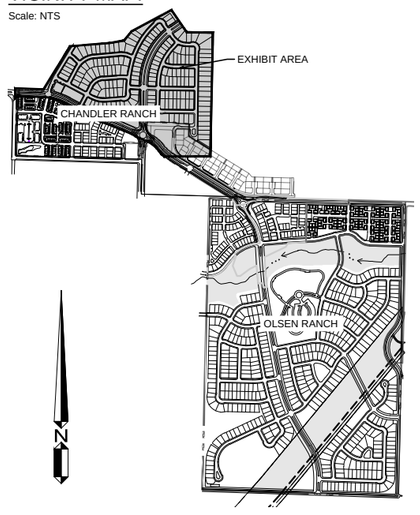
DMA 12g (30,001 SF)
1,000 SF LANDSCAPE AREA
400 CF RETENTION

DMA 12H (34,370 SF)
1,020 SF LANDSCAPE AREA
420 CF RETENTION

DMA12D (35,288 SF)
1,040 SF LANDSCAPE AREA
440 CF RETENTION

DMA 12xx (417,121 SF)
5,760 SF BIO-SWALE AREA
9,024 CF RETENTION

VICINITY MAP:
Scale: NTS



LOW IMPACT DEVELOPMENT
TEMPLATE FOR SUB-CATCHMENT/DMA 12
SINGLE FAMILY RESIDENTIAL LOTS

N

GRAPHIC SCALE
0 50 100 200
(IN FEET)
1 IN = 100 FT

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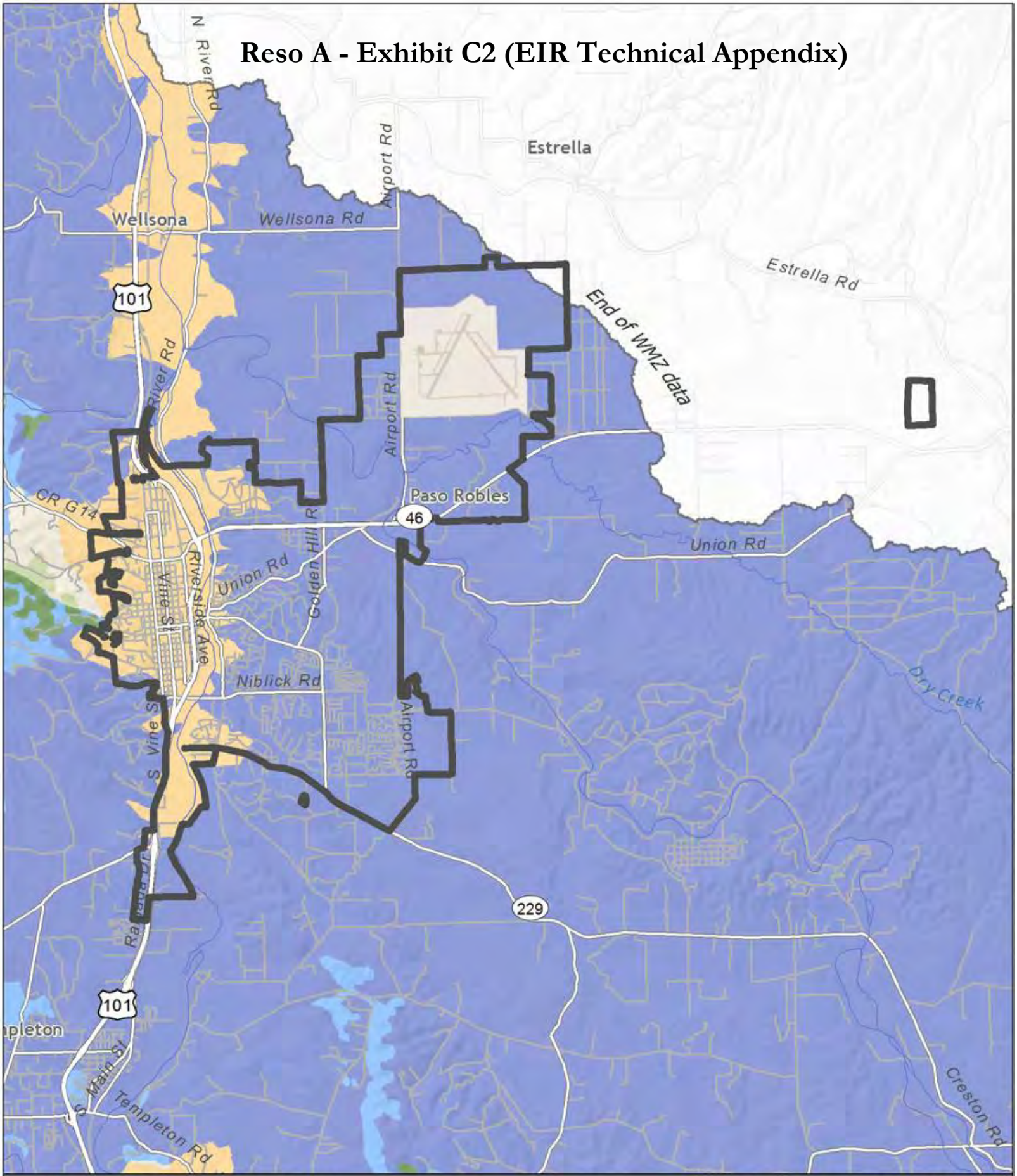
TRACT xxxx, CHANDLER RANCH
PRELIMINARY STORM WATER CONTROL PLAN
DRAINAGE MANAGEMENT AREA (DMA) 12

JOB #: 1465-0001
DESIGNERS: DRT
DRAWN BY: ZKP
DATE: 12-13-2018

DRAWING NO.
3
OF 3 SHEET

Reso A - Exhibit C2 (EIR Technical Appendix)



CENTRAL COAST JOINT EFFORT — **El Paso de Robles, California**

Watershed management zones
1 2 3 4 5 6 7 8 9 10

Urban area boundary

0 0.25 0.5 1 Miles
0 0.5 1 2 km

Data sources
Watershed management zones: Stillwater Sciences, 2012
Base data: ESRI 2010

N

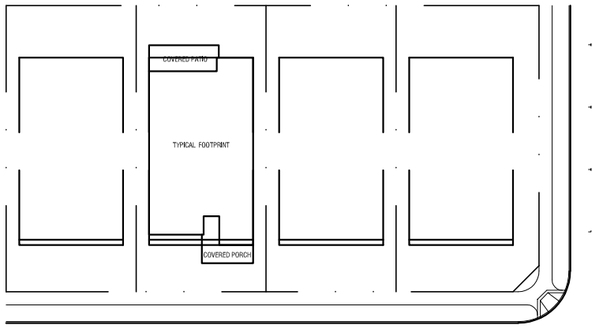
Stillwater Sciences
www.stillwatersci.com

Reso A - Exhibit C2 (EIR Technical Appendix)

LOT COVERAGE CALCULATIONS

Development Type	# Units	Lot Area, SF	FP Area SF	Patio Area SF	Dwy Area SF	Total Impervious SF	% Impervious	
SFR								
50x110	1	5500	2596	471	352	3419	62%	
SFR								
60x110	1	6600	2996	360	368	3724	56%	
SFR								
70x110	1	7700	3604	392	320	4316	56%	
		6600	3065			3820	58%	Average % Imp
						58%		
Small Lot SF								
40x80	1	3200	1418	268	48	1734	54%	
Motorcourt SF	2	2546	1421	83	506	2010	79%	
	2	2025	1109	54	506	1669	82%	
	2	2196	1207	35	506	1748	80%	
		2256	1245					
		16334	SF				80%	Average % Imp
		0.37	Ac					
		21.5	# of Courts					
		129	# of Units					
		8.06	Total Acres					
		16	DU					

Reso A - Exhibit C2 (EIR Technical Appendix)



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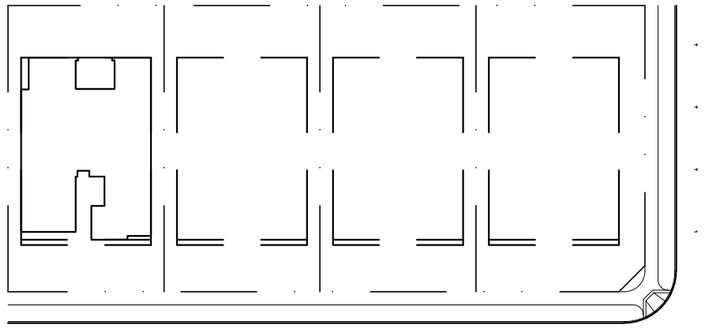

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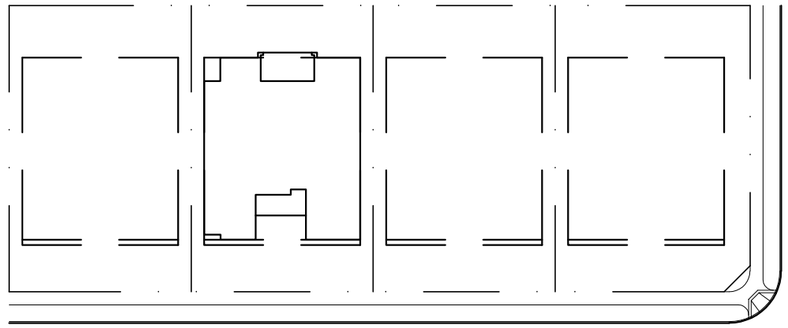

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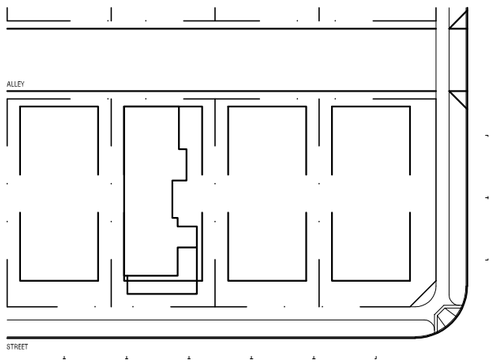

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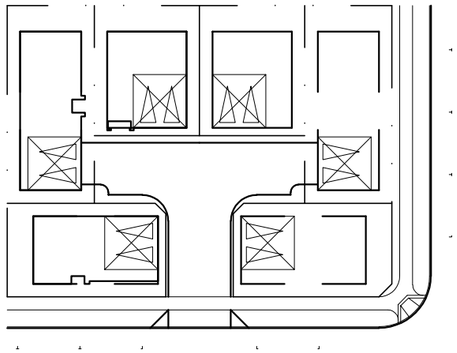
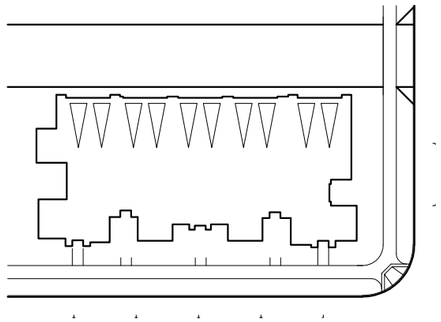


Motorcourts



Townhomes

Central California Coast
Technical Assistance Memo (TAM)

LID Plant Guidance for Bioretention

Low Impact Development

This Technical Assistance Memo (TAM) provides plant selection guidance for the most common bioretention features, such as bioretention swales, stormwater planters and rain gardens. Bioretention systems are low impact development (LID) features that use landscaped areas to slow, treat, retain and infiltrate stormwater runoff, mimicking the natural, pre-development hydrology of a site.

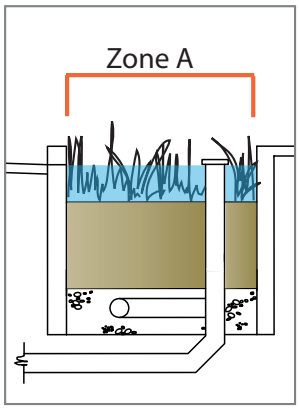
The intent of this TAM is to offer designers, municipalities, developers and homeowners with guidelines for selecting plants for bioretention areas, including a list of appropriate species for the Central Coast. Bioretention systems look like regular landscaped areas, but are designed (engineered) to manage stormwater runoff created by urbanization. Specifying the appropriate plants and soil mix for a bioretention system is critical to its function.

This step-by-step guidance is specific to LID landscapes and will take you from plant selection and layout to installation and on-going maintenance. This guidance is intended to accompany standard landscape methods and point out areas where LID methods may differ.

Step 1: LID Type and Plant Selection

Surface grade and **ponding area** of a bioretention structure are the first factors to consider when choosing which plants to specify. Is the soil surface of the structure sloped or uniform? Stormwater planters and some rain gardens have uniform surface grades. In these designs, ponding will be equal across the structure and all plants will have the same conditions (Zone A). In bioretention swales and some rain gardens, soil surface is sloped, resulting in differing planting conditions across the structure (Zones A and B). Plants located at the bottom where ponding occurs, will have different requirements than those placed on the sideslopes, which receive runoff, but not ponding. A third planting area may occur outside of Zones A and B, on the upper edges of rain gardens and bioswales. This area is not a functional component of the bioretention area, and therefore can be treated as a traditional landscape area.

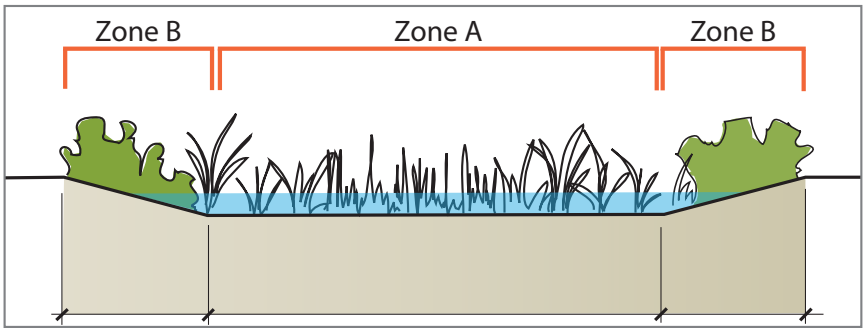
Source: AHBE Landscape Architects



Uniform surface grade: This stormwater planter has a flat bottom with consistent depth of ponding across the structure. All of the plants selected for this design must be tolerant of periodic inundation (**Zone A**).

Varying slope and ponding levels: Varying slope and ponding levels: This bioretention planting area has sloped edges. Plants in the bottom area will be inundated during storms (**Zone A**). Those planted on the sideslopes are above the level of ponding, but will experience seasonally wet conditions (**Zone B**).

Source: Rana Creek



Step 2: Plant Species Selection

Reso A - Exhibit C2 (EIR Technical Appendix)

Once the plant zones are identified (Zone A only or both Zone A and Zone B) for a structure, the plants may be selected. This TAM includes a plant list for bioretention areas (Table 1). There exist other LID plant lists for California and the Central Coast, but this "short list" was refined based on the following criteria: 1) Tolerant of varied moisture conditions (wet and dry), 2) tolerant of varied soil types and growing conditions, 3) available in Central Coast plant nurseries, 4) low maintenance requirements, 5) are not invasive weeds, 6) do not have aggressive/invasive root systems, and 6) exhibit an attractive appearance. When selecting plants from a list, additional site-specific information, such as tolerance to high and low temperatures, coastal conditions and prevailing winds should be considered. In addition, project specific aspects of the design, for example right-of-way vegetation height limits, approved street and parking lot tree lists and fire hazard landscape requirements may further influence selection. Although this plant list includes some non natives, using native plants is highly recommended because of the wide range of benefits they offer (food and forage for native wildlife, adaptation to local climate, low/no water use once established). Knowledge of invasive species is constantly evolving. To avoid specifying noxious plants on a project, check the California inventory at www.cal-ipc.org. Local agencies may also track potential invasives for your area.

Leymus condensatus 'Canyon Prince': This selection grows to 3' and is tolerant of a wide range of conditions, including drought, seasonal wet conditions, poor soils and some shade.

Achillea millefolium: A native perennial that attracts polinators and is tolerant of poor soils, seasonal flooding and deer. Available in many flower colors.

Source : Native Sons Nursery

Muhlenbergia rigens: A native grass with dense bright, grey-green, evergreen foliage. It tolerates a range of soils, sun to part-shade, seasonal flooding and drought.

Source unless noted: Las Pilitas Nursery

Juncus patens: An easy to grow native rush. It tolerates poor drainage, flooding, drought and shade. A strong performer in bioretention areas, more drought tolerant than J. effusus.

Step 3: Soil Specification for Biofiltration

Specifying the correct soils for bioretention areas is critical in order to achieve stormwater objectives and plant health. Soils must balance three primary design objectives: 1) High enough infiltration rates to meet surface water draw down requirements, 2) infiltration rates that are not so high that they preclude pollutant removal function of soils and 3) soil composition that supports plant establishment and long-term health.

Landscape design documents for LID projects must include a bioretention soil specification that specifies the exact materials to be used in the mix (aggregates and compost), the percent of each material included in the mix, how they are to be placed (i.e. in 8" to 12" lifts) and the soil mix depth. Sample bioretention soil specifications and detailed information on BMP design and construction may be found in the LID documents listed under Additional Resources in this TAM.

Organic Compost: A main ingredient of biofiltration soil mixes, compost is the product of natural decomposition of organic wastes by bacteria, fungi, worms and other beneficial organisms. Compost increases the soil's water holding capacity and improves soil structure, nutrient levels and biology, all of which support plant health.

► GENERAL BIORETENTION SOIL SPECIFICATION

Bioretention soils should meet the following criteria.

1. General Requirements

Bioretention soil shall achieve a long-term, in-place infiltration rate of at least 5 inches per hour. Bioretention soil shall also support vigorous plant growth.

Bioretention Soil shall be a well-blended mixture of mineral aggregate and compost, measured on a volume basis. Bioretention soil shall consist of two parts compost (approximately 35 to 40 percent) by volume and three parts Mineral Aggregate (approximately 60 to 65 percent), by volume. The mixture shall be well blended to produce a homogeneous mix.

Bioretention Soil Mix: Construction documents for any LID project should include specifications for the bioretention soil mix that define the ratio of materials in the mix, and the content, gradation, quality analysis and other requirements for each of the materials. Specifications will also provide guidelines for blending and placement of the soil mix.

Table 1. Plants for Bioretention Areas[1]

Zone A: Periodic inundation, area ponds following storm events (24 - 72 hours).

Zone B: Above area of ponding, side slope areas receive runoff, but are never inundated.

Common Name	Scientific Name	Zone(s)	Height/ Width	Light	Notes:	Climate Zones[2]
Trees						
Western Redbud	*Cercis occidentalis*	B	20'/20'	sun	small tree or large shrub, tolerates clay, winter wet, drought, flowers stronger with frost	all but coastal
Desert Willow	*Chilopsis linearis*	B	25'/30'	sun	tolerates alkaline soil, sand, clay, seasonal flooding and drought, not coastal condition	all, but 1A-3A
Western Sycamore	*Platanus racemosa*	B	40'-80'/40'-70'	sun	tolerates sand and clay soils, seasonal flooding, needs space to grow, avoid underground water/sewer pipes	all, but 1A-3A
Coast Live Oak	*Quercus agrifolia*	B	25'-60'/40'-70'	sun - shade	tolerates drought and winter wet conditions, mature trees produce significant litter limiting understory plantings, need space to grow	all, but 1A-3A
Large Shrubs						
Toyon, Christmas Berry	*Heteromeles arbutifolia*	B	8'-20'/8'-20'	sun-pt shade	tolerates sand, clay and serpentine soils, seasonal water with good drainage	all, but 1A-3A
Pacific Wax Myrtle	*Myrica californica*	B	10'-30'/10'-30'	sun-pt shade	large shrub or small tree, tolerates coastal conditions, sand, clay and seasonal inundation	all, but 1A-3A
Western Elderberry	*Sambucus mexicana*	B	10'-30'/8'-20'	sun-pt shade	large shrub to tree, tolerates clay, seasonal flooding and drought, good wildlife food source	all, but 1A-3A
Shrubs and Subshrubs						
Coyote Brush	*Baccharis pilularis*	B	wide variation	sun	adaptable evergreen shrub, provides quick cover and bank stabilization, tolerant of coastal conditions, alkaline soil, sand, clay and seasonal wet	all, but 1A-3A
California Wild Rose	*Rosa californica*	A,B	3'-6'/spreads	sun-pt shade	tolerates a wide variety of soils, seasonal flooding and some drought, spreads aggresively, avoid edges of walkways because of thorns	all
Perennials						
Yarrow	*Achillea millefolium*	B	1'-3'/2'	sun-pt shade	tolerates alkaline soil, sand, clay, seasonal wet conditions, foot traffic and deer, will self sow	all
Beach Strawberry	*Fragaria chiloensis*	B	2-4"/spreads	sun-pt shade	vigorous spreading groundcover, tolerates sand, clay, wet conditions, prefers good drainage	all, but 1A-3A
Douglas Iris	*Iris douglasiana*	B	1.5'-3'/spreads	sun - shade	tolerates sand, clay and serpentine soils, seasonal wet (but not soggy) soils and drought	all, but 1A-3A
Hummingbird Sage	*Salvia spathacea*	B	1'-3'/4'-5'	pt sun-pt shade	low growing perennial, tolerates clay, winter wet, summer drought, prefers light shade, provides nectar for birds and insects, does well under oaks	all, but 1A-3A
Bog Sage	*Salvia uliginosa**	B	3'-6'/spreads	sun	quick growing, spreading perennial, tolerates wet to dry, cut back winter, divide rhizomes	all, but 1A-3A
Blue-eyed Grass	*Sisyrinchium bellum*	B	6"-1'/6"-1'	sun	a semi-evergreen perennial, tolerates sand, clay, seasonal wet soils and deer, dormant in summer, but can be delayed with supplemental irrigation	all, but 1A-3A
California Goldenrod	*Solidago californica*	B	1'-4'/1'-4'	sun-pt shade	tolerates poor soils, seasonal wet and drought, can spread aggressively if over irrigated	all, but 24
Grasses and Grass-like Plants						
Berkeley Sedge, Grey Sedge	*Carex divulsa**	A,B	12"-18"/12"-18"	sun-pt shade	tolerates foot traffic, some drought and boggy soils	all, but 1A-3A
California Meadow Sedge	*Carex pansa*	A,B	6"-12"/spreads	sun - shade	good lawn substitute, tolerates wide range of growing conditions, seasonal inundation, drought, foot traffic and mowing	all, but 1A-3A
Clustered Field Sedge	*Carex praegracilis*	A	1'/spreads	sun-pt shade	useful lawn substitute and bank stabilizer, good planted in masses, tolerates wide range of growing conditions, foot traffic and mowing, may look weedy when mixed with other plants	all, but 1A-3A
San Diego Sedge	*Carex spissa*	A	3'-6'/2'-5'	pt sun-shade	a large grass, tolerates alkaline soil, clay, serpentine, seasonal inundation, and deer	all, but 1A-3A
Small Cape Rush	*Chondropetalum tectorum**	A,B	2'-3'/3'-4'	sun-pt shade	A tough, attractive reed-like plant, tolerates boggy or clay soils and drought once established, Chondropetalum elephantinum is a much larger species	all, but 1A, 2A, 3A, 7
Molate Red Fescue	*Festuca rubra 'Molate'*	A,B	8"-12" /spreads	pt sun-shade	a tufted, spreading bunchgrass, good lawn substitute, provides erosion control, tolerates wet conditions, but looks best with regular water, tolerates drought once established	all
Soft Rush	*Juncus effusus*	A	2'-3'/2'-3'	sun-pt shade	tolerates poor drainage, heavy soils, needs more supplemental water than Juncus patens	all
Wire Grass, Blue Rush	*Juncus patens*	A	1'-2'/1'-2'	sun - shade	strong performance in bioretention ares, tolerates poor drainage, seasonal inundation, drought, shade	all, but 1A-3A
Canyon Prince Wild Rye	*Leymus condensatus 'Canyon Prince'*	B	2'-3'/spreads	sun-pt shade	tolerates drought, wet, but not soggy soils, looks best with supplemental irrigation, spreads by rhizomes	all, but 1A-3A
Deer Grass	*Muhlenbergia rigens*	B	4'-5'/4'-6'	sun-pt shade	a large grass, tolerates sandy and clay soils, seasonal inundation, best when cut back annually to remove old thatch	all, but 1A-3A

[1] See: **www.centralcoastlidi.org** for a photo gallery of the plants in this list.

[2] Refers to Sunset Western Garden Book Climate Zones. The Central Coast includes Zones 1A, 2A, 3A, 7, 9, and 14-24. www.sunset.com/garden/climate-zones

* Indicates non native species. Non natives are only recommended for use in urbanized settings and should not be used on sites in proximity to natura areas.

Step 4: Plant Establishment and Care

Like traditional landscapes, LID planting areas require care and ongoing maintenance for optimal health. Due to the functional nature of LID landscapes and their connectivity to natural receiving water bodies, there are some differences between conventional landscape maintenance and LID maintenance.

Irrigation is an important aspect of any landscape establishment. Typically new plantings need two to three years of irrigation to become established. After that period, native plants will need little to no supplemental irrigation to survive. Plants may enter a dry season dormancy, which affects their appearance. Where this "dry look" is not desired, summer irrigation may be utilized. Systems should include a weather-based controller to avoid watering

during wet weather. Because bioretention soils are formulated to infiltrate, irrigation application rates must be properly designed to avoid overwatering and prevent potential discharges via underdrains.

Compost Mulch (1" - 2") should be applied to bioretention areas to retain moisture, prevent erosion and suppress weed growth. Reapply annually as the mulch breaks down. Use a specified compost mulch and avoid bark mulches that can float during storm events.

Fertilizer should not be used in bioretention areas. Instead, a compost top dressing or application of compost tea can be used to introduce nutrients and beneficial microorganisms to the soil. Apply compost mulch once per year in spring or fall or spray apply compost tea once per year between March and June.

Synthetic herbicides and pesticides should not be used in bioretention areas because of their potential toxicity risk to aquatic organisms. There are a variety of natural methods and products that can be used to control weeds and pests. See the technical manuals included under Additional Resources.

Plant Establishment and Care (cont'd)

Source: SVR Design Company

Provide extra support to trees planted in bioretention areas, especially in high wind areas. They should be securely staked during establishment and inspected once or twice a year and following storm events. Stakes should be removed as soon as they are no longer needed to stabilize the tree (between one and two years).

Weeds compete with plants for nutrients, water and sunlight. They should be regularly removed, with their roots, by hand pulling or with manual pincer-type weeding tools. Care should be given to avoid unnecessary compaction of soils while weeding.

Replace plants that die due to unsuitable plant conditions, disease, underwatering or other unforeseen issues. Dead and dying plants must be removed and replaced to avoid spreading disease, establishment of weeds in bare areas and reduced LID function. Before replacing with the same species, determine if another species may be better suited to the conditions.

Tree Placement Guidance

Including trees in bioretention areas provides additional aesthetic and performance benefits. Following these guidelines will maximize their success and survival:

- Provide sufficient landscape width (a rule of thumb is 8' min.)
- Locate trees on the side slopes (Zone B), not in areas that pond (Zone A). Trees improperly located, in narrow planters that pond, are unlikely to thrive and may eventually fail.
- Select trees that will tolerate seasonally wet soils.
- Do not specify trees with invasive roots.

Guidelines for Municipalities

Project managers who are preparing RFPs or bid packages for public projects that include bioretention systems should clearly define expectations for the following:

- Bioretention soil mix specification
- Guidance for plant species selection
- Appropriate plant zone placement
- Operations and maintenance protocols

To assist in defining vegetative requirements for LID projects, Central Coast municipalities may use this TAM as a reference or attachment to their project description.

Plant Nurseries

This is a partial list of Central Coast nurseries who regularly stock the plants included in this TAM.

Source: Las Pilitas Nursery

- Central Coast Wilds, Santa Cruz
  831-459-0656
  www.centralcoastwilds.com
- Last Pilitas, Santa Margarita
  805-438-5992
  www.laspilitas.com
- Native Sons, Arroyo Grande
  805-481-5996
  www.nativesonsnursery.com
- Rana Creek, Carmel Valley
  831-659-3820
  www.ranacreeknursery.com
- San Marcos Growers, Santa Barbara
  805-683-1561
  www.sanmarcosgrowers.com
- Santa Barbara Natives, Santa Barbara
  805-698-4994
  www.sbnatives.com

Additional Resources

- The Low Impact Development Manual for Southern California: Technical Guidance and Site Planning Strategies
  http://www.casqa.org/LID/tabid/186/Default.aspx
- The California Stormwater Quality Association (CASQA) BMP Handbook for New Development and Redevelopment
  http://www.cabmphandbooks.com/
- Contra Costa Clean Water Program (C3 Guidebook)
  http://www.cccleanwater.org/c3.html
- City of Santa Barbara: Storm Water BMP Guidance Manual
  http://www.santabarbaraca.gov/Resident/Major_Planning_Efforts/Storm_Water_Management_Program/

For additional resources on bioretention plant guidance:

www.centralcoastlidi.org

For questions or to contact the
Central Coast Low Impact Development Initiative:

info@centralcoastlidi.org

Central Coast Water Board

UC Davis LID Initiative

LEGAL DISCLAIMER: This Technical Assistance Memo (TAM) is intended as guidance only and should not be used as a substitute for site specific design and engineering. Applicants are responsible for compliance with all code and rule requirements, whether or not described in this TAM.

Appendix F.4

Infiltration Testing Report

Earth Strata Geotechnical Services, Inc.
Geotechnical, Environmental and Materials Testing Consultants

November 28, 2018

Project No. 182139-12A

OLSEN 212 LLC

c/o Mike Naggar & Associates
445 South D Street
Perris, CA 92570

Subject: **Infiltration Testing for Water Quality Treatment Areas, Proposed Olsen-Chandler Ranch Residential Development, Assessor's Parcel Numbers 009-795-001, 009-795-002, 009-795-003, 009-795-004, 009-795-005, 009-795-006, Located on the West Side of Hanson Road, South of Linne Road and North of Meadowlark Road, Assessor's Parcel Numbers 025-381-005, 025-381-001, 009-798-001, 009-798-002, 009-798-003, 009-796-002, 009-796-003, East of Fontana Road and North of Linne Road, City of El Paso Robles, San Luis Obispo County, California**

Earth Strata Geotechnical Services is pleased to present this infiltration feasibility report for the proposed Olsen-Chandler Ranch Residential Development, Assessor's Parcel Numbers 009-795-001 thru 009-795-006, located on the west side of Hanson Road, south of Linne Road, and north of Meadowlark Road, Assessor's Parcel Numbers 025-381-005, 025-381-001, 009-798-001 thru 009-798-003, 009-0796-002, and 009-796-003, located east of Fontana Road and north of Linne Road in the City of El Paso Robles, San Luis Obispo County, California. The purpose of our study was to determine the infiltration rates and physical characteristics of the subsurface earth materials at the approximate depth of the proposed WQMP area within the proposed development. This feasibility report provides the infiltration rates to be used for the design and the development of the water quality management plan, where applicable.

PROPERTY DESCRIPTION

The subject property is located on the west side of Hanson Road, north and south of Linne Road, north of Meadowlark Road, and east of Fontana Road in the City of El Paso Robles, San Luis Obispo County, California. The approximate location of the site is shown on the Vicinity Map, Figure 1.

The subject property is comprised of approximately 350 acres of undeveloped land, as well as developed land with existing single-family residences. Topographic relief at the subject property is relatively moderate with the terrain being generally flat and hilly. Elevations at the site range from approximately 820 to 970 feet above mean sea level (msl), for a difference of about 150± feet across the entire site. Drainage within the subject property generally flows to the southwest in the area of the existing Chandler Ranch and Centex property, and to the north and northeast in the area of the existing Olsen Ranch.

The site is currently bordered by residential development and vacant property. Most of the vegetation on the site consists of moderate to dense amounts of annual weeds/grasses, along with small to large oak trees scattered across the entire subject site. A ravine intersects the northern portion of the proposed Olsen Ranch development.

PROPOSED CONSTRUCTION

The proposed residential development is expected to consist of concrete, wood or steel framed one- and/or two-story structures utilizing slab on grade construction with associated streets, landscape areas, and utilities. The current development plans include 1,179 residential lots with positioned throughout the site.

SUBSURFACE EXPLORATION AND INFILTRATION TESTING

SUBSURFACE EXPLORATION

Subsurface exploration within the subject site was performed on October 11, October 12, and October 13, 2018 for the exploratory excavations. A truck mounted hollow-stem-auger drill rig was utilized to drill forty-seven (47) borings throughout the site to a maximum depth of 16.5 feet. A backhoe was utilized to excavate nine (9) test pits to a maximum depth of 13 feet. The exploratory holes were excavated for geotechnical evaluation purposes with respect to the proposed developments and to interpret whether groundwater or impermeable soil layers were present. An underground utilities clearance was obtained from Underground Service Alert of Southern California, prior to the subsurface exploration. The approximate locations of the exploratory excavations are shown on the attached Infiltration Location Map, Plate 1 and descriptive logs are presented in Appendix A.

Earth materials encountered during exploration were classified and logged in general accordance with the Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) of ASTM D 2488. Upon completion of laboratory testing, exploratory logs and sample descriptions may have been reconciled to reflect laboratory test results with regard to ASTM D 2487.

EARTH MATERIALS

A general description of the earth materials observed on site is provided below.

- Topsoil (no map symbol): Residual topsoil, encountered in the upper 1 to 3 feet, blankets the site and underlying alluvium and bedrock. These materials were noted to be generally grayish white, brownish gray to grayish brown to medium brown, brown to dark brown silty sand, sandy clay, and clayey sand which were very porous, dry to slightly moist and in a loose to medium dense state.

- Quaternary Alluvium (map symbol Qal): Quaternary alluvium was encountered below the topsoil and above the bedrock in the topographically lower areas of the subject site to a maximum depth of 14 feet below existing surface. These alluvial deposits consist predominately of interlayered pale yellow, brown, gray brown, orangeish brown, olive brown, yellowish brown, and brownish olive, fine to coarse grained silty sand, sandy silt, sandy clay, and occasional poorly-graded sand with varying amounts of clay and silt. These deposits were generally noted to be in a slightly moist to moist, loose to dense state.

- Quaternary Paso Robles Formation (map symbol QTp): Paso Robles Formation bedrock was generally encountered below the topsoil and alluvial materials to the full depth of our exploration. These materials primarily consisted of olive gray, yellow brown, olive brown, to orangeish brown and pale yellow to pale brown, fine to coarse grained sandstone with varying amounts of silt and clay, sandy siltstone, claystone, and breccia. These materials were generally noted to be slightly moist to moist, and moderately hard to very hard.

GROUNDWATER

Groundwater was not observed within the exploratory borings excavated to a depth of 16.5 feet.

INFILTRATION TESTING

The double ring infiltrometer test method was utilized to perform a total of twenty (20) infiltration tests on October 11 through October 13, 2018 and November 19 through November 21, 2018 to evaluate near surface infiltration rates in order to estimate the amount of storm water runoff that can infiltrate into the onsite water quality treatment plan areas. The infiltration tests were performed in general accordance with the requirements of double ring infiltration testing, ASTM D3385 and Appendix A of the Riverside County Flood Control and Water Conservation District.

The infiltration tests were performed using double ring infiltrometer and Mariotte tubes at a depth of 5 feet below existing grades. The locations of the infiltration tests are indicated on the attached infiltration Location Map, Plate 1. The double ring infiltrometer tests were located by property boundary measurement on the site plan and by using geographic features. Infiltration test data recorded in the field are summarized in the following table and is included within Appendix B including the graph of Infiltration Rate versus Elapsed Time.

INFILTRATION TEST SUMMARY

TEST NUMBER	INFILTRATION HOLE DEPTH (ft.)	INFILTRATION RATE (in/hr)	DESCRIPTION
DR-1	5	0.00	Sandy CLAY
DR-2	5	0.27	Silty SAND
DR-3	5	0.54	Silty SAND
DR-4	5	0.00	Sandy CLAY
DR-5	5	1.08	Silty SAND
DR-6	5	0.27	Silty SAND
DR-7	5	0.11	Silty SAND
DR-8	5	0.43	Silty SAND
DR-9	5	0.27	Silty SAND
DR-10	5	1.08	Silty SAND
DR-11	5	0.00	Sandy CLAY
DR-12	5	0.11	Sandy SILT
DR-13	5	0.27	Silty SAND
DR-14	5	0.11	Silty SAND
DR-15	5	0.00	Sandy CLAY
DR-16	5	0.27	Silty SAND

DR-17	5	0.00	Sandy CLAY
DR-18	5	0.81	Silty SAND
DR-19	5	0.54	Silty SAND
DR-20	5	0.27	Silty SAND

The infiltration test rates ranged from 0.00 to 1.08 inches per hour (in/hr).

FINDINGS

NRCS WEB SOIL SURVEY

The soil survey provided by The U.S. Department of Agriculture – Soil Conservation Service, indicates the majority of the site consists of Arbuckle-Positas complex (Map Unit 102), Arbuckle-San Ysidro complex (Map Unit 106), and San Ysidro loam (Map Unit 197).

The Arbuckle-Positas complex (102) is described to have slopes with 9 to 15 percent grade and is mapped in the northern portion of the Chandler Ranch development and the middle and southwestern portion of the Olsen Ranch development. The Arbuckle-San Ysidro complex (106) is described to have slopes with 2 to 9 percent grade and is mapped within the southern portion of the Olsen Ranch development. San Ysidro loam (197) consists of 0 to 2 percent grade and is mapped within the southern portion of the Chandler Ranch development and northern portion of the Olsen Ranch development.

The Arbuckle-Positas complex (102) and Arbuckle-San Ysidro (106) complex falls within the Hydrologic Soil Group C & D. Hydrologic Soil Group C is described to consist of 20 to 40 percent clay while Hydrologic Soil Group D is described to contain more than 40 percent clay. The earth materials encountered during our subsurface exploration confirms the general soil profile descriptions of the NRCS soil surveys. The descriptions for each soil unit is included in Appendix C.

PHASE I

A Phase I Environmental Site Assessment was performed for the subject site and no contamination sites are known to be within the subject site.

Groundwater

Groundwater was not observed during our subsurface exploration to a maximum depth of 16.5 feet, which meets the minimum separation of greater than 10 feet from the bottom of the infiltration facility to the groundwater mark. However, due to limited local well groundwater data and limited borings, it should be noted that localized groundwater could be encountered during grading due to the limited number of exploratory locations or other factors.

Landslides

Landslide debris was not observed during our subsurface exploration and no ancient landslides are known to exist on the site. No landslides are known to exist, or have been mapped, in the vicinity of the site. Geologic mapping of the site conducted during our investigation reveal no geomorphic expressions indicative of landsliding.

Geologic/ Geotechnical Screening

The proposed structures will be supported by compacted fill and competent earth materials, with groundwater at a depth of over 20 feet below ground surface. According to USGS geologic hazards map, the subject site is located in an area where liquefaction potential is considered low. As such, the potential for earthquake induced liquefaction and lateral spreading beneath the proposed structures is considered low due to the recommended compacted fill, relatively low groundwater level, and the dense nature of the deeper onsite earth materials.

Preliminary laboratory test results indicate onsite earth materials exhibit expansion potentials of **LOW, MEDIUM, and HIGH** as classified in accordance with 2016 CBC Section 1803.5.3 and ASTM D4829.

The proposed WQMP areas (see Plate 1) are located at a lower elevation than the proposed structures in competent native earth materials.

Therefore, infiltration within the proposed WQMP areas will not encroach on any proposed structures and will not increase the risk of geologic hazards.

CONCLUSIONS AND RECOMMENDATIONS

General

Based on the data presented in this report and the recommendations set forth herein, it is the opinion of Earth Strata Geotechnical Services that the observed infiltration rates for the proposed WQMP are between 0.00 inches per hour to 1.08 inches per hour.

From geotechnical and engineering geologic points of view, the proposed WQMP areas, where tested, with observed infiltrations rates greater than 0.10 inches per hour is considered suitable for partial infiltration for the proposed development.

The proposed WQMP areas, where tested, with observed infiltration rates of 0.00 inches per hour is considered not suitable for infiltration for the proposed development. Please see the attached Infiltration Map and the Infiltration Test Summary within the report for correlation between the test numbers, locations, and infiltration rates.

GRADING PLAN REVIEW AND CONSTRUCTION SERVICES

This report has been prepared for the exclusive use of **Olsen 212, LLC** and their authorized representative. It likely does not contain sufficient information for other parties or other uses. Earth Strata Geotechnical Services should be engaged to review the final design plans and specifications prior to construction. This is to verify that the recommendations contained in this report have been properly incorporated into the project plans and specifications. Should Earth Strata Geotechnical Services not be accorded the opportunity to review the project plans and specifications, we are not responsibility for misinterpretation of our recommendations.

Earth Strata Geotechnical Services should be retained to provide observations during construction to validate this report. In order to allow for design changes in the event that the subsurface conditions differ from those anticipated prior to construction.

Earth Strata Geotechnical Services should review any changes in the project and modify and approve in writing the conclusions and recommendations of this report. This report and the drawings contained within are intended for design input purposes only and are not intended to act as construction drawings or specifications. In the event that conditions encountered during grading or construction operations appear to be different than those indicated in this report, this office should be notified immediately, as revisions may be required.

REPORT LIMITATIONS

Our services were performed using the degree of care and skill ordinarily exercised, under similar circumstances, by reputable soils engineers and geologists, practicing at the time and location this report was prepared. No other warranty, expressed or implied, is made as to the conclusions and professional advice included in this report.

Earth materials vary in type, strength, and other geotechnical properties between points of observation and exploration. Groundwater and moisture conditions can also vary due to natural processes or the works of man on this or adjacent properties. As a result, we do not and cannot have complete knowledge of the subsurface conditions beneath the subject property. No practical study can completely eliminate uncertainty with regard to the anticipated geotechnical conditions in connection with a subject property.

The conclusions and recommendations within this report are based upon the findings at the points of observation and are subject to confirmation by Earth Strata during construction. This report is considered valid for a period of one year from the time the report was issued.

This report was prepared with the understanding that it is the responsibility of the owner or their representative, to ensure that the conclusions and recommendations contained herein are brought to the attention of the other project consultants and are incorporated into the plans and specifications. The owners' contractor should properly implement the conclusions and recommendations during grading and construction, and notify the owner if they consider any of the recommendations presented herein to be unsafe or unsuitable.

Respectfully submitted,

EARTH STRATA GEOTECHNICAL SERVICES

Stephen M. Poole, PE 40219
President
Principal Engineer

SMP/jf

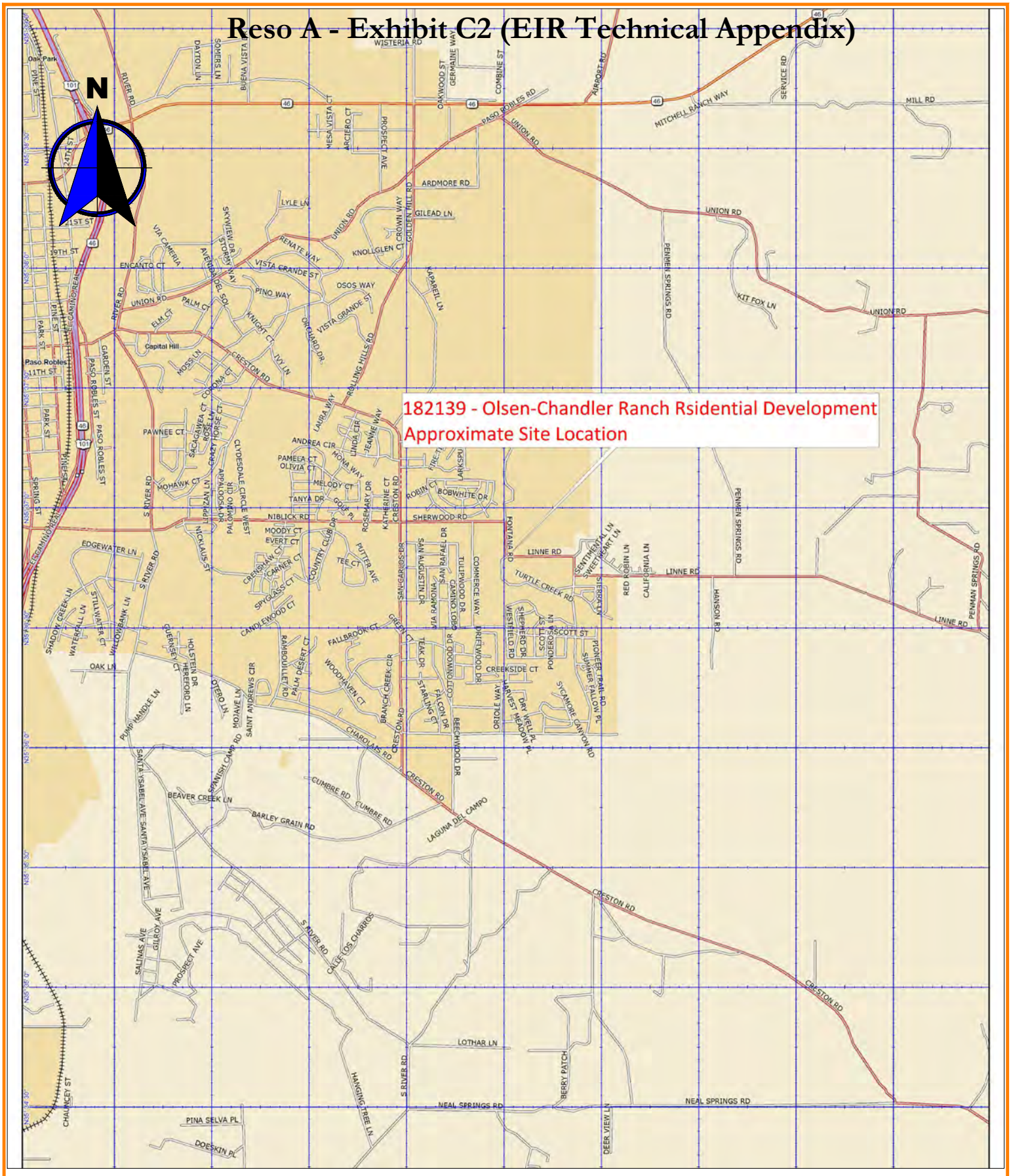
Distribution: (5) Addressee:

Mr. Danny Brose
Mr. Nicholas Brose
Ms. Carissa Hainsworth
Mr. Mike Naggar
Mr. Byron Glenn

Attachments: Figure 1 – Vicinity Map *(Rear of Text)*
Appendix A – Exploratory Logs *(Rear of Text)*
Appendix B – Infiltration Test Sheets *(Rear of Text)*
Appendix C – NRCS Web Soil Survey *(Rear of Text)*

Plate 1 – Infiltration Location Map *(Rear of Text)*

Reso A - Exhibit C2 (EIR Technical Appendix)



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OLSEN-CHANDLER RANCH RESIDENTIAL DEVELOPMENT	182139-10A
VICINITY MAP	SCALE 1:40,625
OCT 2018	FIGURE 1

APPENDIX A

EXPLORATORY LOGS

Reso A - Exhibit C2 (EIR Technical Appendix)

Geotechnical Boring Log B-1

Date: October 11, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0		0-5'				**Topsoil:**
					SM	Silty SAND; brownish gray, dry, loose to medium dense, fine to coarse sand
	49	2.5'	113.1	17.5		**Quaternary Alluvium (Qa):**
					CL	Sandy CLAY; orangeish brown, moist, very dense, fine to coarse sand
5	55	5'	121.1	9.0		
	24	7.5'	87.0	27.0		**Quaternary Paso Robles Formation (QTp):**
						Sandy CLAYSTONE; light olive brown, slighlty moist, medium dense, fine to coarse
10						sand with gravel, trace calcite
	83/11"	10'	107.0	19.9		Yellowish brown, very dense below 10 feet
15	50	15'	114.2	15.5		SANDSTONE with Clay; brownish yellow, moist, hard, fine to coarse sand,
						trace gravel
						Total Depth: 16.5 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-2

Date: October 11, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil**
					SM	Silty SAND; grayish brown, dry, loose to medium dense, fine to coarse sand
	26	2.5'	115.3	13.1		**Quaternary Alluvium (Qa)**
					CL	Sandy CLAY; dark grayish brown, moist, medium dense, fine to medium sand
5						
	33	5'	111.5	5.7	SP-SM	Poorly-Graded SAND with Silt; pale brown, moist, dense, fine to medium sand,
						trace calcite
	43	7.5'	113.2	10.7		Pale yellow below 7 feet
10	34	10'	120.4	8.4		
						Quaternary Paso Robles Formation (QTp)
	46	12.5'	122.1	5.3		SANDSTONE with Clay; pale yellow, moist, hard, fine to coarse sand, trace
						gravel
						Total Depth: 14 feet
15						No Groundwater
20						
25						
30						

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Reso A - Exhibit C2 (EIR Technical Appendix)

Geotechnical Boring Log B-3

Date: October 11, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil**
					SM	Silty SAND; grayish brown, dry, medium dense, fine to coarse sand
	15	2.5'	109.4	10.2		**Quaternary Alluvium (Qa)**
					CL	Sandy CLAY; dark grayish brown, slighlty moist, medium dense, fine to medium
5						sand
	32	5'	114.1	10.8	SP-SM	Poorly-Graded SAND with Silt; pale yellow, slighlty moist, dense, fine to medium
						sand
	57	7.5'	-	2.5		**Quaternary Paso Robles Formation (QTp)**
						Silty SANDSTONE; pale yellow, slightly moist, very hard, fine to coarse grained,
						trace gravel
10	34	10'	119.5	11.4		Fine grained below 10 feet
	31	12.5'	108.1	13.3		
						Total Depth: 14 feet
15						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-4

Date: October 11, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0		0-5'				**Topsoil**
					SM	Silty SAND; medium brown, dry to slightly moist, loose, fine to medium sand
	14	2.5'	118.2	10.5		**Quaternary Alluvium (Qa)**
					CL	Sandy CLAY; dark grayish brown, slightly moist, medium dense, fine to medium
						sand
5	44	5'	120.4	10.5	SC	Clayey SAND; yellowish brown, moist, dense, fine to medium sand
	33	7.5'	114.3	6.5		
					SP-SC	Poorly-Graded SAND with Clay; yellowish brown, moist, dense, fine to medium
						sand
10	28	10'	113.4	10.6		Pale yellow, medium dense below 10 feet
	58	12.5'	119.9	12.7		**Quaternary Paso Robles Formation (QTp)**
						SANDSTONE with Clay; yellowish brown, very hard, fine to coarse grained
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-5

Date: October 11, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil**
					SM	Silty SAND; grayish white, dry, loose to medium dense, fine to coarse sand
	22	2.5'	115.0	13.7		**Quaternary Alluvium (Qa)**
					SC	Clayey SAND; yellowish brown, slightly moist, medium dense, fine to coarse
						sand, trace calcite
5	31	5'	120.3	11.3	SP-SC	Poorly-Graded SAND with Clay; yellowish brown, moist, dense, fine to medium
						sand
	31	7.5'	124.2	8.6		Pale yellow below 7.5 feet
10	32	10'	118.4	12..6		Trace gravel below 10 feet
	28	12.5'	119.6	8.1		
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-6

Date: October 11, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Quaternary Alluvium (Qa)**
	70/10"	2.5'	101.2	13.4	ML	Sandy SILT; grayish brown, dry, soft, fine to coarse sand
					SC-SM	Clayey SAND with Silt; yellowish brown, slightly moist, very dense, fine to medium sand
5	63	5'	113.7	14.5		
	16	7.5'	104.2	15.1	SP-SC	Poorly-Graded SAND with Clay; yellowish brown, moist, medium dense, fine to medium sand
10	21	10'	116.2	13.4		
	23	12.5'	112.4	19.3		
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Reso A - Exhibit C2 (EIR Technical Appendix)

Geotechnical Boring Log B-7

Date: October 11, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Quaternary Alluvium (Qa)**
					SM	Silty SAND; gray, dry, dense, fine to coarse sand
	32	2.5'	71.1	18.6	SC	Clayey SAND; orangeish brown, slightly moist, dense, fine to coarse sand
5	29	5'	123.3	9.0	CL	Sandy CLAY; orangeish brown, slightly moist, medium dense, fine to medium sand
	28	7.5'	105.3	8.0		Pale yellow, trace gravel below 7 feet
10	28	10'	114.0	13.0	SP-SC	Poorly-Graded SAND with Clay; orangeish brown, moist, medium dense, fine to coarse sand
	26	12.5'	108.1	7.3		Brownish yellow below 12 feet
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-8

Date: October 11, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0		0-5'				**Quaternary Allulvium (Qa)**
					CL	Sandy CLAY; olive brown, moist, medium dense, fine to coarse sand
	18	2.5'	106.3	16.7		
5	17	5'	114.1	12.8		
	41	7.5'	109.9	9.0		**Quaternary Paso Robles Formation (QTp)**
						BRECCIA; olive brown, moist, hard, fine to coarse sand
10	34	10'	-	-		No Recovery at 10 feet
	35	12.5'	111.6	17.8		Clayey SANDSTONE; olive yellow, moist, hard, fine to medium sand
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-9

Date: October 11, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Quaternary Alluvium (Qa)**
	38	2.5'	102.3	14.3	SM	Silty SAND; grayish brown, slightly moist, dense, fine to medium sand
5	48	5'	111.3	7.9	SP-SC	Poorly-Graded SAND with Clay; light reddish brown, slightly moist, dense, fine to coarse sand
	13	7.5'	105.5	20.4	CL	Sandy CLAY; olive yellow, moist, very stiff, fine to coarse sand
10	24	10'	108.8	14.1		
	31	12.5'	107.9	8.8		Pale yellow, dense below 12 feet
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-10

Date: October 11, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Quaternary Alluvium (Qa)**
	41	2.5'	112.5	8.8	SC	Clayey SAND; yellowish brown, moist, dense, fine to coarse sand, trace calcite
5	15	5'	111.0	10.1	SP-SC	Poorly-Graded SAND with Clay; pale yellow, medium brown, moist, medium dense, fine to medium sand
	9	7.5'	105.5	18.4		Loose, fine sand with gravel 7 to 10 feet
10	13	10'	95.2	7.1		
	18	12.5'	113.1	14.9	SP	Poorly-Graded SAND; brownish orange, moist, medium dense, fine to coarse sand
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-11

Date: October 11, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Quaternary Alluvium (Qa)**
	21	2.5'	101.8	18.0	CL	Sandy CLAY; yellow brown, moist, medium dense, fine to medium sand, trace calcite
5	15	5'	111.9	17.3		
	45	7.5'	117.4	6.6		**Quaternary Paso Robles Formation (QTp)**
						SANDSTONE with Clay; yellowish brown, moist, hard, fine to medium sand, trace gravel
10	58	10'	111.7	10.3		Very hard 10 to 12 feet
	46	12.5'	102.1	7.4		Hard below 12 feet
15						Total Depth: 14 feet No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-12

Date: October 11, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Quaternary Alluvium (Qa)**
	27	2.5'	107.4	17.7	CL	Sandy CLAY; olive brown, moist, medium dense, fine to medium sand
5	19	5'	103.1	13.0	ML	Sandy SILT; pale yellow, slightly moist, stiff, fine sand
	23	7.5'	104.9	14.2		Orangish brown, very stiff 7 to 10 feet
10	51	10'	114.4	9.3		Olive brown 10 to 12 feet
	43	12.5'	112.4	17.0		Orangeish brown below 12 feet
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-13

Date: October 11, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Quaternary Alluvium (Qa)**
	20	2.5'	97.6	18.5	ML	Sandy SILT; yellow brown, slightly moist, stiff, fine to medium sand
5						**Quaternary Paso Robles Formation (QTp)**
	68	5'	113.2	16.4		Sandy SILTSTONE; pale yellow, slightly moist, very hard, fine to medium sand
	71	7.5'	111.9	13.3		Orange brown below 7 feet
10	56	10'	109.9	13.8		
	43	12.5'	114.3	10.8		Hard below 12 feet
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-14

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil**
					SM	Silty SAND; light brown, dry, medium dense, fine to medium sand, trace gravel
	39	2.5'	116.3	8.5	CL	Sandy CLAY; dark brown, dry, very stiff, fine sand
5						**Quaternary Paso Robles Formation (QTp)**
	41	5'	99.9	13.3		Silty SANDSTONE; yellowish brown, dry, hard, fine to medium sand, trace clay
	51	7.5'	104.4	21.2		Brownish yellow below 7.5 feet
10	54	10'	103.9	21.6		Sandy SILTSTONE; pale yellow to pale brown, dry, very hard, fine sand
	59	12.5'	108.8	4.2		
						Silty SANDSTONE; pale yellow, dry, fine to coarse sand
						Total Depth: 14 feet
15						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-15

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil**
	69	2.5'	111.9	16.6	SM	Silty SAND; brownish gray, dry, medium dense, fine to coarse sand
						Quaternary Paso Robles Formation (QTp)
5	40	5'	109.1	15.5		Sandy SILTSTONE; pale yellow, dry, hard to very hard, fine sand, abundant calcite
	62	7.5'	112.0	8.1		Silty SANDSTONE; pale yellow, dry, very hard, fine to medium sand
10	76	10'	114.9	8.6		Orangeish brown below 10 feet
	54	12.5'	106.2	7.5		
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-16

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil**
					SM	Silty SAND; brownish gray, dry, dense, fine to coarse sand
	48	2.5'	102.5	11.4		**Quaternary Paso Robles Formation (QTp)**
						Silty SANDSTONE; yellow, dry, hard, fine to coarse sand with gravel
5	49	5'	104.3	23.6		Sandy SILTSTONE; yellowish brown to olive gray, moist, hard, fine sand
	39	7.5'	116.9	10.8		Silty SANDSTONE; yellowish brown, slightly moist, hard to very hard, fine to coarse sand, trace gravel and clay
10	55	10'	106.4	8.5		
	60	12.5'	109.0	8.0		
15						Total Depth: 14 feet No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-17

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil**
					SM	Silty SAND; brownish gray, dry, medium dense, fine to coarse sand
	46	2.5'	117.4	10.0		**Quaternary Paso Robles Formation (QTp)**
						Silty SANDSTONE with Clay; reddish brown, slightly moist, hard, fine to coarse
						sand with gravel, abundant calcite
5	26	5'	106.0	21.8		SILTSTONE; orangeish brown, slightly moist, moderately hard, fine sand, trace
						calcite
	20	7.5'	102.3	20.4		
10	26	10'	99.9	25.1		Pale yellow below 10 feet
	37	12.5'	116.5	16.1		Hard below 12 feet
						Total Depth: 14 feet
15						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-18

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ/JF**
Drilling Company: Drilling It	**Type of Rig: B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Quaternary Alluvium (Qa)**
	53	2.5'	111.2	13.4	SM	Silty SAND; brownish gray, dry, medium dense, fine to coarse sand
						Quaternary Paso Robles Formation (QTp)
5	31	5'	108.2	21.0		Sandy CLAYSTONE; orangeish brown, slightly moist, dense, fine sand
	37	7.5'	104.5	16.2		Silty SANDSTONE; yellow brown, slightly moist, hard, fine sand
10	18	10'	95.9	27.3		SILTSTONE; gray, slightly moist, moderately hard
						Sandy SILTSTONE; grayish brown, slightly moist, moderately hard, fine sand
15	23	15'	120.5	13.5		
						Total Depth: 16.5 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-19

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ**
Drilling Company: Drilling It	**Type of Rig: dms-9630**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Quaternary Alluvium (Qa):**
					SM	Silty SAND; brownish gray, slightly moist, medium dense, fine to coarse sand,
	21	2.5'	94.9	11.6		trace gravel
5						**Quaternary Paso Robles Formation (QTp):**
	40	5'	112.0	11.9		Silty SANDSTONE; brownish gray, slightly moist, hard, fine to coarse sand,
						trace gravel
	56	7.5'	98.3	14.2		Orangish rbown below 7 feet
						Abundant gravel below 10 feet
10	53	10'	102.7	8.0		
	50	12.5'	90.9	14.1		
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-20

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ**
Drilling Company: Drilling It	**Type of Rig: dms-9630**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					ML	Sandy SILT; grayish brown, dry, medium dense, fine to medium sand
	29	2.5'	90.9	26.6		**Quaternary Paso Robles Formation (QTp):**
						Sandy SILTSTONE; brownish gray, slightly moist, moderately hard, fine sand,
						abundant calcite
5	23	5'	89.3	26.2		Olive gray, hard from 5 to 8 feet
	31	7.5'	112.3	16.6		
10	51	10'	111.7	8.9		Orangish brown, very hard below 10 feet
						Silty SANDSTONE; orangish brown, slightly moist, hard, fine to coarse sand,
						trace gravel
15	44	15'	115.1	10.3		
						Total Depth: 16.5 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-21

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ**
Drilling Company: Drilling It	**Type of Rig: dms-9630**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0		0-5'				**Topsoil:**
					SM	Silty SAND; grayish brown, dry, loose, fine to coarse sand
	10	2.5'	122.4	10.6		**Quaternary Alluvium (Qa):**
					SC	Clayey SAND; dark blackish brown, moist, loose, fine to coarse sand, trace gravel
5	41	5'	118.7	11.5		**Quaternary Paso Robles Formation (QTp):**
						Sandy CLAYSTONE; olive brown, moist, hard, fine to coarse sand, trace gravel
	20	7.5'	103.1	25.7		Sandy SILTSTONE; olive brown, moist, moderately hard, fine to medium sand
10	42	10'	101.4	28.1		Hard, wet from 10 to 15 feet
15	25	15'	96.9	28.1		Orange, moist, moderately hard below 15 feet
						Total Depth: 16.5 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-22

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ**
Drilling Company: Drilling It	**Type of Rig: dms-9630**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SC	Clayey SAND; black, slightly moist, loose to medium dense
	13	2.5'	118.0	13.5		**Quaternary Alluvium (Qa):**
					CL	Sandy CLAY; olive gray, moist, medium dense, fine to coarse sand, trace gravel
5	52	5'	107.4	21.7		**Quaternary Paso Roles Formation (QTp):**
						SILTSTONE; olive brown, dry to slightly moist, very hard, fine sand
	58	7.5'	99.7	26.9		
10	64	10'	103.4	19.8		
15	32	15'	90.1	32.3		Moderately hard, moist, below 15 feet
						Total Depth: 16.5 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-23

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ**
Drilling Company: Drilling It	**Type of Rig: dms-9630**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; dark brown, slightly moist, loose to medium dense, fine to coarse sand
	41	2.5'	-	-		**Quaternary Paso Robles Formation (QTp):**
						Sandy CLAY; dark gray brown, slightly moist, dense, fine to coarse sand, weathered
5						
	52	5'	93.6	24.5		Sandy SILTSTONE; olive brown, moist, hard, fine to medium sand
						Orange to pale yellow, moderately hard below 7 feet
	25	7.5'	96.9	28.5		
10	29	10'	98.1	28.5		
15	28	15'	106.9	13.9		
						Total Depth: 16.5 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-24

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SC	Sandy CLAY; light brown, dry, medium dense, fine to coarse sand
	45	2.5'	122.3	11.9		
						Quaternary Paso Robles Formation (QTp:)
5						
	45	5'	119.6	8.0	SM	Silty SANDSTONE; brownish yellow to yellowish brown, slightly moist, dense,
						fine to medium sand
	40	7.5'	122.0	9.7		
						Trace gravel below 7 1/2 feet
10						
	41	10'	100.6	26.6	ML	Sandy SILTSTONE; olive gray, slightly moist, very stiff, fine to medium sand
	54	12.5'	116.0	9.9		
					SP-SM	Poorly-graded SANDSTONE with Silt; yellowish brown, dry, very dense, fine
15						to coarse sand with trace gravel
						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-25

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					CL	Sandy CLAY; brown, dry, stiff, fine to medium sand with trace gravel
	55	2.5'	112.6	8.9		
						Quaternary Paso Robles Formation (QTp):
						Silty SANDSTONE; brownish yellow to yellowish brown, slightly moist, dense
5	45	5'	109.2	14.4		fine to medium sand with trace clay
	33	7.5'	119.5	9.8		Dark yellowish brown below 5 feet
						Olive gray to yellow brown, moist, fine sand below 7.5 feet
10	33	10'	108.2	15.0		
	62	12.5'	109.5	9.8		Very Dense below 12.5 feet
						Total Depth: 14 feet
15						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-26

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
						Clayey SAND; dry, brown, medium dense, fine to medium sand
	25	2.5'	107.6	11.0		**Quaternary Paso Robles Formation (QTp):**
						Silty SANDSTONE; brownish yellow, slightly moist, dense, fine to medium
						sand with trace clay
5	62	5'	117.3	14.8		
	44	7.5'	109.5	16.5		
10	40	10'	108.9	17.5		Fine sand below 10 feet
	19	12.5'	107.6	9.9		Pale yellow to brownish yellow, fine to medium sand below 12.5 feet
15						
						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-27

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
						Clayey SAND; dark brown, dry, medium dense, fine to medium sand
	80	2.5'	109.6	14.9		**Quaternary Paso Robles Formation (QTp):**
					SM	Silty SANDSTONE; brownish yellow, dry, very dense, fine to medium sand
5						
	43	5'	117.9	14.7		Fine sand below 5 feet
	39	7.5'	107.1	16.0	ML	Sandy SILTSTONE; yellowish brown, moist, very stiff, fine sand
10	40	10'	-	-		
	31	12.5'	100.3	13.3	SM	Silty SANDSTONE; pale yellow, slightly moist, dense, fine to medium sand
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-28

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SC	Clayey SAND; dark brown, dry, medium dense, fine to coarse sand
	42	2.5'	117.3	9.4		
						Quaternary Paso Robles Formation (QTp):
						Silty SANDSTONE; light yellowish brown, dry, dense, fine to coarse sand with
5	34	5'	115.9	10.8		trace clay and gravel
						Poorly-graded SANDSTONE with Clay; pale olive, moist, dense, fine to coarse sand
	36	7.5'	107.4	10.5		with trace gravel
						Clayey SANDSTONE; yellowish brown, slightly moist, dense, fine to coarse sand
10	71	10'	113.3	9.7		Very dense below 10 feet
	41	12.5'	113.2	13.3		Sandy SILTSTONE; pale olive, moist, very stiff, fine sand
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-29

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SC	Clayey SAND; brown, dry, medium dense, fine to coarse sand
	42	2.5'	115.3	6.6		
						Quaternary Paso Robles Formation (QTp):
					SP-SM	Poorly-graded SAND with Silt; yellowish brown, slightly moist, dense, fine to
5	36	5'	112.9	13.4		coarse sand with trace clay
	47	7.5'	110.5	14.9	SM	Silty SANDSTONE; yellowish brown, slighty moist, dense, fine to medium sand
						with trace clay
10	36	10'	119.0	12.9		
	50/5"	12.5'	110.4	7.2		
15						
						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-30

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					CL	Sandy CLAY; dark brown, dry, stiff, fine to coarse sand with trace gravel
	14	2.5'	108.5	20.4		
						Quaternary Paso Robles Formation (QTp):
						Poorly-graded SANDSTONE with Clay; yellowish brown, slightly moist, very
5	56	5'	116.8	8.8		dense, fine to coarse sand with trace gravel
	41	7.5'	116.3	16.5		
10	44	10'	101.3	24.1		Sandy SILTSTONE; yellow brown, slightly moist, very stiff, fine sand
	43	12.5'	112.7	15.1		
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-31

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SC	Clayey SAND; dark brown, dry, medium dense, fine to coarse sand
	54	2.5'	106.1	18.9		**Quaternary Paso Robles Formation (QTp):**
						Silty SANDSTONE; yellowish brown, slightly moist, very dense fine to medium
						sand with trace clay
5	52	5'	111.2	19.7		
	43	7.5'	118.1	13.1		Light grayish brown, dense
10	38	10'	116.0	14.5		Light grayish brown to pale olive, moist below 10 feet
	40	12.5'	102.4	20.1		
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-32

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; light grayish brown, moist, dense, fine to medium sand
	38	2.5'	99.2	21.2		
						Quaternary Paso Robles Formation (QTp):
						Silty SANDSTONE; light grayish brown, moist, dense, fine to medium sand
5	49	5'	107.8	14.8		
	36	7.5'	96.2	7.2		
						Poorly-graded SANDSTONE with Silt; yellowish brown, dry, dense, fine to coarse
						sand with gravel
10	49	10'	105.1	21.4		
	45	12.5'	103.3	22.5		
15						
						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-33

Date: October 12, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					CL	Sandy CLAY; dark brown, moist, stiff, fine sand
	13	2.5'	104.2	16.1		
						Quaternary Paso Robles Formation (QTp):
						Sandy SILTSTONE; light grayish brown, slightly moist, firm, fine sand
5	26	5'	100.5	23.4		Very stiff below 5 feet
	35	7.5'	104.0	8.6		Yellowish brown below 7.5 feet
10	52	10'	107.3	22.4		Poorly-graded SANDSTONE with Silt; yellowish brown, slightly moist, very dense
	50	12.5'	113.3	15.2		
15						
						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-34

Date: October 13, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0		0-5'				**Topsoil:**
						Sandy SILT; brown, slightly mosit, stiff, fine to medium sand
	84/7"	2.5'	118.4	10.6		**Quaternary Paso Robles Formation (QTp):**
						Silty SANDSTONE; yellowish brown, slightly moist, very dense, fine to coarse sand
						with gravel
5	62	5'	124.8	6.6		BRECCIA; yellowish brown, slightly moist, very dense, fine to coarse gravel
						and sand
	89/11"	7.5'	112.7	10.6		
10	REF/5"	10'	101.2	6.3		Practical Refusal at 10.5 feet
						Total Depth: 10.5 feet
						No Groundwater
15						
20						
25						
30						

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Geotechnical Boring Log B-35

Date: October 13, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
						Sandy SILT; brown, dry, stiff, fine to medium sand
	40	2.5'	89.2	20.4		**Quaternary Alluvium (Qa):**
					ML	Sandy SILT; light grayish brown, slightly moist, very stiff, fine sand
5						
	22	5'	101.1	22.8		Pale yellow, moist below 5 feet
	8	7.5'	98.5	24.5		Light yellowish brown, moist, firm below 7.5 feet
10						
	16	10'	107.6	17.5	CL	CLAY; light grayish brown, moist, stiff below 10 feet
	17	12.5'	96.0	20.9		
15						
						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-36

Date: October 13, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
						Silty SAND; yellowish brown, moist, medium dense, fine to coarse sand with
	26	2.5'	96.0	17.6		trace clay
						Quaternary Paso Robles Formation (QTp):
						Sandy SILTSTONE; yellowish brown, slightly moist, very stiff to hard, fine to
5	78/11"	5'	106.6	17.8		medium sand with trace gravel
	17	7.5'	106.3	18.3		
10	40	10'	100.1	11.1		Abundant gravel below 10 feet
	80/11"	12.5'	-	-		BRECCIA; brownish yellow, moist, very dense, fine to coarse gravel
15						Total Depth: 13.5 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-37

Date: October 13, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					ML	Sandy SILT; dark brown, dry, stiff, fine to coarse sand
	20	2.5'	110.4	14.4		**Quaternary Paso Robles Formation (QTp):**
						Silty SANDSTONE; yellowish brown, moist, medium dense, fine to coarse sand
						with trace gravel
5	26	5'	109.1	16.2		
	23	7.5'	90.2	19.2		Abundant gravel below 7.5 feet
						Sandy SILTSTONE; brownish yellow to yellowish brown, moist, very stiff, fine
10	26	10'	100.3	16.1		sand
	39	12.5'	104.8	14.0		Silty SANDSTONE; brownish yellow, dry, dense, fine to medium sand
15						
						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-38

Date: October 13, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0		0-5'				**Topsoil:**
					CL	Sandy CLAY; dark brown, stiff, fine to coarse sand with gravel
	67	2.5'	109.2	12.9		
						Quaternary Paso Robles Formation (QTp):
						Silty SANDSTONE; yellowish brown, slightly moist, dense to very dense, fine
5	33	5'	101.2	21.5		to medium sand
	41	7.5'	109.0	20.1		Sandy SILTSTONE; yellowish brown, slightly moist, fine sand
10	REF/5"	10'	108.7	10.4		Silty SANDSTONE; yellowish brown, slightly moist, very dense, fine to medium
						sand
	52	12.5'	107.4	3.6		Fine to coarse sand below 12.5 feet
15						
						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-39

Date: October 13, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					CL	Sandy CLAY; brown, dry, very stiff, fine to medium sand
	50	2.5'	114.3	14.9		
						Quaternary Paso Robles Formation (QTp):
						Sandy SILTSTONE; very pale brown, dry, hard, fine sand
5	52	5'	102.6	13.1		
	52	7.5'	106.8	18.7		Yellowish brown below 7.5 feet
10	47	10'	92.2	18.4		
	42	12.5'	110.6	18.0		
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-40

Date: October 13, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Quaternary Paso Robles Formation (QTp):**
						Poorly-graded SANDSTONE with Silt; light grayish brown to pale yellow, dry
	REF/3"	2.5'	113.5	12.0		very dense, fine to coarse sand with gravel
5	87/11"	5'	112.2	8.8		Poorly-graded SANDSTONE with Clay; moist, very dense, fine to coarse sand
						Practical Refusal at 6.5 feet
						Total Depth: 6.5 feet
10						No Groundwater
15						
20						
25						
30						

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Geotechnical Boring Log B-41

Date: October 13, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					ML	Sandy SILT; brown, dry, dense, fine to coarse sand with gravel
	70/11"	2.5'	95.4	11.3		
						Quaternary Paso Robles Formation (QTp):
						BRECCIA; pale yellow, dry, very dense, fine to coarse gravel
5	REF/5"	5'	119.8	5.6		
						Practical Refusal at 6 feet
						Total Depth: 6 feet
						No Groundwater
10						
15						
20						
25						
30						

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Geotechnical Boring Log B-42

Date: October 13, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
						Silty SAND;dark brown, dry, medium dense, fine to coarse sand
	89	2.5'	107.3	8.5		with trace gravel
						Quaternary Paso Robles Formation (QTp):
						Silty SANDSTONE; yellowish brown, slightly moist, very dense, fine to coarse
5	50	5'	119.8	12.1		sand
	41	7.5'	115.6	16.4		
10	43	10'	117.7	16.1		Sandy SILTSTONE; yellowish brown, moist, very stiff, fine sand
	46	12.5'	113.2	17.6		Light olive brown below 12.5 feet
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-43

Date: October 13, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
						Clayey SAND; dark brown, dry, dense, fine to coarse sand
	33	2.5'	111.5	11.1		
						Quaternary Paso Robles Formation (QTp):
						Silty SANDSTONE; yellowish brown, slightly moist, dense, fine to medium
5	39	5'	99.9	22.7		sand
						Sandy SILTSTONE; yellowish brown, slightly moist, very stiff, fine sand
	22	7.5'	106.5	17.6		with gravel
10	46	10'	99.7	18.1		
	39	12.5'	103.2	21.8		
15						
						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-44

Date: October 13, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; brown, dry, medium dense, fine to coarse sand
	5	2.5'	81.9	12.5		
						Quaternary Paso Robles Formation (QTp):
						Sandy SILTSTONE; pale olive, moist, very stiff, fine sand
5	35	5'	100.6	22.3		
	31	7.5'	118.2	15.0		Silty SANDSTONE; brown, slightly moist, dense, fine to coarse sand with trace gravel
10	33	10'	82.9	34.3		BRECCIA; olive, moist, dense, fine to coarse gravel
	43	12.5'	115.7	13.7		Sandy SILTSTONE; pale olive, moist, very stiff, fine sand
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-45

Date: October 13, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					ML	Sandy SILT; dark brown, dry, medium dense, fine sand
	39	2.5'	112.9	16.5		
						Quaternary Paso Robles Formation (QTp):
						Sandy SILTSTONE; light grayish brown, slightly moist, fine sand
5	78	5'	110.5	20.8		
						Pale olive below 5 feet
	41	7.5'	100.5	7.4		
						Poorly-graded SANDSTONE; olive, slightly moist, dense, fine to coarse sand with
						gravel
10	28	10'	100.6	15.0		
	44	12.5'	94.0	28.4		Sandy SILTSTONE; yellowish brown, moist, very stiff, fine sand with gravel
15						
						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-46

Date: October 13, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					CL	Sandy CLAY; dark brown, dry, stiff, fine sand with trace gravel
	35	2.5'	105.1	16.5		
						Quaternary Paso Robles Formation (QTp):
						Sandy SILTSTONE; yellowish brown, slightly moist, stiff, fine sand
5	31	5'	97.1	17.8		
	28	7.5'	92.8	25.1		
10	REF/5"	10'	101.8	20.0		
	49	12.5'	106.9	21.4		
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Boring Log B-47

Date: October 13, 2018	**Project Name: Olsen-Chandler Ranch; Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: JF**
Drilling Company: Drilling It	**Type of Rig: Mobile B-61**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					CL	Sandy CLAY; dark brown, dry, stiff, fine sand
	27	2.5'	85.4	19.1		
						Quaternary Paso Robles Formation (QTp):
						BRECCIA; yellowish brown, slightly moist, moderately hard, fine to coarse sand
5	22	5'	94.2	27.3		Sandy SILTSTONE; yellowish brown, moist, moderately hard, fine sand
	30	7.5'	98.0	26.3		
10	27	10'	96.2	26.0		
						BRECCIA; pale yellow, moist, moderately hard, fine to coarse sand
	24	12.5'	95.9	22.8		
15						Total Depth: 14 feet
						No Groundwater
20						
25						
30						

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Geotechnical Test Pit Log TP-1

Date: October 13, 2018	**Project Name: Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ**
Drilling Company: Drilling It	**Type of Rig: Backhoe**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; grayish brown, dry, medium dense, fine to medium sand
						Quaternary Paso Robles Formation (QTp):
						Silty SANDSTONE with Gravel; grayish brown, slightly moist, fine to coarse sand
						Clayey SILTSTONE; reddish brown, slightly moist, dense, fine to coarse sand
5						Silty SANDSTONE; reddish orange/brown, slightly moist, dense, trace gravel,
						fine to coarse sand
10						Total Depth: 10 feet
						No Groundwater
15						
20						
25						
30						

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Geotechnical Test Pit Log TP-2

Date: October 13, 2018	**Project Name: Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ**
Drilling Company: Drilling It	**Type of Rig: Backhoe**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; orangish brown, slightly moist, loose, fine to coarse sand, trace gravel
						Quaternary Paso Robles Formation (QTp):
						Silty SANDSTONE with Gravel; orangish brown, dry, hard
						Olive brown, trace clay from 4 to 6 feet
5						
						Sandy SILTSTONE; grayish brown, moist, hard, fine to coarse sand
10						Total Depth: 10 feet
						No Grounddwater
15						
20						
25						
30						

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Geotechnical Test Pit Log TP-3

Date: October 13, 2018	**Project Name: Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ**
Drilling Company: Drilling It	**Type of Rig: Backhoe**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; grayish brown, dry, medium dense, fine to coarse sand
						Quaternary Paso Robles Formation (QTp):
						Silty SANDSTONE with Gravel; orangish brown, dry, very hard
5						
						Sandy SILTSTONE; olive brown, slightly moist, dense, fine sand, trace gravel
						Total Depth: 6 feet
						No Groundwater
10						
15						
20						
25						
30						

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Geotechnical Test Pit Log TP-4

Date: October 13, 2018	**Project Name: Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ**
Drilling Company: Drilling It	**Type of Rig: Backhoe**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; grayish brown, dry, very dense, fine to coarse sand
						Quaternary Paso Robles Formation (QTp):
						Gravelly CLAYSTONE; olive gray, moist, very hard, fine to medium sand
5						
						Clayey SANDSTONE; orangish brown, moist, very hard, fine to coarse sand,
						trace gravel
						SILTSTONE; gray, moist, very hard
10						
						Total Depth: 11 feet
						No Groundwater
15						
20						
25						
30						

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Geotechnical Test Pit Log TP-5

Date: October 13, 2018	**Project Name: Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ**
Drilling Company: Drilling It	**Type of Rig: Backhoe**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; brownish gray, dry, medium dense, fine to coarse sand
						Quaternary Paso Robles Formation (QTp):
						Sandy CLAYSTONE; brown, slightly moist, very hard, fine to coarse sand, trace gravel
						Sandy SILTSTONE; yellow brown, slightly moist, hard, fine to medium sand
5						
						Total Depth: 7 feet
						No Groundwater
10						
15						
20						
25						
30						

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Geotechnical Test Pit Log TP-6

Date: October 13, 2018	**Project Name: Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ**
Drilling Company: Drilling It	**Type of Rig: Backhoe**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; grayish brown, dry, fine to coarse sand
						Quaternary Paso Robles Formation (QTp):
						CLAYSTONE; dark gray brown, slightly moist, hard
						Sandy SILTSTONE; orange brown, dry, hard, fine to medium sand
5						
						Total Depth: 7 feet
						No Groundwater
10						
15						
20						
25						
30						

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Geotechnical Test Pit Log TP-7

Date: October 13, 2018	**Project Name: Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ**
Drilling Company: Drilling It	**Type of Rig: Backhoe**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; gray brown, dry, medium dense, fine to coarse sand
						Quaternary Alluvium (Qa):
					CL	Sandy CLAY; dark grayish brown, moist, dense, fine to coarse sand
					ML	Sandy SILT; olive gray, slightly moist, dense, fine to medium sand
5						
10						
						Total Depth: 11 feet
						No Groundwater
15						
20						
25						
30						

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Geotechnical Test Pit Log TP-8

Date: October 13, 2018	**Project Name: Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ**
Drilling Company: Drilling It	**Type of Rig: Backhoe**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; grayish brown, dry, loose, fine to coarse
						Quaternary Alluvium (Qa):
					CL	Sandy CLAY; gray brown, moist, fine to medium sand
					ML	Sandy SILT; grayish olive brown, moist, dense, fine to medium sand
5						
						Quaternary Paso Robles Formation (QTp):
						Sandy SILTSTONE; olive yellow, moist, hard, fine to medium sand
10						
						Total Depth: 13 feet
						No Groundwater
15						
20						
25						
30						

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Geotechnical Test Pit Log TP-9

Date: October 13, 2018	**Project Name: Paso Robles** **Page: 1 of 1**
Project Number: 182139-10A	**Logged By: SNJ**
Drilling Company: Drilling It	**Type of Rig: Backhoe**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; grayish brown, dry, loose to medium dense, fine to coarse sand,
						trace gravel
						Quaternary Paso Robles Formation (QTp):
						Sandy CLAYSTONE; dark gray brown, moist, hard, fine to coarse sand, trace gravel
5						Sandy SILTSTONE; yellowish brown to olive brown, slightly moist, moderately hard,
						fine sand
10						Total Depth: 9 feet
						No Groundwater
15						
20						
25						
30						

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APPENDIX B

INFILTRATION TEST SHEETS

Reso A - Exhibit C2 (EIR Technical Appendix)

Test No.	DR-1	Location	See Map	Turf-Tec International - Record Chart for IN10-W - (12 & 24 Inch Infiltration Rings)

Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT				**Constants**	**Area cm2**	**Depth of Liquid (cm)**	**Liquid Container Number**		**Marriotte Tube Volume**	Earth Strata Geotechnical Services, Inc.
Test Location:	DR-1				**Inner Ring**	729	10.0	1		3000	Geotechnical, Environmental and Materials Testing Consultants
Liquid Used:	TAP WATE	**pH:**	8.0		**Annular Ring**	2189	10.0	2		10000	www.ESGSINC.com (951) 397-8315
Tested By:	rg / cr		**Date**	10/11/2018		**Liquid level maintained**	(X) Flow Valve	( ) Float Valve	( ) Mariotte Tubes		
Depth to water table:	> 20 Feet		Depth of Test	5'		**Penetration Depth of Outer Ring:**		9 cm		**Other**	

						Flow Readings					Infiltration Rates				Ground Temperature		Remarks
Trial #	**Start / End**	**Date MM/DD/YY**	**Time HR:MIN**	**Time Increment /(Total)**	**Elapsed Time (Min)**	**Inner Ring Reading cm**	**Inner Maroitte Tube Flow (ml)**	**Annular Space Reading cm**	**Annular Space Marriotte Tube Flow (ml)**	**Liquid Temp °F**	**Inner Infiltration Rate cm/h**	**Inner Infiltration Rate In/h**	**Annular Infiltration Rate cm/h**	**Annular Infiltration Rate In/h**	**Ground Temp Depth (cm)**	**Temp at Depth (c)**	**Weather conditions Etc...**
	Start Test	10/11/2018	10:00	0:15	15												
1	End Test	10/11/2018	10:15	0:15		6.00	250	6.00	1500		1.37	**0.54**	2.74	**1.08**			
	Start Test	10/11/2018	10:15	0:15	30												
2	End Test	10/11/2018	10:30	0:30		6.00	0	6.00	0		0.00	**0.00**	0.00	**0.00**			
	Start Test	10/11/2018	10:30	0:15	45												
3	End Test	10/11/2018	10:45	0:45		6.00	0	6.00	0		0.00	**0.00**	0.00	**0.00**			

Turf-Tec International

Reso A - Exhibit C2 (EIR Technical Appendix)

Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT		
Test Location:	DR-1		
Liquid Used:	TAP WATE	**pH:**	8.0
Tested By:	rg / cr		
Depth to water table:	> 20 Feet		

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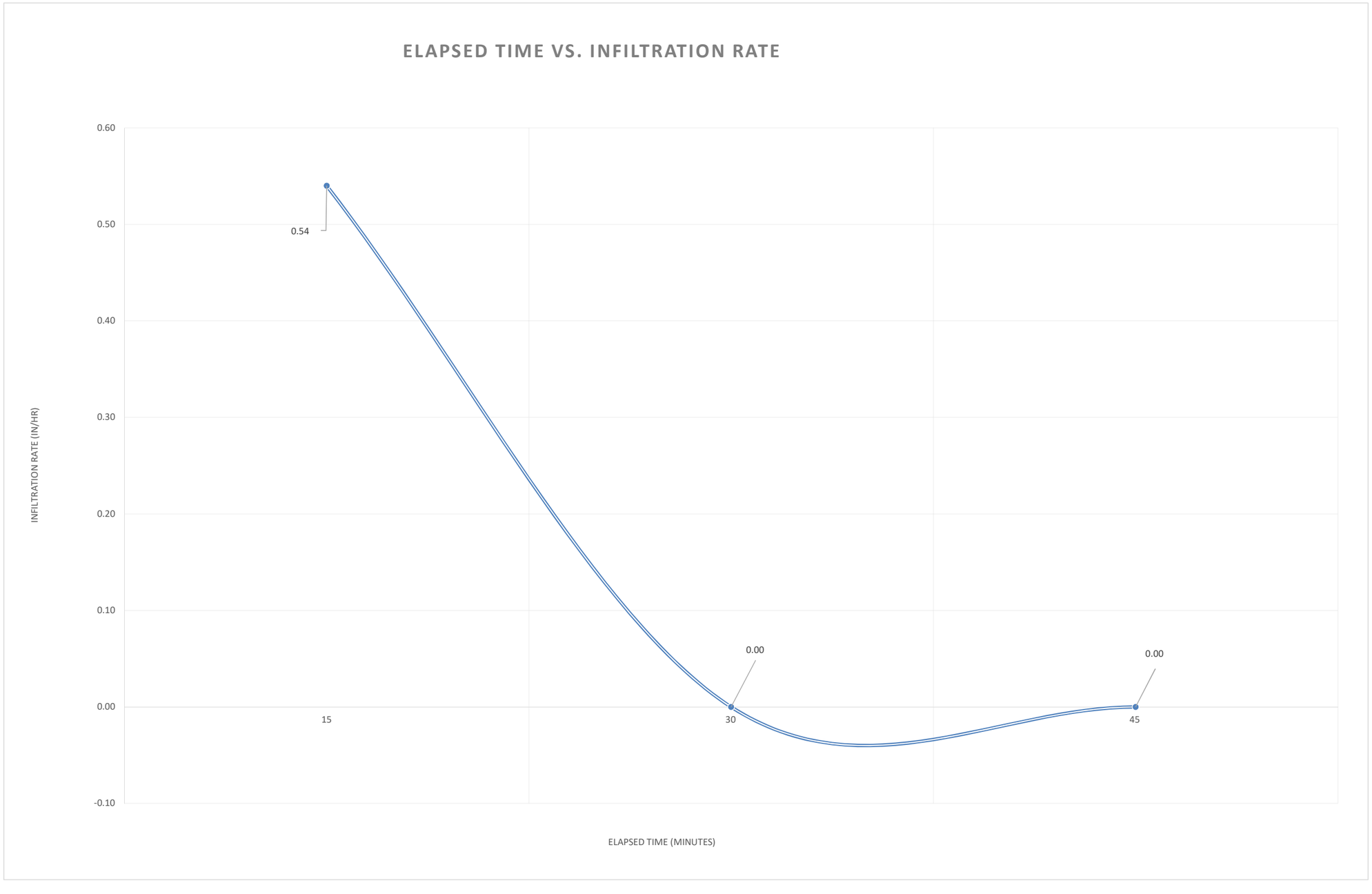

Reso A - Exhibit C2 (EIR Technical Appendix)

Test No.	DR-2	Location	See Map	Turf-Tec International - Record Chart for IN10-W - (12 & 24 Inch Infiltration Rings)

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Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT	Constants	Area cm2	Depth of Liquid (cm)	Liquid Container Number		Marriotte Tube Volume
Test Location:	DR-2	Inner Ring	729	10.0	1		3000
Liquid Used:	TAP WATE pH: 8.0	Annular Ring	2189	10.0	2		10000
Tested By:	rg /cr	Date 10/12/2018	Liquid level maintained	(X) Flow Valve ( ) Float Valve ( ) Mariotte Tubes			
Depth to water table:	> 20 Feet	Depth of Test 5'	Penetration Depth of Outer Ring:	9 cm			Other

Trial #	Start / End	Date MM/DD/YY	Time HR:MIN	Time Increment /(Total)	Elapsed Time (Min)	Flow Readings: Inner Ring Reading cm	Inner Maroitte Tube Flow (ml)	Annular Space Reading cm	Annular Space Marriotte Tube Flow (ml)	Liquid Temp ºF	Infiltration Rates: Inner Infiltration Rate cm/h	Inner Infiltration Rate In/h	Annular Infiltration Rate cm/h	Annular Infiltration Rate In/h	Ground Temperature: Ground Temp Depth (cm)	Temp at Depth (c)	Remarks: Weather conditions Etc...
	Start Test	10/12/2018	10:30	0:30	30	5.00		5.00									
1	End Test	10/12/2018	11:00	0:30		5.00	200	5.00	500		0.55	**0.22**	0.46	**0.18**			
	Start Test	10/12/2018	11:00	0:30	60	5.00		5.00									
2	End Test	10/12/2018	11:30	1:00		6.00	550	5.00	1000		1.51	**0.59**	0.91	**0.36**			
	Start Test	10/12/2018	11:30	0:30	90	5.00		5.00									
3	End Test	10/12/2018	12:00	1:30		5.00	1000	5.00	2000		2.74	**1.08**	1.83	**0.72**			
	Start Test	10/12/2018	12:00	0:30	120	5.00		5.00									
4	End Test	10/12/2018	12:30	2:00		5.00	750	5.00	2500		2.06	**0.81**	2.28	**0.90**			
	Start Test	10/12/2018	12:30	0:30	150	5.00		5.00									
5	End Test	10/12/2018	13:00	2:30		5.00	500	5.00	1500		1.37	**0.54**	1.37	**0.54**			
	Start Test	10/12/2018	13:00	0:30	180	5.00		5.00									
6	End Test	10/12/2018	13:30	3:00		5.00	500	5.00	1000		1.37	**0.54**	0.91	**0.36**			
	Start Test	10/12/2018	13:30	0:30	210	5.00		5.00									
7	End Test	10/12/2018	14:00	3:30		5.00	250	5.00	1000		0.69	**0.27**	0.91	**0.36**			
	Start Test	10/12/2018	14:00	0:30	240	0.00		5.00									
8	End Test	10/12/2018	14:30	4:00		5.00	250	5.00	1000		0.69	**0.27**	0.91	**0.36**			
	Start Test	10/12/2018	14:30	0:30	270	5.00		5.00									
9	End Test	10/12/2018	15:00	4:30		5.00	250	5.00	1000		0.69	**0.27**	0.91	**0.36**			
	Start Test	10/12/2018	15:00	0:30	300	5.00		5.00									
10	End Test	10/12/2018	15:30	5:00		5.00	250	5.00	1000		0.69	**0.27**	0.91	**0.36**			

Turf-Tec International

Reso A - Exhibit C2 (EIR Technical Appendix)

Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT		
Test Location:	DR-2		
Liquid Used:	TAP WATE	**pH:**	8.0
Tested By:	rg /cr		
Depth to water table:	> 20 Feet		

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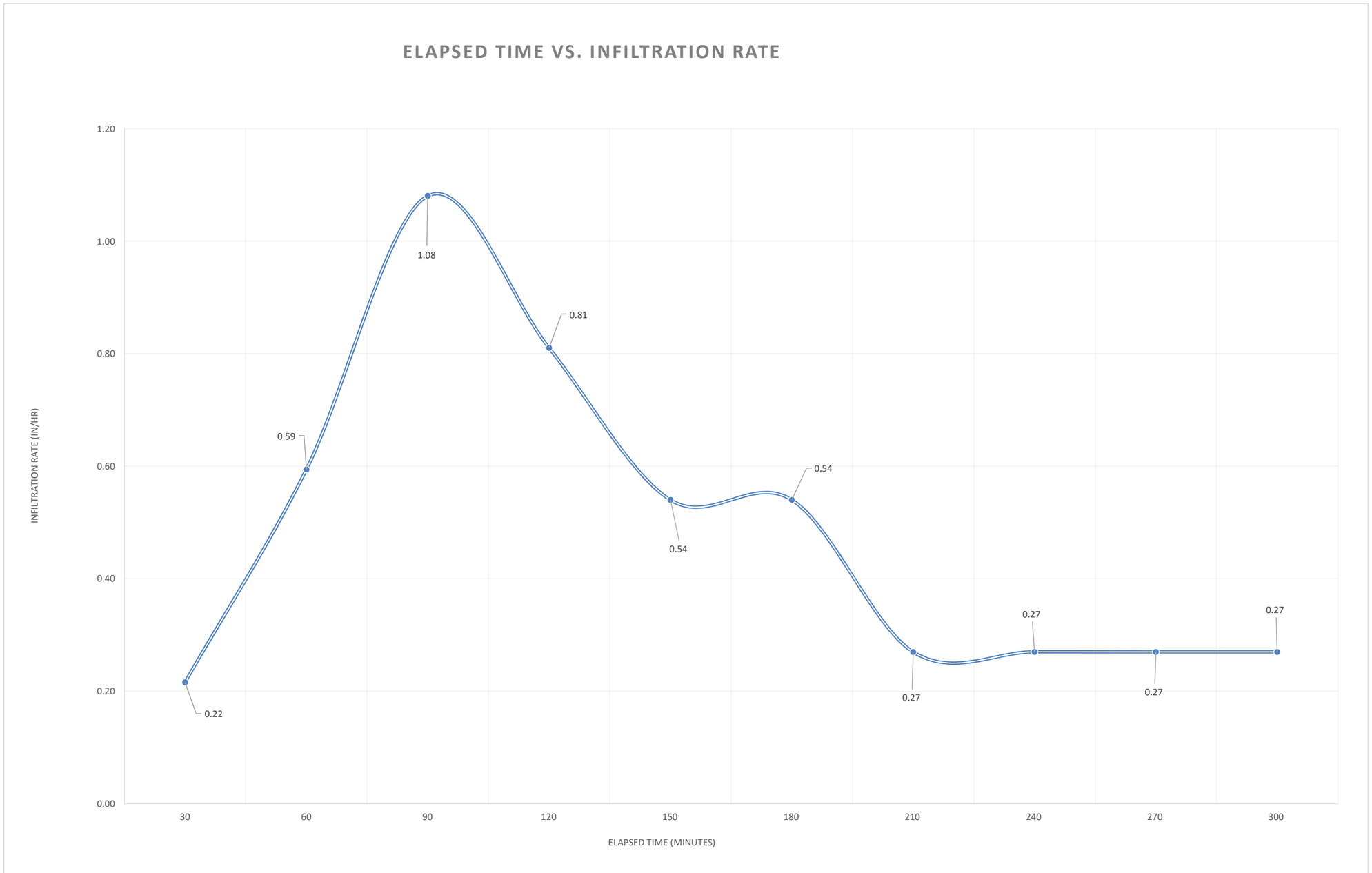

Reso A - Exhibit C2 (EIR Technical Appendix)

Test No.	DR-3	Location	See Map	Turf-Tec International - Record Chart for IN10-W - (12 & 24 Inch Infiltration Rings)

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Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT				Constants		Area cm2	Depth of Liquid (cm)	Liquid Container Number		Marriotte Tube Volume	
Test Location:	DR-3				Inner Ring		729	10.0	1		3000	
Liquid Used:	TAP WATE	pH:	8.0		Annular Ring		2189	10.0	2		10000	
Tested By:	rg / cr		Date			Liquid level maintained	(X) Flow Valve	( ) Float Valve	( ) Mariotte Tubes			
Depth to water table:	> 20 Feet		Depth of Test	5'		Penetration Depth of Outer Ring:		9 cm		Other		

Trial #	Start / End	Date MM/DD/YY	Time HR:MIN	Time Increment /(Total)	Elapsed Time (Min)	Flow Readings				Liquid Temp °F	Infiltration Rates				Ground Temperature		Remarks
						Inner Ring Reading cm	Inner Maroitte Tube Flow (ml)	Annular Space Reading cm	Annular Space Marriotte Tube Flow (ml)		Inner Infiltration Rate cm/h	Inner Infiltration Rate In/h	Annular Infiltration Rate cm/h	Annular Infiltration Rate In/h	Ground Temp Depth (cm)	Temp at Depth (c)	Weather conditions Etc...
1	Start Test	10/13/2018	9:00	0:30	30												
	End Test	10/13/2018	9:30	0:30		6.00	1000	6.00	2500		2.74	**1.08**	2.28	**0.90**			
2	Start Test	10/13/2018	9:30	0:30	60												
	End Test	10/13/2018	10:00	1:00		6.00	650	6.00	2000		1.78	**0.70**	1.83	**0.72**			
3	Start Test	10/13/2018	10:00	0:30	90												
	End Test	10/13/2018	10:30	1:30		6.00	750	6.00	1000		2.06	**0.81**	0.91	**0.36**			
4	Start Test	10/13/2018	10:30	0:30	120												
	End Test	10/13/2018	11:00	2:00		6.00	750	6.00	1000		2.06	**0.81**	0.91	**0.36**			
5	Start Test	10/13/2018	11:00	0:30	150												
	End Test	10/13/2018	11:30	2:30		6.00	500	6.00	2000		1.37	**0.54**	1.83	**0.72**			
6	Start Test	10/13/2018	11:30	0:30	180												
	End Test	10/13/2018	12:00	3:00		6.00	750	6.00	2000		2.06	**0.81**	1.83	**0.72**			
7	Start Test	10/13/2018	12:00	0:30	210												
	End Test	10/13/2018	12:30	3:30		6.00	500	6.00	2000		1.37	**0.54**	1.83	**0.72**			
8	Start Test	10/13/2018	12:30	0:30	240												
	End Test	10/13/2018	13:00	4:00		6.00	500	6.00	2000		1.37	**0.54**	1.83	**0.72**			
9	Start Test	10/13/2018	13:00	0:30	270												
	End Test	10/13/2018	13:30	4:30		6.00	500	6.00	2000		1.37	**0.54**	1.83	**0.72**			
10	Start Test	10/13/2018	13:30	0:30	300												
	End Test	10/13/2018	14:00	5:00		6.00	500	6.00	2000		1.37	**0.54**	1.83	**0.72**			

Turf-Tec International

Reso A - Exhibit C2 (EIR Technical Appendix)

Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT		
Test Location:	DR-3		
Liquid Used:	TAP WATE	**pH:**	8.0
Tested By:	rg / cr		
Depth to water table:	> 20 Feet		

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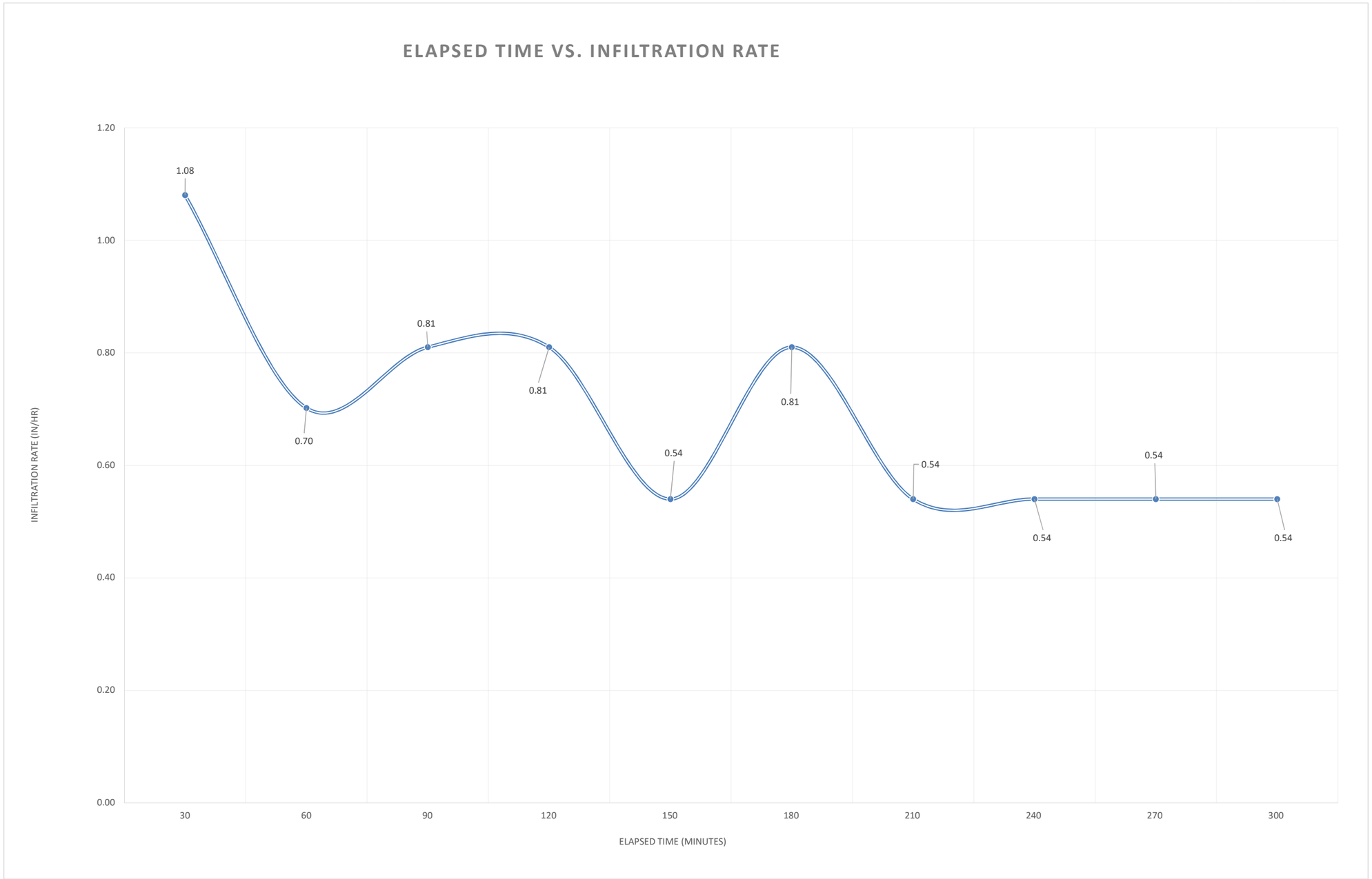

Reso A - Exhibit C2 (EIR Technical Appendix)

Test No.	DR-4	Location	See Map	Turf-Tec International - Record Chart for IN10-W - (12 & 24 Inch Infiltration Rings)

Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT				Constants	Area cm2	Depth of Liquid (cm)	Liquid Container Number		Marriotte Tube Volume	Earth Strata Geotechnical Services, Inc.
Test Location:	DR-4				Inner Ring	729	10.0	1		3000	Geotechnical, Environmental and Materials Testing Consultants
Liquid Used:	TAP WATE	pH:	8.0		Annular Ring	2189	10.0	2		10000	www.ESGSINC.com (951) 397-8315
Tested By:	rg / cr		Date	10/13/2018		Liquid level maintained	(X) Flow Valve	( ) Float Valve	( ) Mariotte Tubes		
Depth to water table:	> 20 Feet		Depth of Test	5'		Penetration Depth of Outer Ring:		9 cm		Other	

						Flow Readings					Infiltration Rates				Ground Temperature		Remarks
Trial #	Start / End	Date MM/DD/YY	Time HR:MIN	Time Increment /(Total)	Elapsed Time (Min)	Inner Ring Reading cm	Inner Maroitte Tube Flow (ml)	Annular Space Reading cm	Annular Space Marriotte Tube Flow (ml)	Liquid Temp °F	Inner Infiltration Rate cm/h	Inner Infiltration Rate In/h	Annular Infiltration Rate cm/h	Annular Infiltration Rate In/h	Ground Temp Depth (cm)	Temp at Depth (c)	Weather conditions Etc...
1	Start Test	10/13/2018	15:30	0:30	30	5.00		5.00									
	End Test	10/13/2018	16:00	0:30		5.00	750	5.00	2000		2.06	**0.81**	1.83	**0.72**			
2	Start Test	10/13/2018	16:00	0:30	60	5.00		5.00									
	End Test	10/13/2018	16:30	1:00		6.00	500	5.00	2000		1.37	**0.54**	1.83	**0.72**			
3	Start Test	10/13/2018	16:30	0:30	90	5.00		5.00									
	End Test	10/13/2018	17:00	1:30		5.00	250	5.00	1500		0.69	**0.27**	1.37	**0.54**			
4	Start Test	10/13/2018	17:00	0:30	120	5.00		5.00									
	End Test	10/13/2018	17:30	2:00		5.00	100	5.00	1500		0.27	**0.11**	1.37	**0.54**			
5	Start Test	10/13/2018	17:30	0:30	150	5.00		5.00									
	End Test	10/13/2018	18:00	2:30		5.00	100	5.00	1500		0.27	**0.11**	1.37	**0.54**			
6	Start Test	10/13/2018	18:00	0:30	180	5.00		5.00									
	End Test	10/13/2018	18:30	3:00		5.00	100	5.00	1000		0.27	**0.11**	0.91	**0.36**			
7	Start Test	10/13/2018	18:30	0:30	210	5.00		5.00									
	End Test	10/13/2018	19:00	3:30		5.00	0	5.00	1000		0.00	**0.00**	0.91	**0.36**			
8	Start Test	10/13/2018	19:00	0:30	240	5.00		5.00									
	End Test	10/13/2018	19:30	4:00		5.00	0	5.00	0		0.00	**0.00**	0.00	**0.00**			
9	Start Test	10/13/2018	19:30	0:30	270	5.00		5.00									
	End Test	10/13/2018	20:00	4:30		5.00	0	5.00	0		0.00	**0.00**	0.00	**0.00**			

Turf-Tec International

Reso A - Exhibit C2 (EIR Technical Appendix)

Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT		
Test Location:	DR-4		
Liquid Used:	TAP WATE	**pH:**	8.0
Tested By:	rg / cr		
Depth to water table:	> 20 Feet		

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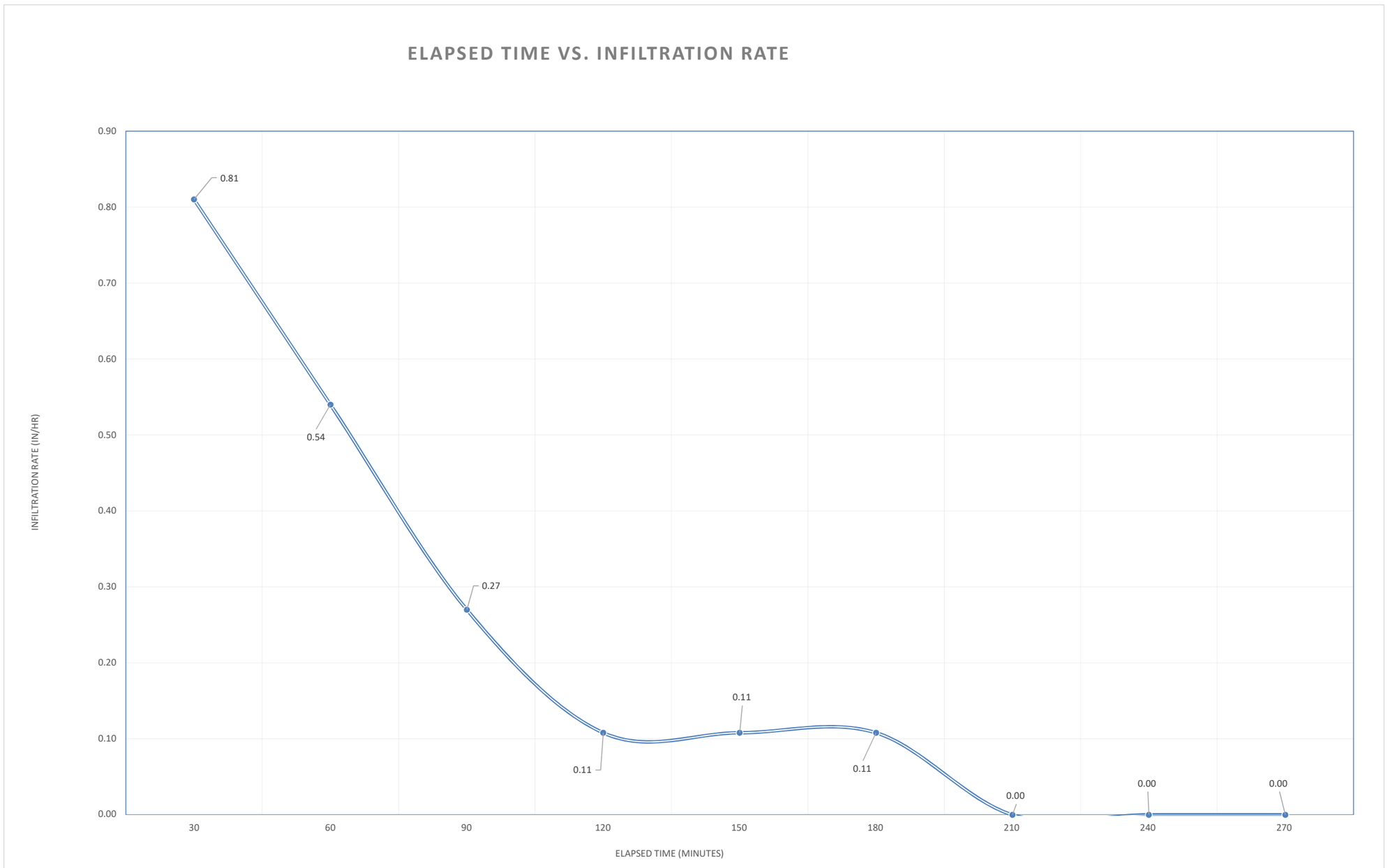

Reso A - Exhibit C2 (EIR Technical Appendix)

Test No.	DR-5	Location	See Map	Turf-Tec International - Record Chart for IN10-W - (12 & 24 Inch Infiltration Rings)

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Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT			Constants	Area cm2	Depth of Liquid (cm)	Liquid Container Number		Marriotte Tube Volume
Test Location:	DR-5			Inner Ring	729	10.0	1		3000
Liquid Used:	TAP WATE	pH:	8.0	Annular Ring	2189	10.0	2		10000
Tested By:	rg / cr	Date	10/14/2018	Liquid level maintained	(X) Flow Valve	( ) Float Valve	( ) Mariotte Tubes		
Depth to water table:	> 20 Feet	Depth of Test	5'	Penetration Depth of Outer Ring:	9 cm	Other			

						Flow Readings					Infiltration Rates				Ground Temperature		Remarks
Trial #	Start / End	Date MM/DD/YY	Time HR:MIN	Time Increment /(Total)	Elapsed Time (Min)	Inner Ring Reading cm	Inner Maroitte Tube Flow (ml)	Annular Space Reading cm	Annular Space Marriotte Tube Flow (ml)	Liquid Temp °F	Inner Infiltration Rate cm/h	Inner Infiltration Rate In/h	Annular Infiltration Rate cm/h	Annular Infiltration Rate In/h	Ground Temp Depth (cm)	Temp at Depth (c)	Weather conditions Etc...
1	Start Test	10/14/2018	13:00	0:30	30												
	End Test	10/14/2018	13:30	0:30		6.00	750	6.00	2000		2.06	**0.81**	1.83	**0.72**			
2	Start Test	10/14/2018	13:30	0:30	60												
	End Test	10/14/2018	14:00	1:00		6.00	750	6.00	4000		2.06	**0.81**	3.65	**1.44**			
3	Start Test	10/14/2018	14:00	0:30	90												
	End Test	10/14/2018	14:30	1:30		6.00	1000	6.00	4000		2.74	**1.08**	3.65	**1.44**			
4	Start Test	10/14/2018	14:30	0:30	120												
	End Test	10/14/2018	15:00	2:00		6.00	1000	6.00	3000		2.74	**1.08**	2.74	**1.08**			
5	Start Test	10/14/2018	15:00	0:30	150												
	End Test	10/14/2018	15:30	2:30		6.00	1000	6.00	3000		2.74	**1.08**	2.74	**1.08**			
6	Start Test	10/14/2018	15:30	0:30	180												
	End Test	10/14/2018	16:00	3:00		6.00	1000	6.00	2500		2.74	**1.08**	2.28	**0.90**			
7	Start Test	10/14/2018	16:00	0:30	210												
	End Test	10/14/2018	16:30	3:30		6.00	1000	6.00	3000		2.74	**1.08**	2.74	**1.08**			
8	Start Test	10/14/2018	16:30	0:30	240												
	End Test	10/14/2018	17:00	4:00		6.00	1000	6.00	3000		2.74	**1.08**	2.74	**1.08**			

Turf-Tec International

Reso A - Exhibit C2 (EIR Technical Appendix)

Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT		
Test Location:	DR-5		
Liquid Used:	TAP WATE	**pH:**	8.0
Tested By:	rg / cr		
Depth to water table:	> 20 Feet		

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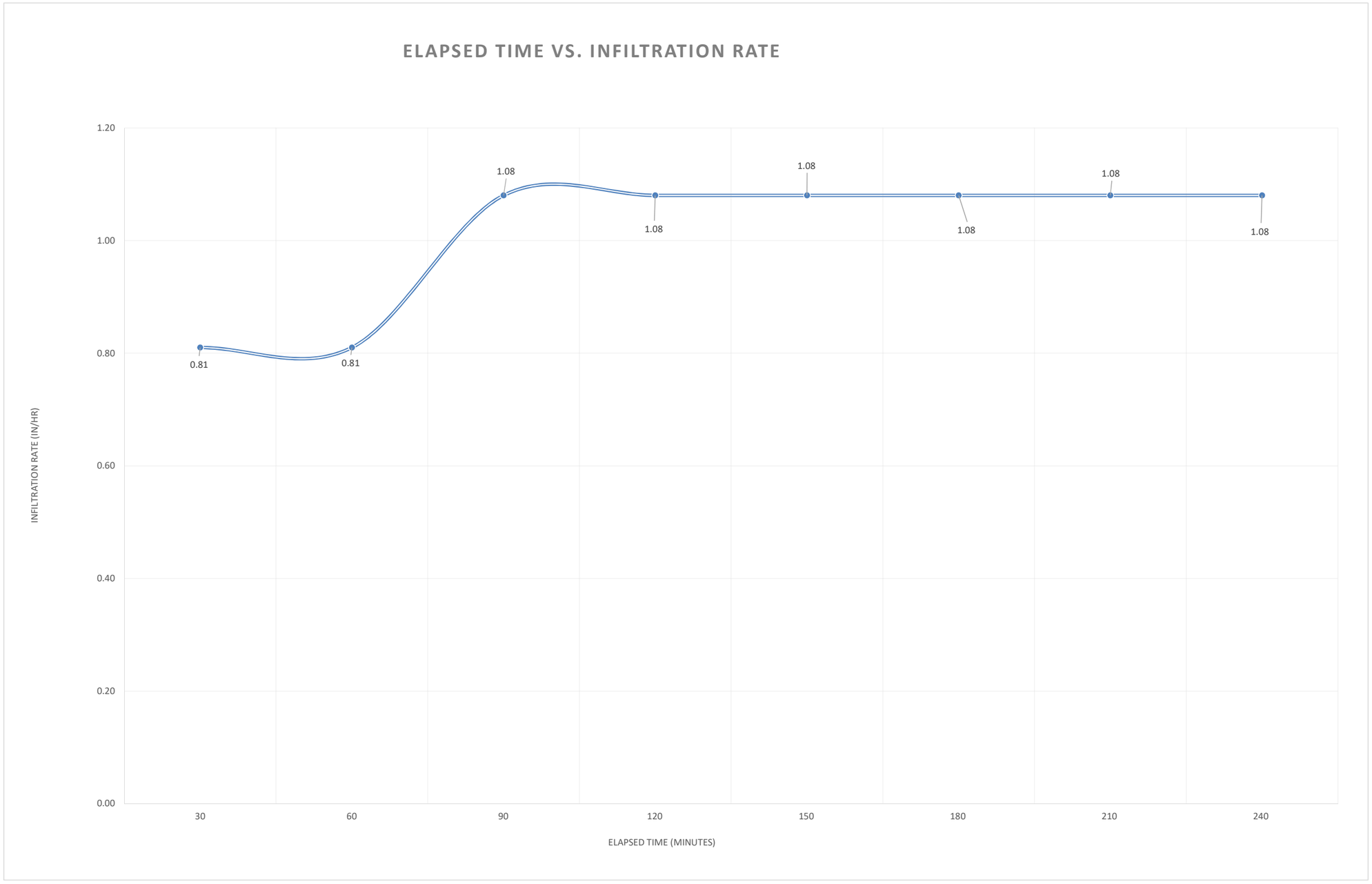

Reso A - Exhibit C2 (EIR Technical Appendix)

Test No.	DR-6	Location	See Map	Turf-Tec International - Record Chart for IN10-W - (12 & 24 Inch Infiltration Rings)

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Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT				Constants	Area cm2	Depth of Liquid (cm)	Liquid Container Number		Marriotte Tube Volume	
Test Location:	DR-6				Inner Ring	729	10.0	1		3000	
Liquid Used:	TAP WATE	pH:	8.0		Annular Ring	2189	10.0	2		10000	
Tested By:	rg / cr		Date	10/13/2018	Liquid level maintained	(X) Flow Valve	( ) Float Valve	( ) Mariotte Tubes			
Depth to water table:	> 20 Feet		Depth of Test	4.5'	Penetration Depth of Outer Ring:		9 cm			Other	

Trial #	Start / End	Date MM/DD/YY	Time HR:MIN	Time Increment /(Total)	Elapsed Time (Min)	Flow Readings: Inner Ring Reading cm	Inner Maroitte Tube Flow (ml)	Annular Space Reading cm	Annular Space Marriotte Tube Flow (ml)	Liquid Temp °F	Infiltration Rates: Inner Infiltration Rate cm/h	Inner Infiltration Rate In/h	Annular Infiltration Rate cm/h	Annular Infiltration Rate In/h	Ground Temperature: Ground Temp Depth (cm)	Temp at Depth (c)	Remarks: Weather conditions Etc...
	Start Test	10/13/2018	11:45	0:30	30	5.00		5.00									
1	End Test	10/13/2018	12:15	0:30		5.00	250	5.00	2000		0.69	**0.27**	1.83	**0.72**			
	Start Test	10/13/2018	12:15	0:30	60	5.00		5.00									
2	End Test	10/13/2018	12:45	1:00		6.00	100	5.00	3000		0.27	**0.11**	2.74	**1.08**			
	Start Test	10/13/2018	12:45	0:30	90	5.00		5.00									
3	End Test	10/13/2018	13:15	1:30		5.00	100	5.00	2000		0.27	**0.11**	1.83	**0.72**			
	Start Test	10/13/2018	13:15	0:30	120	5.00		5.00									
4	End Test	10/13/2018	13:45	2:00		5.00	100	5.00	2000		0.27	**0.11**	1.83	**0.72**			
	Start Test	10/13/2018	13:45	0:30	150	5.00		5.00									
5	End Test	10/13/2018	14:15	2:30		5.00	100	5.00	2000		0.27	**0.11**	1.83	**0.72**			
	Start Test	10/13/2018	14:15	0:30	180	5.00		5.00									
6	End Test	10/13/2018	14:45	3:00		5.00	250	5.00	2000		0.69	**0.27**	1.83	**0.72**			
	Start Test	10/13/2018	14:45	0:30	210	5.00		5.00									
7	End Test	10/13/2018	15:15	3:30		5.00	250	5.00	3000		0.69	**0.27**	2.74	**1.08**			
	Start Test	10/13/2018	15:15	0:30	240	5.00		5.00									
8	End Test	10/13/2018	15:45	4:00		5.00	250	5.00	3000		0.69	**0.27**	2.74	**1.08**			

Turf-Tec International

Reso A - Exhibit C2 (EIR Technical Appendix)

Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT		
Test Location:	DR-6		
Liquid Used:	TAP WATE	**pH:**	8.0
Tested By:	rg / cr		
Depth to water table:	> 20 Feet		

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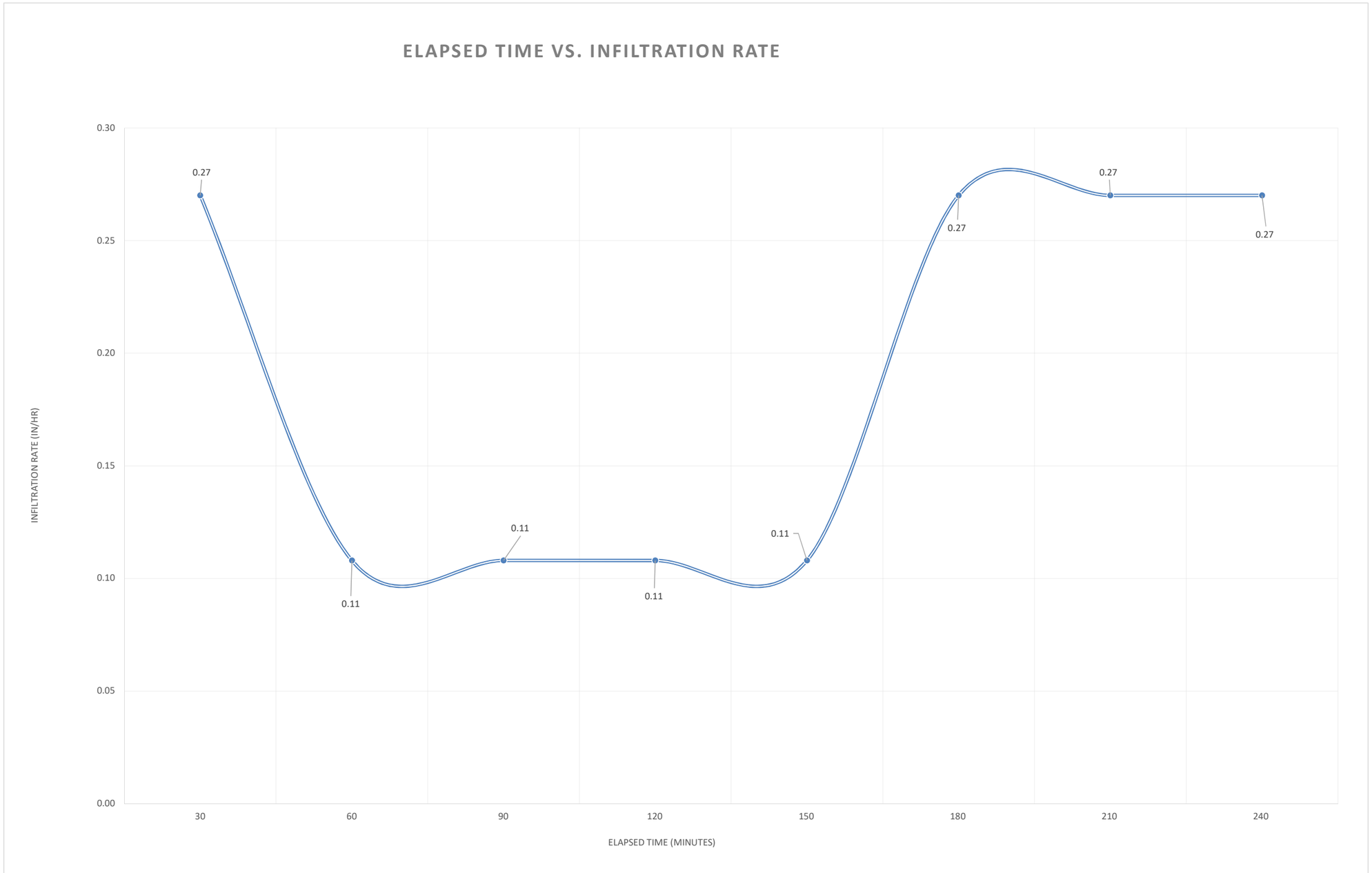

Reso A - Exhibit C2 (EIR Technical Appendix)

Test No.	DR-7	Location	See Map	Turf-Tec International - Record Chart for IN10-W - (12 & 24 Inch Infiltration Rings)

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Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT					Constants	Area cm2	Depth of Liquid (cm)	Liquid Container Number		Marriotte Tube Volume	
Test Location:	DR-7					Inner Ring	729	10.0	1		3000	
Liquid Used:	TAP WATE	pH:	8.0			Annular Ring	2189	10.0	2		10000	
Tested By:	rg / cr		Date	10/12/2018		Liquid level maintained	(X) Flow Valve	( ) Float Valve	( ) Mariotte Tubes			
Depth to water table:	> 20 Feet		Depth of Test	5'		Penetration Depth of Outer Ring:	9 cm		Other			

Trial #	Start / End	Date MM/DD/YY	Time HR:MIN	Time Increment /(Total)	Elapsed Time (Min)	Flow Readings: Inner Ring Reading cm	Flow Readings: Inner Maroitte Tube Flow (ml)	Flow Readings: Annular Space Reading cm	Flow Readings: Annular Space Marriotte Tube Flow (ml)	Liquid Temp °F	Infiltration Rates: Inner Infiltration Rate cm/h	Infiltration Rates: Inner Infiltration Rate In/h	Infiltration Rates: Annular Infiltration Rate cm/h	Infiltration Rates: Annular Infiltration Rate In/h	Ground Temperature: Ground Temp Depth (cm)	Ground Temperature: Temp at Depth (c)	Remarks: Weather conditions Etc...
1	Start Test	10/12/2018	16:15	0:30	30	5.00		5.00									
	End Test	10/12/2018	16:45	0:30		5.00	1000	5.00	2500		2.74	**1.08**	2.28	**0.90**			
2	Start Test	10/12/2018	16:45	0:30	60	5.00		5.00									
	End Test	10/12/2018	17:15	1:00		6.00	500	5.00	2500		1.37	**0.54**	2.28	**0.90**			
3	Start Test	10/12/2018	17:15	0:30	90	5.00		5.00									
	End Test	10/12/2018	17:45	1:30		5.00	500	5.00	2000		1.37	**0.54**	1.83	**0.72**			
4	Start Test	10/12/2018	17:45	0:30	120	5.00		5.00									
	End Test	10/12/2018	18:15	2:00		5.00	250	5.00	2000		0.69	**0.27**	1.83	**0.72**			
5	Start Test	10/12/2018	18:15	0:30	150	5.00		5.00									
	End Test	10/12/2018	18:45	2:30		5.00	100	5.00	1500		0.27	**0.11**	1.37	**0.54**			
6	Start Test	10/12/2018	18:45	0:30	180	5.00		5.00									
	End Test	10/12/2018	19:15	3:00		5.00	100	5.00	1500		0.27	**0.11**	1.37	**0.54**			
7	Start Test	10/12/2018	19:15	0:30	210	5.00		5.00									
	End Test	10/12/2018	19:45	3:30		5.00	100	5.00	1500		0.27	**0.11**	1.37	**0.54**			
8	Start Test	10/12/2018	19:45	0:30	240	0.00		5.00									
	End Test	10/12/2018	20:15	4:00		5.00	100	5.00	1500		0.27	**0.11**	1.37	**0.54**			

Turf-Tec International

Reso A - Exhibit C2 (EIR Technical Appendix)

Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT		
Test Location:	DR-7		
Liquid Used:	TAP WATE	**pH:**	8.0
Tested By:	rg / cr		
Depth to water table:	> 20 Feet		

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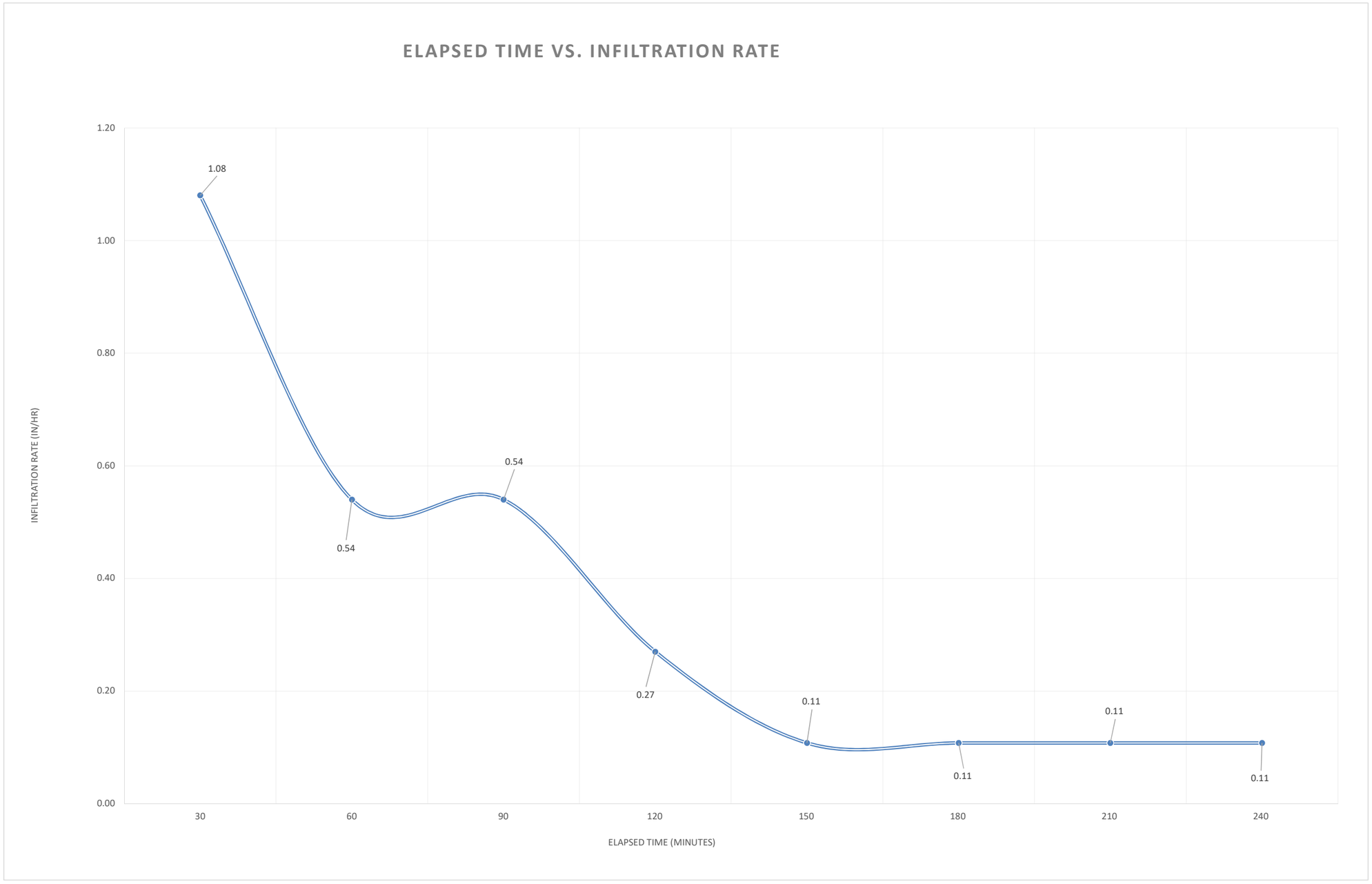

Test No.	DR-8	Location	See Map	Turf-Tec International - Record Chart for IN10-W - (12 & 24 Inch Infiltration Rings)

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Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT	Constants	Area cm2	Depth of Liquid (cm)	Liquid Container Number	Marriotte Tube Volume
Test Location:	DR-8	Inner Ring	729	10.0	1	3000
Liquid Used:	TAP WATE pH: 8.0	Annular Ring	2189	10.0	2	10000
Tested By:	rg / cr Date	Liquid level maintained	(X) Flow Valve ( ) Float Valve ( ) Mariotte Tubes			
Depth to water table:	> 20 Feet Depth of Test 5'	Penetration Depth of Outer Ring:	9 cm	Other		

Trial #	Start / End	Date MM/DD/YY	Time HR:MIN	Time Increment /(Total)	Elapsed Time (Min)	Flow Readings: Inner Ring Reading cm	Inner Maroitte Tube Flow (ml)	Annular Space Reading cm	Annular Space Marriotte Tube Flow (ml)	Liquid Temp ºF	Infiltration Rates: Inner Infiltration Rate cm/h	Inner Infiltration Rate In/h	Annular Infiltration Rate cm/h	Annular Infiltration Rate In/h	Ground Temperature: Ground Temp Depth (cm)	Temp at Depth (c)	Remarks: Weather conditions Etc...
	Start Test	10/16/2018	17:15	0:30	30	5.00		5.00									
1	End Test	10/16/2018	17:45	0:30		5.00	500	5.00	3000		1.37	**0.54**	2.74	**1.08**			
	Start Test	10/16/2018	17:45	0:30	60	5.00		5.00									
2	End Test	10/16/2018	18:15	1:00		6.00	500	5.00	3000		1.37	**0.54**	2.74	**1.08**			
	Start Test	10/16/2018	18:15	0:30	90	5.00		5.00									
3	End Test	10/16/2018	18:45	1:30		5.00	400	5.00	2500		1.10	**0.43**	2.28	**0.90**			
	Start Test	10/16/2018	18:45	0:30	120	5.00		5.00									
4	End Test	10/16/2018	19:15	2:00		5.00	400	5.00	2500		1.10	**0.43**	2.28	**0.90**			
	Start Test	10/16/2018	19:15	0:30	150	5.00		5.00									
5	End Test	10/16/2018	19:45	2:30		5.00	400	5.00	3000		1.10	**0.43**	2.74	**1.08**			
	Start Test	10/16/2018	19:45	0:30	180	5.00		5.00									
6	End Test	10/16/2018	20:15	3:00		5.00	400	5.00	3000		1.10	**0.43**	2.74	**1.08**			
	Start Test	10/16/2018	20:15	0:30	210	5.00		5.00									
7	End Test	10/16/2018	20:45	3:30		5.00	400	5.00	2500		1.10	**0.43**	2.28	**0.90**			
	Start Test	10/16/2018	20:45	0:30	240	0.00		5.00									
8	End Test	10/16/2018	21:15	4:00		5.00	400	5.00	2500		1.10	**0.43**	2.28	**0.90**			

Turf-Tec International

Reso A - Exhibit C2 (EIR Technical Appendix)

Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT		
Test Location:	DR-8		
Liquid Used:	TAP WATE	**pH:**	8.0
Tested By:	rg / cr		
Depth to water table:	> 20 Feet		

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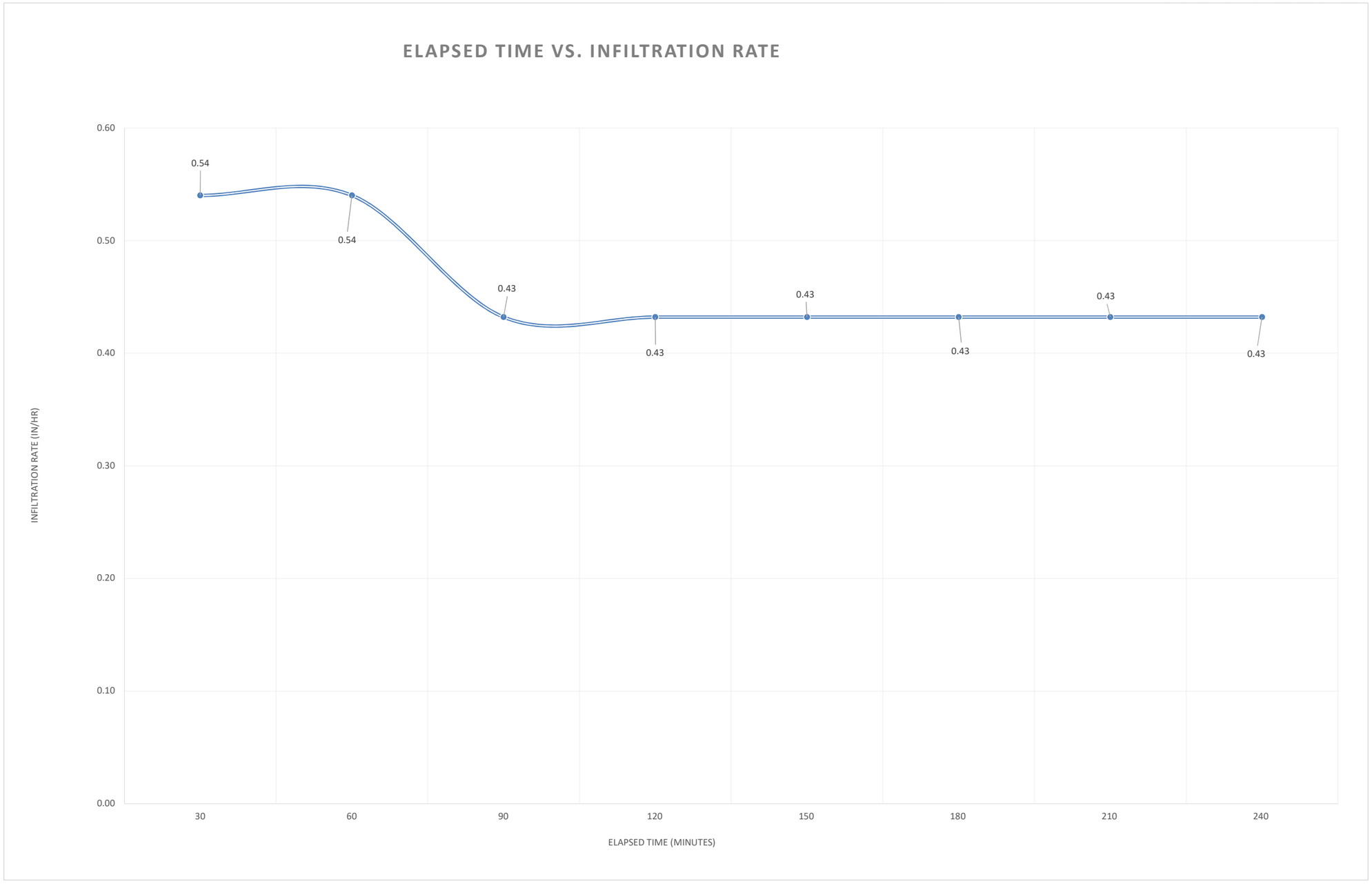

Reso A - Exhibit C2 (EIR Technical Appendix)

Test No.	DR-9	Location	See Map	Turf-Tec International - Record Chart for IN10-W - (12 & 24 Inch Infiltration Rings)

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Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT				Constants	Area cm2	Depth of Liquid (cm)	Liquid Container Number		Marriotte Tube Volume	
Test Location:	DR-9				Inner Ring	729	10.0	1		3000	
Liquid Used:	TAP WATE	pH:	8.0		Annular Ring	2189	10.0	2		10000	
Tested By:	rg / cr		Date	10/17/2018	Liquid level maintained	(X) Flow Valve	( ) Float Valve	( ) Mariotte Tubes			
Depth to water table:	> 20 Feet		Depth of Test	5'	Penetration Depth of Outer Ring:		9 cm			Other	

						Flow Readings					Infiltration Rates				Ground Temperature		Remarks
Trial #	Start / End	Date MM/DD/YY	Time HR:MIN	Time Increment /(Total)	Elapsed Time (Min)	Inner Ring Reading cm	Inner Maroitte Tube Flow (ml)	Annular Space Reading cm	Annular Space Marriotte Tube Flow (ml)	Liquid Temp °F	Inner Infiltration Rate cm/h	Inner Infiltration Rate In/h	Annular Infiltration Rate cm/h	Annular Infiltration Rate In/h	Ground Temp Depth (cm)	Temp at Depth (c)	Weather conditions Etc...
1	Start Test	10/17/2018	11:00	0:30	30	5.00		5.00									
	End Test	10/17/2018	11:30	0:30		5.00	625	5.00	2500		1.71	**0.68**	2.28	**0.90**			
2	Start Test	10/17/2018	11:30	0:30	60	5.00		5.00									
	End Test	10/17/2018	12:00	1:00		6.00	100	5.00	2500		0.27	**0.11**	2.28	**0.90**			
3	Start Test	10/17/2018	12:00	0:30	90	5.00		5.00									
	End Test	10/17/2018	12:30	1:30		5.00	250	5.00	2500		0.69	**0.27**	2.28	**0.90**			
4	Start Test	10/17/2018	12:30	0:30	120	5.00		5.00									
	End Test	10/17/2018	13:00	2:00		5.00	250	5.00	1500		0.69	**0.27**	1.37	**0.54**			
5	Start Test	10/17/2018	13:00	0:30	150	5.00		5.00									
	End Test	10/17/2018	13:30	2:30		5.00	250	5.00	1500		0.69	**0.27**	1.37	**0.54**			
6	Start Test	10/17/2018	13:30	0:30	180	5.00		5.00									
	End Test	10/17/2018	14:00	3:00		5.00	250	5.00	1500		0.69	**0.27**	1.37	**0.54**			
7	Start Test	10/17/2018	14:00	0:30	210	5.00		5.00									
	End Test	10/17/2018	14:30	3:30		5.00	250	5.00	1500		0.69	**0.27**	1.37	**0.54**			
8	Start Test	10/17/2018	14:30	0:30	240	0.00		5.00									
	End Test	10/17/2018	15:00	4:00		5.00	250	5.00	1500		0.69	**0.27**	1.37	**0.54**			

Turf-Tec International

Reso A - Exhibit C2 (EIR Technical Appendix)

Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT		
Test Location:	DR-9		
Liquid Used:	TAP WATE	**pH:**	8.0
Tested By:	rg / cr		
Depth to water table:	> 20 Feet		

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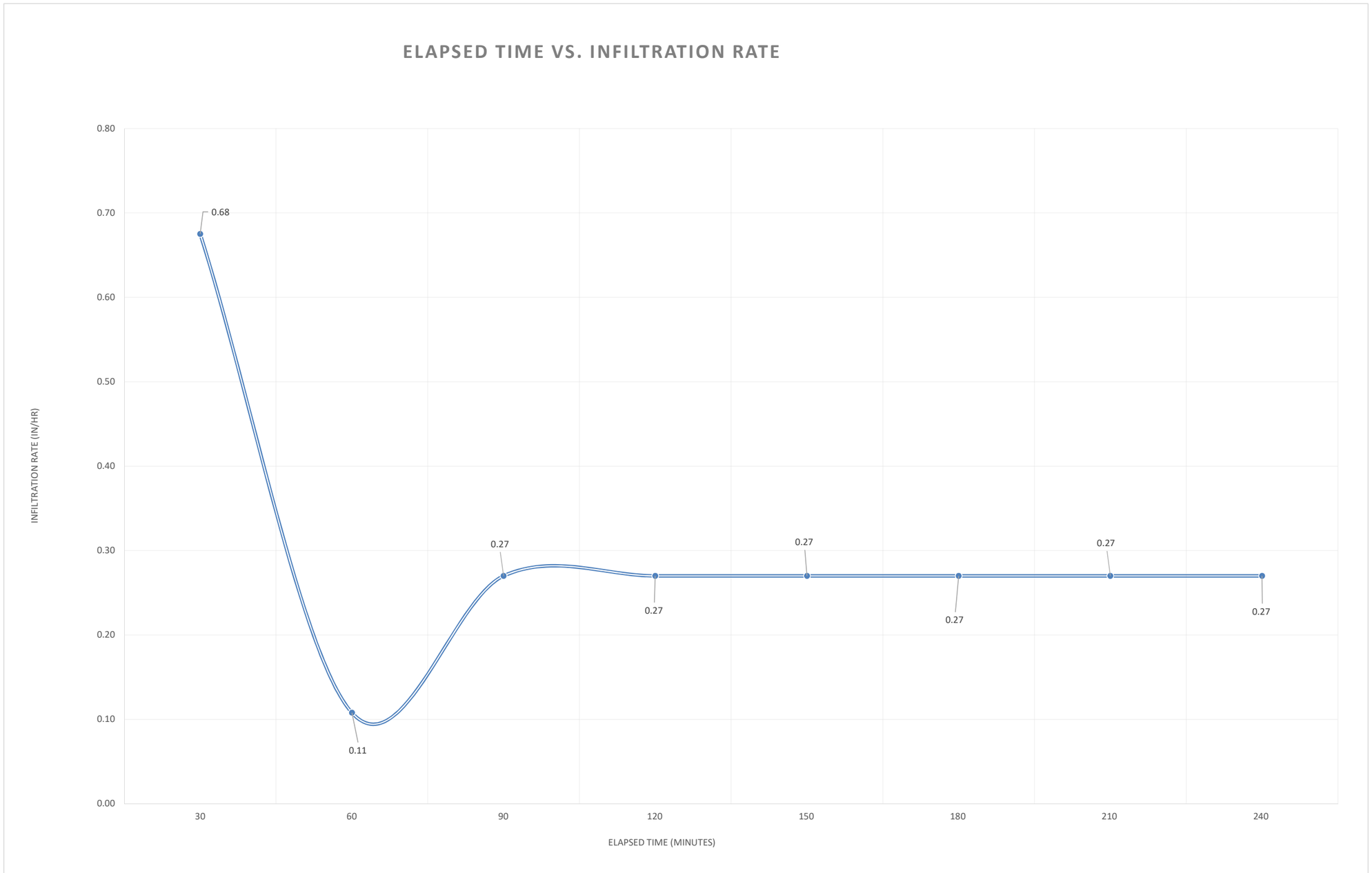

Reso A - Exhibit C2 (EIR Technical Appendix)

Test No.	DR-10	Location	See Map	Turf-Tec International - Record Chart for IN10-W - (12 & 24 Inch Infiltration Rings)

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Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT				Constants	Area cm2	Depth of Liquid (cm)	Liquid Container Number		Marriotte Tube Volume
Test Location:	DR-10				Inner Ring	729	10.0	1		3000
Liquid Used:	TAP WATE	pH:	8.0		Annular Ring	2189	10.0	2		10000
Tested By:	rg / cr		Date	10/17/2018	Liquid level maintained	(X) Flow Valve	( ) Float Valve	( ) Mariotte Tubes		
Depth to water table:	> 20 Feet		Depth of Test	5'	Penetration Depth of Outer Ring:	9 cm		Other		

Trial #	Start / End	Date MM/DD/YY	Time HR:MIN	Time Increment /(Total)	Elapsed Time (Min)	Flow Readings: Inner Ring Reading cm	Inner Maroitte Tube Flow (ml)	Annular Space Reading cm	Annular Space Marriotte Tube Flow (ml)	Liquid Temp °F	Infiltration Rates: Inner Infiltration Rate cm/h	Inner Infiltration Rate In/h	Annular Infiltration Rate cm/h	Annular Infiltration Rate In/h	Ground Temperature: Ground Temp Depth (cm)	Temp at Depth (c)	Remarks: Weather conditions Etc...
	Start Test	10/17/2018	15:00	0:30	30	5.00		5.00									
1	End Test	10/17/2018	15:30	0:30		5.00	750	5.00	1000		2.06	**0.81**	0.91	**0.36**			
	Start Test	10/17/2018	15:30	0:30	60	5.00		5.00									
2	End Test	10/17/2018	16:00	1:00		6.00	1000	5.00	1500		2.74	**1.08**	1.37	**0.54**			
	Start Test	10/17/2018	16:00	0:30	90	5.00		5.00									
3	End Test	10/17/2018	16:30	1:30		5.00	1000	5.00	500		2.74	**1.08**	0.46	**0.18**			
	Start Test	10/17/2018	16:30	0:30	120	5.00		5.00									
4	End Test	10/17/2018	17:00	2:00		5.00	1000	5.00	500		2.74	**1.08**	0.46	**0.18**			
	Start Test	10/17/2018	17:00	0:30	150	5.00		5.00									
5	End Test	10/17/2018	17:30	2:30		5.00	1000	5.00	500		2.74	**1.08**	0.46	**0.18**			
	Start Test	10/17/2018	17:30	0:30	180	5.00		5.00									
6	End Test	10/17/2018	18:00	3:00		5.00	1000	5.00	500		2.74	**1.08**	0.46	**0.18**			
	Start Test	10/17/2018	18:00	0:30	210	5.00		5.00									
7	End Test	10/17/2018	18:30	3:30		5.00	1000	5.00	500		2.74	**1.08**	0.46	**0.18**			
	Start Test	10/17/2018	18:30	0:30	240	0.00		5.00									
8	End Test	10/17/2018	19:00	4:00		5.00	1000	5.00	500		2.74	**1.08**	0.46	**0.18**			

Turf-Tec International

Reso A - Exhibit C2 (EIR Technical Appendix)

Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT		
Test Location:	DR-10		
Liquid Used:	TAP WATE	**pH:**	8.0
Tested By:	rg / cr		
Depth to water table:	> 20 Feet		

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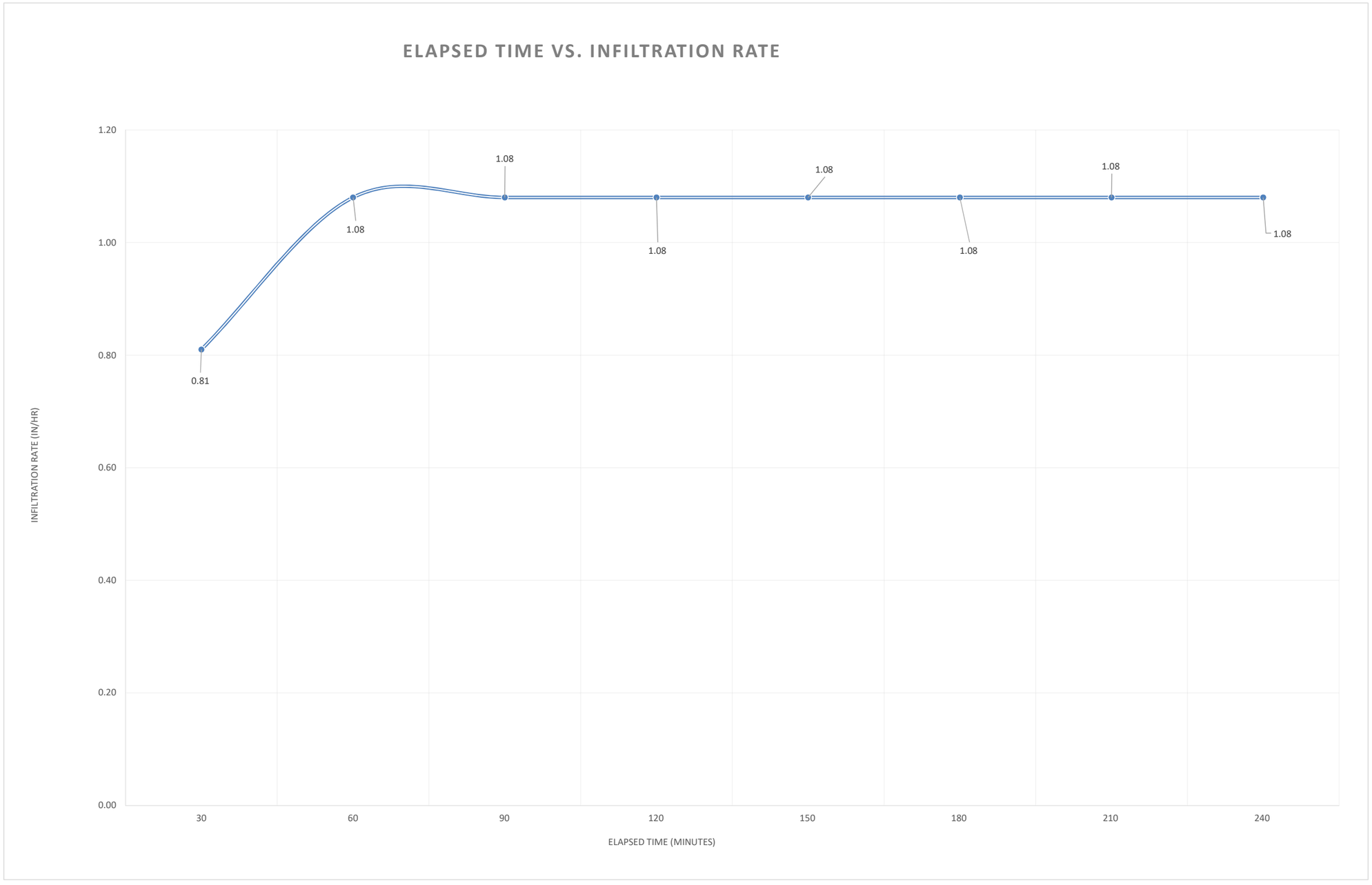

Reso A - Exhibit C2 (EIR Technical Appendix)

Test No.	DR-11	Location	See Map	Turf-Tec International - Record Chart for IN10-W - (12 & 24 Inch Infiltration Rings)

Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT			Constants	Area cm2	Depth of Liquid (cm)	Liquid Container Number		Marriotte Tube Volume	Earth Strata Geotechnical Services, Inc.	
Test Location:	DR-11			Inner Ring	729	10.0	1		3000	Geotechnical, Environmental and Materials Testing Consultants	
Liquid Used:	TAP WATE	pH:	8.0	Annular Ring	2189	10.0	2		10000	www.ESGSINC.com (951) 397-8315	
Tested By:	rg / cr	Date	11/20/2018	Liquid level maintained	(X) Flow Valve	( ) Float Valve	( ) Mariotte Tubes				
Depth to water table:	> 20 Feet	Depth of Test	5'	Penetration Depth of Outer Ring:	9 cm	Other					

						Flow Readings					Infiltration Rates				Ground Temperature		Remarks
Trial #	Start / End	Date MM/DD/YY	Time HR:MIN	Time Increment /(Total)	Elapsed Time (Min)	Inner Ring Reading cm	Inner Maroitte Tube Flow (ml)	Annular Space Reading cm	Annular Space Marriotte Tube Flow (ml)	Liquid Temp °F	Inner Infiltration Rate cm/h	Inner Infiltration Rate In/h	Annular Infiltration Rate cm/h	Annular Infiltration Rate In/h	Ground Temp Depth (cm)	Temp at Depth (c)	Weather conditions Etc...
1	Start Test	11/20/2018	9:30	0:30	30	5.00		5.00									
	End Test	11/20/2018	10:00	0:30		5.00	250	5.00	500		0.69	**0.27**	0.46	**0.18**			
2	Start Test	11/20/2018	10:00	0:30	60	5.00		5.00									
	End Test	11/20/2018	10:30	1:00		6.00	0	5.00	0		0.00	**0.00**	0.00	**0.00**			
3	Start Test	11/20/2018	10:30	0:30	90	5.00		5.00									
	End Test	11/20/2018	11:00	1:30		5.00	0	5.00	0		0.00	**0.00**	0.00	**0.00**			
4	Start Test	11/20/2018	11:00	0:30	120	5.00		5.00									
	End Test	11/20/2018	11:30	2:00		5.00	0	5.00	0		0.00	**0.00**	0.00	**0.00**			
5	Start Test	11/20/2018	11:30	0:30	150	5.00		5.00									
	End Test	11/20/2018	12:00	2:30		5.00	0	5.00	0		0.00	**0.00**	0.00	**0.00**			
6	Start Test	11/20/2018	12:00	0:30	180	5.00		5.00									
	End Test	11/20/2018	12:30	3:00		5.00	0	5.00	0		0.00	**0.00**	0.00	**0.00**			
7	Start Test	11/20/2018	12:30	0:30	210	5.00		5.00									
	End Test	11/20/2018	13:00	3:30		5.00	0	5.00	0		0.00	**0.00**	0.00	**0.00**			
8	Start Test	11/20/2018	13:00	0:30	240	0.00		5.00									
	End Test	11/20/2018	13:30	4:00		5.00	0	5.00	0		0.00	**0.00**	0.00	**0.00**			

Turf-Tec International

Reso A - Exhibit C2 (EIR Technical Appendix)

Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT		
Test Location:	DR-11		
Liquid Used:	TAP WATE	**pH:**	8.0
Tested By:	rg / cr		
Depth to water table:	> 20 Feet		

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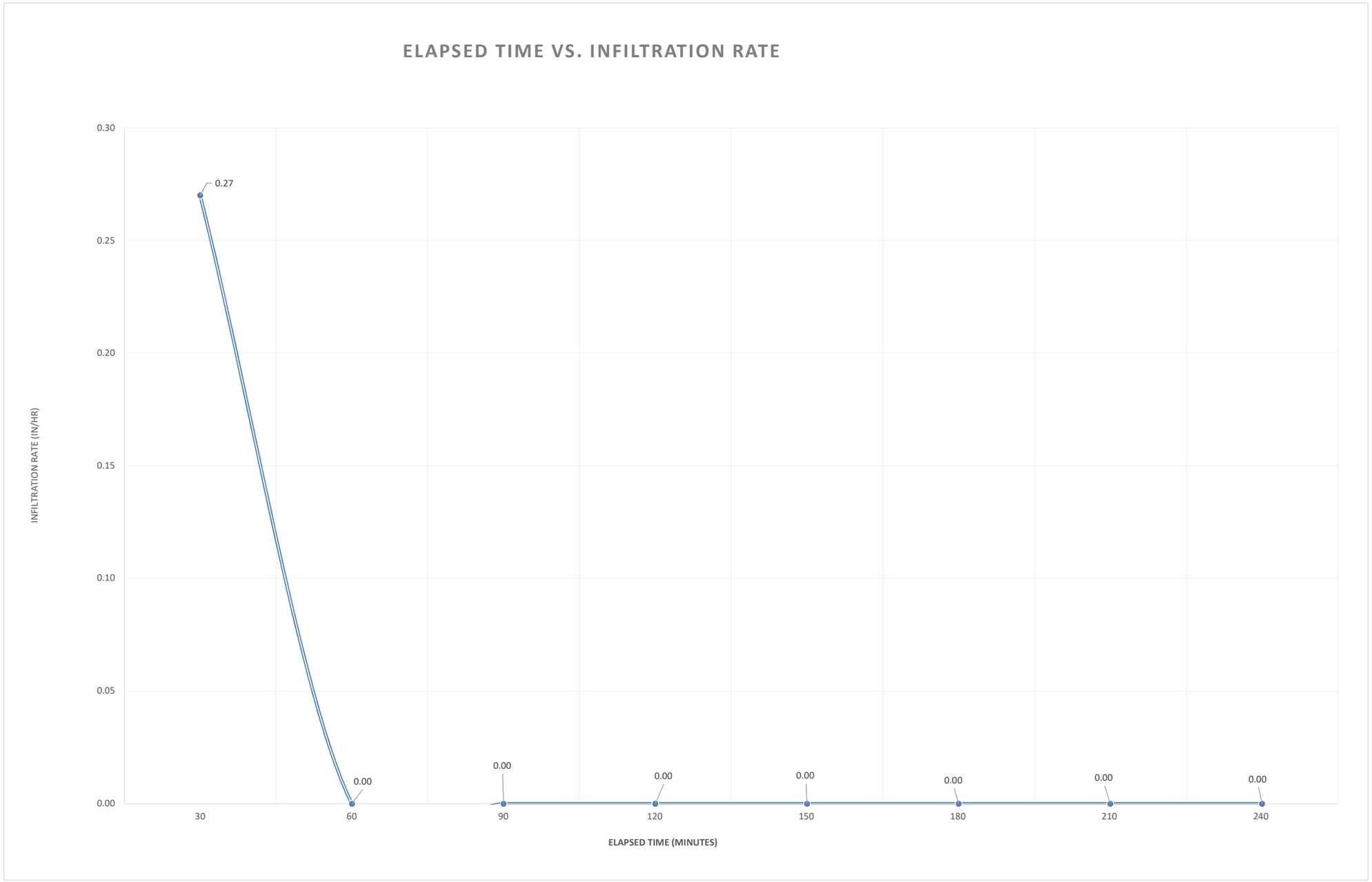

Reso A - Exhibit C2 (EIR Technical Appendix)

Test No.	DR-12	Location	See Map	Turf-Tec International - Record Chart for IN10-W - (12 & 24 Inch Infiltration Rings)

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Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT				Constants	Area cm2	Depth of Liquid (cm)	Liquid Container Number		Marriotte Tube Volume	
Test Location:	DR-12				Inner Ring	729	10.0	1		3000	
Liquid Used:	TAP WATE	pH:	8.0		Annular Ring	2189	10.0	2		10000	
Tested By:	rg / cr		Date	11/20/2018	Liquid level maintained	(X) Flow Valve	( ) Float Valve	( ) Mariotte Tubes			
Depth to water table:	> 20 Feet		Depth of Test	5'	Penetration Depth of Outer Ring:		9 cm			Other	

						Flow Readings					Infiltration Rates				Ground Temperature		Remarks
Trial #	Start / End	Date MM/DD/YY	Time HR:MIN	Time Increment /(Total)	Elapsed Time (Min)	Inner Ring Reading cm	Inner Maroitte Tube Flow (ml)	Annular Space Reading cm	Annular Space Marriotte Tube Flow (ml)	Liquid Temp °F	Inner Infiltration Rate cm/h	Inner Infiltration Rate In/h	Annular Infiltration Rate cm/h	Annular Infiltration Rate In/h	Ground Temp Depth (cm)	Temp at Depth (c)	Weather conditions Etc...
	Start Test	11/20/2018	9:45	0:30	30	5.00		5.00									
1	End Test	11/20/2018	10:15	0:30		5.00	250	5.00	1000		0.69	**0.27**	0.91	**0.36**			
	Start Test	11/20/2018	10:15	0:30	60	5.00		5.00									
2	End Test	11/20/2018	10:45	1:00		6.00	250	5.00	1000		0.69	**0.27**	0.91	**0.36**			
	Start Test	11/20/2018	10:45	0:30	90	5.00		5.00									
3	End Test	11/20/2018	11:15	1:30		5.00	100	5.00	1000		0.27	**0.11**	0.91	**0.36**			
	Start Test	11/20/2018	11:15	0:30	120	5.00		5.00									
4	End Test	11/20/2018	11:45	2:00		5.00	100	5.00	1000		0.27	**0.11**	0.91	**0.36**			
	Start Test	11/20/2018	11:45	0:30	150	5.00		5.00									
5	End Test	11/20/2018	12:15	2:30		5.00	100	5.00	1000		0.27	**0.11**	0.91	**0.36**			
	Start Test	11/20/2018	12:15	0:30	180	5.00		5.00									
6	End Test	11/20/2018	12:45	3:00		5.00	100	5.00	1000		0.27	**0.11**	0.91	**0.36**			
	Start Test	11/20/2018	12:45	0:30	210	5.00		5.00									
7	End Test	11/20/2018	13:15	3:30		5.00	100	5.00	1000		0.27	**0.11**	0.91	**0.36**			
	Start Test	11/20/2018	13:15	0:30	240	0.00		5.00									
8	End Test	11/20/2018	13:45	4:00		5.00	100	5.00	1000		0.27	**0.11**	0.91	**0.36**			

Turf-Tec International

Reso A - Exhibit C2 (EIR Technical Appendix)

Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT		
Test Location:	DR-12		
Liquid Used:	TAP WATE	**pH:**	8.0
Tested By:	rg / cr		
Depth to water table:	> 20 Feet		

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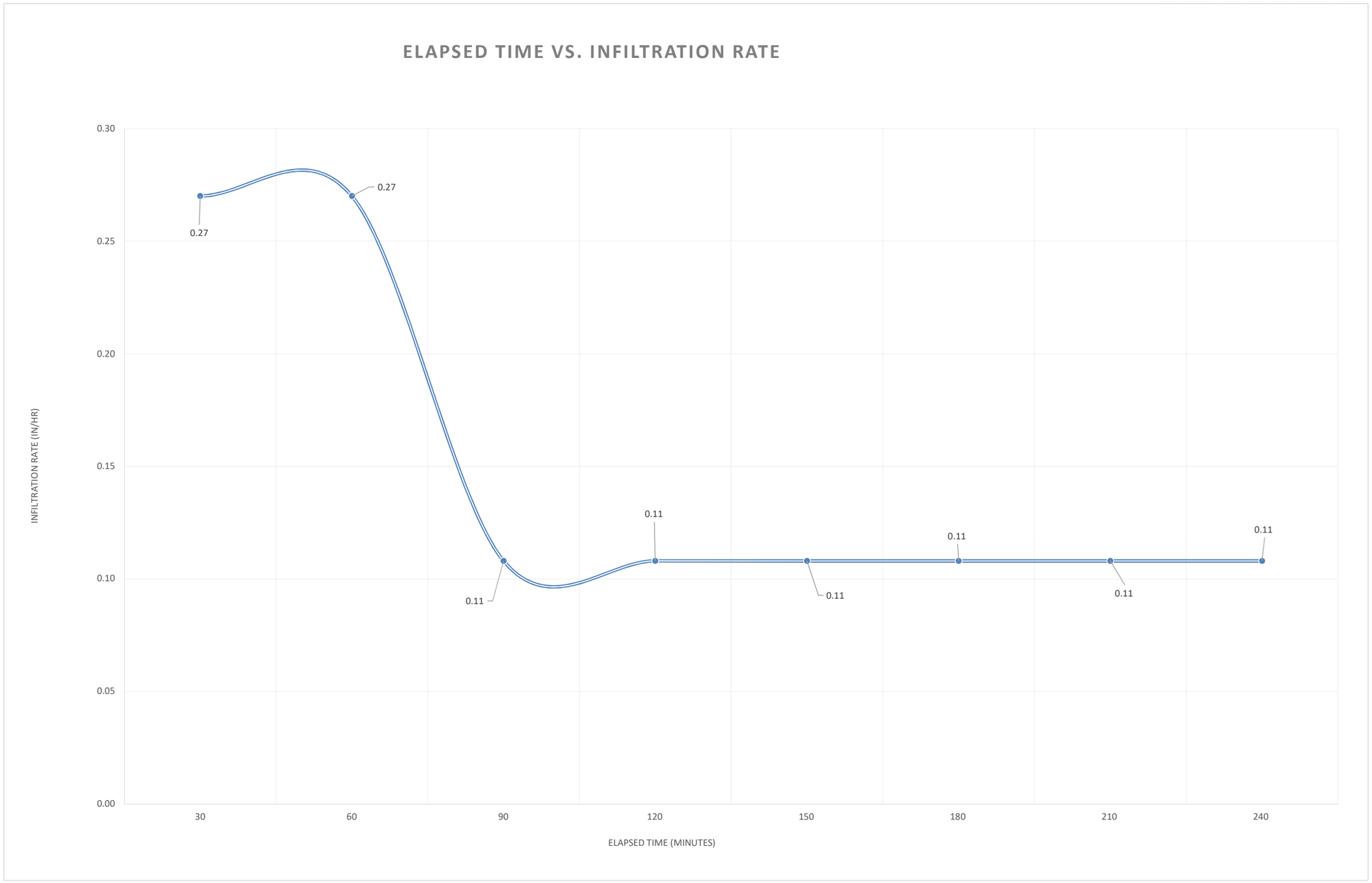

Reso A - Exhibit C2 (EIR Technical Appendix)

Test No.	DR-13	Location	See Map	Turf-Tec International - Record Chart for IN10-W - (12 & 24 Inch Infiltration Rings)

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Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT				Constants	Area cm2	Depth of Liquid (cm)	Liquid Container Number		Marriotte Tube Volume
Test Location:	DR-13				Inner Ring	729	10.0	1		3000
Liquid Used:	TAP WATE	pH:	8.0		Annular Ring	2189	10.0	2		10000
Tested By:	rg / cr		Date	11/20/2018	Liquid level maintained	(X) Flow Valve	( ) Float Valve	( ) Mariotte Tubes		
Depth to water table:	> 20 Feet		Depth of Test	5'	Penetration Depth of Outer Ring:	9 cm		Other		

						Flow Readings					Infiltration Rates				Ground Temperature		Remarks
Trial #	Start / End	Date MM/DD/YY	Time HR:MIN	Time Increment /(Total)	Elapsed Time (Min)	Inner Ring Reading cm	Inner Maroitte Tube Flow (ml)	Annular Space Reading cm	Annular Space Marriotte Tube Flow (ml)	Liquid Temp °F	Inner Infiltration Rate cm/h	Inner Infiltration Rate In/h	Annular Infiltration Rate cm/h	Annular Infiltration Rate In/h	Ground Temp Depth (cm)	Temp at Depth (c)	Weather conditions Etc...
1	Start Test	11/20/2018	14:10	0:30	30	5.00		5.00									
	End Test	11/20/2018	14:40	0:30		5.00	1000	5.00	4000		2.74	**1.08**	3.65	**1.44**			
2	Start Test	11/20/2018	14:40	0:30	60	5.00		5.00									
	End Test	11/20/2018	15:10	1:00		6.00	500	5.00	2000		1.37	**0.54**	1.83	**0.72**			
3	Start Test	11/20/2018	15:10	0:30	90	5.00		5.00									
	End Test	11/20/2018	15:40	1:30		5.00	250	5.00	500		0.69	**0.27**	0.46	**0.18**			
4	Start Test	11/20/2018	15:40	0:30	120	5.00		5.00									
	End Test	11/20/2018	16:10	2:00		5.00	250	5.00	500		0.69	**0.27**	0.46	**0.18**			
5	Start Test	11/20/2018	16:10	0:30	150	5.00		5.00									
	End Test	11/20/2018	16:40	2:30		5.00	250	5.00	500		0.69	**0.27**	0.46	**0.18**			
6	Start Test	11/20/2018	16:40	0:30	180	5.00		5.00									
	End Test	11/20/2018	17:10	3:00		5.00	250	5.00	500		0.69	**0.27**	0.46	**0.18**			
7	Start Test	11/20/2018	17:10	0:30	210	5.00		5.00									
	End Test	11/20/2018	17:40	3:30		5.00	250	5.00	500		0.69	**0.27**	0.46	**0.18**			
8	Start Test	11/20/2018	17:40	0:30	240	0.00		5.00									
	End Test	11/20/2018	18:10	4:00		5.00	250	5.00	500		0.69	**0.27**	0.46	**0.18**			

Turf-Tec International

Reso A - Exhibit C2 (EIR Technical Appendix)

Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT		
Test Location:	DR-13		
Liquid Used:	TAP WATE	**pH:**	8.0
Tested By:	rg / cr		
Depth to water table:	> 20 Feet		

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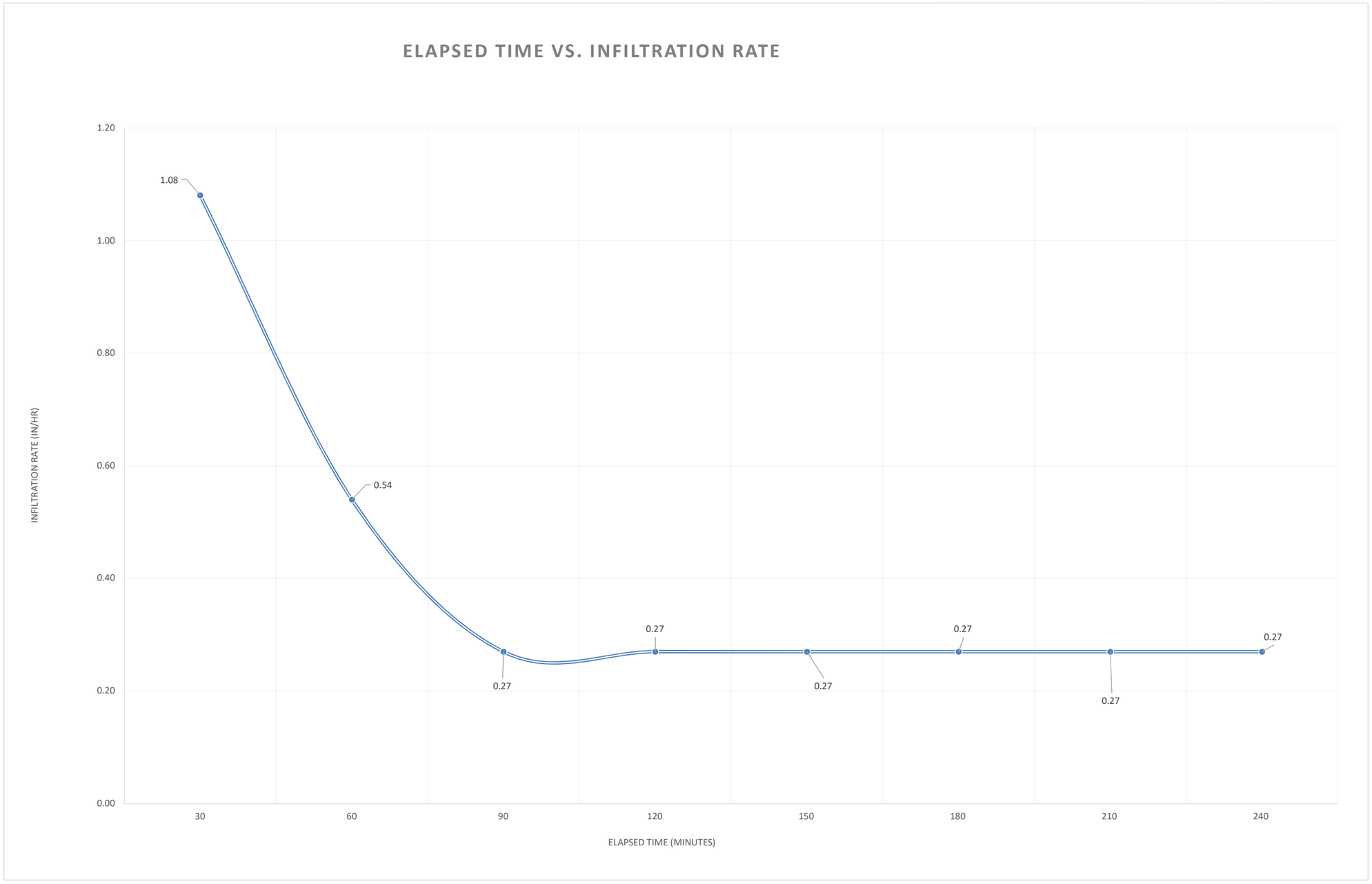

Reso A - Exhibit C2 (EIR Technical Appendix)

Test No.	DR-14	Location	See Map	Turf-Tec International - Record Chart for IN10-W - (12 & 24 Inch Infiltration Rings)

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Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT			Constants	Area cm2	Depth of Liquid (cm)	Liquid Container Number		Marriotte Tube Volume	
Test Location:	DR-14			Inner Ring	729	10.0	1		3000	
Liquid Used:	TAP WATE	pH:	8.0	Annular Ring	2189	10.0	2		10000	
Tested By:	rg / cr	Date	11/20/2018	Liquid level maintained	(X) Flow Valve	( ) Float Valve	( ) Mariotte Tubes			
Depth to water table:	> 20 Feet	Depth of Test	5'	Penetration Depth of Outer Ring:	9 cm				Other	

						Flow Readings					Infiltration Rates				Ground Temperature		Remarks
Trial #	Start / End	Date MM/DD/YY	Time HR:MIN	Time Increment /(Total)	Elapsed Time (Min)	Inner Ring Reading cm	Inner Maroitte Tube Flow (ml)	Annular Space Reading cm	Annular Space Marriotte Tube Flow (ml)	Liquid Temp °F	Inner Infiltration Rate cm/h	Inner Infiltration Rate In/h	Annular Infiltration Rate cm/h	Annular Infiltration Rate In/h	Ground Temp Depth (cm)	Temp at Depth (c)	Weather conditions Etc...
1	Start Test	11/20/2018	14:00	0:30	30	5.00		5.00									
	End Test	11/20/2018	14:30	0:30		5.00	1750	5.00	4000		4.80	**1.89**	3.65	**1.44**			
2	Start Test	11/20/2018	14:30	0:30	60	5.00		5.00									
	End Test	11/20/2018	15:00	1:00		6.00	100	5.00	2500		0.27	**0.11**	2.28	**0.90**			
3	Start Test	11/20/2018	15:00	0:30	90	5.00		5.00									
	End Test	11/20/2018	15:30	1:30		5.00	100	5.00	500		0.27	**0.11**	0.46	**0.18**			
4	Start Test	11/20/2018	15:30	0:30	120	5.00		5.00									
	End Test	11/20/2018	16:00	2:00		5.00	100	5.00	500		0.27	**0.11**	0.46	**0.18**			
5	Start Test	11/20/2018	16:00	0:30	150	5.00		5.00									
	End Test	11/20/2018	16:30	2:30		5.00	100	5.00	500		0.27	**0.11**	0.46	**0.18**			
6	Start Test	11/20/2018	16:30	0:30	180	5.00		5.00									
	End Test	11/20/2018	17:00	3:00		5.00	100	5.00	500		0.27	**0.11**	0.46	**0.18**			
7	Start Test	11/20/2018	17:00	0:30	210	5.00		5.00									
	End Test	11/20/2018	17:30	3:30		5.00	100	5.00	500		0.27	**0.11**	0.46	**0.18**			
8	Start Test	11/20/2018	17:30	0:30	240	0.00		5.00									
	End Test	11/20/2018	18:00	4:00		5.00	100	5.00	500		0.27	**0.11**	0.46	**0.18**			

Turf-Tec International

Reso A - Exhibit C2 (EIR Technical Appendix)

Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT		
Test Location:	DR-14		
Liquid Used:	TAP WATE	**pH:**	8.0
Tested By:	rg / cr		
Depth to water table:	> 20 Feet		

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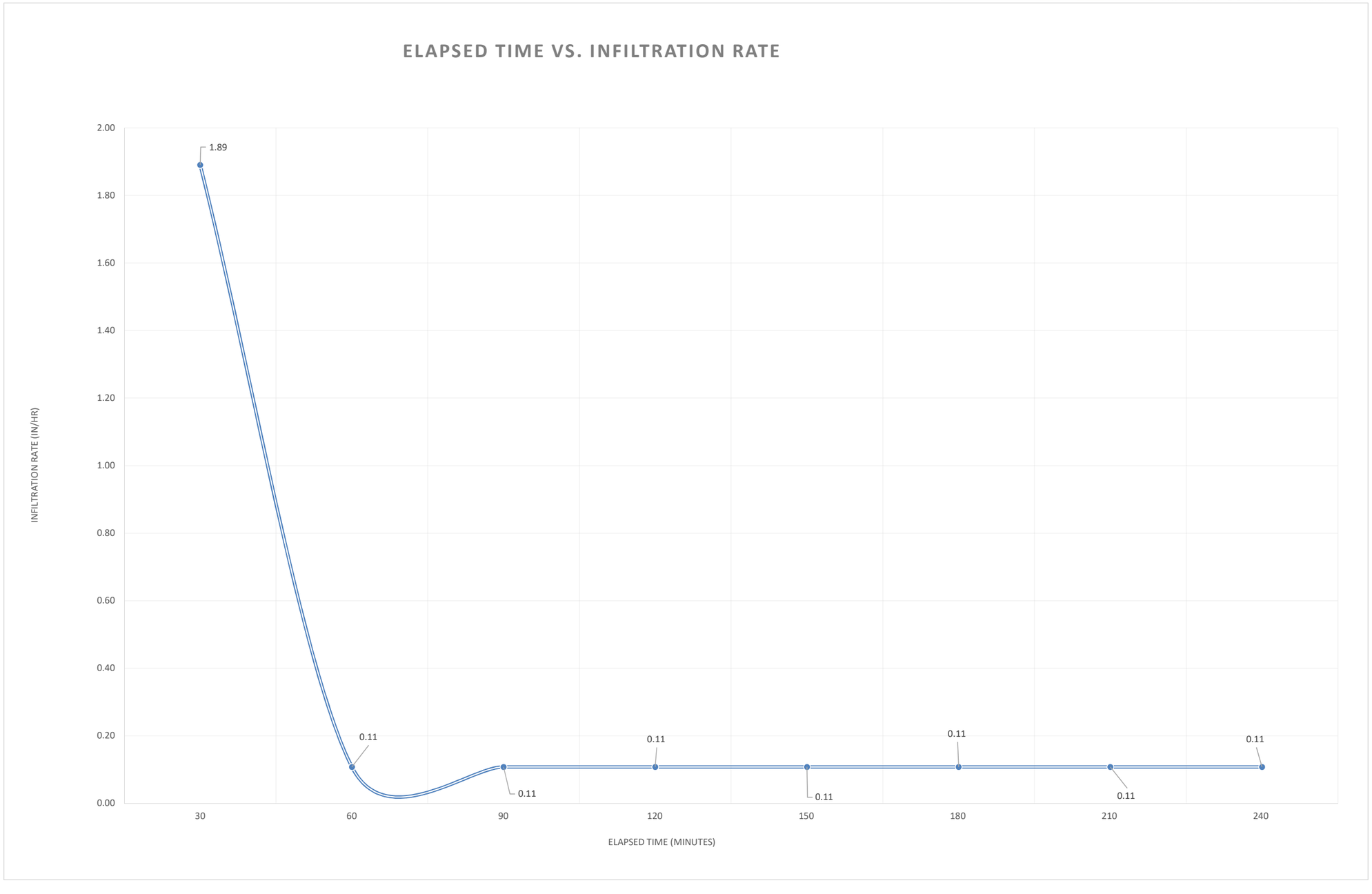

Reso A - Exhibit C2 (EIR Technical Appendix)

Test No.	DR-15	Location	See Map	Turf-Tec International - Record Chart for IN10-W - (12 & 24 Inch Infiltration Rings)

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Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT			Constants	Area cm2	Depth of Liquid (cm)	Liquid Container Number		Marriotte Tube Volume	
Test Location:	DR-15			Inner Ring	729	10.0	1		3000	
Liquid Used:	TAP WATE	pH:	8.0	Annular Ring	2189	10.0	2		10000	
Tested By:	rg / cr	Date	11/21/2018	Liquid level maintained	(X) Flow Valve	( ) Float Valve	( ) Mariotte Tubes			
Depth to water table:	> 20 Feet	Depth of Test	5'	Penetration Depth of Outer Ring:	9 cm		Other			

						Flow Readings					Infiltration Rates				Ground Temperature		Remarks
Trial #	Start / End	Date MM/DD/YY	Time HR:MIN	Time Increment /(Total)	Elapsed Time (Min)	Inner Ring Reading cm	Inner Maroitte Tube Flow (ml)	Annular Space Reading cm	Annular Space Marriotte Tube Flow (ml)	Liquid Temp °F	Inner Infiltration Rate cm/h	Inner Infiltration Rate In/h	Annular Infiltration Rate cm/h	Annular Infiltration Rate In/h	Ground Temp Depth (cm)	Temp at Depth (c)	Weather conditions Etc...
	Start Test	11/21/2018	5:30	0:30	30	5.00		5.00									
1	End Test	11/21/2018	6:00	0:30		5.00	250	5.00	500		0.69	**0.27**	0.46	**0.18**			
	Start Test	11/21/2018	6:00	0:30	60	5.00		5.00									
2	End Test	11/21/2018	6:30	1:00		6.00	250	5.00	500		0.69	**0.27**	0.46	**0.18**			
	Start Test	11/21/2018	6:30	0:30	90	5.00		5.00									
3	End Test	11/21/2018	7:00	1:30		5.00	0	5.00	0		0.00	**0.00**	0.00	**0.00**			
	Start Test	11/21/2018	7:00	0:30	120	5.00		5.00									
4	End Test	11/21/2018	7:30	2:00		5.00	0	5.00	0		0.00	**0.00**	0.00	**0.00**			
	Start Test	11/21/2018	7:30	0:30	150	5.00		5.00									
5	End Test	11/21/2018	8:00	2:30		5.00	0	5.00	0		0.00	**0.00**	0.00	**0.00**			
	Start Test	11/21/2018	8:00	0:30	180	5.00		5.00									
6	End Test	11/21/2018	8:30	3:00		5.00	0	5.00	0		0.00	**0.00**	0.00	**0.00**			
	Start Test	11/21/2018	8:30	0:30	210	5.00		5.00									
7	End Test	11/21/2018	9:00	3:30		5.00	0	5.00	0		0.00	**0.00**	0.00	**0.00**			
	Start Test	11/21/2018	9:00	0:30	240	0.00		5.00									
8	End Test	11/21/2018	9:30	4:00		5.00	0	5.00	0		0.00	**0.00**	0.00	**0.00**			

Turf-Tec International

Reso A - Exhibit C2 (EIR Technical Appendix)

Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT		
Test Location:	DR-15		
Liquid Used:	TAP WATE	**pH:**	8.0
Tested By:	rg / cr		
Depth to water table:	> 20 Feet		

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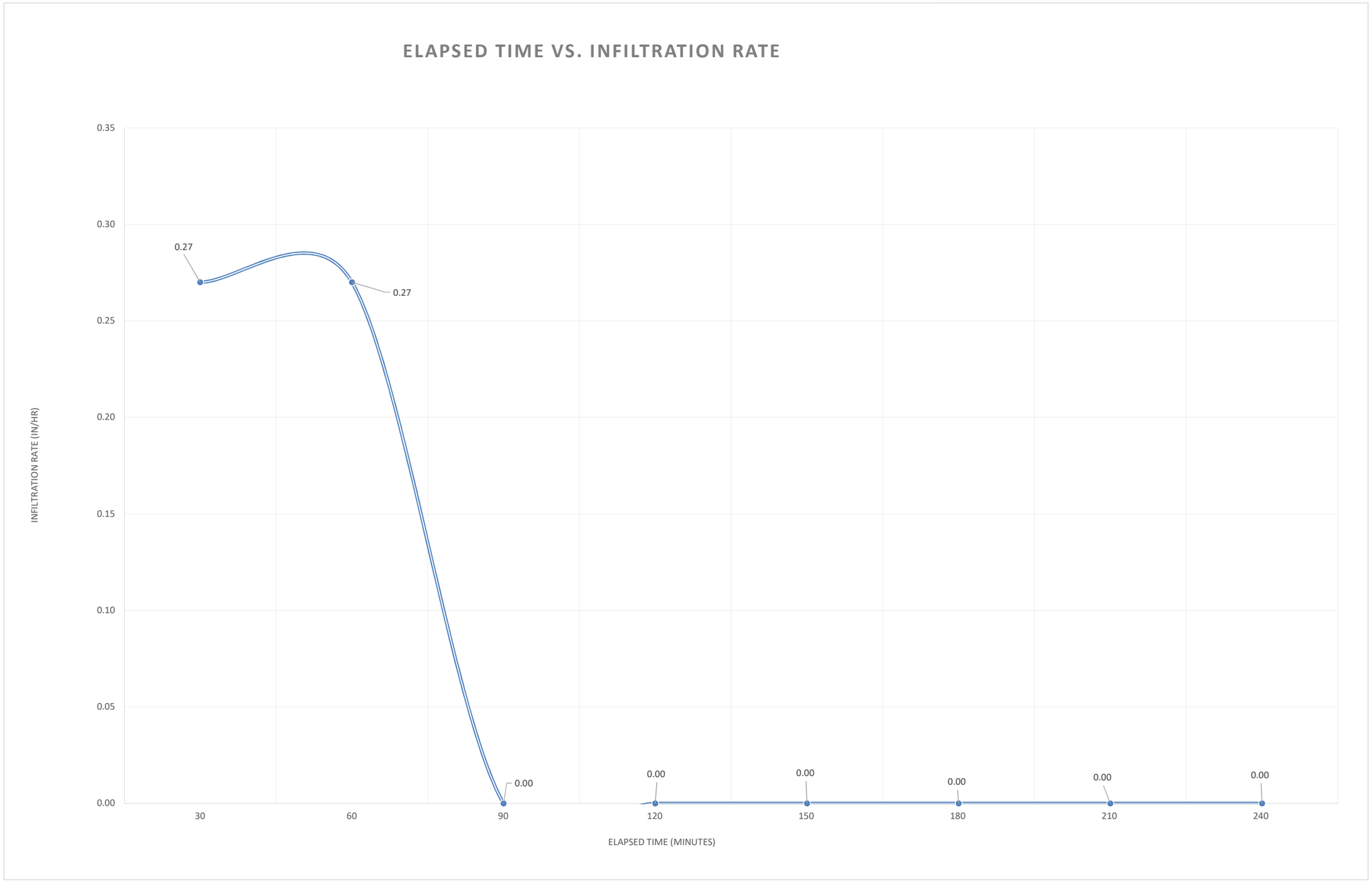

Reso A - Exhibit C2 (EIR Technical Appendix)

Test No.	DR-16	Location	See Map	Turf-Tec International - Record Chart for IN10-W - (12 & 24 Inch Infiltration Rings)

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Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT				Constants	Area cm2	Depth of Liquid (cm)	Liquid Container Number		Marriotte Tube Volume	
Test Location:	DR-16				Inner Ring	729	10.0	1		3000	
Liquid Used:	TAP WATE	pH:	8.0		Annular Ring	2189	10.0	2		10000	
Tested By:	rg / cr		Date	11/21/2018	Liquid level maintained	(X) Flow Valve	( ) Float Valve	( ) Mariotte Tubes			
Depth to water table:	> 20 Feet		Depth of Test	5'	Penetration Depth of Outer Ring:		9 cm		Other		

Trial #	Start / End	Date MM/DD/YY	Time HR:MIN	Time Increment /(Total)	Elapsed Time (Min)	Flow Readings: Inner Ring Reading cm	Inner Maroitte Tube Flow (ml)	Annular Space Reading cm	Annular Space Marriotte Tube Flow (ml)	Liquid Temp °F	Infiltration Rates: Inner Infiltration Rate cm/h	Inner Infiltration Rate In/h	Annular Infiltration Rate cm/h	Annular Infiltration Rate In/h	Ground Temperature: Ground Temp Depth (cm)	Temp at Depth (c)	Remarks: Weather conditions Etc...
	Start Test	11/21/2018	5:45	0:30	30	5.00		5.00									
1	End Test	11/21/2018	6:15	0:30		5.00	1000	5.00	2000		2.74	**1.08**	1.83	**0.72**			
	Start Test	11/21/2018	6:15	0:30	60	5.00		5.00									
2	End Test	11/21/2018	6:45	1:00		6.00	500	5.00	1250		1.37	**0.54**	1.14	**0.45**			
	Start Test	11/21/2018	6:45	0:30	90	5.00		5.00									
3	End Test	11/21/2018	7:15	1:30		5.00	250	5.00	950		0.69	**0.27**	0.87	**0.34**			
	Start Test	11/21/2018	7:15	0:30	120	5.00		5.00									
4	End Test	11/21/2018	7:45	2:00		5.00	250	5.00	500		0.69	**0.27**	0.46	**0.18**			
	Start Test	11/21/2018	7:45	0:30	150	5.00		5.00									
5	End Test	11/21/2018	8:15	2:30		5.00	250	5.00	500		0.69	**0.27**	0.46	**0.18**			
	Start Test	11/21/2018	8:15	0:30	180	5.00		5.00									
6	End Test	11/21/2018	8:45	3:00		5.00	250	5.00	500		0.69	**0.27**	0.46	**0.18**			
	Start Test	11/21/2018	8:45	0:30	210	5.00		5.00									
7	End Test	11/21/2018	9:15	3:30		5.00	250	5.00	500		0.69	**0.27**	0.46	**0.18**			
	Start Test	11/21/2018	9:15	0:30	240	0.00		5.00									
8	End Test	11/21/2018	9:45	4:00		5.00	250	5.00	500		0.69	**0.27**	0.46	**0.18**			

Turf-Tec International®

Reso A - Exhibit C2 (EIR Technical Appendix)

Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT		
Test Location:	DR-16		
Liquid Used:	TAP WATE	**pH:**	8.0
Tested By:	rg / cr		
Depth to water table:	> 20 Feet		

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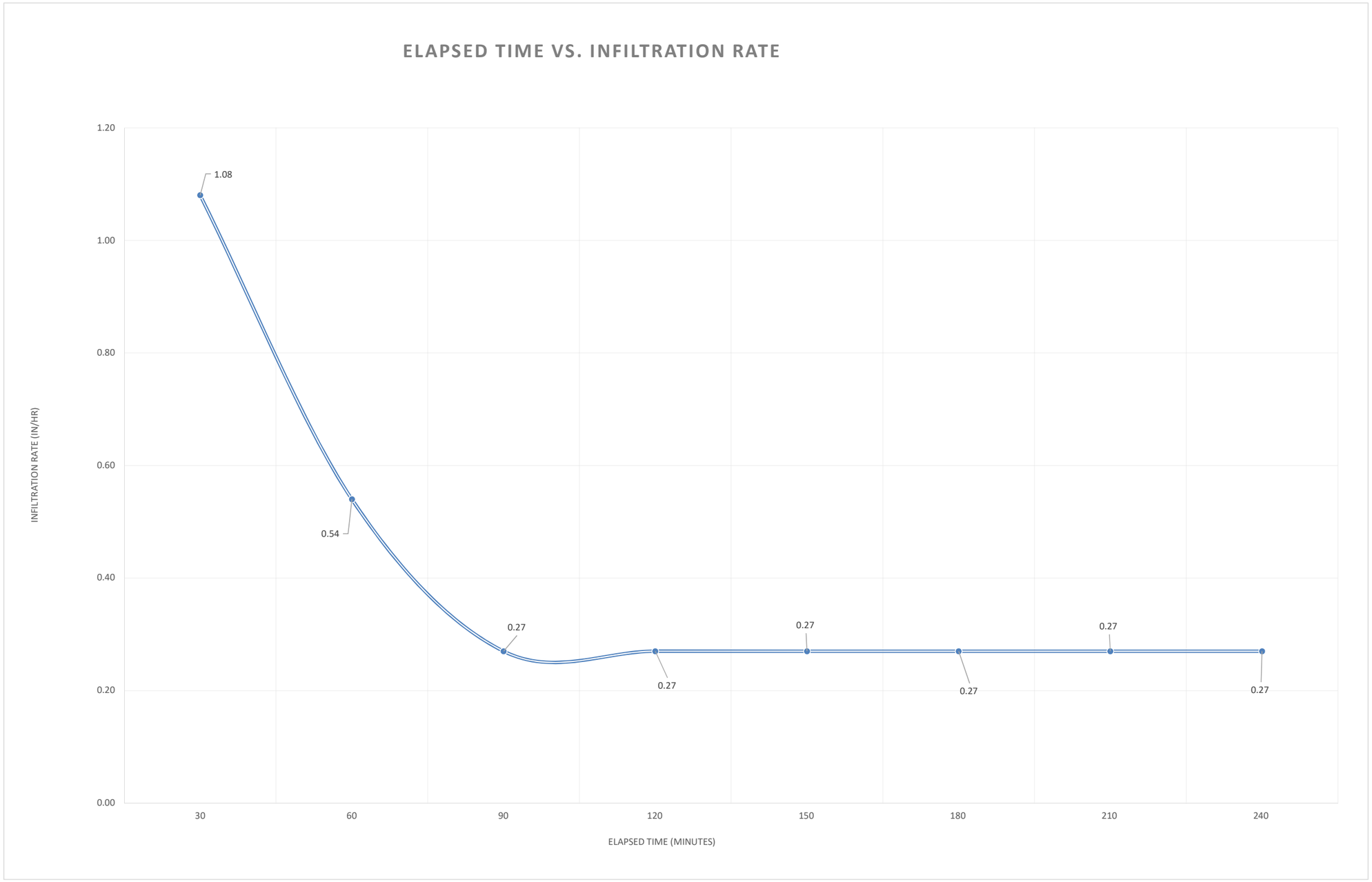

Reso A - Exhibit C2 (EIR Technical Appendix)

Test No.	DR-17	Location	See Map	Turf-Tec International - Record Chart for IN10-W - (12 & 24 Inch Infiltration Rings)

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Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT				Constants	Area cm2	Depth of Liquid (cm)	Liquid Container Number		Marriotte Tube Volume		
Test Location:	DR-17				Inner Ring	729	10.0	1		3000		
Liquid Used:	TAP WATE	pH:	8.0		Annular Ring	2189	10.0	2		10000		
Tested By:	rg / cr		Date	11/21/2018	Liquid level maintained	(X) Flow Valve	( ) Float Valve	( ) Mariotte Tubes				
Depth to water table:	> 20 Feet		Depth of Test	5'	Penetration Depth of Outer Ring:	9 cm				Other		

Trial #	Start / End	Date MM/DD/YY	Time HR:MIN	Time Increment /(Total)	Elapsed Time (Min)	Flow Readings				Liquid Temp °F	Infiltration Rates				Ground Temperature		Remarks
						Inner Ring Reading cm	Inner Maroitte Tube Flow (ml)	Annular Space Reading cm	Annular Space Marriotte Tube Flow (ml)		Inner Infiltration Rate cm/h	Inner Infiltration Rate In/h	Annular Infiltration Rate cm/h	Annular Infiltration Rate In/h	Ground Temp Depth (cm)	Temp at Depth (c)	Weather conditions Etc...
1	Start Test	11/21/2018	11:30	0:30	30	5.00		5.00									
	End Test	11/21/2018	12:00	0:30		5.00	2000	5.00	3500		5.49	**2.16**	3.20	**1.26**			
2	Start Test	11/21/2018	12:00	0:30	60	5.00		5.00									
	End Test	11/21/2018	12:30	1:00		6.00	500	5.00	1000		1.37	**0.54**	0.91	**0.36**			
3	Start Test	11/21/2018	12:30	0:30	90	5.00		5.00									
	End Test	11/21/2018	13:00	1:30		5.00	500	5.00	1000		1.37	**0.54**	0.91	**0.36**			
4	Start Test	11/21/2018	13:00	0:30	120	5.00		5.00									
	End Test	11/21/2018	13:30	2:00		5.00	0	5.00	500		0.00	**0.00**	0.46	**0.18**			
5	Start Test	11/21/2018	13:30	0:30	150	5.00		5.00									
	End Test	11/21/2018	14:00	2:30		5.00	0	5.00	500		0.00	**0.00**	0.46	**0.18**			
6	Start Test	11/21/2018	14:00	0:30	180	5.00		5.00									
	End Test	11/21/2018	14:30	3:00		5.00	0	5.00	0		0.00	**0.00**	0.00	**0.00**			
7	Start Test	11/21/2018	14:30	0:30	210	5.00		5.00									
	End Test	11/21/2018	15:00	3:30		5.00	0	5.00	0		0.00	**0.00**	0.00	**0.00**			
8	Start Test	11/21/2018	15:00	0:30	240	0.00		5.00									
	End Test	11/21/2018	15:30	4:00		5.00	0	5.00	0		0.00	**0.00**	0.00	**0.00**			

Turf-Tec International

Reso A - Exhibit C2 (EIR Technical Appendix)

Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT		
Test Location:	DR-17		
Liquid Used:	TAP WATE	**pH:**	8.0
Tested By:	rg / cr		
Depth to water table:	> 20 Feet		

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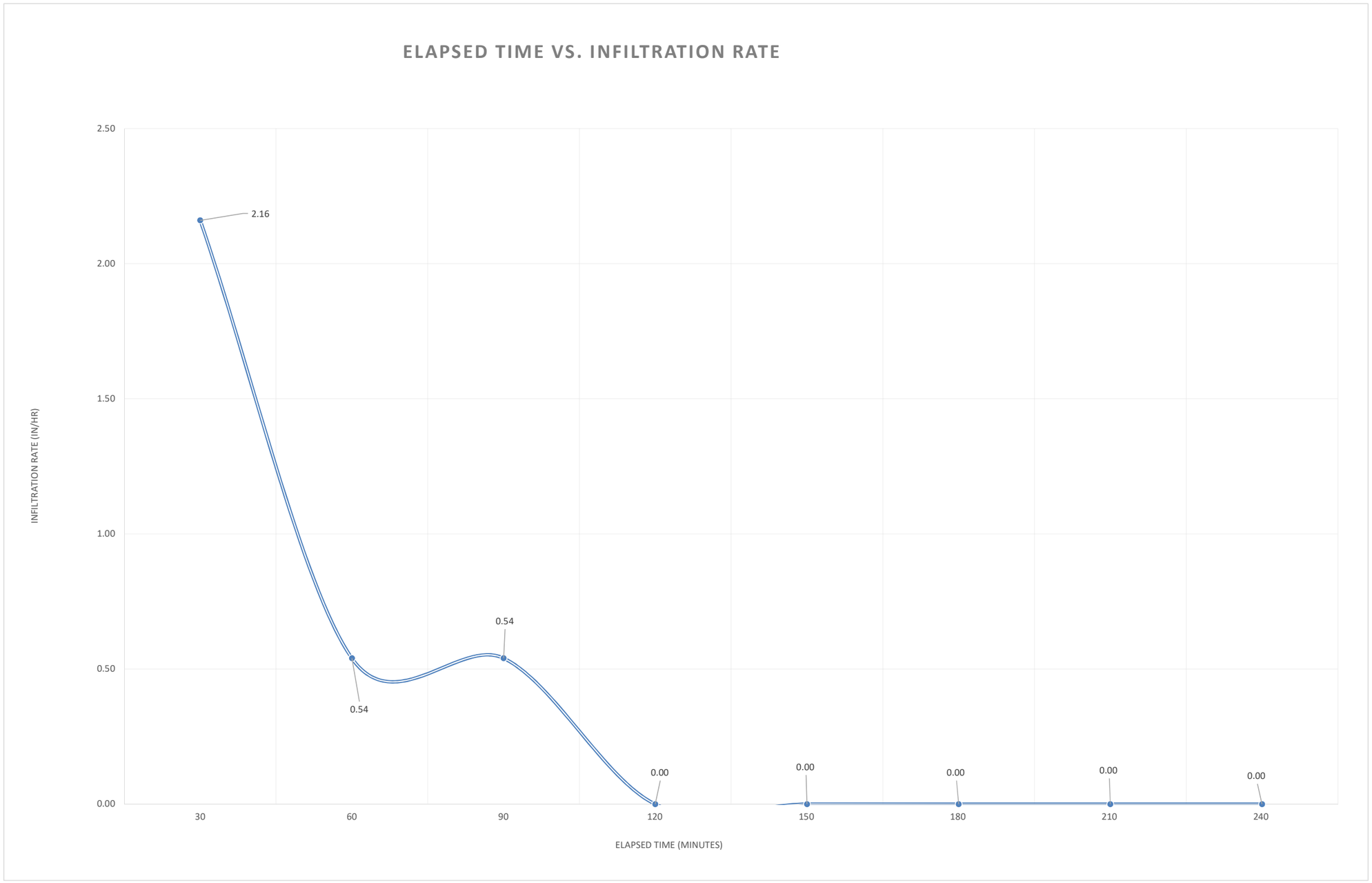

Reso A - Exhibit C2 (EIR Technical Appendix)

Test No.	DR-18	Location	See Map	Turf-Tec International - Record Chart for IN10-W - (12 & 24 Inch Infiltration Rings)

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Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT				Constants	Area cm2	Depth of Liquid (cm)	Liquid Container Number		Marriotte Tube Volume	
Test Location:	DR-18				Inner Ring	729	10.0	1		3000	
Liquid Used:	TAP WATE	pH:	8.0		Annular Ring	2189	10.0	2		10000	
Tested By:	rg / cr		Date	11/21/2018	Liquid level maintained	(X) Flow Valve	( ) Float Valve	( ) Mariotte Tubes			
Depth to water table:	> 20 Feet		Depth of Test	5'	Penetration Depth of Outer Ring:	9 cm		Other			

Trial #	Start / End	Date MM/DD/YY	Time HR:MIN	Time Increment /(Total)	Elapsed Time (Min)	Flow Readings: Inner Ring Reading cm	Inner Maroitte Tube Flow (ml)	Annular Space Reading cm	Annular Space Marriotte Tube Flow (ml)	Liquid Temp °F	Infiltration Rates: Inner Infiltration Rate cm/h	Inner Infiltration Rate In/h	Annular Infiltration Rate cm/h	Annular Infiltration Rate In/h	Ground Temperature: Ground Temp Depth (cm)	Temp at Depth (c)	Remarks: Weather conditions Etc...
	Start Test	11/21/2018	11:35	0:30	30	5.00		5.00									
1	End Test	11/21/2018	12:05	0:30		5.00	2000	5.00	4000		5.49	**2.16**	3.65	**1.44**			
	Start Test	11/21/2018	12:05	0:30	60	5.00		5.00									
2	End Test	11/21/2018	12:35	1:00		6.00	1250	5.00	4000		3.43	**1.35**	3.65	**1.44**			
	Start Test	11/21/2018	12:35	0:30	90	5.00		5.00									
3	End Test	11/21/2018	13:05	1:30		5.00	1750	5.00	2000		4.80	**1.89**	1.83	**0.72**			
	Start Test	11/21/2018	13:05	0:30	120	5.00		5.00									
4	End Test	11/21/2018	13:35	2:00		5.00	1200	5.00	2500		3.29	**1.30**	2.28	**0.90**			
	Start Test	11/21/2018	13:35	0:30	150	5.00		5.00									
5	End Test	11/21/2018	14:05	2:30		5.00	750	5.00	2500		2.06	**0.81**	2.28	**0.90**			
	Start Test	11/21/2018	14:05	0:30	180	5.00		5.00									
6	End Test	11/21/2018	14:35	3:00		5.00	750	5.00	2500		2.06	**0.81**	2.28	**0.90**			
	Start Test	11/21/2018	14:35	0:30	210	5.00		5.00									
7	End Test	11/21/2018	15:05	3:30		5.00	750	5.00	2500		2.06	**0.81**	2.28	**0.90**			
	Start Test	11/21/2018	15:05	0:30	240	0.00		5.00									
8	End Test	11/21/2018	15:35	4:00		5.00	750	5.00	2500		2.06	**0.81**	2.28	**0.90**			

Turf-Tec International

Reso A - Exhibit C2 (EIR Technical Appendix)

Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT		
Test Location:	DR-18		
Liquid Used:	TAP WATE	**pH:**	8.0
Tested By:	rg / cr		
Depth to water table:	> 20 Feet		

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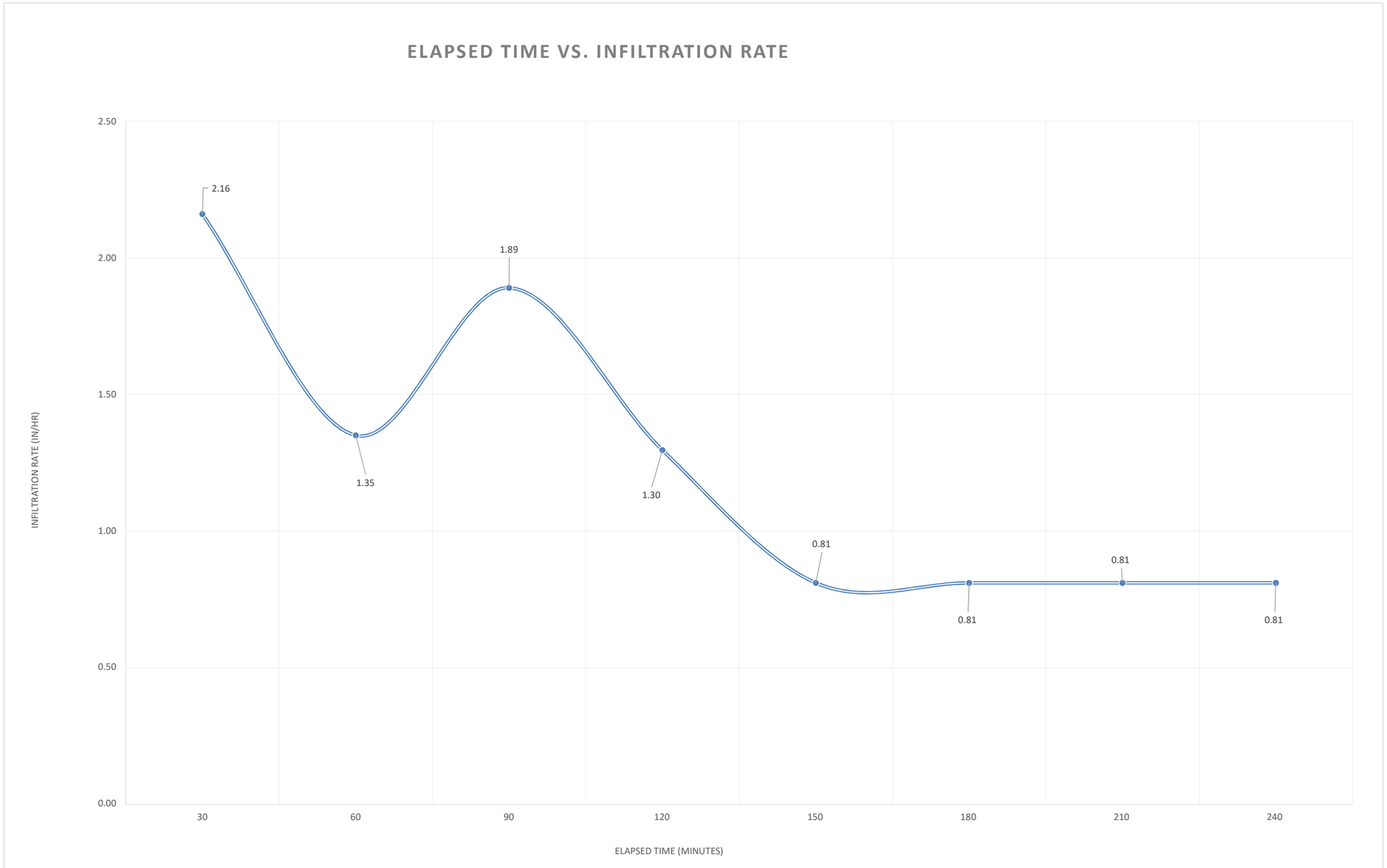

Reso A - Exhibit C2 (EIR Technical Appendix)

Test No.	DR-19	Location	See Map	Turf-Tec International - Record Chart for IN10-W - (12 & 24 Inch Infiltration Rings)

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Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT			Constants	Area cm2	Depth of Liquid (cm)	Liquid Container Number		Marriotte Tube Volume	
Test Location:	DR-19			Inner Ring	729	10.0	1		3000	
Liquid Used:	TAP WATE	pH:	8.0	Annular Ring	2189	10.0	2		10000	
Tested By:	rg / cr	Date	11/21/2018	Liquid level maintained	(X) Flow Valve	( ) Float Valve	( ) Mariotte Tubes			
Depth to water table:	> 20 Feet	Depth of Test	5'	Penetration Depth of Outer Ring:	9 cm	Other				

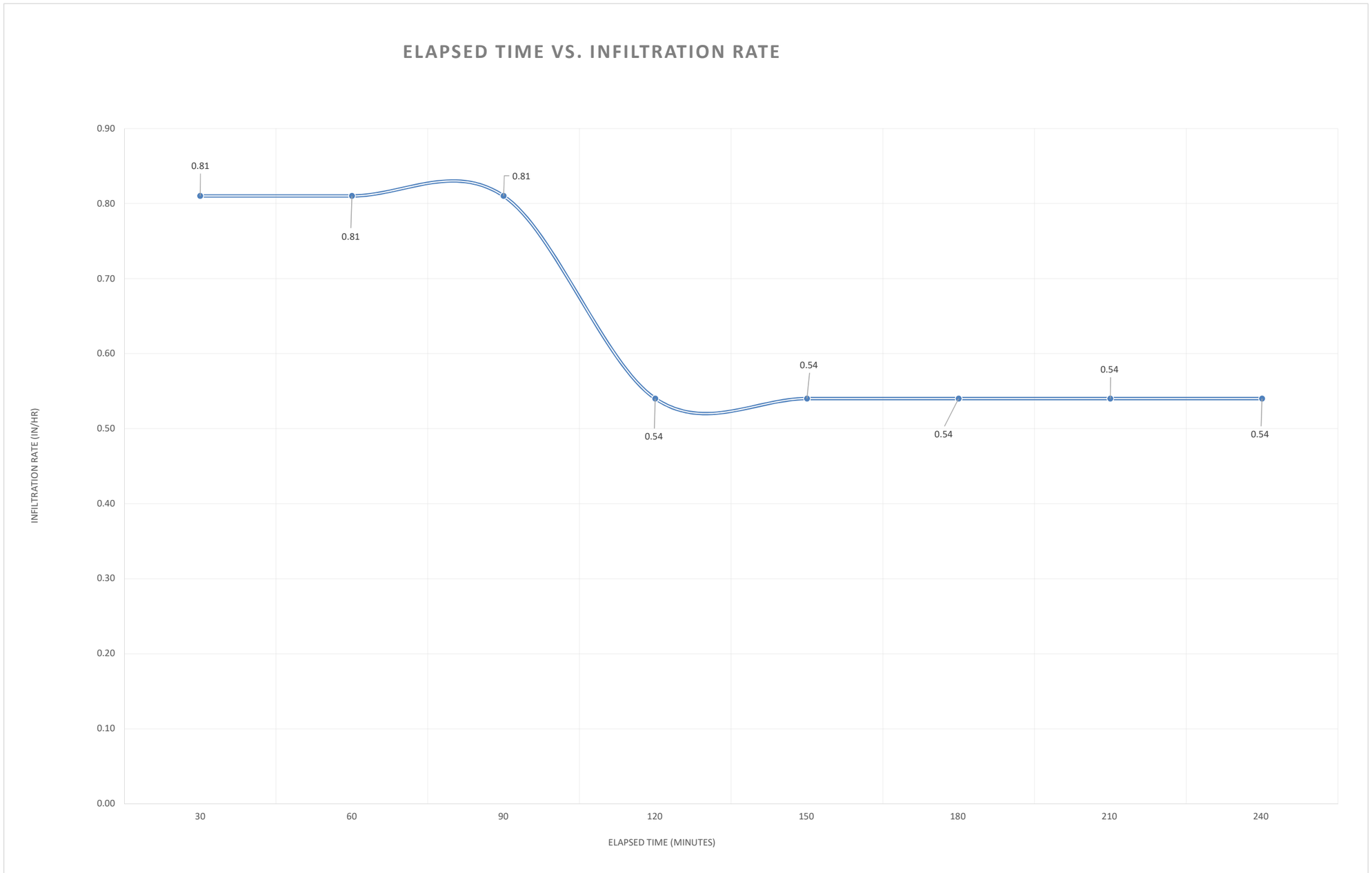
						Flow Readings					Infiltration Rates				Ground Temperature		Remarks
Trial #	Start / End	Date MM/DD/YY	Time HR:MIN	Time Increment /(Total)	Elapsed Time (Min)	Inner Ring Reading cm	Inner Maroitte Tube Flow (ml)	Annular Space Reading cm	Annular Space Marriotte Tube Flow (ml)	Liquid Temp °F	Inner Infiltration Rate cm/h	Inner Infiltration Rate In/h	Annular Infiltration Rate cm/h	Annular Infiltration Rate In/h	Ground Temp Depth (cm)	Temp at Depth (c)	Weather conditions Etc...
1	Start Test	11/21/2018	16:00	0:30	30	5.00		5.00									
	End Test	11/21/2018	16:30	0:30		5.00	750	5.00	1000		2.06	**0.81**	0.91	**0.36**			
2	Start Test	11/21/2018	16:30	0:30	60	5.00		5.00									
	End Test	11/21/2018	17:00	1:00		6.00	750	5.00	1000		2.06	**0.81**	0.91	**0.36**			
3	Start Test	11/21/2018	17:00	0:30	90	5.00		5.00									
	End Test	11/21/2018	17:30	1:30		5.00	750	5.00	1000		2.06	**0.81**	0.91	**0.36**			
4	Start Test	11/21/2018	17:30	0:30	120	5.00		5.00									
	End Test	11/21/2018	18:00	2:00		5.00	500	5.00	1000		1.37	**0.54**	0.91	**0.36**			
5	Start Test	11/21/2018	18:00	0:30	150	5.00		5.00									
	End Test	11/21/2018	18:30	2:30		5.00	500	5.00	1000		1.37	**0.54**	0.91	**0.36**			
6	Start Test	11/21/2018	18:30	0:30	180	5.00		5.00									
	End Test	11/21/2018	19:00	3:00		5.00	500	5.00	750		1.37	**0.54**	0.69	**0.27**			
7	Start Test	11/21/2018	19:00	0:30	210	5.00		5.00									
	End Test	11/21/2018	19:30	3:30		5.00	500	5.00	750		1.37	**0.54**	0.69	**0.27**			
8	Start Test	11/21/2018	19:30	0:30	240	0.00		5.00									
	End Test	11/21/2018	20:00	4:00		5.00	500	5.00	750		1.37	**0.54**	0.69	**0.27**			

Turf-Tec International

Reso A - Exhibit C2 (EIR Technical Appendix)

Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT		
Test Location:	DR-19		
Liquid Used:	TAP WATE	**pH:**	8.0
Tested By:	rg / cr		
Depth to water table:	> 20 Feet		

Earth Strata Geotechnical Services, Inc.
Geotechnical, Environmental and Materials Testing Consultants
www.ESGSINC.com (951) 397-8315



Reso A - Exhibit C2 (EIR Technical Appendix)

Test No.	DR-20	Location	See Map	Turf-Tec International - Record Chart for IN10-W - (12 & 24 Inch Infiltration Rings)

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Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT			Constants	Area cm2	Depth of Liquid (cm)	Liquid Container Number		Marriotte Tube Volume
Test Location:	DR-20			Inner Ring	729	10.0	1		3000
Liquid Used:	TAP WATE	pH:	8.0	Annular Ring	2189	10.0	2		10000
Tested By:	rg / cr	Date	11/21/2018	Liquid level maintained	(X) Flow Valve	( ) Float Valve	( ) Mariotte Tubes		
Depth to water table:	> 20 Feet	Depth of Test	5'	Penetration Depth of Outer Ring:	9 cm	Other			

						Flow Readings					Infiltration Rates				Ground Temperature		Remarks
Trial #	Start / End	Date MM/DD/YY	Time HR:MIN	Time Increment /(Total)	Elapsed Time (Min)	Inner Ring Reading cm	Inner Maroitte Tube Flow (ml)	Annular Space Reading cm	Annular Space Marriotte Tube Flow (ml)	Liquid Temp °F	Inner Infiltration Rate cm/h	Inner Infiltration Rate In/h	Annular Infiltration Rate cm/h	Annular Infiltration Rate In/h	Ground Temp Depth (cm)	Temp at Depth (c)	Weather conditions Etc...
	Start Test	11/21/2018	16:10	0:30	30	5.00		5.00									
1	End Test	11/21/2018	16:40	0:30		5.00	250	5.00	500		0.69	**0.27**	0.46	**0.18**			
	Start Test	11/21/2018	16:40	0:30	60	5.00		5.00									
2	End Test	11/21/2018	17:10	1:00		6.00	250	5.00	500		0.69	**0.27**	0.46	**0.18**			
	Start Test	11/21/2018	17:10	0:30	90	5.00		5.00									
3	End Test	11/21/2018	17:40	1:30		5.00	250	5.00	500		0.69	**0.27**	0.46	**0.18**			
	Start Test	11/21/2018	17:40	0:30	120	5.00		5.00									
4	End Test	11/21/2018	18:10	2:00		5.00	250	5.00	500		0.69	**0.27**	0.46	**0.18**			
	Start Test	11/21/2018	18:10	0:30	150	5.00		5.00									
5	End Test	11/21/2018	18:40	2:30		5.00	250	5.00	500		0.69	**0.27**	0.46	**0.18**			
	Start Test	11/21/2018	18:40	0:30	180	5.00		5.00									
6	End Test	11/21/2018	19:10	3:00		5.00	250	5.00	500		0.69	**0.27**	0.46	**0.18**			
	Start Test	11/21/2018	19:10	0:30	210	5.00		5.00									
7	End Test	11/21/2018	19:40	3:30		5.00	250	5.00	500		0.69	**0.27**	0.46	**0.18**			
	Start Test	11/21/2018	19:40	0:30	240	0.00		5.00									
8	End Test	11/21/2018	20:10	4:00		5.00	250	5.00	500		0.69	**0.27**	0.46	**0.18**			

Turf-Tec International

Reso A - Exhibit C2 (EIR Technical Appendix)

Project Identification:	OLSEN/CHANDLER RANCH DEVELOPMENT		
Test Location:	DR-20		
Liquid Used:	TAP WATE	**pH:**	8.0
Tested By:	rg / cr		
Depth to water table:	> 20 Feet		

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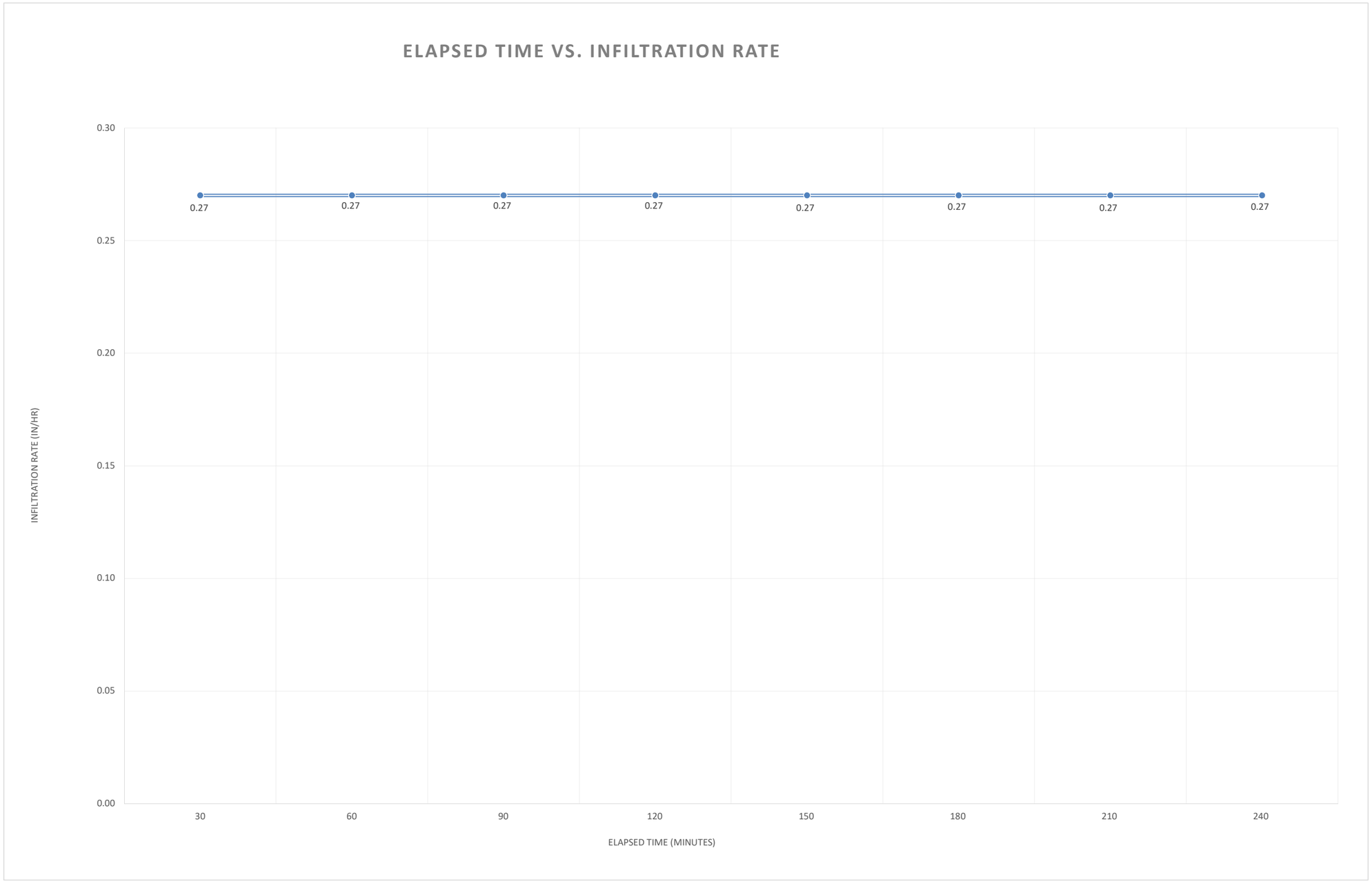
www.ESGSINC.com (951) 397-8315

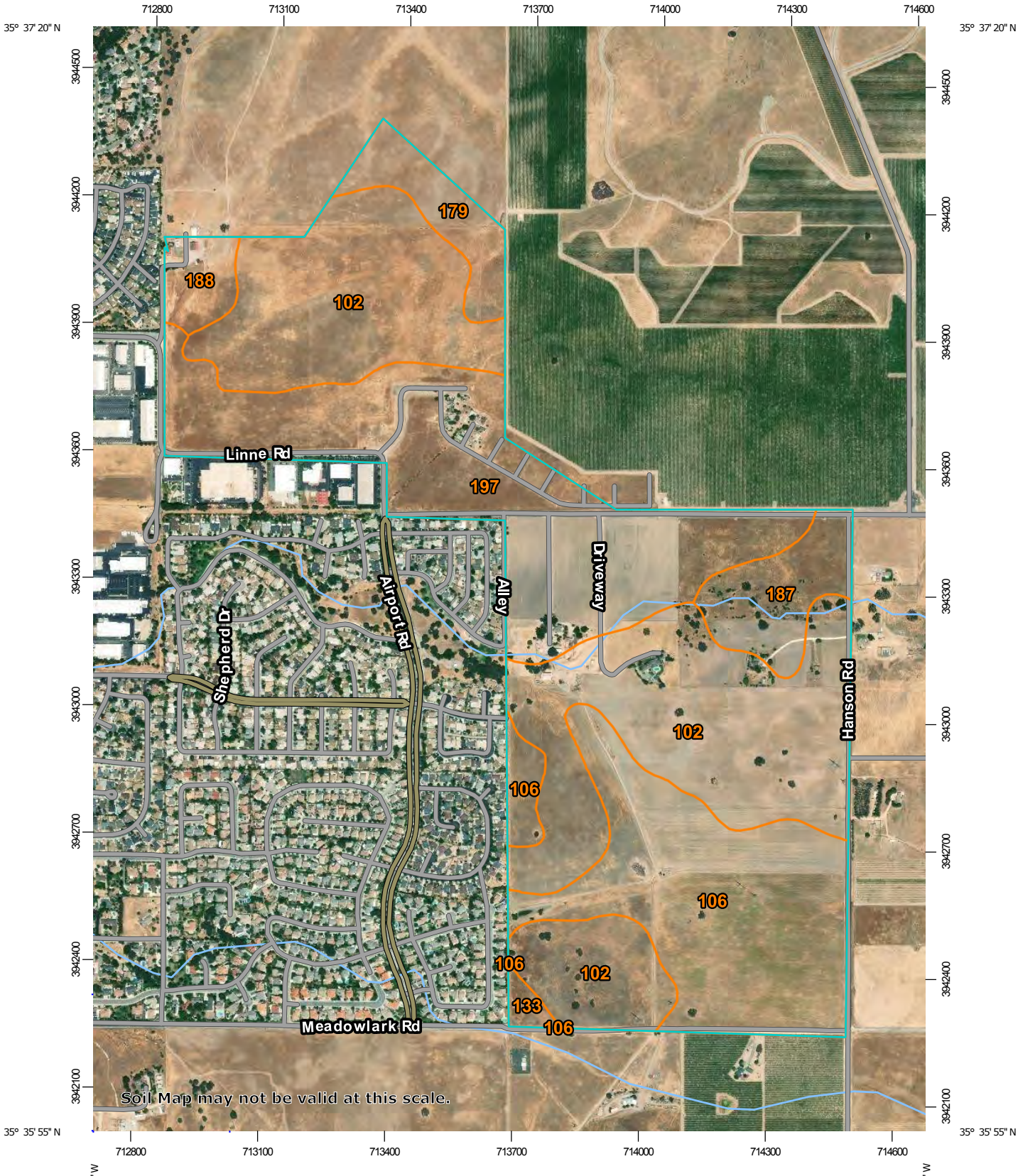


APPENDIX C

NRCS WEB SOIL SURVEY

Reso A - Exhibit C2 (EIR Technical Appendix)

Soil Map—San Luis Obispo County, California, Paso Robles Area
(OLSEN-CHANDLER RANCH RESIDENTIAL DEVELOPMENT)



Map Scale: 1:12,700 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 150 300 600 900

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

Soil Map—San Luis Obispo County, California, Paso Robles Area
(OLSEN-CHANDLER RANCH RESIDENTIAL DEVELOPMENT)

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: San Luis Obispo County, California, Paso Robles Area
Survey Area Data: Version 12, Sep 14, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 17, 2016—Oct 1, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
102	Arbuckle-Positas complex, 9 to 15 percent slopes	159.5	41.6%
106	Arbuckle-San Ysidro complex, 2 to 9 percent slopes	81.4	21.2%
133	Cropley clay, 2 to 9 percent slopes, MLRA 14	2.4	0.6%
179	Nacimiento-Los Osos complex, 9 to 30 percent slopes	15.2	4.0%
187	Rincon clay loam, 0 to 2 percent slopes	19.4	5.1%
188	Rincon clay loam, 2 to 9 percent slopes, MLRA 14	8.6	2.2%
197	San Ysidro loam, 0 to 2 percent slopes, MLRA 14	96.9	25.3%
Totals for Area of Interest		**383.4**	**100.0%**

San Luis Obispo County, California, Paso Robles Area

102—Arbuckle-Positas complex, 9 to 15 percent slopes

Map Unit Setting

National map unit symbol: hbrk
Elevation: 600 to 1,500 feet
Mean annual precipitation: 12 to 20 inches
Mean annual air temperature: 60 to 61 degrees F
Frost-free period: 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Arbuckle and similar soils: 40 percent
Positas and similar soils: 30 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arbuckle

Setting

Landform: Terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium from mixed rock sources

Typical profile

H1 - 0 to 29 inches: fine sandy loam
H2 - 29 to 53 inches: sandy clay loam
H3 - 53 to 62 inches: stratified sandy loam to very gravelly sandy clay loam

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 8.4 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C

Ecological site: COARSE LOAMY (R014XE003CA)
Hydric soil rating: No

Description of Positas

Setting

Landform: Terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium from mixed rock sources

Typical profile

H1 - 0 to 10 inches: coarse sandy loam
H2 - 10 to 28 inches: clay
H3 - 28 to 40 inches: sandy clay loam
H4 - 40 to 60 inches: stratified sandy loam to gravelly clay loam

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: 9 to 20 inches to abrupt textural change
Natural drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Very low (about 1.2 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: COARSE LOAMY CLAYPAN (R014XE005CA)
Hydric soil rating: No

Minor Components

Greenfield, fine sandy loam

Percent of map unit: 10 percent
Hydric soil rating: No

Positas

Percent of map unit: 10 percent
Hydric soil rating: No

Cropley

Percent of map unit: 4 percent
Hydric soil rating: No

Hanford, fine sandy loam
Percent of map unit: 3 percent
Hydric soil rating: No

Unnamed, areas of 15 to 30 percent slope
Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, areas of 15 to 30 percent slope
Percent of map unit: 1 percent
Hydric soil rating: No

Unnamed, areas with cobbles on the surface
Percent of map unit: 1 percent
Hydric soil rating: No

Data Source Information

Soil Survey Area: San Luis Obispo County, California, Paso Robles Area
Survey Area Data: Version 12, Sep 14, 2018

San Luis Obispo County, California, Paso Robles Area

106—Arbuckle-San Ysidro complex, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: hbrp
Elevation: 600 to 1,500 feet
Mean annual precipitation: 12 to 20 inches
Mean annual air temperature: 60 to 61 degrees F
Frost-free period: 200 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Arbuckle and similar soils: 40 percent
San ysidro and similar soils: 20 percent
Minor components: 39 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Arbuckle

Setting

Landform: Terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium from mixed rock sources

Typical profile

H1 - 0 to 29 inches: fine sandy loam
H2 - 29 to 38 inches: sandy clay loam
H3 - 38 to 62 inches: stratified sandy loam to very gravelly sandy clay loam

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.8 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C

Ecological site: COARSE LOAMY (R014XE003CA)
Hydric soil rating: No

Description of San Ysidro

Setting

Landform: Terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from mixed rocks

Typical profile

H1 - 0 to 23 inches: loam
H2 - 23 to 38 inches: clay loam
H3 - 38 to 71 inches: sandy loam

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: 20 to 37 inches to abrupt textural change
Natural drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: D
Ecological site: LOAMY CLAYPAN (R014XE029CA)
Hydric soil rating: No

Minor Components

Greenfield, fine sandy loam

Percent of map unit: 14 percent
Hydric soil rating: No

Unnamed, similar to san ysidro soil

Percent of map unit: 10 percent
Hydric soil rating: No

Hanford, fine sandy loam

Percent of map unit: 5 percent
Hydric soil rating: No

Unnamed, simialr to arbuckle

Percent of map unit: 5 percent
Hydric soil rating: No

Cropley, clay

Percent of map unit: 2 percent
Hydric soil rating: No

Rincon, clay loam

Percent of map unit: 2 percent
Hydric soil rating: No

Unnamed

Percent of map unit: 1 percent
Landform: Drainageways
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: San Luis Obispo County, California, Paso Robles Area
Survey Area Data: Version 12, Sep 14, 2018

San Luis Obispo County, California, Paso Robles Area

197—San Ysidro loam, 0 to 2 percent slopes, MLRA 14

Map Unit Setting

National map unit symbol: 2tyys
Elevation: 70 to 1,990 feet
Mean annual precipitation: 13 to 22 inches
Mean annual air temperature: 59 to 61 degrees F
Frost-free period: 300 to 360 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

San ysidro and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of San Ysidro

Setting

Landform: Alluvial fans, valley floors, terraces
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Tread, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock

Typical profile

A - 0 to 23 inches: loam
B1 - 23 to 38 inches: clay loam
Bt2 - 38 to 64 inches: loam

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: 16 to 24 inches to abrupt textural change
Natural drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: C
Ecological site: LOAMY CLAYPAN (R014XE029CA)
Hydric soil rating: No

Minor Components

Arbuckle
Percent of map unit: 6 percent
Hydric soil rating: No

Rincon
Percent of map unit: 2 percent
Hydric soil rating: No

Solano
Percent of map unit: 2 percent
Hydric soil rating: No

Pleasanton, loam
Percent of map unit: 2 percent
Hydric soil rating: No

Pescadero
Percent of map unit: 1 percent
Landform: Basin floors
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

Cropley, clay
Percent of map unit: 1 percent
Hydric soil rating: No

Palexeralfs
Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: San Luis Obispo County, California, Paso Robles Area
Survey Area Data: Version 12, Sep 14, 2018

Appendix G

Phase I Environmental Site Assessment

PHASE I ENVIRONMENTAL SITE ASSESSMENT

Of

AGRICULTURE PROPERTIES
ASSESSOR PARCEL NUMBERS
009-795-001, 009-795-002, 009-795-003,
009-795-004, 009-795-005, 009-795-006,
025-381-001 AND 025-381-005
PASO ROBLES, CALIFORNIA 92592

Prepared for:
Mike Naggar and Associates
445 South D Street
Perris, CA 92570

Prepared by:

Earth Strata Geotechnical Services
42184 Remington Ave
Temecula, California 92590
(951) 397-8315
www.earth-strata.com
E-S Project #P182139-60A

Issue Date: November 8, 2018

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PHASE I ESA EXECUTIVE SUMMARY OVERVIEW Agricultural Property Paso Robles, CA				
Section Topic	**No RECs Identified**	**Non-REC Issue Identified**	**RECs Identified**	**Comments**
Historical Usage	✔			
Regulatory Database Review (on-site)	✔			
Regulatory Database Review (nearby sites)	✔			
On-site Operations	✔			
Haz. Mat. Handling	✔			
Haz. Waste Handling	✔			
USTs/ ASTs	✔			
ACMs	✔			
LBP	✔			
PCBs	✔			
Radon	✔			
Other	✔			

SECTION I.
EXECUTIVE SUMMARY & RECOMMENDATIONS

Earth Strata Geotechnical Services, (E-S) was retained by Mike Naggar an Associates, to perform a Phase I Environmental Site Assessment (Phase I ESA or Assessment) of a site with the assessor's parcel numbers 009-795-001, 009-795-002, 009-795-003, 009-795-004, 009-795-005, 009-795-006, Located on the West Side of Hanson Road, South of Linne Road and North of Meadowlark Road, Assessor's Parcel Numbers 025-381-005, 025-381-001, East of Fontana Road and North of Linne Road, City of Paso Robles, San Luis Obispo County, California , At the time of the October 15, 2018 site visit, the subject property consisted of one vacant parcel, totaling approximately 338 Acres. The subject site is located within a ranch style residential development and vineyard/winery use area.

This Phase I ESA was performed in accordance with the scope and limitations of the *American Society for Testing and Materials (ASTM) Phase I ESA Standard E1527-2013,* (Equivalent to the USEPA's All Appropriate Inquiry [AAI] Standard), the scope of work defined in this report, as well as the signed service agreement. The following summarizes ES's independent conclusions and best professional judgment based upon information available to us during the course of this Assessment.

During the site visit, the E-S Assessor was not accompanied by anyone, because the properties are vacant developed as agriculture use with residences on parcels 009-795-001, 009-975-002 and 009-795-005. The "Key Site Manager" was identified as Mrs. Hainsworth. As defined by ASTM E1527-2005, the Key Site Manager is that person having good knowledge of the uses and physical characteristics of the subject property, and in a position to provide reasonably accurate information for the Key Site Manager Environmental Questionnaire. The questioner was performed by E-S and can be found in appendix F. Based upon the limited site reconnaissance, historical review, regulatory records review, and other information detailed within this report; this Assessment did not identify any evidence of ASTM Recognized Environmental Conditions (RECs) or other issues in connection with the subject property. Potential Vapor Intrusion issues were also evaluated, and E-S found no potential sources that would impact the property.

RECOMMENDATIONS

Based on the results of this Phase I ESA, no further investigation is recommended for this site.

An Executive Summary Overview is also included in the previous section. However, when making any decisions concerning the findings of this Assessment, please also refer to the entirety of this report, which may present other items of interest that are not discussed in the Executive Summary, or further details regarding the above items. In addition, please refer to the Data Gaps section (IV-H) of this report regarding information that may have been unavailable or incomplete which may have a bearing on the findings or usage of this report.

SECTION II.
SCOPE OF WORK & LIMITATIONS

PURPOSE

The primary goal of this Phase I Environmental Site Assessment is to assist the client in satisfying one of the requirements to qualify for the "innocent landowner, contiguous property owner, or bona fide prospective purchaser limitations on CERCLA liability" (42 U.S.C. § 9601 et. seq.). Qualification for these limitations is predicated on the assumption that "…the defendant must have undertaken, at the time of acquisition, all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice in an effort to minimize liability…." The secondary goal of this Assessment is to provide information that will assist in evaluating the risk of potential significant value impairment of the security interest due to environmental impacts.

PROTOCOL

The *American Society for Testing and Materials (ASTM) Phase I ESA Standard E1527-2013* is the most current method used in attempting to perform the due diligence required to achieve the above purpose. The E1527-2013 Standard was created by the ASTM "…in an effort to define good commercial and customary practice in the United States of America for conducting an environmental site assessment.…" and is equivalent to the USEPA's All Appropriate Inquiry [AAI] Standard issued November 1, 2013. The ASTM Standard E1527-2013 is intended to identify recognized environmental conditions (RECs) in connection with a given property. The term recognized environmental conditions is not intended to include "*de minimus*" conditions that generally do not present a material risk of harm or that are unlikely to be the subject of enforcement actions by governmental agencies. Other conditions or issues that are beyond the ASTM scope may also be discussed in this report, as detailed within each section.

SCOPE OF WORK

Utilizing ASTM Standard E1527-2013, as well as the scope of work discussed below and in the work authorization document, this Assessment involved: A site reconnaissance of the subject property, limited observations of adjoining properties, a review of the historical usage of the subject property, and a review of relevant documentation provided by various public and private sources (including the client and/or owner of the subject property) to identify conditions indicative of releases or threatened releases of hazardous substances, as defined in CERCLA Section 101 (14) U.S.C. § 312.1(c) evaluate the presence or likely existence of:

- Recognized environmental conditions, specified by ASTM E1527-2013 as: "the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a

material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater or surface water of the property."

- A brief evaluation and assessment of potential environmental issues which may not rise to the level of recognized environmental conditions, such as: obviously improper hazardous material or waste handling, suspect asbestos-containing materials, lead-based paint, polychlorinated bi-phenyls, and radon gas.

LIMITATIONS

As discussed in ASTM E1527-2013, no Phase I ESA can completely eliminate uncertainty regarding the potential for RECs in connection with a subject property. This investigation is simply intended to reduce uncertainty within reasonable limits of time and cost.

Refer to Section VI-A for a brief discussion of some (but not necessarily all) specific limitations to E-S's subject property observations at the time of the site visit. The observations contained within this Assessment are based upon conditions readily observable during the site visit. These observations are typically unable to address conditions of areas not inspected, hidden from view, subsurface soil, groundwater, underground storage tanks, neighboring properties, and the like, unless specifically mentioned. It is not the purpose of this Assessment to determine the actual presence, or degree or extent of contamination (if any) at the subject property. Unless specifically noted within this report, this Assessment does not include observations, testing, coring, or sampling analysis to address groundwater, soil, or extraneous materials contamination (including mold, bio-hazardous or radiologic issues) in or on the subject property. E-S also is not providing geological interpretations or recommendations. Electromagnetic issues (e.g., proximity to high-voltage power lines) are also not included. This Assessment does not include, or address reasonably ascertainable environmental liens recorded against the subject property, unless stated.

E-S makes no warranties or guarantees as to the accuracy or completeness of information obtained from or compiled by others. Information may also exist which was beyond the scope of this investigation or was not provided to E-S that may have an impact on the conclusions of this Assessment. This Assessment does not attempt to address past or forecast future site conditions. E-S also cannot forecast or be responsible for changes in regulatory guidelines or protocols, industry standards or the like, which may affect the conclusions and/or future usage of this report.

This Assessment has been conducted and prepared in accordance with generally accepted practices and procedures exercised by reputable professionals under similar circumstances. E-S makes no other warranties or guarantees, either expressed or implied, as to the findings, opinions, or recommendations contained in the report, or as to the existence or non-existence of RECs or other issues at the subject property.

SECTION III.
GENERAL SITE DESCRIPTION

During the site visit, the properties are developed as agriculture and three of the parcels have a residence, 009-975-001, 009-975-002 and 009-975-005. power utilities were visible along Linne Road and high-power electric transmission lines are to the south. Residential properties are located to the north, Linne Road is separates the properties northeast and southwest, agricultural properties are to south. The subject property location is shown on various Figures in Appendix A.

A. CLIENT PROVIDED INFORMATION

As discussed in ASTM E1527-2013, the user (e.g., Client) is required to perform certain tasks or provide certain information to E-S to identify potential RECs. Tasks or information to be provided by the Client include: 1) review of judicial and title records for environmental liens, environmental deed restrictions or activity and use limitations (AULs); 2) provide specialized, actual, commonly known or reasonably ascertainable knowledge regarding the property; and, 3) identify reasons for a significantly lower purchase price (if applicable). The client has not provided any other information.

B. ADJOINING AND ADJACENT PROPERTIES

As discussed in ASTM E1527-2013, an adjoining property is any real property whose border is contiguous or partially contiguous with the subject property or would be if the properties were not separated by a roadway, street or other public thoroughfare. For the purposes of this report, an adjacent property is any real property located within approximately one block or less of the subject property's border.

Specifically, the subject property is bordered by the following:

North: Immediately by Linne Road and Agricultural vineyard properties.

East: Immediately by Agricultural vineyard properties.

South: Immediately by Agricultural vineyard properties.

West: Immediately by residential properties.

C. USGS TOPOGRAPHIC MAP

The subject property's physical setting was researched employing a United States Geological Survey (USGS) 7.5 Minute Topographic Quadrangle (Quad) Map relevant to the subject property. The USGS 7.5 Minute Quad Map has an approximate scale of 1 inch to 24,000 feet, and shows physical features such as wetlands, roadways, mines, and buildings. The USGS 7.5 Minute Quad Map was used as the Standard Physical Setting Source and is sufficient as a single reference. The Templeton, California Quad Map shows no physical features that are likely to environmentally impact the subject property. The subject property is identified as a rural residential developed, rectangular property. No mines, aboveground storage tanks, or wetlands were depicted in the immediate area of the subject property. The elevation of the subject property is approximately 837 feet above mean sea level with a gentle topographic gradient to the southeast (USGS Templeton 7.5' Quadrangle). A copy of the map can be found in the Appendix.

D. GENERAL HYDROGEOLOGIC CHARACTERISTICS

The subject property is within the Paso Robles Basin. The Paso Robles Basin is comprised predominantly of Paso Robles Formation sedimentary layers that extend from the ground surface to more than 2,000 feet below sea level in some areas of the Paso Robles Basin, resulting in basin sediments with a thickness of more than 2,500 feet in the greater Paso Robles Basin and up to 800 feet in the Nacimiento River area (Fugro, 2002). The Paso Robles Formation is a Plio-Pleistocene, predominantly non-marine geologic unit comprised of relatively thin, often discontinuous sand and gravel layers interbedded with thicker layers of silt and clay. It was deposited in alluvial fan, flood plain, and lake depositional environments. Seashells are reported in some well logs near the base of the Paso Robles Formation, suggesting a near-shore marine depositional environment. The formation is unconsolidated and generally poorly sorted. It is not usually intensely deformed, except locally near fault zones. The sand and gravel beds within the unit have a high percentage of Monterey shale gravel and generally have moderately lower permeability compared to the shallow, unconsolidated alluvial sand and gravel beds. The formation is typically sufficiently thick such that water wells generally produce several hundred gpm (Fugro, 2002).

. Site-specific groundwater information for the subject property was unavailable. Please see the EDR Summary Radius Map Report for Hydrologic and Geologic information, appendix D.

SECTION IV.
HISTORICAL REVIEW

The site historical review is used to develop an understanding of the previous uses of the subject property and surrounding area to identify the likelihood of past uses, or activities having environmentally impacted, the subject property. The historical review consisted of a search of various public and private Standard Historical Sources, as detailed in the sections below.

As defined by ASTM E1527-2013, a Standard Historical Source is considered complete if the information contained within the source identifies all uses of the subject property from the time the property was first used for residential, agricultural, commercial, industrial or governmental purposes. Ideally, the information should be available in either five-year intervals or site milestone events (i.e., initial construction activities, demolition activities, etc.). However, available public and private historical sources do not always fulfill this goal, in which case, the closest approximation is made based upon the sources readily available at the time of historical review.

Historical Review Summary: From the historical information review discussed below, E-S concludes that the subject property has never been residentially or commercially developed and a portion of the southern property and surrounding area used primarily for agriculture starting in the late 1940s. No dry cleaners, gasoline stations, major landfills, military bases, or heavy industrial businesses were identified on the subject property. Currently the site is vacant and undeveloped.

A. AERIAL PHOTOGRAPH REVIEW

Aerial photographs were reviewed by E-S to evaluate past land-use patterns of the subject property and vicinity. The photos were supplied by EDR and are from the following years 1949, 1957, 1960, 1976, 1981, 1994, 2006, 2009, 2012 and 2016. Copies of representative aerial photographs can be found in Appendix C. This review revealed the following:

1949 to 1981
The subject property and surrounding area is primarily agricultural with a ranch house sporadically developed within historical parcel boundaries. Two residences are visible in the 1949 photo's and the third residence shows up in the 1981 photo.

1981 to Present
The subject property and surrounding area has become more developed with residential properties to the north, and the typical infrastructure that goes with modern development.

B. BUILDING PERMIT REVIEW

In an effort to evaluate the development history of the subject property, E-S reviewed the San Louis Obispo County, Department of Planning. Review of this information indicated the Assessor's Parcel Numbers for the subject property are 009-795-001, 009-795-002, 009-795-003, 009-795-004, 009-795-005, 009-795-006, 025-381-005 and 025-381-001. The recorded lot size for the above is approximately 340 acres. No other information significant to this report was obtained from the Assessor's data. The data can also be found in the appendix E.

C. SANBORN FIRE INSURANCE MAP REVIEW

E-S requested Sanborn Fire Insurance Maps for the subject property; however, no maps were available for the subject property.

D. CITY STREET DIRECTORY REVIEW

E-S did not request a "City Street Directory" for the area of the subject property due to the rural nature of the Site.

E. HISTORICAL TOPOGRAPHIC MAP REVIEW

Historical topographic maps were reviewed by E-S. No significant additional information was revealed after review.

F. INTERVIEWS

As specified in ASTM E1527-2013, interviews will be conducted with parties including present land owners and occupants, past land owners and occupants, and adjoining property owners, as appropriate and as available. E-S interviewed Mr. Olsen and Mrs. Hainsworth who helped answer questions and fill out the questionnaire. No significant additional information was revealed after the interview. During the site visit, the E-S Assessor was not accompanied by the Key Site Manager due to the current vacant state of the Site.

G. RECORDED LAND TITLE RECORDS

As specified in ASTM E1527-2013 *recorded land title records* means records of historical fee ownership, which may include leases, land contracts and AULs on or of the *property* recorded in the place where land title records are, by law or custom, recorded for the local jurisdiction in which the *property* is located (often such records are kept by a municipal or county recorder or clerk). Such records may be obtained from title companies or directly from the local government agency. Information about the title to the *property* that is recorded in a U.S. district court or any place other than where land title records are, by law or custom, recorded for the local jurisdiction in which the *property* is located, are not considered part of *recorded land title records*, because often this source will provide only names of previous *owners*,

lessees, easement holders, etc., and little or no information about uses or occupancies of the *property*, but when employed in combination with another source *recorded land title records* may provide helpful information about uses of the *property*. This source cannot be the sole historical source consulted. If this source is consulted, at least one additional standard historical source must also be consulted. E-S's performed a search of the Riverside County Assessor's office, the assessor's report and parcel map can be found in Appendix E.

A title report was not provided; however, a search was conducted on-line at the Riverside County Land information site (http://www3.tlma.co.riverside.ca.us/pa/rclis/index.html). Such a report typically does not list all documents related to the subject property, simply those that the title insurer wants to exclude from coverage and/or that are of potential interest to the transaction. Title reports may also be one method to evaluate the environmental liens search required by the ASTM E1527-2013 standard, which is required to be performed by the report User. A liens/use limitations search by the User is required by the ASTM/AAI standard 180 days or less prior to acquisition of a property, but a general review of the above title report was performed by E-S. No obvious issues that would significantly environmentally impact the subject property were noted from this review. In addition, no environmental liens, environmental deed restrictions, nor activity and or use limitations related to environmental issues were specifically listed. If more in-depth information is desired regarding the contents of the title report, appropriate legal counsel or a title professional should be consulted.

H. DATA GAPS

As specified in ASTM E1527-2013, data gaps are defined as "a lack or inability to obtain information required by the standards and practices listed in the regulation despite good faith efforts by the Environmental Professional or prospective landowner to gather such information". Data failure occurs when historical research does not identify standard historical sources that are "reasonably ascertainable" and "likely to provide useful information to identify prior uses of the property". Per ASTM E1527-13, the assessment must document data failure and give reasons why historical sources were not available or excluded (if applicable). Based on E-S's research, no significant data gaps were identified for the subject site.

SECTION V.
AGENCY RECORDS REVIEW

In an effort to evaluate whether the subject property and/or nearby sites have reported USTs, hazardous waste generation, or hazardous material releases, regulatory information from the federal, state, and local agencies listed below were reviewed. The database report was compiled by a third-party database provider and is reportedly the most recent database information available from each agency. A copy of the database report is included in the appendix. According to the database provider, their search of the various databases conforms to ASTM E1527-2013 Standards. However, the accuracy of the information provided by the agencies is not without error or omission, and the information listed is limited to that which was reported to or gathered by that agency. A limited discussion of the number of sites identified, and of their potential impact to the subject property, follows this page. In addition, E-S may request state and/or local regulatory agency information for the subject property, targeting those agencies most likely to provide information useful for this Assessment. The primary databases reviewed and their general search range criteria are below:

Federal Database	Search Range
USEPA NPL/Superfund databases:	Target Property to 1.0 mile
USEPA CERCLIS databases:	Target Property to 0.5 mile
USEPA RCRIS facilities databases	
Corrective Action Sites:	1.0 mile
TSD Facilities:	0.5 mile
Generators:	0.25 mile
USEPA ERNS database:	Target Property
US Engineering Controls:	0.5 mile
US Institutional Controls:	0.5 mile
US DOD/FUDS databases:	1.0 mile
US Brownfields:	0.5 mile
State/Local Database	**Search Range**
State Superfund databases:	
Hist Cal-Sites:	1.0 mile
CA Bond Exp. Plan	1.0 mile
State Landfills database:	0.5 mile
State Cortese	0.5 mile
State/Local LUST databases:	0.5 mile
State Spills databases:	
SLIC:	0.5 mile
CHMIRS:	Target Property
State/Local UST/AST databases:	0.25 mile
State Liens database:	Target Property
State Deed database:	0.5 mile
State VCP database:	0.5 mile
State EnviroStor/Response databases:	1.0 mile
State HAZNET database:	Target Property
Local Haz-Mat/Cleanup databases:	Target Property

A. REVIEW OF FEDERALLY REPORTED ENVIRONMENTAL DATA

The review of the federal environmental databases listed below attempts to identify environmental problem sites, activities, and occurrences from the records of the U.S. Environmental Protection Agency (USEPA). The detailed listing, and a map showing the location of the sites relative to the subject property, is included in the appendix.

National Priorities List (NPL) of Superfund Sites:
The NPL is the USEPA's database of hazardous waste sites currently identified and targeted for priority cleanup action under the Superfund program. This search includes Proposed NPL sites, Delisted NPL sites, and NPL Recovery sites. NPL sites may encompass relatively large areas. As such, polygon coverage for the site boundaries (for a majority of the NPL sites), as produced by the EPA may be provided. A search of the NPL database identified the following number of Superfund sites within the specified database search range:

Number of Sites	Number Listed at Subject Property
None	None

National Priorities List Liens (NPL Liens):

The NPL Liens database contains a list of filed notices of Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. A search of the NPL Liens database identified the following number of sites within the specified database search range:

Number of Sites	Number Listed at Subject Property
None	None

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980:
Mandated as part of the 1980 Superfund Act, the CERCLIS (Comprehensive Environmental Response, Compensation and Liability Information System) list is an EPA compilation of the sites investigated, or currently being investigated, for a release or potential release of a regulated hazardous substance under the CERCLA regulations. A search of the CERCLIS and CERCLIS-NFRAP (no further remedial action planned) databases identified the following number of sites within the specified database search range:

Number of Sites	Number Listed at Subject Property
One	None

RCRIS Corrective Action (RCRIS-CA) Sites:

The RCRIS-CA report contains information pertaining to hazardous waste handling facilities which have conducted, or are currently conducting corrective actions, as regulated by the Resource Conservation and Recovery Act. A search of the RCRIS-CA list identified the following number of sites within the specified database search range:

Number of Sites	Number Listed at Subject Property
One	None

Resource Conservation and Recovery Act Information System (RCRIS) Treatment, Storage, and Disposal (TSD) Facilities:

The RCRA program identifies and tracks hazardous waste from generation source to the point of ultimate disposal. The RCRIS-TSD facilities database is the composite of reporting facilities that transport, store, or dispose of controlled or hazardous waste. Identification on this list does not indicate that a site has impacted the environment. A search of the RCRIS-TSD database identified the following number of facilities within the specified database search range:

Number of Sites	Number Listed at Subject Property
None	None

RCRIS Generator Facilities:

The RCRIS program identifies and tracks hazardous waste from generation source to the point of ultimate disposal. The RCRIS generator facilities database (large and small quantity generators and various derivations) is the composite of reporting facilities that generate hazardous waste. Identification on these lists does not indicate that a site has impacted the environment. A search of the RCRIS facilities databases identified the following number of sites within the specified database search range:

Number of Sites	Number Listed at Subject Property
One	None

Emergency Response Notification System (ERNS):

The ERNS database is the historical record of releases of hazardous substances reported to the USEPA. A search of the ERNS database identified the following number of releases within the specified database search range:

Number of Sites	Number Listed at Subject Property
None	None

EPA Engineering and Institutional Controls (US ENG/INST CONTROL) Sites:

These databases include listings of sites with engineering or institutional controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are required as part of the institutional controls. A search of the US ENG/INST CONTROL database(s) identified the following number of sites within the specified database search range:

Number of Sites	Number Listed at Subject Property
None	None

Department of Defense (DOD) Sites:

The Unites States Geological Survey (USGS) maintains the DOD database, which consists of federally owned or administered lands, administered by the DOD, that have an area equal to or greater than 640 acres of the United States, Puerto Rico, and the US Virgin Islands. A search of the DOD database identified the following number of sites within the specified database search range:

Number of Sites	Number Listed at Subject Property
None	None

Formerly Used Defense Sites (FUDS):

The U.S. Army Corps of Engineers database contains a listing of locations of Formerly Used Defense Sites (FUDS) where the U.S. Army Corps of Engineers is actively working or will take necessary cleanup actions. A search of the FUDS database identified the following number of sites within the specified database search range:

Number of Sites	Number Listed at Subject Property
None	None

US Brownfields Sites (Brownfields):

The US Brownfields site includes brownfields properties addressed by Cooperative Agreement Recipients (CAR) and brownfields properties addressed by Targeted Brownfields Assessments (TBA). EPA's TBA program is designed to help states, tribes, and municipalities minimize the uncertainties of contamination often associated with brownfields. Cooperative Agreement Recipients (states, political subdivisions, territories, and Indian tribes) become Brownfields Cleanup Revolving Loan Fund (BCRLF) cooperative agreement recipients when they enter into BCRLF cooperative agreements with the USEPA. EPA selects BCRLF cooperative agreement recipients based on a proposal and application process. BCRLF cooperative agreement recipients must use EPA funds provided through BCRLF cooperative agreement for specified brownfields-related cleanup activities. A search of the Brownfields database identified the following number of sites within the specified database search range:

Number of Sites	Number Listed at Subject Property
None	None

CERCLA Lien Information (LIENS 2):

A Federal Superfund Lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties. A search of the LEINS 2 database identified the following number of sites within the specified database search range:

Number of Sites	Number Listed at Subject Property
None	None

Facility Index System (FINDS) sites:

The FINDS Report is a computerized inventory of all facilities that are regulated or tracked by the U.S. Environmental Protection Agency. These facilities are assigned a unique identification number that serves as a cross-reference for databases in the EPA's program system. Identification on this database does not indicate that a site has impacted the environment. A search of the FINDS database identified the following number of sites within the specified database search range:

Number of Sites	Number Listed at Subject Property
None	None

B. REVIEW OF STATE-REPORTED ENVIRONMENTAL DATA

Results of the state regulatory records search follow. Each section begins with a general description of the databases searched and the corresponding responsible state or local agency. The detailed listing, and a map showing the location of the sites relative to the subject property, is included in the appendix.

State Hazardous Waste Site (SHWS) Databases:

State Hazardous Waste Site records are the states' equivalent to CERCLIS. The Department of Toxic Substances Control (DTSC) Hist Cal-Sites database contains potential or confirmed hazardous substance release properties. The Calsites database was created by the Department of Toxic Substances and Control (DTSC), but DTSC no longer up-dates the Calsites database. The Calsites database was replaced by the EnviroStor database (see EnviroStor section below). The CA Bond Expenditure Plan database contains the Department of Health Services site-specific expenditure plan, which is the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. A search of the State Hazardous Waste Site database(s) identified the following number of sites within the specified database search range:

Number of Sites	Number Listed at Subject Property
Four	None

Solid Waste Facilities, Landfills and Recycling Facilities:

The State Solid Waste Facilities and Landfills and Recycling databases include an inventory of active, closed, and inactive solid waste disposal facilities, landfills, refuse transfer stations, and recycling facilities (non-landfill sites). A search of these databases identified the following number of sites within the specified database search range:

Number of Sites	Number Listed at Subject Property
None	None

Historical Cortese Database:

The Historical Cortese list contains hazardous waste and substance sites compiled pursuant to Assembly Bill 3750 (Cortese, Chapter 1048, Statutes of 1986). The information included in this list was compiled with information from the California DTSC, the State Water Resources Control Board, and the California Waste Management Board. This database contains primarily LUST sites, although other types of sites may be included. A search of the Cortese database identified the following number of sites within the specified search range:

Number of Sites	Number Listed at Subject Property
One	None

Leaking Underground Storage Tanks (LUSTs):

State and/or local agencies maintain inventories of LUSTs (also known as LTANKS) in a statewide database. A search of the LUST database identified the following number of reported LUST sites within the specified search range:

Number of Sites	Number Listed at Subject Property
None	None

State/Local Spills Databases:

The Spills, Leaks, Investigations, and Cleanup (SLIC) Cost Recovery Listing program is designed to protect and restore water quality from spills, leaks, and similar discharges. The database(s) included in this section are the states' equivalent to the ERNS report and generally contain information for reported hazardous material/waste surface or groundwater contamination release investigations reported in that state or locality. The California Hazardous

Material Incident Report System (CHMIRS) database contains information on reported hazardous waste material incidents (accidental releases or spills). A search of these databases identified the following number of sites within the specified database search range:

Number of Sites	Number Listed at Subject Property
None	None

Underground Storage Tanks (USTs)/Aboveground Storage Tanks (ASTs):

USTs are regulated under Subtitle I of the RCRA (as well as various state regulations) and must be registered with the State Underground Storage Tank Program. These are registered USTs only, and identification on this list(s) does not necessarily indicate that the site has impacted the environment. This search includes review of the Active UST Facilities (UST) database, Facility Inventory Database (CA FID UST), Hazardous Substance Storage Container Database (HIST UST), and SWEEPS UST Listing database (SWEEPS UST). Also potentially included in this section are sites identified on historic UST databases that are no longer maintained. The AST database is the State Water Resources Control Board's Hazardous Substance Storage Container Database for registered ASTs. A search of these UST and AST databases identified the following number of sites within the specified search range:

Number of Sites	Number Listed at Subject Property
One	None

Environmental Liens Listing (LIENS):

The Department of Toxic Substances Control's (DTSC) LIENS database includes a listing of property locations with environmental liens for California where DTSC is a lien holder. A search of the LIENS database identified the following number of sites within the specified database search range:

Number of Sites	Number Listed at Subject Property
None	None

Deed Restriction Listing (DEED):

The Department of Toxic Substances Control's (DTSC) DEED database includes a listing of Site Mitigation and Brownfields Reuse Program (SMBRP) Facility Sites with Deed Restrictions and Hazardous Waste Management Program Facility Sites with Deed/Land Use Restrictions. The SMBRP list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active, and some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners. A search of the DEED database identified the following number of sites within the specified database search range:

Number of Sites	Number Listed at Subject Property
One	None

Voluntary Cleanup Program (VCP):

The Department of Toxic Substances Control's (DTSC) VCP database contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have requested that DTSC oversee the investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs. A search of the VCP database identified the following number of sites within the specified database search range:

Number of Sites	Number Listed at Subject Property
One	None

State Response/EnviroStor Databases:

The Department of Toxic Substances Control's (DTSC) RESPONSE database identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk. The DTSC's Site Mitigation and Brownfields Reuse Program's (SMBRPs) EnviroStor database identifies sites that have reported contamination or sites for which there may be reason to investigate further. The database includes the following site types: Federal Superfund Sites

(National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in Cal-Sites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites. A search of the Response and EnviroStor databases identified the following number of sites within the specified database search range:

Number of Sites	Number Listed at Subject Property
Five	None

State and/or Local Agency Generators (HAZNET):

The HAZNET data is extracted from copies of hazardous waste manifests kept by the Cal-EPA, DTSC. These manifests track hazardous wastes from generation source to the point of ultimate disposal. Permit data is generally culled from local agency database(s) for hazardous material handlers and generators. Identification on these lists does not indicate that a site has impacted the environment and the data has not always been verified for accuracy by the DTSC or local agencies. A search of the HAZNET and Permit data identified the following number of reported sites within the specified database search range:

Number of Sites	Number Listed at Subject Property
One	None

National Pollutant Discharge Elimination System (NPDES) Database:

The National Pollutant Discharge Elimination System (NPDES) includes sites that have had or have a permit for the discharge of wastewater or storm water issued by the Regional Water Quality Control Board or a local agency (e.g., Public Works Department). The NPDES data identified the following number of reported sites within the specified database search range:

Number of Sites	Number Listed at Subject Property
None	None

State and/or Local Agency Air Emissions Database (EMI):

The EMI data is extracted from permits for air emissions kept by the state or local air resources agency. Identification on these lists does not indicate that a site has impacted the environment. A search of the EMI database identified the following number of reported sites within the specified database search range:

Number of Sites	Number Listed at Subject Property
None	None

Notify 65 Database:

Notify 65 listings generally indicate that some type of release and/or groundwater impact have occurred which was required to be reported under Proposition 65 rules. A search of the Notify 65 data identified the following number of reported sites within the specified database search range:

Number of Sites	Number Listed at Subject Property
None	None

EDR Historical Auto Stations, Historical Cleaners, & Manufactured Gas Plants Databases:

These databases include former gas stations, auto repair shops, dry cleaners, Laundromats, and manufactured gas plants that are typically no longer active. Identification on these databases does not necessarily indicate that such activities actually occurred at that site or that a site has impacted the environment. A search of these databases identified the following number of sites within the specified database search range:

Type of Site	Number of Sites	Number Listed at Subject Property
Historical Auto Stations	None	None
Historical Cleaners	None	None
Historical Manufactured Gas	None	None

Orphan Unplottable Sites:
"Orphan" sites are those which could not be plotted by the database provider using conventional geo-coding methods, typically because the information provided in the original government database was unclear, incorrect or missing. A listing of orphan sites (if any) appears at the end of the database, immediately after the last plottable site description.

E-S reviewed the orphan list for sites with the same name as the subject property (if applicable) and/or the same or similar property address. This review is inherently limited by the incomplete and/or possibly incorrect data reported in the orphan listings. For orphans apparently not related to the subject property, only those obviously located adjoining or within a short distance that may affect the property are discussed. Orphan sites which are also listed in the plotted section are not re-discussed. E-S's review of the orphan list revealed no obvious sites of concern listed at or adjoining the subject property.

C. LOCAL AGENCY RECORDS SEARCH

The following is a discussion of the results of E-S's written records requests, online regulatory database review, and/or personal/telephone contacts (as applicable) made to state and/or local government agencies in an effort to obtain potential information relevant to the subject property:

San Louis Obispo County Environmental Department (CUPA):

E-S contacted the San Louis Obispo Environmental Health in an effort to evaluate whether hazardous material incidents, USTs, and/or LUSTs have been reported at the subject property address. No UST's or AST's are located on the properties, however, addresses 3161 and 3045 Linne Road reported agricultural hazardous materials and a pesticide license.

California EPA - Department of Toxic Substances Control (DTSC):

E-S also reviewed CalEPA-DTSC's Hazardous Waste Tracking System (HWTS) online database (http://hwts.dtsc.ca.gov) to identify potential hazardous waste generation/disposal activities associated with the subject property address. A search was performed for the addresses with CUPA listings and no records were found.

California Department of Water Resources and Geotracker:

E-S contacted the California Department of Water Resources in an effort to evaluate whether any state listed water wells or water resources are located on the subject property address. No water wells are located on the property.

D. TRIBAL RECORDS SEARCH

According ASTM E1527-2013, records for local and tribal records shall be checked to satisfy all appropriate inquiry for this assessment. The following is a discussion of the results of E-S's written records requests, online regulatory database review, and/or personal/telephone contacts (as applicable) made to tribal governmental agencies in an effort to obtain potential information relevant to the subject property:

The subject property is not located on tribal property and therefore no inquiry was necessary.

SECTION VI.
SITE VISIT OBSERVATIONS

A. SITE STRUCTURE CHARACTERISTICS

During the site visit, the properties are developed as agriculture and three of the parcels have a residence, 009-975-001, 009-975-002 and 009-975-005. power utilities were visible along Linne Road and high-power electric transmission lines are to the south. Residential properties are located to the north, Linne Road is separates the properties northeast and southwest, agricultural properties are to south. The subject property location is shown on various Figures in Appendix A.

B. WASTEWATER AND STORMWATER MANAGEMENT

No wastewater was observed at the subject site.

Storm water and surface run-off from the subject property and adjacent properties inter the natural storm water and natural water conveyance systems.

C. POTABLE WATER SUPPLY

The subject property would utilize water from Paso Robles Water Division.

E. BUSINESS OPERATIONS DESCRIPTION

According to the San Louis Obispo County Department of Planning, the subject property zone is RS. E-S's research indicates no dry cleaners, gasoline stations, military bases, or major manufacturing operations have occupied the subject property.

SECTION VII.
HAZARDOUS MATERIAL/WASTE OBSERVATIONS

A. HAZARDOUS MATERIALS HANDLING AND STORAGE

No hazardous materials were observed at the subject property. No significant staining or spillage was observed in any of the areas inspected. No other significant hazardous materials handling or storage were observed on the subject property during the site visit.

B. WASTESTREAM GENERATION, STORAGE AND DISPOSAL

During the inspection, no hazardous waste generation, storage, or improper hazardous waste disposal was observed on the subject property. Minor amounts of construction debris were observed around the perimeter of the property. Stained or discolored sinks, drains, catch basins, drip pads, or sumps were not observed. Additionally, significant spills or staining were not observed at the subject property.

C. SOLID WASTE DISPOSAL

During the inspection, no solid waste generation, storage, or improper solid waste disposal was observed on the subject property.

D. ABOVEGROUND STORAGE TANKS (ASTs)

Visual or physical indicators of current or former ASTs were not observed at the subject property during the site visit.

E. UNDERGROUND STORAGE TANKS (USTs)

As discussed in the Section V (Agency Records Review) of this report, no USTs were reported at the subject property. In addition, no visual or physical evidence of current or past USTs were discovered during the site visit in the readily visible areas of the property. In particular, E-S searched for: fill pipes, vent pipes, man-ways, manholes, access covers, and or concrete pads not homogeneous with surrounding surfaces, concrete built-up areas potentially indicating pump islands, abandoned pumping equipment, or fuel pumps.

SECTION VIII.
OTHER POTENTIAL ISSUES OF CONCERN

A. PCB-CONTAINING EXTERIOR ELECTRICAL TRANSFORMERS

No transformers were observed on the subject property.

B. OTHER PCB-CONTAINING INTERIOR OR EXTERIOR EQUIPMENT

During the on-site inspection, no evidence was observed of any equipment likely containing PCB-contaminated fluid (e.g., interior electric transformers, hydraulic elevators, hydraulic hoists/lifts, hydraulic loading dock ramps, other fluid containing equipment, etc.).

C. SUSPECT ASBESTOS-CONTAINING MATERIALS (ACMs)

Buildings on two of the parcels are 1930's vintage and could potentially contain asbestos materials. Asbestos-containing materials (ACMs) were not identified during this assessment and not within the scope of this project, however E-S recommends that a qualified ACM person should be present during removal any disturbance of the older buildings.

D. LEAD-BASED PAINT (LBP)

Buildings on two of the parcels are 1930's vintage and could potentially contain lead-based paint. Lead based paints (ACMs) were not identified during this assessment and not within the scope of this project, however E-S recommends that care should be taken in the removal of such materials and properly disposed of, at an appropriate facility.

E. LEAD IN DRINKING WATER

Federal regulations limit lead in publicly supplied water to no more than 15 parts per billion (ppb), however, the most common source of lead in tap water is from interior plumbing systems (piping, connections, faucets, etc.). Children are the most susceptible to possible health effects from consuming lead-tainted drinking water. Due to the future planned redeveloped of the property, no observations of these sources were observed. The presence or absence of elevated lead concentrations in the water can only be confirmed through laboratory testing, and such analysis is beyond the scope of this assessment.

F. AIR QUALITY

Unusual smells, noxious odors, or visual emissions were not observed during the inspection of the subject property. However, these observations are general in nature and should not be construed as an air quality assessment.

G. RADON

According to the USEPA, the general area of the site has a predicted average indoor screening level of less than the EPA guideline action level of 4.0 picoCuries per liter of air (EPA Radon Zone Level of 2). Therefore, based upon the reported subsurface characteristics of the area, the subject property exhibits no potential for high-level radon exposure.

H. RAILROAD RIGHTS-OF-WAY

There are several potential environmental risks associated with railroad rights-of-way, including the usage of herbicides, pesticides, petroleum materials and related heavy metals (e.g. arsenic) to maintain the tracks, as well as the potential spillage of hazardous materials from railcars. During the site visit, no railroad rights-of-way, spurs, or related features were observed immediately adjoining the subject property.

SECTION IX.
ADJOINING PROPERTY OBSERVATIONS

As discussed below, based upon limited observations of the adjoining properties from publicly accessible locations, as well as a review of federal, state, and local environmental databases, none of the adjoining properties appeared to have significantly environmentally impacted the subject property at this time.

A. ADJOINING PROPERTIES MATERIALS STORAGE

Visual observations of the portions of the adjoining properties visible from the subject property or public roadways did not indicate the exterior storage of hazardous materials or wastes. No indications of spillage or staining were observed in the observable exterior areas of these sites. Additionally, no obvious indications of improper hazardous material storage or unusual or suspicious materials handling or storage practices were observed.

B. ADJOINING PROPERTIES WASTESTREAM DISPOSAL

No unusual or suspicious waste stream disposal activities were observed on the portions of the adjoining properties visible from the subject property or public roadways.

C. RECOMMENDATIONS

Based on the results of this Phase I, no further investigation is recommended for this Site.

SECTION X.
STATEMENT OF THE ENVIRONMENTAL PROFESSIONALS

This Assessment has been performed for the exclusive use and benefit of the addressee(s) identified on the cover of this report, or agents directly specified by it (them), for the transaction at issue concerning the subject property described in this report. This Assessment shall not be used or relied upon by others without the prior written consent of Earth-Strata, Inc. and of the addressee(s) named on the cover of this report.

STATEMENT OF QUALITY ASSURANCE

I declare that, to the best of my professional knowledge and belief, I meet the definition of an Environmental Professional as defined in § 312.10 of 40 CFR 312 and 12.13.2. I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. I have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312. The conclusions contained within this Assessment are based upon site conditions I readily observed and were reasonably ascertainable and present at the time of the site visit. The findings and conclusions represent my best professional opinion and judgment. In addition, the conclusions and recommendations stated in this report are based upon personal observations made by E-S and upon information provided by others. I have no reason to suspect or believe that the information provided is inaccurate.

STATEMENT OF QUALITY CONTROL

The objective of this Phase I ESA was to ascertain the potential presence or absence of RECs that could impact the subject property, as delineated in the scope of services and limitations identified in this report and in the service agreement. The procedure was to perform reasonable steps in accordance with the existing regulations, currently available technology, and generally accepted environmental consulting practices, in order to accomplish the stated objective.

Signature of Professional Geologist – *William T. Doyle, #8601:*

Signature/Environmental Assessor

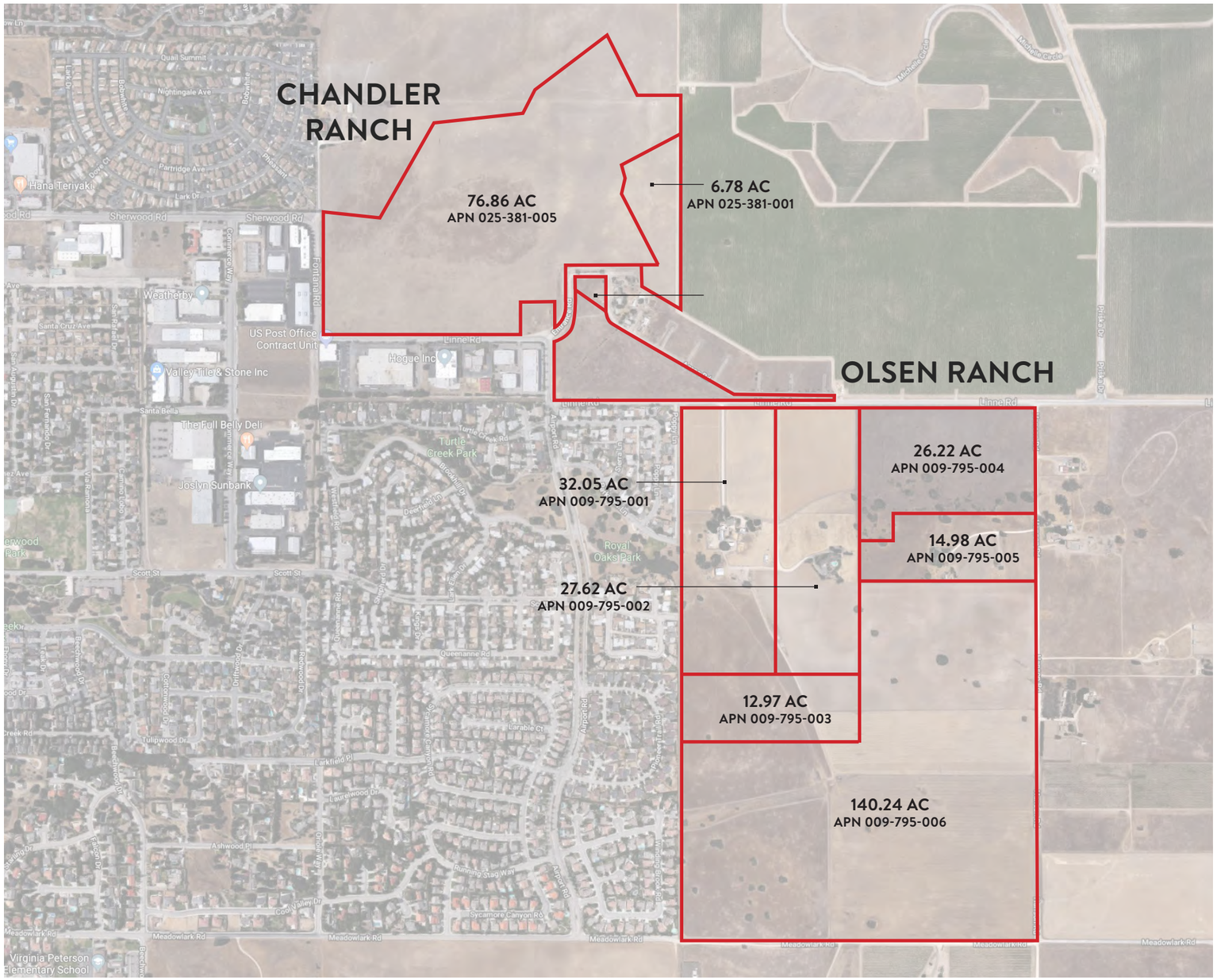
Acronyms and Abbreviations

Below are several abbreviations that E-S uses to describe various projects.

ACM	Asbestos-containing material
AQMD	Air Quality Management District
AST	aboveground storage tank
ASTM	American Society for Testing and Materials
bgs	Below Ground Surface
BTEX	Benzene-toluene-ethylbenzene-xylene
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System
CFR	Code of Federal Regulations
CHMIRS	California Hazardous Material Incident Report System
COC's	Chemicals of Concern
CDL	Clandestine Drug Labs
DEP	Department of Environmental Protection
DOD	Department of Defense
DOE	Department of Energy
DTSC	Department of Toxic Substance Control
EDR	Environmental Data Resources, Inc.
ERNS	Emergency Response Notification System
ESA	Environmental Site Assessment
FINDS	Facility Index System
FUDS	Formerly Used Defense Sites
HMIRS	Hazardous Materials Information Reporting System
ICIS	Integrated Compliance Information System
LBP	Lead Based Paint
LDL	Laboratory Detection Limit
LEL	Lower Explosion Limit
LUCIS	Land Use Control Information System
LUST	leaking underground storage tank
MCL	Maximum Contaminant Level
MLTS	Material License Tracking System
mg/L	Milligrams per liter
MSDS	Material Safety Data Sheet
MTBE	Methyl Tertiary Butyl Ether
NFA	No Further Action
NPL	National Priority List
ODI	Open Dump Inventory
PADS	PCB Activity Database System
PCB	Poly Chlorinated Biphenyl
PEL	Permissible Exposure Limit
Ppb	Parts per billion
RAP	Remedial Action Plan
RCRA	Resource Conservation and Recovery Act
REC	Recognized environmental condition
RWQCB	Regional Water Quality Control Board
SVE	Soil Vapor Extraction
Ug/L	Micrograms per Liter
UST	Underground storage tank
VOC	Volatile Organic Compound

APPENDIX

A



CHANDLER RANCH

APN	ACRES
025-381-005	76.86
025-381-001	6.78
	83.64

TOTAL ACREAGE: XX.XX

OLSEN RANCH

APN	ACRES
009-795-001	32.05
009-795-002	27.62
009-795-003	12.97
009-795-004	26.22
009-795-005	14.98
009-795-006	140.24

TOTAL ACREAGE: 254.08

OLSEN-CHANDLER SPECIFIC PLAN

TOTAL ACREAGE: 337.72+

N

NTS

OP+UM DESIGN GROUP

PROJECT PARCEL + APN MAP

OLSEN-CHANDLER RANCH

05.01.18

OLSEN 212 LLC

SITE PHOTO'S

OLSEN CHANDLER RANCH, PASO ROBLES, CALIFORNIA

APPENDIX

B

Olsen Chandler

Not Reported

Paso Robles, CA 93446

Inquiry Number: 5465952.5

November 07, 2018

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

11/07/18

Site Name:

Olsen Chandler
Not Reported
Paso Robles, CA 93446
EDR Inquiry # 5465952.5

Client Name:

Rainwater Consulting
24051 Golden Pheasant Lane
Murrieta, CA 92562
Contact: Tim Doyle

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

Search Results:

Year	Scale	Details	Source
2016	1"=875'	Flight Year: 2016	USDA/NAIP
2012	1"=875'	Flight Year: 2012	USDA/NAIP
2009	1"=875'	Flight Year: 2009	USDA/NAIP
2006	1"=875'	Flight Year: 2006	USDA/NAIP
1994	1"=875'	Acquisition Date: September 03, 1994	USGS/DOQQ
1981	1"=875'	Flight Date: August 01, 1981	USDA
1976	1"=875'	Flight Date: May 24, 1976	USGS
1960	1"=875'	Flight Date: April 02, 1960	USGS
1957	1"=875'	Flight Date: August 08, 1957	USDA
1949	1"=875'	Flight Date: March 31, 1949	USDA

When delivered electronically by EDR, the aerial photo images included with this report are for ONE TIME USE ONLY. Further reproduction of these aerial photo images is prohibited without permission from EDR. For more information contact your EDR Account Executive.

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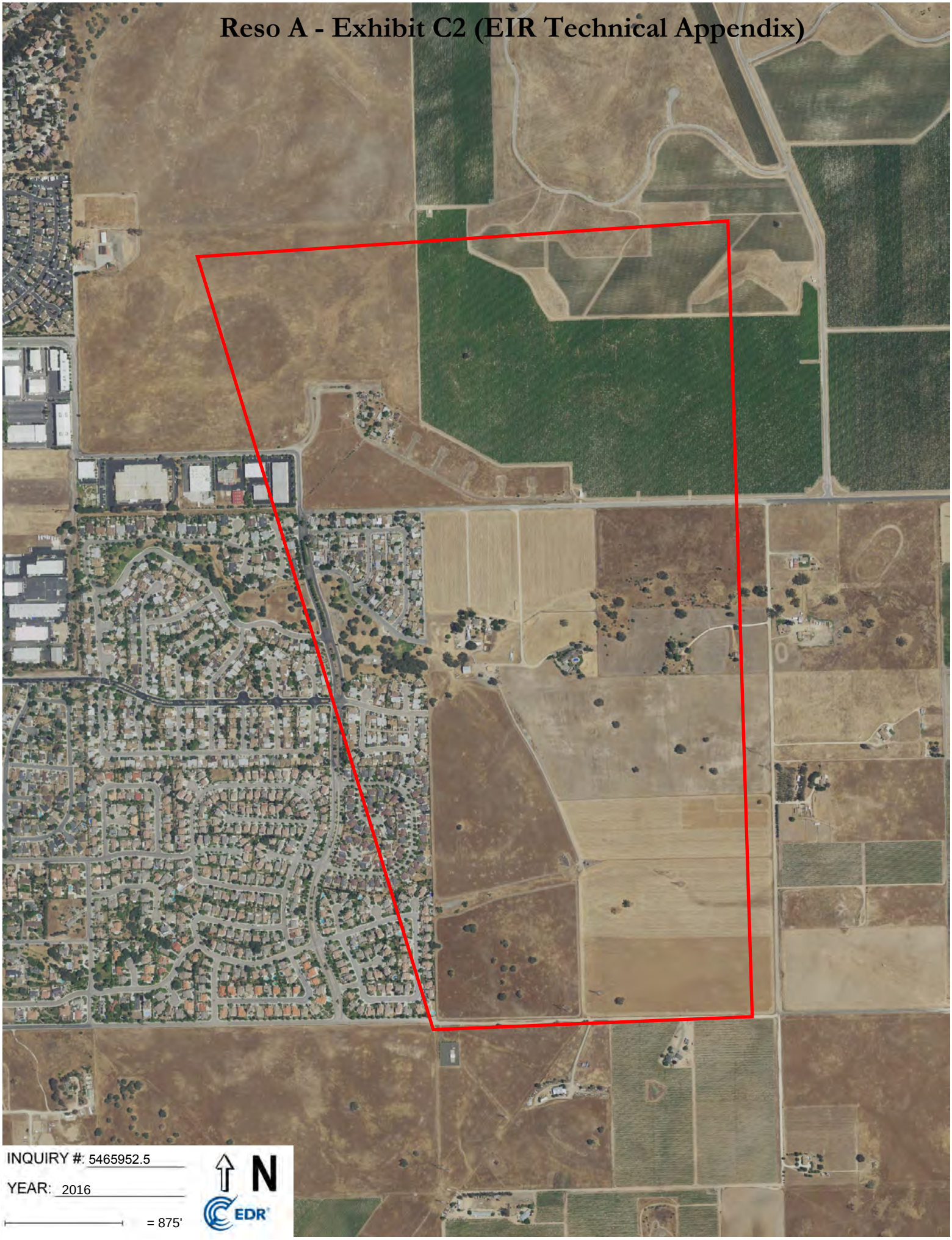
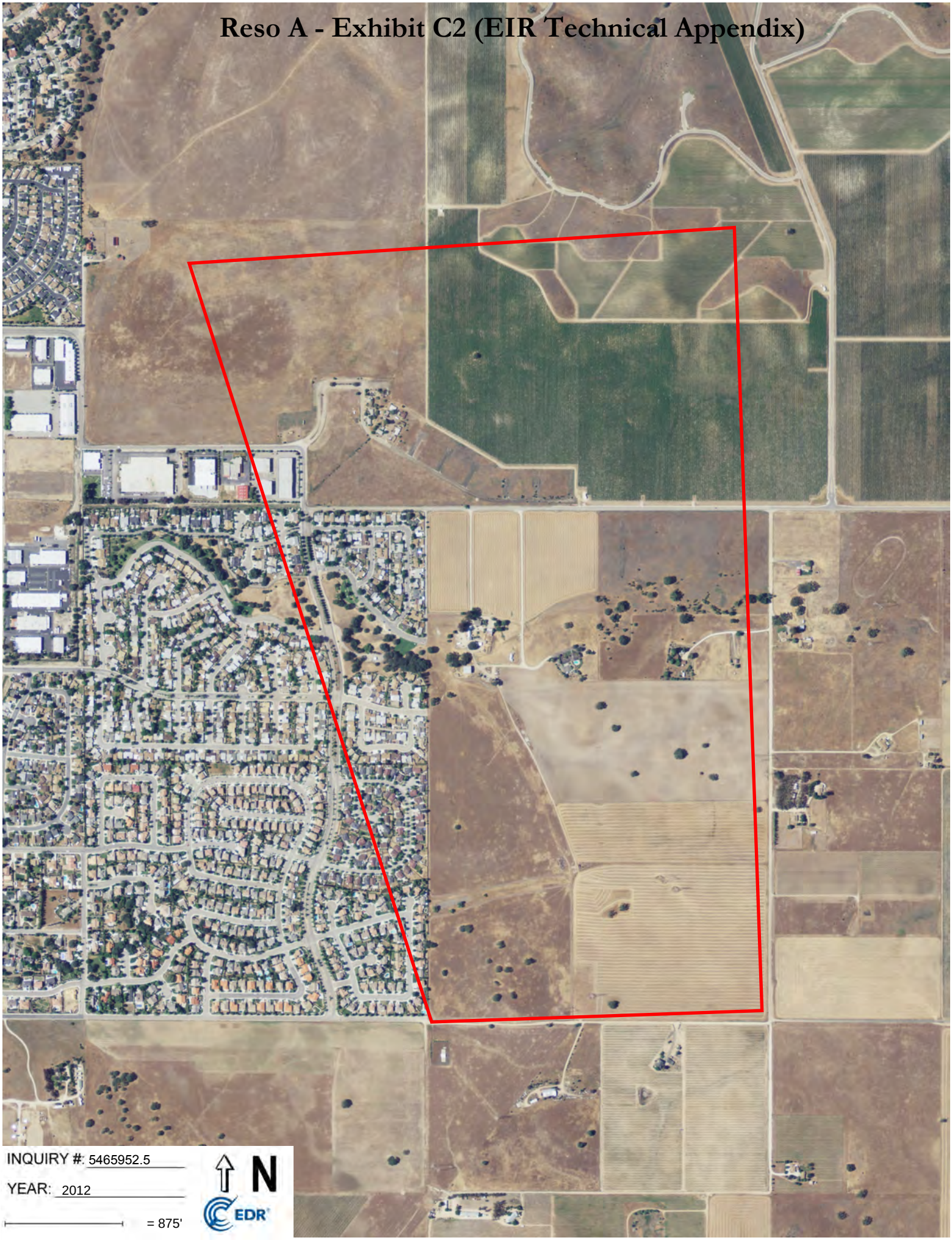
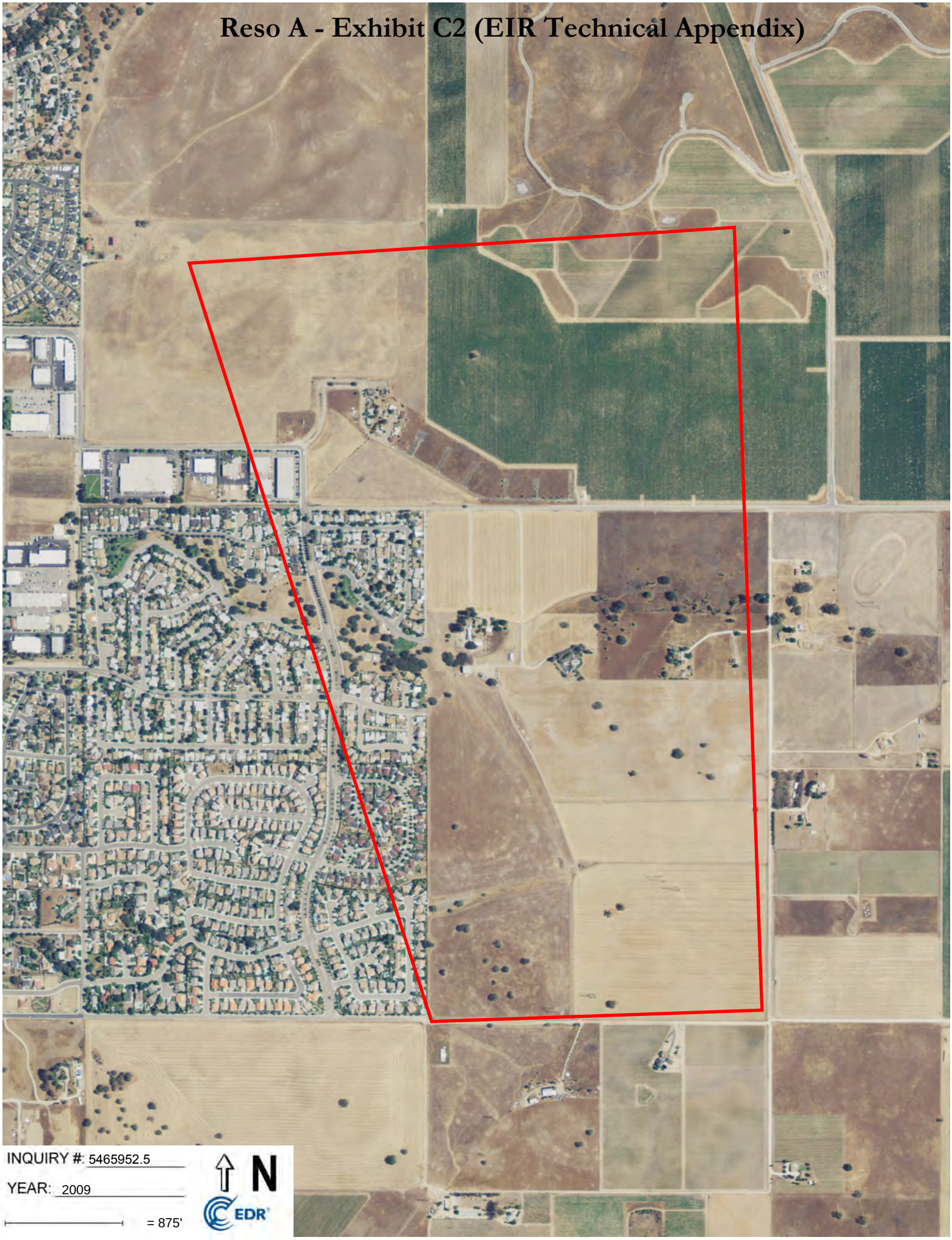
Reso A - Exhibit C2 (EIR Technical Appendix)



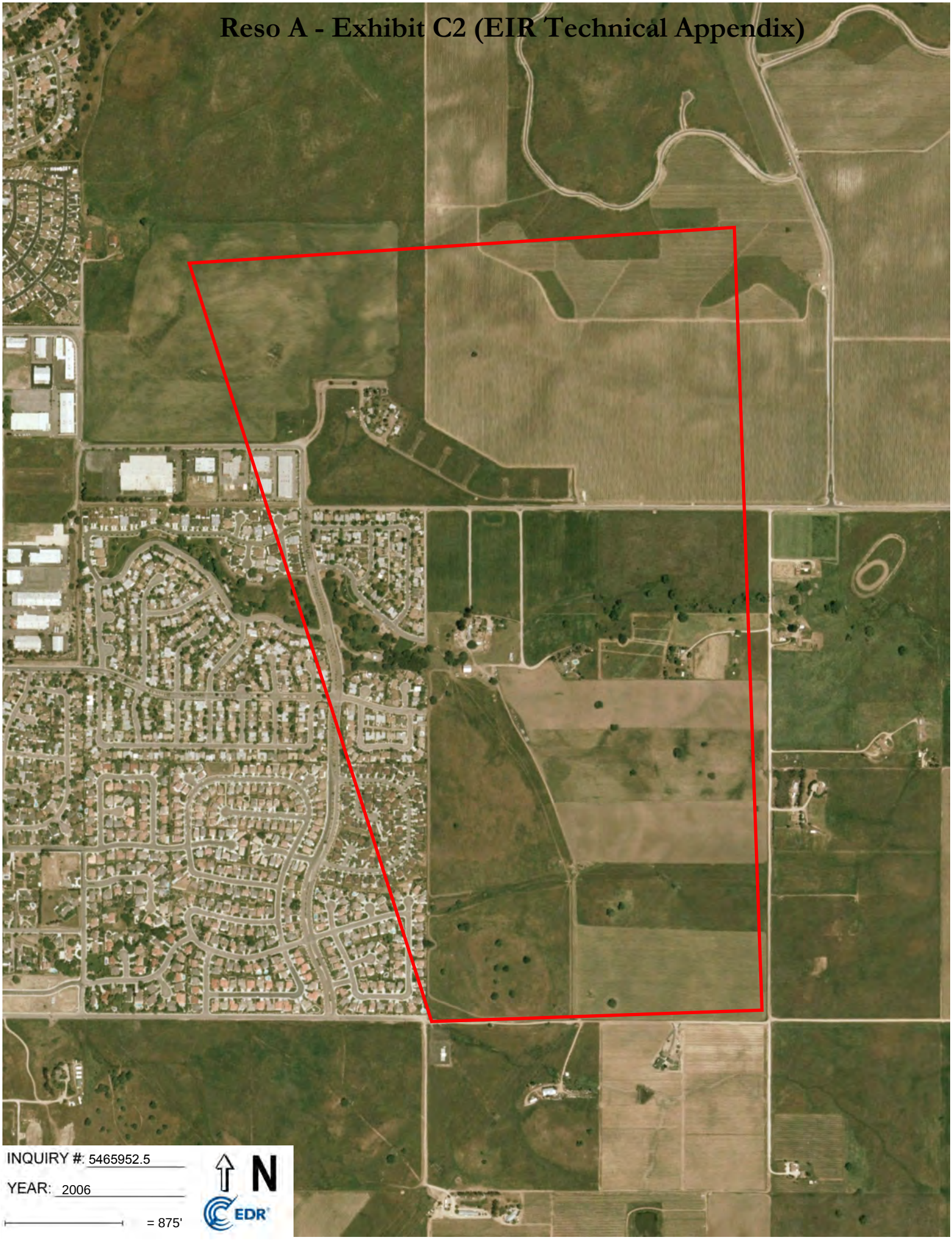
Reso A - Exhibit C2 (EIR Technical Appendix)



Reso A - Exhibit C2 (EIR Technical Appendix)



Reso A - Exhibit C2 (EIR Technical Appendix)



Reso A - Exhibit C2 (EIR Technical Appendix)

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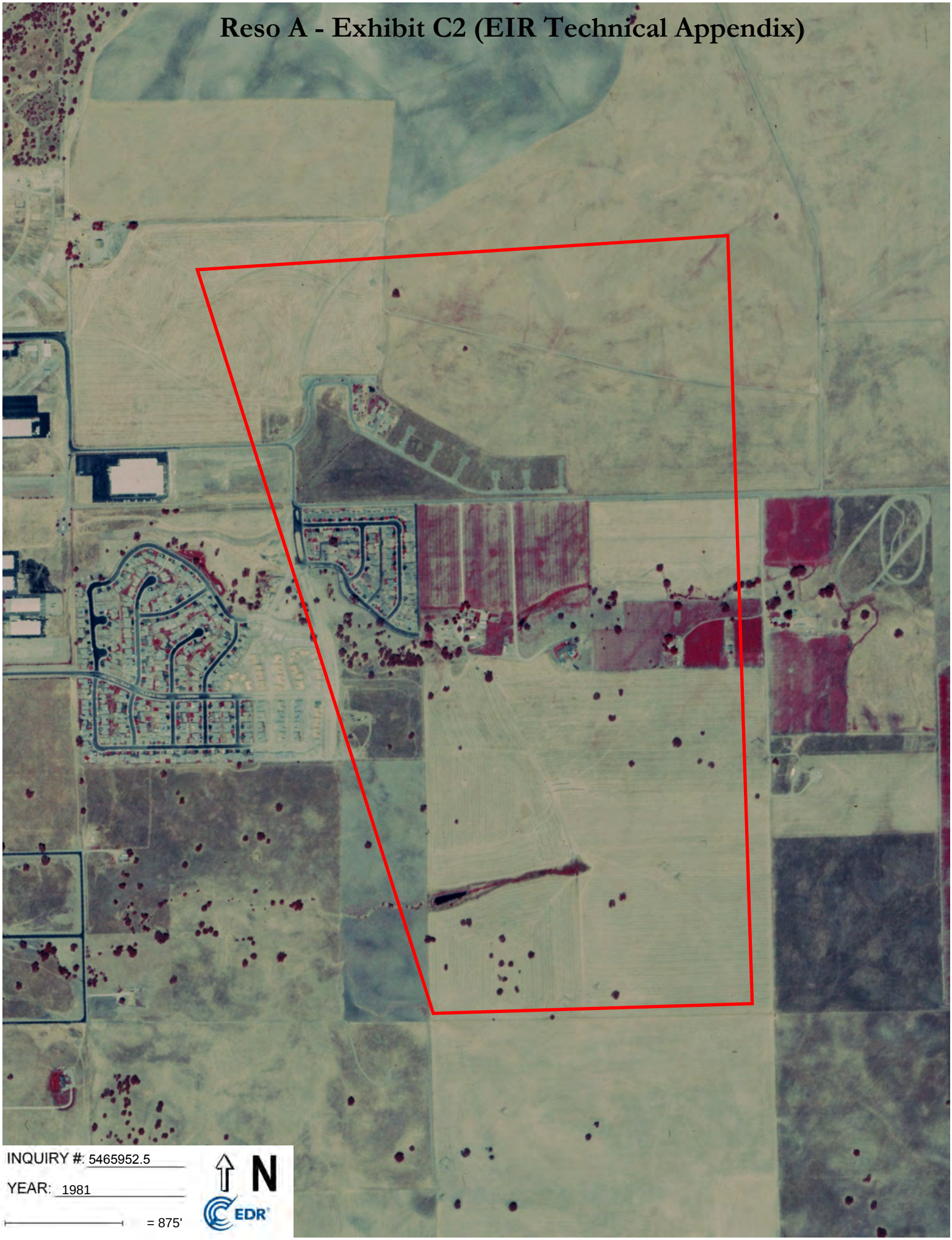

Reso A - Exhibit C2 (EIR Technical Appendix)

Reso A - Exhibit C2 (EIR Technical Appendix)

Reso A - Exhibit C2 (EIR Technical Appendix)

Reso A - Exhibit C2 (EIR Technical Appendix)

APPENDIX

C

Olsen Chandler
Not Reported
Paso Robles, CA 93446

Inquiry Number: 5465952.2s
October 25, 2018

The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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Physical Setting Source Records Searched	PSGR-1

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

NOT REPORTED
PASO ROBLES, CA 93446

COORDINATES

Latitude (North):	35.6116160 - 35° 36' 41.81''
Longitude (West):	120.6393320 - 120° 38' 21.59''
Universal Tranverse Mercator:	Zone 10
UTM X (Meters):	713824.4
UTM Y (Meters):	3943238.8
Elevation:	837 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	5603492 TEMPLETON, CA
Version Date:	2012
Northeast Map:	5603462 ESTRELLA, CA
Version Date:	2012
Southeast Map:	5603458 CRESTON, CA
Version Date:	2012
Northwest Map:	5603478 PASO ROBLES, CA
Version Date:	2012

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20140604
Source:	USDA

Reso A - Exhibit C2 (EIR Technical Appendix)

MAPPED SITES SUMMARY

Target Property Address:
NOT REPORTED
PASO ROBLES, CA 93446

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
1	MELISSA SOTO	1546 POPPY LN	HAZNET	Lower	1 ft.
2	JOSE G RODRIGUEZ	1039 PARKVIEW LN	PEST LIC	Lower	1 ft.
A3	SURGITEK	634 AIRPORT RD.	FINDS, ECHO	Lower	1 ft.
A4	SURGITEK MEDICAL ENG	634 AIRPORT RD	RCRA NonGen / NLR	Lower	1 ft.
A5	VOLUMETRICS INC	634 AIRPORT RD	RCRA NonGen / NLR, FINDS, ECHO	Lower	1 ft.
B6	RAVERA FARMING	3995 LINNE RD	CUPA Listings, CERS HAZ WASTE	Higher	1 ft.
C7	L.M. MACHINING CENTE	580 LINNE RD STE 120	CUPA Listings, CERS HAZ WASTE, CERS	Lower	1 ft.
C8	L.M. MACHINING CENTE	580 LINNE RD STE 120	FINDS	Lower	1 ft.
C9	EL PASO DE ROBLES SC	0 AIRPORT RD	RGA LUST	Lower	1 ft.
B10	RAVERA FARMING	3995 LINNE RD	FINDS	Higher	1 ft.
11	OLSEN, NEIL	3161 LINNE RD	CUPA Listings	Lower	1 ft.
D12	BERNARD O OLSEN	3045 LINNE RD	PEST LIC	Higher	1 ft.
D13	BERNARD O OLSEN	3045 LINNE RD	PEST LIC	Higher	1 ft.
D14	BERNARD O OLSEN	3045 LINNE RD	PEST LIC	Higher	1 ft.
15	PASO ROBLES WELL SIT	1750 AIRPORT RD	CUPA Listings	Lower	1 ft.
16	ROLLING L RANCH	3333 MEADOWLARK RD	CUPA Listings	Higher	64, 0.012, SSE
17	LEVEL 3 COMMUNICATIO	3293 MEADOWLARK RD	CUPA Listings, CERS	Higher	130, 0.025, South
E18	MICHAEL E CROTHER	1180 VENDELS CIR	CUPA Listings, PEST LIC, CERS	Lower	177, 0.034, West
E19		560 LINNE	AST	Lower	177, 0.034, West
20	HUERO HUERO VINEYARD	LINNE RD	CUPA Listings, CERS	Higher	371, 0.070, East
E21	HOGUE GRIPS	550 LINNE RD	CUPA Listings, EMI, CERS HAZ WASTE	Lower	398, 0.075, West
F22	NICHE CHEMICAL, INC	500 LINNE RD G	CUPA Listings, HAZNET	Lower	787, 0.149, West
F23	CTS KEENE INC	500 LINNE RD	SEMS-ARCHIVE, CORRACTS, RCRA-SQG, ENVIROSTOR, HIST...	Lower	787, 0.149, West
F24	SPINTECH, INC	500 LINNE RD F	CUPA Listings, HAZNET	Lower	787, 0.149, West
25	CORNUCOPIA TOOL AND	448 SHERWOOD RD	CUPA Listings, HAZNET	Lower	1177, 0.223, WNW
26	PIC MANUFACTURING CO	410 SHERWOOD RD	RCRA-SQG, ENVIROSTOR, FINDS, ECHO, NPDES, CIWQS	Lower	1446, 0.274, WNW
G27	JOSLYN SUNBANK COMPA	1740 COMMERCE WAY	RCRA-LQG, ENVIROSTOR, AST, HIST UST, DEED, CHMIRS,...	Lower	2167, 0.410, West
G28	ZURN INDUSTRIES WILK	1747 COMMERCE WAY	ENVIROSTOR, VCP, CUPA Listings, NPDES, CERS HAZ...	Lower	2199, 0.416, West
29	SHERWOOD FIELD	SOUTHEASTERN PORTION	ENVIROSTOR	Lower	2261, 0.428, WNW

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL ---------- National Priority List
Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ---------- National Priority List Deletions

Federal CERCLIS list

FEDERAL FACILITY ---------- Federal Facility Site Information listing
SEMS ---------- Superfund Enterprise Management System

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG ---------- RCRA - Large Quantity Generators
RCRA-CESQG ---------- RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

LUCIS ---------- Land Use Control Information System
US ENG CONTROLS ---------- Engineering Controls Sites List
US INST CONTROL ---------- Sites with Institutional Controls

Federal ERNS list

ERNS ---------- Emergency Response Notification System

State- and tribal - equivalent NPL

RESPONSE ---------- State Response Sites

State and tribal landfill and/or solid waste disposal site lists

SWF/LF ---------- Solid Waste Information System

State and tribal leaking storage tank lists

LUST ---------- Geotracker's Leaking Underground Fuel Tank Report
INDIAN LUST ---------- Leaking Underground Storage Tanks on Indian Land
CPS-SLIC ---------- Statewide SLIC Cases

State and tribal registered storage tank lists

FEMA UST ---------- Underground Storage Tank Listing
UST ---------- Active UST Facilities
INDIAN UST ---------- Underground Storage Tanks on Indian Land

State and tribal voluntary cleanup sites

INDIAN VCP ---------- Voluntary Cleanup Priority Listing

State and tribal Brownfields sites

BROWNFIELDS ---------- Considered Brownfieds Sites Listing

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS ---------- A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT ---------- Waste Management Unit Database
SWRCY ---------- Recycler Database
HAULERS ---------- Registered Waste Tire Haulers Listing
INDIAN ODI ---------- Report on the Status of Open Dumps on Indian Lands
ODI ---------- Open Dump Inventory
DEBRIS REGION 9 ---------- Torres Martinez Reservation Illegal Dump Site Locations
IHS OPEN DUMPS ---------- Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL ---------- Delisted National Clandestine Laboratory Register
HIST Cal-Sites ---------- Historical Calsites Database
SCH ---------- School Property Evaluation Program
CDL ---------- Clandestine Drug Labs
Toxic Pits ---------- Toxic Pits Cleanup Act Sites
US CDL ---------- National Clandestine Laboratory Register

Local Lists of Registered Storage Tanks

SWEEPS UST ---------- SWEEPS UST Listing
CA FID UST ---------- Facility Inventory Database

CERS TANKS	California Environmental Reporting System (CERS) Tanks

Local Land Records

LIENS	Environmental Liens Listing
LIENS 2	CERCLA Lien Information

Records of Emergency Release Reports

HMIRS	Hazardous Materials Information Reporting System
CHMIRS	California Hazardous Material Incident Report System
LDS	Land Disposal Sites Listing
MCS	Military Cleanup Sites Listing
SPILLS 90	SPILLS 90 data from FirstSearch

Other Ascertainable Records

FUDS	Formerly Used Defense Sites
DOD	Department of Defense Sites
SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR	Financial Assurance Information
EPA WATCH LIST	EPA WATCH LIST
2020 COR ACTION	2020 Corrective Action Program List
TSCA	Toxic Substances Control Act
TRIS	Toxic Chemical Release Inventory System
SSTS	Section 7 Tracking Systems
ROD	Records Of Decision
RMP	Risk Management Plans
RAATS	RCRA Administrative Action Tracking System
PRP	Potentially Responsible Parties
PADS	PCB Activity Database System
ICIS	Integrated Compliance Information System
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS	Material Licensing Tracking System
COAL ASH DOE	Steam-Electric Plant Operation Data
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER	PCB Transformer Registration Database
RADINFO	Radiation Information Database
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS	Incident and Accident Data
CONSENT	Superfund (CERCLA) Consent Decrees
INDIAN RESERV	Indian Reservations
FUSRAP	Formerly Utilized Sites Remedial Action Program
UMTRA	Uranium Mill Tailings Sites
LEAD SMELTERS	Lead Smelter Sites
US AIRS	Aerometric Information Retrieval System Facility Subsystem
US MINES	Mines Master Index File
ABANDONED MINES	Abandoned Mines
DOCKET HWC	Hazardous Waste Compliance Docket Listing
UXO	Unexploded Ordnance Sites
FUELS PROGRAM	EPA Fuels Program Registered Listing
CA BOND EXP. PLAN	Bond Expenditure Plan
Cortese	"Cortese" Hazardous Waste & Substances Sites List
DRYCLEANERS	Cleaner Facilities

EMI	Emissions Inventory Data
ENF	Enforcement Action Listing
Financial Assurance	Financial Assurance Information Listing
ICE	ICE
HIST CORTESE	Hazardous Waste & Substance Site List
HWT	Registered Hazardous Waste Transporter Database
MINES	Mines Site Location Listing
MWMP	Medical Waste Management Program Listing
NPDES	NPDES Permits Listing
PROC	Certified Processors Database
Notify 65	Proposition 65 Records
UIC	UIC Listing
WASTEWATER PITS	Oil Wastewater Pits Listing
WDS	Waste Discharge System
WIP	Well Investigation Program Case List
NON-CASE INFO	NON-CASE INFO (GEOTRACKER)
MILITARY PRIV SITES	MILITARY PRIV SITES (GEOTRACKER)
WDR	Waste Discharge Requirements Listing
PROD WATER PONDS	PROD WATER PONDS (GEOTRACKER)
CIWQS	California Integrated Water Quality System
SAMPLING POINT	SAMPLING POINT (GEOTRACKER)
OTHER OIL GAS	OTHER OIL & GAS (GEOTRACKER)
PROJECT	PROJECT (GEOTRACKER)
WELL STIM PROJ	Well Stimulation Project (GEOTRACKER)
UIC GEO	UIC GEO (GEOTRACKER)

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP	EDR Proprietary Manufactured Gas Plants
EDR Hist Auto	EDR Exclusive Historical Auto Stations
EDR Hist Cleaner	EDR Exclusive Historical Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF	Recovered Government Archive Solid Waste Facilities List

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

EXECUTIVE SUMMARY

STANDARD ENVIRONMENTAL RECORDS

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

A review of the SEMS-ARCHIVE list, as provided by EDR, and dated 07/17/2018 has revealed that there is 1 SEMS-ARCHIVE site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
CTS KEENE INC	***500 LINNE RD***	***W 1/8 - 1/4 (0.149 mi.)***	***F23***	***42***
Site ID: 0900350				
EPA Id: CAT080010705				

Federal RCRA CORRACTS facilities list

CORRACTS: CORRACTS is a list of handlers with RCRA Corrective Action Activity. This report shows which nationally-defined corrective action core events have occurred for every handler that has had corrective action activity.

A review of the CORRACTS list, as provided by EDR, and dated 03/01/2018 has revealed that there is 1 CORRACTS site within approximately 1 mile of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
CTS KEENE INC	***500 LINNE RD***	***W 1/8 - 1/4 (0.149 mi.)***	***F23***	***42***
EPA ID:: CAT080010705				

Federal RCRA generators list

RCRA-SQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

A review of the RCRA-SQG list, as provided by EDR, and dated 03/01/2018 has revealed that there is 1 RCRA-SQG site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
CTS KEENE INC	***500 LINNE RD***	***W 1/8 - 1/4 (0.149 mi.)***	***F23***	***42***
EPA ID:: CAT080010705				

State- and tribal - equivalent CERCLIS

ENVIROSTOR: The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

A review of the ENVIROSTOR list, as provided by EDR, and dated 07/30/2018 has revealed that there are 5 ENVIROSTOR sites within approximately 1 mile of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
CTS KEENE INC	***500 LINNE RD***	***W 1/8 - 1/4 (0.149 mi.)***	***F23***	***42***
Facility Id: 80001824				
Status: Inactive - Action Required				
PIC MANUFACTURING CO	***410 SHERWOOD RD***	***WNW 1/4 - 1/2 (0.274 mi.)***	***26***	***74***
Facility Id: 40350003				
Status: No Further Action				
JOSLYN SUNBANK COMPA	***1740 COMMERCE WAY***	***W 1/4 - 1/2 (0.410 mi.)***	***G27***	***79***
Facility Id: 71002645				
Status: Certified O&M - Land Use Restrictions Only				
ZURN INDUSTRIES WILK	***1747 COMMERCE WAY***	***W 1/4 - 1/2 (0.416 mi.)***	***G28***	***138***
Facility Id: 40340001				
Status: No Further Action				
SHERWOOD FIELD	SOUTHEASTERN PORTION	WNW 1/4 - 1/2 (0.428 mi.)	29	152
Facility Id: 80000757				
Status: Inactive - Action Required				

State and tribal registered storage tank lists

AST: A listing of aboveground storage tank petroleum storage tank locations.

A review of the AST list, as provided by EDR, has revealed that there is 1 AST site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
Not reported	560 LINNE	W 0 - 1/8 (0.034 mi.)	E19	31
Database: AST, Date of Government Version: 07/06/2016				

State and tribal voluntary cleanup sites

VCP: Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

A review of the VCP list, as provided by EDR, and dated 07/30/2018 has revealed that there is 1 VCP site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
ZURN INDUSTRIES WILK	***1747 COMMERCE WAY***	***W 1/4 - 1/2 (0.416 mi.)***	***G28***	***138***
Status: No Further Action				
Facility Id: 40340001				

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Hazardous waste / Contaminated Sites

CERS HAZ WASTE: List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Hazardous Chemical Management, Hazardous Waste Onsite Treatment, Household Hazardous Waste Collection, Hazardous Waste Generator, and RCRA LQ HW Generator programs.

A review of the CERS HAZ WASTE list, as provided by EDR, and dated 07/23/2018 has revealed that there are 4 CERS HAZ WASTE sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
RAVERA FARMING	***3995 LINNE RD***	***0 - 1/8 (0.000 mi.)***	***B6***	***12***

Lower Elevation	Address	Direction / Distance	Map ID	Page
L.M. MACHINING CENTE	***580 LINNE RD STE 120***	***0 - 1/8 (0.000 mi.)***	***C7***	***16***
HOGUE GRIPS	***550 LINNE RD***	***W 0 - 1/8 (0.075 mi.)***	***E21***	***32***
CTS KEENE INC	***500 LINNE RD***	***W 1/8 - 1/4 (0.149 mi.)***	***F23***	***42***

Local Lists of Registered Storage Tanks

HIST UST: Historical UST Registered Database.

A review of the HIST UST list, as provided by EDR, and dated 10/15/1990 has revealed that there is 1 HIST UST site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
CTS KEENE INC	***500 LINNE RD***	***W 1/8 - 1/4 (0.149 mi.)***	***F23***	***42***
Facility Id: 00000004608				

Local Land Records

DEED: The use of recorded land use restrictions is one of the methods the DTSC uses to protect the public from unsafe exposures to hazardous substances and wastes .

A review of the DEED list, as provided by EDR, and dated 09/04/2018 has revealed that there is 1 DEED site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
JOSLYN SUNBANK COMPA	***1740 COMMERCE WAY***	***W 1/4 - 1/2 (0.410 mi.)***	***G27***	***79***
Status: CERTIFIED O&M - LAND USE RESTRICTIONS ONLY Envirostor ID: 71002645				

Other Ascertainable Records

RCRA NonGen / NLR: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

A review of the RCRA NonGen / NLR list, as provided by EDR, and dated 03/01/2018 has revealed that there are 2 RCRA NonGen / NLR sites within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
SURGITEK MEDICAL ENG EPA ID:: CAD982407488	634 AIRPORT RD	0 - 1/8 (0.000 mi.)	A4	9
VOLUMETRICS INC EPA ID:: CAD009542051	***634 AIRPORT RD***	***0 - 1/8 (0.000 mi.)***	***A5***	***10***

FINDS: The Facility Index System contains both facility information and "pointers" to other sources of information that contain more detail. These include: RCRIS; Permit Compliance System (PCS); Aerometric Information Retrieval System (AIRS); FATES (FIFRA [Federal Insecticide Fungicide Rodenticide Act] and TSCA Enforcement System, FTTS [FIFRA/TSCA Tracking System]; CERCLIS; DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes); Federal Underground Injection Control (FURS); Federal Reporting Data System (FRDS); Surface Impoundments (SIA); TSCA Chemicals in Commerce Information System (CICS); PADS; RCRA-J (medical waste transporters/disposers); TRIS; and TSCA. The source of this database is the U.S. EPA/NTIS.

A review of the FINDS list, as provided by EDR, and dated 08/07/2018 has revealed that there are 4 FINDS sites within approximately 0.001 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
RAVERA FARMING Registry ID:: 110064927717	3995 LINNE RD	0 - 1/8 (0.000 mi.)	B10	19

Lower Elevation	Address	Direction / Distance	Map ID	Page
SURGITEK	***634 AIRPORT RD.***	***0 - 1/8 (0.000 mi.)***	***A3***	***8***

Registry ID:: 110002145982

VOLUMETRICS INC	***634 AIRPORT RD***	***0 - 1/8 (0.000 mi.)***	***A5***	***10***
Registry ID:: 110009529297				
L.M. MACHINING CENTE	580 LINNE RD STE 120	0 - 1/8 (0.000 mi.)	C8	18
Registry ID:: 110065270138				

ECHO: ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

A review of the ECHO list, as provided by EDR, and dated 09/02/2018 has revealed that there are 2 ECHO sites within approximately 0.001 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
SURGITEK	***634 AIRPORT RD.***	***0 - 1/8 (0.000 mi.)***	***A3***	***8***
Registry ID: 110002145982				
VOLUMETRICS INC	***634 AIRPORT RD***	***0 - 1/8 (0.000 mi.)***	***A5***	***10***
Registry ID: 110009529297				

CUPA Listings: A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

A review of the CUPA Listings list, as provided by EDR, has revealed that there are 13 CUPA Listings sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
RAVERA FARMING	***3995 LINNE RD***	***0 - 1/8 (0.000 mi.)***	***B6***	***12***
Database: CUPA SAN LUIS OBISPO, Date of Government Version: 08/20/2018				
Facility Id: FA0005718				
Status: Active, billable				
Status: Inactive, non-billable				
ROLLING L RANCH	3333 MEADOWLARK RD	SSE 0 - 1/8 (0.012 mi.)	16	21
Database: CUPA SAN LUIS OBISPO, Date of Government Version: 08/20/2018				
Facility Id: FA0005806				
Status: Inactive, non-billable				
LEVEL 3 COMMUNICATIO	***3293 MEADOWLARK RD***	***S 0 - 1/8 (0.025 mi.)***	***17***	***21***
Database: CUPA SAN LUIS OBISPO, Date of Government Version: 08/20/2018				
Facility Id: FA0006459				
Facility Id: FA0007171				
Status: Inactive, non-billable				
Status: Active, billable				
HUERO HUERO VINEYARD	***LINNE RD***	***E 0 - 1/8 (0.070 mi.)***	***20***	***32***
Database: CUPA SAN LUIS OBISPO, Date of Government Version: 08/20/2018				
Facility Id: FA0003844				
Status: Inactive, non-billable				

Lower Elevation	Address	Direction / Distance	Map ID	Page
L.M. MACHINING CENTE	***580 LINNE RD STE 120***	***0 - 1/8 (0.000 mi.)***	***C7***	***16***
Database: CUPA SAN LUIS OBISPO, Date of Government Version: 08/20/2018				

Facility Id: FA0005457
Status: Inactive, non-billable

OLSEN, NEIL | 3161 LINNE RD | 0 - 1/8 (0.000 mi.) | 11 | 19
Database: CUPA SAN LUIS OBISPO, Date of Government Version: 08/20/2018
Facility Id: FA0006400
Status: Inactive, non-billable

PASO ROBLES WELL SIT | 1750 AIRPORT RD | 0 - 1/8 (0.000 mi.) | 15 | 20
Database: CUPA SAN LUIS OBISPO, Date of Government Version: 08/20/2018
Facility Id: FA0001667
Status: Inactive, non-billable
Status: Active, exempt from billing

MICHAEL E CROTHER | ***1180 VENDELS CIR*** | ***W 0 - 1/8 (0.034 mi.)*** | ***E18*** | ***26***
Database: CUPA SAN LUIS OBISPO, Date of Government Version: 08/20/2018
Facility Id: FA0001901
Status: Active, billable

HOGUE GRIPS | ***550 LINNE RD*** | ***W 0 - 1/8 (0.075 mi.)*** | ***E21*** | ***32***
Database: CUPA SAN LUIS OBISPO, Date of Government Version: 08/20/2018
Facility Id: FA0002361
Status: Inactive, non-billable
Status: Active, billable

NICHE CHEMICAL, INC | ***500 LINNE RD G*** | ***W 1/8 - 1/4 (0.149 mi.)*** | ***F22*** | ***39***
Database: CUPA SAN LUIS OBISPO, Date of Government Version: 08/20/2018
Facility Id: FA0002139
Status: Inactive, non-billable

CTS KEENE INC | ***500 LINNE RD*** | ***W 1/8 - 1/4 (0.149 mi.)*** | ***F23*** | ***42***
Database: CUPA SAN LUIS OBISPO, Date of Government Version: 08/20/2018
Facility Id: FA0012937
Facility Id: FA0008373
Status: Active, billable
Status: Inactive, non-billable

SPINTECH, INC | ***500 LINNE RD F*** | ***W 1/8 - 1/4 (0.149 mi.)*** | ***F24*** | ***72***
Database: CUPA SAN LUIS OBISPO, Date of Government Version: 08/20/2018
Facility Id: FA0002363
Status: Inactive, non-billable

CORNUCOPIA TOOL AND | ***448 SHERWOOD RD*** | ***WNW 1/8 - 1/4 (0.223 mi.)*** | ***25*** | ***74***
Database: CUPA SAN LUIS OBISPO, Date of Government Version: 08/20/2018
Facility Id: FA0009536
Status: Inactive, non-billable
Status: Active, billable

HAZNET: The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000-1,000,000 annually, representing approximately 350,000-500,000 shipments. Data from non-California manifests & continuation sheets are not included at the present time. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, & disposal method. The source is the Department of Toxic Substance Control is the agency. This database begins with calendar year 1993.

A review of the HAZNET list, as provided by EDR, and dated 12/31/2016 has revealed that there is 1 HAZNET site within approximately 0.001 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
MELISSA SOTO	1546 POPPY LN	0 - 1/8 (0.000 mi.)	1	8

GEPAID: CAC002780179

HWP: Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

A review of the HWP list, as provided by EDR, and dated 08/20/2018 has revealed that there is 1 HWP site within approximately 1 mile of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
CTS KEENE INC	***500 LINNE RD***	***W 1/8 - 1/4 (0.149 mi.)***	***F23***	***42***
EPA Id: CAT080010705				
Cleanup Status: NON-OPERATING				

PEST LIC: A listing of licenses and certificates issued by the Department of Pesticide Regulation. The DPR issues licenses and/or certificates to: Persons and businesses that apply or sell pesticides; Pest control dealers and brokers; Persons who advise on agricultural pesticide applications.

A review of the PEST LIC list, as provided by EDR, and dated 09/04/2018 has revealed that there are 4 PEST LIC sites within approximately 0.001 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
BERNARD O OLSEN	3045 LINNE RD	0 - 1/8 (0.000 mi.)	D12	20
BERNARD O OLSEN	3045 LINNE RD	0 - 1/8 (0.000 mi.)	D13	20
BERNARD O OLSEN	3045 LINNE RD	0 - 1/8 (0.000 mi.)	D14	20

Lower Elevation	Address	Direction / Distance	Map ID	Page
JOSE G RODRIGUEZ	1039 PARKVIEW LN	0 - 1/8 (0.000 mi.)	2	8

CERS: The CalEPA Regulated Site Portal database combines data about environmentally regulated sites and facilities in California into a single database. It combines data from a variety of state and federal databases, and provides an overview of regulated activities across the spectrum of environmental programs for any given location in California. These activities include hazardous materials and waste, state and federal cleanups, impacted ground and surface waters, and toxic materials

A review of the CERS list, as provided by EDR, and dated 07/23/2018 has revealed that there is 1 CERS site within approximately 0.001 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
L.M. MACHINING CENTE	***580 LINNE RD STE 120***	***0 - 1/8 (0.000 mi.)***	***C7***	***16***

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

EXECUTIVE SUMMARY

RGA LUST: The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the State Water Resources Control Board in California.

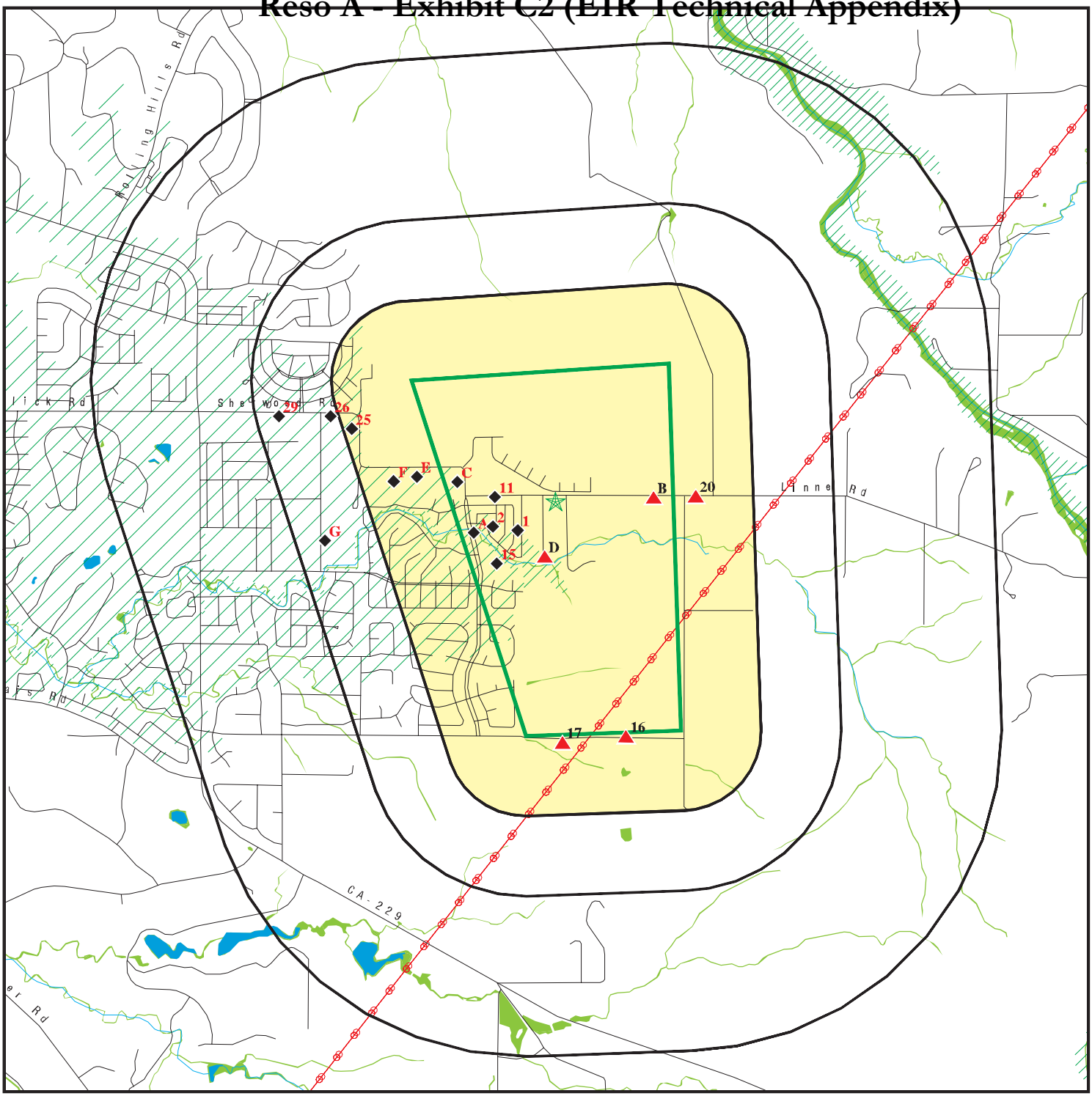
A review of the RGA LUST list, as provided by EDR, has revealed that there is 1 RGA LUST site within approximately 0.001 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
EL PASO DE ROBLES SC	0 AIRPORT RD	0 - 1/8 (0.000 mi.)	C9	19

EXECUTIVE SUMMARY

There were no unmapped sites in this report.

OVERVIEW MAP - 5465952.2S



Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

National Priority List Sites

Dept. Defense Sites

0 1/4 1/2 1 Miles

Indian Reservations BIA

Power transmission lines

100-year flood zone

500-year flood zone

National Wetland Inventory

State Wetlands

Areas of Concern

N

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Olsen Chandler	CLIENT:	Rainwater Consulting
ADDRESS:	Not Reported Paso Robles CA 93446	CONTACT:	Tim Doyle
LAT/LONG:	35.611616 / 120.639332	INQUIRY #:	5465952.2s
		DATE:	October 25, 2018 7:43 pm

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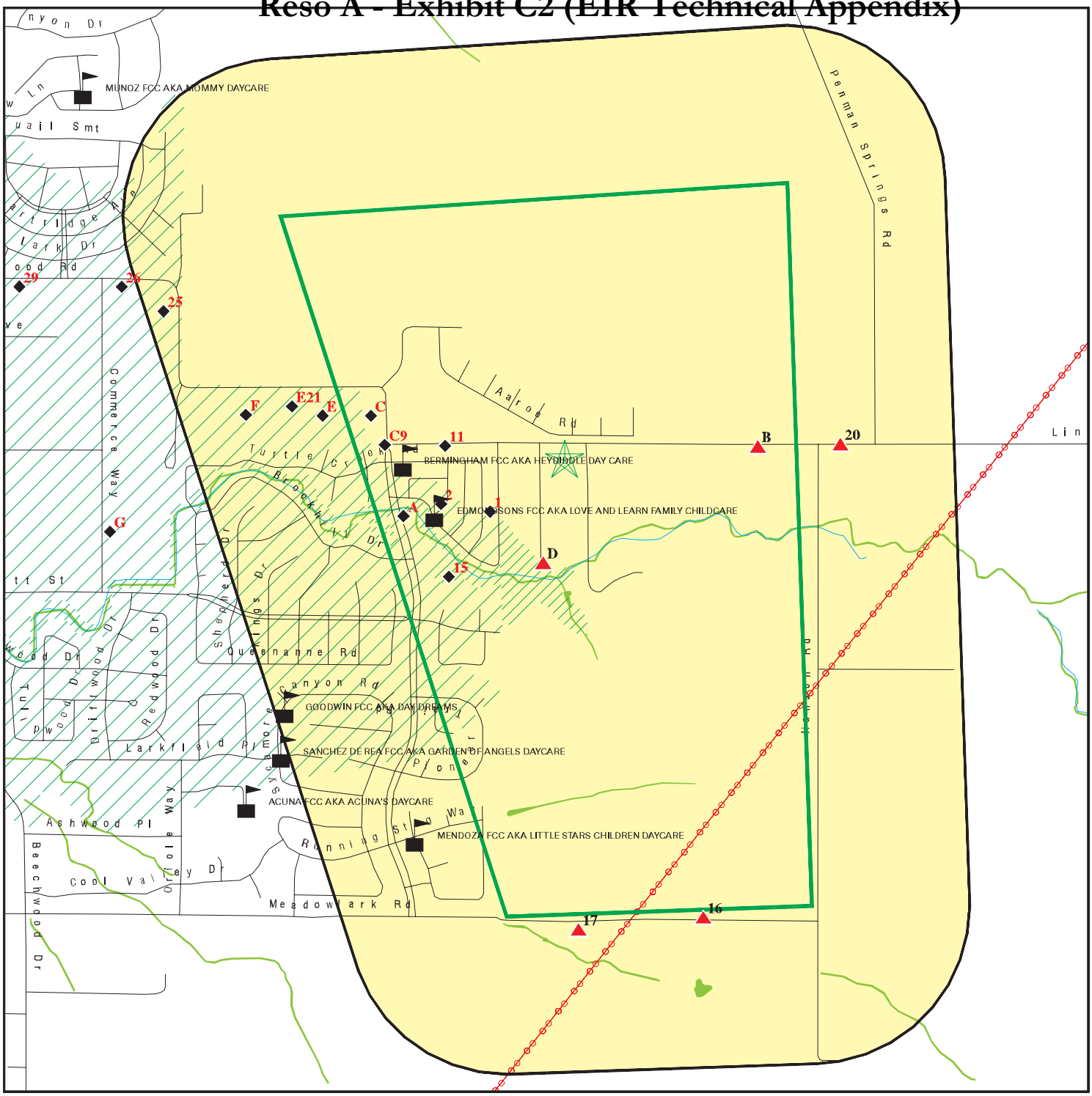
DETAIL MAP - 5465952.2S

Reso A - Exhibit C2 (EIR Technical Appendix)



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Olsen Chandler	CLIENT: Rainwater Consulting
ADDRESS: Not Reported Paso Robles CA 93446	CONTACT: Tim Doyle
LAT/LONG: 35.611616 / 120.639332	INQUIRY #: 5465952.2s DATE: October 25, 2018 7:45 pm

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MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	0.001		0	NR	NR	NR	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	0.500		0	1	0	NR	NR	1
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	1	0	0	NR	1
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	1	NR	NR	NR	1
RCRA-CESQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	0.001		0	NR	NR	NR	NR	0
State- and tribal - equivalent NPL								
RESPONSE	1.000		0	0	0	0	NR	0
State- and tribal - equivalent CERCLIS								
ENVIROSTOR	1.000		0	1	4	0	NR	5
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
LUST	0.500		0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
INDIAN LUST	0.500		0	0	0	NR	NR	0
CPS-SLIC	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
FEMA UST	0.250		0	0	NR	NR	NR	0
UST	0.250		0	0	NR	NR	NR	0
AST	0.250		1	0	NR	NR	NR	1
INDIAN UST	0.250		0	0	NR	NR	NR	0
State and tribal voluntary cleanup sites								
VCP	0.500		0	0	1	NR	NR	1
INDIAN VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
WMUDS/SWAT	0.500		0	0	0	NR	NR	0
SWRCY	0.500		0	0	0	NR	NR	0
HAULERS	0.001		0	NR	NR	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	0.001		0	NR	NR	NR	NR	0
HIST Cal-Sites	1.000		0	0	0	0	NR	0
SCH	0.250		0	0	NR	NR	NR	0
CDL	0.001		0	NR	NR	NR	NR	0
Toxic Pits	1.000		0	0	0	0	NR	0
US CDL	0.001		0	NR	NR	NR	NR	0
CERS HAZ WASTE	0.250		3	1	NR	NR	NR	4
Local Lists of Registered Storage Tanks								
SWEEPS UST	0.250		0	0	NR	NR	NR	0
HIST UST	0.250		0	1	NR	NR	NR	1
CA FID UST	0.250		0	0	NR	NR	NR	0
CERS TANKS	0.250		0	0	NR	NR	NR	0
Local Land Records								
LIENS	0.001		0	NR	NR	NR	NR	0
LIENS 2	0.001		0	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
DEED	0.500		0	0	1	NR	NR	1
Records of Emergency Release Reports								
HMIRS	0.001		0	NR	NR	NR	NR	0
CHMIRS	0.001		0	NR	NR	NR	NR	0
LDS	0.001		0	NR	NR	NR	NR	0
MCS	0.001		0	NR	NR	NR	NR	0
SPILLS 90	0.001		0	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		2	0	NR	NR	NR	2
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	0.001		0	NR	NR	NR	NR	0
EPA WATCH LIST	0.001		0	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	0.001		0	NR	NR	NR	NR	0
TRIS	0.001		0	NR	NR	NR	NR	0
SSTS	0.001		0	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	0.001		0	NR	NR	NR	NR	0
RAATS	0.001		0	NR	NR	NR	NR	0
PRP	0.001		0	NR	NR	NR	NR	0
PADS	0.001		0	NR	NR	NR	NR	0
ICIS	0.001		0	NR	NR	NR	NR	0
FTTS	0.001		0	NR	NR	NR	NR	0
MLTS	0.001		0	NR	NR	NR	NR	0
COAL ASH DOE	0.001		0	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	0.001		0	NR	NR	NR	NR	0
RADINFO	0.001		0	NR	NR	NR	NR	0
HIST FTTS	0.001		0	NR	NR	NR	NR	0
DOT OPS	0.001		0	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	0.001		0	NR	NR	NR	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	0.001		0	NR	NR	NR	NR	0
US AIRS	0.001		0	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.001		0	NR	NR	NR	NR	0
FINDS	0.001		4	NR	NR	NR	NR	4
DOCKET HWC	0.001		0	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
ECHO	0.001		2	NR	NR	NR	NR	2
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
CA BOND EXP. PLAN	1.000		0	0	0	0	NR	0
Cortese	0.500		0	0	0	NR	NR	0
CUPA Listings	0.250		9	4	NR	NR	NR	13
DRYCLEANERS	0.250		0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
EMI	0.001		0	NR	NR	NR	NR	0
ENF	0.001		0	NR	NR	NR	NR	0
Financial Assurance	0.001		0	NR	NR	NR	NR	0
HAZNET	0.001		1	NR	NR	NR	NR	1
ICE	0.001		0	NR	NR	NR	NR	0
HIST CORTESE	0.500		0	0	0	NR	NR	0
HWP	1.000		0	1	0	0	NR	1
HWT	0.250		0	0	NR	NR	NR	0
MINES	0.001		0	NR	NR	NR	NR	0
MWMP	0.250		0	0	NR	NR	NR	0
NPDES	0.001		0	NR	NR	NR	NR	0
PEST LIC	0.001		4	NR	NR	NR	NR	4
PROC	0.500		0	0	0	NR	NR	0
Notify 65	1.000		0	0	0	0	NR	0
UIC	0.001		0	NR	NR	NR	NR	0
WASTEWATER PITS	0.500		0	0	0	NR	NR	0
WDS	0.001		0	NR	NR	NR	NR	0
WIP	0.250		0	0	NR	NR	NR	0
NON-CASE INFO	0.001		0	NR	NR	NR	NR	0
MILITARY PRIV SITES	0.001		0	NR	NR	NR	NR	0
CERS	0.001		1	NR	NR	NR	NR	1
WDR	0.001		0	NR	NR	NR	NR	0
PROD WATER PONDS	0.001		0	NR	NR	NR	NR	0
CIWQS	0.001		0	NR	NR	NR	NR	0
SAMPLING POINT	0.001		0	NR	NR	NR	NR	0
OTHER OIL GAS	0.001		0	NR	NR	NR	NR	0
PROJECT	0.001		0	NR	NR	NR	NR	0
WELL STIM PROJ	0.001		0	NR	NR	NR	NR	0
UIC GEO	0.001		0	NR	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.125		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA LF	0.001		0	NR	NR	NR	NR	0
RGA LUST	0.001		1	NR	NR	NR	NR	1
- Totals --		0	28	11	6	0	0	45

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

MAP FINDINGS

Map ID / Direction / Distance / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
1	**MELISSA SOTO** **1546 POPPY LN** **PASO ROBLES, CA 93446**	**HAZNET**	**S118217748** **N/A**
< 1/8 **1 ft.**			
Relative: **Lower**	HAZNET:		
Actual: **829 ft.**	envid: S118217748 Year: 2014 GEPAID: CAC002780179 Contact: MELISSA SOTO Telephone: 8052960980 Mailing Name: Not reported Mailing Address: 1546 POPPY LN Mailing City,St,Zip: PASO ROBLES, CA 934464306 Gen County: San Luis Obispo TSD EPA ID: AZC950823111 TSD County: 99 Waste Category: Asbestos containing waste Disposal Method: Landfill Or Surface Impoundment That Will Be Closed As Landfill(To Include On-Site Treatment And/Or Stabilization) Tons: 0.46 Cat Decode: Not reported Method Decode: Not reported Facility County: San Luis Obispo		
2	**JOSE G RODRIGUEZ** **1039 PARKVIEW LN** **PASO ROBLES, CA 93446**	**PEST LIC**	**S117631960** **N/A**
< 1/8 **1 ft.**			
Relative: **Lower**	PEST LIC:		
Actual: **826 ft.**	Facility Type: QAC Categories: Q License No: 123753 Issued or Renewed Date: 02/28/2018 Expiration Date: 12/31/2019		
A3	**SURGITEK** **634 AIRPORT RD.** **PASO ROBLES, CA 93446**	**FINDS** **ECHO**	**1016070216** **N/A**
< 1/8 **1 ft.**	**Site 1 of 3 in cluster A**		
Relative: **Lower**	FINDS:		
Actual: **823 ft.**	Registry ID: 110002145982 Environmental Interest/Information System US EPA TRIS (Toxics Release Inventory System) contains information from facilities on the amounts of over 300 listed toxic chemicals that these facilities release directly to air, water, land, or that are transported off-site. RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and		

MAP FINDINGS

Map ID / Direction / Distance / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number

SURGITEK (Continued) **1016070216**

corrective action activities required under RCRA.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:

Envid:	1016070216
Registry ID:	110002145982
DFR URL:	http://echo.epa.gov/detailed-facility-report?fid=110002145982

A4 **SURGITEK MEDICAL ENGINEERING** **RCRA NonGen / NLR** **1000235576**
634 AIRPORT RD **CAD982407488**
< 1/8 **PASO ROBLES, CA 93446**
1 ft.

Site 2 of 3 in cluster A

Relative: Lower
Actual: 823 ft.

RCRA NonGen / NLR:

Date form received by agency:	07/23/1992
Facility name:	SURGITEK MEDICAL ENGINEERING
Facility address:	634 AIRPORT RD PASO ROBLES, CA 93446
EPA ID:	CAD982407488
Mailing address:	3003 ROLLIE GATES DR PASO ROBLES, CA 93446
Contact:	RUSSELL MADSEN
Contact address:	P O BOX 182 EAST SYRACUSE, NY 13057
Contact country:	US
Contact telephone:	315-432-2886
Contact email:	Not reported
EPA Region:	09
Classification:	Non-Generator
Description:	Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:

Owner/operator name:	FRANCISCAN CO
Owner/operator address:	1920 BROAD ST SAN LUIS OBISPO, CA 93401
Owner/operator country:	Not reported
Owner/operator telephone:	805-543-3767
Owner/operator email:	Not reported
Owner/operator fax:	Not reported
Owner/operator extension:	Not reported
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Owner/operator name:	NOT REQUIRED
Owner/operator address:	NOT REQUIRED NOT REQUIRED, ME 99999
Owner/operator country:	Not reported
Owner/operator telephone:	415-555-1212
Owner/operator email:	Not reported
Owner/operator fax:	Not reported
Owner/operator extension:	Not reported

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

SURGITEK MEDICAL ENGINEERING (Continued) **1000235576**

Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Violation Status: No violations found

A5 **VOLUMETRICS INC** **RCRA NonGen / NLR** **1000426247**
634 AIRPORT RD **FINDS** **CAD009542051**
< 1/8 **PASO ROBLES, CA 93446** **ECHO**
1 ft.

Site 3 of 3 in cluster A

Relative: Lower
Actual: 823 ft.

RCRA NonGen / NLR:
Date form received by agency: 10/04/1982
Facility name: VOLUMETRICS INC
Facility address: 634 AIRPORT RD
PASO ROBLES, CA 93446
EPA ID: CAD009542051
Mailing address: PO BOX 2084
PASO ROBLES, CA 93446
Contact: ENVIRONMENTAL MANAGER
Contact address: 634 AIRPORT RD
PASO ROBLES, CA 93446
Contact country: US
Contact telephone: 805-239-0110
Contact email: Not reported
EPA Region: 09
Land type: Other land type
Classification: Non-Generator
Description: Handler: Non-Generators do not presently generate hazardous waste

Owner/Operator Summary:
Owner/operator name: CARP JAMES SIEGEL SAM
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: 415-555-1212
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

VOLUMETRICS INC (Continued) **1000426247**

Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Owner/operator name: NOT REQUIRED
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: 415-555-1212
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Violation Status: No violations found

Evaluation Action Summary:
Evaluation date: 03/07/1984
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

FINDS:

Registry ID: 110009529297

Environmental Interest/Information System
RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

VOLUMETRICS INC (Continued) **1000426247**

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:
- Envid: 1000426247
- Registry ID: 110009529297
- DFR URL: http://echo.epa.gov/detailed-facility-report?fid=110009529297

B6 **RAVERA FARMING** **CUPA Listings** **S110743889**
3995 LINNE RD **CERS HAZ WASTE** **N/A**
< 1/8 **PASO ROBLES, CA 93446**
1 ft.

Site 1 of 2 in cluster B

Relative: Higher
Actual: 851 ft.

CUPA SAN LUIS OBISPO:
- Facility Id: FA0005718
- Program Element Code: 0772
- Program Element: HAZMAT DISCLOSURE -1-4 AG HAZARDOUS MATERIALS
- Record Id: PR0008844
- Cross Street: Not reported
- Status Code: 01
- Status: Active, billable
- Latitude: 35.61078
- Longitude: -120.61908

- Facility Id: FA0005718
- Program Element Code: 0775
- Program Element: AG DEPT - STATE SITE SURCHARGE
- Record Id: PR0008845
- Cross Street: Not reported
- Status Code: 02
- Status: Inactive, non-billable
- Latitude: 35.61078
- Longitude: -120.61908

- Facility Id: FA0005718
- Program Element Code: 1124
- Program Element: HAZWASTE GEN - AG (1 WS <27 GAL/MO, SELF REP)
- Record Id: PR0010826
- Cross Street: Not reported
- Status Code: 01
- Status: Active, billable
- Latitude: 35.61078
- Longitude: -120.61908

CERS HAZ WASTE:
- Site ID: 146722
- CERS ID: 10438984
- CERS Description: Hazardous Waste Generator

Violations:
- Site ID: 146722
- Site Name: RAVERA FARMING
- Violation Date: 08-15-2013
- Citation: HSC 6.95 25505(a) - California Health and Safety Code, Chapter 6.95, Section(s) 25505(a)

RAVERA FARMING (Continued) **S110743889**

Violation Description: Owner/Operator failed to complete and/or submit a Hazardous Materials Business Plan when storing hazardous materials at or above the thresholds quantities of 55 gallons/500 lbs/200 cubic feet.
Violation Notes: Returned to compliance on 08/22/2013.
Violation Division: San Luis Obispo County Environmental Health
Violation Program: HMRRP
Violation Source: CERS

Site ID: 146722
Site Name: RAVERA FARMING
Violation Date: 08-15-2013
Citation: HSC 6.67 Multiple - California Health and Safety Code, Chapter 6.67, Section(s) Multiple
Violation Description: Haz Waste Generator Program - Operations/Maintenance - General
Violation Notes: Returned to compliance on 09/05/2013.
Violation Division: San Luis Obispo County Environmental Health
Violation Program: HW
Violation Source: CERS

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-08-2015
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HMRRP
Eval Source: CERS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-08-2015
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HW
Eval Source: CERS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-12-2017
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HMRRP
Eval Source: CERS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-12-2017
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HW
Eval Source: CERS

Eval General Type: Compliance Evaluation Inspection

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

RAVERA FARMING (Continued) **S110743889**

Eval Date:	08-15-2013
Violations Found:	Yes
Eval Type:	Routine done by local agency
Eval Notes:	Not reported
Eval Division:	San Luis Obispo County Environmental Health
Eval Program:	HMRRP
Eval Source:	CERS

Eval General Type:	Compliance Evaluation Inspection
Eval Date:	08-15-2013
Violations Found:	Yes
Eval Type:	Routine done by local agency
Eval Notes:	Not reported
Eval Division:	San Luis Obispo County Environmental Health
Eval Program:	HW
Eval Source:	CERS

Eval General Type:	Other/Unknown
Eval Date:	08-22-2013
Violations Found:	No
Eval Type:	Other, not routine, done by local agency
Eval Notes:	Not reported
Eval Division:	San Luis Obispo County Environmental Health
Eval Program:	HMRRP
Eval Source:	CERS

Eval General Type:	Other/Unknown
Eval Date:	09-03-2013
Violations Found:	No
Eval Type:	Other, not routine, done by local agency
Eval Notes:	Not reported
Eval Division:	San Luis Obispo County Environmental Health
Eval Program:	HW
Eval Source:	CERS

Coordinates:

Site ID:	146722
Facility Name:	RAVERA FARMING
Env Int Type Code:	HWG
Program ID:	10438984
Coord Name:	Not reported
Ref Point Type Desc:	Center of a facility or station.
Latitude:	35.605750
Longitude:	-120.619060

Affiliation:

Affiliation Type Desc:	CUPA District
Entity Name:	SLO County Env Health
Entity Title:	Not reported
Affiliation Address:	2156 Sierra Way
Affiliation City:	San Luis Obispo
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	93406
Affiliation Phone:	(805) 781-5544

MAP FINDINGS

Map ID
Direction
Distance
Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

RAVERA FARMING (Continued) **S110743889**

Affiliation Type Desc:	Environmental Contact
Entity Name:	Larry Ravera
Entity Title:	Not reported
Affiliation Address:	3995 Linne Rd
Affiliation City:	Paso Robles
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	93446
Affiliation Phone:	(805) 239-0395

Affiliation Type Desc:	Facility Mailing Address
Entity Name:	Mailing Address
Entity Title:	Not reported
Affiliation Address:	3995 LINNE RD
Affiliation City:	PASO ROBLES
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	93446
Affiliation Phone:	Not reported

Affiliation Type Desc:	Legal Owner
Entity Name:	RAVERA, LARRY
Entity Title:	Not reported
Affiliation Address:	3995 LINNE RD
Affiliation City:	PASO ROBLES
Affiliation State:	CA
Affiliation Country:	United States
Affiliation Zip:	93446
Affiliation Phone:	(805) 239-0395

Affiliation Type Desc:	Operator
Entity Name:	Larry Ravera
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	(805) 239-0395

Affiliation Type Desc:	Parent Corporation
Entity Name:	RAVERA FARMING
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

MAP FINDINGS

Map ID / Direction / Distance / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
C7	**L.M. MACHINING CENTER**	**CUPA Listings**	**S117845201**
	580 LINNE RD STE 120	**CERS HAZ WASTE**	**N/A**
< 1/8	**PASO ROBLES, CA 93446**	**CERS**	
1 ft.			

Site 1 of 3 in cluster C

Relative: Lower

Actual: 829 ft.

CUPA SAN LUIS OBISPO:

Facility Id:	FA0005457
Program Element Code:	0710
Program Element:	HAZMAT DISCLOSURE/HWG ONLY < TQ
Record Id:	PR0008166
Cross Street:	Not reported
Status Code:	02
Status:	Inactive, non-billable
Latitude:	35.61274
Longitude:	120.64448

Facility Id:	FA0005457
Program Element Code:	1126
Program Element:	HAZWASTE GEN (1-5 WASTE STREAMS)
Record Id:	PR0008165
Cross Street:	Not reported
Status Code:	02
Status:	Inactive, non-billable
Latitude:	35.61274
Longitude:	120.64448

CERS HAZ WASTE:

Site ID:	42384
CERS ID:	10438363
CERS Description:	Hazardous Waste Generator

Evaluation:

Eval General Type:	Compliance Evaluation Inspection
Eval Date:	09-03-2013
Violations Found:	No
Eval Type:	Routine done by local agency
Eval Notes:	Facility closed.
Eval Division:	San Luis Obispo County Environmental Health
Eval Program:	HW
Eval Source:	CERS

Affiliation:

Affiliation Type Desc:	CUPA District
Entity Name:	SLO County Env Health
Entity Title:	Not reported
Affiliation Address:	2156 Sierra Way
Affiliation City:	San Luis Obispo
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	93406
Affiliation Phone:	(805) 781-5544

Affiliation Type Desc:	Environmental Contact
Entity Name:	Michael Slavinski
Entity Title:	Not reported
Affiliation Address:	580 Linne Suite 120
Affiliation City:	Paso Robles
Affiliation State:	Ca

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

L.M. MACHINING CENTER (Continued) **S117845201**

Affiliation Country: Not reported
Affiliation Zip: 93446
Affiliation Phone: (805) 226-9546

Affiliation Type Desc: Facility Mailing Address
Entity Name: Mailing Address
Entity Title: Not reported
Affiliation Address: 580 LINNE RD STE 120
Affiliation City: PASO ROBLES
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 93446
Affiliation Phone: Not reported

Affiliation Type Desc: Legal Owner
Entity Name: SLAVINSKI, MICHAEL
Entity Title: Not reported
Affiliation Address: 580 LINNE RD STE 120
Affiliation City: PASO ROBLES
Affiliation State: CA
Affiliation Country: United States
Affiliation Zip: 93446
Affiliation Phone: (805) 226-9546

Affiliation Type Desc: Parent Corporation
Entity Name: L.M. MACHINING CENTER
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: Not reported

CERS TANKS:
Site ID: 42384
CERS ID: 10438363
CERS Description: Chemical Storage Facilities

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 09-03-2013
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Facility closed.
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HW
Eval Source: CERS

Affiliation:
Affiliation Type Desc: CUPA District
Entity Name: SLO County Env Health
Entity Title: Not reported
Affiliation Address: 2156 Sierra Way
Affiliation City: San Luis Obispo
Affiliation State: CA

MAP FINDINGS

Map ID / Direction / Distance / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number

L.M. MACHINING CENTER (Continued) **S117845201**

Affiliation Country:	Not reported
Affiliation Zip:	93406
Affiliation Phone:	(805) 781-5544
Affiliation Type Desc:	Environmental Contact
Entity Name:	Michael Slavinski
Entity Title:	Not reported
Affiliation Address:	580 Linne Suite 120
Affiliation City:	Paso Robles
Affiliation State:	Ca
Affiliation Country:	Not reported
Affiliation Zip:	93446
Affiliation Phone:	(805) 226-9546
Affiliation Type Desc:	Facility Mailing Address
Entity Name:	Mailing Address
Entity Title:	Not reported
Affiliation Address:	580 LINNE RD STE 120
Affiliation City:	PASO ROBLES
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	93446
Affiliation Phone:	Not reported
Affiliation Type Desc:	Legal Owner
Entity Name:	SLAVINSKI, MICHAEL
Entity Title:	Not reported
Affiliation Address:	580 LINNE RD STE 120
Affiliation City:	PASO ROBLES
Affiliation State:	CA
Affiliation Country:	United States
Affiliation Zip:	93446
Affiliation Phone:	(805) 226-9546
Affiliation Type Desc:	Parent Corporation
Entity Name:	L.M. MACHINING CENTER
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

C8 **L.M. MACHINING CENTER** **FINDS** **1023239321**
580 LINNE RD STE 120 **N/A**
< 1/8 **PASO ROBLES, CA 93446**
1 ft.

Site 2 of 3 in cluster C

Relative: Lower

Actual: 829 ft.

FINDS:

Registry ID: 110065270138

Environmental Interest/Information System
STATE MASTER

MAP FINDINGS

Map ID / Direction / Distance / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
	L.M. MACHINING CENTER (Continued)		**1023239321**
	Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.		
C9	**EL PASO DE ROBLES SCHOOL**	**RGA LUST**	**S114614108**
	0 AIRPORT RD		**N/A**
< 1/8	**PASO ROBLES, CA**		
1 ft.	**Site 3 of 3 in cluster C**		
Relative: Lower	RGA LUST:		
	2002 EL PASO DE ROBLES SCHOOL 0 AIRPORT RD		
Actual: 830 ft.			
B10	**RAVERA FARMING**	**FINDS**	**1023207566**
	3995 LINNE RD		**N/A**
< 1/8	**PASO ROBLES, CA 93446**		
1 ft.	**Site 2 of 2 in cluster B**		
Relative: Higher	FINDS:		
Actual: 851 ft.	Registry ID: 110064927717		
	Environmental Interest/Information System: STATE MASTER		
	Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.		
11	**OLSEN, NEIL**	**CUPA Listings**	**S117845418**
	3161 LINNE RD		**N/A**
< 1/8	**PASO ROBLES, CA 93446**		
1 ft.			
	CUPA SAN LUIS OBISPO:		
Relative: Lower	Facility Id: FA0006400		
	Program Element Code: 0773		
Actual: 830 ft.	Program Element: HAZMAT DISCLOSURE - 5+ AG HAZARDOUS MATERIALS		
	Record Id: PR0010060		
	Cross Street: Not reported		
	Status Code: 02		
	Status: Inactive, non-billable		
	Latitude: 35.60908		
	Longitude: -120.63842		

MAP FINDINGS

Map ID / Direction / Distance / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
D12	**BERNARD O OLSEN** **3045 LINNE RD** **PASO ROBLES, CA 93446**	**PEST LIC**	**S117627251** **N/A**
< 1/8 **1 ft.**			
	Site 1 of 3 in cluster D		
Relative: **Higher**	PEST LIC:		
Actual: **837 ft.**	Facility Type: QAL Categories: DJ License No: 105955 Issued or Renewed Date: 01/01/2018 Expiration Date: 12/31/2019		
D13	**BERNARD O OLSEN** **3045 LINNE RD** **PASO ROBLES, CA 93446**	**PEST LIC**	**S117646096** **N/A**
< 1/8 **1 ft.**			
	Site 2 of 3 in cluster D		
Relative: **Higher**	PEST LIC:		
Actual: **837 ft.**	Facility Type: PCA Categories: ABCDEG License No: 75975 Issued or Renewed Date: 01/01/2018 Expiration Date: 12/31/2019		
D14	**BERNARD O OLSEN** **3045 LINNE RD** **PASO ROBLES, CA 93446**	**PEST LIC**	**S117649788** **N/A**
< 1/8 **1 ft.**			
	Site 3 of 3 in cluster D		
Relative: **Higher**	PEST LIC:		
Actual: **837 ft.**	Facility Type: QAC Categories: DJ License No: 90812 Issued or Renewed Date: 01/01/2018 Expiration Date: 12/31/2019		
15	**PASO ROBLES WELL SITE #20** **1750 AIRPORT RD** **PASO ROBLES, CA 93446**	**CUPA Listings**	**S110743567** **N/A**
< 1/8 **1 ft.**			
Relative: **Lower**	CUPA SAN LUIS OBISPO:		
Actual: **831 ft.**	Facility Id: FA0001667 Program Element Code: 0705 Program Element: STATE SITE SURCHARGE Record Id: PR0006519 Cross Street: Not reported Status Code: 02 Status: Inactive, non-billable Latitude: 35.60872 Longitude: -120.64247 Facility Id: FA0001667 Program Element Code: 0749		

MAP FINDINGS

Map ID / Direction / Distance / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number

PASO ROBLES WELL SITE #20 (Continued) **S110743567**

Program Element: HAZMAT DISCLOSURE - EXEMPT FACILITY
Record Id: PR0001667
Cross Street: Not reported
Status Code: 04
Status: Active, exempt from billing
Latitude: 35.60872
Longitude: -120.64247

16
SSE
< 1/8
0.012 mi.
64 ft.

ROLLING L RANCH **CUPA Listings** **S117845275**
3333 MEADOWLARK RD **N/A**
PASO ROBLES, CA 93446

Relative:
Higher

Actual:
869 ft.

CUPA SAN LUIS OBISPO:
Facility Id: FA0005806
Program Element Code: 0772
Program Element: HAZMAT DISCLOSURE -1-4 AG HAZARDOUS MATERIALS
Record Id: PR0009022
Cross Street: Not reported
Status Code: 02
Status: Inactive, non-billable
Latitude: Not reported
Longitude: Not reported

Facility Id: FA0005806
Program Element Code: 0775
Program Element: AG DEPT - STATE SITE SURCHARGE
Record Id: PR0009023
Cross Street: Not reported
Status Code: 02
Status: Inactive, non-billable
Latitude: Not reported
Longitude: Not reported

17
South
< 1/8
0.025 mi.
130 ft.

LEVEL 3 COMMUNICATIONS - PASO ROBLES - PSRBCAJC **CUPA Listings** **S110744105**
3293 MEADOWLARK RD **CERS** **N/A**
PASO ROBLES, CA 93446

Relative:
Higher

Actual:
877 ft.

CUPA SAN LUIS OBISPO:
Facility Id: FA0006459
Program Element Code: 0772
Program Element: HAZMAT DISCLOSURE -1-4 AG HAZARDOUS MATERIALS
Record Id: PR0010131
Cross Street: Not reported
Status Code: 02
Status: Inactive, non-billable
Latitude: Not reported
Longitude: Not reported

Facility Id: FA0007171
Program Element Code: 0726
Program Element: HAZMAT DISCLOSURE - 1-4 HAZARDOUS MATERIALS
Record Id: PR0011107

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

LEVEL 3 COMMUNICATIONS - PASO ROBLES - PSRBCAJC (Continued) **S110744105**

Cross Street: Not reported
Status Code: 01
Status: Active, billable
Latitude: 35.59693
Longitude: -120.64014

CERS TANKS:
Site ID: 439505
CERS ID: 10705663
CERS Description: Chemical Storage Facilities

Coordinates:
Site ID: 439505
Facility Name: Verizon Wireless Meadowlark
Env Int Type Code: HMBP
Program ID: 10705663
Coord Name: Not reported
Ref Point Type Desc: Center of a facility or station.
Latitude: 35.595490
Longitude: -120.639440

Affiliation:
Affiliation Type Desc: CUPA District
Entity Name: SLO County Env Health
Entity Title: Not reported
Affiliation Address: 2156 Sierra Way
Affiliation City: San Luis Obispo
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 93406
Affiliation Phone: (805) 781-5544

Affiliation Type Desc: Document Preparer
Entity Name: Steve Skanderson
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: Not reported

Affiliation Type Desc: Environmental Contact
Entity Name: Environmental Compliance
Entity Title: Not reported
Affiliation Address: 295 Parkshore Drive
Affiliation City: Folsom
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 95630
Affiliation Phone: (866) 694-2415

Affiliation Type Desc: Facility Mailing Address
Entity Name: Mailing Address
Entity Title: Not reported
Affiliation Address: 295 Parkshore Drive
Affiliation City: Folsom

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

LEVEL 3 COMMUNICATIONS - PASO ROBLES - PSRBCAJC (Continued) **S110744105**

Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	95630
Affiliation Phone:	Not reported
Affiliation Type Desc:	Identification Signer
Entity Name:	armand delgado
Entity Title:	environmental compliance mgr
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported
Affiliation Type Desc:	Legal Owner
Entity Name:	Verizon Wireless
Entity Title:	Not reported
Affiliation Address:	295 Parkshore Drive
Affiliation City:	Folsom
Affiliation State:	CA
Affiliation Country:	United States
Affiliation Zip:	95630
Affiliation Phone:	(866) 694-2415
Affiliation Type Desc:	Operator
Entity Name:	Verizon Wireless
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	(866) 694-2415
Affiliation Type Desc:	Parent Corporation
Entity Name:	Verizon Wireless [Northern California]
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported
Affiliation Type Desc:	Property Owner
Entity Name:	PG&E
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	United States
Affiliation Zip:	Not reported
Affiliation Phone:	(925) 323-9664
Site ID:	396563

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

LEVEL 3 COMMUNICATIONS - PASO ROBLES - PSRBCAJC (Continued) **S110744105**

CERS ID: 10397299
CERS Description: Chemical Storage Facilities

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-08-2014
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HMRRP
Eval Source: CERS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 01-08-2015
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HMRRP
Eval Source: CERS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 08-04-2017
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Items marked N/A not reviewed during inspection.
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HMRRP
Eval Source: CERS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 12-10-2015
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HMRRP
Eval Source: CERS

Coordinates:
Site ID: 396563
Facility Name: LEVEL 3 COMMUNICATIONS - PASO ROBLES - PSRBCAJC
Env Int Type Code: HMBP
Program ID: 10397299
Coord Name: Not reported
Ref Point Type Desc: Center of a facility or station.
Latitude: 35.595490
Longitude: -120.639440

Affiliation:
Affiliation Type Desc: CUPA District
Entity Name: SLO County Env Health
Entity Title: Not reported
Affiliation Address: 2156 Sierra Way
Affiliation City: San Luis Obispo
Affiliation State: CA

Map ID
Direction
Distance
Elevation Site

MAP FINDINGS

Database(s) EDR ID Number EPA ID Number

LEVEL 3 COMMUNICATIONS - PASO ROBLES - PSRBCAJC (Continued) **S110744105**

Affiliation Country:	Not reported
Affiliation Zip:	93406
Affiliation Phone:	(805) 781-5544
Affiliation Type Desc:	Document Preparer
Entity Name:	Robert Gurdikian
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported
Affiliation Type Desc:	Environmental Contact
Entity Name:	Bob Gurdikian
Entity Title:	Not reported
Affiliation Address:	1025 Eldorado Blvd, Environmental Management 23-202
Affiliation City:	Broomfield
Affiliation State:	CO
Affiliation Country:	Not reported
Affiliation Zip:	80021
Affiliation Phone:	(720) 888-0676
Affiliation Type Desc:	Facility Mailing Address
Entity Name:	Mailing Address
Entity Title:	Not reported
Affiliation Address:	1025 Eldorado Blvd, Environmental Management 23-202
Affiliation City:	Broomfield
Affiliation State:	CO
Affiliation Country:	Not reported
Affiliation Zip:	80021
Affiliation Phone:	Not reported
Affiliation Type Desc:	Identification Signer
Entity Name:	Robert Gurdikian
Entity Title:	Sr. Environmental Project Manager
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported
Affiliation Type Desc:	Legal Owner
Entity Name:	Level 3 Communications, LLC
Entity Title:	Not reported
Affiliation Address:	1025 Eldorado Blvd.
Affiliation City:	Broomfield
Affiliation State:	CO
Affiliation Country:	United States
Affiliation Zip:	80021
Affiliation Phone:	(720) 888-1000
Affiliation Type Desc:	Operator
Entity Name:	Level 3 Communications, LLC
Entity Title:	Not reported

LEVEL 3 COMMUNICATIONS - PASO ROBLES - PSRBCAJC (Continued) **S110744105**

Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	(720) 888-0676
Affiliation Type Desc:	Parent Corporation
Entity Name:	Level 3 Communications
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

E18 **MICHAEL E CROTHER** **CUPA Listings** **S110743637**
West **1180 VENDELS CIR** **PEST LIC** **N/A**
< 1/8 **PASO ROBLES, CA 93446** **CERS**
0.034 mi.
177 ft. **Site 1 of 3 in cluster E**

Relative: **Lower**

Actual: **825 ft.**

CUPA SAN LUIS OBISPO:

Facility Id:	FA0001901
Program Element Code:	0728
Program Element:	HAZMAT DISCLOSURE - 11+ HAZARDOUS MATERIALS
Record Id:	PR0001901
Cross Street:	Not reported
Status Code:	01
Status:	Active, billable
Latitude:	35.61302
Longitude:	-120.64652
Facility Id:	FA0001901
Program Element Code:	1201
Program Element:	AGT ANNUAL TANK PERMIT
Record Id:	PR0006646
Cross Street:	Not reported
Status Code:	01
Status:	Active, billable
Latitude:	35.61302
Longitude:	-120.64652

PEST LIC:

Facility Type:	DDA
Categories:	Not reported
License No:	133740
Issued or Renewed Date:	01/01/2019
Expiration Date:	12/31/2020
Facility Type:	DDA
Categories:	Not reported
License No:	136595
Issued or Renewed Date:	01/01/2017
Expiration Date:	12/31/2018

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

MICHAEL E CROTHER (Continued) **S110743637**

CERS TANKS:
Site ID: 423874
CERS ID: 10436776
CERS Description: Chemical Storage Facilities

Violations:
Site ID: 423874
Site Name: HOWARD PRODUCTS
Violation Date: 08-19-2013
Citation: HSC 6.95 25505(a) - California Health and Safety Code, Chapter 6.95, Section(s) 25505(a)
Violation Description: Owner/Operator failed to complete and/or submit a Hazardous Materials Business Plan when storing hazardous materials at or above the thresholds quantities of 55 gallons/500 lbs/200 cubic feet.
Violation Notes: Returned to compliance on 08/22/2013.
Violation Division: San Luis Obispo County Environmental Health
Violation Program: HMRRP
Violation Source: CERS

Site ID: 423874
Site Name: HOWARD PRODUCTS
Violation Date: 09-25-2014
Citation: HSC 6.67 25270.4.5(a) - California Health and Safety Code, Chapter 6.67, Section(s) 25270.4.5(a)
Violation Description: Failure to test or inspect aboveground tanks for integrity by a person qualified in accordance with industry standards.
Violation Notes: Returned to compliance on 02/24/2015. PLEASE RESEARCH AND REPORT TO ME THE MANUFACTURER'S REQUIREMENTS FOR TANK INTEGRITY TESTING.
Violation Division: San Luis Obispo County Environmental Health
Violation Program: APSA
Violation Source: CERS

Site ID: 423874
Site Name: HOWARD PRODUCTS
Violation Date: 11-03-2015
Citation: HSC 6.95 25508(d) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(d)
Violation Description: Failure to complete and/or electronically submit a business plan when storing/handling a hazardous material at or above reportable quantities.
Violation Notes: Returned to compliance on 12/03/2015. Please verify your haz mat business plan via the Public Portal website. At a minimum please change the date range at the top and the submission date at the bottom of the Form S Owmer/Operator page.
Violation Division: San Luis Obispo County Environmental Health
Violation Program: HMRRP
Violation Source: CERS

Evaluation:
Eval General Type: Other/Unknown
Eval Date: 02-23-2015
Violations Found: No
Eval Type: Other, not routine, done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: APSA
Eval Source: CERS

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

MICHAEL E CROTHER (Continued) **S110743637**

Eval General Type:	Compliance Evaluation Inspection
Eval Date:	06-26-2017
Violations Found:	No
Eval Type:	Routine done by local agency
Eval Notes:	Not reported
Eval Division:	San Luis Obispo County Environmental Health
Eval Program:	APSA
Eval Source:	CERS

Eval General Type:	Compliance Evaluation Inspection
Eval Date:	06-26-2017
Violations Found:	No
Eval Type:	Routine done by local agency
Eval Notes:	Items marked N/A not reviewed during inspection. Revise chemical inventory electronically, preferably through the SLO County Portal at www.ezsubmitslogov.org (remove PEG-40 Castor oil, PEG-7 Glyceryl Soyate, ammonium hydroxide(?)).
Eval Division:	San Luis Obispo County Environmental Health
Eval Program:	HMRRP
Eval Source:	CERS

Eval General Type:	Compliance Evaluation Inspection
Eval Date:	08-19-2013
Violations Found:	No
Eval Type:	Routine done by local agency
Eval Notes:	Not reported
Eval Division:	San Luis Obispo County Environmental Health
Eval Program:	APSA
Eval Source:	CERS

Eval General Type:	Compliance Evaluation Inspection
Eval Date:	08-19-2013
Violations Found:	Yes
Eval Type:	Routine done by local agency
Eval Notes:	Not reported
Eval Division:	San Luis Obispo County Environmental Health
Eval Program:	HMRRP
Eval Source:	CERS

Eval General Type:	Other/Unknown
Eval Date:	08-22-2013
Violations Found:	No
Eval Type:	Other, not routine, done by local agency
Eval Notes:	Not reported
Eval Division:	San Luis Obispo County Environmental Health
Eval Program:	HMRRP
Eval Source:	CERS

Eval General Type:	Compliance Evaluation Inspection
Eval Date:	09-25-2014
Violations Found:	No
Eval Type:	Routine done by local agency
Eval Notes:	Not reported
Eval Division:	San Luis Obispo County Environmental Health
Eval Program:	HMRRP
Eval Source:	CERS

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

MICHAEL E CROTHER (Continued) **S110743637**

Eval General Type:	Compliance Evaluation Inspection
Eval Date:	09-25-2014
Violations Found:	Yes
Eval Type:	Routine done by local agency
Eval Notes:	Not reported
Eval Division:	San Luis Obispo County Environmental Health
Eval Program:	APSA
Eval Source:	CERS

Eval General Type:	Compliance Evaluation Inspection
Eval Date:	11-03-2015
Violations Found:	No
Eval Type:	Routine done by local agency
Eval Notes:	Not reported
Eval Division:	San Luis Obispo County Environmental Health
Eval Program:	APSA
Eval Source:	CERS

Eval General Type:	Compliance Evaluation Inspection
Eval Date:	11-03-2015
Violations Found:	Yes
Eval Type:	Routine done by local agency
Eval Notes:	Not reported
Eval Division:	San Luis Obispo County Environmental Health
Eval Program:	HMRRP
Eval Source:	CERS

Eval General Type:	Other/Unknown
Eval Date:	12-03-2015
Violations Found:	No
Eval Type:	Other, not routine, done by local agency
Eval Notes:	Not reported
Eval Division:	San Luis Obispo County Environmental Health
Eval Program:	HMRRP
Eval Source:	CERS

Coordinates:

Site ID:	423874
Facility Name:	HOWARD PRODUCTS
Env Int Type Code:	HMBP
Program ID:	10436776
Coord Name:	Not reported
Ref Point Type Desc:	Center of a facility or station.
Latitude:	35.612590
Longitude:	-120.646130

Affiliation:

Affiliation Type Desc:	CUPA District
Entity Name:	SLO County Env Health
Entity Title:	Not reported
Affiliation Address:	2156 Sierra Way
Affiliation City:	San Luis Obispo
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	93406
Affiliation Phone:	(805) 781-5544

MAP FINDINGS

Map ID
Direction
Distance
Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

MICHAEL E CROTHER (Continued) **S110743637**

Affiliation Type Desc:	Document Preparer
Entity Name:	ERIC HOWARD
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

Affiliation Type Desc:	Environmental Contact
Entity Name:	Eric Howard
Entity Title:	Not reported
Affiliation Address:	560 Linne Road
Affiliation City:	Paso Robles
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	93446
Affiliation Phone:	(805) 227-1000

Affiliation Type Desc:	Facility Mailing Address
Entity Name:	Mailing Address
Entity Title:	Not reported
Affiliation Address:	560 LINNE RD
Affiliation City:	PASO ROBLES
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	93446
Affiliation Phone:	Not reported

Affiliation Type Desc:	Identification Signer
Entity Name:	ERIC HOWARD
Entity Title:	COO
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

Affiliation Type Desc:	Legal Owner
Entity Name:	HOWARD PRODUCTS
Entity Title:	Not reported
Affiliation Address:	560 LINNE RD
Affiliation City:	PASO ROBLES
Affiliation State:	CA
Affiliation Country:	United States
Affiliation Zip:	93446
Affiliation Phone:	(805) 227-1000

Affiliation Type Desc:	Operator
Entity Name:	Eric Howard and Kevin Howard
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported

MAP FINDINGS

Map ID / Direction / Distance / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number

MICHAEL E CROTHER (Continued) **S110743637**

Affiliation Zip:	Not reported
Affiliation Phone:	(805) 227-1000
Affiliation Type Desc:	Parent Corporation
Entity Name:	HOWARD PRODUCTS
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

E19 **AST** **A100345239**
West **560 LINNE** **N/A**
< 1/8 **PASO ROBLES, CA**
0.034 mi.
177 ft. **Site 2 of 3 in cluster E**

Relative: AST:
Lower

Actual:
825 ft.

Certified Unified Program Agencies:	San Luis Obispo
Owner:	HOWARD PRODUCTS
Total Gallons:	24000
CERSID:	Not reported
Facility ID:	Not reported
Business Name:	Not reported
Phone:	Not reported
Fax:	Not reported
Mailing Address:	Not reported
Mailing Address City:	Not reported
Mailing Address State:	Not reported
Mailing Address Zip Code:	Not reported
Operator Name:	Not reported
Operator Phone:	Not reported
Owner Phone:	Not reported
Owner Mail Address:	Not reported
Owner State:	Not reported
Owner Zip Code:	Not reported
Owner Country:	Not reported
Property Owner Name:	Not reported
Property Owner Phone:	Not reported
Property Owner Mailing Address:	Not reported
Property Owner City:	Not reported
Property Owner Stat :	Not reported
Property Owner Zip Code:	Not reported
Property Owner Country:	Not reported
EPAID:	Not reported

MAP FINDINGS

Map ID / Direction / Distance / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
20	**HUERO HUERO VINEYARD**	**CUPA Listings**	**S117845141**
East	**LINNE RD**	**CERS**	**N/A**
< 1/8	**PASO ROBLES, CA 93446**		
0.070 mi.			
371 ft.			

Relative: Higher

Actual: 853 ft.

CUPA SAN LUIS OBISPO:

Facility Id:	FA0003844
Program Element Code:	0772
Program Element:	HAZMAT DISCLOSURE -1-4 AG HAZARDOUS MATERIALS
Record Id:	PR0003844
Cross Street:	Not reported
Status Code:	02
Status:	Inactive, non-billable
Latitude:	Not reported
Longitude:	Not reported

CERS TANKS:

Site ID:	180981
CERS ID:	10596460
CERS Description:	Chemical Storage Facilities

Affiliation:

Affiliation Type Desc:	CUPA District
Entity Name:	SLO County Env Health
Entity Title:	Not reported
Affiliation Address:	2156 Sierra Way
Affiliation City:	San Luis Obispo
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	93406
Affiliation Phone:	(805) 781-5544

Affiliation Type Desc:	Parent Corporation
Entity Name:	HUERO HUERO VINEYARD
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

E21	**HOGUE GRIPS**	**CUPA Listings**	**S104579306**
West	**550 LINNE RD**	**EMI**	**N/A**
< 1/8	**PASO ROBLES, CA 93446**	**CERS HAZ WASTE**	
0.075 mi.			
398 ft.	**Site 3 of 3 in cluster E**		

Relative: Lower

Actual: 823 ft.

CUPA SAN LUIS OBISPO:

Facility Id:	FA0002361
Program Element Code:	0705
Program Element:	STATE SITE SURCHARGE
Record Id:	PR0006900
Cross Street:	Not reported
Status Code:	02
Status:	Inactive, non-billable
Latitude:	35.61306
Longitude:	120.64736

MAP FINDINGS

Map ID
Direction
Distance
Elevation | Site | Database(s) | EDR ID Number EPA ID Number

HOGUE GRIPS (Continued) **S104579306**

Facility Id: FA0002361
Program Element Code: 0726
Program Element: HAZMAT DISCLOSURE - 1-4 HAZARDOUS MATERIALS
Record Id: PR0001884
Cross Street: Not reported
Status Code: 01
Status: Active, billable
Latitude: 35.61306
Longitude: 120.64736

Facility Id: FA0002361
Program Element Code: 1126
Program Element: HAZWASTE GEN (1-5 WASTE STREAMS)
Record Id: PR0002361
Cross Street: Not reported
Status Code: 01
Status: Active, billable
Latitude: 35.61306
Longitude: 120.64736

EMI:
Year: 2013
County Code: 40
Air Basin: SCC
Facility ID: 2916
Air District Name: SLO
SIC Code: 3479
Air District Name: SAN LUIS OBISPO COUNTY APCD
Community Health Air Pollution Info System: Not reported
Consolidated Emission Reporting Rule: Not reported
Total Organic Hydrocarbon Gases Tons/Yr: 0.021825
Reactive Organic Gases Tons/Yr: 0.0215609175
Carbon Monoxide Emissions Tons/Yr: 0
NOX - Oxides of Nitrogen Tons/Yr: 0
SOX - Oxides of Sulphur Tons/Yr: 0
Particulate Matter Tons/Yr: 0
Part. Matter 10 Micrometers and Smllr Tons/Yr: 0

Year: 2014
County Code: 40
Air Basin: SCC
Facility ID: 2916
Air District Name: SLO
SIC Code: 3479
Air District Name: SAN LUIS OBISPO COUNTY APCD
Community Health Air Pollution Info System: Not reported
Consolidated Emission Reporting Rule: Not reported
Total Organic Hydrocarbon Gases Tons/Yr: 0.021825
Reactive Organic Gases Tons/Yr: 0.0215609175
Carbon Monoxide Emissions Tons/Yr: 0
NOX - Oxides of Nitrogen Tons/Yr: 0
SOX - Oxides of Sulphur Tons/Yr: 0
Particulate Matter Tons/Yr: 0
Part. Matter 10 Micrometers and Smllr Tons/Yr: 0

Year: 2015
County Code: 40

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

HOGUE GRIPS (Continued) **S104579306**

Air Basin:	SCC
Facility ID:	2916
Air District Name:	SLO
SIC Code:	3479
Air District Name:	SAN LUIS OBISPO COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0.009
Reactive Organic Gases Tons/Yr:	0.0088911
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	0
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0

Year:	2016
County Code:	40
Air Basin:	SCC
Facility ID:	2916
Air District Name:	SLO
SIC Code:	3479
Air District Name:	SAN LUIS OBISPO COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0.046275
Reactive Organic Gases Tons/Yr:	0.0457150725
Carbon Monoxide Emissions Tons/Yr:	Not reported
NOX - Oxides of Nitrogen Tons/Yr:	Not reported
SOX - Oxides of Sulphur Tons/Yr:	Not reported
Particulate Matter Tons/Yr:	Not reported
Part. Matter 10 Micrometers and Smllr Tons/Yr:	Not reported

CERS HAZ WASTE:

Site ID:	36649
CERS ID:	10438036
CERS Description:	Hazardous Waste Generator

Violations:

Site ID:	36649
Site Name:	HOGUE GRIPS
Violation Date:	03-27-2014
Citation:	19 CCR 4 2729.2(a)(3) - California Code of Regulations, Title 19, Chapter 4, Section(s) 2729.2(a)(3)
Violation Description:	Failure to complete and/or submit an annotated site map if required by CUPA.
Violation Notes:	Returned to compliance on 06/26/2014.
Violation Division:	San Luis Obispo County Environmental Health
Violation Program:	HMRRP
Violation Source:	CERS

Site ID:	36649
Site Name:	HOGUE GRIPS
Violation Date:	03-27-2014
Citation:	HSC 6.95 25505(a) - California Health and Safety Code, Chapter 6.95, Section(s) 25505(a)
Violation Description:	Owner/Operator failed to complete and/or submit a Hazardous Materials Business Plan when storing hazardous materials at or above the

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

HOGUE GRIPS (Continued) **S104579306**

	thresholds quantities of 55 gallons/500 lbs/200 cubic feet.
Violation Notes:	Returned to compliance on 06/26/2014.
Violation Division:	San Luis Obispo County Environmental Health
Violation Program:	HMRRP
Violation Source:	CERS
Site ID:	36649
Site Name:	HOGUE GRIPS
Violation Date:	07-07-2015
Citation:	HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1)
Violation Description:	Failure to complete and electronically submit a site map with all required content.
Violation Notes:	Returned to compliance on 09/14/2015. Please review your site map for current accuracy (e.g.: compressed gas storage).
Violation Division:	San Luis Obispo County Environmental Health
Violation Program:	HMRRP
Violation Source:	CERS
Site ID:	36649
Site Name:	HOGUE GRIPS
Violation Date:	03-27-2014
Citation:	HSC 6.95 25504(a) - California Health and Safety Code, Chapter 6.95, Section(s) 25504(a)
Violation Description:	Failure to complete and/or submit hazardous material inventory forms for all reportable hazardous materials on site.
Violation Notes:	Returned to compliance on 06/26/2014.
Violation Division:	San Luis Obispo County Environmental Health
Violation Program:	HMRRP
Violation Source:	CERS
Site ID:	36649
Site Name:	HOGUE GRIPS
Violation Date:	07-07-2015
Citation:	HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1)
Violation Description:	Failure to complete and electronically submit hazardous material inventory information for all reportable hazardous materials on site at or above reportable quantities.
Violation Notes:	Returned to compliance on 09/14/2015. Please review and edit your chemical inventory (e.g.: compressed gas maximum daily amount, largest container. Please update your Owner Operator page certification date before submitting your revisions.
Violation Division:	San Luis Obispo County Environmental Health
Violation Program:	HMRRP
Violation Source:	CERS
Site ID:	36649
Site Name:	HOGUE GRIPS
Violation Date:	03-17-2017
Citation:	22 CCR 12 66262.12 - California Code of Regulations, Title 22, Chapter 12, Section(s) 66262.12
Violation Description:	Failure to obtain an Identification Number prior to treating, storing, disposing of, transporting or offering for transportation any hazardous waste.
Violation Notes:	Returned to compliance on 04/03/2017. Immediately reactivate EPA ID number (http://www.dtsc.ca.gov/IDManifest/ReactivateID.cfm)

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

HOGUE GRIPS (Continued) **S104579306**

Violation Division:	San Luis Obispo County Environmental Health
Violation Program:	HW
Violation Source:	CERS
Site ID:	36649
Site Name:	HOGUE GRIPS
Violation Date:	03-17-2017
Citation:	22 CCR 12 66262.40(a) - California Code of Regulations, Title 22, Chapter 12, Section(s) 66262.40(a)
Violation Description:	Failure to keep a copy of each properly signed manifest for at least three years from the date the waste was accepted by the initial transporter. The manifest signed at the time the waste was accepted for transport shall be kept until receiving a signed copy from the designated facility which received the waste.
Violation Notes:	Returned to compliance on 04/28/2017. Please send your inspector copies of hazardous waste manifests from July 2015-present by 4/16/2017. Email to msbliss@co.slo.ca.us or fax to (805) 781-4211 Attn Mattie.
Violation Division:	San Luis Obispo County Environmental Health
Violation Program:	HW
Violation Source:	CERS
Site ID:	36649
Site Name:	HOGUE GRIPS
Violation Date:	03-17-2017
Citation:	HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1)
Violation Description:	Failure to complete and electronically submit hazardous material inventory information for all reportable hazardous materials on site at or above reportable quantities.
Violation Notes:	Returned to compliance on 04/24/2017. Electronically update Chemical Inventory of Hazardous Materials Business Plan by 4/16/2017. Add waste sediment/sludge (largest container 55 gal, max. daily 330 gal), waste solids/rags (110 gal max daily), waste cutting rocks (max. daily 220 gal), waste metal shavings (max. daily 110 gal). Update Hydraulic oil (largest container 55 gal, max. daily 55 gal) and waste hydraulic oil (max daily 220 gal).
Violation Division:	San Luis Obispo County Environmental Health
Violation Program:	HMRRP
Violation Source:	CERS
Site ID:	36649
Site Name:	HOGUE GRIPS
Violation Date:	03-27-2014
Citation:	HSC 6.95 Multiple Sections - California Health and Safety Code, Chapter 6.95, Section(s) Multiple Sections
Violation Description:	Business Plan Program - Operations/Maintenance - General
Violation Notes:	Returned to compliance on 06/26/2014.
Violation Division:	San Luis Obispo County Environmental Health
Violation Program:	HMRRP
Violation Source:	CERS

Evaluation:

Eval General Type:	Compliance Evaluation Inspection
Eval Date:	03-17-2017
Violations Found:	Yes
Eval Type:	Routine done by local agency

MAP FINDINGS

Map ID
Direction
Distance
Elevation | Site | Database(s) | EDR ID Number EPA ID Number

HOGUE GRIPS (Continued) **S104579306**

Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HMRRP
Eval Source: CERS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 03-17-2017
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HW
Eval Source: CERS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 03-27-2014
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HW
Eval Source: CERS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 03-27-2014
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HMRRP
Eval Source: CERS

Eval General Type: Other/Unknown
Eval Date: 04-24-2017
Violations Found: No
Eval Type: Other, not routine, done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HMRRP
Eval Source: CERS

Eval General Type: Other/Unknown
Eval Date: 04-28-2017
Violations Found: No
Eval Type: Other, not routine, done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HW
Eval Source: CERS

Eval General Type: Other/Unknown
Eval Date: 06-26-2014
Violations Found: No
Eval Type: Other, not routine, done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HMRRP

MAP FINDINGS

Map ID
Direction
Distance
Elevation | Site | Database(s) | EDR ID Number EPA ID Number

HOGUE GRIPS (Continued) **S104579306**

Eval Source: CERS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-07-2015
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HW
Eval Source: CERS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-07-2015
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HMRRP
Eval Source: CERS

Eval General Type: Other/Unknown
Eval Date: 09-14-2015
Violations Found: No
Eval Type: Other, not routine, done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HMRRP
Eval Source: CERS

Coordinates:
Site ID: 36649
Facility Name: HOGUE GRIPS
Env Int Type Code: HWG
Program ID: 10438036
Coord Name: Not reported
Ref Point Type Desc: Center of a facility or station.
Latitude: 35.612590
Longitude: -120.646940

Affiliation:
Affiliation Type Desc: CUPA District
Entity Name: SLO County Env Health
Entity Title: Not reported
Affiliation Address: 2156 Sierra Way
Affiliation City: San Luis Obispo
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 93406
Affiliation Phone: (805) 781-5544

Affiliation Type Desc: Environmental Contact
Entity Name: Jason Holmes
Entity Title: Not reported
Affiliation Address: 550 Linne Road
Affiliation City: Paso Robles
Affiliation State: Ca

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

HOGUE GRIPS (Continued) **S104579306**

Affiliation Country:	Not reported
Affiliation Zip:	93446
Affiliation Phone:	(805) 712-1001
Affiliation Type Desc:	Facility Mailing Address
Entity Name:	Mailing Address
Entity Title:	Not reported
Affiliation Address:	550 LINNE RD
Affiliation City:	PASO ROBLES
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	93446
Affiliation Phone:	Not reported
Affiliation Type Desc:	Legal Owner
Entity Name:	HOGUE PATRICK
Entity Title:	Not reported
Affiliation Address:	550 LINNE RD
Affiliation City:	PASO ROBLES
Affiliation State:	CA
Affiliation Country:	United States
Affiliation Zip:	93446
Affiliation Phone:	(805) 712-7287
Affiliation Type Desc:	Operator
Entity Name:	Steve Helmace
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	(800) 438-4747
Affiliation Type Desc:	Parent Corporation
Entity Name:	HOGUE GRIPS
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

F22 **NICHE CHEMICAL, INC** **CUPA Listings** **S113107646**
West **500 LINNE RD G** **HAZNET** **N/A**
1/8-1/4 **PASO ROBLES, CA 93446**
0.149 mi.
787 ft. **Site 1 of 3 in cluster F**

Relative: **Lower**

Actual: **820 ft.**

CUPA SAN LUIS OBISPO:

Facility Id:	FA0002139
Program Element Code:	0705
Program Element:	STATE SITE SURCHARGE
Record Id:	PR0006717
Cross Street:	Not reported
Status Code:	02

Map ID
Direction
Distance
Elevation Site

MAP FINDINGS

Database(s) EDR ID Number EPA ID Number

NICHE CHEMICAL, INC (Continued) **S113107646**

Status: Inactive, non-billable
Latitude: 35.61233
Longitude: -120.64760

Facility Id: FA0002139
Program Element Code: 0726
Program Element: HAZMAT DISCLOSURE - 1-4 HAZARDOUS MATERIALS
Record Id: PR0001540
Cross Street: Not reported
Status Code: 02
Status: Inactive, non-billable
Latitude: 35.61233
Longitude: -120.64760

Facility Id: FA0002139
Program Element Code: 1126
Program Element: HAZWASTE GEN (1-5 WASTE STREAMS)
Record Id: PR0002139
Cross Street: Not reported
Status Code: 02
Status: Inactive, non-billable
Latitude: 35.61233
Longitude: -120.64760

HAZNET:
envid: S113107646
Year: 2013
GEPAID: CAL000212658
Contact: RUSSELL WHITE
Telephone: 8054234185
Mailing Name: Not reported
Mailing Address: 2425 Golden Hill Rd.
Mailing City,St,Zip: Paso Robles, CA 934460000
Gen County: San Luis Obispo
TSD EPA ID: ARD981057870
TSD County: 99
Waste Category: Not reported
Disposal Method: Fuel Blending Prior To Energy Recovery At Another Site
Tons: 0.187
Cat Decode: Not reported
Method Decode: Not reported
Facility County: Not reported

envid: S113107646
Year: 2013
GEPAID: CAL000212658
Contact: RUSSELL WHITE
Telephone: 8054234185
Mailing Name: Not reported
Mailing Address: 2425 Golden Hill Rd.
Mailing City,St,Zip: Paso Robles, CA 934460000
Gen County: San Luis Obispo
TSD EPA ID: ARD981057870
TSD County: 99
Waste Category: Not reported
Disposal Method: Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

NICHE CHEMICAL, INC (Continued) **S113107646**

Tons: 0.748
Cat Decode: Not reported
Method Decode: Not reported
Facility County: Not reported

envid: S113107646
Year: 2003
GEPAID: CAL000212658
Contact: RUSSELL WHITE
Telephone: 8052398488
Mailing Name: Not reported
Mailing Address: PO BOX 2758
Mailing City,St,Zip: ATASCADERO, CA 934230000
Gen County: Not reported
TSD EPA ID: CAD008488025
TSD County: Not reported
Waste Category: Unspecified aqueous solution
Disposal Method: Recycler
Tons: 10.42
Cat Decode: Not reported
Method Decode: Not reported
Facility County: San Luis Obispo

envid: S113107646
Year: 2003
GEPAID: CAL000212658
Contact: RUSSELL WHITE
Telephone: 8052398488
Mailing Name: Not reported
Mailing Address: PO BOX 2758
Mailing City,St,Zip: ATASCADERO, CA 934230000
Gen County: Not reported
TSD EPA ID: CAD044429835
TSD County: Not reported
Waste Category: Unspecified organic liquid mixture
Disposal Method: Not reported
Tons: 2.98
Cat Decode: Not reported
Method Decode: Not reported
Facility County: San Luis Obispo

envid: S113107646
Year: 2003
GEPAID: CAL000212658
Contact: RUSSELL WHITE
Telephone: 8052398488
Mailing Name: Not reported
Mailing Address: PO BOX 2758
Mailing City,St,Zip: ATASCADERO, CA 934230000
Gen County: Not reported
TSD EPA ID: CAD044429835
TSD County: Not reported
Waste Category: Other organic solids
Disposal Method: Disposal, Other
Tons: 0.05
Cat Decode: Not reported
Method Decode: Not reported

MAP FINDINGS

Map ID / Direction / Distance / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
	NICHE CHEMICAL, INC (Continued)		**S113107646**
	Facility County: San Luis Obispo		

Click this hyperlink while viewing on your computer to access
6 additional CA_HAZNET: record(s) in the EDR Site Report.

F23	**CTS KEENE INC**	**SEMS-ARCHIVE**	**1000111896**
West	**500 LINNE RD**	**CORRACTS**	**CAT080010705**
1/8-1/4	**PASO ROBLES, CA 93446**	**RCRA-SQG**	
0.149 mi.		**ENVIROSTOR**	
787 ft.	**Site 2 of 3 in cluster F**	**HIST UST**	
Relative:		**FINDS**	
Lower		**ECHO**	
		CUPA Listings	
Actual:		**HAZNET**	
820 ft.		**HWP**	
		CERS HAZ WASTE	
		CERS	

SEMS Archive:

Site ID:	900350
EPA ID:	CAT080010705
Cong District:	20
FIPS Code:	6079
FF:	N
NPL:	Not on the NPL
Non NPL Status:	Deferred to RCRA (Subtitle C)

SEMS Archive Detail:

Region:	9
Site ID:	900350
EPA ID:	CAT080010705
Site Name:	CTS KEENE INC
NPL:	N
FF:	N
OU:	0
Action Code:	VS
Action Name:	ARCH SITE
SEQ:	1
Start Date:	Not reported
Finish Date:	1996-01-23 00:00:00
Qual:	Not reported
Current Action Lead:	EPA Perf In-Hse

Region:	9
Site ID:	900350
EPA ID:	CAT080010705
Site Name:	CTS KEENE INC
NPL:	N
FF:	N
OU:	0
Action Code:	PA
Action Name:	PA
SEQ:	1
Start Date:	Not reported
Finish Date:	1991-09-12 00:00:00
Qual:	D
Current Action Lead:	EPA Perf

MAP FINDINGS

Map ID
Direction
Distance
Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

CTS KEENE INC (Continued) **1000111896**

Region:	9
Site ID:	900350
EPA ID:	CAT080010705
Site Name:	CTS KEENE INC
NPL:	N
FF:	N
OU:	0
Action Code:	DS
Action Name:	DISCVRY
SEQ:	1
Start Date:	1991-04-01 00:00:00
Finish Date:	1991-04-01 00:00:00
Qual:	Not reported
Current Action Lead:	EPA Perf

CORRACTS:

EPA ID:	CAT080010705
EPA Region:	9
Area Name:	ENTIRE FACILITY
Actual Date:	Not reported
Action:	CA03193
NAICS Code(s):	334419 Other Electronic Component Manufacturing
Original schedule date:	19931001
Schedule end date:	Not reported

EPA ID:	CAT080010705
EPA Region:	9
Area Name:	ENTIRE FACILITY
Actual Date:	19950614
Action:	CA250 - CMS Imposition
NAICS Code(s):	334419 Other Electronic Component Manufacturing
Original schedule date:	Not reported
Schedule end date:	Not reported

EPA ID:	CAT080010705
EPA Region:	9
Area Name:	ENTIRE FACILITY
Actual Date:	19950614
Action:	CA200 - RFI Approved
NAICS Code(s):	334419 Other Electronic Component Manufacturing
Original schedule date:	Not reported
Schedule end date:	Not reported

EPA ID:	CAT080010705
EPA Region:	9
Area Name:	ENTIRE FACILITY
Actual Date:	19950614
Action:	CA300 - CMS Workplan Approved
NAICS Code(s):	334419 Other Electronic Component Manufacturing
Original schedule date:	Not reported
Schedule end date:	Not reported

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

CTS KEENE INC (Continued) **1000111896**

EPA ID: CAT080010705
EPA Region: 9
Area Name: ENTIRE FACILITY
Actual Date: 19950614
Action: CA150 - RFI Workplan Approved
NAICS Code(s): 334419
Other Electronic Component Manufacturing
Original schedule date: Not reported
Schedule end date: Not reported

EPA ID: CAT080010705
EPA Region: 9
Area Name: ENTIRE FACILITY
Actual Date: 19950101
Action: CA100 - RFI Imposition
NAICS Code(s): 334419
Other Electronic Component Manufacturing
Original schedule date: Not reported
Schedule end date: Not reported

EPA ID: CAT080010705
EPA Region: 9
Area Name: ENTIRE FACILITY
Actual Date: 19920227
Action: CA225NR - Stabilization Measures Evaluation, This facility is, not amenable to stabilization activity at the, present time for reasons other than (1) it appears to be technically, infeasible or inappropriate (NF) or (2) there is a lack of technical, information (IN). Reasons for this conclusion may be the status of, closure at the facility, the degree of risk, timing considerations, the status of corrective action work at the facility, or other, administrative considerations
NAICS Code(s): 334419
Other Electronic Component Manufacturing
Original schedule date: Not reported
Schedule end date: Not reported

EPA ID: CAT080010705
EPA Region: 9
Area Name: ENTIRE FACILITY
Actual Date: 19920227
Action: CA075LO - CA Prioritization, Facility or area was assigned a low corrective action priority
NAICS Code(s): 334419
Other Electronic Component Manufacturing
Original schedule date: Not reported
Schedule end date: Not reported

EPA ID: CAT080010705
EPA Region: 9
Area Name: ENTIRE FACILITY
Actual Date: 19910819
Action: CA050 - RFA Completed
NAICS Code(s): 334419
Other Electronic Component Manufacturing
Original schedule date: Not reported
Schedule end date: Not reported

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

CTS KEENE INC (Continued) **1000111896**

EPA ID: CAT080010705
EPA Region: 9
Area Name: ENTIRE FACILITY
Actual Date: 19910819
Action: CA049PA
NAICS Code(s): 334419
Other Electronic Component Manufacturing
Original schedule date: Not reported
Schedule end date: Not reported

EPA ID: CAT080010705
EPA Region: 9
Area Name: ENTIRE FACILITY
Actual Date: 19910819
Action: CA029ST
NAICS Code(s): 334419
Other Electronic Component Manufacturing
Original schedule date: Not reported
Schedule end date: Not reported

EPA ID: CAT080010705
EPA Region: 9
Area Name: ENTIRE FACILITY
Actual Date: 19910819
Action: CA075LO - CA Prioritization, Facility or area was assigned a low corrective action priority
NAICS Code(s): 334419
Other Electronic Component Manufacturing
Original schedule date: Not reported
Schedule end date: Not reported

RCRA-SQG:
Date form received by agency: 09/01/1996
Facility name: CTS KEENE INC
Facility address: 500 LINNE RD
PASO ROBLES, CA 93446
EPA ID: CAT080010705
Mailing address: 500 LINNE ROAD
PASO ROBLES, CA 93446
Contact: Not reported
Contact address: Not reported
Not reported
Contact country: US
Contact telephone: Not reported
Contact email: Not reported
EPA Region: 09
Land type: Facility is not located on Indian land. Additional information is not known.
Classification: Small Small Quantity Generator
Description: Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:
Owner/operator name: CTS KEENE INC.

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

CTS KEENE INC (Continued) **1000111896**

Owner/operator address: 500 LINNE ROAD
CITY NOT REPORTED, CA 99999
Owner/operator country: Not reported
Owner/operator telephone: 805-238-0350
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Owner/operator name: CTS KEENE INC.
Owner/operator address: 500 LINNE ROAD
PASO ROBLES, CA 93446
Owner/operator country: Not reported
Owner/operator telephone: 805-238-0350
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: Yes
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Historical Generators:
Date form received by agency: 04/11/1990
Site name: C T S ELECTRONICSCORP
Classification: Large Quantity Generator

Date form received by agency: 08/18/1980
Site name: CTS KEENE INC
Classification: Large Quantity Generator

Corrective Action Summary:
Event date: 08/19/1991
Event: LEAD AGENCY DETERMINATION

Event date: 08/19/1991

CTS KEENE INC (Continued) **1000111896**

Event: CA PRIORITIZATION-LOW CA PRIORITY

Event date: 08/19/1991
Event: PA OR CERCLA INSPECTION

Event date: 08/19/1991
Event: RFA COMPLETED

Event date: 02/27/1992
Event: CA PRIORITIZATION-LOW CA PRIORITY

Event date: 02/27/1992
Event: STABILIZATION MEASURES EVALUATION-FACILITY NOT AMENABLE TO STABILIZATION

Event date: 01/01/1995
Event: INVESTIGATION IMPOSITION

Event date: 06/14/1995
Event: INVESTIGATION WORKPLAN APPROVED

Event date: 06/14/1995
Event: INVESTIGATION COMPLETE

Event date: 06/14/1995
Event: CMS IMPOSITION

Event date: 06/14/1995
Event: CMS WORKPLAN APPROVED

Event date: Not reported
Event: REEVALUATE IN FY

Facility Has Received Notices of Violations:
Regulation violated: Not reported
Area of violation: TSD - General
Date violation determined: 01/20/1988
Date achieved compliance: 02/19/1988
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 02/19/1988
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Evaluation Action Summary:
Evaluation date: 11/13/1991
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 01/20/1988

CTS KEENE INC (Continued) **1000111896**

Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD - General
Date achieved compliance: 02/19/1988
Evaluation lead agency: State

Evaluation date: 01/04/1988
Evaluation: FINANCIAL RECORD REVIEW
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

ENVIROSTOR:
Facility ID: 80001824
Status: Inactive - Action Required
Status Date: 09/29/2014
Site Code: Not reported
Site Type: Corrective Action
Site Type Detailed: Corrective Action
Acres: 0
NPL: NO
Regulatory Agencies: SMBRP
Lead Agency: WM
Program Manager: John Bystra
Supervisor: Noel Shrum
Division Branch: Cleanup Sacramento
Assembly: 35
Senate: 17
Special Program: Not reported
Restricted Use: NO
Site Mgmt Req: NONE SPECIFIED
Funding: Not reported
Latitude: 35.61251
Longitude: -120.6487
APN: NONE SPECIFIED
Past Use: NONE SPECIFIED
Potential COC: NONE SPECIFIED
Confirmed COC: NONE SPECIFIED
Potential Description: NONE SPECIFIED
Alias Name: CAT080010705
Alias Type: EPA Identification Number
Alias Name: 80001824
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Correspondence
Completed Date: 11/20/1992
Comments: This letter outlined that additional activities would take place as part of CTS Corporations due diligence, relating to sampling of the electroplating room floor and two waste water collection tanks removed in 1985.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Correspondence
Completed Date: 08/10/1992
Comments: This letter was sent to DTSC to clarify the conditions and status of

CTS KEENE INC (Continued) **1000111896**

various units at the CTS Corporation facility, and to offer information about site conditions based on soil sampling data.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Correspondence
Completed Date: 02/04/1992
Comments: This letter outlines additional sampling needed for DTSC to be able to approve certification of closure at the facility.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Correspondence
Completed Date: 11/03/1992
Comments: This is a letter giving information about historical activities and cleanup, and also contains the results of soil sampling results for the facility.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Assessment Report
Completed Date: 08/19/1991
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 01/20/2010
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Closure Certification
Completed Date: 08/05/1992
Comments: This is the closure certification letter and supporting data from CTS Electronics for closure of the RCRA Interim Status drum storage area at the CTS facility.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Closure Certification
Completed Date: 08/09/1991
Comments: This letter and supporting manifests demonstrated closure of the facility.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Closure Certification
Completed Date: 05/19/1992
Comments: This is a letter from CTS to DTSC, containing additional data for DTSC to verify that closure was performed successfully.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Technical Report
Completed Date: 10/13/1992
Comments: The letter summarized information needed to establish background

CTS KEENE INC (Continued) **1000111896**

arsenic concentrations in soil at the CTS Corporation facility, and the included data supported the determination that the wastewater pretreatment permit could be revoked.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Closure Certification
Completed Date: 08/21/1991
Comments: This report, originally sent to DHS's Fresno District Office, was sent to DTSC to verify closure of the Wastewater Pretreatment Facility and the Container Storage Area.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Interim Measures Questionnaire
Completed Date: 02/27/1992
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: RCRA Facility Assessment Report
Completed Date: 08/19/1991
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Consent Order
Completed Date: 01/15/1994
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Correspondence
Completed Date: 08/11/1992
Comments: Since this was for Non-RCRA unit closure, it was sent to DTSC for our records, not for regulatory approval.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Correspondence
Completed Date: 11/25/1991
Comments: This is the cover letter for the Soil Sample Results Assessment performed at the facility.

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

HIST UST:
File Number: 0002B787
URL: http://geotracker.waterboards.ca.gov/ustpdfs/pdf/0002B787.pdf

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

CTS KEENE INC (Continued) **1000111896**

Region:	STATE
Facility ID:	00000004608
Facility Type:	Other
Other Type:	MANUFACTURING PLANT
Contact Name:	MANUFACTURING PLANT, FONTANA R
Telephone:	8052380350
Owner Name:	CTS CORPORATION
Owner Address:	905 WEST BLVD.
Owner City,St,Zip:	ELKHART, IN 46514
Total Tanks:	0010
Tank Num:	001
Container Num:	1
Year Installed:	1980
Tank Capacity:	00000550
Tank Used for:	WASTE
Type of Fuel:	WASTE OIL
Container Construction Thickness:	3/16
Leak Detection:	None
Tank Num:	002
Container Num:	2
Year Installed:	1980
Tank Capacity:	00000550
Tank Used for:	PRODUCT
Type of Fuel:	Not reported
Container Construction Thickness:	3/16
Leak Detection:	None
Tank Num:	003
Container Num:	3
Year Installed:	1980
Tank Capacity:	00000550
Tank Used for:	PRODUCT
Type of Fuel:	UNLEADED
Container Construction Thickness:	3/16
Leak Detection:	None
Tank Num:	004
Container Num:	4
Year Installed:	1980
Tank Capacity:	00009730
Tank Used for:	WASTE
Type of Fuel:	Not reported
Container Construction Thickness:	3/16
Leak Detection:	Stock Inventor
Tank Num:	005
Container Num:	5
Year Installed:	1980
Tank Capacity:	00004090
Tank Used for:	WASTE
Type of Fuel:	Not reported
Container Construction Thickness:	3/16
Leak Detection:	Stock Inventor
Tank Num:	006

MAP FINDINGS

Map ID
Direction
Distance
Elevation | Site | Database(s) | EDR ID Number EPA ID Number

CTS KEENE INC (Continued) **1000111896**

Container Num:	1
Year Installed:	1980
Tank Capacity:	00000550
Tank Used for:	WASTE
Type of Fuel:	WASTE OIL
Container Construction Thickness:	3/16
Leak Detection:	None
Tank Num:	007
Container Num:	2
Year Installed:	1980
Tank Capacity:	00000550
Tank Used for:	PRODUCT
Type of Fuel:	Not reported
Container Construction Thickness:	3/16
Leak Detection:	None
Tank Num:	008
Container Num:	3
Year Installed:	1980
Tank Capacity:	00000550
Tank Used for:	PRODUCT
Type of Fuel:	UNLEADED
Container Construction Thickness:	3/16
Leak Detection:	None
Tank Num:	009
Container Num:	4
Year Installed:	1980
Tank Capacity:	00009730
Tank Used for:	WASTE
Type of Fuel:	Not reported
Container Construction Thickness:	3/16
Leak Detection:	Stock Inventor
Tank Num:	010
Container Num:	5
Year Installed:	1980
Tank Capacity:	00004090
Tank Used for:	WASTE
Type of Fuel:	Not reported
Container Construction Thickness:	3/16
Leak Detection:	Stock Inventor

Click here for Geo Tracker PDF:

FINDS:

Registry ID: 110000737882

Environmental Interest/Information System

US EPA TRIS (Toxics Release Inventory System) contains information from facilities on the amounts of over 300 listed toxic chemicals that these facilities release directly to air, water, land, or that are transported off-site.

RCRAInfo is a national information system that supports the Resource

MAP FINDINGS

Map ID / Direction / Distance / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number

CTS KEENE INC (Continued) **1000111896**

Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:

Envid:	1000111896
Registry ID:	110000737882
DFR URL:	http://echo.epa.gov/detailed-facility-report?fid=110000737882

CUPA SAN LUIS OBISPO:

Facility Id:	FA0012937
Program Element Code:	0726
Program Element:	HAZMAT DISCLOSURE - 1-4 HAZARDOUS MATERIALS
Record Id:	PR0018469
Cross Street:	Not reported
Status Code:	01
Status:	Active, billable
Latitude:	35.61263
Longitude:	-120.64875

Facility Id:	FA0012937
Program Element Code:	1123
Program Element:	HAZWASTE GEN (2 WASTE STREAMS <27 GAL/MO)
Record Id:	PR0018470
Cross Street:	Not reported
Status Code:	01
Status:	Active, billable
Latitude:	35.61263
Longitude:	-120.64875

Facility Id:	FA0008373
Program Element Code:	0726
Program Element:	HAZMAT DISCLOSURE - 1-4 HAZARDOUS MATERIALS
Record Id:	PR0014156
Cross Street:	Not reported
Status Code:	01
Status:	Active, billable
Latitude:	35.61310
Longitude:	-120.64941

Facility Id:	FA0008373
Program Element Code:	1123
Program Element:	HAZWASTE GEN (2 WASTE STREAMS <27 GAL/MO)
Record Id:	PR0015924
Cross Street:	Not reported
Status Code:	01
Status:	Active, billable
Latitude:	35.61310
Longitude:	-120.64941

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

CTS KEENE INC (Continued) **1000111896**

Facility Id: FA0008373
Program Element Code: 1126
Program Element: HAZWASTE GEN (1-5 WASTE STREAMS)
Record Id: PR0014157
Cross Street: Not reported
Status Code: 02
Status: Inactive, non-billable
Latitude: 35.61310
Longitude: -120.64941

HAZNET:
envid: 1000111896
Year: 2016
GEPAID: CAL000338884
Contact: LEE CHAMBERLAIN
Telephone: 8052392501
Mailing Name: Not reported
Mailing Address: 500 LINNE RD-I
Mailing City,St,Zip: PASO ROBLES, CA 934460000
Gen County: San Luis Obispo
TSD EPA ID: AZR000501510
TSD County: 99
Waste Category: Unspecified oil-containing waste
Disposal Method: Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Tons: 0.6672
Cat Decode: Unspecified oil-containing waste
Method Decode: Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Facility County: San Luis Obispo

envid: 1000111896
Year: 2016
GEPAID: CAL000338884
Contact: LEE CHAMBERLAIN
Telephone: 8052392501
Mailing Name: Not reported
Mailing Address: 500 LINNE RD-I
Mailing City,St,Zip: PASO ROBLES, CA 934460000
Gen County: San Luis Obispo
TSD EPA ID: AZR000501510
TSD County: 99
Waste Category: Other organic solids
Disposal Method: Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Tons: 0.065
Cat Decode: Other organic solids
Method Decode: Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Facility County: San Luis Obispo

HWP:
EPA Id: CAT080010705
Cleanup Status: NON-OPERATING
Latitude: 35.61251
Longitude: -120.6487

CTS KEENE INC (Continued) **1000111896**

Facility Type: Historical - Non-Operating
Facility Size: Not reported
Team: Not reported
Supervisor: Not reported
Site Code: Not reported
Assembly District: 35
Senate District: 17
Public Information Officer: Not reported
Public Information Officer: Not reported

Closure:
EPA Id: CAT080010705
Facility Type: Historical - Non-Operating
Unit Names: Not reported
Event Description: Closure Certification - ISSUE CLOSURE VERIFICATION
Actual Date: 08/21/1991

EPA Id: CAT080010705
Facility Type: Historical - Non-Operating
Unit Names: Not reported
Event Description: Closure Certification - ISSUE CLOSURE VERIFICATION
Actual Date: 08/09/1991

EPA Id: CAT080010705
Facility Type: Historical - Non-Operating
Unit Names: Not reported
Event Description: Closure Certification - ISSUE CLOSURE VERIFICATION
Actual Date: 05/19/1992

EPA Id: CAT080010705
Facility Type: Historical - Non-Operating
Unit Names: Not reported
Event Description: Closure Certification - ISSUE CLOSURE VERIFICATION
Actual Date: 08/05/1992

CERS HAZ WASTE:
Site ID: 424417
CERS ID: 10740505
CERS Description: Hazardous Waste Generator

Violations:
Site ID: 424417
Site Name: Advanced Powder Coating & Sandblasting Inc.
Violation Date: 07-05-2017
Citation: HSC 6.5 25250.22 - California Health and Safety Code, Chapter 6.5, Section(s) 25250.22
Violation Description: Failure to properly manage used oil and/or fuel filters in accordance with the requirements.
Violation Notes: Returned to compliance on 07/05/2017.
Violation Division: San Luis Obispo County Environmental Health
Violation Program: HW
Violation Source: CERS

Site ID: 424417
Site Name: Advanced Powder Coating & Sandblasting Inc.
Violation Date: 07-05-2017
Citation: 22 CCR 12 66262.40(a) - California Code of Regulations, Title 22,

CTS KEENE INC (Continued) **1000111896**

	Chapter 12, Section(s) 66262.40(a)
Violation Description:	Failure to keep a copy of each properly signed manifest for at least three years from the date the waste was accepted by the initial transporter. The manifest signed at the time the waste was accepted for transport shall be kept until receiving a signed copy from the designated facility which received the waste.
Violation Notes:	Returned to compliance on 07/05/2017. Maintain copies of disposal receipts/manifests from permitted waste disposal facility on site for at least three years.
Violation Division:	San Luis Obispo County Environmental Health
Violation Program:	HW
Violation Source:	CERS
Site ID:	424417
Site Name:	Advanced Powder Coating & Sandblasting Inc.
Violation Date:	07-05-2017
Citation:	HSC 6.5 25250.7 - California Health and Safety Code, Chapter 6.5, Section(s) 25250.7
Violation Description:	Failure to prevent intentional contamination of used oil with other hazardous waste other than minimal amounts of vehicle fuel.
Violation Notes:	Returned to compliance on 07/05/2017. Maintain waste oil and filters in separate containers that are closed when transferring activities are not occuring. Observed open drain pan with oil and filters stored on dock at facility.
Violation Division:	San Luis Obispo County Environmental Health
Violation Program:	HW
Violation Source:	CERS
Site ID:	424417
Site Name:	Advanced Powder Coating & Sandblasting Inc.
Violation Date:	07-05-2017
Citation:	HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1)
Violation Description:	Failure to complete and electronically submit a business plan when storing/handling a hazardous material at or above reportable quantities.
Violation Notes:	Returned to compliance on 08/03/2017. Electronically submit a Hazardous Materials Business Plan through the SLO County Portal (www.ezsubmitslogov.org) or California Environmental Reporting System CERS (http://cers.calepa.ca.gov/) within 30 days of receipt of this report. Include Business Owner/Operator information, Chemical Inventory, Facility Site Map, Emergency Response, and Employee Training Plans.
Violation Division:	San Luis Obispo County Environmental Health
Violation Program:	HMRRP
Violation Source:	CERS
Site ID:	424417
Site Name:	Advanced Powder Coating & Sandblasting Inc.
Violation Date:	07-05-2017
Citation:	HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1)
Violation Description:	Failure to complete and electronically submit hazardous material inventory information for all reportable hazardous materials on site at or above reportable quantities.
Violation Notes:	Returned to compliance on 08/03/2017.
Violation Division:	San Luis Obispo County Environmental Health

CTS KEENE INC (Continued) **1000111896**

Violation Program: HMRRP
Violation Source: CERS

Site ID: 424417
Site Name: Advanced Powder Coating & Sandblasting Inc.
Violation Date: 07-05-2017
Citation: 22 CCR 12 66262.12 - California Code of Regulations, Title 22, Chapter 12, Section(s) 66262.12
Violation Description: Failure to obtain an Identification Number prior to treating, storing, disposing of, transporting or offering for transportation any hazardous waste.
Violation Notes: Returned to compliance on 11/07/2017. Obtain an EPA ID number (http://www.dtsc.ca.gov/IDManifest/PERMHWID.cfm) for waste oil and filters produced at facility.
Violation Division: San Luis Obispo County Environmental Health
Violation Program: HW
Violation Source: CERS

Site ID: 424417
Site Name: Advanced Powder Coating & Sandblasting Inc.
Violation Date: 07-05-2017
Citation: HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1)
Violation Description: Failure to establish and electronically submit an adequate emergency response plan and procedures for a release or threatened release of a hazardous material.
Violation Notes: Returned to compliance on 08/03/2017.
Violation Division: San Luis Obispo County Environmental Health
Violation Program: HMRRP
Violation Source: CERS

Site ID: 424417
Site Name: Advanced Powder Coating & Sandblasting Inc.
Violation Date: 07-05-2017
Citation: HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1)
Violation Description: Failure to establish and electronically submit an adequate training program in safety procedures in the event of a release or threatened release of a hazardous material.
Violation Notes: Returned to compliance on 08/04/2017.
Violation Division: San Luis Obispo County Environmental Health
Violation Program: HMRRP
Violation Source: CERS

Site ID: 424417
Site Name: Advanced Powder Coating & Sandblasting Inc.
Violation Date: 07-05-2017
Citation: HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1)
Violation Description: Failure to complete and electronically submit a site map with all required content.
Violation Notes: Returned to compliance on 08/03/2017.
Violation Division: San Luis Obispo County Environmental Health
Violation Program: HMRRP
Violation Source: CERS

Site ID: 424417

CTS KEENE INC (Continued) **1000111896**

Site Name:	Advanced Powder Coating & Sandblasting Inc.
Violation Date:	07-05-2017
Citation:	HSC 6.5 25201(a) - California Health and Safety Code, Chapter 6.5, Section(s) 25201(a)
Violation Description:	Failure to dispose of hazardous waste at a facility which has a permit from DTSC or disposing of hazardous waste at any point which is not authorized according to this chapter.
Violation Notes:	Returned to compliance on 07/05/2017. Begin disposing of waste oil and filters at an approved facility. Businesses may dispose of small amounts of waste oil and filters through Integrated Waste Management at the local landfills (contact Patti Toews (805 782-8530) or go to IWMA.com for more information) or contact a licensed hazardous waste hauler to pick up wastes from facility.
Violation Division:	San Luis Obispo County Environmental Health
Violation Program:	HW
Violation Source:	CERS
Site ID:	424417
Site Name:	Advanced Powder Coating & Sandblasting Inc.
Violation Date:	07-05-2017
Citation:	HSC 6.95 Multiple Sections - California Health and Safety Code, Chapter 6.95, Section(s) Multiple Sections
Violation Description:	Business Plan Program - Administration/Documentation - General
Violation Notes:	Returned to compliance on 07/18/2017. Contact our office at 805-781-5544 or visit https://sloonline.envisionconnect.com/#/onlinePayments to pay program fees.
Violation Division:	San Luis Obispo County Environmental Health
Violation Program:	HMRRP
Violation Source:	CERS

Evaluation:

Eval General Type:	Compliance Evaluation Inspection
Eval Date:	07-05-2017
Violations Found:	Yes
Eval Type:	Routine done by local agency
Eval Notes:	Not reported
Eval Division:	San Luis Obispo County Environmental Health
Eval Program:	HW
Eval Source:	CERS
Eval General Type:	Compliance Evaluation Inspection
Eval Date:	07-05-2017
Violations Found:	Yes
Eval Type:	Routine done by local agency
Eval Notes:	Items marked N/A not reviewed during inspection. Please see email for more information regarding electronic reporting of Hazardous Materials Business Plan.
Eval Division:	San Luis Obispo County Environmental Health
Eval Program:	HMRRP
Eval Source:	CERS
Eval General Type:	Other/Unknown
Eval Date:	08-03-2017
Violations Found:	No
Eval Type:	Other, not routine, done by local agency
Eval Notes:	Not reported

CTS KEENE INC (Continued) **1000111896**

Eval Division: San Luis Obispo County Environmental Health
Eval Program: HMRRP
Eval Source: CERS

Eval General Type: Other/Unknown
Eval Date: 08-03-2017
Violations Found: No
Eval Type: Other, not routine, done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HW
Eval Source: CERS

Eval General Type: Other/Unknown
Eval Date: 08-24-2017
Violations Found: No
Eval Type: Other, not routine, done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HW
Eval Source: CERS

Eval General Type: Other/Unknown
Eval Date: 11-08-2017
Violations Found: No
Eval Type: Other, not routine, done by local agency
Eval Notes: EPA ID number reactivated. Original paperwork was sent in 8/28/2017 with no result; second time sending in paperwork and calling DTSC resulted in number activated.
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HW
Eval Source: CERS

Affiliation:
Affiliation Type Desc: CUPA District
Entity Name: SLO County Env Health
Entity Title: Not reported
Affiliation Address: 2156 Sierra Way
Affiliation City: San Luis Obispo
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 93406
Affiliation Phone: (805) 781-5544

Affiliation Type Desc: Document Preparer
Entity Name: Maria Petti
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: Not reported

Affiliation Type Desc: Environmental Contact
Entity Name: Maria Petti
Entity Title: Not reported

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

CTS KEENE INC (Continued) **1000111896**

Affiliation Address:	807 Casals Drive
Affiliation City:	Paso Robles
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	93446
Affiliation Phone:	(805) 238-4451
Affiliation Type Desc:	Facility Mailing Address
Entity Name:	Mailing Address
Entity Title:	Not reported
Affiliation Address:	807 Casals Drive
Affiliation City:	Paso Robles
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	93446
Affiliation Phone:	Not reported
Affiliation Type Desc:	Identification Signer
Entity Name:	Maria Petti
Entity Title:	Secretary
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported
Affiliation Type Desc:	Legal Owner
Entity Name:	Panfilo Petti
Entity Title:	Not reported
Affiliation Address:	807 Casals Drive
Affiliation City:	Paso Robles
Affiliation State:	CA
Affiliation Country:	United States
Affiliation Zip:	93446
Affiliation Phone:	(805) 238-4451
Affiliation Type Desc:	Operator
Entity Name:	Advanced Powder Coating & Sandblasting Inc.
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	(805) 238-4451
Affiliation Type Desc:	Parent Corporation
Entity Name:	Advanced Powder Coating & Sandblasting Inc.
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

CTS KEENE INC (Continued) **1000111896**

Affiliation Type Desc:	Property Owner
Entity Name:	Panfilo Petti
Entity Title:	Not reported
Affiliation Address:	807 Casals Drive
Affiliation City:	Paso Robles
Affiliation State:	CA
Affiliation Country:	United States
Affiliation Zip:	93446
Affiliation Phone:	(805) 238-4451

Site ID:	99889
CERS ID:	10435876
CERS Description:	Hazardous Waste Generator

Violations:

Site ID:	99889
Site Name:	BRASSWORKS
Violation Date:	07-05-2017
Citation:	HSC 6.5 25201(a) - California Health and Safety Code, Chapter 6.5, Section(s) 25201(a)
Violation Description:	Failure to dispose of hazardous waste at a facility which has a permit from DTSC or disposing of hazardous waste at any point which is not authorized according to this chapter.
Violation Notes:	Returned to compliance on 07/05/2017. Discontinue taking wastes to IWMA and O'reillys as Household Hazardous Waste. Waste may be taken to IWMA as a business. Contact Patti Toews (805) 782-8530 or go to iwma.com for more information. Retain all disposal receipts for review.
Violation Division:	San Luis Obispo County Environmental Health
Violation Program:	HW
Violation Source:	CERS

Site ID:	99889
Site Name:	BRASSWORKS
Violation Date:	07-05-2017
Citation:	22 CCR 12 66262.34(f) - California Code of Regulations, Title 22, Chapter 12, Section(s) 66262.34(f)
Violation Description:	Failure to properly label hazardous waste accumulation containers and portable tanks with the following requirements: "Hazardous Waste", name and address of the generator, physical and chemical characteristics of the Hazardous Waste, and starting accumulation date.
Violation Notes:	Label hazardous waste container as stated in the violation text.
Violation Division:	San Luis Obispo County Environmental Health
Violation Program:	HW
Violation Source:	CERS

Site ID:	99889
Site Name:	BRASSWORKS
Violation Date:	07-05-2017
Citation:	22 CCR 12 66262.40(a) - California Code of Regulations, Title 22, Chapter 12, Section(s) 66262.40(a)
Violation Description:	Failure to keep a copy of each properly signed manifest for at least three years from the date the waste was accepted by the initial transporter. The manifest signed at the time the waste was accepted for transport shall be kept until receiving a signed copy from the designated facility which received the waste.

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

CTS KEENE INC (Continued) **1000111896**

Violation Notes: Returned to compliance on 07/05/2017. Retain hazardous waste disposal receipts/ manifests at the facility for at least three years.
Violation Division: San Luis Obispo County Environmental Health
Violation Program: HW
Violation Source: CERS

Site ID: 99889
Site Name: BRASSWORKS
Violation Date: 08-29-2013
Citation: HSC 6.95 25505(a) - California Health and Safety Code, Chapter 6.95, Section(s) 25505(a)
Violation Description: Owner/Operator failed to complete and/or submit a Hazardous Materials Business Plan when storing hazardous materials at or above the thresholds quantities of 55 gallons/500 lbs/200 cubic feet.
Violation Notes: Returned to compliance on 09/04/2013.
Violation Division: San Luis Obispo County Environmental Health
Violation Program: HMRRP
Violation Source: CERS

Site ID: 99889
Site Name: BRASSWORKS
Violation Date: 08-29-2013
Citation: HSC 6.95 25504(a) - California Health and Safety Code, Chapter 6.95, Section(s) 25504(a)
Violation Description: Failure to complete and/or submit hazardous material inventory forms for all reportable hazardous materials on site.
Violation Notes: Returned to compliance on 09/04/2013.
Violation Division: San Luis Obispo County Environmental Health
Violation Program: HMRRP
Violation Source: CERS

Site ID: 99889
Site Name: BRASSWORKS
Violation Date: 07-05-2017
Citation: 22 CCR 12 66262.12 - California Code of Regulations, Title 22, Chapter 12, Section(s) 66262.12
Violation Description: Failure to obtain an Identification Number prior to treating, storing, disposing of, transporting or offering for transportation any hazardous waste.
Violation Notes: Returned to compliance on 07/19/2017. Immediately activate EPA ID number (http://www.dtsc.ca.gov/IDManifest/ReactivateID.cfm).
Violation Division: San Luis Obispo County Environmental Health
Violation Program: HW
Violation Source: CERS

Site ID: 99889
Site Name: BRASSWORKS
Violation Date: 11-03-2015
Citation: HSC 6.95 25508(d) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(d)
Violation Description: Failure to complete and/or electronically submit a business plan when storing/handling a hazardous material at or above reportable quantities.
Violation Notes: Returned to compliance on 11/05/2015. Please change the date range at the top and the submission date at the bottom of the Form S Owner Operator page of your online haz mat business plan.
Violation Division: San Luis Obispo County Environmental Health

MAP FINDINGS

Map ID
Direction
Distance
Elevation | Site | Database(s) | EDR ID Number EPA ID Number

CTS KEENE INC (Continued) **1000111896**

Violation Program: HMRRP
Violation Source: CERS

Site ID: 99889
Site Name: BRASSWORKS
Violation Date: 07-05-2017
Citation: HSC 6.95 Multiple - California Health and Safety Code, Chapter 6.95, Section(s) Multiple
Violation Description: Business Plan Program - Release/Leaks/Spills - General
Violation Notes: Provide secondary containment for hazardous waste stored outside by 8/5/2017.
Violation Division: San Luis Obispo County Environmental Health
Violation Program: HMRRP
Violation Source: CERS

Site ID: 99889
Site Name: BRASSWORKS
Violation Date: 11-03-2015
Citation: HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1)
Violation Description: Failure to complete and electronically submit hazardous material inventory information for all reportable hazardous materials on site at or above reportable quantities.
Violation Notes: Returned to compliance on 11/05/2015. Please verify and update your chemical inventory (e.g. amount of solder flux is 55 gallons not 5 gallons).
Violation Division: San Luis Obispo County Environmental Health
Violation Program: HMRRP
Violation Source: CERS

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 04-24-2017
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HW
Eval Source: CERS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-05-2017
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HW
Eval Source: CERS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-05-2017
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Items marked N/A not reviewed during inspection. Send your inspector a copy of the employee sign-in sheet for the hazard communication/emergency response safety briefing. Electronically update soldering flux on Chemical Inventory of Hazardous Materials

MAP FINDINGS

Map ID / Direction / Distance / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number

CTS KEENE INC (Continued) **1000111896**

	Business Plan. Review "treatment" requirements for evaporating off wastewater with use of heat (oven).
Eval Division:	San Luis Obispo County Environmental Health
Eval Program:	HMRRP
Eval Source:	CERS
Eval General Type:	Compliance Evaluation Inspection
Eval Date:	07-07-2016
Violations Found:	No
Eval Type:	Routine done by local agency
Eval Notes:	Not reported
Eval Division:	San Luis Obispo County Environmental Health
Eval Program:	HW
Eval Source:	CERS
Eval General Type:	Compliance Evaluation Inspection
Eval Date:	08-29-2013
Violations Found:	No
Eval Type:	Routine done by local agency
Eval Notes:	Not reported
Eval Division:	San Luis Obispo County Environmental Health
Eval Program:	HW
Eval Source:	CERS
Eval General Type:	Compliance Evaluation Inspection
Eval Date:	08-29-2013
Violations Found:	Yes
Eval Type:	Routine done by local agency
Eval Notes:	Not reported
Eval Division:	San Luis Obispo County Environmental Health
Eval Program:	HMRRP
Eval Source:	CERS
Eval General Type:	Other/Unknown
Eval Date:	09-03-2013
Violations Found:	No
Eval Type:	Other, not routine, done by local agency
Eval Notes:	Not reported
Eval Division:	San Luis Obispo County Environmental Health
Eval Program:	HMRRP
Eval Source:	CERS
Eval General Type:	Compliance Evaluation Inspection
Eval Date:	09-25-2014
Violations Found:	No
Eval Type:	Routine done by local agency
Eval Notes:	Not reported
Eval Division:	San Luis Obispo County Environmental Health
Eval Program:	HMRRP
Eval Source:	CERS
Eval General Type:	Compliance Evaluation Inspection
Eval Date:	09-25-2014
Violations Found:	No
Eval Type:	Routine done by local agency
Eval Notes:	Only a small amount of waste present during inspection. However, no wastes disposed of since last inspection. Please dispose of waste test

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

CTS KEENE INC (Continued) **1000111896**

water and retain a receipt for future inspection.
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HW
Eval Source: CERS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-03-2015
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Facility self transports haz wastes to Chicago Grade landfill. Please reconfigure your storage area to secondarily contain your haz waste while drying.
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HW
Eval Source: CERS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 11-03-2015
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HMRRP
Eval Source: CERS

Eval General Type: Other/Unknown
Eval Date: 11-05-2015
Violations Found: No
Eval Type: Other, not routine, done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HMRRP
Eval Source: CERS

Affiliation:
Affiliation Type Desc: CUPA District
Entity Name: SLO County Env Health
Entity Title: Not reported
Affiliation Address: 2156 Sierra Way
Affiliation City: San Luis Obispo
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 93406
Affiliation Phone: (805) 781-5544

Affiliation Type Desc: Environmental Contact
Entity Name: The Brassworks c/o Lee Chamberlain
Entity Title: Not reported
Affiliation Address: 500 linne road unit i
Affiliation City: paso robles
Affiliation State: ca
Affiliation Country: Not reported
Affiliation Zip: 93446
Affiliation Phone: (805) 239-2501

Affiliation Type Desc: Facility Mailing Address
Entity Name: Mailing Address

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

CTS KEENE INC (Continued) **1000111896**

Entity Title: Not reported
Affiliation Address: 500 LINNE RD UNIT I
Affiliation City: PASO ROBLES
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 93446
Affiliation Phone: Not reported

Affiliation Type Desc: Legal Owner
Entity Name: CHAMBERLAIN, LEE
Entity Title: Not reported
Affiliation Address: 500 LINNE RD UNIT I
Affiliation City: PASO ROBLES
Affiliation State: CA
Affiliation Country: United States
Affiliation Zip: 93446
Affiliation Phone: (805) 239-2501

Affiliation Type Desc: Operator
Entity Name: The Brassworks
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: (805) 239-2501

Affiliation Type Desc: Parent Corporation
Entity Name: BRASSWORKS
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: Not reported

CERS TANKS:
Site ID: 424417
CERS ID: 10740505
CERS Description: Chemical Storage Facilities

Violations:
Site ID: 424417
Site Name: Advanced Powder Coating & Sandblasting Inc.
Violation Date: 07-05-2017
Citation: HSC 6.5 25250.22 - California Health and Safety Code, Chapter 6.5, Section(s) 25250.22
Violation Description: Failure to properly manage used oil and/or fuel filters in accordance with the requirements.
Violation Notes: Returned to compliance on 07/05/2017.
Violation Division: San Luis Obispo County Environmental Health
Violation Program: HW
Violation Source: CERS

CTS KEENE INC (Continued) **1000111896**

Site ID:	424417
Site Name:	Advanced Powder Coating & Sandblasting Inc.
Violation Date:	07-05-2017
Citation:	22 CCR 12 66262.40(a) - California Code of Regulations, Title 22, Chapter 12, Section(s) 66262.40(a)
Violation Description:	Failure to keep a copy of each properly signed manifest for at least three years from the date the waste was accepted by the initial transporter. The manifest signed at the time the waste was accepted for transport shall be kept until receiving a signed copy from the designated facility which received the waste.
Violation Notes:	Returned to compliance on 07/05/2017. Maintain copies of disposal receipts/manifests from permitted waste disposal facility on site for at least three years.
Violation Division:	San Luis Obispo County Environmental Health
Violation Program:	HW
Violation Source:	CERS

Site ID:	424417
Site Name:	Advanced Powder Coating & Sandblasting Inc.
Violation Date:	07-05-2017
Citation:	HSC 6.5 25250.7 - California Health and Safety Code, Chapter 6.5, Section(s) 25250.7
Violation Description:	Failure to prevent intentional contamination of used oil with other hazardous waste other than minimal amounts of vehicle fuel.
Violation Notes:	Returned to compliance on 07/05/2017. Maintain waste oil and filters in separate containers that are closed when transferring activities are not occuring. Observed open drain pan with oil and filters stored on dock at facility.
Violation Division:	San Luis Obispo County Environmental Health
Violation Program:	HW
Violation Source:	CERS

Site ID:	424417
Site Name:	Advanced Powder Coating & Sandblasting Inc.
Violation Date:	07-05-2017
Citation:	HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1)
Violation Description:	Failure to complete and electronically submit a business plan when storing/handling a hazardous material at or above reportable quantities.
Violation Notes:	Returned to compliance on 08/03/2017. Electronically submit a Hazardous Materials Business Plan through the SLO County Portal (www.ezsubmitslogov.org) or California Environmental Reporting System CERS (http://cers.calepa.ca.gov/) within 30 days of receipt of this report. Include Business Owner/Operator information, Chemical Inventory, Facility Site Map, Emergency Response, and Employee Training Plans.
Violation Division:	San Luis Obispo County Environmental Health
Violation Program:	HMRRP
Violation Source:	CERS

Site ID:	424417
Site Name:	Advanced Powder Coating & Sandblasting Inc.
Violation Date:	07-05-2017
Citation:	HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1)
Violation Description:	Failure to complete and electronically submit hazardous material

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

CTS KEENE INC (Continued) **1000111896**

inventory information for all reportable hazardous materials on site at or above reportable quantities.
Violation Notes: Returned to compliance on 08/03/2017.
Violation Division: San Luis Obispo County Environmental Health
Violation Program: HMRRP
Violation Source: CERS

Site ID: 424417
Site Name: Advanced Powder Coating & Sandblasting Inc.
Violation Date: 07-05-2017
Citation: 22 CCR 12 66262.12 - California Code of Regulations, Title 22, Chapter 12, Section(s) 66262.12
Violation Description: Failure to obtain an Identification Number prior to treating, storing, disposing of, transporting or offering for transportation any hazardous waste.
Violation Notes: Returned to compliance on 11/07/2017. Obtain an EPA ID number (http://www.dtsc.ca.gov/IDManifest/PERMHWID.cfm) for waste oil and filters produced at facility.
Violation Division: San Luis Obispo County Environmental Health
Violation Program: HW
Violation Source: CERS

Site ID: 424417
Site Name: Advanced Powder Coating & Sandblasting Inc.
Violation Date: 07-05-2017
Citation: HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1)
Violation Description: Failure to establish and electronically submit an adequate emergency response plan and procedures for a release or threatened release of a hazardous material.
Violation Notes: Returned to compliance on 08/03/2017.
Violation Division: San Luis Obispo County Environmental Health
Violation Program: HMRRP
Violation Source: CERS

Site ID: 424417
Site Name: Advanced Powder Coating & Sandblasting Inc.
Violation Date: 07-05-2017
Citation: HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1)
Violation Description: Failure to establish and electronically submit an adequate training program in safety procedures in the event of a release or threatened release of a hazardous material.
Violation Notes: Returned to compliance on 08/04/2017.
Violation Division: San Luis Obispo County Environmental Health
Violation Program: HMRRP
Violation Source: CERS

Site ID: 424417
Site Name: Advanced Powder Coating & Sandblasting Inc.
Violation Date: 07-05-2017
Citation: HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1)
Violation Description: Failure to complete and electronically submit a site map with all required content.
Violation Notes: Returned to compliance on 08/03/2017.
Violation Division: San Luis Obispo County Environmental Health

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

CTS KEENE INC (Continued) **1000111896**

Violation Program: HMRRP
Violation Source: CERS

Site ID: 424417
Site Name: Advanced Powder Coating & Sandblasting Inc.
Violation Date: 07-05-2017
Citation: HSC 6.5 25201(a) - California Health and Safety Code, Chapter 6.5, Section(s) 25201(a)
Violation Description: Failure to dispose of hazardous waste at a facility which has a permit from DTSC or disposing of hazardous waste at any point which is not authorized according to this chapter.
Violation Notes: Returned to compliance on 07/05/2017. Begin disposing of waste oil and filters at an approved facility. Businesses may dispose of small amounts of waste oil and filters through Integrated Waste Management at the local landfills (contact Patti Toews (805 782-8530) or go to IWMA.com for more information) or contact a licensed hazardous waste hauler to pick up wastes from facility.
Violation Division: San Luis Obispo County Environmental Health
Violation Program: HW
Violation Source: CERS

Site ID: 424417
Site Name: Advanced Powder Coating & Sandblasting Inc.
Violation Date: 07-05-2017
Citation: HSC 6.95 Multiple Sections - California Health and Safety Code, Chapter 6.95, Section(s) Multiple Sections
Violation Description: Business Plan Program - Administration/Documentation - General
Violation Notes: Returned to compliance on 07/18/2017. Contact our office at 805-781-5544 or visit https://sloonline.envisionconnect.com/#/onlinePayments to pay program fees.
Violation Division: San Luis Obispo County Environmental Health
Violation Program: HMRRP
Violation Source: CERS

Evaluation:
Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-05-2017
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HW
Eval Source: CERS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-05-2017
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Items marked N/A not reviewed during inspection. Please see email for more information regarding electronic reporting of Hazardous Materials Business Plan.
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HMRRP
Eval Source: CERS

Eval General Type: Other/Unknown

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

CTS KEENE INC (Continued) **1000111896**

Eval Date: 08-03-2017
Violations Found: No
Eval Type: Other, not routine, done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HMRRP
Eval Source: CERS

Eval General Type: Other/Unknown
Eval Date: 08-03-2017
Violations Found: No
Eval Type: Other, not routine, done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HW
Eval Source: CERS

Eval General Type: Other/Unknown
Eval Date: 08-24-2017
Violations Found: No
Eval Type: Other, not routine, done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HW
Eval Source: CERS

Eval General Type: Other/Unknown
Eval Date: 11-08-2017
Violations Found: No
Eval Type: Other, not routine, done by local agency
Eval Notes: EPA ID number reactivated. Original paperwork was sent in 8/28/2017 with no result; second time sending in paperwork and calling DTSC resulted in number activated.
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HW
Eval Source: CERS

Affiliation:
Affiliation Type Desc: CUPA District
Entity Name: SLO County Env Health
Entity Title: Not reported
Affiliation Address: 2156 Sierra Way
Affiliation City: San Luis Obispo
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 93406
Affiliation Phone: (805) 781-5544

Affiliation Type Desc: Document Preparer
Entity Name: Maria Petti
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: Not reported

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

CTS KEENE INC (Continued) **1000111896**

Affiliation Type Desc:	Environmental Contact
Entity Name:	Maria Petti
Entity Title:	Not reported
Affiliation Address:	807 Casals Drive
Affiliation City:	Paso Robles
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	93446
Affiliation Phone:	(805) 238-4451

Affiliation Type Desc:	Facility Mailing Address
Entity Name:	Mailing Address
Entity Title:	Not reported
Affiliation Address:	807 Casals Drive
Affiliation City:	Paso Robles
Affiliation State:	CA
Affiliation Country:	Not reported
Affiliation Zip:	93446
Affiliation Phone:	Not reported

Affiliation Type Desc:	Identification Signer
Entity Name:	Maria Petti
Entity Title:	Secretary
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	Not reported

Affiliation Type Desc:	Legal Owner
Entity Name:	Panfilo Petti
Entity Title:	Not reported
Affiliation Address:	807 Casals Drive
Affiliation City:	Paso Robles
Affiliation State:	CA
Affiliation Country:	United States
Affiliation Zip:	93446
Affiliation Phone:	(805) 238-4451

Affiliation Type Desc:	Operator
Entity Name:	Advanced Powder Coating & Sandblasting Inc.
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	Not reported
Affiliation Phone:	(805) 238-4451

Affiliation Type Desc:	Parent Corporation
Entity Name:	Advanced Powder Coating & Sandblasting Inc.
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported

MAP FINDINGS

Map ID / Direction / Distance / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number

CTS KEENE INC (Continued) **1000111896**

Affiliation Zip: Not reported
Affiliation Phone: Not reported

Affiliation Type Desc: Property Owner
Entity Name: Panfilo Petti
Entity Title: Not reported
Affiliation Address: 807 Casals Drive
Affiliation City: Paso Robles
Affiliation State: CA
Affiliation Country: United States
Affiliation Zip: 93446
Affiliation Phone: (805) 238-4451

Site ID: 228521
CERS ID: CAT080010705
CERS Description: Hazardous Waste

Affiliation:
Affiliation Type Desc: Facility Contact
Entity Name: UNDELIVERABLE PER SURVEY
Entity Title: Not reported
Affiliation Address: 12/94 NW
Affiliation City: PASO ROBLES
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 934460000
Affiliation Phone: 8052380350

Affiliation Type Desc: Facility Owner
Entity Name: CTS CORP IN CALIF
Entity Title: Not reported
Affiliation Address: 500 LINNE RD
Affiliation City: PASO ROBLES
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 934460000
Affiliation Phone: 8052380350

F24 **SPINTECH, INC** **CUPA Listings** **S113121862**
West **500 LINNE RD F** **HAZNET** **N/A**
1/8-1/4 **PASO ROBLES, CA 93446**
0.149 mi.
787 ft. **Site 3 of 3 in cluster F**

Relative: **Lower**
Actual: **820 ft.**

CUPA SAN LUIS OBISPO:
Facility Id: FA0002363
Program Element Code: 0705
Program Element: STATE SITE SURCHARGE
Record Id: PR0006902
Cross Street: Not reported
Status Code: 02
Status: Inactive, non-billable
Latitude: 35.61223
Longitude: -120.64843

Facility Id: FA0002363

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

SPINTECH, INC (Continued) **S113121862**

Program Element Code: 0727
Program Element: HAZMAT DISCLOSURE - 5-10 HAZARDOUS MATERIALS
Record Id: PR0001892
Cross Street: Not reported
Status Code: 02
Status: Inactive, non-billable
Latitude: 35.61223
Longitude: -120.64843

Facility Id: FA0002363
Program Element Code: 1126
Program Element: HAZWASTE GEN (1-5 WASTE STREAMS)
Record Id: PR0002363
Cross Street: Not reported
Status Code: 02
Status: Inactive, non-billable
Latitude: 35.61223
Longitude: -120.64843

HAZNET:
envid: S113121862
Year: 2004
GEPAID: CAL000258627
Contact: RICK GOUDY SR.
Telephone: 8052374994
Mailing Name: Not reported
Mailing Address: 500 LINNE RD UNIT F
Mailing City,St,Zip: PASO ROBLES, CA 93446
Gen County: Not reported
TSD EPA ID: NVD980895338
TSD County: Not reported
Waste Category: Unspecified oil-containing waste
Disposal Method: Disposal, Land Fill
Tons: 0.5
Cat Decode: Not reported
Method Decode: Not reported
Facility County: San Luis Obispo

envid: S113121862
Year: 2003
GEPAID: CAL000258627
Contact: RICK GOUDY SR.
Telephone: 8052374994
Mailing Name: Not reported
Mailing Address: 500 LINNE RD UNIT F
Mailing City,St,Zip: PASO ROBLES, CA 93446
Gen County: Not reported
TSD EPA ID: WAD991281767
TSD County: Not reported
Waste Category: Unspecified oil-containing waste
Disposal Method: Recycler
Tons: 0.1
Cat Decode: Not reported
Method Decode: Not reported
Facility County: San Luis Obispo

MAP FINDINGS

Map ID / Direction / Distance / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
25	**CORNUCOPIA TOOL AND PLASTICS**	**CUPA Listings**	**S113152589**
WNW	**448 SHERWOOD RD**	**HAZNET**	**N/A**
1/8-1/4	**PASO ROBLES, CA 93446**		
0.223 mi.			
1177 ft.			

Relative: **Lower**

Actual: **820 ft.**

CUPA SAN LUIS OBISPO:

Facility Id:	FA0009536
Program Element Code:	0710
Program Element:	HAZMAT DISCLOSURE/HWG ONLY < TQ
Record Id:	PR0015930
Cross Street:	Not reported
Status Code:	02
Status:	Inactive, non-billable
Latitude:	35.61498
Longitude:	-120.65061

Facility Id:	FA0009536
Program Element Code:	1123
Program Element:	HAZWASTE GEN (2 WASTE STREAMS <27 GAL/MO)
Record Id:	PR0015927
Cross Street:	Not reported
Status Code:	01
Status:	Active, billable
Latitude:	35.61498
Longitude:	-120.65061

HAZNET:

envid:	S113152589
Year:	2008
GEPAID:	CAL000332462
Contact:	ART HORN
Telephone:	8052387660
Mailing Name:	Not reported
Mailing Address:	PO BOX 1915
Mailing City,St,Zip:	PASO ROBLES, CA 934471915
Gen County:	Not reported
TSD EPA ID:	WAD991281767
TSD County:	Not reported
Waste Category:	Waste oil and mixed oil
Disposal Method:	Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Tons:	1.045
Cat Decode:	Not reported
Method Decode:	Not reported
Facility County:	San Luis Obispo

26	**PIC MANUFACTURING CO**	**RCRA-SQG**	**1000595424**
WNW	**410 SHERWOOD RD**	**ENVIROSTOR**	**CAD983593609**
1/4-1/2	**PASO ROBLES, CA 93446**	**FINDS**	
0.274 mi.		**ECHO**	
1446 ft.		**NPDES**	
		CIWQS	

Relative: **Lower**

Actual: **820 ft.**

RCRA-SQG:

Date form received by agency:	07/16/1991
Facility name:	PIC MANUFACTURING CO
Facility address:	410 SHERWOOD RD PASO ROBLES, CA 93446

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number / EPA ID Number

PIC MANUFACTURING CO (Continued) **1000595424**

EPA ID: CAD983593609
Mailing address: P O BOX 665
PASO ROBLES, CA 93447
Contact: CAMP DENNIS
Contact address: 410 SHERWOOD RD
PASO ROBLES, CA 93446
Contact country: US
Contact telephone: 805-238-5451
Contact email: Not reported
EPA Region: 09
Classification: Small Small Quantity Generator
Description: Handler: generates more than 100 and less than 1000 kg of hazardous waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:
Owner/operator name: MICHAEL CAMP
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: 415-555-1212
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Owner/operator name: NOT REQUIRED
Owner/operator address: NOT REQUIRED
NOT REQUIRED, ME 99999
Owner/operator country: Not reported
Owner/operator telephone: 415-555-1212
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

PIC MANUFACTURING CO (Continued) **1000595424**

Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

Violation Status: No violations found

ENVIROSTOR:
Facility ID: 40350003
Status: No Further Action
Status Date: 01/15/1992
Site Code: Not reported
Site Type: Historical
Site Type Detailed: * Historical
Acres: Not reported
NPL: NO
Regulatory Agencies: NONE SPECIFIED
Lead Agency: NONE SPECIFIED
Program Manager: Not reported
Supervisor: Not reported
Division Branch: Cleanup Sacramento
Assembly: 35
Senate: 17
Special Program: Not reported
Restricted Use: NO
Site Mgmt Req: NONE SPECIFIED
Funding: Not reported
Latitude: 35.61493
Longitude: -120.6517
APN: NONE SPECIFIED
Past Use: NONE SPECIFIED
Potential COC: NONE SPECIFIED
Confirmed COC: NONE SPECIFIED
Potential Description: NONE SPECIFIED
Alias Name: 110002851851
Alias Type: EPA (FRS #)
Alias Name: 40350003
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Discovery
Completed Date: 03/01/1983
Comments: FACILITY IDENTIFIED DUN AND BRADSTREET

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

FINDS:

MAP FINDINGS

Map ID
Direction
Distance
Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

PIC MANUFACTURING CO (Continued) **1000595424**

Registry ID: 110002851851

Environmental Interest/Information System

California Hazardous Waste Tracking System - Datamart (HWTS-DATAMART) provides California with information on hazardous waste shipments for generators, transporters, and treatment, storage, and disposal facilities.

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:

Envid:	1000595424
Registry ID:	110002851851
DFR URL:	http://echo.epa.gov/detailed-facility-report?fid=110002851851

NPDES:

Facility Status:	Not reported
NPDES Number:	Not reported
Region:	Not reported
Agency Number:	Not reported
Regulatory Measure ID:	Not reported
Place ID:	Not reported
Order Number:	Not reported
WDID:	3 40C365604
Regulatory Measure Type:	Construction
Program Type:	Not reported
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Expiration Date Of Regulatory Measure:	Not reported
Discharge Address:	Not reported
Discharge Name:	Not reported
Discharge City:	Not reported
Discharge State:	Not reported
Discharge Zip:	Not reported
Status:	Terminated
Status Date:	10/29/2013
Operator Name:	AMC Machining Inc
Operator Address:	PO Box 665
Operator City:	Paso Robles
Operator State:	California
Operator Zip:	93447

NPDES as of 03/2018:

NPDES Number:	Not reported
Status:	Not reported
Agency Number:	Not reported
Region:	3

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

PIC MANUFACTURING CO (Continued) **1000595424**

Regulatory Measure ID:	434399
Order Number:	Not reported
Regulatory Measure Type:	Construction
Place ID:	Not reported
WDID:	3 40C365604
Program Type:	Not reported
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	Not reported
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	10/04/2013
Discharge Name:	Not reported
Discharge Address:	Not reported
Discharge City:	Not reported
Discharge State:	Not reported
Discharge Zip:	Not reported
Received Date:	01/29/2013
Processed Date:	02/06/2013
Status:	Terminated
Status Date:	10/29/2013
Place Size:	1.77
Place Size Unit:	Acres
Contact:	Alex Camp
Contact Title:	Owner
Contact Phone:	805-238-5452
Contact Phone Ext:	Not reported
Contact Email:	alex@amcmachining.com
Operator Name:	AMC Machining Inc
Operator Address:	PO Box 665
Operator City:	Paso Robles
Operator State:	California
Operator Zip:	93447
Operator Contact:	Alex Camp
Operator Contact Title:	Owner
Operator Contact Phone:	805-238-5452
Operator Contact Phone Ext:	Not reported
Operator Contact Email:	alex@amcmachining.com
Operator Type:	Private Business
Developer:	AMC Machining Inc
Developer Address:	PO Box 665
Developer City:	Paso Robles
Developer State:	California
Developer Zip:	93447
Developer Contact:	Alex Camp
Developer Contact Title:	Owner
Constype Linear Utility Ind:	N
Emergency Phone:	Not reported
Emergency Phone Ext:	Not reported
Constype Above Ground Ind:	N
Constype Below Ground Ind:	N
Constype Cable Line Ind:	N
Constype Comm Line Ind:	N
Constype Commertial Ind:	Y
Constype Electrical Line Ind:	N
Constype Gas Line Ind:	N
Constype Industrial Ind:	N
Constype Other Description:	Not reported
Constype Other Ind:	N

MAP FINDINGS

Map ID / Direction / Distance / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number

PIC MANUFACTURING CO (Continued) **1000595424**

Constype Recons Ind:	N
Constype Residential Ind:	N
Constype Transport Ind:	N
Constype Utility Description:	Not reported
Constype Utility Ind:	N
Constype Water Sewer Ind:	N
Dir Discharge Uswater Ind:	N
Receiving Water Name:	Salinas River
Certifier:	Alex Camp
Certifier Title:	Not reported
Certification Date:	29-JAN-13
Primary Sic:	Not reported
Secondary Sic:	Not reported
Tertiary Sic:	Not reported

CIWQS:

Agency:	AMC Machining Inc
Agency Address:	PO Box 665, Paso Robles, CA 93447
Place/Project Type:	Construction - Commercial
SIC/NAICS:	Not reported
Region:	3
Program:	CONSTW
Regulatory Measure Status:	Terminated
Regulatory Measure Type:	Storm water construction
Order Number:	2009-0009-DWQ
WDID:	3 40C365604
NPDES Number:	CAS000002
Adoption Date:	Not reported
Effective Date:	02/06/2013
Termination Date:	10/04/2013
Expiration/Review Date:	Not reported
Design Flow:	Not reported
Major/Minor:	Not reported
Complexity:	Not reported
TTWQ:	Not reported
Enforcement Actions within 5 years:	0
Violations within 5 years:	0
Latitude:	35.615
Longitude:	-120.65

G27 **JOSLYN SUNBANK COMPANY L L C** **RCRA-LQG** **1000161759**
West **1740 COMMERCE WAY** **ENVIROSTOR** **CAD097458533**
1/4-1/2 **PASO ROBLES, CA 93446** **AST**
0.410 mi. **HIST UST**
2167 ft. **Site 1 of 2 in cluster G** **DEED**
CHMIRS
Relative: **ICIS**
Lower **FINDS**
ECHO
Actual: **CUPA Listings**
810 ft. **EMI**
NPDES
WDS
CIWQS

RCRA-LQG:

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Date form received by agency: 02/29/2016
Facility name: JOSLYN SUNBANK CO LLC
Facility address: 1740 COMMERCE WAY
PASO ROBLES, CA 93446
EPA ID: CAD097458533
Mailing address: COMMERCE WAY
PASO ROBLES, CA 93446
Contact: PATRICIA HARRIS
Contact address: COMMERCE WAY
PASO ROBLES, CA 93446
Contact country: US
Contact telephone: 805-238-2840
Telephone ext.: 2164
Contact email: PATRICIA.HARRIS@ESTERLINE.COM
EPA Region: 09
Land type: Private
Classification: Large Quantity Generator
Description: Handler: generates 1,000 kg or more of hazardous waste during any calendar month; or generates more than 1 kg of acutely hazardous waste during any calendar month; or generates more than 100 kg of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month; or generates 1 kg or less of acutely hazardous waste during any calendar month, and accumulates more than 1 kg of acutely hazardous waste at any time; or generates 100 kg or less of any residue or contaminated soil, waste or other debris resulting from the cleanup of a spill, into or on any land or water, of acutely hazardous waste during any calendar month, and accumulates more than 100 kg of that material at any time

Owner/Operator Summary:
Owner/operator name: LAURA COATS REVOCABLE TRUST
Owner/operator address: DESIDERATA LANE
BISHOP, CA 93514
Owner/operator country: US
Owner/operator telephone: Not reported
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: 03/01/1983
Owner/Op end date: Not reported

Owner/operator name: DANAHER CORP
Owner/operator address: 1250 TWENTY FOURTH ST NW NO 80
WASHINGTON, DC 20037
Owner/operator country: Not reported
Owner/operator telephone: 202-828-0850
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Owner/operator name: JOSLYN SUNBANK CO LLC
Owner/operator address: Not reported
Not reported
Owner/operator country: Not reported
Owner/operator telephone: Not reported
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Operator
Owner/Op start date: 07/01/1978
Owner/Op end date: Not reported

Owner/operator name: DANAHER CORP
Owner/operator address: 1250 24TH ST N W NO 800
WASHINGTON, DC 20037
Owner/operator country: Not reported
Owner/operator telephone: 202-828-0850
Owner/operator email: Not reported
Owner/operator fax: Not reported
Owner/operator extension: Not reported
Legal status: Private
Owner/Operator Type: Owner
Owner/Op start date: Not reported
Owner/Op end date: Not reported

Handler Activities Summary:
U.S. importer of hazardous waste: No
Mixed waste (haz. and radioactive): No
Recycler of hazardous waste: No
Transporter of hazardous waste: No
Treater, storer or disposer of HW: No
Underground injection activity: No
On-site burner exemption: No
Furnace exemption: No
Used oil fuel burner: No
Used oil processor: No
User oil refiner: No
Used oil fuel marketer to burner: No
Used oil Specification marketer: No
Used oil transfer facility: No
Used oil transporter: No

. Waste code: 121
. Waste name: Alkaline solution (pH >12.5) with metals (antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc)

. Waste code: 135
. Waste name: Unspecified aqueous solution

. Waste code: 141
. Waste name: Off-specification, aged, or surplus inorganics

. Waste code: 181
. Waste name: Other inorganic solid waste

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

. Waste code: 214
. Waste name: Unspecified solvent mixture

. Waste code: 223
. Waste name: Unspecified oil-containing waste

. Waste code: 343
. Waste name: Unspecified organic liquid mixture

. Waste code: 352
. Waste name: Other organic solids

. Waste code: 513
. Waste name: Empty containers less than 30 gallons

. Waste code: 726
. Waste name: Liquids with nickel > 134 mg/l

. Waste code: 791
. Waste name: Liquids with pH < 2

. Waste code: D001
. Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

. Waste code: D002
. Waste name: A WASTE WHICH HAS A PH OF LESS THAN 2 OR GREATER THAN 12.5 IS CONSIDERED TO BE A CORROSIVE HAZARDOUS WASTE. SODIUM HYDROXIDE, A CAUSTIC SOLUTION WITH A HIGH PH, IS OFTEN USED BY INDUSTRIES TO CLEAN OR DEGREASE PARTS. HYDROCHLORIC ACID, A SOLUTION WITH A LOW PH, IS USED BY MANY INDUSTRIES TO CLEAN METAL PARTS PRIOR TO PAINTING. WHEN THESE CAUSTIC OR ACID SOLUTIONS BECOME CONTAMINATED AND MUST BE DISPOSED, THE WASTE WOULD BE A CORROSIVE HAZARDOUS WASTE.

. Waste code: D003
. Waste name: A MATERIAL IS CONSIDERED TO BE A REACTIVE HAZARDOUS WASTE IF IT IS NORMALLY UNSTABLE, REACTS VIOLENTLY WITH WATER, GENERATES TOXIC GASES WHEN EXPOSED TO WATER OR CORROSIVE MATERIALS, OR IF IT IS CAPABLE OF DETONATION OR EXPLOSION WHEN EXPOSED TO HEAT OR A FLAME. ONE EXAMPLE OF SUCH WASTE WOULD BY WASTE GUNPOWDER.

. Waste code: D004
. Waste name: ARSENIC

. Waste code: D005
. Waste name: BARIUM

. Waste code: D006
. Waste name: CADMIUM

. Waste code: D007
. Waste name: CHROMIUM

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

. Waste code: D008
. Waste name: LEAD

. Waste code: D010
. Waste name: SELENIUM

. Waste code: D011
. Waste name: SILVER

. Waste code: D035
. Waste name: METHYL ETHYL KETONE

. Waste code: D039
. Waste name: TETRACHLOROETHYLENE

. Waste code: F003
. Waste name: THE FOLLOWING SPENT NON-HALOGENATED SOLVENTS: XYLENE, ACETONE, ETHYL ACETATE, ETHYL BENZENE, ETHYL ETHER, METHYL ISOBUTYL KETONE, N-BUTYL ALCOHOL, CYCLOHEXANONE, AND METHANOL; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONLY THE ABOVE SPENT NON-HALOGENATED SOLVENTS; AND ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONE OR MORE OF THE ABOVE NON-HALOGENATED SOLVENTS, AND, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THOSE SOLVENTS LISTED IN F001, F002, F004, AND F005, AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

. Waste code: F005
. Waste name: THE FOLLOWING SPENT NON-HALOGENATED SOLVENTS: TOLUENE, METHYL ETHYL KETONE, CARBON DISULFIDE, ISOBUTANOL, PYRIDINE, BENZENE, 2-ETHOXYETHANOL, AND 2-NITROPROPANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE NON-HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F002, OR F004; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

. Waste code: F006
. Waste name: WASTEWATER TREATMENT SLUDGES FROM ELECTROPLATING OPERATIONS EXCEPT FROM THE FOLLOWING PROCESSES: (1) SULFURIC ACID ANODIZING OF ALUMINUM; (2) TIN PLATING ON CARBON STEEL; (3) ZINC PLATING (SEGREGATED BASIS) ON CARBON STEEL; (4) ALUMINUM OR ZINC-ALUMINUM PLATING ON CARBON STEEL; (5) CLEANING/STRIPPING ASSOCIATED WITH TIN, ZINC AND ALUMINUM PLATING ON CARBON STEEL; AND (6) CHEMICAL ETCHING AND MILLING OF ALUMINUM.

. Waste code: F008
. Waste name: PLATING BATH RESIDUES FROM THE BOTTOM OF PLATING BATHS FROM ELECTROPLATING OPERATIONS WHERE CYANIDES ARE USED IN THE PROCESS.

. Waste code: P030
. Waste name: CYANIDES (SOLUBLE CYANIDE SALTS), NOT OTHERWISE SPECIFIED

Historical Generators:
Date form received by agency: 03/27/2014
Site name: JOSLYN SUNBANK CO LLC
Classification: Large Quantity Generator

MAP FINDINGS

Map ID / Direction / Distance / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

. Waste code: 122
. Waste name: Alkaline solution without metals (pH > 12.5)

. Waste code: 132
. Waste name: Aqueous solution w/metals (< restricted levels and see waste code 121 for a list of metals)

. Waste code: 135
. Waste name: Unspecified aqueous solution

. Waste code: 141
. Waste name: Off-specification, aged, or surplus inorganics

. Waste code: 171
. Waste name: Metal sludge (see 121)

. Waste code: 181
. Waste name: Other inorganic solid waste

. Waste code: 213
. Waste name: Hydrocarbon solvents (benzene, hexane, Stoddard, etc.)

. Waste code: 214
. Waste name: Unspecified solvent mixture

. Waste code: 331
. Waste name: Off-specification, aged, or surplus organics

. Waste code: 343
. Waste name: Unspecified organic liquid mixture

. Waste code: 352
. Waste name: Other organic solids

. Waste code: 491
. Waste name: Unspecified sludge waste

. Waste code: 513
. Waste name: Empty containers less than 30 gallons

. Waste code: 611
. Waste name: Contaminated soil from site clean-ups

. Waste code: 726
. Waste name: Liquids with nickel > 134 mg/l

. Waste code: 791
. Waste name: Liquids with pH < 2

. Waste code: 792
. Waste name: Liquids with pH < 2 with metals

. Waste code: D001
. Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET,

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

. Waste code: D002
. Waste name: A WASTE WHICH HAS A PH OF LESS THAN 2 OR GREATER THAN 12.5 IS CONSIDERED TO BE A CORROSIVE HAZARDOUS WASTE. SODIUM HYDROXIDE, A CAUSTIC SOLUTION WITH A HIGH PH, IS OFTEN USED BY INDUSTRIES TO CLEAN OR DEGREASE PARTS. HYDROCHLORIC ACID, A SOLUTION WITH A LOW PH, IS USED BY MANY INDUSTRIES TO CLEAN METAL PARTS PRIOR TO PAINTING. WHEN THESE CAUSTIC OR ACID SOLUTIONS BECOME CONTAMINATED AND MUST BE DISPOSED, THE WASTE WOULD BE A CORROSIVE HAZARDOUS WASTE.

. Waste code: D003
. Waste name: A MATERIAL IS CONSIDERED TO BE A REACTIVE HAZARDOUS WASTE IF IT IS NORMALLY UNSTABLE, REACTS VIOLENTLY WITH WATER, GENERATES TOXIC GASES WHEN EXPOSED TO WATER OR CORROSIVE MATERIALS, OR IF IT IS CAPABLE OF DETONATION OR EXPLOSION WHEN EXPOSED TO HEAT OR A FLAME. ONE EXAMPLE OF SUCH WASTE WOULD BY WASTE GUNPOWDER.

. Waste code: D004
. Waste name: ARSENIC

. Waste code: D005
. Waste name: BARIUM

. Waste code: D006
. Waste name: CADMIUM

. Waste code: D007
. Waste name: CHROMIUM

. Waste code: D008
. Waste name: LEAD

. Waste code: D010
. Waste name: SELENIUM

. Waste code: D011
. Waste name: SILVER

. Waste code: D035
. Waste name: METHYL ETHYL KETONE

. Waste code: D039
. Waste name: TETRACHLOROETHYLENE

. Waste code: F003
. Waste name: THE FOLLOWING SPENT NON-HALOGENATED SOLVENTS: XYLENE, ACETONE, ETHYL ACETATE, ETHYL BENZENE, ETHYL ETHER, METHYL ISOBUTYL KETONE, N-BUTYL ALCOHOL, CYCLOHEXANONE, AND METHANOL; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONLY THE ABOVE SPENT NON-HALOGENATED SOLVENTS; AND ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONE OR MORE OF THE ABOVE NON-HALOGENATED SOLVENTS, AND, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THOSE SOLVENTS LISTED IN F001, F002, F004, AND F005, AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

MIXTURES.

. Waste code: F005
. Waste name: THE FOLLOWING SPENT NON-HALOGENATED SOLVENTS: TOLUENE, METHYL ETHYL KETONE, CARBON DISULFIDE, ISOBUTANOL, PYRIDINE, BENZENE, 2-ETHOXYETHANOL, AND 2-NITROPROPANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE NON-HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F002, OR F004; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

. Waste code: F006
. Waste name: WASTEWATER TREATMENT SLUDGES FROM ELECTROPLATING OPERATIONS EXCEPT FROM THE FOLLOWING PROCESSES: (1) SULFURIC ACID ANODIZING OF ALUMINUM; (2) TIN PLATING ON CARBON STEEL; (3) ZINC PLATING (SEGREGATED BASIS) ON CARBON STEEL; (4) ALUMINUM OR ZINC-ALUMINUM PLATING ON CARBON STEEL; (5) CLEANING/STRIPPING ASSOCIATED WITH TIN, ZINC AND ALUMINUM PLATING ON CARBON STEEL; AND (6) CHEMICAL ETCHING AND MILLING OF ALUMINUM.

. Waste code: F008
. Waste name: PLATING BATH RESIDUES FROM THE BOTTOM OF PLATING BATHS FROM ELECTROPLATING OPERATIONS WHERE CYANIDES ARE USED IN THE PROCESS.

. Waste code: P030
. Waste name: CYANIDES (SOLUBLE CYANIDE SALTS), NOT OTHERWISE SPECIFIED

Date form received by agency: 03/01/2014
Site name: JOSLYN SUNBANK CO LLC
Classification: Large Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

. Waste code: D002
. Waste name: A WASTE WHICH HAS A PH OF LESS THAN 2 OR GREATER THAN 12.5 IS CONSIDERED TO BE A CORROSIVE HAZARDOUS WASTE. SODIUM HYDROXIDE, A CAUSTIC SOLUTION WITH A HIGH PH, IS OFTEN USED BY INDUSTRIES TO CLEAN OR DEGREASE PARTS. HYDROCHLORIC ACID, A SOLUTION WITH A LOW PH, IS USED BY MANY INDUSTRIES TO CLEAN METAL PARTS PRIOR TO PAINTING. WHEN THESE CAUSTIC OR ACID SOLUTIONS BECOME CONTAMINATED AND MUST BE DISPOSED, THE WASTE WOULD BE A CORROSIVE HAZARDOUS WASTE.

. Waste code: D003
. Waste name: A MATERIAL IS CONSIDERED TO BE A REACTIVE HAZARDOUS WASTE IF IT IS NORMALLY UNSTABLE, REACTS VIOLENTLY WITH WATER, GENERATES TOXIC GASES WHEN EXPOSED TO WATER OR CORROSIVE MATERIALS, OR IF IT IS CAPABLE OF DETONATION OR EXPLOSION WHEN EXPOSED TO HEAT OR A FLAME. ONE EXAMPLE OF SUCH WASTE WOULD BY WASTE GUNPOWDER.

. Waste code: D004

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

. Waste name: ARSENIC

. Waste code: D005
. Waste name: BARIUM

. Waste code: D006
. Waste name: CADMIUM

. Waste code: D007
. Waste name: CHROMIUM

. Waste code: D008
. Waste name: LEAD

. Waste code: D010
. Waste name: SELENIUM

. Waste code: D011
. Waste name: SILVER

. Waste code: D035
. Waste name: METHYL ETHYL KETONE

. Waste code: D039
. Waste name: TETRACHLOROETHYLENE

. Waste code: F003
. Waste name: THE FOLLOWING SPENT NON-HALOGENATED SOLVENTS: XYLENE, ACETONE, ETHYL ACETATE, ETHYL BENZENE, ETHYL ETHER, METHYL ISOBUTYL KETONE, N-BUTYL ALCOHOL, CYCLOHEXANONE, AND METHANOL; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONLY THE ABOVE SPENT NON-HALOGENATED SOLVENTS; AND ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONE OR MORE OF THE ABOVE NON-HALOGENATED SOLVENTS, AND, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THOSE SOLVENTS LISTED IN F001, F002, F004, AND F005, AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

. Waste code: F005
. Waste name: THE FOLLOWING SPENT NON-HALOGENATED SOLVENTS: TOLUENE, METHYL ETHYL KETONE, CARBON DISULFIDE, ISOBUTANOL, PYRIDINE, BENZENE, 2-ETHOXYETHANOL, AND 2-NITROPROPANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE NON-HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F002, OR F004; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

. Waste code: F006
. Waste name: WASTEWATER TREATMENT SLUDGES FROM ELECTROPLATING OPERATIONS EXCEPT FROM THE FOLLOWING PROCESSES: (1) SULFURIC ACID ANODIZING OF ALUMINUM; (2) TIN PLATING ON CARBON STEEL; (3) ZINC PLATING (SEGREGATED BASIS) ON CARBON STEEL; (4) ALUMINUM OR ZINC-ALUMINUM PLATING ON CARBON STEEL; (5) CLEANING/STRIPPING ASSOCIATED WITH TIN, ZINC AND ALUMINUM PLATING ON CARBON STEEL; AND (6) CHEMICAL ETCHING AND MILLING OF ALUMINUM.

. Waste code: F008

MAP FINDINGS

Map ID
Direction
Distance
Elevation | Site | Database(s) | EDR ID Number EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

. Waste name: PLATING BATH RESIDUES FROM THE BOTTOM OF PLATING BATHS FROM ELECTROPLATING OPERATIONS WHERE CYANIDES ARE USED IN THE PROCESS.

. Waste code: P030
. Waste name: CYANIDES (SOLUBLE CYANIDE SALTS), NOT OTHERWISE SPECIFIED

Date form received by agency: 03/21/2012
Site name: JOSLYN SUNBANK CO LLC
Classification: Large Quantity Generator

. Waste code: 122
. Waste name: Alkaline solution without metals (pH > 12.5)

. Waste code: 132
. Waste name: Aqueous solution w/metals (< restricted levels and see waste code 121 for a list of metals)

. Waste code: 135
. Waste name: Unspecified aqueous solution

. Waste code: 141
. Waste name: Off-specification, aged, or surplus inorganics

. Waste code: 171
. Waste name: Metal sludge (see 121)

. Waste code: 181
. Waste name: Other inorganic solid waste

. Waste code: 213
. Waste name: Hydrocarbon solvents (benzene, hexane, Stoddard, etc.)

. Waste code: 214
. Waste name: Unspecified solvent mixture

. Waste code: 331
. Waste name: Off-specification, aged, or surplus organics

. Waste code: 343
. Waste name: Unspecified organic liquid mixture

. Waste code: 352
. Waste name: Other organic solids

. Waste code: 491
. Waste name: Unspecified sludge waste

. Waste code: 513
. Waste name: Empty containers less than 30 gallons

. Waste code: 611
. Waste name: Contaminated soil from site clean-ups

. Waste code: 726
. Waste name: Liquids with nickel > 134 mg/l

. Waste code: 791

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

. Waste name: Liquids with pH < 2

. Waste code: 792
. Waste name: Liquids with pH < 2 with metals

. Waste code: D001
. Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

. Waste code: D002
. Waste name: A WASTE WHICH HAS A PH OF LESS THAN 2 OR GREATER THAN 12.5 IS CONSIDERED TO BE A CORROSIVE HAZARDOUS WASTE. SODIUM HYDROXIDE, A CAUSTIC SOLUTION WITH A HIGH PH, IS OFTEN USED BY INDUSTRIES TO CLEAN OR DEGREASE PARTS. HYDROCHLORIC ACID, A SOLUTION WITH A LOW PH, IS USED BY MANY INDUSTRIES TO CLEAN METAL PARTS PRIOR TO PAINTING. WHEN THESE CAUSTIC OR ACID SOLUTIONS BECOME CONTAMINATED AND MUST BE DISPOSED, THE WASTE WOULD BE A CORROSIVE HAZARDOUS WASTE.

. Waste code: D003
. Waste name: A MATERIAL IS CONSIDERED TO BE A REACTIVE HAZARDOUS WASTE IF IT IS NORMALLY UNSTABLE, REACTS VIOLENTLY WITH WATER, GENERATES TOXIC GASES WHEN EXPOSED TO WATER OR CORROSIVE MATERIALS, OR IF IT IS CAPABLE OF DETONATION OR EXPLOSION WHEN EXPOSED TO HEAT OR A FLAME. ONE EXAMPLE OF SUCH WASTE WOULD BY WASTE GUNPOWDER.

. Waste code: D004
. Waste name: ARSENIC

. Waste code: D005
. Waste name: BARIUM

. Waste code: D006
. Waste name: CADMIUM

. Waste code: D007
. Waste name: CHROMIUM

. Waste code: D008
. Waste name: LEAD

. Waste code: D010
. Waste name: SELENIUM

. Waste code: D011
. Waste name: SILVER

. Waste code: D035
. Waste name: METHYL ETHYL KETONE

. Waste code: D039
. Waste name: TETRACHLOROETHYLENE

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

. Waste code: F003
. Waste name: THE FOLLOWING SPENT NON-HALOGENATED SOLVENTS: XYLENE, ACETONE, ETHYL ACETATE, ETHYL BENZENE, ETHYL ETHER, METHYL ISOBUTYL KETONE, N-BUTYL ALCOHOL, CYCLOHEXANONE, AND METHANOL; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONLY THE ABOVE SPENT NON-HALOGENATED SOLVENTS; AND ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONE OR MORE OF THE ABOVE NON-HALOGENATED SOLVENTS, AND, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THOSE SOLVENTS LISTED IN F001, F002, F004, AND F005, AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

. Waste code: F005
. Waste name: THE FOLLOWING SPENT NON-HALOGENATED SOLVENTS: TOLUENE, METHYL ETHYL KETONE, CARBON DISULFIDE, ISOBUTANOL, PYRIDINE, BENZENE, 2-ETHOXYETHANOL, AND 2-NITROPROPANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE NON-HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F002, OR F004; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.

. Waste code: F006
. Waste name: WASTEWATER TREATMENT SLUDGES FROM ELECTROPLATING OPERATIONS EXCEPT FROM THE FOLLOWING PROCESSES: (1) SULFURIC ACID ANODIZING OF ALUMINUM; (2) TIN PLATING ON CARBON STEEL; (3) ZINC PLATING (SEGREGATED BASIS) ON CARBON STEEL; (4) ALUMINUM OR ZINC-ALUMINUM PLATING ON CARBON STEEL; (5) CLEANING/STRIPPING ASSOCIATED WITH TIN, ZINC AND ALUMINUM PLATING ON CARBON STEEL; AND (6) CHEMICAL ETCHING AND MILLING OF ALUMINUM.

. Waste code: F008
. Waste name: PLATING BATH RESIDUES FROM THE BOTTOM OF PLATING BATHS FROM ELECTROPLATING OPERATIONS WHERE CYANIDES ARE USED IN THE PROCESS.

. Waste code: P030
. Waste name: CYANIDES (SOLUBLE CYANIDE SALTS), NOT OTHERWISE SPECIFIED

Date form received by agency: 06/15/2010
Site name: JOSLYN SUNBANK CO. LLC
Classification: Large Quantity Generator

. Waste code: 141
. Waste name: Off-specification, aged, or surplus inorganics

. Waste code: 171
. Waste name: Metal sludge (see 121)

. Waste code: 181
. Waste name: Other inorganic solid waste

. Waste code: 213
. Waste name: Hydrocarbon solvents (benzene, hexane, Stoddard, etc.)

. Waste code: 214
. Waste name: Unspecified solvent mixture

. Waste code: 331

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

. Waste name: Off-specification, aged, or surplus organics

. Waste code: 343
. Waste name: Unspecified organic liquid mixture

. Waste code: 791
. Waste name: Liquids with pH < 2

. Waste code: 792
. Waste name: Liquids with pH < 2 with metals

. Waste code: D001
. Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

. Waste code: D002
. Waste name: A WASTE WHICH HAS A PH OF LESS THAN 2 OR GREATER THAN 12.5 IS CONSIDERED TO BE A CORROSIVE HAZARDOUS WASTE. SODIUM HYDROXIDE, A CAUSTIC SOLUTION WITH A HIGH PH, IS OFTEN USED BY INDUSTRIES TO CLEAN OR DEGREASE PARTS. HYDROCHLORIC ACID, A SOLUTION WITH A LOW PH, IS USED BY MANY INDUSTRIES TO CLEAN METAL PARTS PRIOR TO PAINTING. WHEN THESE CAUSTIC OR ACID SOLUTIONS BECOME CONTAMINATED AND MUST BE DISPOSED, THE WASTE WOULD BE A CORROSIVE HAZARDOUS WASTE.

. Waste code: D003
. Waste name: A MATERIAL IS CONSIDERED TO BE A REACTIVE HAZARDOUS WASTE IF IT IS NORMALLY UNSTABLE, REACTS VIOLENTLY WITH WATER, GENERATES TOXIC GASES WHEN EXPOSED TO WATER OR CORROSIVE MATERIALS, OR IF IT IS CAPABLE OF DETONATION OR EXPLOSION WHEN EXPOSED TO HEAT OR A FLAME. ONE EXAMPLE OF SUCH WASTE WOULD BY WASTE GUNPOWDER.

. Waste code: D006
. Waste name: CADMIUM

. Waste code: D007
. Waste name: CHROMIUM

. Waste code: D008
. Waste name: LEAD

. Waste code: D039
. Waste name: TETRACHLOROETHYLENE

. Waste code: F006
. Waste name: WASTEWATER TREATMENT SLUDGES FROM ELECTROPLATING OPERATIONS EXCEPT FROM THE FOLLOWING PROCESSES: (1) SULFURIC ACID ANODIZING OF ALUMINUM; (2) TIN PLATING ON CARBON STEEL; (3) ZINC PLATING (SEGREGATED BASIS) ON CARBON STEEL; (4) ALUMINUM OR ZINC-ALUMINUM PLATING ON CARBON STEEL; (5) CLEANING/STRIPPING ASSOCIATED WITH TIN, ZINC AND ALUMINUM PLATING ON CARBON STEEL; AND (6) CHEMICAL ETCHING AND MILLING OF ALUMINUM.

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

. Waste code: F008
. Waste name: PLATING BATH RESIDUES FROM THE BOTTOM OF PLATING BATHS FROM ELECTROPLATING OPERATIONS WHERE CYANIDES ARE USED IN THE PROCESS.

Date form received by agency: 02/29/2008
Site name: JOSLYN SUNBANK CO. LLC
Classification: Large Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

. Waste code: D002
. Waste name: A WASTE WHICH HAS A PH OF LESS THAN 2 OR GREATER THAN 12.5 IS CONSIDERED TO BE A CORROSIVE HAZARDOUS WASTE. SODIUM HYDROXIDE, A CAUSTIC SOLUTION WITH A HIGH PH, IS OFTEN USED BY INDUSTRIES TO CLEAN OR DEGREASE PARTS. HYDROCHLORIC ACID, A SOLUTION WITH A LOW PH, IS USED BY MANY INDUSTRIES TO CLEAN METAL PARTS PRIOR TO PAINTING. WHEN THESE CAUSTIC OR ACID SOLUTIONS BECOME CONTAMINATED AND MUST BE DISPOSED, THE WASTE WOULD BE A CORROSIVE HAZARDOUS WASTE.

. Waste code: D003
. Waste name: A MATERIAL IS CONSIDERED TO BE A REACTIVE HAZARDOUS WASTE IF IT IS NORMALLY UNSTABLE, REACTS VIOLENTLY WITH WATER, GENERATES TOXIC GASES WHEN EXPOSED TO WATER OR CORROSIVE MATERIALS, OR IF IT IS CAPABLE OF DETONATION OR EXPLOSION WHEN EXPOSED TO HEAT OR A FLAME. ONE EXAMPLE OF SUCH WASTE WOULD BY WASTE GUNPOWDER.

. Waste code: D004
. Waste name: ARSENIC

. Waste code: D006
. Waste name: CADMIUM

. Waste code: D008
. Waste name: LEAD

. Waste code: D039
. Waste name: TETRACHLOROETHYLENE

. Waste code: F006
. Waste name: WASTEWATER TREATMENT SLUDGES FROM ELECTROPLATING OPERATIONS EXCEPT FROM THE FOLLOWING PROCESSES: (1) SULFURIC ACID ANODIZING OF ALUMINUM; (2) TIN PLATING ON CARBON STEEL; (3) ZINC PLATING (SEGREGATED BASIS) ON CARBON STEEL; (4) ALUMINUM OR ZINC-ALUMINUM PLATING ON CARBON STEEL; (5) CLEANING/STRIPPING ASSOCIATED WITH TIN, ZINC AND ALUMINUM PLATING ON CARBON STEEL; AND (6) CHEMICAL ETCHING AND MILLING OF ALUMINUM.

. Waste code: F007
. Waste name: SPENT CYANIDE PLATING BATH SOLUTIONS FROM ELECTROPLATING OPERATIONS

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

. Waste code: F008
. Waste name: PLATING BATH RESIDUES FROM THE BOTTOM OF PLATING BATHS FROM ELECTROPLATING OPERATIONS WHERE CYANIDES ARE USED IN THE PROCESS.

. Waste code: P012
. Waste name: ARSENIC OXIDE AS2O3

. Waste code: P029
. Waste name: COPPER CYANIDE

. Waste code: U080
. Waste name: METHANE, DICHLORO-

. Waste code: U144
. Waste name: ACETIC ACID, LEAD(2+) SALT

Date form received by agency: 03/17/2006
Site name: JOSLYN SUNBANK COMPANY ,LLC
Classification: Large Quantity Generator

. Waste code: 121
. Waste name: Alkaline solution (pH >12.5) with metals (antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, vanadium, and zinc)

. Waste code: 122
. Waste name: Alkaline solution without metals (pH > 12.5)

. Waste code: 132
. Waste name: Aqueous solution w/metals (< restricted levels and see waste code 121 for a list of metals)

. Waste code: 171
. Waste name: Metal sludge (see 121)

. Waste code: 213
. Waste name: Hydrocarbon solvents (benzene, hexane, Stoddard, etc.)

. Waste code: 214
. Waste name: Unspecified solvent mixture

. Waste code: 221
. Waste name: Waste oil and mixed oil

. Waste code: 352
. Waste name: Other organic solids

. Waste code: 726
. Waste name: Liquids with nickel > 134 mg/l

. Waste code: D001
. Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT

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WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

. Waste code: D002
. Waste name: A WASTE WHICH HAS A PH OF LESS THAN 2 OR GREATER THAN 12.5 IS CONSIDERED TO BE A CORROSIVE HAZARDOUS WASTE. SODIUM HYDROXIDE, A CAUSTIC SOLUTION WITH A HIGH PH, IS OFTEN USED BY INDUSTRIES TO CLEAN OR DEGREASE PARTS. HYDROCHLORIC ACID, A SOLUTION WITH A LOW PH, IS USED BY MANY INDUSTRIES TO CLEAN METAL PARTS PRIOR TO PAINTING. WHEN THESE CAUSTIC OR ACID SOLUTIONS BECOME CONTAMINATED AND MUST BE DISPOSED, THE WASTE WOULD BE A CORROSIVE HAZARDOUS WASTE.

. Waste code: D006
. Waste name: CADMIUM

. Waste code: D007
. Waste name: CHROMIUM

. Waste code: F006
. Waste name: WASTEWATER TREATMENT SLUDGES FROM ELECTROPLATING OPERATIONS EXCEPT FROM THE FOLLOWING PROCESSES: (1) SULFURIC ACID ANODIZING OF ALUMINUM; (2) TIN PLATING ON CARBON STEEL; (3) ZINC PLATING (SEGREGATED BASIS) ON CARBON STEEL; (4) ALUMINUM OR ZINC-ALUMINUM PLATING ON CARBON STEEL; (5) CLEANING/STRIPPING ASSOCIATED WITH TIN, ZINC AND ALUMINUM PLATING ON CARBON STEEL; AND (6) CHEMICAL ETCHING AND MILLING OF ALUMINUM.

Date form received by agency: 02/27/2004
Site name: JOSLYN SUNBANK COMPANY, LLC
Classification: Large Quantity Generator

. Waste code: D001
. Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

. Waste code: D002
. Waste name: A WASTE WHICH HAS A PH OF LESS THAN 2 OR GREATER THAN 12.5 IS CONSIDERED TO BE A CORROSIVE HAZARDOUS WASTE. SODIUM HYDROXIDE, A CAUSTIC SOLUTION WITH A HIGH PH, IS OFTEN USED BY INDUSTRIES TO CLEAN OR DEGREASE PARTS. HYDROCHLORIC ACID, A SOLUTION WITH A LOW PH, IS USED BY MANY INDUSTRIES TO CLEAN METAL PARTS PRIOR TO PAINTING. WHEN THESE CAUSTIC OR ACID SOLUTIONS BECOME CONTAMINATED AND MUST BE DISPOSED, THE WASTE WOULD BE A CORROSIVE HAZARDOUS WASTE.

. Waste code: D006
. Waste name: CADMIUM

. Waste code: D007
. Waste name: CHROMIUM

. Waste code: F006
. Waste name: WASTEWATER TREATMENT SLUDGES FROM ELECTROPLATING OPERATIONS EXCEPT FROM THE FOLLOWING PROCESSES: (1) SULFURIC ACID ANODIZING OF ALUMINUM;

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(2) TIN PLATING ON CARBON STEEL; (3) ZINC PLATING (SEGREGATED BASIS) ON CARBON STEEL; (4) ALUMINUM OR ZINC-ALUMINUM PLATING ON CARBON STEEL; (5) CLEANING/STRIPPING ASSOCIATED WITH TIN, ZINC AND ALUMINUM PLATING ON CARBON STEEL; AND (6) CHEMICAL ETCHING AND MILLING OF ALUMINUM.

Date form received by agency: 03/14/2002
Site name: JOSLYN SUNBANK COMPANY, LLC
Classification: Large Quantity Generator

Date form received by agency: 10/12/2000
Site name: JOSLYN SUNBANK COMPANY, LLC
Classification: Large Quantity Generator

Date form received by agency: 03/04/1999
Site name: JOSLYN SUNBANK COMPANY, LLC
Classification: Large Quantity Generator

Date form received by agency: 12/09/1997
Site name: JOSLYN SUNBANK CO LLC
Classification: Large Quantity Generator

. Waste code: D000
. Waste name: Not Defined

. Waste code: D001
. Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.

. Waste code: D002
. Waste name: A WASTE WHICH HAS A PH OF LESS THAN 2 OR GREATER THAN 12.5 IS CONSIDERED TO BE A CORROSIVE HAZARDOUS WASTE. SODIUM HYDROXIDE, A CAUSTIC SOLUTION WITH A HIGH PH, IS OFTEN USED BY INDUSTRIES TO CLEAN OR DEGREASE PARTS. HYDROCHLORIC ACID, A SOLUTION WITH A LOW PH, IS USED BY MANY INDUSTRIES TO CLEAN METAL PARTS PRIOR TO PAINTING. WHEN THESE CAUSTIC OR ACID SOLUTIONS BECOME CONTAMINATED AND MUST BE DISPOSED, THE WASTE WOULD BE A CORROSIVE HAZARDOUS WASTE.

. Waste code: D006
. Waste name: CADMIUM

. Waste code: D007
. Waste name: CHROMIUM

. Waste code: F006
. Waste name: WASTEWATER TREATMENT SLUDGES FROM ELECTROPLATING OPERATIONS EXCEPT FROM THE FOLLOWING PROCESSES: (1) SULFURIC ACID ANODIZING OF ALUMINUM; (2) TIN PLATING ON CARBON STEEL; (3) ZINC PLATING (SEGREGATED BASIS) ON CARBON STEEL; (4) ALUMINUM OR ZINC-ALUMINUM PLATING ON CARBON STEEL; (5) CLEANING/STRIPPING ASSOCIATED WITH TIN, ZINC AND ALUMINUM PLATING ON CARBON STEEL; AND (6) CHEMICAL ETCHING AND MILLING OF ALUMINUM.

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

. Waste code: F007
. Waste name: SPENT CYANIDE PLATING BATH SOLUTIONS FROM ELECTROPLATING OPERATIONS

Date form received by agency: 12/09/1997
Site name: JOSLYN SUNBANK CO LLC
Classification: Large Quantity Generator

Date form received by agency: 09/10/1997
Site name: JOSLYN SUNBANK CO LLC
Classification: Large Quantity Generator

Date form received by agency: 09/01/1996
Site name: JOSLYN SUNBANK CO LLC
Classification: Large Quantity Generator

Date form received by agency: 02/26/1996
Site name: JOSLYN SUNBANK CORPORATION
Classification: Large Quantity Generator

Date form received by agency: 02/12/1996
Site name: JOSLYN SUNBANK CO LLC
Classification: Large Quantity Generator

Date form received by agency: 03/29/1994
Site name: JOSLYN SUNBANK CORPORATION
Classification: Large Quantity Generator

Date form received by agency: 01/25/1992
Site name: SUNBANK ELECTRONICS
Classification: Large Quantity Generator

Biennial Reports:

Last Biennial Reporting Year: 2017

Annual Waste Handled:

Waste code: D001
Waste name: IGNITABLE HAZARDOUS WASTES ARE THOSE WASTES WHICH HAVE A FLASHPOINT OF LESS THAN 140 DEGREES FAHRENHEIT AS DETERMINED BY A PENSKY-MARTENS CLOSED CUP FLASH POINT TESTER. ANOTHER METHOD OF DETERMINING THE FLASH POINT OF A WASTE IS TO REVIEW THE MATERIAL SAFETY DATA SHEET, WHICH CAN BE OBTAINED FROM THE MANUFACTURER OR DISTRIBUTOR OF THE MATERIAL. LACQUER THINNER IS AN EXAMPLE OF A COMMONLY USED SOLVENT WHICH WOULD BE CONSIDERED AS IGNITABLE HAZARDOUS WASTE.
Amount (Lbs): 2715

Waste code: D002
Waste name: A WASTE WHICH HAS A PH OF LESS THAN 2 OR GREATER THAN 12.5 IS CONSIDERED TO BE A CORROSIVE HAZARDOUS WASTE. SODIUM HYDROXIDE, A CAUSTIC SOLUTION WITH A HIGH PH, IS OFTEN USED BY INDUSTRIES TO CLEAN OR DEGREASE PARTS. HYDROCHLORIC ACID, A SOLUTION WITH A LOW PH, IS USED BY MANY INDUSTRIES TO CLEAN METAL PARTS PRIOR TO PAINTING. WHEN THESE CAUSTIC OR ACID SOLUTIONS BECOME CONTAMINATED AND MUST BE DISPOSED, THE WASTE WOULD BE A CORROSIVE HAZARDOUS WASTE.
Amount (Lbs): 90909.1

Waste code: D003
Waste name: A MATERIAL IS CONSIDERED TO BE A REACTIVE HAZARDOUS WASTE IF IT IS

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

NORMALLY UNSTABLE, REACTS VIOLENTLY WITH WATER, GENERATES TOXIC GASES WHEN EXPOSED TO WATER OR CORROSIVE MATERIALS, OR IF IT IS CAPABLE OF DETONATION OR EXPLOSION WHEN EXPOSED TO HEAT OR A FLAME. ONE EXAMPLE OF SUCH WASTE WOULD BY WASTE GUNPOWDER.

Amount (Lbs): 18000

Waste code: D005
Waste name: BARIUM
Amount (Lbs): 1500

Waste code: D006
Waste name: CADMIUM
Amount (Lbs): 61301.3

Waste code: D007
Waste name: CHROMIUM
Amount (Lbs): 60881.3

Waste code: D008
Waste name: LEAD
Amount (Lbs): 96977.2

Waste code: D035
Waste name: METHYL ETHYL KETONE
Amount (Lbs): 2715

Waste code: F003
Waste name: THE FOLLOWING SPENT NON-HALOGENATED SOLVENTS: XYLENE, ACETONE, ETHYL ACETATE, ETHYL BENZENE, ETHYL ETHER, METHYL ISOBUTYL KETONE, N-BUTYL ALCOHOL, CYCLOHEXANONE, AND METHANOL; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONLY THE ABOVE SPENT NON-HALOGENATED SOLVENTS; AND ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, ONE OR MORE OF THE ABOVE NON-HALOGENATED SOLVENTS, AND, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THOSE SOLVENTS LISTED IN F001, F002, F004, AND F005, AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.
Amount (Lbs): 2715

Waste code: F005
Waste name: THE FOLLOWING SPENT NON-HALOGENATED SOLVENTS: TOLUENE, METHYL ETHYL KETONE, CARBON DISULFIDE, ISOBUTANOL, PYRIDINE, BENZENE, 2-ETHOXYETHANOL, AND 2-NITROPROPANE; ALL SPENT SOLVENT MIXTURES/BLENDS CONTAINING, BEFORE USE, A TOTAL OF TEN PERCENT OR MORE (BY VOLUME) OF ONE OR MORE OF THE ABOVE NON-HALOGENATED SOLVENTS OR THOSE SOLVENTS LISTED IN F001, F002, OR F004; AND STILL BOTTOMS FROM THE RECOVERY OF THESE SPENT SOLVENTS AND SPENT SOLVENT MIXTURES.
Amount (Lbs): 2715

Waste code: F006
Waste name: WASTEWATER TREATMENT SLUDGES FROM ELECTROPLATING OPERATIONS EXCEPT FROM THE FOLLOWING PROCESSES: (1) SULFURIC ACID ANODIZING OF ALUMINUM; (2) TIN PLATING ON CARBON STEEL; (3) ZINC PLATING (SEGREGATED BASIS) ON CARBON STEEL; (4) ALUMINUM OR ZINC-ALUMINUM PLATING ON CARBON STEEL; (5) CLEANING/STRIPPING ASSOCIATED WITH TIN, ZINC AND ALUMINUM PLATING ON CARBON STEEL; AND (6) CHEMICAL ETCHING AND MILLING OF ALUMINUM.

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Amount (Lbs): 18000

Waste code: F008
Waste name: PLATING BATH RESIDUES FROM THE BOTTOM OF PLATING BATHS FROM ELECTROPLATING OPERATIONS WHERE CYANIDES ARE USED IN THE PROCESS.
Amount (Lbs): 40566.3

Waste code: P030
Waste name: CYANIDES (SOLUBLE CYANIDE SALTS), NOT OTHERWISE SPECIFIED
Amount (Lbs): 460

Facility Has Received Notices of Violations:
Regulation violated: Not reported
Area of violation: State Statute or Regulation
Date violation determined: 10/25/2011
Date achieved compliance: 06/26/2012
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 10/26/2011
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - Pre-transport
Date violation determined: 10/25/2011
Date achieved compliance: 06/26/2012
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 10/26/2011
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD IS-Preparedness and Prevention
Date violation determined: 10/25/2011
Date achieved compliance: 11/01/2011
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 10/26/2011
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: State Statute or Regulation

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Date violation determined: 10/25/2011
Date achieved compliance: 08/06/2012
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 10/26/2011
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: LDR - General
Date violation determined: 10/25/2011
Date achieved compliance: 06/26/2012
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 10/26/2011
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - Pre-transport
Date violation determined: 10/25/2011
Date achieved compliance: 11/01/2011
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 10/26/2011
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD IS-Financial Requirements
Date violation determined: 07/12/2010
Date achieved compliance: 09/30/2010
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 07/12/2010
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD IS-Financial Requirements
Date violation determined: 07/12/2010

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Date achieved compliance: 09/30/2010
Violation lead agency: State
Enforcement action: FINAL CIVIL JUDICIAL ACTION FOR COMPLIANCE AND/OR MONETARY PENALTY
Enforcement action date: 12/14/2010
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 200000
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: State Statute or Regulation
Date violation determined: 02/10/2010
Date achieved compliance: 05/01/2010
Violation lead agency: State
Enforcement action: Not reported
Enforcement action date: Not reported
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: Not reported
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - Pre-transport
Date violation determined: 02/10/2010
Date achieved compliance: 03/13/2010
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 02/25/2010
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: State Statute or Regulation
Date violation determined: 02/10/2010
Date achieved compliance: 09/03/2010
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 02/25/2010
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Formal Enforcement Agreement or Order
Date violation determined: 02/10/2010
Date achieved compliance: 07/17/2010

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JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 02/25/2010
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: State Statute or Regulation
Date violation determined: 02/10/2010
Date achieved compliance: 05/01/2010
Violation lead agency: State
Enforcement action: FINAL CIVIL JUDICIAL ACTION FOR COMPLIANCE AND/OR MONETARY PENALTY
Enforcement action date: 12/14/2010
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 200000
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - Pre-transport
Date violation determined: 02/10/2010
Date achieved compliance: 02/10/2010
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 02/25/2010
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: State Statute or Regulation
Date violation determined: 02/10/2010
Date achieved compliance: 08/03/2010
Violation lead agency: State
Enforcement action: Not reported
Enforcement action date: Not reported
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: Not reported
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD IS-Preparedness and Prevention
Date violation determined: 02/10/2010
Date achieved compliance: 07/17/2010
Violation lead agency: State

Map ID
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JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Enforcement action: Not reported
Enforcement action date: Not reported
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: Not reported
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Formal Enforcement Agreement or Order
Date violation determined: 02/10/2010
Date achieved compliance: 07/17/2010
Violation lead agency: State
Enforcement action: Not reported
Enforcement action date: Not reported
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: Not reported
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: State Statute or Regulation
Date violation determined: 02/10/2010
Date achieved compliance: 08/03/2010
Violation lead agency: State
Enforcement action: FINAL CIVIL JUDICIAL ACTION FOR COMPLIANCE AND/OR MONETARY PENALTY
Enforcement action date: 12/14/2010
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 200000
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: State Statute or Regulation
Date violation determined: 02/10/2010
Date achieved compliance: 09/03/2010
Violation lead agency: State
Enforcement action: Not reported
Enforcement action date: Not reported
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: Not reported
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD IS-Preparedness and Prevention
Date violation determined: 02/10/2010
Date achieved compliance: 07/17/2010
Violation lead agency: State
Enforcement action: FINAL CIVIL JUDICIAL ACTION FOR COMPLIANCE AND/OR MONETARY PENALTY

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Enforcement action date: 12/14/2010
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 200000
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: State Statute or Regulation
Date violation determined: 02/10/2010
Date achieved compliance: 09/03/2010
Violation lead agency: State
Enforcement action: FINAL CIVIL JUDICIAL ACTION FOR COMPLIANCE AND/OR MONETARY PENALTY
Enforcement action date: 12/14/2010
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 200000
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD IS-Preparedness and Prevention
Date violation determined: 02/10/2010
Date achieved compliance: 07/17/2010
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 02/25/2010
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: State Statute or Regulation
Date violation determined: 02/10/2010
Date achieved compliance: 05/01/2010
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 02/25/2010
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Formal Enforcement Agreement or Order
Date violation determined: 02/10/2010
Date achieved compliance: 07/17/2010
Violation lead agency: State
Enforcement action: FINAL CIVIL JUDICIAL ACTION FOR COMPLIANCE AND/OR MONETARY PENALTY
Enforcement action date: 12/14/2010

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 200000
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: State Statute or Regulation
Date violation determined: 02/10/2010
Date achieved compliance: 08/03/2010
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 02/25/2010
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD IS-Tank System Standards
Date violation determined: 03/12/2009
Date achieved compliance: 06/12/2009
Violation lead agency: State
Enforcement action: FINAL CIVIL JUDICIAL ACTION FOR COMPLIANCE AND/OR MONETARY PENALTY
Enforcement action date: 08/20/2009
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 75000
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD IS-Tank System Standards
Date violation determined: 03/12/2009
Date achieved compliance: 06/12/2009
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 03/18/2009
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD IS-Tank System Standards
Date violation determined: 03/12/2009
Date achieved compliance: 06/12/2009
Violation lead agency: State
Enforcement action: Not reported
Enforcement action date: Not reported
Enf. disposition status: Not reported

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Enf. disp. status date: Not reported
Enforcement lead agency: Not reported
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: TSD IS-Tank System Standards
Date violation determined: 03/12/2009
Date achieved compliance: 06/12/2009
Violation lead agency: State
Enforcement action: INJUNCTIVE RELIEF
Enforcement action date: 08/06/2009
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 07/13/2005
Date achieved compliance: 01/15/2006
Violation lead agency: State
Enforcement action: INITIAL CIVIL JUDICIAL ACTION FOR COMPLIANCE AND/OR MONETARY PENALTY
Enforcement action date: 03/21/2007
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 07/13/2005
Date achieved compliance: 01/15/2006
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 07/13/2005
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - Pre-transport
Date violation determined: 07/13/2005
Date achieved compliance: 01/15/2006
Violation lead agency: State
Enforcement action: INJUNCTIVE RELIEF
Enforcement action date: 03/21/2007
Enf. disposition status: Not reported
Enf. disp. status date: Not reported

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 07/13/2005
Date achieved compliance: 01/15/2006
Violation lead agency: State
Enforcement action: FINAL CIVIL JUDICIAL ACTION FOR COMPLIANCE AND/OR MONETARY PENALTY
Enforcement action date: 03/28/2007
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 495000
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - Pre-transport
Date violation determined: 07/13/2005
Date achieved compliance: 01/15/2006
Violation lead agency: State
Enforcement action: INITIAL CIVIL JUDICIAL ACTION FOR COMPLIANCE AND/OR MONETARY PENALTY
Enforcement action date: 03/21/2007
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 07/13/2005
Date achieved compliance: 01/15/2006
Violation lead agency: State
Enforcement action: REFERRAL TO ATTORNEY GENERAL
Enforcement action date: 10/03/2005
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - Pre-transport
Date violation determined: 07/13/2005
Date achieved compliance: 01/15/2006
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 07/13/2005
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - Pre-transport
Date violation determined: 07/13/2005
Date achieved compliance: 01/15/2006
Violation lead agency: State
Enforcement action: FINAL CIVIL JUDICIAL ACTION FOR COMPLIANCE AND/OR MONETARY PENALTY
Enforcement action date: 03/28/2007
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 495000
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 07/13/2005
Date achieved compliance: 01/15/2006
Violation lead agency: State
Enforcement action: INJUNCTIVE RELIEF
Enforcement action date: 03/21/2007
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - Pre-transport
Date violation determined: 07/13/2005
Date achieved compliance: 01/15/2006
Violation lead agency: State
Enforcement action: REFERRAL TO ATTORNEY GENERAL
Enforcement action date: 10/03/2005
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 06/23/2005
Date achieved compliance: 08/03/2005
Violation lead agency: State
Enforcement action: INJUNCTIVE RELIEF
Enforcement action date: 03/21/2007
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 06/23/2005
Date achieved compliance: 01/15/2006
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 06/23/2005
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 06/23/2005
Date achieved compliance: 01/15/2006
Violation lead agency: State
Enforcement action: INITIAL CIVIL JUDICIAL ACTION FOR COMPLIANCE AND/OR MONETARY PENALTY
Enforcement action date: 03/21/2007
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 06/23/2005
Date achieved compliance: 08/03/2005
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 06/23/2005
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 06/23/2005
Date achieved compliance: 08/03/2005
Violation lead agency: State
Enforcement action: FINAL CIVIL JUDICIAL ACTION FOR COMPLIANCE AND/OR MONETARY PENALTY
Enforcement action date: 03/28/2007
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 495000

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 06/23/2005
Date achieved compliance: 01/15/2006
Violation lead agency: State
Enforcement action: FINAL CIVIL JUDICIAL ACTION FOR COMPLIANCE AND/OR MONETARY PENALTY
Enforcement action date: 03/28/2007
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: 495000
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 06/23/2005
Date achieved compliance: 08/03/2005
Violation lead agency: State
Enforcement action: REFERRAL TO ATTORNEY GENERAL
Enforcement action date: 10/03/2005
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - Pre-transport
Date violation determined: 06/23/2005
Date achieved compliance: 07/07/2005
Violation lead agency: State
Enforcement action: WRITTEN INFORMAL
Enforcement action date: 06/23/2005
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 06/23/2005
Date achieved compliance: 01/15/2006
Violation lead agency: State
Enforcement action: REFERRAL TO ATTORNEY GENERAL
Enforcement action date: 10/03/2005
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 06/23/2005
Date achieved compliance: 01/15/2006
Violation lead agency: State
Enforcement action: INJUNCTIVE RELIEF
Enforcement action date: 03/21/2007
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 06/23/2005
Date achieved compliance: 08/03/2005
Violation lead agency: State
Enforcement action: INITIAL CIVIL JUDICIAL ACTION FOR COMPLIANCE AND/OR MONETARY PENALTY
Enforcement action date: 03/21/2007
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: State
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Regulation violated: Not reported
Area of violation: Generators - General
Date violation determined: 03/24/2005
Date achieved compliance: 06/03/2005
Violation lead agency: EPA
Enforcement action: Not reported
Enforcement action date: 05/20/2005
Enf. disposition status: Not reported
Enf. disp. status date: Not reported
Enforcement lead agency: EPA
Proposed penalty amount: Not reported
Final penalty amount: Not reported
Paid penalty amount: Not reported

Evaluation Action Summary:
Evaluation date: 06/07/2016
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 10/08/2013
Evaluation: FINANCIAL RECORD REVIEW
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 11/01/2012
Evaluation: FOLLOW-UP INSPECTION

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 10/25/2011
Evaluation: FOLLOW-UP INSPECTION
Area of violation: LDR - General
Date achieved compliance: 06/26/2012
Evaluation lead agency: State

Evaluation date: 10/25/2011
Evaluation: FOLLOW-UP INSPECTION
Area of violation: State Statute or Regulation
Date achieved compliance: 08/06/2012
Evaluation lead agency: State

Evaluation date: 10/25/2011
Evaluation: FOLLOW-UP INSPECTION
Area of violation: Generators - Pre-transport
Date achieved compliance: 11/01/2011
Evaluation lead agency: State

Evaluation date: 10/25/2011
Evaluation: FOLLOW-UP INSPECTION
Area of violation: Generators - Pre-transport
Date achieved compliance: 06/26/2012
Evaluation lead agency: State

Evaluation date: 10/25/2011
Evaluation: FOLLOW-UP INSPECTION
Area of violation: TSD IS-Preparedness and Prevention
Date achieved compliance: 11/01/2011
Evaluation lead agency: State

Evaluation date: 10/25/2011
Evaluation: FOLLOW-UP INSPECTION
Area of violation: State Statute or Regulation
Date achieved compliance: 06/26/2012
Evaluation lead agency: State

Evaluation date: 09/30/2010
Evaluation: NOT A SIGNIFICANT NON-COMPLIER
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 07/12/2010
Evaluation: FINANCIAL RECORD REVIEW
Area of violation: TSD IS-Financial Requirements
Date achieved compliance: 09/30/2010
Evaluation lead agency: State

Evaluation date: 02/10/2010
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - Pre-transport
Date achieved compliance: 03/13/2010
Evaluation lead agency: State

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Evaluation date: 02/10/2010
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD IS-Preparedness and Prevention
Date achieved compliance: 07/17/2010
Evaluation lead agency: State

Evaluation date: 02/10/2010
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: State Statute or Regulation
Date achieved compliance: 05/01/2010
Evaluation lead agency: State

Evaluation date: 02/10/2010
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Formal Enforcement Agreement or Order
Date achieved compliance: 07/17/2010
Evaluation lead agency: State

Evaluation date: 02/10/2010
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: State Statute or Regulation
Date achieved compliance: 09/03/2010
Evaluation lead agency: State

Evaluation date: 02/10/2010
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: State Statute or Regulation
Date achieved compliance: 08/03/2010
Evaluation lead agency: State

Evaluation date: 02/10/2010
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - Pre-transport
Date achieved compliance: 02/10/2010
Evaluation lead agency: State

Evaluation date: 02/10/2010
Evaluation: SIGNIFICANT NON-COMPLIER
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 06/12/2009
Evaluation: NOT A SIGNIFICANT NON-COMPLIER
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 03/12/2009
Evaluation: SIGNIFICANT NON-COMPLIER
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 03/12/2009
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: TSD IS-Tank System Standards

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Date achieved compliance: 06/12/2009
Evaluation lead agency: State

Evaluation date: 02/07/2006
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 01/15/2006
Evaluation: NOT A SIGNIFICANT NON-COMPLIER
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 09/08/2005
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 07/13/2005
Evaluation: FOLLOW-UP INSPECTION
Area of violation: Generators - General
Date achieved compliance: 01/15/2006
Evaluation lead agency: State

Evaluation date: 07/13/2005
Evaluation: FOLLOW-UP INSPECTION
Area of violation: Generators - Pre-transport
Date achieved compliance: 01/15/2006
Evaluation lead agency: State

Evaluation date: 06/23/2005
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 08/03/2005
Evaluation lead agency: State

Evaluation date: 06/23/2005
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 01/15/2006
Evaluation lead agency: State

Evaluation date: 06/23/2005
Evaluation: SIGNIFICANT NON-COMPLIER
Area of violation: Not reported
Date achieved compliance: Not reported
Evaluation lead agency: State

Evaluation date: 06/23/2005
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - Pre-transport
Date achieved compliance: 07/07/2005
Evaluation lead agency: State

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Evaluation date: 03/24/2005
Evaluation: COMPLIANCE EVALUATION INSPECTION ON-SITE
Area of violation: Generators - General
Date achieved compliance: 06/03/2005
Evaluation lead agency: EPA

ENVIROSTOR:
Facility ID: 71002645
Status: Certified O&M - Land Use Restrictions Only
Status Date: 02/28/2012
Site Code: 600890
Site Type: Tiered Permit
Site Type Detailed: Tiered Permit
Acres: 5.4
NPL: NO
Regulatory Agencies: SMBRP
Lead Agency: SMBRP
Program Manager: Hamid Hashemian
Supervisor: Emad Yemut
Division Branch: Southern California Schools & Brownfields Outreach
Assembly: 35
Senate: 17
Special Program: Not reported
Restricted Use: YES
Site Mgmt Req: NONE SPECIFIED
Funding: Responsible Party
Latitude: 35.60991
Longitude: -120.6513
APN: NONE SPECIFIED
Past Use: AEROSPACE MANUFACTURING/MAINTENANCE
Potential COC: Benzene Tetrachloroethylene (PCE 1,1,1-Trichloroethane (TCA Trichloroethylene (TCE Acetone Propylene glycol Selenium Toluene Zinc
Confirmed COC: Tetrachloroethylene (PCE Trichloroethylene (TCE
Potential Description: OTH, SOIL, SV
Alias Name: CAD097458533
Alias Type: EPA Identification Number
Alias Name: 110000481782
Alias Type: EPA (FRS #)
Alias Name: 600890
Alias Type: Project Code (Site Code)
Alias Name: 71002645
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Annual Oversight Cost Estimate
Completed Date: 11/26/2013
Comments: Letter sent.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedy Selection and Statement of Basis
Completed Date: 01/24/2011
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported

MAP FINDINGS

Map ID
Direction
Distance
Elevation | Site | Database(s) | EDR ID Number EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Completed Document Type: No Further Action Letter
Completed Date: 02/01/2012
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Annual Oversight Cost Estimate
Completed Date: 09/09/2016
Comments: FY1617 Annual Oversight Cost Estimate completed and mailed.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Phase 1
Completed Date: 06/22/2001
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Risk Assessment Workplan
Completed Date: 12/31/2007
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Workplan
Completed Date: 06/10/2002
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Corrective Measures Proposal Approval
Completed Date: 01/24/2011
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Well Decommissioning Report
Completed Date: 05/31/2011
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Annual Oversight Cost Estimate
Completed Date: 11/12/2015
Comments: FY 1516 Annual Cost Estimate completed.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Annual Oversight Cost Estimate
Completed Date: 07/08/2014
Comments: FY 1415 Annual Cost Estimate Letter sent.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other
Completed Date: 08/10/2015
Comments: Annual Inspection Checklist

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Land Use Restriction - Site Inspection/Visit
Completed Date: 07/18/2018
Comments: Completed

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Acknowledgement of Satisfaction
Completed Date: 12/17/2011
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Corrective Action Completion Determination
Completed Date: 02/01/2012
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Phase I Verification
Completed Date: 07/27/1999
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Inspections/Visit (Non LUR)
Completed Date: 07/13/2002
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Phase I Verification
Completed Date: 06/22/2001
Comments: Inspection report sent on 6/22/2001

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Annual Oversight Cost Estimate
Completed Date: 09/26/2017
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other
Completed Date: 08/19/2014
Comments: Completed

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Land Use Restriction
Completed Date: 02/15/2011
Comments: Project Manager: Nora

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Oversight

Map ID
Direction
Distance
Elevation Site

MAP FINDINGS

Database(s) EDR ID Number EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Completed Date: 07/12/2002
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Consent Agreement
Completed Date: 01/10/2002
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Consent Agreement
Completed Date: 01/10/2002
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other
Completed Date: 08/05/2013
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Annual Oversight Cost Estimate
Completed Date: 07/18/2018
Comments: Annual Estimate for FY 18/19: $2,938

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other
Completed Date: 08/07/2017
Comments: Completed

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Land Use Restriction - Site Inspection/Visit
Completed Date: 08/19/2016
Comments: Completed

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

AST:
Certified Unified Program Agencies: Not reported
Owner: JOSLYN SUNBANK COMPANY, LLC
Total Gallons: Not reported
CERSID: 10437532
Facility ID: Not reported
Business Name: JOSLYN SUNBANK COMPANY, LLC
Phone: (805) 238-2840

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Fax:	Not reported
Mailing Address:	1740 COMMERCE WAY
Mailing Address City:	PASO ROBLES
Mailing Address State:	CA
Mailing Address Zip Code:	93446
Operator Name:	Not reported
Operator Phone:	(805) 238-2840
Owner Phone:	(805) 238-2840
Owner Mail Address:	1740 COMMERCE WAY
Owner State:	CA
Owner Zip Code:	93446
Owner Country:	United States
Property Owner Name:	Not reported
Property Owner Phone:	Not reported
Property Owner Mailing Address:	Not reported
Property Owner City:	Not reported
Property Owner Stat :	Not reported
Property Owner Zip Code:	Not reported
Property Owner Country:	Not reported
EPAID:	Not reported

HIST UST:

File Number:	0002BA1F
URL:	http://geotracker.waterboards.ca.gov/ustpdfs/pdf/0002BA1F.pdf
Region:	STATE
Facility ID:	00000042223
Facility Type:	Other
Other Type:	MANUFACTURING
Contact Name:	WARD VOORHEES
Telephone:	8052382840
Owner Name:	ROY E. COATS
Owner Address:	ROCKY CANYON ROAD
Owner City,St,Zip:	CRESTON, CA 93432
Total Tanks:	0003
Tank Num:	001
Container Num:	02
Year Installed:	1982
Tank Capacity:	00002000
Tank Used for:	PRODUCT
Type of Fuel:	DIESEL
Container Construction Thickness:	Not reported
Leak Detection:	Visual, Stock Inventor
Tank Num:	002
Container Num:	01
Year Installed:	1982
Tank Capacity:	00001000
Tank Used for:	PRODUCT
Type of Fuel:	REGULAR
Container Construction Thickness:	Not reported
Leak Detection:	Visual, Stock Inventor
Tank Num:	003
Container Num:	03
Year Installed:	1980
Tank Capacity:	00001000

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Tank Used for: WASTE
Type of Fuel: WASTE OIL
Container Construction Thickness: Not reported
Leak Detection: Visual

Click here for Geo Tracker PDF:

DEED:
Envirostor ID: 71002645
Area: PROJECT WIDE
Sub Area: Not reported
Site Type: TIERED PERMIT
Status: CERTIFIED O&M - LAND USE RESTRICTIONS ONLY
Agency: Not reported
Covenant Uploaded: Not reported
Deed Date(s): Not reported
File Name: Envirostor Land Use Restrictions

CHMIRS:

OES Incident Number:	0-5811
OES notification:	12/08/2000
OES Date:	Not reported
OES Time:	Not reported
Date Completed:	**Not reported**
Property Use:	Not reported
Agency Id Number:	Not reported
Agency Incident Number:	Not reported
Time Notified:	Not reported
Time Completed:	Not reported
Surrounding Area:	Not reported
Estimated Temperature:	Not reported
Property Management:	Not reported
More Than Two Substances Involved?:	Not reported
Resp Agncy Personel # Of Decontaminated:	Not reported
Responding Agency Personel # Of Injuries:	Not reported
Responding Agency Personel # Of Fatalities:	Not reported
Others Number Of Decontaminated:	Not reported
Others Number Of Injuries:	Not reported
Others Number Of Fatalities:	Not reported
Vehicle Make/year:	Not reported
Vehicle License Number:	Not reported
Vehicle State:	Not reported
Vehicle Id Number:	Not reported
CA DOT PUC/ICC Number:	Not reported
Company Name:	Not reported
Reporting Officer Name/ID:	Not reported
Report Date:	Not reported
Facility Telephone:	Not reported
Waterway Involved:	No
Waterway:	Not reported
Spill Site:	Not reported
Cleanup By:	Responsible Party
Containment:	Not reported
What Happened:	Not reported
Type:	Not reported
Measure:	Not reported

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Other:	Not reported
Date/Time:	Not reported
Year:	2000
Agency:	City of Paseo Robles
Incident Date:	12/8/200012:00:00 AM
Admin Agency:	San Luis Obispo County Public Health
Amount:	Not reported
Contained:	Yes
Site Type:	Industrial Plant
E Date:	Not reported
Substance:	Sodium cyanide , Caustic Soda, Cadmium
Gallons:	100
Unknown:	0
Substance #2:	Not reported
Substance #3:	Not reported
Evacuations:	0
Number of Injuries:	0
Number of Fatalities:	0
#1 Pipeline:	Not reported
#2 Pipeline:	Not reported
#3 Pipeline:	Not reported
#1 Vessel >= 300 Tons:	Not reported
#2 Vessel >= 300 Tons:	Not reported
#3 Vessel >= 300 Tons:	Not reported
Evacs:	Not reported
Injuries:	Not reported
Fatals:	Not reported
Comments:	Not reported
Description:	While injecting material via a pump, pump failure caused it to flow past the pump and into the street. The substance is contained to the street, no threat to any waterways.

ICIS:

Enforcement Action ID:	09-2000-0250
FRS ID:	110000481782
Action Name:	JOSLYN SUNBANK
Facility Name:	JOSLYN SUNBANK COMPANY L L C
Facility Address:	1740 COMMERCE WAY PASO ROBLES, CA 93446
Enforcement Action Type:	EPCRA 325 Action For Penalty
Facility County:	SAN LUIS OBISPO
Program System Acronym:	ICIS
Enforcement Action Forum Desc:	Administrative - Formal
EA Type Code:	325
Facility SIC Code:	3644
Federal Facility ID:	Not reported
Latitude in Decimal Degrees:	35.610442
Longitude in Decimal Degrees:	-120.652366
Permit Type Desc:	Not reported
Program System Acronym:	8567
Facility NAICS Code:	Not reported
Tribal Land Code:	Not reported

Facility Name:	JOSLYN SUNBANK CO LLC
Address:	1740 COMMERCE WAY

MAP FINDINGS

Map ID / Direction / Distance / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 3644

Facility Name: JOSLYN SUNBANK CO LLC
Address: 1740 COMMERCE WAY
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 3644

Facility Name: JOSLYN SUNBANK CO LLC
Address: 1740 COMMERCE WAY
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 3644

Facility Name: JOSLYN SUNBANK CO LLC
Address: 1740 COMMERCE WAY
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 3644

Facility Name: JOSLYN SUNBANK CO LLC
Address: 1740 COMMERCE WAY
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 3644

Facility Name: JOSLYN SUNBANK CO LLC
Address: 1740 COMMERCE WAY
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 3644

Facility Name: JOSLYN SUNBANK CO LLC
Address: 1740 COMMERCE WAY
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 3644

Facility Name: JOSLYN SUNBANK CO LLC
Address: 1740 COMMERCE WAY
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 3644

Facility Name: JOSLYN SUNBANK CO LLC
Address: 1740 COMMERCE WAY
Tribal Indicator: N

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Fed Facility: No
NAIC Code: Not reported
SIC Code: 3644

Facility Name: JOSLYN SUNBANK CO LLC
Address: 1740 COMMERCE WAY
Tribal Indicator: N
Fed Facility: No
NAIC Code: Not reported
SIC Code: 3644

FINDS:

Registry ID: 110000481782

Environmental Interest/Information System

NCDB (National Compliance Data Base) supports implementation of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and the Toxic Substances Control Act (TSCA). The system tracks inspections in regions and states with cooperative agreements, enforcement actions, and settlements.

California Hazardous Waste Tracking System - Datamart (HWTS-DATAMART) provides California with information on hazardous waste shipments for generators, transporters, and treatment, storage, and disposal facilities.

US EPA TRIS (Toxics Release Inventory System) contains information from facilities on the amounts of over 300 listed toxic chemicals that these facilities release directly to air, water, land, or that are transported off-site.

HAZARDOUS AIR POLLUTANT MAJOR

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

US National Pollutant Discharge Elimination System (NPDES) module of the Compliance Information System (ICIS) tracks surface water permits issued under the Clean Water Act. Under NPDES, all facilities that discharge pollutants from any point source into waters of the United States are required to obtain a permit. The permit will likely contain limits on what can be discharged, impose monitoring and reporting requirements, and include other provisions to ensure that the discharge does not adversely affect water quality.

HAZARDOUS WASTE BIENNIAL REPORTER

STATE MASTER

ICIS (Integrated Compliance Information System) is the Integrated Compliance Information System and provides a database that, when complete, will contain integrated Enforcement and Compliance

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

information across most of EPA's programs. The vision for ICIS is to replace EPA's independent databases that contain Enforcement data with a single repository for that information. Currently, ICIS contains all Federal Administrative and Judicial enforcement actions. This information is maintained in ICIS by EPA in the Regional offices and it Headquarters. A future release of ICIS will replace the Permit Compliance System (PCS) which supports the NPDES and will integrate that information with Federal actions already in the system. ICIS also has the capability to track other activities occurring in the Region that support Compliance and Enforcement programs. These include; Incident Tracking, Compliance Assistance, and Compliance Monitoring.

Click this hyperlink while viewing on your computer to access additional FINDS: detail in the EDR Site Report.

ECHO:

Envid:	1000161759
Registry ID:	110000481782
DFR URL:	http://echo.epa.gov/detailed-facility-report?fid=110000481782

CUPA SAN LUIS OBISPO:

Facility Id:	FA0002218
Program Element Code:	0201
Program Element:	CAL ACCIDENTAL RELEASE PREVENTION - PRGM 1
Record Id:	PR0010350
Cross Street:	Not reported
Status Code:	01
Status:	Active, billable
Latitude:	35.61040
Longitude:	120.65230

Facility Id:	FA0002218
Program Element Code:	0400
Program Element:	TIERED PERMITTING - PERMIT BY RULE
Record Id:	PR0008300
Cross Street:	Not reported
Status Code:	01
Status:	Active, billable
Latitude:	35.61040
Longitude:	120.65230

Facility Id:	FA0002218
Program Element Code:	0728
Program Element:	HAZMAT DISCLOSURE - 11+ HAZARDOUS MATERIALS
Record Id:	PR0001652
Cross Street:	Not reported
Status Code:	01
Status:	Active, billable
Latitude:	35.61040
Longitude:	120.65230

Facility Id:	FA0002218
Program Element Code:	1000
Program Element:	HAZWASTE GEN (RCRA-LQG)
Record Id:	PR0010369

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Cross Street: Not reported
Status Code: 04
Status: Active, exempt from billing
Latitude: 35.61040
Longitude: 120.65230

Facility Id: FA0002218
Program Element Code: 1129
Program Element: HAZWASTE GEN (6+ WASTE STREAMS)
Record Id: PR0002218
Cross Street: Not reported
Status Code: 01
Status: Active, billable
Latitude: 35.61040
Longitude: 120.65230

Facility Id: FA0002218
Program Element Code: 1201
Program Element: AGT ANNUAL TANK PERMIT
Record Id: PR0006780
Cross Street: Not reported
Status Code: 01
Status: Active, billable
Latitude: 35.61040
Longitude: 120.65230

EMI:

Year: 1997
County Code: 40
Air Basin: SCC
Facility ID: 5
Air District Name: SLO
SIC Code: 3429
Air District Name: SAN LUIS OBISPO COUNTY APCD
Community Health Air Pollution Info System: Not reported
Consolidated Emission Reporting Rule: Not reported
Total Organic Hydrocarbon Gases Tons/Yr: 1
Reactive Organic Gases Tons/Yr: 0
Carbon Monoxide Emissions Tons/Yr: 0
NOX - Oxides of Nitrogen Tons/Yr: 3
SOX - Oxides of Sulphur Tons/Yr: 0
Particulate Matter Tons/Yr: 0
Part. Matter 10 Micrometers and Smllr Tons/Yr: 0

Year: 1998
County Code: 40
Air Basin: SCC
Facility ID: 5
Air District Name: SLO
SIC Code: 3429
Air District Name: SAN LUIS OBISPO COUNTY APCD
Community Health Air Pollution Info System: Not reported
Consolidated Emission Reporting Rule: Not reported
Total Organic Hydrocarbon Gases Tons/Yr: 1
Reactive Organic Gases Tons/Yr: 0
Carbon Monoxide Emissions Tons/Yr: 1
NOX - Oxides of Nitrogen Tons/Yr: 1

MAP FINDINGS

Map ID
Direction
Distance
Elevation | Site | Database(s) | EDR ID Number EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0

Year:	1999
County Code:	40
Air Basin:	SCC
Facility ID:	5
Air District Name:	SLO
SIC Code:	3429
Air District Name:	SAN LUIS OBISPO COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	1
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	0
NOX - Oxides of Nitrogen Tons/Yr:	1
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0

Year:	2000
County Code:	40
Air Basin:	SCC
Facility ID:	5
Air District Name:	SLO
SIC Code:	3429
Air District Name:	SAN LUIS OBISPO COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	1
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	1
NOX - Oxides of Nitrogen Tons/Yr:	1
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0

Year:	2001
County Code:	40
Air Basin:	SCC
Facility ID:	5
Air District Name:	SLO
SIC Code:	3429
Air District Name:	SAN LUIS OBISPO COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	2
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	1
NOX - Oxides of Nitrogen Tons/Yr:	1
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0

Year:	2002
County Code:	40

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Air Basin:	SCC
Facility ID:	5
Air District Name:	SLO
SIC Code:	3429
Air District Name:	SAN LUIS OBISPO COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	1
NOX - Oxides of Nitrogen Tons/Yr:	1
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0

Year:	2003
County Code:	40
Air Basin:	SCC
Facility ID:	5
Air District Name:	SLO
SIC Code:	3429
Air District Name:	SAN LUIS OBISPO COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0
Reactive Organic Gases Tons/Yr:	0
Carbon Monoxide Emissions Tons/Yr:	1
NOX - Oxides of Nitrogen Tons/Yr:	1
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0

Year:	2004
County Code:	40
Air Basin:	SCC
Facility ID:	5
Air District Name:	SLO
SIC Code:	3429
Air District Name:	SAN LUIS OBISPO COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0.2966
Reactive Organic Gases Tons/Yr:	0.12031832
Carbon Monoxide Emissions Tons/Yr:	0.578
NOX - Oxides of Nitrogen Tons/Yr:	0.693
SOX - Oxides of Sulphur Tons/Yr:	0.004
Particulate Matter Tons/Yr:	0.052
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0.052

Year:	2005
County Code:	40
Air Basin:	SCC
Facility ID:	5
Air District Name:	SLO
SIC Code:	3429
Air District Name:	SAN LUIS OBISPO COUNTY APCD
Community Health Air Pollution Info System:	Not reported

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	.2966
Reactive Organic Gases Tons/Yr:	.12031832
Carbon Monoxide Emissions Tons/Yr:	.578
NOX - Oxides of Nitrogen Tons/Yr:	.693
SOX - Oxides of Sulphur Tons/Yr:	.004
Particulate Matter Tons/Yr:	.052
Part. Matter 10 Micrometers and Smllr Tons/Yr:	.052

Year:	2006
County Code:	40
Air Basin:	SCC
Facility ID:	5
Air District Name:	SLO
SIC Code:	3429
Air District Name:	SAN LUIS OBISPO COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	.2966
Reactive Organic Gases Tons/Yr:	.12031832
Carbon Monoxide Emissions Tons/Yr:	.578
NOX - Oxides of Nitrogen Tons/Yr:	.693
SOX - Oxides of Sulphur Tons/Yr:	.004
Particulate Matter Tons/Yr:	.052
Part. Matter 10 Micrometers and Smllr Tons/Yr:	.052

Year:	2007
County Code:	40
Air Basin:	SCC
Facility ID:	5
Air District Name:	SLO
SIC Code:	3429
Air District Name:	SAN LUIS OBISPO COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	.2966
Reactive Organic Gases Tons/Yr:	.12031832
Carbon Monoxide Emissions Tons/Yr:	.000289
NOX - Oxides of Nitrogen Tons/Yr:	.693
SOX - Oxides of Sulphur Tons/Yr:	.004
Particulate Matter Tons/Yr:	.052
Part. Matter 10 Micrometers and Smllr Tons/Yr:	.052

Year:	2008
County Code:	40
Air Basin:	SCC
Facility ID:	5
Air District Name:	SLO
SIC Code:	3429
Air District Name:	SAN LUIS OBISPO COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	2.357
Reactive Organic Gases Tons/Yr:	.944354
Carbon Monoxide Emissions Tons/Yr:	.532
NOX - Oxides of Nitrogen Tons/Yr:	.633
SOX - Oxides of Sulphur Tons/Yr:	.003

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Particulate Matter Tons/Yr:	.048
Part. Matter 10 Micrometers and Smllr Tons/Yr:	.048
Year:	2009
County Code:	40
Air Basin:	SCC
Facility ID:	5
Air District Name:	SLO
SIC Code:	3429
Air District Name:	SAN LUIS OBISPO COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	2.3570000000000002
Reactive Organic Gases Tons/Yr:	0.94435400000000003
Carbon Monoxide Emissions Tons/Yr:	0.53200000000000003
NOX - Oxides of Nitrogen Tons/Yr:	0.63300000000000001
SOX - Oxides of Sulphur Tons/Yr:	3.0000000000000001E-3
Particulate Matter Tons/Yr:	4.8000000000000001E-2
Part. Matter 10 Micrometers and Smllr Tons/Yr:	4.8000000000000001E-2
Year:	2010
County Code:	40
Air Basin:	SCC
Facility ID:	5
Air District Name:	SLO
SIC Code:	3429
Air District Name:	SAN LUIS OBISPO COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0.71899999999999997
Reactive Organic Gases Tons/Yr:	0.28793299999999999
Carbon Monoxide Emissions Tons/Yr:	0.115
NOX - Oxides of Nitrogen Tons/Yr:	0.13700000000000001
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0.01
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0.01
Year:	2011
County Code:	40
Air Basin:	SCC
Facility ID:	5
Air District Name:	SLO
SIC Code:	3429
Air District Name:	SAN LUIS OBISPO COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0.06
Reactive Organic Gases Tons/Yr:	0.0247326
Carbon Monoxide Emissions Tons/Yr:	0.115
NOX - Oxides of Nitrogen Tons/Yr:	0.251
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0.019
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0.019
Year:	2012
County Code:	40
Air Basin:	SCC

MAP FINDINGS

Map ID
Direction
Distance
Elevation | Site | Database(s) | EDR ID Number EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Facility ID:	5
Air District Name:	SLO
SIC Code:	3429
Air District Name:	SAN LUIS OBISPO COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0.06
Reactive Organic Gases Tons/Yr:	0.0247326
Carbon Monoxide Emissions Tons/Yr:	0.115
NOX - Oxides of Nitrogen Tons/Yr:	0.251
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0.019
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0.019

Year:	2013
County Code:	40
Air Basin:	SCC
Facility ID:	5
Air District Name:	SLO
SIC Code:	3429
Air District Name:	SAN LUIS OBISPO COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0.06
Reactive Organic Gases Tons/Yr:	0.0247326
Carbon Monoxide Emissions Tons/Yr:	0.115
NOX - Oxides of Nitrogen Tons/Yr:	0.251
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0.019
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0.019

Year:	2014
County Code:	40
Air Basin:	SCC
Facility ID:	5
Air District Name:	SLO
SIC Code:	3429
Air District Name:	SAN LUIS OBISPO COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0.06
Reactive Organic Gases Tons/Yr:	0.02532
Carbon Monoxide Emissions Tons/Yr:	0.115
NOX - Oxides of Nitrogen Tons/Yr:	0.251
SOX - Oxides of Sulphur Tons/Yr:	0
Particulate Matter Tons/Yr:	0.019
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0.019

Year:	2015
County Code:	40
Air Basin:	SCC
Facility ID:	5
Air District Name:	SLO
SIC Code:	3429
Air District Name:	SAN LUIS OBISPO COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported

MAP FINDINGS

Map ID
Direction
Distance
Elevation | Site | Database(s) | EDR ID Number EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Total Organic Hydrocarbon Gases Tons/Yr:	0.3003
Reactive Organic Gases Tons/Yr:	0.121052
Carbon Monoxide Emissions Tons/Yr:	0.178
NOX - Oxides of Nitrogen Tons/Yr:	0.212
SOX - Oxides of Sulphur Tons/Yr:	0.001278
Particulate Matter Tons/Yr:	0.016
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0.016

Year:	2016
County Code:	40
Air Basin:	SCC
Facility ID:	5
Air District Name:	SLO
SIC Code:	3429
Air District Name:	SAN LUIS OBISPO COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	0.30043
Reactive Organic Gases Tons/Yr:	0.1211092
Carbon Monoxide Emissions Tons/Yr:	0.1386
NOX - Oxides of Nitrogen Tons/Yr:	0.213
SOX - Oxides of Sulphur Tons/Yr:	0.001278
Particulate Matter Tons/Yr:	0.016188
Part. Matter 10 Micrometers and Smllr Tons/Yr:	0.016188

NPDES:

Facility Status:	Active
NPDES Number:	CAS000001
Region:	3
Agency Number:	0
Regulatory Measure ID:	185694
Place ID:	Not reported
Order Number:	97-03-DWQ
WDID:	3 40I002899
Regulatory Measure Type:	Enrollee
Program Type:	Industrial
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	04/02/1992
Termination Date Of Regulatory Measure:	Not reported
Expiration Date Of Regulatory Measure:	Not reported
Discharge Address:	1740 Commerce Way
Discharge Name:	Joslyn Sunbank Co
Discharge City:	Paso Robles
Discharge State:	California
Discharge Zip:	93446
Status:	Not reported
Status Date:	Not reported
Operator Name:	Not reported
Operator Address:	Not reported
Operator City:	Not reported
Operator State:	Not reported
Operator Zip:	Not reported

NPDES as of 03/2018:

NPDES Number:	Not reported
Status:	Not reported
Agency Number:	Not reported

MAP FINDINGS

Map ID / Direction / Distance / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Region:	3
Regulatory Measure ID:	185694
Order Number:	Not reported
Regulatory Measure Type:	Industrial
Place ID:	Not reported
WDID:	3 40I002899
Program Type:	Not reported
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	Not reported
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	Not reported
Discharge Address:	Not reported
Discharge City:	Not reported
Discharge State:	Not reported
Discharge Zip:	Not reported
Received Date:	05/09/2008
Processed Date:	04/02/1992
Status:	Active
Status Date:	04/02/1992
Place Size:	262940
Place Size Unit:	SqFt
Contact:	Patricia Harris
Contact Title:	Not reported
Contact Phone:	805-238-2840
Contact Phone Ext:	Not reported
Contact Email:	patricia.harris@esterline.com
Operator Name:	Joslyn Sunbank Co
Operator Address:	1740 Commerce Way
Operator City:	Paso Robles
Operator State:	California
Operator Zip:	93446
Operator Contact:	Patricia Harris
Operator Contact Title:	Not reported
Operator Contact Phone:	805-238-2840
Operator Contact Phone Ext:	Not reported
Operator Contact Email:	patricia.harris@esterline.com
Operator Type:	Private Business
Developer:	Not reported
Developer Address:	Not reported
Developer City:	Not reported
Developer State:	California
Developer Zip:	Not reported
Developer Contact:	Not reported
Developer Contact Title:	Not reported
Constype Linear Utility Ind:	Not reported
Emergency Phone:	805-238-2840
Emergency Phone Ext:	Not reported
Constype Above Ground Ind:	Not reported
Constype Below Ground Ind:	Not reported
Constype Cable Line Ind:	Not reported
Constype Comm Line Ind:	Not reported
Constype Commertial Ind:	Not reported
Constype Electrical Line Ind:	Not reported
Constype Gas Line Ind:	Not reported
Constype Industrial Ind:	Not reported
Constype Other Description:	Not reported

MAP FINDINGS

Map ID
Direction
Distance
Elevation | Site | Database(s) | EDR ID Number EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Constype Other Ind:	Not reported
Constype Recons Ind:	Not reported
Constype Residential Ind:	Not reported
Constype Transport Ind:	Not reported
Constype Utility Description:	Not reported
Constype Utility Ind:	Not reported
Constype Water Sewer Ind:	Not reported
Dir Discharge Uswater Ind:	N
Receiving Water Name:	Turtle Creek
Certifier:	Patricia Harris
Certifier Title:	HSE Manager
Certification Date:	25-JUN-15
Primary Sic:	3644-Noncurrent-Carrying Wiring Devices
Secondary Sic:	Not reported
Tertiary Sic:	Not reported
NPDES Number:	CAS000001
Status:	Active
Agency Number:	0
Region:	3
Regulatory Measure ID:	185694
Order Number:	97-03-DWQ
Regulatory Measure Type:	Enrollee
Place ID:	Not reported
WDID:	3 40I002899
Program Type:	Industrial
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	04/02/1992
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	Joslyn Sunbank Co
Discharge Address:	1740 Commerce Way
Discharge City:	Paso Robles
Discharge State:	California
Discharge Zip:	93446
Received Date:	Not reported
Processed Date:	Not reported
Status:	Not reported
Status Date:	Not reported
Place Size:	Not reported
Place Size Unit:	Not reported
Contact:	Not reported
Contact Title:	Not reported
Contact Phone:	Not reported
Contact Phone Ext:	Not reported
Contact Email:	Not reported
Operator Name:	Not reported
Operator Address:	Not reported
Operator City:	Not reported
Operator State:	Not reported
Operator Zip:	Not reported
Operator Contact:	Not reported
Operator Contact Title:	Not reported
Operator Contact Phone:	Not reported
Operator Contact Phone Ext:	Not reported
Operator Contact Email:	Not reported
Operator Type:	Not reported

MAP FINDINGS

Map ID
Direction
Distance
Elevation | Site | Database(s) | EDR ID Number EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Developer:	Not reported
Developer Address:	Not reported
Developer City:	Not reported
Developer State:	Not reported
Developer Zip:	Not reported
Developer Contact:	Not reported
Developer Contact Title:	Not reported
Constype Linear Utility Ind:	Not reported
Emergency Phone:	Not reported
Emergency Phone Ext:	Not reported
Constype Above Ground Ind:	Not reported
Constype Below Ground Ind:	Not reported
Constype Cable Line Ind:	Not reported
Constype Comm Line Ind:	Not reported
Constype Commertial Ind:	Not reported
Constype Electrical Line Ind:	Not reported
Constype Gas Line Ind:	Not reported
Constype Industrial Ind:	Not reported
Constype Other Description:	Not reported
Constype Other Ind:	Not reported
Constype Recons Ind:	Not reported
Constype Residential Ind:	Not reported
Constype Transport Ind:	Not reported
Constype Utility Description:	Not reported
Constype Utility Ind:	Not reported
Constype Water Sewer Ind:	Not reported
Dir Discharge Uswater Ind:	Not reported
Receiving Water Name:	Not reported
Certifier:	Not reported
Certifier Title:	Not reported
Certification Date:	Not reported
Primary Sic:	Not reported
Secondary Sic:	Not reported
Tertiary Sic:	Not reported

Facility Status:	Not reported
NPDES Number:	Not reported
Region:	Not reported
Agency Number:	Not reported
Regulatory Measure ID:	Not reported
Place ID:	Not reported
Order Number:	Not reported
WDID:	3 40I002899
Regulatory Measure Type:	Industrial
Program Type:	Not reported
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Expiration Date Of Regulatory Measure:	Not reported
Discharge Address:	Not reported
Discharge Name:	Not reported
Discharge City:	Not reported
Discharge State:	Not reported
Discharge Zip:	Not reported
Status:	Active
Status Date:	04/02/1992

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Operator Name:	Joslyn Sunbank Co
Operator Address:	1740 Commerce Way
Operator City:	Paso Robles
Operator State:	California
Operator Zip:	93446

NPDES as of 03/2018:

NPDES Number:	Not reported
Status:	Not reported
Agency Number:	Not reported
Region:	3
Regulatory Measure ID:	185694
Order Number:	Not reported
Regulatory Measure Type:	Industrial
Place ID:	Not reported
WDID:	3 40I002899
Program Type:	Not reported
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	Not reported
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	Not reported
Discharge Address:	Not reported
Discharge City:	Not reported
Discharge State:	Not reported
Discharge Zip:	Not reported
Received Date:	05/09/2008
Processed Date:	04/02/1992
Status:	Active
Status Date:	04/02/1992
Place Size:	262940
Place Size Unit:	SqFt
Contact:	Patricia Harris
Contact Title:	Not reported
Contact Phone:	805-238-2840
Contact Phone Ext:	Not reported
Contact Email:	patricia.harris@esterline.com
Operator Name:	Joslyn Sunbank Co
Operator Address:	1740 Commerce Way
Operator City:	Paso Robles
Operator State:	California
Operator Zip:	93446
Operator Contact:	Patricia Harris
Operator Contact Title:	Not reported
Operator Contact Phone:	805-238-2840
Operator Contact Phone Ext:	Not reported
Operator Contact Email:	patricia.harris@esterline.com
Operator Type:	Private Business
Developer:	Not reported
Developer Address:	Not reported
Developer City:	Not reported
Developer State:	California
Developer Zip:	Not reported
Developer Contact:	Not reported
Developer Contact Title:	Not reported
Constype Linear Utility Ind:	Not reported
Emergency Phone:	805-238-2840
Emergency Phone Ext:	Not reported

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Constype Above Ground Ind:	Not reported
Constype Below Ground Ind:	Not reported
Constype Cable Line Ind:	Not reported
Constype Comm Line Ind:	Not reported
Constype Commertial Ind:	Not reported
Constype Electrical Line Ind:	Not reported
Constype Gas Line Ind:	Not reported
Constype Industrial Ind:	Not reported
Constype Other Description:	Not reported
Constype Other Ind:	Not reported
Constype Recons Ind:	Not reported
Constype Residential Ind:	Not reported
Constype Transport Ind:	Not reported
Constype Utility Description:	Not reported
Constype Utility Ind:	Not reported
Constype Water Sewer Ind:	Not reported
Dir Discharge Uswater Ind:	N
Receiving Water Name:	Turtle Creek
Certifier:	Patricia Harris
Certifier Title:	HSE Manager
Certification Date:	25-JUN-15
Primary Sic:	3644-Noncurrent-Carrying Wiring Devices
Secondary Sic:	Not reported
Tertiary Sic:	Not reported
NPDES Number:	CAS000001
Status:	Active
Agency Number:	0
Region:	3
Regulatory Measure ID:	185694
Order Number:	97-03-DWQ
Regulatory Measure Type:	Enrollee
Place ID:	Not reported
WDID:	3 40I002899
Program Type:	Industrial
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	04/02/1992
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	Joslyn Sunbank Co
Discharge Address:	1740 Commerce Way
Discharge City:	Paso Robles
Discharge State:	California
Discharge Zip:	93446
Received Date:	Not reported
Processed Date:	Not reported
Status:	Not reported
Status Date:	Not reported
Place Size:	Not reported
Place Size Unit:	Not reported
Contact:	Not reported
Contact Title:	Not reported
Contact Phone:	Not reported
Contact Phone Ext:	Not reported
Contact Email:	Not reported
Operator Name:	Not reported
Operator Address:	Not reported

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Operator City:	Not reported
Operator State:	Not reported
Operator Zip:	Not reported
Operator Contact:	Not reported
Operator Contact Title:	Not reported
Operator Contact Phone:	Not reported
Operator Contact Phone Ext:	Not reported
Operator Contact Email:	Not reported
Operator Type:	Not reported
Developer:	Not reported
Developer Address:	Not reported
Developer City:	Not reported
Developer State:	Not reported
Developer Zip:	Not reported
Developer Contact:	Not reported
Developer Contact Title:	Not reported
Constype Linear Utility Ind:	Not reported
Emergency Phone:	Not reported
Emergency Phone Ext:	Not reported
Constype Above Ground Ind:	Not reported
Constype Below Ground Ind:	Not reported
Constype Cable Line Ind:	Not reported
Constype Comm Line Ind:	Not reported
Constype Commertial Ind:	Not reported
Constype Electrical Line Ind:	Not reported
Constype Gas Line Ind:	Not reported
Constype Industrial Ind:	Not reported
Constype Other Description:	Not reported
Constype Other Ind:	Not reported
Constype Recons Ind:	Not reported
Constype Residential Ind:	Not reported
Constype Transport Ind:	Not reported
Constype Utility Description:	Not reported
Constype Utility Ind:	Not reported
Constype Water Sewer Ind:	Not reported
Dir Discharge Uswater Ind:	Not reported
Receiving Water Name:	Not reported
Certifier:	Not reported
Certifier Title:	Not reported
Certification Date:	Not reported
Primary Sic:	Not reported
Secondary Sic:	Not reported
Tertiary Sic:	Not reported

WDS:

Facility ID:	Central Coastal 40I002899
Facility Type:	Industrial - Facility that treats and/or disposes of liquid or semisolid wastes from any servicing, producing, manufacturing or processing operation of whatever nature, including mining, gravel washing, geothermal operations, air conditioning, ship building and repairing, oil production, storage and disposal operations, water pumping.
Facility Status:	Active - Any facility with a continuous or seasonal discharge that is under Waste Discharge Requirements.
NPDES Number:	CAS000001 The 1st 2 characters designate the state. The remaining 7 are assigned by the Regional Board

MAP FINDINGS

Map ID
Direction
Distance
Elevation | Site | Database(s) | EDR ID Number EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Subregion:	3
Facility Telephone:	8052382840
Facility Contact:	RON THAELE
Agency Name:	JOSLYN SUNBANK CO
Agency Address:	1740 Commerce Way
Agency City,St,Zip:	Paso Robles 934463620
Agency Contact:	RON THAELE
Agency Telephone:	8052382840
Agency Type:	Private
SIC Code:	0
SIC Code 2:	Not reported
Primary Waste Type:	Not reported
Primary Waste:	Not reported
Waste Type2:	Not reported
Waste2:	Not reported
Primary Waste Type:	Not reported
Secondary Waste:	Not reported
Secondary Waste Type:	Not reported
Design Flow:	0
Baseline Flow:	0
Reclamation:	Not reported
POTW:	Not reported
Treat To Water:	Minor Threat to Water Quality. A violation of a regional board order should cause a relatively minor impairment of beneficial uses compared to a major or minor threat. Not: All nurds without a TTWQ will be considered a minor threat to water quality unless coded at a higher Level. A Zero (0) may be used to code those NURDS that are found to represent no threat to water quality.
Complexity:	Category C - Facilities having no waste treatment systems, such as cooling water dischargers or thosewho must comply through best management practices, facilities with passive waste treatment and disposal systems, such as septic systems with subsurface disposal, or dischargers having waste storage systems with land disposal such as dairy waste ponds.

CIWQS:

Agency:	Joslyn Sunbank Co
Agency Address:	1740 Commerce Way, Paso Robles, CA 93446
Place/Project Type:	Industrial - Noncurrent-Carrying Wiring Devices
SIC/NAICS:	3644
Region:	3
Program:	INDSTW
Regulatory Measure Status:	Active
Regulatory Measure Type:	Storm water industrial
Order Number:	2014-0057-DWQ
WDID:	3 40I002899
NPDES Number:	CAS000001
Adoption Date:	Not reported
Effective Date:	04/02/1992
Termination Date:	Not reported
Expiration/Review Date:	Not reported
Design Flow:	Not reported
Major/Minor:	Not reported
Complexity:	Not reported
TTWQ:	Not reported
Enforcement Actions within 5 years:	0
Violations within 5 years:	0

MAP FINDINGS

Map ID / Direction / Distance / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number

JOSLYN SUNBANK COMPANY L L C (Continued) **1000161759**

Latitude: 35.61045
Longitude: -120.65233

G28 **ZURN INDUSTRIES WILKINS DIV** **ENVIROSTOR** **S100878290**
West **1747 COMMERCE WAY** **VCP** **N/A**
1/4-1/2 **PASO ROBLES, CA 93446** **CUPA Listings**
0.416 mi. **NPDES**
2199 ft. **Site 2 of 2 in cluster G** **CERS HAZ WASTE**
CERS
Relative: Lower **CIWQS**

Actual: 810 ft.

ENVIROSTOR:

Facility ID:	40340001
Status:	No Further Action
Status Date:	03/13/1995
Site Code:	100487
Site Type:	Voluntary Cleanup
Site Type Detailed:	Voluntary Cleanup
Acres:	0
NPL:	NO
Regulatory Agencies:	SMBRP
Lead Agency:	SMBRP
Program Manager:	Not reported
Supervisor:	Kevin Shaddy
Division Branch:	Cleanup San Joaquin
Assembly:	35
Senate:	17
Special Program:	Voluntary Cleanup Program
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	Responsible Party
Latitude:	35.61058
Longitude:	-120.6523
APN:	NONE SPECIFIED
Past Use:	MANUFACTURING - METAL
Potential COC:	Lead Copper and compounds
Confirmed COC:	Copper and compounds Lead
Potential Description:	NMA
Alias Name:	110000481791
Alias Type:	EPA (FRS #)
Alias Name:	100487
Alias Type:	Project Code (Site Code)
Alias Name:	40340001
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	*Voluntary Cleanup Agreement Completion
Completed Date:	12/14/1995
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Preliminary Endangerment Assessment Report
Completed Date:	03/13/1995
Comments:	PRELIMINARY ENDANGERMENT ASSESSMENT (PEA) -- Reviewed analytical data generated from site invetsigations and verification/split sampling by

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

ZURN INDUSTRIES WILKINS DIV (Continued) **S100878290**

DTSC staff indicated that the site did not pose a public health or environmental problem and resulted in issuance of a No Further Action Determination.

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Voluntary Cleanup Agreement
Completed Date:	08/24/1994
Comments:	Not reported
Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported
Schedule Revised Date:	Not reported

VCP:

Facility ID:	40340001
Site Type:	Voluntary Cleanup
Site Type Detail:	Voluntary Cleanup
Site Mgmt. Req.:	NONE SPECIFIED
Acres:	0
National Priorities List:	NO
Cleanup Oversight Agencies:	SMBRP
Lead Agency:	SMBRP
Lead Agency Description:	DTSC - Site Cleanup Program
Project Manager:	Not reported
Supervisor:	Kevin Shaddy
Division Branch:	Cleanup San Joaquin
Site Code:	100487
Assembly:	35
Senate:	17
Special Programs Code:	Voluntary Cleanup Program
Status:	No Further Action
Status Date:	03/13/1995
Restricted Use:	NO
Funding:	Responsible Party
Lat/Long:	35.61058 / -120.6523
APN:	NONE SPECIFIED
Past Use:	MANUFACTURING - METAL
Potential COC:	30013, 30156
Confirmed COC:	30156,30013
Potential Description:	NMA
Alias Name:	110000481791
Alias Type:	EPA (FRS #)
Alias Name:	100487
Alias Type:	Project Code (Site Code)
Alias Name:	40340001
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported

ZURN INDUSTRIES WILKINS DIV (Continued) **S100878290**

Completed Document Type: *Voluntary Cleanup Agreement Completion
Completed Date: 12/14/1995
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Report
Completed Date: 03/13/1995
Comments: PRELIMINARY ENDANGERMENT ASSESSMENT (PEA) -- Reviewed analytical data generated from site invetsigations and verification/split sampling by DTSC staff indicated that the site did not pose a public health or environmental problem and resulted in issuance of a No Further Action Determination.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Voluntary Cleanup Agreement
Completed Date: 08/24/1994
Comments: Not reported

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

CUPA SAN LUIS OBISPO:
Facility Id: FA0002313
Program Element Code: 0727
Program Element: HAZMAT DISCLOSURE - 5-10 HAZARDOUS MATERIALS
Record Id: PR0001806
Cross Street: Not reported
Status Code: 01
Status: Active, billable
Latitude: 35.61050
Longitude: 120.65270

Facility Id: FA0002313
Program Element Code: 1126
Program Element: HAZWASTE GEN (1-5 WASTE STREAMS)
Record Id: PR0002313
Cross Street: Not reported
Status Code: 01
Status: Active, billable
Latitude: 35.61050
Longitude: 120.65270

NPDES:
Facility Status: Active
NPDES Number: CAS000001
Region: 3
Agency Number: 0

MAP FINDINGS

Map ID
Direction
Distance
Elevation | Site | Database(s) | EDR ID Number EPA ID Number

ZURN INDUSTRIES WILKINS DIV (Continued) **S100878290**

Regulatory Measure ID:	185697
Place ID:	Not reported
Order Number:	97-03-DWQ
WDID:	3 40I004898
Regulatory Measure Type:	Enrollee
Program Type:	Industrial
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	04/07/1992
Termination Date Of Regulatory Measure:	Not reported
Expiration Date Of Regulatory Measure:	Not reported
Discharge Address:	1747 Commerce Way
Discharge Name:	Zurn Industries Wilkins Div
Discharge City:	Paso Robles
Discharge State:	California
Discharge Zip:	93446
Status:	Not reported
Status Date:	Not reported
Operator Name:	Not reported
Operator Address:	Not reported
Operator City:	Not reported
Operator State:	Not reported
Operator Zip:	Not reported

NPDES as of 03/2018:

NPDES Number:	Not reported
Status:	Not reported
Agency Number:	Not reported
Region:	3
Regulatory Measure ID:	185697
Order Number:	Not reported
Regulatory Measure Type:	Industrial
Place ID:	Not reported
WDID:	3 40I004898
Program Type:	Not reported
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	Not reported
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	Not reported
Discharge Address:	Not reported
Discharge City:	Not reported
Discharge State:	Not reported
Discharge Zip:	Not reported
Received Date:	05/09/2008
Processed Date:	04/07/1992
Status:	Active
Status Date:	11/24/2015
Place Size:	10
Place Size Unit:	Acres
Contact:	Edward Stettler
Contact Title:	Plant Manager
Contact Phone:	805-226-6225
Contact Phone Ext:	Not reported
Contact Email:	ed.stettler@zurn.com
Operator Name:	Zurn Industries Wilkins Div
Operator Address:	1747 Commerce Way
Operator City:	Paso Robles
Operator State:	California

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

ZURN INDUSTRIES WILKINS DIV (Continued) **S100878290**

Operator Zip:	93446
Operator Contact:	Edward Stettler
Operator Contact Title:	Plant Manager
Operator Contact Phone:	805-226-6225
Operator Contact Phone Ext:	Not reported
Operator Contact Email:	ed.stettler@zurn.com
Operator Type:	Private Business
Developer:	Not reported
Developer Address:	Not reported
Developer City:	Not reported
Developer State:	California
Developer Zip:	Not reported
Developer Contact:	Not reported
Developer Contact Title:	Not reported
Constype Linear Utility Ind:	Not reported
Emergency Phone:	805-835-2025
Emergency Phone Ext:	Not reported
Constype Above Ground Ind:	Not reported
Constype Below Ground Ind:	Not reported
Constype Cable Line Ind:	Not reported
Constype Comm Line Ind:	Not reported
Constype Commertial Ind:	Not reported
Constype Electrical Line Ind:	Not reported
Constype Gas Line Ind:	Not reported
Constype Industrial Ind:	Not reported
Constype Other Description:	Not reported
Constype Other Ind:	Not reported
Constype Recons Ind:	Not reported
Constype Residential Ind:	Not reported
Constype Transport Ind:	Not reported
Constype Utility Description:	Not reported
Constype Utility Ind:	Not reported
Constype Water Sewer Ind:	Not reported
Dir Discharge Uswater Ind:	N
Receiving Water Name:	Salinas River
Certifier:	Edward Stettler
Certifier Title:	Plant Manager
Certification Date:	26-JUN-15
Primary Sic:	3491-Industrial Valves
Secondary Sic:	Not reported
Tertiary Sic:	Not reported
NPDES Number:	CAS000001
Status:	Active
Agency Number:	0
Region:	3
Regulatory Measure ID:	185697
Order Number:	97-03-DWQ
Regulatory Measure Type:	Enrollee
Place ID:	Not reported
WDID:	3 40I004898
Program Type:	Industrial
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	04/07/1992
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	Zurn Industries Wilkins Div

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

ZURN INDUSTRIES WILKINS DIV (Continued) **S100878290**

Discharge Address:	1747 Commerce Way
Discharge City:	Paso Robles
Discharge State:	California
Discharge Zip:	93446
Received Date:	Not reported
Processed Date:	Not reported
Status:	Not reported
Status Date:	Not reported
Place Size:	Not reported
Place Size Unit:	Not reported
Contact:	Not reported
Contact Title:	Not reported
Contact Phone:	Not reported
Contact Phone Ext:	Not reported
Contact Email:	Not reported
Operator Name:	Not reported
Operator Address:	Not reported
Operator City:	Not reported
Operator State:	Not reported
Operator Zip:	Not reported
Operator Contact:	Not reported
Operator Contact Title:	Not reported
Operator Contact Phone:	Not reported
Operator Contact Phone Ext:	Not reported
Operator Contact Email:	Not reported
Operator Type:	Not reported
Developer:	Not reported
Developer Address:	Not reported
Developer City:	Not reported
Developer State:	Not reported
Developer Zip:	Not reported
Developer Contact:	Not reported
Developer Contact Title:	Not reported
Constype Linear Utility Ind:	Not reported
Emergency Phone:	Not reported
Emergency Phone Ext:	Not reported
Constype Above Ground Ind:	Not reported
Constype Below Ground Ind:	Not reported
Constype Cable Line Ind:	Not reported
Constype Comm Line Ind:	Not reported
Constype Commertial Ind:	Not reported
Constype Electrical Line Ind:	Not reported
Constype Gas Line Ind:	Not reported
Constype Industrial Ind:	Not reported
Constype Other Description:	Not reported
Constype Other Ind:	Not reported
Constype Recons Ind:	Not reported
Constype Residential Ind:	Not reported
Constype Transport Ind:	Not reported
Constype Utility Description:	Not reported
Constype Utility Ind:	Not reported
Constype Water Sewer Ind:	Not reported
Dir Discharge Uswater Ind:	Not reported
Receiving Water Name:	Not reported
Certifier:	Not reported
Certifier Title:	Not reported
Certification Date:	Not reported

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

ZURN INDUSTRIES WILKINS DIV (Continued) **S100878290**

Primary Sic:	Not reported
Secondary Sic:	Not reported
Tertiary Sic:	Not reported
Facility Status:	Not reported
NPDES Number:	Not reported
Region:	Not reported
Agency Number:	Not reported
Regulatory Measure ID:	Not reported
Place ID:	Not reported
Order Number:	Not reported
WDID:	3 40I004898
Regulatory Measure Type:	Industrial
Program Type:	Not reported
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Expiration Date Of Regulatory Measure:	Not reported
Discharge Address:	Not reported
Discharge Name:	Not reported
Discharge City:	Not reported
Discharge State:	Not reported
Discharge Zip:	Not reported
Status:	Active
Status Date:	11/24/2015
Operator Name:	Zurn Industries Wilkins Div
Operator Address:	1747 Commerce Way
Operator City:	Paso Robles
Operator State:	California
Operator Zip:	93446

NPDES as of 03/2018:

NPDES Number:	Not reported
Status:	Not reported
Agency Number:	Not reported
Region:	3
Regulatory Measure ID:	185697
Order Number:	Not reported
Regulatory Measure Type:	Industrial
Place ID:	Not reported
WDID:	3 40I004898
Program Type:	Not reported
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	Not reported
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	Not reported
Discharge Address:	Not reported
Discharge City:	Not reported
Discharge State:	Not reported
Discharge Zip:	Not reported
Received Date:	05/09/2008
Processed Date:	04/07/1992
Status:	Active
Status Date:	11/24/2015
Place Size:	10
Place Size Unit:	Acres

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

ZURN INDUSTRIES WILKINS DIV (Continued) **S100878290**

Contact:	Edward Stettler
Contact Title:	Plant Manager
Contact Phone:	805-226-6225
Contact Phone Ext:	Not reported
Contact Email:	ed.stettler@zurn.com
Operator Name:	Zurn Industries Wilkins Div
Operator Address:	1747 Commerce Way
Operator City:	Paso Robles
Operator State:	California
Operator Zip:	93446
Operator Contact:	Edward Stettler
Operator Contact Title:	Plant Manager
Operator Contact Phone:	805-226-6225
Operator Contact Phone Ext:	Not reported
Operator Contact Email:	ed.stettler@zurn.com
Operator Type:	Private Business
Developer:	Not reported
Developer Address:	Not reported
Developer City:	Not reported
Developer State:	California
Developer Zip:	Not reported
Developer Contact:	Not reported
Developer Contact Title:	Not reported
Constype Linear Utility Ind:	Not reported
Emergency Phone:	805-835-2025
Emergency Phone Ext:	Not reported
Constype Above Ground Ind:	Not reported
Constype Below Ground Ind:	Not reported
Constype Cable Line Ind:	Not reported
Constype Comm Line Ind:	Not reported
Constype Commertial Ind:	Not reported
Constype Electrical Line Ind:	Not reported
Constype Gas Line Ind:	Not reported
Constype Industrial Ind:	Not reported
Constype Other Description:	Not reported
Constype Other Ind:	Not reported
Constype Recons Ind:	Not reported
Constype Residential Ind:	Not reported
Constype Transport Ind:	Not reported
Constype Utility Description:	Not reported
Constype Utility Ind:	Not reported
Constype Water Sewer Ind:	Not reported
Dir Discharge Uswater Ind:	N
Receiving Water Name:	Salinas River
Certifier:	Edward Stettler
Certifier Title:	Plant Manager
Certification Date:	26-JUN-15
Primary Sic:	3491-Industrial Valves
Secondary Sic:	Not reported
Tertiary Sic:	Not reported
NPDES Number:	CAS000001
Status:	Active
Agency Number:	0
Region:	3
Regulatory Measure ID:	185697
Order Number:	97-03-DWQ

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

ZURN INDUSTRIES WILKINS DIV (Continued) **S100878290**

Regulatory Measure Type:	Enrollee
Place ID:	Not reported
WDID:	3 40I004898
Program Type:	Industrial
Adoption Date Of Regulatory Measure:	Not reported
Effective Date Of Regulatory Measure:	04/07/1992
Expiration Date Of Regulatory Measure:	Not reported
Termination Date Of Regulatory Measure:	Not reported
Discharge Name:	Zurn Industries Wilkins Div
Discharge Address:	1747 Commerce Way
Discharge City:	Paso Robles
Discharge State:	California
Discharge Zip:	93446
Received Date:	Not reported
Processed Date:	Not reported
Status:	Not reported
Status Date:	Not reported
Place Size:	Not reported
Place Size Unit:	Not reported
Contact:	Not reported
Contact Title:	Not reported
Contact Phone:	Not reported
Contact Phone Ext:	Not reported
Contact Email:	Not reported
Operator Name:	Not reported
Operator Address:	Not reported
Operator City:	Not reported
Operator State:	Not reported
Operator Zip:	Not reported
Operator Contact:	Not reported
Operator Contact Title:	Not reported
Operator Contact Phone:	Not reported
Operator Contact Phone Ext:	Not reported
Operator Contact Email:	Not reported
Operator Type:	Not reported
Developer:	Not reported
Developer Address:	Not reported
Developer City:	Not reported
Developer State:	Not reported
Developer Zip:	Not reported
Developer Contact:	Not reported
Developer Contact Title:	Not reported
Constype Linear Utility Ind:	Not reported
Emergency Phone:	Not reported
Emergency Phone Ext:	Not reported
Constype Above Ground Ind:	Not reported
Constype Below Ground Ind:	Not reported
Constype Cable Line Ind:	Not reported
Constype Comm Line Ind:	Not reported
Constype Commertial Ind:	Not reported
Constype Electrical Line Ind:	Not reported
Constype Gas Line Ind:	Not reported
Constype Industrial Ind:	Not reported
Constype Other Description:	Not reported
Constype Other Ind:	Not reported
Constype Recons Ind:	Not reported
Constype Residential Ind:	Not reported

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

ZURN INDUSTRIES WILKINS DIV (Continued) **S100878290**

Constype Transport Ind:	Not reported
Constype Utility Description:	Not reported
Constype Utility Ind:	Not reported
Constype Water Sewer Ind:	Not reported
Dir Discharge Uswater Ind:	Not reported
Receiving Water Name:	Not reported
Certifier:	Not reported
Certifier Title:	Not reported
Certification Date:	Not reported
Primary Sic:	Not reported
Secondary Sic:	Not reported
Tertiary Sic:	Not reported

CERS HAZ WASTE:

Site ID:	408102
CERS ID:	10437868
CERS Description:	Hazardous Waste Generator

Violations:

Site ID:	408102
Site Name:	ZURN INDUSTRIES, INC.
Violation Date:	06-29-2017
Citation:	HSC 6.95 25508(a)(1) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(a)(1)
Violation Description:	Failure to complete and electronically submit hazardous material inventory information for all reportable hazardous materials on site at or above reportable quantities.
Violation Notes:	Returned to compliance on 08/24/2017. Electronically update largest container size and maximum daily amount of product oils and compressed gases in chemical inventory by 7/29/2017.
Violation Division:	San Luis Obispo County Environmental Health
Violation Program:	HMRRP
Violation Source:	CERS

Site ID:	408102
Site Name:	ZURN INDUSTRIES, INC.
Violation Date:	08-28-2015
Citation:	HSC 6.95 25508(d) - California Health and Safety Code, Chapter 6.95, Section(s) 25508(d)
Violation Description:	Failure to complete and/or electronically submit a business plan when storing/handling a hazardous material at or above reportable quantities.
Violation Notes:	Returned to compliance on 09/08/2015. Please review and update, where necessary, your haz mat business plan. At a minimum, please change the date range ata the top and the certification date at the bottom of the Form S Owner Operator page.
Violation Division:	San Luis Obispo County Environmental Health
Violation Program:	HMRRP
Violation Source:	CERS

Evaluation:

Eval General Type:	Compliance Evaluation Inspection
Eval Date:	06-29-2017
Violations Found:	No
Eval Type:	Routine done by local agency
Eval Notes:	Not reported

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

ZURN INDUSTRIES WILKINS DIV (Continued) **S100878290**

Eval Division: San Luis Obispo County Environmental Health
Eval Program: HW
Eval Source: CERS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 06-29-2017
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Items marked N/A not reviewed during inspection. Determine cause and repair small oil leak at compressor.
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HMRRP
Eval Source: CERS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-18-2014
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HMRRP
Eval Source: CERS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 07-18-2014
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HW
Eval Source: CERS

Eval General Type: Other/Unknown
Eval Date: 08-24-2017
Violations Found: No
Eval Type: Other, not routine, done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HMRRP
Eval Source: CERS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 08-28-2015
Violations Found: No
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HW
Eval Source: CERS

Eval General Type: Compliance Evaluation Inspection
Eval Date: 08-28-2015
Violations Found: Yes
Eval Type: Routine done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HMRRP

ZURN INDUSTRIES WILKINS DIV (Continued) **S100878290**

Eval Source: CERS

Eval General Type: Other/Unknown
Eval Date: 08-28-2017
Violations Found: No
Eval Type: Other, not routine, done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HMRRP
Eval Source: CERS

Eval General Type: Other/Unknown
Eval Date: 09-08-2015
Violations Found: No
Eval Type: Other, not routine, done by local agency
Eval Notes: Not reported
Eval Division: San Luis Obispo County Environmental Health
Eval Program: HMRRP
Eval Source: CERS

Coordinates:
Site ID: 408102
Facility Name: ZURN INDUSTRIES, INC.
Env Int Type Code: HWG
Program ID: 10437868
Coord Name: Not reported
Ref Point Type Desc: Center of a facility or station.
Latitude: 35.610240
Longitude: -120.652420

Affiliation:
Affiliation Type Desc: CUPA District
Entity Name: SLO County Env Health
Entity Title: Not reported
Affiliation Address: 2156 Sierra Way
Affiliation City: San Luis Obispo
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 93406
Affiliation Phone: (805) 781-5544

Affiliation Type Desc: Environmental Contact
Entity Name: Ed Stettler
Entity Title: Not reported
Affiliation Address: 1747 Commerce Way
Affiliation City: Paso Robles
Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 93422
Affiliation Phone: (805) 226-6225

Affiliation Type Desc: Facility Mailing Address
Entity Name: Mailing Address
Entity Title: Not reported
Affiliation Address: 1747 COMMERCE WAY
Affiliation City: PASO ROBLES

MAP FINDINGS

Map ID
Direction
Distance
Elevation | Site | Database(s) | EDR ID Number EPA ID Number

ZURN INDUSTRIES WILKINS DIV (Continued) **S100878290**

Affiliation State: CA
Affiliation Country: Not reported
Affiliation Zip: 93446
Affiliation Phone: Not reported

Affiliation Type Desc: Legal Owner
Entity Name: Zurn Industries, Inc.
Entity Title: Not reported
Affiliation Address: 1747 COMMERCE WAY
Affiliation City: PASO ROBLES
Affiliation State: CA
Affiliation Country: United States
Affiliation Zip: 93446
Affiliation Phone: (805) 226-6225

Affiliation Type Desc: Operator
Entity Name: Zurn Industries, Inc.
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: (805) 226-6225

Affiliation Type Desc: Parent Corporation
Entity Name: Zurn Industries, Inc.
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: Not reported
Affiliation Phone: Not reported

CERS TANKS:
Site ID: 87350
CERS ID: 93446ZRNND1747C
CERS Description: Toxic Release Inventory

Affiliation:
Affiliation Type Desc: Company Official
Entity Name: Ed Stettler
Entity Title: Operations Manager
Affiliation Address: Not reported
Affiliation City: Not reported
Affiliation State: Not reported
Affiliation Country: Not reported
Affiliation Zip: 93446
Affiliation Phone: Not reported

Affiliation Type Desc: Parent Company
Entity Name: REXNORD CORP
Entity Title: Not reported
Affiliation Address: Not reported
Affiliation City: Not reported

Map ID
Direction
Distance
Elevation Site

MAP FINDINGS

Database(s) EDR ID Number EPA ID Number

ZURN INDUSTRIES WILKINS DIV (Continued) **S100878290**

Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	93446
Affiliation Phone:	Not reported
Affiliation Type Desc:	Public Contact
Entity Name:	ED STETTLER
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	93446
Affiliation Phone:	8052266225
Affiliation Type Desc:	Technical Contact
Entity Name:	ED STETTLER
Entity Title:	Not reported
Affiliation Address:	Not reported
Affiliation City:	Not reported
Affiliation State:	Not reported
Affiliation Country:	Not reported
Affiliation Zip:	93446
Affiliation Phone:	8052266225

CIWQS:

Agency:	Zurn Industries Wilkins Div
Agency Address:	1747 Commerce Way, Paso Robles, CA 93446
Place/Project Type:	Industrial - Industrial Valves
SIC/NAICS:	3491
Region:	3
Program:	INDSTW
Regulatory Measure Status:	Active
Regulatory Measure Type:	Storm water industrial
Order Number:	2014-0057-DWQ
WDID:	3 40I004898
NPDES Number:	CAS000001
Adoption Date:	Not reported
Effective Date:	04/07/1992
Termination Date:	Not reported
Expiration/Review Date:	Not reported
Design Flow:	Not reported
Major/Minor:	Not reported
Complexity:	Not reported
TTWQ:	Not reported
Enforcement Actions within 5 years:	0
Violations within 5 years:	0
Latitude:	35.61026
Longitude:	-120.65233

MAP FINDINGS

Map ID / Direction / Distance / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
29 WNW 1/4-1/2 0.428 mi. 2261 ft.	**SHERWOOD FIELD** **SOUTHEASTERN PORTION OF THE CITY OF PASO ROBLES** **PASO ROBLES, CA 93446**	**ENVIROSTOR**	**S117038750** **N/A**

Relative: Lower

Actual: 814 ft.

ENVIROSTOR:

Facility ID:	80000757
Status:	Inactive - Action Required
Status Date:	01/23/2018
Site Code:	900196
Site Type:	Military Evaluation
Site Type Detailed:	FUDS
Acres:	181
NPL:	NO
Regulatory Agencies:	SMBRP
Lead Agency:	SMBRP
Program Manager:	Gregory Ruiz
Supervisor:	Fernando A. Amador
Division Branch:	Cleanup Sacramento
Assembly:	35
Senate:	17
Special Program:	DSMOA
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	DERA
Latitude:	35.61186
Longitude:	-120.6550
APN:	NONE SPECIFIED
Past Use:	AIRCRAFT MAINTENANCE, AIRFIELD OPERATIONS, FUEL - AIRCRAFT STORAGE/ REFUELING, JET FUEL STORAGE/REFUELING, UNDERGROUND STORAGE TANKS
Potential COC:	TPH-gas TPH-JET FUEL TPH-MOTOR OIL
Confirmed COC:	30025-NO 3002501-NO 3002502-NO
Potential Description:	OTH, SOIL
Alias Name:	CA99799F990700
Alias Type:	Federal Facility ID
Alias Name:	J09CA7086
Alias Type:	INPR
Alias Name:	900196
Alias Type:	Project Code (Site Code)
Alias Name:	80000757
Alias Type:	Envirostor ID Number
Alias Name:	http://www.ewarbirds.org/sherwood.html
Alias Type:	External Website Link / URL

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Site Screening
Completed Date:	11/07/2016
Comments:	Not reported
Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	Not reported
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Not reported
Schedule Due Date:	Not reported

MAP FINDINGS

Map ID / Direction / Distance / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
	SHERWOOD FIELD (Continued)		**S117038750**
	Schedule Revised Date: Not reported		

Count: 0 records.

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
		NO SITES FOUND			

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 07/17/2018
Date Data Arrived at EDR: 08/09/2018
Date Made Active in Reports: 09/07/2018
Number of Days to Update: 29

Source: EPA
Telephone: N/A
Last EDR Contact: 10/04/2018
Next Scheduled EDR Contact: 01/14/2019
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 07/17/2018
Date Data Arrived at EDR: 08/09/2018
Date Made Active in Reports: 09/07/2018
Number of Days to Update: 29

Source: EPA
Telephone: N/A
Last EDR Contact: 10/04/2018
Next Scheduled EDR Contact: 01/14/2019
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

Federal Delisted NPL site list

Delisted NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 07/17/2018
Date Data Arrived at EDR: 08/09/2018
Date Made Active in Reports: 09/07/2018
Number of Days to Update: 29

Source: EPA
Telephone: N/A
Last EDR Contact: 10/04/2018
Next Scheduled EDR Contact: 01/14/2019
Data Release Frequency: Quarterly

Federal CERCLIS list

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 11/07/2016
Date Data Arrived at EDR: 01/05/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 92

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 07/06/2018
Next Scheduled EDR Contact: 10/15/2018
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 07/17/2018
Date Data Arrived at EDR: 08/09/2018
Date Made Active in Reports: 09/07/2018
Number of Days to Update: 29

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 10/04/2018
Next Scheduled EDR Contact: 01/28/2019
Data Release Frequency: Quarterly

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 07/17/2018
Date Data Arrived at EDR: 08/09/2018
Date Made Active in Reports: 09/07/2018
Number of Days to Update: 29

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 10/04/2018
Next Scheduled EDR Contact: 01/28/2019
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/28/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 86

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 09/19/2018
Next Scheduled EDR Contact: 01/07/2019
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/28/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 09/19/2018
Next Scheduled EDR Contact: 01/07/2019
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/28/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 09/19/2018
Next Scheduled EDR Contact: 01/07/2019
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/28/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 09/19/2018
Next Scheduled EDR Contact: 01/07/2019
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/28/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 09/19/2018
Next Scheduled EDR Contact: 01/07/2019
Data Release Frequency: Quarterly

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 05/14/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 07/16/2018
Next Scheduled EDR Contact: 11/26/2018
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 07/31/2018
Date Data Arrived at EDR: 08/28/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 17

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 08/28/2018
Next Scheduled EDR Contact: 12/10/2018
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 07/31/2018
Date Data Arrived at EDR: 08/28/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 17

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 08/28/2018
Next Scheduled EDR Contact: 12/10/2018
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 06/18/2018
Date Data Arrived at EDR: 06/27/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 79

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 09/25/2018
Next Scheduled EDR Contact: 01/07/2019
Data Release Frequency: Quarterly

State- and tribal - equivalent NPL

RESPONSE: State Response Sites

Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 07/30/2018
Date Data Arrived at EDR: 07/31/2018
Date Made Active in Reports: 09/07/2018
Number of Days to Update: 38

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 07/31/2018
Next Scheduled EDR Contact: 11/12/2018
Data Release Frequency: Quarterly

State- and tribal - equivalent CERCLIS

ENVIROSTOR: EnviroStor Database

The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 07/30/2018
Date Data Arrived at EDR: 07/31/2018
Date Made Active in Reports: 09/07/2018
Number of Days to Update: 38

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 07/31/2018
Next Scheduled EDR Contact: 11/12/2018
Data Release Frequency: Quarterly

State and tribal landfill and/or solid waste disposal site lists

SWF/LF (SWIS): Solid Waste Information System

Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 08/08/2018
Date Data Arrived at EDR: 08/10/2018
Date Made Active in Reports: 08/24/2018
Number of Days to Update: 14

Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 08/10/2018
Next Scheduled EDR Contact: 11/26/2018
Data Release Frequency: Quarterly

State and tribal leaking storage tank lists

LUST REG 1: Active Toxic Site Investigation

Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 7: Leaking Underground Storage Tank Case Listing

Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-776-8943
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST: Leaking Underground Fuel Tank Report (GEOTRACKER)

Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 09/10/2018
Date Data Arrived at EDR: 09/12/2018
Date Made Active in Reports: 10/08/2018
Number of Days to Update: 26

Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 09/12/2018
Next Scheduled EDR Contact: 12/24/2018
Data Release Frequency: Quarterly

LUST REG 9: Leaking Underground Storage Tank Report

Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 09/26/2011
Next Scheduled EDR Contact: 01/09/2012
Data Release Frequency: No Update Planned

LUST REG 6V: Leaking Underground Storage Tank Case Listing

Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22

Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 6L: Leaking Underground Storage Tank Case Listing

For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 5: Leaking Underground Storage Tank Database

Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

LUST REG 2: Fuel Leak List

Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

LUST REG 3: Leaking Underground Storage Tank Database

Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

LUST REG 4: Underground Storage Tank Leak List

Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

LUST REG 8: Leaking Underground Storage Tanks

California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 04/12/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 04/10/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 04/25/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63
Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 04/24/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63
Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 04/01/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63
Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 05/08/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63
Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 04/13/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63
Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 04/12/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63
Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

CPS-SLIC: Statewide SLIC Cases (GEOTRACKER)
Cleanup Program Sites (CPS; also known as Site Cleanups [SC] and formerly known as Spills, Leaks, Investigations, and Cleanups [SLIC] sites) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 09/10/2018
Date Data Arrived at EDR: 09/12/2018
Date Made Active in Reports: 10/09/2018
Number of Days to Update: 27
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 12/24/2018
Data Release Frequency: Varies

SLIC REG 1: Active Toxic Site Investigations
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: Semi-Annually

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Varies

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Semi-Annually

SLIC REG 6L: SLIC Sites
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35
Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 7: SLIC List
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36
Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11
Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17
Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 08/08/2011
Next Scheduled EDR Contact: 11/21/2011
Data Release Frequency: Annually

State and tribal registered storage tank lists

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 05/15/2017
Date Data Arrived at EDR: 05/30/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 136
Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 10/10/2018
Next Scheduled EDR Contact: 01/21/2019
Data Release Frequency: Varies

UST: Active UST Facilities
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 09/10/2018
Date Data Arrived at EDR: 09/12/2018
Date Made Active in Reports: 10/03/2018
Number of Days to Update: 21
Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 09/12/2018
Next Scheduled EDR Contact: 12/24/2018
Data Release Frequency: Semi-Annually

UST CLOSURE: Proposed Closure of Underground Storage Tank (UST) Cases

UST cases that are being considered for closure by either the State Water Resources Control Board or the Executive Director have been posted for a 60-day public comment period. UST Case Closures being proposed for consideration by the State Water Resources Control Board. These are primarily UST cases that meet closure criteria under the decisional framework in State Water Board Resolution No. 92-49 and other Board orders. UST Case Closures proposed for consideration by the Executive Director pursuant to State Water Board Resolution No. 2012-0061. These are cases that meet the criteria of the Low-Threat UST Case Closure Policy. UST Case Closure Review Denials and Approved Orders.

Date of Government Version: 09/10/2018
Date Data Arrived at EDR: 09/12/2018
Date Made Active in Reports: 10/03/2018
Number of Days to Update: 21

Source: State Water Resources Control Board
Telephone: 916-327-7844
Last EDR Contact: 09/12/2018
Next Scheduled EDR Contact: 12/24/2018
Data Release Frequency: Varies

MILITARY UST SITES: Military UST Sites (GEOTRACKER)

Military ust sites

Date of Government Version: 09/10/2018
Date Data Arrived at EDR: 09/12/2018
Date Made Active in Reports: 10/09/2018
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 12/24/2018
Data Release Frequency: Varies

AST: Aboveground Petroleum Storage Tank Facilities

A listing of aboveground storage tank petroleum storage tank locations.

Date of Government Version: 07/06/2016
Date Data Arrived at EDR: 07/12/2016
Date Made Active in Reports: 09/19/2016
Number of Days to Update: 69

Source: California Environmental Protection Agency
Telephone: 916-327-5092
Last EDR Contact: 09/17/2018
Next Scheduled EDR Contact: 12/31/2018
Data Release Frequency: Quarterly

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 05/08/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 04/12/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 04/10/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 04/12/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63
Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 04/13/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63
Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 04/24/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63
Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 04/01/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63
Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 04/25/2018
Date Data Arrived at EDR: 05/18/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 63
Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

State and tribal voluntary cleanup sites

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27
Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

VCP: Voluntary Cleanup Program Properties

Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 07/30/2018
Date Data Arrived at EDR: 07/31/2018
Date Made Active in Reports: 09/07/2018
Number of Days to Update: 38

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 07/31/2018
Next Scheduled EDR Contact: 11/12/2018
Data Release Frequency: Quarterly

INDIAN VCP R1: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 09/24/2018
Next Scheduled EDR Contact: 01/07/2019
Data Release Frequency: Varies

State and tribal Brownfields sites

BROWNFIELDS: Considered Brownfieds Sites Listing

A listing of sites the SWRCB considers to be Brownfields since these are sites have come to them through the MOA Process.

Date of Government Version: 09/24/2018
Date Data Arrived at EDR: 09/25/2018
Date Made Active in Reports: 10/15/2018
Number of Days to Update: 20

Source: State Water Resources Control Board
Telephone: 916-323-7905
Last EDR Contact: 09/25/2018
Next Scheduled EDR Contact: 01/07/2019
Data Release Frequency: Quarterly

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 06/18/2018
Date Data Arrived at EDR: 06/20/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 09/18/2018
Next Scheduled EDR Contact: 12/31/2018
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

WMUDS/SWAT: Waste Management Unit Database

Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 07/24/2018
Next Scheduled EDR Contact: 11/12/2018
Data Release Frequency: No Update Planned

SWRCY: Recycler Database
A listing of recycling facilities in California.

Date of Government Version: 09/10/2018
Date Data Arrived at EDR: 09/12/2018
Date Made Active in Reports: 10/15/2018
Number of Days to Update: 33

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 09/12/2018
Next Scheduled EDR Contact: 12/24/2018
Data Release Frequency: Quarterly

HAULERS: Registered Waste Tire Haulers Listing
A listing of registered waste tire haulers.

Date of Government Version: 05/29/2018
Date Data Arrived at EDR: 05/30/2018
Date Made Active in Reports: 07/17/2018
Number of Days to Update: 48

Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 08/07/2018
Next Scheduled EDR Contact: 11/26/2018
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 07/30/2018
Next Scheduled EDR Contact: 11/12/2018
Data Release Frequency: Varies

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 10/22/2018
Next Scheduled EDR Contact: 02/04/2019
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land
A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176

Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 08/03/2018
Next Scheduled EDR Contact: 11/12/2018
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 05/18/2018
Date Data Arrived at EDR: 06/20/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 86

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 08/28/2018
Next Scheduled EDR Contact: 12/10/2018
Data Release Frequency: No Update Planned

HIST CAL-SITES: Calsites Database

The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/03/2006
Date Made Active in Reports: 08/24/2006
Number of Days to Update: 21

Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2009
Next Scheduled EDR Contact: 05/25/2009
Data Release Frequency: No Update Planned

SCH: School Property Evaluation Program

This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 07/30/2018
Date Data Arrived at EDR: 07/31/2018
Date Made Active in Reports: 09/07/2018
Number of Days to Update: 38

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 07/31/2018
Next Scheduled EDR Contact: 11/12/2018
Data Release Frequency: Quarterly

CDL: Clandestine Drug Labs

A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 06/12/2018
Date Made Active in Reports: 08/06/2018
Number of Days to Update: 55

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 10/22/2018
Next Scheduled EDR Contact: 01/21/2019
Data Release Frequency: Varies

TOXIC PITS: Toxic Pits Cleanup Act Sites

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 05/18/2018
Date Data Arrived at EDR: 06/20/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 86

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 08/28/2018
Next Scheduled EDR Contact: 12/10/2018
Data Release Frequency: Quarterly

CERS HAZ WASTE: CERS HAZ WASTE

List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Hazardous Chemical Management, Hazardous Waste Onsite Treatment, Household Hazardous Waste Collection, Hazardous Waste Generator, and RCRA LQ HW Generator programs.

Date of Government Version: 07/23/2018
Date Data Arrived at EDR: 07/25/2018
Date Made Active in Reports: 09/05/2018
Number of Days to Update: 42

Source: CalEPA
Telephone: 916-323-2514
Last EDR Contact: 10/23/2018
Next Scheduled EDR Contact: 02/04/2019
Data Release Frequency: Quarterly

Local Lists of Registered Storage Tanks

SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

UST MENDOCINO: Mendocino County UST Database

A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 03/28/2018
Date Data Arrived at EDR: 05/25/2018
Date Made Active in Reports: 07/10/2018
Number of Days to Update: 46

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 10/09/2018
Next Scheduled EDR Contact: 12/10/2018
Data Release Frequency: Annually

HIST UST: Hazardous Substance Storage Container Database

The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SAN FRANCISCO AST: Aboveground Storage Tank Site Listing

Aboveground storage tank sites

Date of Government Version: 09/11/2018
Date Data Arrived at EDR: 09/12/2018
Date Made Active in Reports: 10/11/2018
Number of Days to Update: 29

Source: San Francisco County Department of Public Health
Telephone: 415-252-3896
Last EDR Contact: 08/01/2018
Next Scheduled EDR Contact: 11/19/2018
Data Release Frequency: Varies

CA FID UST: Facility Inventory Database

The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24
Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CERS TANKS: California Environmental Reporting System (CERS) Tanks
List of sites in the California Environmental Protection Agency (CalEPA) Regulated Site Portal which fall under the Aboveground Petroleum Storage and Underground Storage Tank regulatory programs.

Date of Government Version: 07/23/2018
Date Data Arrived at EDR: 07/25/2018
Date Made Active in Reports: 09/05/2018
Number of Days to Update: 42
Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 10/23/2018
Next Scheduled EDR Contact: 02/04/2019
Data Release Frequency: Quarterly

Local Land Records

LIENS: Environmental Liens Listing
A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 08/29/2018
Date Data Arrived at EDR: 08/30/2018
Date Made Active in Reports: 10/01/2018
Number of Days to Update: 32
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 08/29/2018
Next Scheduled EDR Contact: 12/17/2018
Data Release Frequency: Varies

LIENS 2: CERCLA Lien Information
A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 07/17/2018
Date Data Arrived at EDR: 08/09/2018
Date Made Active in Reports: 10/05/2018
Number of Days to Update: 57
Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 10/04/2018
Next Scheduled EDR Contact: 01/14/2019
Data Release Frequency: Semi-Annually

DEED: Deed Restriction Listing
Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 09/04/2018
Date Data Arrived at EDR: 09/05/2018
Date Made Active in Reports: 10/02/2018
Number of Days to Update: 27
Source: DTSC and SWRCB
Telephone: 916-323-3400
Last EDR Contact: 09/05/2018
Next Scheduled EDR Contact: 12/17/2018
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System
Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 03/26/2018
Date Data Arrived at EDR: 03/27/2018
Date Made Active in Reports: 06/08/2018
Number of Days to Update: 73
Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 09/25/2018
Next Scheduled EDR Contact: 01/07/2019
Data Release Frequency: Quarterly

CHMIRS: California Hazardous Material Incident Report System
California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 04/06/2018
Date Data Arrived at EDR: 04/24/2018
Date Made Active in Reports: 06/14/2018
Number of Days to Update: 51
Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Semi-Annually

LDS: Land Disposal Sites Listing (GEOTRACKER)
Land Disposal sites (Landfills) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 09/10/2018
Date Data Arrived at EDR: 09/12/2018
Date Made Active in Reports: 10/08/2018
Number of Days to Update: 26
Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 12/24/2018
Data Release Frequency: Quarterly

MCS: Military Cleanup Sites Listing (GEOTRACKER)
Military sites (consisting of: Military UST sites; Military Privatized sites; and Military Cleanup sites [formerly known as DoD non UST]) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 09/10/2018
Date Data Arrived at EDR: 09/12/2018
Date Made Active in Reports: 10/09/2018
Number of Days to Update: 27
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 12/24/2018
Data Release Frequency: Quarterly

SPILLS 90: SPILLS90 data from FirstSearch
Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 06/06/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/22/2013
Number of Days to Update: 50
Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated
RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 03/01/2018
Date Data Arrived at EDR: 03/28/2018
Date Made Active in Reports: 06/22/2018
Number of Days to Update: 86
Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 09/19/2018
Next Scheduled EDR Contact: 01/07/2019
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 01/31/2015
Date Data Arrived at EDR: 07/08/2015
Date Made Active in Reports: 10/13/2015
Number of Days to Update: 97
Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 08/24/2018
Next Scheduled EDR Contact: 12/03/2018
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62
Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 10/12/2018
Next Scheduled EDR Contact: 01/21/2019
Data Release Frequency: Semi-Annually

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339
Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 10/12/2018
Next Scheduled EDR Contact: 01/21/2019
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 01/01/2017
Date Data Arrived at EDR: 02/03/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 63
Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 08/17/2018
Next Scheduled EDR Contact: 11/26/2018
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 06/27/2018
Date Made Active in Reports: 10/05/2018
Number of Days to Update: 100
Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 09/25/2018
Next Scheduled EDR Contact: 01/07/2019
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 08/03/2018
Next Scheduled EDR Contact: 11/19/2018
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 05/08/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 08/10/2018
Next Scheduled EDR Contact: 11/19/2018
Data Release Frequency: Varies

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 06/21/2017
Date Made Active in Reports: 01/05/2018
Number of Days to Update: 198

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 09/21/2018
Next Scheduled EDR Contact: 12/31/2018
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 01/10/2018
Date Made Active in Reports: 01/12/2018
Number of Days to Update: 2

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 08/24/2018
Next Scheduled EDR Contact: 12/03/2018
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 10/24/2018
Next Scheduled EDR Contact: 02/04/2019
Data Release Frequency: Annually

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 07/17/2018
Date Data Arrived at EDR: 08/09/2018
Date Made Active in Reports: 10/05/2018
Number of Days to Update: 57

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 10/04/2018
Next Scheduled EDR Contact: 12/17/2018
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 08/01/2018
Date Data Arrived at EDR: 08/22/2018
Date Made Active in Reports: 10/05/2018
Number of Days to Update: 44

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 10/23/2018
Next Scheduled EDR Contact: 02/04/2019
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 10/17/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 3

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 10/04/2018
Next Scheduled EDR Contact: 11/19/2018
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 06/01/2017
Date Data Arrived at EDR: 06/09/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 126

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 10/11/2018
Next Scheduled EDR Contact: 01/21/2019
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 10/09/2018
Next Scheduled EDR Contact: 01/21/2019
Data Release Frequency: Quarterly

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: Quarterly

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 08/30/2016
Date Data Arrived at EDR: 09/08/2016
Date Made Active in Reports: 10/21/2016
Number of Days to Update: 43

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 09/28/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Quarterly

COAL ASH DOE: Steam-Electric Plant Operation Data

A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 09/07/2018
Next Scheduled EDR Contact: 12/17/2018
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List

A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 07/01/2014
Date Data Arrived at EDR: 09/10/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 09/04/2018
Next Scheduled EDR Contact: 12/17/2018
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 05/24/2017
Date Data Arrived at EDR: 11/30/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 15
Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 07/27/2018
Next Scheduled EDR Contact: 11/05/2018
Data Release Frequency: Varies

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 07/02/2018
Date Data Arrived at EDR: 07/05/2018
Date Made Active in Reports: 10/05/2018
Number of Days to Update: 92
Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 10/03/2018
Next Scheduled EDR Contact: 01/14/2019
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

DOT OPS: Incident and Accident Data
Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 08/07/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 42
Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 08/09/2018
Next Scheduled EDR Contact: 11/12/2018
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees
Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 06/30/2018
Date Data Arrived at EDR: 07/17/2018
Date Made Active in Reports: 10/05/2018
Number of Days to Update: 80
Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 10/01/2018
Next Scheduled EDR Contact: 12/31/2018
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2015
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 09/28/2017
Number of Days to Update: 218
Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 08/24/2018
Next Scheduled EDR Contact: 12/03/2018
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546
Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 10/09/2018
Next Scheduled EDR Contact: 01/21/2019
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 08/08/2017
Date Data Arrived at EDR: 09/11/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 3
Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 09/11/2018
Next Scheduled EDR Contact: 11/19/2018
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 06/23/2017
Date Data Arrived at EDR: 10/11/2017
Date Made Active in Reports: 11/03/2017
Number of Days to Update: 23
Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 08/20/2018
Next Scheduled EDR Contact: 12/03/2018
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 07/17/2018
Date Data Arrived at EDR: 08/09/2018
Date Made Active in Reports: 10/05/2018
Number of Days to Update: 57
Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 10/04/2018
Next Scheduled EDR Contact: 01/14/2019
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 08/01/2018
Date Data Arrived at EDR: 08/29/2018
Date Made Active in Reports: 10/05/2018
Number of Days to Update: 37

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 08/29/2018
Next Scheduled EDR Contact: 12/10/2018
Data Release Frequency: Semi-Annually

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing

This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 12/05/2005
Date Data Arrived at EDR: 02/29/2008
Date Made Active in Reports: 04/18/2008
Number of Days to Update: 49

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 08/31/2018
Next Scheduled EDR Contact: 12/10/2018
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 08/31/2018
Next Scheduled EDR Contact: 12/10/2018
Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 09/10/2018
Date Data Arrived at EDR: 09/11/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 3

Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 09/10/2018
Next Scheduled EDR Contact: 12/24/2018
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 08/07/2018
Date Data Arrived at EDR: 09/05/2018
Date Made Active in Reports: 10/05/2018
Number of Days to Update: 30

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 09/18/2018
Next Scheduled EDR Contact: 12/17/2018
Data Release Frequency: Quarterly

UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 06/19/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 87

Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 10/15/2018
Next Scheduled EDR Contact: 01/28/2019
Data Release Frequency: Varies

DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 07/26/2018
Date Made Active in Reports: 10/05/2018
Number of Days to Update: 71

Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 08/31/2018
Next Scheduled EDR Contact: 12/10/2018
Data Release Frequency: Varies

ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 09/02/2018
Date Data Arrived at EDR: 09/05/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 9

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 09/05/2018
Next Scheduled EDR Contact: 12/17/2018
Data Release Frequency: Quarterly

FUELS PROGRAM: EPA Fuels Program Registered Listing

This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 08/22/2018
Date Data Arrived at EDR: 08/22/2018
Date Made Active in Reports: 10/05/2018
Number of Days to Update: 44

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 08/22/2018
Next Scheduled EDR Contact: 12/03/2018
Data Release Frequency: Quarterly

CA BOND EXP. PLAN: Bond Expenditure Plan

Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6

Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CORTESE: "Cortese" Hazardous Waste & Substances Sites List

The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 09/24/2018
Date Data Arrived at EDR: 09/25/2018
Date Made Active in Reports: 10/16/2018
Number of Days to Update: 21

Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 09/25/2018
Next Scheduled EDR Contact: 01/07/2019
Data Release Frequency: Quarterly

CUPA SAN FRANCISCO CO: CUPA Facility Listing

Cupa facilities

Date of Government Version: 09/11/2018
Date Data Arrived at EDR: 09/12/2018
Date Made Active in Reports: 09/19/2018
Number of Days to Update: 7

Source: San Francisco County Department of Environmental Health
Telephone: 415-252-3896
Last EDR Contact: 08/01/2018
Next Scheduled EDR Contact: 11/19/2018
Data Release Frequency: Varies

CUPA LIVERMORE-PLEASANTON: CUPA Facility Listing

list of facilities associated with the various CUPA programs in Livermore-Pleasanton

Date of Government Version: 04/03/2018
Date Data Arrived at EDR: 05/07/2018
Date Made Active in Reports: 06/15/2018
Number of Days to Update: 39

Source: Livermore-Pleasanton Fire Department
Telephone: 925-454-2361
Last EDR Contact: 08/24/2018
Next Scheduled EDR Contact: 11/26/2018
Data Release Frequency: Varies

DRYCLEAN SOUTH COAST: South Coast Air Quality Management District Drycleaner Listing

A listing of dry cleaners in the South Coast Air Quality Management District

Date of Government Version: 08/24/2018
Date Data Arrived at EDR: 08/30/2018
Date Made Active in Reports: 10/01/2018
Number of Days to Update: 32

Source: South Coast Air Quality Management District
Telephone: 909-396-3211
Last EDR Contact: 10/05/2018
Next Scheduled EDR Contact: 12/10/2018
Data Release Frequency: Varies

DRYCLEAN AVAQMD: Antelope Valley Air Quality Management District Drycleaner Listing

A listing of dry cleaners in the Antelope Valley Air Quality Management District.

Date of Government Version: 06/25/2018
Date Data Arrived at EDR: 06/28/2018
Date Made Active in Reports: 08/06/2018
Number of Days to Update: 39

Source: Antelope Valley Air Quality Management District
Telephone: 661-723-8070
Last EDR Contact: 10/15/2018
Next Scheduled EDR Contact: 12/17/2018
Data Release Frequency: Varies

DRYCLEANERS: Cleaner Facilities

A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 06/20/2018
Date Made Active in Reports: 08/06/2018
Number of Days to Update: 47

Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 08/29/2018
Next Scheduled EDR Contact: 12/17/2018
Data Release Frequency: Annually

EMI: Emissions Inventory Data

Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 06/20/2018
Date Made Active in Reports: 08/06/2018
Number of Days to Update: 47

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 09/21/2018
Next Scheduled EDR Contact: 12/31/2018
Data Release Frequency: Varies

ENF: Enforcement Action Listing

A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

Date of Government Version: 08/01/2018
Date Data Arrived at EDR: 08/02/2018
Date Made Active in Reports: 09/07/2018
Number of Days to Update: 36

Source: State Water Resoruces Control Board
Telephone: 916-445-9379
Last EDR Contact: 10/22/2018
Next Scheduled EDR Contact: 02/04/2019
Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing

Financial Assurance information

Date of Government Version: 07/17/2018
Date Data Arrived at EDR: 07/24/2018
Date Made Active in Reports: 09/10/2018
Number of Days to Update: 48

Source: Department of Toxic Substances Control
Telephone: 916-255-3628
Last EDR Contact: 10/22/2018
Next Scheduled EDR Contact: 02/04/2019
Data Release Frequency: Varies

Financial Assurance 2: Financial Assurance Information Listing

A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 08/14/2018
Date Data Arrived at EDR: 08/16/2018
Date Made Active in Reports: 09/10/2018
Number of Days to Update: 25

Source: California Integrated Waste Management Board
Telephone: 916-341-6066
Last EDR Contact: 08/07/2018
Next Scheduled EDR Contact: 11/26/2018
Data Release Frequency: Varies

HAZNET: Facility and Manifest Data

Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method. This database begins with calendar year 1993.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 07/12/2017
Date Made Active in Reports: 10/17/2017
Number of Days to Update: 97

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 10/10/2018
Next Scheduled EDR Contact: 01/21/2019
Data Release Frequency: Annually

ICE: ICE
Contains data pertaining to the Permitted Facilities with Inspections / Enforcements sites tracked in Envirostor.

Date of Government Version: 08/20/2018
Date Data Arrived at EDR: 08/21/2018
Date Made Active in Reports: 09/10/2018
Number of Days to Update: 20

Source: Department of Toxic Subsances Control
Telephone: 877-786-9427
Last EDR Contact: 08/21/2018
Next Scheduled EDR Contact: 12/03/2018
Data Release Frequency: Quarterly

HIST CORTESE: Hazardous Waste & Substance Site List
The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 01/22/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

HWP: EnviroStor Permitted Facilities Listing
Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 08/20/2018
Date Data Arrived at EDR: 08/21/2018
Date Made Active in Reports: 09/10/2018
Number of Days to Update: 20

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 08/21/2018
Next Scheduled EDR Contact: 12/03/2018
Data Release Frequency: Quarterly

HWT: Registered Hazardous Waste Transporter Database
A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

Date of Government Version: 07/09/2018
Date Data Arrived at EDR: 07/11/2018
Date Made Active in Reports: 08/24/2018
Number of Days to Update: 44

Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 10/10/2018
Next Scheduled EDR Contact: 01/21/2019
Data Release Frequency: Quarterly

MINES: Mines Site Location Listing
A listing of mine site locations from the Office of Mine Reclamation.

Date of Government Version: 09/10/2018
Date Data Arrived at EDR: 09/12/2018
Date Made Active in Reports: 10/09/2018
Number of Days to Update: 27

Source: Department of Conservation
Telephone: 916-322-1080
Last EDR Contact: 09/12/2018
Next Scheduled EDR Contact: 12/24/2018
Data Release Frequency: Quarterly

MWMP: Medical Waste Management Program Listing
The Medical Waste Management Program (MWMP) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste Offsite Treatment Facilities (PDF) and Transfer Stations (PDF) throughout the state. MWMP also oversees all Medical Waste Transporters.

Date of Government Version: 08/28/2018
Date Data Arrived at EDR: 09/05/2018
Date Made Active in Reports: 10/03/2018
Number of Days to Update: 28

Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 09/05/2018
Next Scheduled EDR Contact: 12/17/2018
Data Release Frequency: Varies

NPDES: NPDES Permits Listing
A listing of NPDES permits, including stormwater.

Date of Government Version: 08/09/2018
Date Data Arrived at EDR: 08/10/2018
Date Made Active in Reports: 09/10/2018
Number of Days to Update: 31
Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 08/10/2018
Next Scheduled EDR Contact: 11/26/2018
Data Release Frequency: Quarterly

PEST LIC: Pesticide Regulation Licenses Listing
A listing of licenses and certificates issued by the Department of Pesticide Regulation. The DPR issues licenses and/or certificates to: Persons and businesses that apply or sell pesticides; Pest control dealers and brokers; Persons who advise on agricultural pesticide applications.

Date of Government Version: 09/04/2018
Date Data Arrived at EDR: 09/05/2018
Date Made Active in Reports: 10/03/2018
Number of Days to Update: 28
Source: Department of Pesticide Regulation
Telephone: 916-445-4038
Last EDR Contact: 09/05/2018
Next Scheduled EDR Contact: 12/17/2018
Data Release Frequency: Quarterly

PROC: Certified Processors Database
A listing of certified processors.

Date of Government Version: 09/10/2018
Date Data Arrived at EDR: 09/12/2018
Date Made Active in Reports: 10/15/2018
Number of Days to Update: 33
Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 09/12/2018
Next Scheduled EDR Contact: 12/24/2018
Data Release Frequency: Quarterly

NOTIFY 65: Proposition 65 Records
Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

Date of Government Version: 09/19/2018
Date Data Arrived at EDR: 09/20/2018
Date Made Active in Reports: 10/19/2018
Number of Days to Update: 29
Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 09/17/2018
Next Scheduled EDR Contact: 12/31/2018
Data Release Frequency: No Update Planned

UIC: UIC Listing
A listing of wells identified as underground injection wells, in the California Oil and Gas Wells database.

Date of Government Version: 04/27/2018
Date Data Arrived at EDR: 06/13/2018
Date Made Active in Reports: 07/17/2018
Number of Days to Update: 34
Source: Deaprtment of Conservation
Telephone: 916-445-2408
Last EDR Contact: 09/13/2018
Next Scheduled EDR Contact: 12/24/2018
Data Release Frequency: Varies

WASTEWATER PITS: Oil Wastewater Pits Listing
Water officials discovered that oil producers have been dumping chemical-laden wastewater into hundreds of unlined pits that are operating without proper permits. Inspections completed by the Central Valley Regional Water Quality Control Board revealed the existence of previously unidentified waste sites. The water boards review found that more than one-third of the region's active disposal pits are operating without permission.

Date of Government Version: 05/08/2018
Date Data Arrived at EDR: 07/11/2018
Date Made Active in Reports: 09/13/2018
Number of Days to Update: 64
Source: RWQCB, Central Valley Region
Telephone: 559-445-5577
Last EDR Contact: 10/12/2018
Next Scheduled EDR Contact: 01/21/2019
Data Release Frequency: Varies

WDS: Waste Discharge System
Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9
Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 08/17/2018
Next Scheduled EDR Contact: 12/03/2018
Data Release Frequency: Quarterly

WIP: Well Investigation Program Case List
Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009
Date Data Arrived at EDR: 07/21/2009
Date Made Active in Reports: 08/03/2009
Number of Days to Update: 13
Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 09/25/2018
Next Scheduled EDR Contact: 01/07/2019
Data Release Frequency: Varies

CIWQS: California Integrated Water Quality System
The California Integrated Water Quality System (CIWQS) is a computer system used by the State and Regional Water Quality Control Boards to track information about places of environmental interest, manage permits and other orders, track inspections, and manage violations and enforcement activities.

Date of Government Version: 09/04/2018
Date Data Arrived at EDR: 09/05/2018
Date Made Active in Reports: 10/02/2018
Number of Days to Update: 27
Source: State Water Resources Control Board
Telephone: 866-794-4977
Last EDR Contact: 09/05/2018
Next Scheduled EDR Contact: 12/17/2018
Data Release Frequency: Varies

WDR: Waste Discharge Requirements Listing
In general, the Waste Discharge Requirements (WDRs) Program (sometimes also referred to as the "Non Chapter 15 (Non 15) Program") regulates point discharges that are exempt pursuant to Subsection 20090 of Title 27 and not subject to the Federal Water Pollution Control Act. Exemptions from Title 27 may be granted for nine categories of discharges (e.g., sewage, wastewater, etc.) that meet, and continue to meet, the preconditions listed for each specific exemption. The scope of the WDRs Program also includes the discharge of wastes classified as inert, pursuant to section 20230 of Title 27.

Date of Government Version: 09/10/2018
Date Data Arrived at EDR: 09/12/2018
Date Made Active in Reports: 10/09/2018
Number of Days to Update: 27
Source: State Water Resources Control Board
Telephone: 916-341-5810
Last EDR Contact: 09/12/2018
Next Scheduled EDR Contact: 12/24/2018
Data Release Frequency: Quarterly

WELL STIM PROJ: Well Stimulation Project (GEOTRACKER)
Includes areas of groundwater monitoring plans, a depiction of the monitoring network, and the facilities, boundaries, and subsurface characteristics of the oilfield and the features (oil and gas wells, produced water ponds, UIC wells, water supply wells, etc?) being monitored

Date of Government Version: 09/10/2018
Date Data Arrived at EDR: 09/12/2018
Date Made Active in Reports: 10/09/2018
Number of Days to Update: 27
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 12/24/2018
Data Release Frequency: Varies

MILITARY PRIV SITES: Military Privatized Sites (GEOTRACKER)
Military privatized sites

Date of Government Version: 09/10/2018
Date Data Arrived at EDR: 09/12/2018
Date Made Active in Reports: 10/09/2018
Number of Days to Update: 27
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 12/24/2018
Data Release Frequency: Varies

OTHER OIL GAS: Other Oil & Gas Projects Sites (GEOTRACKER)
Other Oil & Gas Projects sites

Date of Government Version: 09/10/2018
Date Data Arrived at EDR: 09/12/2018
Date Made Active in Reports: 10/09/2018
Number of Days to Update: 27
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 12/24/2018
Data Release Frequency: Varies

CERS: CalEPA Regulated Site Portal Data
The CalEPA Regulated Site Portal database combines data about environmentally regulated sites and facilities in California into a single database. It combines data from a variety of state and federal databases, and provides an overview of regulated activities across the spectrum of environmental programs for any given location in California. These activities include hazardous materials and waste, state and federal cleanups, impacted ground and surface waters, and toxic materials

Date of Government Version: 07/23/2018
Date Data Arrived at EDR: 07/25/2018
Date Made Active in Reports: 09/05/2018
Number of Days to Update: 42
Source: California Environmental Protection Agency
Telephone: 916-323-2514
Last EDR Contact: 10/23/2018
Next Scheduled EDR Contact: 02/04/2019
Data Release Frequency: Varies

UIC GEO: Underground Injection Control Sites (GEOTRACKER)
Underground control injection sites

Date of Government Version: 09/10/2018
Date Data Arrived at EDR: 09/12/2018
Date Made Active in Reports: 10/09/2018
Number of Days to Update: 27
Source: State Water Resource Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 12/24/2018
Data Release Frequency: Varies

SAMPLING POINT: Sampling Point ? Public Sites (GEOTRACKER)
Sampling point - public sites

Date of Government Version: 09/10/2018
Date Data Arrived at EDR: 09/12/2018
Date Made Active in Reports: 10/09/2018
Number of Days to Update: 27
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 12/24/2018
Data Release Frequency: Varies

NON-CASE INFO: Non-Case Information Sites (GEOTRACKER)
Non-Case Information sites

Date of Government Version: 09/10/2018
Date Data Arrived at EDR: 09/12/2018
Date Made Active in Reports: 10/09/2018
Number of Days to Update: 27
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 12/24/2018
Data Release Frequency: Varies

PROJECT: Project Sites (GEOTRACKER)
Projects sites

Date of Government Version: 09/10/2018
Date Data Arrived at EDR: 09/12/2018
Date Made Active in Reports: 10/09/2018
Number of Days to Update: 27
Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 12/24/2018
Data Release Frequency: Varies

PROD WATER PONDS: Produced Water Ponds Sites (GEOTRACKER)
Produced water ponds sites

Date of Government Version: 09/10/2018
Date Data Arrived at EDR: 09/12/2018
Date Made Active in Reports: 10/09/2018
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 12/24/2018
Data Release Frequency: Varies

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF: Recovered Government Archive Solid Waste Facilities List
The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Resources Recycling and Recovery in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/13/2014
Number of Days to Update: 196
Source: Department of Resources Recycling and Recovery
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank
The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the State Water Resources Control Board in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/30/2013
Number of Days to Update: 182
Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

COUNTY RECORDS

ALAMEDA COUNTY:

CS ALAMEDA: Contaminated Sites
A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 08/03/2018
Date Data Arrived at EDR: 08/06/2018
Date Made Active in Reports: 09/05/2018
Number of Days to Update: 30
Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 10/05/2018
Next Scheduled EDR Contact: 01/21/2019
Data Release Frequency: Semi-Annually

UST ALAMEDA: Underground Tanks
Underground storage tank sites located in Alameda county.

Date of Government Version: 07/06/2018
Date Data Arrived at EDR: 07/10/2018
Date Made Active in Reports: 09/11/2018
Number of Days to Update: 63
Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 10/05/2018
Next Scheduled EDR Contact: 04/24/2047
Data Release Frequency: Semi-Annually

AMADOR COUNTY:

CUPA AMADOR: CUPA Facility List
Cupa Facility List

Date of Government Version: 07/01/2018
Date Data Arrived at EDR: 07/24/2018
Date Made Active in Reports: 08/20/2018
Number of Days to Update: 27
Source: Amador County Environmental Health
Telephone: 209-223-6439
Last EDR Contact: 08/29/2018
Next Scheduled EDR Contact: 12/17/2018
Data Release Frequency: Varies

BUTTE COUNTY:

CUPA BUTTE: CUPA Facility Listing
Cupa facility list.

Date of Government Version: 04/21/2017
Date Data Arrived at EDR: 04/25/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 106

Source: Public Health Department
Telephone: 530-538-7149
Last EDR Contact: 10/05/2018
Next Scheduled EDR Contact: 01/21/2019
Data Release Frequency: No Update Planned

CALVERAS COUNTY:

CUPA CALVERAS: CUPA Facility Listing
Cupa Facility Listing

Date of Government Version: 08/02/2018
Date Data Arrived at EDR: 08/06/2018
Date Made Active in Reports: 08/20/2018
Number of Days to Update: 14

Source: Calveras County Environmental Health
Telephone: 209-754-6399
Last EDR Contact: 09/24/2018
Next Scheduled EDR Contact: 01/07/2019
Data Release Frequency: Quarterly

COLUSA COUNTY:

CUPA COLUSA: CUPA Facility List
Cupa facility list.

Date of Government Version: 05/23/2018
Date Data Arrived at EDR: 05/24/2018
Date Made Active in Reports: 07/13/2018
Number of Days to Update: 50

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 08/17/2018
Next Scheduled EDR Contact: 11/19/2018
Data Release Frequency: Semi-Annually

CONTRA COSTA COUNTY:

SL CONTRA COSTA: Site List
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 08/20/2018
Date Data Arrived at EDR: 08/21/2018
Date Made Active in Reports: 09/11/2018
Number of Days to Update: 21

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 07/30/2018
Next Scheduled EDR Contact: 11/12/2018
Data Release Frequency: Semi-Annually

DEL NORTE COUNTY:

CUPA DEL NORTE: CUPA Facility List
Cupa Facility list

Date of Government Version: 04/27/2018
Date Data Arrived at EDR: 05/02/2018
Date Made Active in Reports: 06/15/2018
Number of Days to Update: 44

Source: Del Norte County Environmental Health Division
Telephone: 707-465-0426
Last EDR Contact: 07/24/2018
Next Scheduled EDR Contact: 11/12/2018
Data Release Frequency: Varies

EL DORADO COUNTY:

CUPA EL DORADO: CUPA Facility List
CUPA facility list.

Date of Government Version: 09/04/2018
Date Data Arrived at EDR: 09/05/2018
Date Made Active in Reports: 09/18/2018
Number of Days to Update: 13

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 07/30/2018
Next Scheduled EDR Contact: 11/12/2018
Data Release Frequency: Varies

FRESNO COUNTY:

CUPA FRESNO: CUPA Resources List
Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 07/11/2018
Date Data Arrived at EDR: 07/17/2018
Date Made Active in Reports: 08/30/2018
Number of Days to Update: 44

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 10/15/2018
Next Scheduled EDR Contact: 01/14/2019
Data Release Frequency: Semi-Annually

GLENN COUNTY:

CUPA GLENN: CUPA Facility List
Cupa facility list

Date of Government Version: 01/22/2018
Date Data Arrived at EDR: 01/24/2018
Date Made Active in Reports: 03/14/2018
Number of Days to Update: 49

Source: Glenn County Air Pollution Control District
Telephone: 830-934-6500
Last EDR Contact: 10/22/2018
Next Scheduled EDR Contact: 02/04/2019
Data Release Frequency: Varies

HUMBOLDT COUNTY:

CUPA HUMBOLDT: CUPA Facility List
CUPA facility list.

Date of Government Version: 07/11/2018
Date Data Arrived at EDR: 07/13/2018
Date Made Active in Reports: 08/22/2018
Number of Days to Update: 40

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 08/20/2018
Next Scheduled EDR Contact: 12/03/2018
Data Release Frequency: Semi-Annually

IMPERIAL COUNTY:

CUPA IMPERIAL: CUPA Facility List
Cupa facility list.

Date of Government Version: 07/17/2018
Date Data Arrived at EDR: 07/24/2018
Date Made Active in Reports: 09/05/2018
Number of Days to Update: 43

Source: San Diego Border Field Office
Telephone: 760-339-2777
Last EDR Contact: 10/22/2018
Next Scheduled EDR Contact: 02/04/2019
Data Release Frequency: Varies

INYO COUNTY:

CUPA INYO: CUPA Facility List
Cupa facility list.

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/03/2018
Date Made Active in Reports: 06/14/2018
Number of Days to Update: 72

Source: Inyo County Environmental Health Services
Telephone: 760-878-0238
Last EDR Contact: 10/15/2018
Next Scheduled EDR Contact: 12/03/2018
Data Release Frequency: Varies

KERN COUNTY:

UST KERN: Underground Storage Tank Sites & Tank Listing
Kern County Sites and Tanks Listing.

Date of Government Version: 07/20/2018
Date Data Arrived at EDR: 07/25/2018
Date Made Active in Reports: 09/12/2018
Number of Days to Update: 49

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 07/20/2018
Next Scheduled EDR Contact: 11/19/2018
Data Release Frequency: Quarterly

KINGS COUNTY:

CUPA KINGS: CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 08/23/2018
Date Data Arrived at EDR: 08/24/2018
Date Made Active in Reports: 09/18/2018
Number of Days to Update: 25

Source: Kings County Department of Public Health
Telephone: 559-584-1411
Last EDR Contact: 08/17/2018
Next Scheduled EDR Contact: 12/03/2018
Data Release Frequency: Varies

LAKE COUNTY:

CUPA LAKE: CUPA Facility List
Cupa facility list

Date of Government Version: 08/08/2018
Date Data Arrived at EDR: 08/09/2018
Date Made Active in Reports: 08/22/2018
Number of Days to Update: 13

Source: Lake County Environmental Health
Telephone: 707-263-1164
Last EDR Contact: 10/15/2018
Next Scheduled EDR Contact: 01/28/2019
Data Release Frequency: Varies

LASSEN COUNTY:

CUPA LASSEN: CUPA Facility List
Cupa facility list

Date of Government Version: 07/27/2018
Date Data Arrived at EDR: 08/06/2018
Date Made Active in Reports: 09/05/2018
Number of Days to Update: 30

Source: Lassen County Environmental Health
Telephone: 530-251-8528
Last EDR Contact: 10/22/2018
Next Scheduled EDR Contact: 02/04/2019
Data Release Frequency: Varies

LOS ANGELES COUNTY:

AOCONCERN: San Gabriel Valley Areas of Concern
San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office.

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 10/23/2009
Number of Days to Update: 206
Source: EPA Region 9
Telephone: 415-972-3178
Last EDR Contact: 09/17/2018
Next Scheduled EDR Contact: 12/31/2018
Data Release Frequency: No Update Planned

HMS LOS ANGELES: HMS: Street Number List
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 07/02/2018
Date Data Arrived at EDR: 07/13/2018
Date Made Active in Reports: 09/10/2018
Number of Days to Update: 59
Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 10/05/2018
Next Scheduled EDR Contact: 01/21/2019
Data Release Frequency: Semi-Annually

LF LOS ANGELES: List of Solid Waste Facilities
Solid Waste Facilities in Los Angeles County.

Date of Government Version: 07/16/2018
Date Data Arrived at EDR: 07/18/2018
Date Made Active in Reports: 08/24/2018
Number of Days to Update: 37
Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 10/16/2018
Next Scheduled EDR Contact: 01/28/2019
Data Release Frequency: Varies

LF LOS ANGELES CITY: City of Los Angeles Landfills
Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 01/01/2018
Date Data Arrived at EDR: 05/01/2018
Date Made Active in Reports: 05/14/2018
Number of Days to Update: 13
Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 10/15/2018
Next Scheduled EDR Contact: 01/28/2019
Data Release Frequency: Varies

SITE MIT LOS ANGELES: Site Mitigation List
Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 04/01/2018
Date Data Arrived at EDR: 04/17/2018
Date Made Active in Reports: 06/19/2018
Number of Days to Update: 63
Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 10/16/2018
Next Scheduled EDR Contact: 01/28/2019
Data Release Frequency: Annually

UST EL SEGUNDO: City of El Segundo Underground Storage Tank
Underground storage tank sites located in El Segundo city.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 04/19/2017
Date Made Active in Reports: 05/10/2017
Number of Days to Update: 21
Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 10/15/2018
Next Scheduled EDR Contact: 01/28/2019
Data Release Frequency: Semi-Annually

UST LONG BEACH: City of Long Beach Underground Storage Tank
Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 03/09/2017
Date Data Arrived at EDR: 03/10/2017
Date Made Active in Reports: 05/03/2017
Number of Days to Update: 54
Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 10/22/2018
Next Scheduled EDR Contact: 02/04/2019
Data Release Frequency: Annually

UST TORRANCE: City of Torrance Underground Storage Tank
Underground storage tank sites located in the city of Torrance.

Date of Government Version: 01/04/2018
Date Data Arrived at EDR: 01/05/2018
Date Made Active in Reports: 01/18/2018
Number of Days to Update: 13

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 10/05/2018
Next Scheduled EDR Contact: 01/21/2019
Data Release Frequency: Semi-Annually

MADERA COUNTY:

CUPA MADERA: CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 08/30/2018
Date Data Arrived at EDR: 09/04/2018
Date Made Active in Reports: 09/19/2018
Number of Days to Update: 15

Source: Madera County Environmental Health
Telephone: 559-675-7823
Last EDR Contact: 08/17/2018
Next Scheduled EDR Contact: 12/03/2018
Data Release Frequency: Varies

MARIN COUNTY:

UST MARIN: Underground Storage Tank Sites
Currently permitted USTs in Marin County.

Date of Government Version: 07/11/2018
Date Data Arrived at EDR: 07/17/2018
Date Made Active in Reports: 09/12/2018
Number of Days to Update: 57

Source: Public Works Department Waste Management
Telephone: 415-473-6647
Last EDR Contact: 10/01/2018
Next Scheduled EDR Contact: 01/14/2019
Data Release Frequency: Semi-Annually

MERCED COUNTY:

CUPA MERCED: CUPA Facility List
CUPA facility list.

Date of Government Version: 08/29/2018
Date Data Arrived at EDR: 08/31/2018
Date Made Active in Reports: 09/19/2018
Number of Days to Update: 19

Source: Merced County Environmental Health
Telephone: 209-381-1094
Last EDR Contact: 08/29/2018
Next Scheduled EDR Contact: 12/03/2018
Data Release Frequency: Varies

MONO COUNTY:

CUPA MONO: CUPA Facility List
CUPA Facility List

Date of Government Version: 07/18/2018
Date Data Arrived at EDR: 09/04/2018
Date Made Active in Reports: 09/19/2018
Number of Days to Update: 15

Source: Mono County Health Department
Telephone: 760-932-5580
Last EDR Contact: 08/24/2018
Next Scheduled EDR Contact: 12/10/2018
Data Release Frequency: Varies

MONTEREY COUNTY:

CUPA MONTEREY: CUPA Facility Listing
CUPA Program listing from the Environmental Health Division.

Date of Government Version: 07/30/2018
Date Data Arrived at EDR: 08/02/2018
Date Made Active in Reports: 09/05/2018
Number of Days to Update: 34

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 10/01/2018
Next Scheduled EDR Contact: 01/14/2019
Data Release Frequency: Varies

NAPA COUNTY:

LUST NAPA: Sites With Reported Contamination
A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 01/09/2017
Date Data Arrived at EDR: 01/11/2017
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 50

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 08/24/2018
Next Scheduled EDR Contact: 12/10/2018
Data Release Frequency: No Update Planned

UST NAPA: Closed and Operating Underground Storage Tank Sites
Underground storage tank sites located in Napa county.

Date of Government Version: 08/27/2018
Date Data Arrived at EDR: 08/28/2018
Date Made Active in Reports: 10/03/2018
Number of Days to Update: 36

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 08/24/2018
Next Scheduled EDR Contact: 12/10/2018
Data Release Frequency: No Update Planned

NEVADA COUNTY:

CUPA NEVADA: CUPA Facility List
CUPA facility list.

Date of Government Version: 07/31/2018
Date Data Arrived at EDR: 08/02/2018
Date Made Active in Reports: 09/05/2018
Number of Days to Update: 34

Source: Community Development Agency
Telephone: 530-265-1467
Last EDR Contact: 07/24/2018
Next Scheduled EDR Contact: 11/12/2018
Data Release Frequency: Varies

ORANGE COUNTY:

IND_SITE ORANGE: List of Industrial Site Cleanups
Petroleum and non-petroleum spills.

Date of Government Version: 07/13/2018
Date Data Arrived at EDR: 08/08/2018
Date Made Active in Reports: 09/10/2018
Number of Days to Update: 33

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 05/07/2018
Next Scheduled EDR Contact: 11/19/2018
Data Release Frequency: Annually

LUST ORANGE: List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 07/13/2018
Date Data Arrived at EDR: 08/08/2018
Date Made Active in Reports: 09/10/2018
Number of Days to Update: 33

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 08/03/2018
Next Scheduled EDR Contact: 11/19/2018
Data Release Frequency: Quarterly

UST ORANGE: List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 07/13/2018
Date Data Arrived at EDR: 08/06/2018
Date Made Active in Reports: 09/12/2018
Number of Days to Update: 37
Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 08/06/2018
Next Scheduled EDR Contact: 11/19/2018
Data Release Frequency: Quarterly

PLACER COUNTY:

MS PLACER: Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 09/04/2018
Date Data Arrived at EDR: 09/06/2018
Date Made Active in Reports: 10/03/2018
Number of Days to Update: 27
Source: Placer County Health and Human Services
Telephone: 530-745-2363
Last EDR Contact: 08/29/2018
Next Scheduled EDR Contact: 12/17/2018
Data Release Frequency: Semi-Annually

PLUMAS COUNTY:

CUPA PLUMAS: CUPA Facility List
Plumas County CUPA Program facilities.

Date of Government Version: 07/19/2018
Date Data Arrived at EDR: 07/25/2018
Date Made Active in Reports: 09/05/2018
Number of Days to Update: 42
Source: Plumas County Environmental Health
Telephone: 530-283-6355
Last EDR Contact: 10/22/2018
Next Scheduled EDR Contact: 02/04/2019
Data Release Frequency: Varies

RIVERSIDE COUNTY:

LUST RIVERSIDE: Listing of Underground Tank Cleanup Sites
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 10/10/2018
Date Data Arrived at EDR: 10/12/2018
Date Made Active in Reports: 10/16/2018
Number of Days to Update: 4
Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 09/17/2018
Next Scheduled EDR Contact: 12/31/2018
Data Release Frequency: Quarterly

UST RIVERSIDE: Underground Storage Tank Tank List
Underground storage tank sites located in Riverside county.

Date of Government Version: 07/09/2018
Date Data Arrived at EDR: 07/13/2018
Date Made Active in Reports: 09/12/2018
Number of Days to Update: 61
Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 09/17/2018
Next Scheduled EDR Contact: 12/31/2018
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

CS SACRAMENTO: Toxic Site Clean-Up List
List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 05/07/2018
Date Data Arrived at EDR: 07/03/2018
Date Made Active in Reports: 08/13/2018
Number of Days to Update: 41

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 10/02/2018
Next Scheduled EDR Contact: 01/14/2019
Data Release Frequency: Quarterly

ML SACRAMENTO: Master Hazardous Materials Facility List
Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 05/14/2018
Date Data Arrived at EDR: 07/03/2018
Date Made Active in Reports: 08/13/2018
Number of Days to Update: 41

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 10/02/2018
Next Scheduled EDR Contact: 01/14/2019
Data Release Frequency: Quarterly

SAN BENITO COUNTY:

CUPA SAN BENITO: CUPA Facility List
Cupa facility list

Date of Government Version: 08/07/2018
Date Data Arrived at EDR: 08/09/2018
Date Made Active in Reports: 09/05/2018
Number of Days to Update: 27

Source: San Benito County Environmental Health
Telephone: N/A
Last EDR Contact: 08/01/2018
Next Scheduled EDR Contact: 11/19/2018
Data Release Frequency: Varies

SAN BERNARDINO COUNTY:

PERMITS SAN BERNARDINO: Hazardous Material Permits
This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 07/27/2018
Date Data Arrived at EDR: 07/31/2018
Date Made Active in Reports: 09/10/2018
Number of Days to Update: 41

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 07/24/2018
Next Scheduled EDR Contact: 11/19/2018
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

HMMD SAN DIEGO: Hazardous Materials Management Division Database
The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 06/04/2018
Date Data Arrived at EDR: 06/06/2018
Date Made Active in Reports: 07/17/2018
Number of Days to Update: 41

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 09/06/2018
Next Scheduled EDR Contact: 12/17/2018
Data Release Frequency: Quarterly

LF SAN DIEGO: Solid Waste Facilities
San Diego County Solid Waste Facilities.

Date of Government Version: 04/18/2018
Date Data Arrived at EDR: 04/24/2018
Date Made Active in Reports: 06/19/2018
Number of Days to Update: 56
Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 10/22/2018
Next Scheduled EDR Contact: 02/04/2019
Data Release Frequency: Varies

SAN DIEGO CO LOP: Local Oversight Program Listing
A listing of all LOP release sites that are or were under the County of San Diego's jurisdiction. Included are closed or transferred cases, open cases, and cases that did not have a case type indicated. The cases without a case type are mostly complaints; however, some of them could be LOP cases.

Date of Government Version: 07/17/2018
Date Data Arrived at EDR: 07/24/2018
Date Made Active in Reports: 08/24/2018
Number of Days to Update: 31
Source: Department of Environmental Health
Telephone: 858-505-6874
Last EDR Contact: 10/22/2018
Next Scheduled EDR Contact: 02/04/2019
Data Release Frequency: Varies

SAN DIEGO CO. SAM: Environmental Case Listing
The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010
Date Data Arrived at EDR: 06/15/2010
Date Made Active in Reports: 07/09/2010
Number of Days to Update: 24
Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 08/29/2018
Next Scheduled EDR Contact: 12/17/2018
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

LUST SAN FRANCISCO: Local Oversite Facilities
A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 09/29/2008
Number of Days to Update: 10
Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 08/01/2018
Next Scheduled EDR Contact: 11/19/2018
Data Release Frequency: Quarterly

UST SAN FRANCISCO: Underground Storage Tank Information
Underground storage tank sites located in San Francisco county.

Date of Government Version: 09/17/2018
Date Data Arrived at EDR: 09/18/2018
Date Made Active in Reports: 10/03/2018
Number of Days to Update: 15
Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 08/01/2018
Next Scheduled EDR Contact: 11/19/2018
Data Release Frequency: Quarterly

SAN JOAQUIN COUNTY:

UST SAN JOAQUIN: San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 06/22/2018
Date Data Arrived at EDR: 06/26/2018
Date Made Active in Reports: 07/11/2018
Number of Days to Update: 15
Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 09/17/2018
Next Scheduled EDR Contact: 12/31/2018
Data Release Frequency: Semi-Annually

SAN LUIS OBISPO COUNTY:

CUPA SAN LUIS OBISPO: CUPA Facility List
Cupa Facility List.

Date of Government Version: 08/20/2018
Date Data Arrived at EDR: 08/21/2018
Date Made Active in Reports: 09/07/2018
Number of Days to Update: 17

Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 08/17/2018
Next Scheduled EDR Contact: 12/03/2018
Data Release Frequency: Varies

SAN MATEO COUNTY:

BI SAN MATEO: Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 06/12/2018
Date Data Arrived at EDR: 06/15/2018
Date Made Active in Reports: 08/06/2018
Number of Days to Update: 52

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 09/10/2018
Next Scheduled EDR Contact: 12/24/2018
Data Release Frequency: Annually

LUST SAN MATEO: Fuel Leak List
A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 09/18/2018
Date Data Arrived at EDR: 09/20/2018
Date Made Active in Reports: 10/17/2018
Number of Days to Update: 27

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 09/10/2018
Next Scheduled EDR Contact: 12/24/2018
Data Release Frequency: Semi-Annually

SANTA BARBARA COUNTY:

CUPA SANTA BARBARA: CUPA Facility Listing
CUPA Program Listing from the Environmental Health Services division.

Date of Government Version: 09/08/2011
Date Data Arrived at EDR: 09/09/2011
Date Made Active in Reports: 10/07/2011
Number of Days to Update: 28

Source: Santa Barbara County Public Health Department
Telephone: 805-686-8167
Last EDR Contact: 08/17/2018
Next Scheduled EDR Contact: 12/03/2018
Data Release Frequency: Varies

SANTA CLARA COUNTY:

CUPA SANTA CLARA: Cupa Facility List
Cupa facility list

Date of Government Version: 08/17/2018
Date Data Arrived at EDR: 08/22/2018
Date Made Active in Reports: 09/07/2018
Number of Days to Update: 16

Source: Department of Environmental Health
Telephone: 408-918-1973
Last EDR Contact: 08/17/2018
Next Scheduled EDR Contact: 12/03/2018
Data Release Frequency: Varies

HIST LUST SANTA CLARA: HIST LUST - Fuel Leak Site Activity Report
A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22

Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LUST SANTA CLARA: LOP Listing
A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 03/03/2014
Date Data Arrived at EDR: 03/05/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 13
Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 08/24/2018
Next Scheduled EDR Contact: 12/10/2018
Data Release Frequency: Annually

SAN JOSE HAZMAT: Hazardous Material Facilities
Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 08/01/2018
Date Data Arrived at EDR: 08/06/2018
Date Made Active in Reports: 09/11/2018
Number of Days to Update: 36
Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 08/01/2018
Next Scheduled EDR Contact: 11/19/2018
Data Release Frequency: Annually

SANTA CRUZ COUNTY:

CUPA SANTA CRUZ: CUPA Facility List
CUPA facility listing.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 90
Source: Santa Cruz County Environmental Health
Telephone: 831-464-2761
Last EDR Contact: 08/17/2018
Next Scheduled EDR Contact: 12/03/2018
Data Release Frequency: Varies

SHASTA COUNTY:

CUPA SHASTA: CUPA Facility List
Cupa Facility List.

Date of Government Version: 06/15/2017
Date Data Arrived at EDR: 06/19/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 51
Source: Shasta County Department of Resource Management
Telephone: 530-225-5789
Last EDR Contact: 08/17/2018
Next Scheduled EDR Contact: 12/03/2018
Data Release Frequency: Varies

SOLANO COUNTY:

LUST SOLANO: Leaking Underground Storage Tanks
A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 08/29/2018
Date Data Arrived at EDR: 09/04/2018
Date Made Active in Reports: 10/17/2018
Number of Days to Update: 43
Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 08/29/2018
Next Scheduled EDR Contact: 12/17/2018
Data Release Frequency: Quarterly

UST SOLANO: Underground Storage Tanks
Underground storage tank sites located in Solano county.

Date of Government Version: 08/29/2018
Date Data Arrived at EDR: 09/04/2018
Date Made Active in Reports: 10/18/2018
Number of Days to Update: 44
Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 08/29/2018
Next Scheduled EDR Contact: 12/17/2018
Data Release Frequency: Quarterly

SONOMA COUNTY:

CUPA SONOMA: Cupa Facility List
Cupa Facility list

Date of Government Version: 09/24/2018
Date Data Arrived at EDR: 09/25/2018
Date Made Active in Reports: 10/16/2018
Number of Days to Update: 21

Source: County of Sonoma Fire & Emergency Services Department
Telephone: 707-565-1174
Last EDR Contact: 09/24/2018
Next Scheduled EDR Contact: 01/07/2019
Data Release Frequency: Varies

LUST SONOMA: Leaking Underground Storage Tank Sites
A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 07/03/2018
Date Data Arrived at EDR: 07/10/2018
Date Made Active in Reports: 08/24/2018
Number of Days to Update: 45

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 09/24/2018
Next Scheduled EDR Contact: 01/07/2019
Data Release Frequency: Quarterly

STANISLAUS COUNTY:

CUPA STANISLAUS: CUPA Facility List
Cupa facility list

Date of Government Version: 08/14/2018
Date Data Arrived at EDR: 08/16/2018
Date Made Active in Reports: 08/24/2018
Number of Days to Update: 8

Source: Stanislaus County Department of Ennvironmental Protection
Telephone: 209-525-6751
Last EDR Contact: 10/15/2018
Next Scheduled EDR Contact: 01/28/2019
Data Release Frequency: Varies

SUTTER COUNTY:

UST SUTTER: Underground Storage Tanks
Underground storage tank sites located in Sutter county.

Date of Government Version: 06/04/2018
Date Data Arrived at EDR: 06/08/2018
Date Made Active in Reports: 07/11/2018
Number of Days to Update: 33

Source: Sutter County Department of Agriculture
Telephone: 530-822-7500
Last EDR Contact: 09/17/2018
Next Scheduled EDR Contact: 12/17/2018
Data Release Frequency: Semi-Annually

TEHAMA COUNTY:

CUPA TEHAMA: CUPA Facility List
Cupa facilities

Date of Government Version: 07/17/2018
Date Data Arrived at EDR: 08/02/2018
Date Made Active in Reports: 09/07/2018
Number of Days to Update: 36

Source: Tehama County Department of Environmental Health
Telephone: 530-527-8020
Last EDR Contact: 08/01/2018
Next Scheduled EDR Contact: 11/19/2018
Data Release Frequency: Varies

TRINITY COUNTY:

CUPA TRINITY: CUPA Facility List
Cupa facility list

Date of Government Version: 07/17/2018
Date Data Arrived at EDR: 07/24/2018
Date Made Active in Reports: 09/07/2018
Number of Days to Update: 45

Source: Department of Toxic Substances Control
Telephone: 760-352-0381
Last EDR Contact: 10/22/2018
Next Scheduled EDR Contact: 02/04/2019
Data Release Frequency: Varies

TULARE COUNTY:

CUPA TULARE: CUPA Facility List
Cupa program facilities

Date of Government Version: 09/13/2018
Date Data Arrived at EDR: 09/14/2018
Date Made Active in Reports: 09/19/2018
Number of Days to Update: 5

Source: Tulare County Environmental Health Services Division
Telephone: 559-624-7400
Last EDR Contact: 09/13/2018
Next Scheduled EDR Contact: 11/19/2018
Data Release Frequency: Varies

TUOLUMNE COUNTY:

CUPA TUOLUMNE: CUPA Facility List
Cupa facility list

Date of Government Version: 04/23/2018
Date Data Arrived at EDR: 04/25/2018
Date Made Active in Reports: 06/25/2018
Number of Days to Update: 61

Source: Divison of Environmental Health
Telephone: 209-533-5633
Last EDR Contact: 10/22/2018
Next Scheduled EDR Contact: 02/04/2019
Data Release Frequency: Varies

VENTURA COUNTY:

BWT VENTURA: Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 07/02/2018
Date Data Arrived at EDR: 07/26/2018
Date Made Active in Reports: 09/05/2018
Number of Days to Update: 41

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 10/22/2018
Next Scheduled EDR Contact: 02/04/2019
Data Release Frequency: Quarterly

LF VENTURA: Inventory of Illegal Abandoned and Inactive Sites
Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 12/01/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 49

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 10/01/2018
Next Scheduled EDR Contact: 01/14/2019
Data Release Frequency: Annually

LUST VENTURA: Listing of Underground Tank Cleanup Sites
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 08/07/2018
Next Scheduled EDR Contact: 11/26/2018
Data Release Frequency: Quarterly

MED WASTE VENTURA: Medical Waste Program List
To protect public health and safety and the environment from potential exposure to disease causing agents, the Environmental Health Division Medical Waste Program regulates the generation, handling, storage, treatment and disposal of medical waste throughout the County.

Date of Government Version: 07/02/2018
Date Data Arrived at EDR: 07/26/2018
Date Made Active in Reports: 08/24/2018
Number of Days to Update: 29
Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 10/22/2018
Next Scheduled EDR Contact: 02/04/2019
Data Release Frequency: Quarterly

UST VENTURA: Underground Tank Closed Sites List
Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 09/04/2018
Date Data Arrived at EDR: 09/12/2018
Date Made Active in Reports: 10/04/2018
Number of Days to Update: 22
Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 09/12/2018
Next Scheduled EDR Contact: 12/24/2018
Data Release Frequency: Quarterly

YOLO COUNTY:

UST YOLO: Underground Storage Tank Comprehensive Facility Report
Underground storage tank sites located in Yolo county.

Date of Government Version: 06/20/2018
Date Data Arrived at EDR: 07/03/2018
Date Made Active in Reports: 07/12/2018
Number of Days to Update: 9
Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 10/15/2018
Next Scheduled EDR Contact: 01/14/2019
Data Release Frequency: Annually

YUBA COUNTY:

CUPA YUBA: CUPA Facility List
CUPA facility listing for Yuba County.

Date of Government Version: 05/10/2018
Date Data Arrived at EDR: 05/15/2018
Date Made Active in Reports: 06/15/2018
Number of Days to Update: 31
Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 08/07/2018
Next Scheduled EDR Contact: 11/12/2018
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data
Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 08/10/2018
Date Data Arrived at EDR: 08/10/2018
Date Made Active in Reports: 09/10/2018
Number of Days to Update: 31
Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 08/09/2018
Next Scheduled EDR Contact: 11/26/2018
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 07/13/2018
Date Made Active in Reports: 08/01/2018
Number of Days to Update: 19
Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 10/09/2018
Next Scheduled EDR Contact: 01/21/2019
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 07/01/2018
Date Data Arrived at EDR: 08/01/2018
Date Made Active in Reports: 08/31/2018
Number of Days to Update: 30
Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 08/01/2018
Next Scheduled EDR Contact: 11/12/2018
Data Release Frequency: Quarterly

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 07/25/2017
Date Made Active in Reports: 09/25/2017
Number of Days to Update: 62
Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 10/15/2018
Next Scheduled EDR Contact: 01/28/2019
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 02/23/2018
Date Made Active in Reports: 04/09/2018
Number of Days to Update: 45
Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 08/21/2018
Next Scheduled EDR Contact: 12/03/2018
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 06/15/2018
Date Made Active in Reports: 07/09/2018
Number of Days to Update: 24
Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 09/06/2018
Next Scheduled EDR Contact: 12/24/2018
Data Release Frequency: Annually

Oil/Gas Pipelines
Source: PennWell Corporation
Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Electric Power Transmission Line Data
Source: PennWell Corporation
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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish and Wildlife
Telephone: 916-445-0411

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

STREET AND ADDRESS INFORMATION

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GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

OLSEN CHANDLER
NOT REPORTED
PASO ROBLES, CA 93446

TARGET PROPERTY COORDINATES

Latitude (North):	35.611616 - 35° 36' 41.82''
Longitude (West):	120.639332 - 120° 38' 21.60''
Universal Tranverse Mercator:	Zone 10
UTM X (Meters):	713824.4
UTM Y (Meters):	3943238.8
Elevation:	837 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	5603492 TEMPLETON, CA
Version Date:	2012
Northeast Map:	5603462 ESTRELLA, CA
Version Date:	2012
Southeast Map:	5603458 CRESTON, CA
Version Date:	2012
Northwest Map:	5603478 PASO ROBLES, CA
Version Date:	2012

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

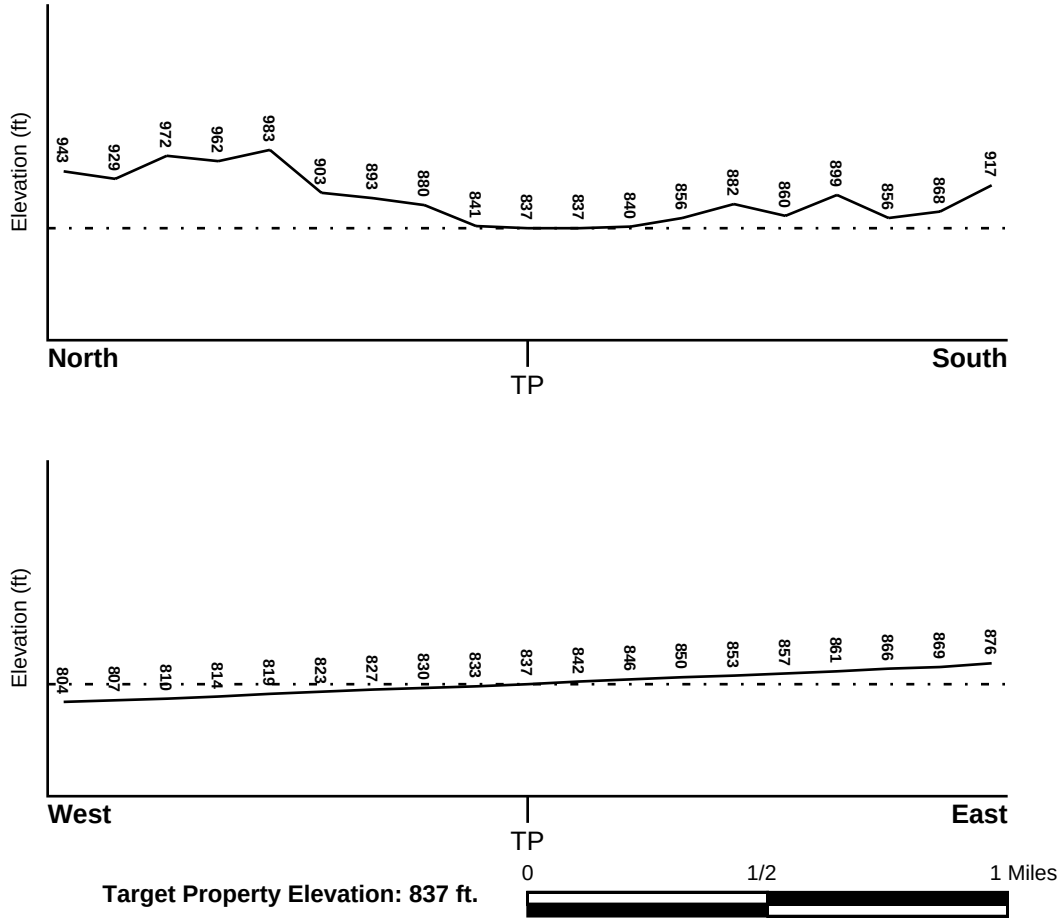
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General SSW

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Flood Plain Panel at Target Property	FEMA Source Type
06079C0607G	FEMA FIRM Flood data

Additional Panels in search area:	FEMA Source Type
06079C0394G	FEMA FIRM Flood data
06079C0606G	FEMA FIRM Flood data
06079C0650G	FEMA FIRM Flood data

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
TEMPLETON	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius:	1.25 miles
Status:	Not found

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

* ©1996 Site−specific hydrogeological data gathered by CERCLIS Alerts, Inc., Bainbridge Island, WA. All rights reserved. All of the information and opinions presented are those of the cited EPA report(s), which were completed under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

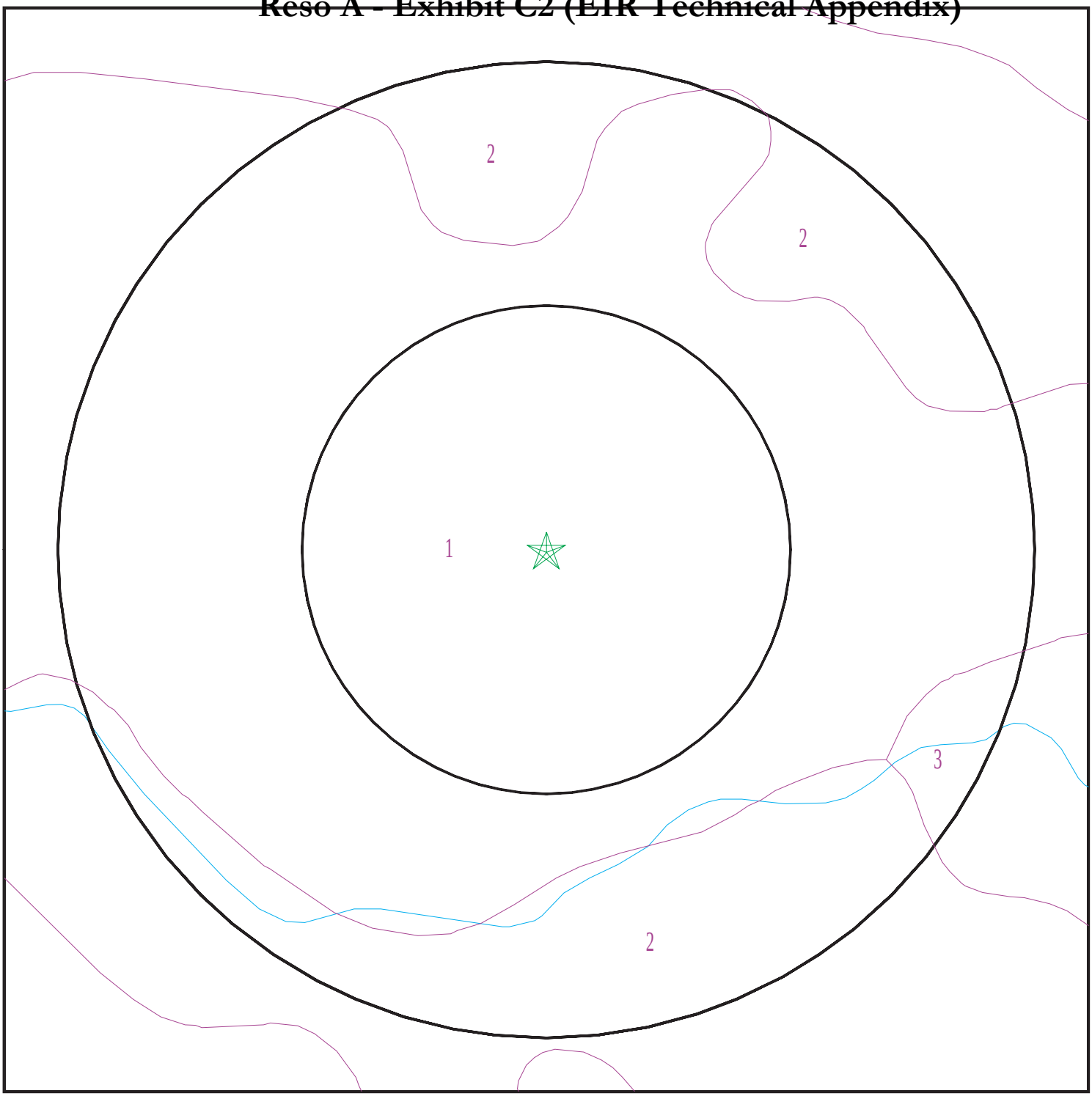
Era:	Cenozoic
System:	Tertiary
Series:	Pliocene
Code:	Tpc *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Continental Deposits

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 5465952.2s



Target Property
SSURGO Soil
Water

0 1/16 1/8 1/4 Miles

N

SITE NAME:	Olsen Chandler	CLIENT:	Rainwater Consulting
ADDRESS:	Not Reported Paso Robles CA 93446	CONTACT:	Tim Doyle
LAT/LONG:	35.611616 / 120.639332	INQUIRY #:	5465952.2s
		DATE:	October 25, 2018 7:46 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: San Ysidro

Soil Surface Texture: loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Moderately well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	22 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 1.4 Min: 0.42	Max: 8.4 Min: 7.9
2	22 inches	38 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 1.4 Min: 0.42	Max: 8.4 Min: 7.9
3	38 inches	64 inches	sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 1.4 Min: 0.42	Max: 8.4 Min: 7.9

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Map ID: 2

Soil Component Name: Arbuckle

Soil Surface Texture: fine sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information

	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	29 inches	fine sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 4 Min: 1.4	Max: 7.8 Min: 6.1
2	29 inches	53 inches	sandy clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 4 Min: 1.4	Max: 7.8 Min: 6.1
3	53 inches	61 inches	stratified sandy loam to very gravelly sandy clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 4 Min: 1.4	Max: 7.8 Min: 6.1

Soil Map ID: 3

Soil Component Name: Rincon

Soil Surface Texture: clay loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	18 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 1.4 Min: 0.42	Max: 8.4 Min: 6.6
2	18 inches	64 inches	clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 1.4 Min: 0.42	Max: 8.4 Min: 6.6

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 0.001 miles
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	USGS40000165179	1/2 - 1 Mile West
3	USGS40000165180	1/2 - 1 Mile West
4	USGS40000165203	1/2 - 1 Mile WNW

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
2	16594	1/2 - 1 Mile WSW

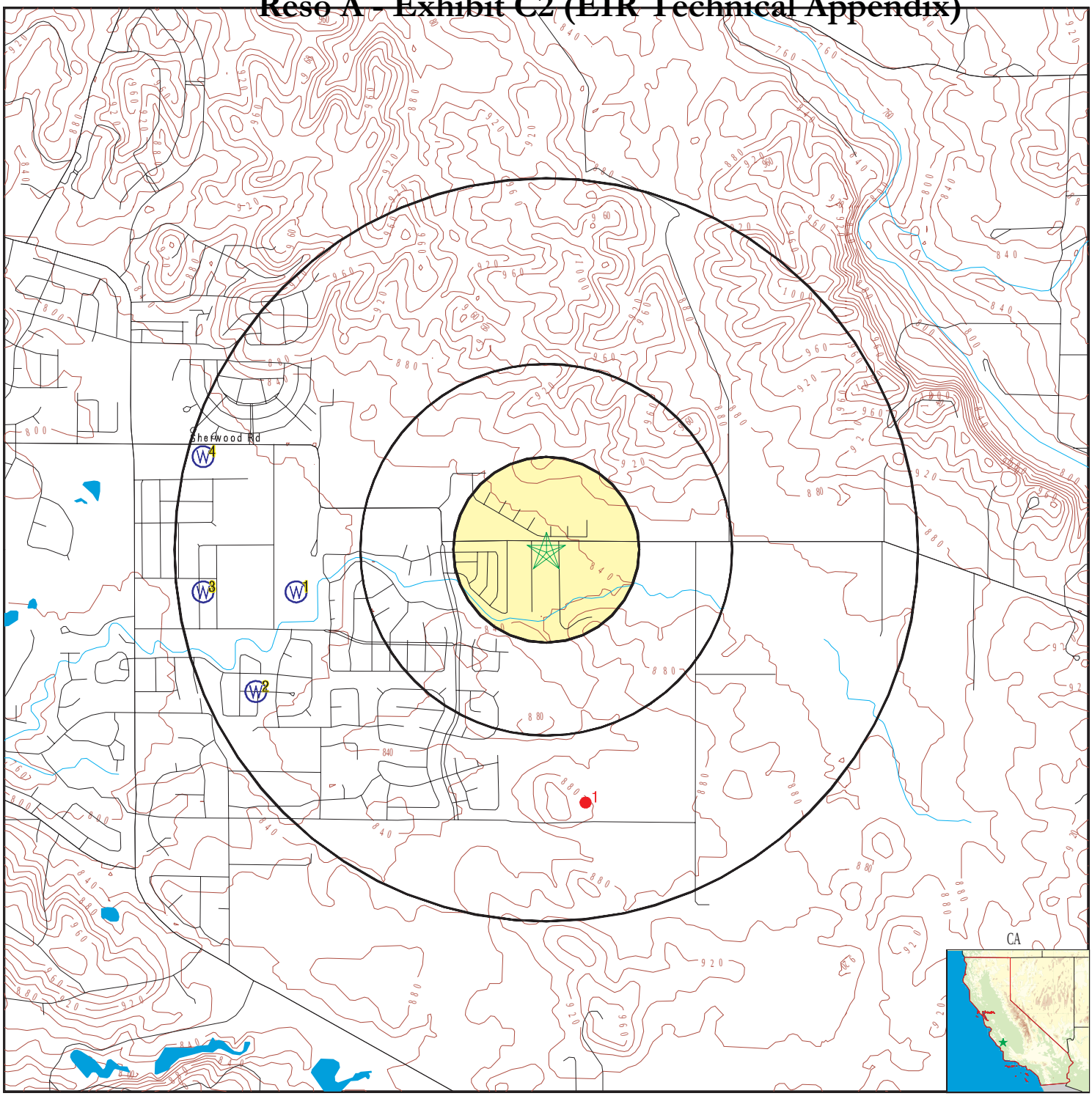
OTHER STATE DATABASE INFORMATION

STATE OIL/GAS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	CAOG11000256662	1/2 - 1 Mile South

PHYSICAL SETTING SOURCE MAP - 5465952.2s

Reso A - Exhibit C2 (EIR Technical Appendix)



- County Boundary
- Major Roads
- Contour Lines
- Earthquake Fault Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- GI Indeterminate Groundwater Flow at Location
- GV Groundwater Flow Varies at Location
- HD Closest Hydrogeological Data
- Oil, gas or related wells

SITE NAME:	Olsen Chandler	CLIENT:	Rainwater Consulting
ADDRESS:	Not Reported Paso Robles CA 93446	CONTACT:	Tim Doyle
		INQUIRY #:	5465952.2s
LAT/LONG:	35.611616 / 120.639332	DATE:	October 25, 2018 7:45 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

	Database	EDR ID Number
1		
West	**FED USGS**	**USGS40000165179**
1/2 - 1 Mile		
Lower		

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	027S012E02F002M	Type:	Well
Description:	Not Reported	HUC:	18060005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	California Coastal Basin aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19730101	Well Depth:	600
Well Depth Units:	ft	Well Hole Depth:	600
Well Hole Depth Units:	ft		

2			
WSW		**CA WELLS**	**16594**
1/2 - 1 Mile			
Lower			

Seq:	16594	Prim sta c:	27S/12E-02L02 M
Frds no:	4010007006	County:	40
District:	06	User id:	TAP
System no:	4010007	Water type:	G
Source nam:	OSBORNE WELL 14	Station ty:	WELL/AMBNT/MUN/INTAKE
Latitude:	353622.1	Longitude:	1203908.7
Precision:	3	Status:	AR
Comment 1:	Not Reported	Comment 2:	Not Reported
Comment 3:	Not Reported	Comment 4:	Not Reported
Comment 5:	Not Reported	Comment 6:	Not Reported
Comment 7:	Not Reported		

System no:	4010007	System nam:	PASO ROBLES WATER DEPARTMENT
Hqname:	Not Reported	Address:	1240 PASO ROBLES ST.
City:	PASO ROBLES	State:	CA
Zip:	93447	Zip ext:	Not Reported
Pop serv:	21450	Connection:	6171
Area serve:	CITY OF PASO ROBLES		

Sample date:	07-SEP-17	Finding:	2.2
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	07-SEP-17	Finding:	2.
Chemical:	CHROMIUM, HEXAVALENT	Report units:	UG/L
Dlr:	1.		

Sample date:	16-JUN-16	Finding:	2.7
Chemical:	NITRATE (AS N)	Report units:	MG/L
Dlr:	0.4		

Sample date:	10-SEP-15	Finding:	260.
Chemical:	ALKALINITY (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		

Sample date:	10-SEP-15	Finding:	310.

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Chemical:	BICARBONATE ALKALINITY	Report units:	MG/L
Dlr:	0.		
Sample date:	10-SEP-15	Finding:	270.
Chemical:	HARDNESS (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	10-SEP-15	Finding:	53.
Chemical:	CALCIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	10-SEP-15	Finding:	33.
Chemical:	MAGNESIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	10-SEP-15	Finding:	51.
Chemical:	SODIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	10-SEP-15	Finding:	1.9
Chemical:	POTASSIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	10-SEP-15	Finding:	66.
Chemical:	CHLORIDE	Report units:	MG/L
Dlr:	0.		
Sample date:	10-SEP-15	Finding:	25.
Chemical:	SULFATE	Report units:	MG/L
Dlr:	0.5		
Sample date:	10-SEP-15	Finding:	0.33
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)	Report units:	MG/L
Dlr:	0.1		
Sample date:	10-SEP-15	Finding:	5.6
Chemical:	ARSENIC	Report units:	UG/L
Dlr:	2.		
Sample date:	10-SEP-15	Finding:	140.
Chemical:	BARIUM	Report units:	UG/L
Dlr:	100.		
Sample date:	10-SEP-15	Finding:	140.
Chemical:	BORON	Report units:	UG/L
Dlr:	100.		
Sample date:	10-SEP-15	Finding:	280.
Chemical:	IRON	Report units:	UG/L
Dlr:	100.		
Sample date:	10-SEP-15	Finding:	8.3
Chemical:	VANADIUM	Report units:	UG/L
Dlr:	3.		
Sample date:	10-SEP-15	Finding:	450.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	10-SEP-15	Finding:	0.8
Chemical:	LANGELIER INDEX @ 60 C	Report units:	Not Reported
Dlr:	0.		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Sample date:	10-SEP-15	Finding:	0.19
Chemical:	LANGELIER INDEX AT SOURCE TEMP.	Report units:	Not Reported
Dlr:	0.		
Sample date:	10-SEP-15	Finding:	6.4
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	10-SEP-15	Finding:	1.38
Chemical:	TURBIDITY, LABORATORY	Report units:	NTU
Dlr:	0.1		
Sample date:	10-SEP-15	Finding:	12.03
Chemical:	AGGRSSIVE INDEX (CORROSIVITY)	Report units:	Not Reported
Dlr:	0.		
Sample date:	10-SEP-15	Finding:	1400.
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	10-SEP-15	Finding:	7.5
Chemical:	PH, LABORATORY	Report units:	Not Reported
Dlr:	0.		
Sample date:	10-SEP-15	Finding:	730.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US
Dlr:	0.		
Sample date:	10-SEP-15	Finding:	20.
Chemical:	SOURCE TEMPERATURE C	Report units:	C
Dlr:	0.		
Sample date:	04-JUN-15	Finding:	20.
Chemical:	SOURCE TEMPERATURE C	Report units:	C
Dlr:	0.		
Sample date:	04-JUN-15	Finding:	820.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US
Dlr:	0.		
Sample date:	04-JUN-15	Finding:	7.4
Chemical:	PH, LABORATORY	Report units:	Not Reported
Dlr:	0.		
Sample date:	04-JUN-15	Finding:	270.
Chemical:	ALKALINITY (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	04-JUN-15	Finding:	320.
Chemical:	BICARBONATE ALKALINITY	Report units:	MG/L
Dlr:	0.		
Sample date:	04-JUN-15	Finding:	290.
Chemical:	HARDNESS (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	04-JUN-15	Finding:	59.
Chemical:	CALCIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	04-JUN-15	Finding:	35.
Chemical:	MAGNESIUM	Report units:	MG/L

Dlr:	0.		
Sample date:	04-JUN-15	Finding:	55.
Chemical:	SODIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	04-JUN-15	Finding:	2.
Chemical:	POTASSIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	04-JUN-15	Finding:	92.
Chemical:	CHLORIDE	Report units:	MG/L
Dlr:	0.		
Sample date:	04-JUN-15	Finding:	23.
Chemical:	SULFATE	Report units:	MG/L
Dlr:	0.5		
Sample date:	04-JUN-15	Finding:	0.3
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)	Report units:	MG/L
Dlr:	0.1		
Sample date:	04-JUN-15	Finding:	4.9
Chemical:	ARSENIC	Report units:	UG/L
Dlr:	2.		
Sample date:	04-JUN-15	Finding:	190.
Chemical:	BARIUM	Report units:	UG/L
Dlr:	100.		
Sample date:	04-JUN-15	Finding:	150.
Chemical:	BORON	Report units:	UG/L
Dlr:	100.		
Sample date:	04-JUN-15	Finding:	490.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L
Dlr:	0.		
Sample date:	04-JUN-15	Finding:	0.72
Chemical:	LANGELIER INDEX @ 60 C	Report units:	Not Reported
Dlr:	0.		
Sample date:	04-JUN-15	Finding:	0.11
Chemical:	LANGELIER INDEX AT SOURCE TEMP.	Report units:	Not Reported
Dlr:	0.		
Sample date:	04-JUN-15	Finding:	0.38
Chemical:	TURBIDITY, LABORATORY	Report units:	NTU
Dlr:	0.1		
Sample date:	04-JUN-15	Finding:	11.95
Chemical:	AGGRSSIVE INDEX (CORROSIVITY)	Report units:	Not Reported
Dlr:	0.		
Sample date:	04-JUN-15	Finding:	2500.
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	10-DEC-14	Finding:	0.632
Chemical:	RADIUM 228 COUNTING ERROR	Report units:	PCI/L
Dlr:	0.		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Sample date:	10-DEC-14	Finding:	0.2
Chemical:	RADIUM 228 MDA95	Report units:	PCI/L
Dlr:	0.		
Sample date:	10-DEC-14	Finding:	0.418
Chemical:	RADIUM, TOTAL, MDA95-NTNC ONLY, BY 903.0		
Report units:	PCI/L	Dlr:	0.
Sample date:	10-DEC-14	Finding:	0.106
Chemical:	RA-226 FOR CWS OR TOTAL RA FOR NTNC BY 903.0		
Report units:	PCI/L	Dlr:	0.
Sample date:	10-DEC-14	Finding:	0.138
Chemical:	RA-226 OR TOTAL RA BY 903.0 C.E.	Report units:	PCI/L
Dlr:	0.		
Sample date:	02-OCT-14	Finding:	8.4
Chemical:	GROSS ALPHA	Report units:	PCI/L
Dlr:	3.		
Sample date:	02-OCT-14	Finding:	2.6
Chemical:	GROSS ALPHA COUNTING ERROR	Report units:	PCI/L
Dlr:	0.		
Sample date:	02-OCT-14	Finding:	1.1
Chemical:	URANIUM (PCI/L)	Report units:	PCI/L
Dlr:	1.		
Sample date:	02-OCT-14	Finding:	1.9
Chemical:	GROSS ALPHA MDA95	Report units:	PCI/L
Dlr:	0.		
Sample date:	02-OCT-14	Finding:	0.88
Chemical:	URANIUM MDA95	Report units:	PCI/L
Dlr:	0.		
Sample date:	02-OCT-14	Finding:	0.59
Chemical:	URANIUM COUNTING ERROR	Report units:	PCI/L
Dlr:	0.		
Sample date:	08-SEP-14	Finding:	2.
Chemical:	CHROMIUM, HEXAVALENT	Report units:	UG/L
Dlr:	1.		
Sample date:	04-SEP-14	Finding:	6.3
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	12-SEP-13	Finding:	6.9
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	06-SEP-12	Finding:	140.
Chemical:	BORON	Report units:	UG/L
Dlr:	100.		
Sample date:	06-SEP-12	Finding:	15.
Chemical:	NICKEL	Report units:	UG/L
Dlr:	10.		
Sample date:	06-SEP-12	Finding:	420.
Chemical:	TOTAL DISSOLVED SOLIDS	Report units:	MG/L

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Dlr:	0.		
Sample date:	06-SEP-12	Finding:	0.53
Chemical:	LANGELIER INDEX @ 60 C	Report units:	Not Reported
Dlr:	0.		
Sample date:	06-SEP-12	Finding:	7.
Chemical:	NITRATE (AS NO3)	Report units:	MG/L
Dlr:	2.		
Sample date:	06-SEP-12	Finding:	0.28
Chemical:	TURBIDITY, LABORATORY	Report units:	NTU
Dlr:	0.1		
Sample date:	06-SEP-12	Finding:	11.77
Chemical:	AGGRSSIVE INDEX (CORROSIVITY)	Report units:	Not Reported
Dlr:	0.		
Sample date:	06-SEP-12	Finding:	1600.
Chemical:	NITRATE + NITRITE (AS N)	Report units:	MG/L
Dlr:	0.4		
Sample date:	06-SEP-12	Finding:	160.
Chemical:	BARIUM	Report units:	UG/L
Dlr:	100.		
Sample date:	06-SEP-12	Finding:	4.2
Chemical:	ARSENIC	Report units:	UG/L
Dlr:	2.		
Sample date:	06-SEP-12	Finding:	0.35
Chemical:	FLUORIDE (F) (NATURAL-SOURCE)	Report units:	MG/L
Dlr:	0.1		
Sample date:	06-SEP-12	Finding:	25.
Chemical:	SULFATE	Report units:	MG/L
Dlr:	0.5		
Sample date:	06-SEP-12	Finding:	65.
Chemical:	CHLORIDE	Report units:	MG/L
Dlr:	0.		
Sample date:	06-SEP-12	Finding:	2.1
Chemical:	POTASSIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	06-SEP-12	Finding:	53.
Chemical:	SODIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	06-SEP-12	Finding:	34.
Chemical:	MAGNESIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	06-SEP-12	Finding:	63.
Chemical:	CALCIUM	Report units:	MG/L
Dlr:	0.		
Sample date:	06-SEP-12	Finding:	300.
Chemical:	HARDNESS (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Sample date:	06-SEP-12	Finding:	310.
Chemical:	BICARBONATE ALKALINITY	Report units:	MG/L
Dlr:	0.		
Sample date:	06-SEP-12	Finding:	250.
Chemical:	ALKALINITY (TOTAL) AS CACO3	Report units:	MG/L
Dlr:	0.		
Sample date:	06-SEP-12	Finding:	7.3
Chemical:	PH, LABORATORY	Report units:	Not Reported
Dlr:	0.		
Sample date:	06-SEP-12	Finding:	750.
Chemical:	SPECIFIC CONDUCTANCE	Report units:	US
Dlr:	0.		
Sample date:	06-SEP-12	Finding:	20.
Chemical:	SOURCE TEMPERATURE C	Report units:	C
Dlr:	0.		

3
West **FED USGS** **USGS40000165180**
1/2 - 1 Mile
Lower

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	027S012E02E001M	Type:	Well
Description:	Not Reported	HUC:	18060005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	California Coastal Basin aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	19600510	Well Depth:	Not Reported
Well Depth Units:	Not Reported	Well Hole Depth:	607
Well Hole Depth Units:	ft		

4
WNW **FED USGS** **USGS40000165203**
1/2 - 1 Mile
Lower

Organization ID:	USGS-CA		
Organization Name:	USGS California Water Science Center		
Monitor Location:	027S012E02D001M	Type:	Well
Description:	Not Reported	HUC:	18060005
Drainage Area:	Not Reported	Drainage Area Units:	Not Reported
Contrib Drainage Area:	Not Reported	Contrib Drainage Area Unts:	Not Reported
Aquifer:	California Coastal Basin aquifers		
Formation Type:	Not Reported	Aquifer Type:	Not Reported
Construction Date:	1951	Well Depth:	850
Well Depth Units:	ft	Well Hole Depth:	Not Reported
Well Hole Depth Units:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance

Database EDR ID Number

1
South
1/2 - 1 Mile

OIL_GAS **CAOG11000256662**

Districtnu:	3	Apinumber:	07900497
Blmwell:	N	Redrillcan:	Not Reported
Dryhole:	Y	Wellstatus:	P
Operatorna:	Oryx Energy Company	Countyname:	San Luis Obispo
Fieldname:	Any Field	Areaname:	Any Area
Section:	1	Township:	27S
Range:	12E	Basemeridi:	MD
Elevation:	Not Reported	Locationde:	Not Reported
Gissourcec:	hud	Comments:	Not Reported
Leasename:	Harper	Wellnumber:	1
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	Not Reported
Welldeptha:	0	Redrillfoo:	0
Abandonedd:	Not Reported	Completion:	Not Reported
Directiona:	Not Directionally drilled	Gissymbol:	POG
Site id:	CAOG11000256662		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: CA Radon

Radon Test Results

Zipcode	Num Tests	> 4 pCi/L
93446	158	15

Federal EPA Radon Zone for SAN LUIS OBISPO County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 93446

Number of sites tested: 1

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	-0.500 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	Not Reported	Not Reported	Not Reported	Not Reported

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish and Wildlife
Telephone: 916-445-0411

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Water Well Database
Source: Department of Water Resources
Telephone: 916-651-9648

California Drinking Water Quality Database
Source: Department of Public Health
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

OTHER STATE DATABASE INFORMATION

California Oil and Gas Well Locations
Source: Department of Conservation
Telephone: 916-323-1779
Oil and Gas well locations in the state.

RADON

State Database: CA Radon
Source: Department of Health Services
Telephone: 916-324-2208
Radon Database for California

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

STREET AND ADDRESS INFORMATION

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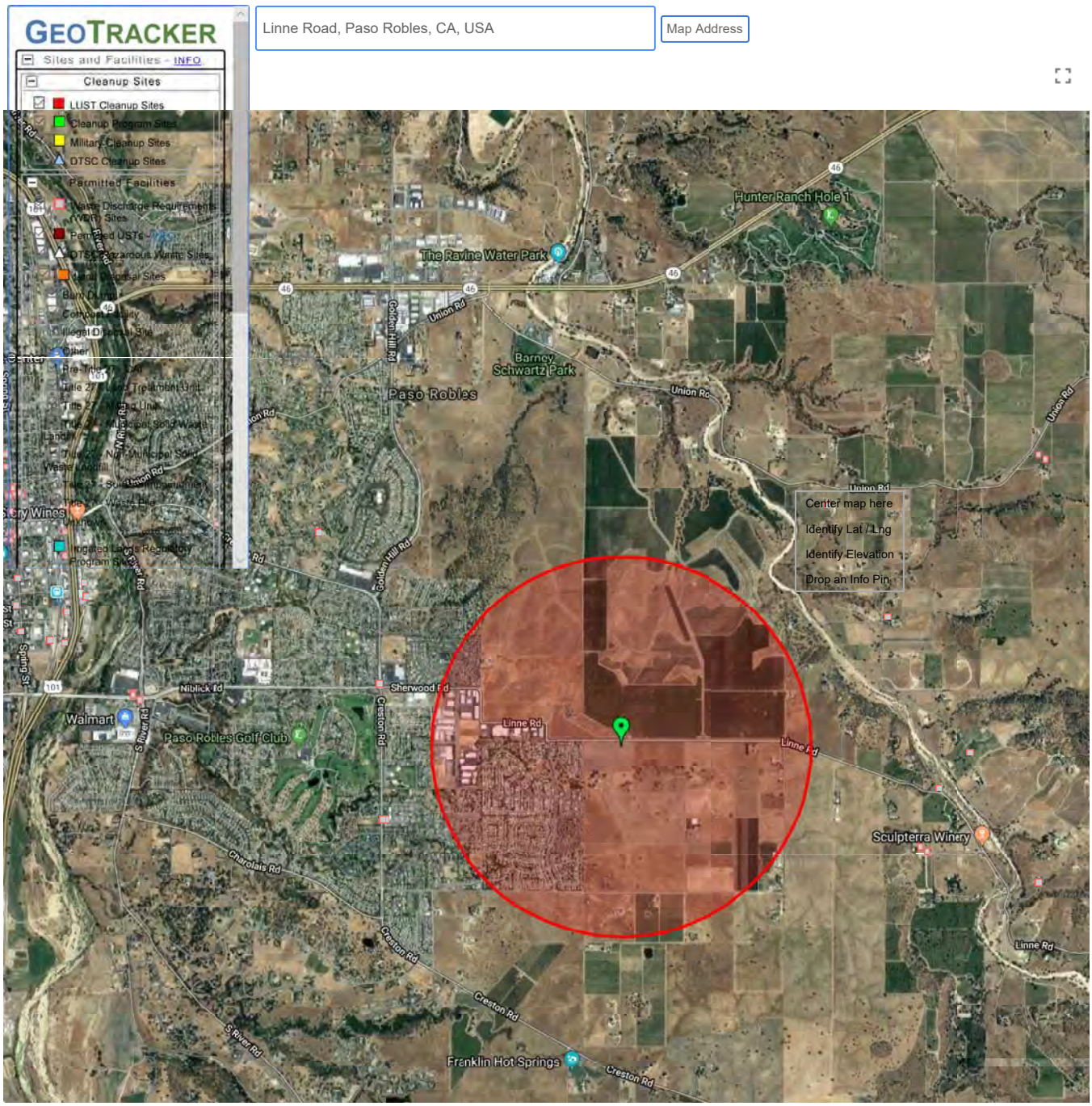
APPENDIX

D

Reso A - Exhibit C2 (EIR Technical Appendix)



SITES FOUND IN SEARCH RADIUS

Olsen Chandler

Not Reported

Paso Robles, CA 93446

Inquiry Number: 5465952.3

October 25, 2018

Certified Sanborn® Map Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

10/25/18

Site Name:

Olsen Chandler
Not Reported
Paso Robles, CA 93446
EDR Inquiry # 5465952.3

Client Name:

Rainwater Consulting
24051 Golden Pheasant Lane
Murrieta, CA 92562
Contact: Tim Doyle

The Sanborn Library has been searched by EDR and maps covering the target property location as provided by Rainwater Consulting were identified for the years listed below. The Sanborn Library is the largest, most complete collection of fire insurance maps. The collection includes maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow, and others. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by the Sanborn Library LLC, the copyright holder for the collection. Results can be authenticated by visiting www.edrnet.com/sanborn.

The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

Certified Sanborn Results:

Certification # 08E0-4137-A745

PO # 1025018

Project Olsen Chandler

UNMAPPED PROPERTY

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

Sanborn® Library search results

Certification #: 08E0-4137-A745

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ☑ Library of Congress
- ☑ University Publications of America
- ☑ EDR Private Collection

The Sanborn Library LLC Since 1866™

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Property Information Search Results

4 matching records were found for APN 009795001.

Assessment Number	Owner Name	Community	Structure Type	
009795001	Olsen Investments LLC	Paso Robles	Residence	Select
009795001	Olsen Investments LLC	Paso Robles	Residence	Select
009795001	Olsen Investments LLC	Paso Robles	Residence	Select
009795001	Olsen Investments LLC	Paso Robles	Residence	Select

Assessment Information for the 2018/2019 Tax Year

Assessment Number:	009-795-001
Owner Name:	Olsen Investments LLC
Street Address:	(Protected per CA Govt Code Section 6254.21)
Community Code:	Paso Robles
Tax Rate Area:	002-039
Parcel Size:	32.05 Acres
Link to Map:	009795001

Assessed Value:	176,924
Land Value:	51,732
Improvements:	125,192
Personal Property:	0
Fixtures Value:	0
Total Exemption:	0
Net:	176,924

Property Information as of December 28, 2011

Primary Structure

Structure Type:	Residence
Original Size:	2,150
Addition Size:	290
Total Area:	2,440
Year Built:	1930
Bedrooms:	5
Bathrooms:	3
Levels:	2
Parking:	None

Miscellaneous Improvements

Description:	Horse Barn
Size:	612
Description:	Storage Barn
Size:	1440
Description:	Workshop
Size:	682
Description:	Porch

Disclaimer:
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Property Information Search Results

One matching record was found for APN 009-795-002.

Assessment Number	Owner Name	Community	Structure Type	
009795002	Olsen Investments LLCA Ca LLC	Paso Robles	Residence	Select

Assessment Information for the 2018/2019 Tax Year

Assessment Number:	009-795-002
Owner Name:	Olsen Investments LLCA Ca LLC
Street Address:	(Protected per CA Govt Code Section 6254.21)
Community Code:	Paso Robles
Tax Rate Area:	002-039
Parcel Size:	27.62 Acres
Link to Map:	009795002

Assessed Value:	603,689
Land Value:	230,277
Improvements:	366,895
Personal Property:	6,517
Fixtures Value:	0
Total Exemption:	0
Net:	603,689

Property Information as of September 1, 2005

Primary Structure

Structure Type:	Residence
Original Size:	3,650
Addition Size:	0
Total Area:	3,650
Year Built:	1980
Bedrooms:	5
Bathrooms:	3
Levels:	1
Parking:	Garage

Miscellaneous Improvements

Description:	Pool - Below Ground
Size:	468
Description:	Flatwork
Description:	Flatwork
Description:	Patio
Description:	Porch

Disclaimer:
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Property Information Search Results

One matching record was found for APN 009-795-003.

Assessment Number	Owner Name	Community	Structure Type	
009795003	Olsen Bernard N	Paso Robles	Land	Select

Assessment Information for the 2018/2019 Tax Year

Assessment Number:	009-795-003		
Owner Name:	Olsen Bernard N	Assessed Value:	17,679
Street Address:	(Protected per CA Govt Code Section 6254.21)	Land Value:	17,679
		Improvements:	0
		Personal Property:	0
Community Code:	Paso Robles	Fixtures Value:	0
Tax Rate Area:	002-039	Total Exemption:	0
Parcel Size:	12.97 Acres	Net:	17,679
Link to Map:	009795003		

Property Information as of September 1, 2005

Primary Structure		Miscellaneous Improvements
Structure Type:	Land	
Original Size:	0	
Addition Size:	0	
Total Area:	0	Improvements: (none)
Year Built:	0	
Bedrooms:	0	
Bathrooms:	0	
Levels:	0	
Parking:	None	

Disclaimer:
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Property Information Search Results

One matching record was found for APN 009-795-004.

Assessment Number	Owner Name	Community	Structure Type	
009795004	Linne Road Properties LLC	Paso Robles	Land	Select

Assessment Information for the 2018/2019 Tax Year

Assessment Number:	009-795-004
Owner Name:	Linne Road Properties LLC
Street Address:	(Protected per CA Govt Code Section 6254.21)
Community Code:	Paso Robles
Tax Rate Area:	002-039
Parcel Size:	26.22 Acres
Link to Map:	009795004

Assessed Value:	208,206
Land Value:	208,206
Improvements:	0
Personal Property:	0
Fixtures Value:	0
Total Exemption:	0
Net:	208,206

Property Information as of September 1, 2005

Primary Structure

Structure Type:	Land
Original Size:	0
Addition Size:	0
Total Area:	0
Year Built:	0
Bedrooms:	0
Bathrooms:	0
Levels:	0
Parking:	None

Miscellaneous Improvements

Improvements: (none)

Disclaimer:
The data contained in this database is deemed reliable but not guaranteed. This information should be used for informational use only and does not constitute a legal document for the description of these properties. Every effort has been made to ensure the accuracy of this data; however, this material may be slightly dated which would have an impact on its accuracy. The San Luis Obispo County Assessor's Office disclaims any responsibility or liability for any direct or indirect damages resulting from the use of this data.

Property Information Search Results

One matching record was found for APN 009-795-005.

Assessment Number	Owner Name	Community	Structure Type	
009795005	Goulart Lois D Tre	Paso Robles	Residence	Select

Property Information as of September 1, 2005

Assessment Information for the 2018/2019 Tax Year

Assessment Number:	009-795-005		
Owner Name:	Goulart Lois D Tre	Assessed Value:	140,797
Street Address:	(Protected per CA Govt Code Section 6254.21)	Land Value:	84,898
		Improvements:	55,899
		Personal Property:	0
Community Code:	Paso Robles	Fixtures Value:	0
Tax Rate Area:	002-039	Total Exemption:	7,000
Parcel Size:	14.98 Acres	Net:	133,797
Link to Map:	009795005		

Primary Structure

Structure Type:	Residence
Original Size:	959
Addition Size:	510
Total Area:	1,469
Year Built:	1922
Bedrooms:	5
Bathrooms:	1
Levels:	1
Parking:	Garage

Miscellaneous Improvements

Description:	Storage Barn
Size:	1170
Description:	Porch
Description:	Porch

Disclaimer:
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Property Information Search Results

One matching record was found for APN 009-795-006.

Assessment Number	Owner Name	Community	Structure Type	
009795006	Olsen Investments LLC	Paso Robles	Land	Select

Assessment Information for the 2018/2019 Tax Year

Assessment Number:	009-795-006
Owner Name:	Olsen Investments LLC
Street Address:	(Protected per CA Govt Code Section 6254.21)
Community Code:	Paso Robles
Tax Rate Area:	002-039
Parcel Size:	140.24 Acres
Link to Map:	009795006

Assessed Value:	211,028
Land Value:	211,028
Improvements:	0
Personal Property:	0
Fixtures Value:	0
Total Exemption:	0
Net:	211,028

Property Information as of September 1, 2005

Primary Structure

Structure Type:	Land
Original Size:	0
Addition Size:	0
Total Area:	0
Year Built:	0
Bedrooms:	0
Bathrooms:	0
Levels:	0
Parking:	None

Miscellaneous Improvements

Improvements: (none)

Disclaimer:
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Property Information Search Results

One matching record was found for APN 025-381-001.

Assessment Number	Owner Name	Community	Structure Type	
025381001	Wurth Larry M	Paso Robles	Land	Select

Assessment Information for the 2018/2019 Tax Year

Assessment Number:	025-381-001		
Owner Name:	Wurth Larry M	Assessed Value:	8,091
Street Address:	(Protected per CA Govt Code Section 6254.21)	Land Value:	8,091
		Improvements:	0
		Personal Property:	0
Community Code:	Paso Robles	Fixtures Value:	0
Tax Rate Area:	002-010	Total Exemption:	0
Parcel Size:	7 Acres	Net:	8,091
Link to Map:	025381001		

Property Information as of March 1, 1989

Primary Structure		Miscellaneous Improvements
Structure Type:	Land	
Original Size:	0	
Addition Size:	0	
Total Area:	0	Improvements: (none)
Year Built:	0	
Bedrooms:	0	
Bathrooms:	0	
Levels:	0	
Parking:	None	

Disclaimer:
The data contained in this database is deemed reliable but not guaranteed. This information should be used for informational use only and does not constitute a legal document for the description of these properties. Every effort has been made to ensure the accuracy of this data; however, this material may be slightly dated which would have an impact on its accuracy. The San Luis Obispo County Assessor's Office disclaims any responsibility or liability for any direct or indirect damages resulting from the use of this data.

Property Information Search Results

One matching record was found for APN 025-381-005.

Assessment Number	Owner Name	Community	Structure Type	
025381005	Wurth Larry M	Paso Robles	Land	Select

Assessment Information for the 2018/2019 Tax Year

Assessment Number:	025-381-005		
Owner Name:	Wurth Larry M	Assessed Value:	95,830
Street Address:	(Protected per CA Govt Code Section 6254.21)	Land Value:	94,106
		Improvements:	1,724
Community Code:	Paso Robles	Personal Property:	0
		Fixtures Value:	0
Tax Rate Area:	002-010	Total Exemption:	0
Parcel Size:	76.8 Acres	Net:	95,830
Link to Map:	025381005		

Property Information as of March 1, 1989

Primary Structure		Miscellaneous Improvements
Structure Type:	Land	
Original Size:	0	
Addition Size:	0	
Total Area:	0	Improvements: (none)
Year Built:	0	
Bedrooms:	0	
Bathrooms:	0	
Levels:	0	
Parking:	None	

Disclaimer:
The data contained in this database is deemed reliable but not guaranteed. This information should be used for informational use only and does not constitute a legal document for the description of these properties. Every effort has been made to ensure the accuracy of this data; however, this material may be slightly dated which would have an impact on its accuracy. The San Luis Obispo County Assessor's Office disclaims any responsibility or liability for any direct or indirect damages resulting from the use of this data.

APPENDIX

E

ENVIRONMENTAL SITE ASSESSMENT TRANSACTION SCREEN QUESTIONNAIRE

This document is an excerpt of Practice E1528-06: Standard Practice for Environmental Site Assessments: Transaction Screen Process, which is under the jurisdiction of ASTM Committee E50 on Environmental Assessment as is the direct responsibility of Subcommittee E50.02 on Commercial Real Estate Transactions. This questionnaire represents only Sections 5 and 6 of Practice E 1528-06 and should not be construed as being the complete standard. It is necessary to refer to the full standard prior to using this questionnaire. COPYRIGHT@ 2006 ASTM INTERNATIONAL, West Conshohocken, PA. Prior edition copyrighted 2000. Stock # ADJE152806. For the complete standard, or to order additional copies of this questionnaire, contact ASTM Customer service at (610) 832-9585.

5. Introduction to Transaction Screen Questionnaire

5.1 *Process*--The *transaction screen process* consists of asking questions contained within the *transaction screen questionnaire* of *owners* and *occupants* of the *property*, observing site conditions at the property with direction provided by the *transaction screen questionnaire*, and, to the extent *reasonably ascertainable*, conducting limited research regarding certain government records and certain standard historical sources. The questions asked of *owners* are the same questions as those asked of *occupants*.

5.2 *Guide*--The *transaction screen questionnaire* is followed by a guide designed to assist the person completing the *transaction screen questionnaire*. The guide to the *transaction screen questionnaire* is set out in Sections 7-10 of this practice. The guide is divided into three sections: Guide for Owner/Occupant Inquiry, Guide to Site Visit, and Guide to Government Records/Historical Sources Inquiry.

5.2.1 To assist the *user*, its employee or agent, or the preparer in preparing a report, the guide repeats each of the questions set out in the *transaction screen questionnaire* in both the guide for *owner/occupant* inquiry and the guide to *site visit*. The questions regarding government records/historical sources inquiry are also repeated in the guide to that section.

5.2.2 The guide also describes the procedures to be followed to determine if reliance upon the information in a prior *transaction screen* is appropriate under this practice.

5.2.3 A *user*, his employee or agent, or *preparer* conducting the *transaction screen process* should not use the *transaction screen questionnaire* without reference to or without familiarity with the guide based on prior use of the guide.

5.3 The *user* may either conduct the *transaction screen process*, or delegate it to an employee or agent or may contract with a third party to prepare the questionnaire on behalf of the *user*. No matter who prepares the questionnaire, the *user* remains responsible for the decision to conduct limited environmental *due diligence* and the impact of that decision on risk management.

5.4 The *preparer* conducting the *transaction screen* process should use good faith efforts in determining answers to the questions set forth in the *transaction screen questionnaire*. The *user* should take time and care to check whatever records are in the *user's* possession and forward relevant information or specialized knowledge to the *preparer*.

5.5 *Knowledge*--All answers should be given to the best of the *owner's* or *occupant's* knowledge. The most knowledgeable person available should be chosen to answer the questions.

5.5.1 While the person conducting the *transaction screen* has an obligation to ask the questions in the *transaction screen questionnaire*, others may have no obligation to answer them.

5.5.2 The *transaction screen questionnaire* and the *transaction screen guide* sometimes include the phrase "to the best of your knowledge." This phrase does not impose a constructive knowledge standard. It is intended as an assurance to the person being questioned that he or she is not obligated to search out information he or she does not currently have in order to answer the particular question.

5.6 *Conclusions Regarding Afirmative* or *Unknown Answers*-Once a *transaction screen questionnaire* has been completed, it shall be presented to the user. Subject to 5.6 through 5.7, an affirmative, unknown, or no response is presumed to be a *potential environmental concern*. If any of the questions set forth in the *transaction screen questionnaire* are answered in the affirmative, the *preparer* must document the reason for the affirmative answer. If any of the questions are not answered or the answer is unknown, the *user* should document such nonresponse or answer of unknown and evaluate it in light of the other information obtained in the *transaction screen process*, including, in particular, the site visit and the government recordslhistorical sources inquiry. If the *user* decides no further inquiry is warranted after receiving no response, an answer of unknown, or an affirmative answer, the *user* must document the reasons for any such conclusion.

5.6.1 Upon obtaining an affirmative answer, an answer of unknown or no response, the *user* should first refer to the guide. The guide may provide sufficient explanation to allow a *user* to conclude that no further inquiry is appropriate with respect to the particular question.

5.6.2 If the guide to a particular question does not, in itself, permit a user to conclude that no further inquiry is appropriate, then the user should consider other information obtained from the *transaction screen process* relating to this question. For example, while on the site performing a *site visit*, a person may find a storage tank on the *property* and therefore answer Question 10 of the *transaction screen questionnaire* in the affirmative. However, during or subsequent to the *owner/occupant* inquiry, the *owner* may establish that substances now or historically contained in the tank (for example, water) are not likely to cause contamination.

5.6.3 If either the guide to the question or other information obtained during the *transaction screen process* does not permit a *user* to conclude no further inquiry is appropriate with respect to such question, then the user must determine, in the exercise of the *user's* reasonable business judgment, based upon the totality of unresolved affirmative answers or answers of unknown received during the *transaction screen process*, whether further inquiry may be limited to those specific issues identified as of concern.

5.7 *Presumption*--A presumption exists that further inquiry is necessary if an affirmative answer is given to a question or because the answer was unknown or no response was given. In rebutting this presumption, the *user* should evaluate information obtained from each component of the *transaction screen* process and consider whether sufficient information has been obtained to conclude that no further inquiry is necessary. The *user* must determine, in the exercise of the *user's* reasonable business judgment, the scope of such further inquiry.

5.8 *Further Inquiry*--Upon completing the *transaction screen questionnaire*, if the *user* concludes that further inquiry or action is needed (for example, consult with an environmental consultant, contractor, governmental authority, or perform additional governmental and/or historical records review), the *user* should proceed with such inquiry. (Note that if the *user* determines to proceed with a Phase I Environment Site Assessment, the *user* may apply the current Practice E 1527 or alternatively the provisions of EPA's regulation "Standards and Practices for All Appropriate Inquiries," 40 C.F.R. Part 312.)

5.9 *Signature*--The user and the *preparer* of the *transaction screen questionnaire* must complete and sign the questionnaire as provided at the end of the questionnaire.

6. Transaction Screen Questionnaire

6.1 *Persons to Be Questioned*-The following questions should be asked of *(1)* the current owner of the *property*, *(2)* any major occupant of the *property* or, if the property does not have any *major occupants*, at least 10 % of the occupants of the *property*, and *(3)* in addition to the current owner and the occupants identified in *(2)*, any *occupant* likely to be using, treating, generating, storing, or disposing of *hazardous substances* or *petroleum products* on or from the *property*. A major occupant is any *occupant* using at least 40 % of the leasable area of the *property* or any anchor tenant when the *property* is a shopping center. In a multifamily *property* containing both residential and commercial uses, the *preparer* does not need to ask questions of the residential *occupants*. The *preparer* should ask each person to answer all questions to the best of the respondent's *actual knowledge* and in good faith. When completing the *site visit* column, the *preparer* should be sure to observe the *property* and any buildings and other structures on the *property*. The guide to this *transaction screen questionnaire* (see Sections 7-10) provides further details on the appropriate use of this questionnaire. (See Note 2.)
NOTE 2-Unk = "unknown" or "no response."

Description of Site Address:

_____

_____

_____

Question	Owner	Occupants (if applicable)	Observed During Site Visit	If yes, provide description
1a. Is the property used for an industrial use?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○	Yes ○ No ○	
1b. Is any adjoining property used for an industrial use?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○	Yes ○ No ○	
2a. Did you observe evidence or do you have any prior knowledge that the property has been used for an industrial use in the past?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○	Yes ○ No ○	
2b. Did you observe evidence or do you have any prior knowledge that any adjoining property has been used for an industrial use in the past?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○	Yes ○ No ○	
3a. Is the property used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility (if applicable, identify which)?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○	Yes ○ No ○	
3b. Is any adjoining property used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility (if applicable, identify which)?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○	Yes ○ No ○	
4a. Did you observe evidence or do you have any prior knowledge that the property has been used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility (if applicable, identify which)?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○	Yes ○ No ○	
4b. Did you observe evidence or do you have any prior knowledge that any adjoining property has been used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility (if applicable, identify which)?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○	Yes ○ No ○	
5a. Are there currently any damaged or discarded automotive or industrial batteries, pesticides, paints, or other chemicals in individual containers of >5 gal (19 L) in volume or 50 gal (190 L) in the aggregate, stored on or used at the property or at the facility?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○	Yes ○ No ○	
5b. Did you observe evidence or do you have any prior knowledge that there have been previously any damaged or discarded automotive or industrial batteries, or pesticides, paints, or other chemicals in individual containers of >5 gal (19 L) in volume or 50 gal (190 L) in the aggregate, stored on or used at the property or at the facility?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○	Yes ○ No ○	
6a. Are there currently any industrial drums (typically 55 gal (208 L)) or sacks of chemicals located on the property or at the facility?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○	Yes ○ No ○	
6b. Did you observe evidence or do you have any prior knowledge that there have been previously any industrial drums (typically 55 gal (208 L)) or sacks of chemicals located on the property or at the facility?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○	Yes ○ No ○	
7a. Did you observe evidence or do you have any prior knowledge that fill dirt has been brought onto the property that originated from a contaminated site?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○	Yes ○ No ○	

' Unk = "unknown" or "no response"

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Question	Owner	Occupants (if applicable)	Observed During Site Visit	If yes, provide description
7b. Did you observe evidence or do you have any prior knowledge that fill dirt has been brought onto the property that is of an unknown origin?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○	Yes ○ No ○	
8a. Are there currently any pits, ponds, or lagoons located on the property in connection with waste treatment or waste disposal?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○	Yes ○ No ○	
8b. Did you observe evidence or do you have any prior knowledge that there have been previously, any pits, ponds, or lagoons located on the property in connection with waste treatment or waste disposal?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○	Yes ○ No ○	
9a. Is there currently any stained soil on the property?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○	Yes ○ No ○	
9b. Did you observe evidence or do you have any prior knowledge that there has been previously, any stained soil on the property?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○	Yes ○ No ○	
10a. Are there currently any registered or unregistered storage tanks (above or underground) located on the property?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○	Yes ○ No ○	
10b. Did you observe evidence or do you have any prior knowledge that there have been previously, any registered or unregistered storage tanks (above or underground) located on the property?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○	Yes ○ No ○	
11a. Are there currently any vent pipes, fill pipes, or access ways indicating a fill pipe protruding from the ground on the property or adjacent to any structure located on the property?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○	Yes ○ No ○	
11b. Did you observe evidence or do you have any prior knowledge that there have been previously, any vent pipes, fill pipes, or access ways indicating a fill pipe protruding from the ground on the property or adjacent to any structure located on the property?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○	Yes ○ No ○	
12a. Is there currently evidence of leaks, spills or staining by substances other than water, or foul odors, associated with any flooring, drains, walls, ceilings, or exposed grounds on the property?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○	Yes ○ No ○	
12b. Did you observe evidence or do you have any prior knowledge that there have been previously any leaks, spills, or staining by substances other than water, or foul odors, associated with any flooring drains, walls, ceilings or exposed grounds on the property?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○	Yes ○ No ○	
13a. If the property is served by a private well or non-public water system, is there evidence or do you have prior knowledge that contaminants have been identified in the well or system that exceed guidelines applicable to the water system?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○	Yes ○ No ○	
13b. If the property is served by a private well or non-public water system, is there evidence or do you have prior knowledge that the well has been designated as contaminated by any government environment health agency?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○	Yes ○ No ○	
14. Does the owner or occupant of the property have any knowledge of environmental liens or governmental notification relating to past or recurrent violations of environmental laws with respect to the property or any facility located on the property?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○		
15a. Has the owner or occupant of the property been informed of the past existence of hazardous substances or petroleum products with respect to the property or any facility located on the property?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○		
15b. Has the owner or occupant of the property been informed of the current existence of hazardous substances or petroleum products with respect to the property or any facility located on the property?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○		
15c. Has the owner or occupant of the property been informed of the past existence of environmental violations with respect to the property or any facility located on the property?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○		
15d. Has the owner or occupant of the property been informed of the current existence of environmental violations with respect to the property or any facility located on the property?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○		

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Reso A - Exhibit C2 (EIR Technical Appendix)

ENVIRONMENTAL SITE ASSESSMENT
TRANSACTION SCREEN QUESTIONNAIRE

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5. Introduction to Transaction Screen Questionnaire

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5.5.1 While the person conducting the *transaction screen* has an obligation to ask the questions in the *transaction screen questionnaire*, others may have no obligation to answer them.

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5.6 *Conclusions Regarding Afirmative* or *Unknown Answers*-Once a *transaction screen questionnaire* has been completed, it shall be presented to the user. Subject to 5.6 through 5.7, an affirmative, unknown, or no response is presumed to be a *potential environmental concern*. If any of the questions set forth in the *transaction screen questionnaire* are answered in the affirmative, the *preparer* must document the reason for the affirmative answer. If any of the questions are not answered or the answer is unknown, the *user* should document such nonresponse or answer of unknown and evaluate it in light of the other information obtained in the *transaction screen process*, including, in particular, the site visit and the government recordslhistorical sources inquiry. If the *user* decides no further inquiry is warranted after receiving no response, an answer of unknown, or an affirmative answer, the *user* must document the reasons for any such conclusion.

5.6.1 Upon obtaining an affirmative answer, an answer of unknown or no response, the *user* should first refer to the guide. The guide may provide sufficient explanation to allow a *user* to conclude that no further inquiry is appropriate with respect to the particular question.

5.6.2 If the guide to a particular question does not, in itself, permit a user to conclude that no further inquiry is appropriate, then the user should consider other information obtained from the *transaction screen process* relating to this question. For example, while on the site performing a *site visit*, a person may find a storage tank on the *property* and therefore answer Question 10 of the *transaction screen questionnaire* in the affirmative. However, during or subsequent to the *owner/occupant* inquiry, the *owner* may establish that substances now or historically contained in the tank (for example, water) are not likely to cause contamination.

5.6.3 If either the guide to the question or other information obtained during the *transaction screen process* does not permit a *user* to conclude no further inquiry is appropriate with respect to such question, then the user must determine, in the exercise of the *user's* reasonable business judgment, based upon the totality of unresolved affirmative answers or answers of unknown received during the *transaction screen process*, whether further inquiry may be limited to those specific issues identified as of concern.

5.7 *Presumption*--A presumption exists that further inquiry is necessary if an affirmative answer is given to a question or because the answer was unknown or no response was given. In rebutting this presumption, the *user* should evaluate information obtained from each component of the *transaction screen* process and consider whether sufficient information has been obtained to conclude that no further inquiry is necessary. The *user* must determine, in the exercise of the *user's* reasonable business judgment, the scope of such further inquiry.

5.8 *Further Inquiry*--Upon completing the *transaction screen questionnaire*, if the *user* concludes that further inquiry or action is needed (for example, consult with an environmental consultant, contractor, governmental authority, or perform additional governmental and/or historical records review), the *user* should proceed with such inquiry. (Note that if the *user* determines to proceed with a Phase I Environment Site Assessment, the *user* may apply the current Practice E 1527 or alternatively the provisions of EPA's regulation "Standards and Practices for All Appropriate Inquiries," 40 C.F.R. Part 312.)

5.9 *Signature*--The user and the *preparer* of the *transaction screen questionnaire* must complete and sign the questionnaire as provided at the end of the questionnaire.

6. Transaction Screen Questionnaire

6.1 *Persons to Be Questioned*-The following questions should be asked of *(1)* the current owner of the *property*, *(2)* any major occupant of the *property* or, if the property does not have any *major occupants*, at least 10 % of the occupants of the *property*, and *(3)* in addition to the current owner and the occupants identified in *(2)*, any *occupant* likely to be using, treating, generating, storing, or disposing of *hazardous substances* or *petroleum products* on or from the *property*. A major occupant is any *occupant* using at least 40 % of the leasable area of the *property* or any anchor tenant when the *property* is a shopping center. In multifamily *properties* or buildings with residential and commercial uses, the *preparer* does not need to ask questions of the residential *occupants*. The *preparer* should ask each person to answer all questions to the best of the respondent's *actual knowledge* and in good faith. When completing the *site visit* column, the *preparer* should be sure to observe the *property* and any buildings and other structures on the *property*. The guide to this *transaction screen questionnaire* (see Sections 7-10) provides further details on the appropriate use of this questionnaire. (See Note 2.)
NOTE 2-Unk = "unknown" or "no response."

Description of Site Address:

Chandler / Olsen Ranch Development

Question	Owner	Occupants (if applicable)	Observed During Site Visit	If yes, provide description
1a. Is the property used for an industrial use?	Yes ○ No ● Unk ○	Yes ○ No ● Unk ○	Yes ○ No ●	
1b. Is any adjoining property used for an industrial use?	Yes ○ No ● Unk ○	Yes ○ No ● Unk ○	Yes ○ No ●	
2a. Did you observe evidence or do you have any prior knowledge that the property has been used for an industrial use in the past?	Yes ○ No ● Unk ○	Yes ○ No ● Unk ○	Yes ○ No ●	
2b. Did you observe evidence or do you have any prior knowledge that any adjoining property has been used for an industrial use in the past?	Yes ○ No ● Unk ○	Yes ○ No ● Unk ○	Yes ○ No ●	
3a. Is the property used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility (if applicable, identify which)?	Yes ○ No ● Unk ○	Yes ○ No ● Unk ○	Yes ○ No ●	
3b. Is any adjoining property used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility (if applicable, identify which)?	Yes ○ No ● Unk ○	Yes ○ No ● Unk ○	Yes ○ No ●	
4a. Did you observe evidence or do you have any prior knowledge that the property has been used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility (if applicable, identify which)?	Yes ○ No ● Unk ○	Yes ○ No ● Unk ○	Yes ○ No ●	
4b. Did you observe evidence or do you have any prior knowledge that any adjoining property has been used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility (if applicable, identify which)?	Yes ○ No ● Unk ○	Yes ○ No ● Unk ○	Yes ○ No ●	
5a. Are there currently any damaged or discarded automotive or industrial batteries, pesticides, paints, or other chemicals in individual containers of >5 gal (19 L) in volume or 50 gal (190 L) in the aggregate, stored on or used at the property or at the facility?	Yes ○ No ● Unk ○	Yes ○ No ● Unk ○	Yes ○ No ●	
5b. Did you observe evidence or do you have any prior knowledge that there have been previously any damaged or discarded automotive or industrial batteries, or pesticides, paints, or other chemicals in individual containers of >5 gal (19 L) in volume or 50 gal (190 L) in the aggregate, stored on or used at the property or at the facility?	Yes ○ No ● Unk ○	Yes ○ No ● Unk ○	Yes ○ No ●	
6a. Are there currently any industrial drums (typically 55 gal (208 L)) or sacks of chemicals located on the property or at the facility?	Yes ○ No ● Unk ○	Yes ○ No ● Unk ○	Yes ○ No ●	
6b. Did you observe evidence or do you have any prior knowledge that there have been previously any industrial drums (typically 55 gal (208 L)) or sacks of chemicals located on the property or at the facility?	Yes ○ No ● Unk ○	Yes ○ No ● Unk ○	Yes ○ No ●	
7a. Did you observe evidence or do you have any prior knowledge that fill dirt has been brought onto the property that originated from a contaminated site?	Yes ○ No ● Unk ○	Yes ○ No ● Unk ○	Yes ○ No ●	

' Unk = "unknown" or "no response"

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Question	Owner	Occupants (if applicable)	Observed During Site Visit	If yes, provide description
7b. Did you observe evidence or do you have any prior knowledge that fill dirt has been brought onto the property that is of an unknown origin?	Yes ○ No ● Unk ○	Yes ○ No ● Unk ○	Yes ○ No ●	
8a. Are there currently any pits, ponds, or lagoons located on the property in connection with waste treatment or waste disposal?	Yes ○ No ● Unk ○	Yes ○ No ● Unk ○	Yes ○ No ●	
8b. Did you observe evidence or do you have any prior knowledge that there have been previously, any pits, ponds, or lagoons located on the property in connection with waste treatment or waste disposal?	Yes ○ No ● Unk ○	Yes ○ No ● Unk ○	Yes ○ No ●	
9a. Is there currently any stained soil on the property?	Yes ○ No ● Unk ○	Yes ○ No ● Unk ○	Yes ○ No ●	
9b. Did you observe evidence or do you have any prior knowledge that there has been previously, any stained soil on the property?	Yes ○ No ○ Unk ○	Yes ○ No ● Unk ○	Yes ○ No ●	
10a. Are there currently any registered or unregistered storage tanks (above or underground) located on the property?	Yes ○ No ● Unk ○	Yes ○ No ● Unk ○	Yes ○ No ●	
10b. Did you observe evidence or do you have any prior knowledge that there have been previously, any registered or unregistered storage tanks (above or underground) located on the property?	Yes ○ No ● Unk ○	Yes ○ No ● Unk ○	Yes ○ No ●	
11a. Are there currently any vent pipes, fill pipes, or access ways indicating a fill pipe protruding from the ground on the property or adjacent to any structure located on the property?	Yes ○ No ● Unk ○	Yes ○ No ● Unk ○	Yes ○ No ●	
11b. Did you observe evidence or do you have any prior knowledge that there have been previously, any vent pipes, fill pipes, or access ways indicating a fill pipe protruding from the ground on the property or adjacent to any structure located on the property?	Yes ○ No ● Unk ○	Yes ○ No ● Unk ○	Yes ○ No ●	
12a. Is there currently evidence of leaks, spills or staining by substances other than water, or foul odors, associated with any flooring, drains, walls, ceilings, or exposed grounds on the property?	Yes ○ No ● Unk ○	Yes ○ No ● Unk ○	Yes ○ No ●	
12b. Did you observe evidence or do you have any prior knowledge that there have been previously any leaks, spills, or staining by substances other than water, or foul odors, associated with any flooring drains, walls, ceilings or exposed grounds on the property?	Yes ○ No ● Unk ○	Yes ○ No ● Unk ○	Yes ○ No ●	
13a. If the property is served by a private well or non-public water system, is there evidence or do you have prior knowledge that contaminants have been identified in the well or system that exceed guidelines applicable to the water system?	Yes ○ No ● Unk ○	Yes ○ No ● Unk ○	Yes ○ No ●	
13b. If the property is served by a private well or non-public water system, is there evidence or do you have prior knowledge that the well has been designated as contaminated by any government environment health agency?	Yes ○ No ● Unk ○	Yes ○ No ● Unk ○	Yes ○ No ●	
14. Does the owner or occupant of the property have any knowledge of environmental liens or governmental notification relating to past or recurrent violations of environmental laws with respect to the property or any facility located on the property?	Yes ○ No ● Unk ○	Yes ○ No ● Unk ○		
15a. Has the owner or occupant of the property been informed of the past existence of hazardous substances or petroleum products with respect to the property or any facility located on the property?	Yes ○ No ● Unk ○	Yes ○ No ● Unk ○		
15b. Has the owner or occupant of the property been informed of the current existence of hazardous substances or petroleum products with respect to the property or any facility located on the property?	Yes ○ No ● Unk ○	Yes ○ No ● Unk ○		
15c. Has the owner or occupant of the property been informed of the past existence of environmental violations with respect to the property or any facility located on the property?	Yes ○ No ● Unk ○	Yes ○ No ● Unk ○		
15d. Has the owner or occupant of the property been informed of the current existence of environmental violations with respect to the property or any facility located on the property?	Yes ○ No ● Unk ○	Yes ○ No ● Unk ○		

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Question	Owner	Occupants if applicable	Observed During Site Visit	If yes, provide description
16. Does the owner or occupant of the property have any knowledge of any environmental site assessment of the property or facility that indicated the presence of hazardous substances or petroleum products on, or contamination of, the property or recommended further assessment of the property?	Yes ○ No ◉ Unk ○	Yes ○ No ◉ Unk ○		
17. Does the owner or occupant of the property know of any past, threatened, or pending lawsuits or administrative proceedings concerning a release or threatened release of any hazardous substance or petroleum products involving the property by any owner or occupant of the property?	Yes ○ No ◉ Unk ○	Yes ○ No ◉ Unk ○		
18a. Does the property discharge waste-water (not including sanitary waste or storm water) onto or adjacent to the property and/or into a storm water system?	Yes ○ No ◉ Unk ○	Yes ○ No ◉ Unk ○	Yes ○ No ◉	
18b. Does the property discharge waste water (not including sanitary waste or storm water) onto or adjacent to the property and/or into a sanitary sewer system?	Yes ○ No ◉ Unk ○	Yes ○ No ◉ Unk ○	Yes ○ No ◉	
19. Did you observe evidence or do you have any prior knowledge that any hazardous substances or petroleum products, unidentified waste materials, tires, automotive or industrial batteries, or any other waste materials have been dumped above grade, buried and/or burned on the property?	Yes ○ No ◉ Unk ○	Yes ○ No ◉ Unk ○	Yes ○ No ◉	
20. Is there a transformer, capacitor, or any hydraulic equipment for which there are any records indicating the presence of PCBs?	Yes ○ No ◉ Unk ○	Yes ○ No ◉ Unk ○	Yes ○ No ◉	

Government Records/Historical Sources Inquiry

(See guide, Section 10)

21. Do any of the following federal, state, or tribal government record systems list the property or any property within the search distance noted below (where available):	Approximate Minimum Search Distance, miles (kilometres)		
Federal NPL site	1.0	Yes ○	No ◉
Federal Delisted NPL site	0.5	Yes ○	No ◉
Federal CERCLIS	0.5	Yes ○	No ◉
Federal CERCLIS NFRAP site	0.5	Yes ○	No ◉
Federal RCRA CORRACTS facilities	1.0	Yes ○	No ◉
Federal RCRA non-CORRACTS TSD	0.5	Yes ○	No ◉
Federal RCRA generators	property and adjoining properties	Yes ○	No ◉
Federal institutional control/engineering control registries	property only		
Federal ERNS	property only	Yes ○	No ◉

State and tribal lists of hazardous waste sites identified for investigation or remediation:

State-and tribal-equivalent NPL	1.0	Yes ○	No ◉
State-and tribal-equivalent	0.5	Yes ○	No ◉
State-and tribal-landfill andlor solid waste disposal site lists	0.5	Yes ○	No ◉
State-and tribal-leaking storage tank lists	0.5	Yes ○	No ◉
State and tribal registered storage tank lists	property and adjoiningproperties	Yes ○	No ◉
State and tribal institutional controllengineering control registries	property only	Yes ○	No ◉
State and tribal voluntary cleanup sites	0.5	Yes ○	No ◉
State and tribal Brownfield sites	0.5	Yes ○	No ◉

22. Based upon a review of fire insurance maps (10.2.3) or local street directories (10.2.3), all as specified in the guide, are any buildings or other improvements on the property or on an adjoiningproperty identified as having been used for an industrial use or uses likely to lead to contamination of the property? Yes ○ No ◉ Unavailable ○

Result CLEAR

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The Owner questionnaire answers were provided was completed by:

Name: Mike Naggar and Associates
Title: Developer
Firm: Mike Naggar and Associates
Address: 445 South D street
Perris California 92570
Phone Number: 951-437-4329
Date: 11/5/2018
Role (s) at the site:
Number of years at the site:
Relationship to use (e.g. principal, employee, agent, consultant):

The Occupant questionnaire answers were provided by:

Name:
Title:
Firm:
Address:
Phone Number:
Date:
Role (s) at the site:
Number of years at the site:
Realationship to use (e.g. principal, employee, agent, consultant):

The Site Visit questionnaire was completed by:

Name: William Doyle
Title: Geologist
Firm: ESGS
Address: 42184 Remington Ave
Temecula California
Phone Number: 951-219-4751
Date: 11/5/2018
Role (s) at the site:
Number of years at the site:
Realationship to use (e.g. principal, employee, agent, consultant):

It is the user's responsibility to draw conclusions regarding afirmative or unknown answers.

The Government Records and Historical Sources Inquiry questionnaire was completed by:

Name: William Doyle
Title: Geologist
Firm: ESGS
Address: 42184 Remington Ave
Temecula California
Phone Number: 951-219-4752
Date: 11/5/2018
Role (s) at the site: Assessor
Number of years at the site:
Relationship to use (e.g. principal, employee, agent, consultant):

User's relationship to the site (for example, owner, prospective purchaser, lender, etc.)

If the preparer (s) is different from the user, complete the following:

Name of User:
User's Address:
User's Phone Number:

Copies of the completed questionnaires have been filed at:

Copies of the completed questionnaires have been mailed or delivered to:

Preparer represents that to the best of the preparer's knowledge the above statements and facts are true and correct and to the best of the preparer's actual knowledge no material facts have been suppressed or misstated.

Signature: William Doyle
Date: 11/7/2018

Signature:
Date:

Signature:
Date:

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e-mail: service@astm.org

100 Barr Harbor Drive
PO Box C700
West Conshohocken, PA 19428-2959

Question	Owner	Occupants (if applicable)	Observed During Site Visit	If yes, provide description
16. Does the owner or occupant of the property have any knowledge of any environmental site assessment of the property or facility that indicated the presence of hazardous substances or petroleum products on, or contamination of, the property or recommended further assessment of the property?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○		
17. Does the owner or occupant of the property know of any past, threatened, or pending lawsuits or administrative proceedings concerning a release or threatened release of any hazardous substance or petroleum products involving the property by any owner or occupant of the property?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○		
18a. Does the property discharge waste-water (not including sanitary waste or storm water) onto or adjacent to the property and/or into a storm water system?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○	Yes ○ No ○	
18b. Does the property discharge waste water (not including sanitary waste or storm water) onto or adjacent to the property and/or into a sanitary sewer system?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○	Yes ○ No ○	
19. Did you observe evidence or do you have any prior knowledge that any hazardous substances or petroleum products, unidentified waste materials, tires, automotive or industrial batteries, or any other waste materials have been dumped above grade, buried and/or burned on the property?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○	Yes ○ No ○	
20. Is there a transformer, capacitor, or any hydraulic equipment for which there are any records indicating the presence of PCBs?	Yes ○ No ◉ Unk ○	Yes ○ No ○ Unk ○	Yes ○ No ○	

Government Records/Historical Sources Inquiry

(See guide, Section 10)

21. Do any of the following federal, state, or tribal government record systems list the property or any property within the search distance noted below (where available):	Approximate Minimum Search Distance, miles (kilometres)		
Federal NPL site	1.0	Yes ○	No ◉
Federal Delisted NPL site	0.5	Yes ○	No ◉
Federal CERCLIS	0.5	Yes ○	No ◉
Federal CERCLIS NFRAP site	0.5	Yes ○	No ◉
Federal RCRA CORRACTS facilities	1.0	Yes ○	No ◉
Federal RCRA non-CORRACTS TSD	0.5	Yes ○	No ◉
Federal RCRA generators	property and adjoining properties	Yes ○	No ◉
Federal institutional control/engineering control registries	property only		
Federal ERNS	property only	Yes ○	No ◉

State and tribal lists of hazardous waste sites identified for investigation or remediation:

State-and tribal-equivalent NPL	1.0	Yes ○	No ◉
State-and tribal-equivalent	0.5	Yes ○	No ◉
State-and tribal-landfill andlor solid waste disposal site lists	0.5	Yes ○	No ◉
State-and tribal-leaking storage tank lists	0.5	Yes ○	No ◉
State and tribal registered storage tank lists	property and adjoiningproperties	Yes ○	No ◉
State and tribal institutional controllengineering control registries	property only	Yes ○	No ◉
State and tribal voluntary cleanup sites	0.5	Yes ○	No ◉
State and tribal Brownfield sites	0.5	Yes ○	No ◉

22. Based upon a review of fire insurance maps (10.2.3) or local street directories (10.2.3), all as specified in the guide, are any buildings or other improvements on the property or on an adjoiningproperty identified as having been used for an industrial use or uses likely to lead to contamination of the property? Yes ○ No ◉ Unavailable ○

Result _____

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The Owner questionnaire answers were provided was completed by:

Name: Carissa Hainsworth

Title: Project Manager

Firm: Mike Naggar & Associates, Inc

Address: 445 South D Street

Perris, CA 92570

Phone Number: 951-437-4329

Date: 10/07/2018

Role (s) at the site: Project Manager

Number of years at the site: >1 year

Relationship to use (e.g. principal, employee, agent, consultant)

Consultant

The Occupant questionnaire answers were provided by:

Name

Title

Firm

Address

Phone Number

Date

Role (s) at the site

Number of years at the site

Realationship to use (e.g. principal, employee, agent, consultant)

The Site Visit questionnaire was completed by:

Name

Title

Firm

Address

Phone Number

Date

Role (s) at the site

Number of years at the site

Realationship to use (e.g. principal, employee, agent, consultant)

It is the user's responsibility to draw conclusions regarding afirmative or unknown answers.

The Government Records and Historical Sources Inquiry questionnaire was completed by:

Name

Title

Firm

Address

Phone Number

Date

Role (s) at the site

Number of years at the site

Relationship to use (e.g. principal, employee, agent, consultant)

User's relationship to the site (for example, owner, prospective purchaser, lender, etc.)

If the preparer (s) is different from the user, complete the following:

Name of User

User's Address

User's Phone Number

Copies of the completed questionnaires have been filed at:

Copies of the completed questionnaires have been mailed or delivered to:

Preparer represents that to the best of the preparer's knowledge the above statements and facts are true and correct and to the best of the preparer's actual knowledge no material facts have been suppressed or misstated.

Signature:

Date: 11/7/18

Signature:

Date:

Signature:

Date:

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West Conshohocken, PA 19428-2959

Appendix H

Noise Impact Assessment

NOISE IMPACT ASSESSMENT

FOR

OLSEN-CHANDLER SPECIFIC PLAN

PASO ROBLES, CA

AUGUST 2019

PREPARED FOR:

Mike Naggar and Associates, Inc.
445 S. D Street
Perris, CA 92570

PREPARED BY:

AMBIENT
AIR QUALITY & NOISE CONSULTING

612 12TH STREET, SUITE 201
PASO ROBLES, CA 93446

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A. Ambient Noise Monitoring Surveys
B. Traffic Noise Modeling

INTRODUCTION

This report discusses the existing noise setting and identifies potential noise impacts associated with the implementation of the proposed Olsen-Chandler Specific Plan Project. Noise mitigation measures are recommended where the predicted noise levels would exceed applicable noise standards.

PROJECT OVERVIEW

The proposed Olsen-Chandler Specific Plan will provide a combination of land uses that include residential, commercial, community park/open space, private recreation, and school. The plan will include 1,293 residential dwelling units (comprised of 1,065 single-family units and 228 multi-family units), 10,659 square feet of shopping center, 29,335 square feet of private recreation, and 495-student elementary school. The project site is generally located to the north and south of Linne Road, between Fontana Road and Hanson Road. The proposed Olsen-Chandler Specific Plan is depicted in Figure 1.

ACOUSTIC FUNDAMENTALS

Noise is generally defined as sound that is loud, disagreeable, or unexpected. Sound, as described in more detail below, is mechanical energy transmitted in the form of a wave because of a disturbance or vibration.

Amplitude

Amplitude is the difference between ambient air pressure and the peak pressure of the sound wave. Amplitude is measured in decibels (dB) on a logarithmic scale. For example, a 65 dB source of a sound, such as a truck, when joined by another 65 dB source results in a sound amplitude of 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by 3 dB). Amplitude is interpreted by the ear as corresponding to different degrees of loudness. Laboratory measurements correlate a 10 dB increase in amplitude with a perceived doubling of loudness and establish a 3 dB change in amplitude as the minimum audible difference perceptible to the average person.

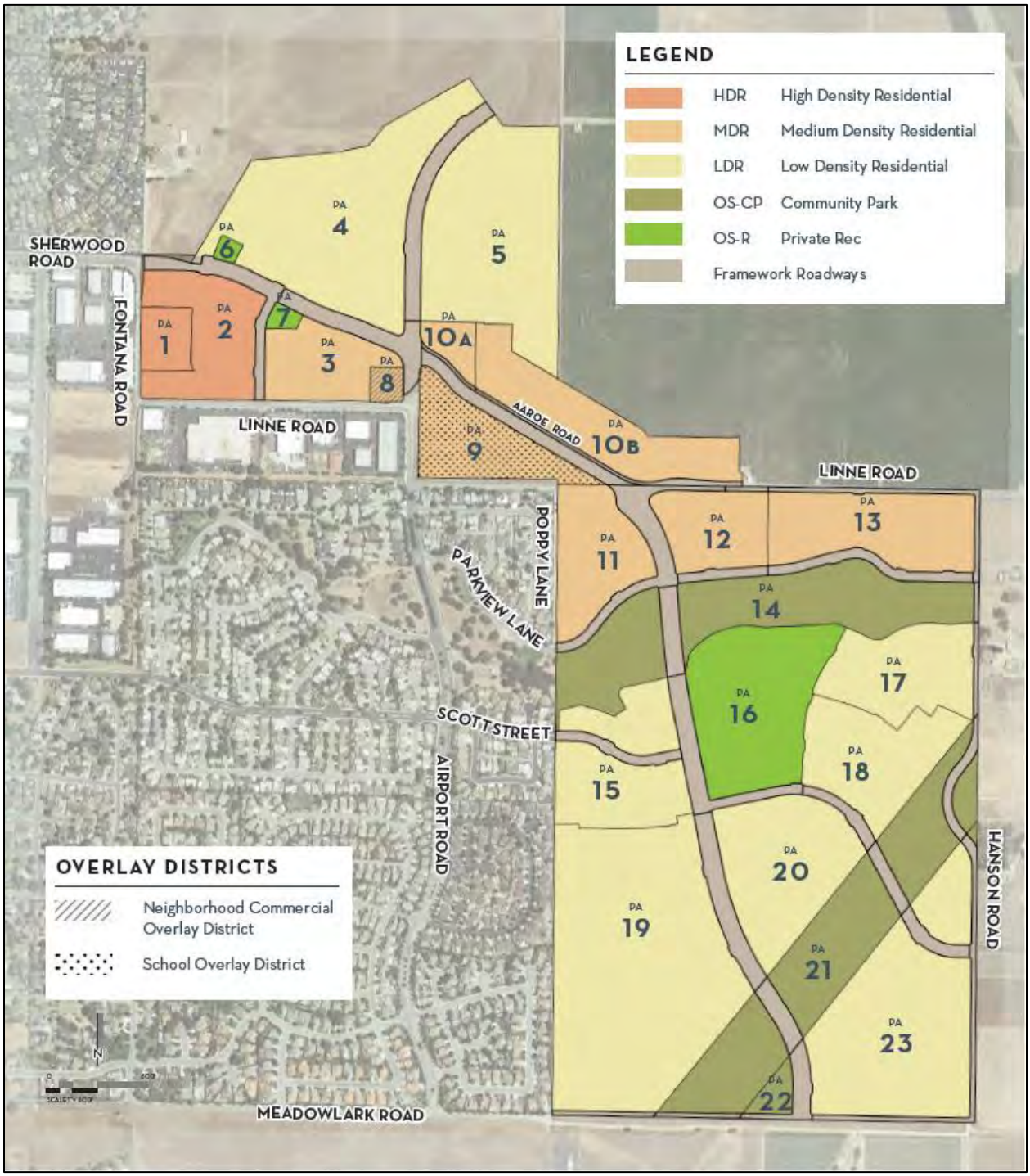
Frequency

Frequency is the number of fluctuations in the pressure wave per second. The unit of frequency is the Hertz (Hz). One Hz equals one cycle per second. The human ear is not equally sensitive to the sound of different frequencies. Sound waves below 16 Hz or above 20,000 Hz cannot be heard at all, and the ear is more sensitive to sound in the higher portion of this range than in the lower. To approximate this sensitivity, the environmental sound is usually measured in A-weighted decibels (dBA). On this scale, the normal range of human hearing extends from about 10 dBA to about 140 dBA. Common community noise sources and noise levels are depicted in Figure 2.

Addition of Decibels

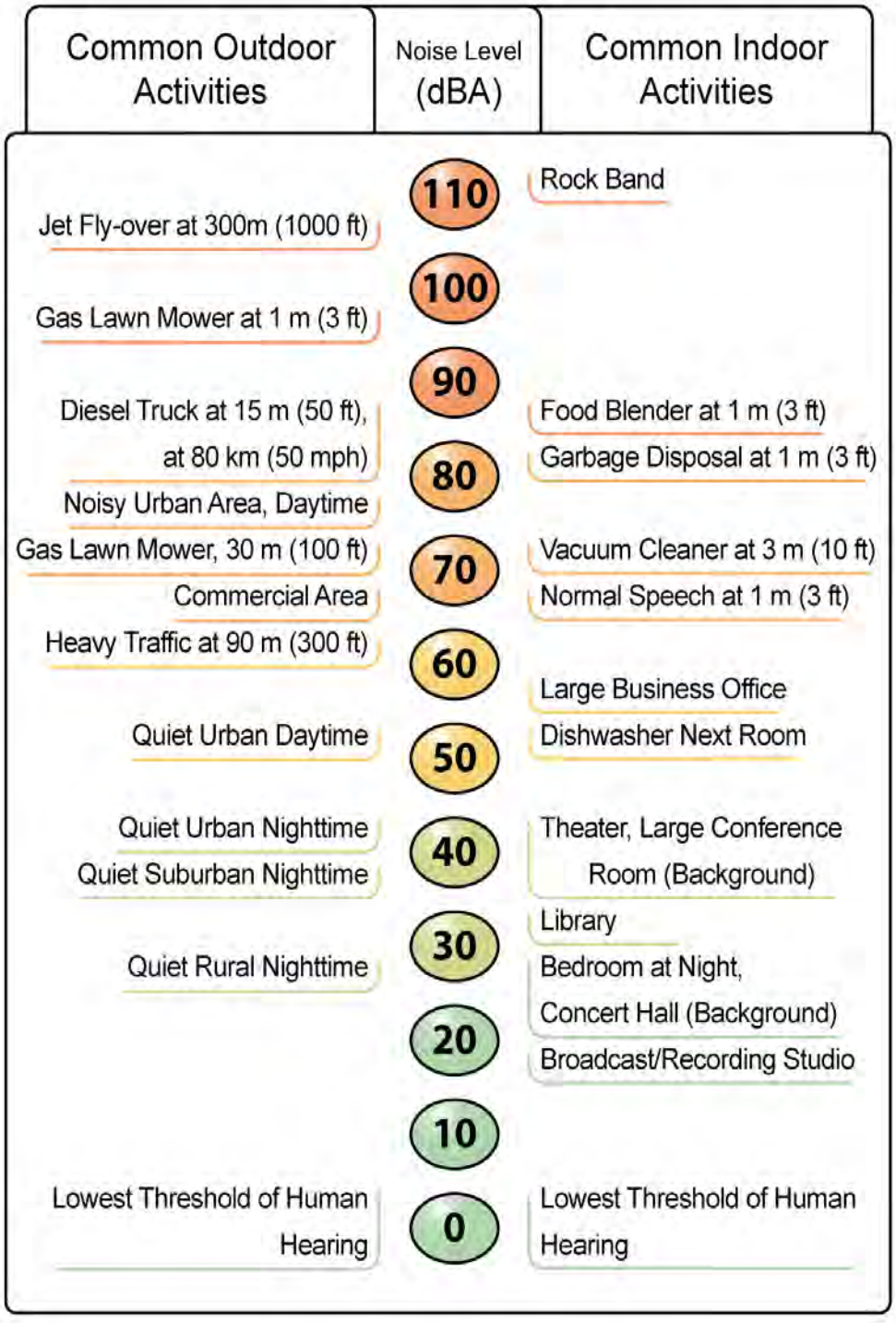
Because decibels are logarithmic units, sound levels cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3-dB increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dB higher than one source under the same conditions. For example, if one automobile produces a sound level of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB; rather, they would combine to produce 73 dB. Under the decibel scale, three sources of equal loudness together would produce an increase of 5 dB.

Figure 1
Proposed Olsen-Chandler Specific Plan



Note: Low Density and Medium Density Residential consist of single-family units. High-Density Residential consists of multi-family units.
Source: Rincon Consultants 2019

Figure 2
Common Noise Levels



Source: Caltrans 2012

Sound Propagation & Attenuation

Geometric Spreading

The sound from a localized source (i.e., a point source) propagates uniformly outward in a spherical pattern. The sound level decreases (attenuates) at a rate of approximately 6 decibels for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path, and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of approximately 3 decibels for each doubling of distance from a line source, depending on ground surface characteristics. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receiver, such as a parking lot or body of water,), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between a line source and the receiver, such as soft dirt, grass, or scattered bushes and trees), an excess ground-attenuation value of 1.5 decibels per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation for soft surfaces results in an overall attenuation rate of 4.5 decibels per doubling of distance from a line source.

Shielding by Natural or Human-Made Features

A large object or barrier in the path between a noise source and a receiver can substantially attenuate noise levels at the receiver. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Natural terrain features (e.g., hills and dense woods) and human-made features (e.g., buildings and walls) can substantially reduce noise levels. Walls are often constructed between a source and a receiver specifically to reduce noise. A barrier that breaks the line of sight between a source and a receiver will typically result in an approximate 5 dB of noise reduction. Taller barriers provide increased noise reduction.

Noise Descriptors

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Although the intensity (energy per unit area) of the sound is a purely physical quantity, the loudness or human response is determined by the characteristics of the human ear.

Human hearing is limited in the range of audible frequencies as well as in the way it perceives the sound-pressure level in that range. In general, people are most sensitive to the frequency range of 1,000–8,000 Hz, and perceive sounds within that range better than sounds of the same amplitude in higher or lower frequencies. To approximate the response of the human ear, sound levels of individual frequency bands are weighted, depending on the human sensitivity to those frequencies, which is referred to as the "A-weighted" sound level (expressed in units of dBA). The A-weighting network approximates the frequency response of the average young ear when listening to most ordinary sounds. When people make judgments of the relative loudness or annoyance of a sound, their judgments correlate well with the A-weighted noise scale. Other weighting networks have been devised to address high noise levels or other special problems (e.g., B-, C-, and D-scales), but these scales are rarely used in conjunction with environmental noise.

The intensity of environmental noise fluctuates over time, and several descriptors of time-averaged noise levels are typically used. For the evaluation of environmental noise, the most commonly used descriptors are L_{eq}, L_{dn}, and CNEL. The energy-equivalent noise level, L_{eq}, is a measure of the average energy content (intensity) of noise over any given period. Many communities use 24-hour descriptors of noise levels to regulate noise. The day-night average noise level, L_{dn}, is the 24-hour average of the noise intensity, with a 10-dBA "penalty" added for nighttime noise (10 p.m. to 7 a.m.) to account for the greater sensitivity to noise during this period. CNEL, the community equivalent noise level, is similar to L_{dn} but adds an additional 5-dBA penalty for evening noise (7 p.m. to 10 p.m.) Common noise descriptors are summarized in Table 1.

Table 1
Common Acoustical Terms and Descriptors

Descriptor	Definition
Decibel (dB)	A unit-less measure of sound on a logarithmic scale, which indicates the squared ratio of sound pressure amplitude to referenced sound pressure amplitude. The reference pressure is 20 micro-pascals.
A-Weighted Decibel (dBA)	An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.
Energy Equivalent Noise Level (L_{eq})	The energy means (average) noise level. The instantaneous noise levels during a specific period of time in dBA are converted to relative energy values. From the sum of the relative energy values, an average energy value (in dBA) is calculated.
Minimum Noise Level (L_{min})	The minimum instantaneous noise level during a specific period of time.
Maximum Noise Level (L_{max})	The maximum instantaneous noise level during a specific period of time.
Day-Night Average Noise Level (DNL or L_{dn})	The 24-hour L_{eq} with a 10 dBA "penalty" for noise events that occur during the noise-sensitive hours between 10:00 p.m. and 7:00 a.m. In other words, 10 dBA is "added" to noise events that occur in the nighttime hours to account for increased sensitivity to noise during these hours.
Community Noise Equivalent Level (CNEL)	The CNEL is similar to the L_{dn} described above, but with an additional 5 dBA "penalty" added to noise events that occur between the hours of 7:00 p.m. to 10:00 p.m. The calculated CNEL is typically approximately 0.5 dBA higher than the calculated Ldn.

Human Response to Noise

The human response to environmental noise is subjective and varies considerably from individual to individual. Noise in the community has often been cited as a health problem, not in terms of actual physiological damage, such as hearing impairment, but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise in the community arise from interference with human activities, including sleep, speech, recreation, and tasks that demand concentration or coordination. Hearing loss can occur at the highest noise intensity levels. When community noise interferes with human activities or contributes to stress, public annoyance with the noise source increases. The acceptability of noise and the threat to public well-being are the basis for land use planning policies preventing exposure to excessive community noise levels.

Unfortunately, there is no completely satisfactory way to measure the subjective effects of noise or of the corresponding reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance and habituation to noise over differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted: the so-called "ambient" environment. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged. Regarding increases in A-weighted noise levels, knowledge of the following relationships will be helpful in understanding this analysis:

- Except in carefully controlled laboratory experiments, a change of 1 dB cannot be perceived by humans;
- Outside of the laboratory, a 3-dB change is considered a just-perceivable difference;
- A change in the level of at least 5 dB is required before any noticeable change in community response would be expected. An increase of 5 dB is typically considered substantial;
- A 10-dB change is subjectively heard as an approximate doubling in loudness and would almost certainly cause an adverse change in community response.

Speech Communication

For most noise-sensitive land uses, an interior noise level of 45 dB L_{eq} is typically identified for the protection of speech communication in order to provide for 100-percent intelligibility of speech sounds. Assuming an average 20-dB reduction in sound level between outdoors and indoors (which is an average amount of sound attenuation that assumes windows are closed), this interior noise level would equate to an exterior noise level of 65 dBA L_{eq}. For outdoor voice communication, an exterior noise level of 60 dBA L_{eq} allows normal conversation at distances up to 2 meters with 95 percent sentence intelligibility (U.S. EPA 1974.) Based on this information, speech interference begins to become a problem when steady noise levels reach approximately 60 to 65 dBA. Within more noise-sensitive interior environments, such as educational facilities and places of worship, an average-hourly background noise level of 45 dBA L_{eq} is typically recommended.

Annoyance & Sleep Disruption

With regard to potential increases in annoyance, activity interference, and sleep disruption, land use compatibility determinations are typically based on the use of the cumulative noise exposure metrics (i.e., CNEL or L_{dn}). Perhaps the most comprehensive and widely accepted evaluation of the relationship between noise exposure and the extent of annoyance was one originally developed by Theodore J. Schultz in 1978. In 1978 the research findings of Theodore J. Schultz provided support for L_{dn} as the descriptor for environmental noise. Research conducted by Schultz identified a correlation between the cumulative noise exposure metric and individuals who were highly annoyed by transportation noise. The Schultz curve, expressing this correlation, became a basis for noise standards. When expressed graphically, this relationship is typically referred to as the Schultz curve. The Schultz curve indicates that approximately 13 percent of the population is highly annoyed at a noise level of 65 dBA L_{dn}. It also indicates that the percentage of people describing themselves as being highly annoyed accelerates smoothly between 55 and 70 dBA L_{dn}. A noise level of 65 dBA L_{dn} is a commonly referenced dividing point between lower and higher rates of people describing themselves as being highly annoyed.

The Schultz curve and associated research became the basis for many of the noise criteria subsequently established for federal, state, and local entities. Most federal and state of California regulations and policies related to transportation noise sources establish a noise level of 65 dBA CNEL/L_{dn} as the basic limit of acceptable noise exposure for residential and other noise-sensitive land uses. For instance, with respect to aircraft noise, both the Federal Aviation Administration (FAA) and the State of California have identified a noise level of 65 dBA L_{dn} as the dividing point between normally compatible and normally incompatible residential land use generally applied for the determination of land use compatibility. For noise-sensitive land uses exposed to aircraft noise, noise levels in excess of 65 dBA CNEL/L_{dn} are typically considered to result in a potentially significant increase in levels of annoyance.

Allowing for an average exterior-to-interior noise reduction of 20 dB, an exterior noise level of 65 dBA CNEL/L_{dn} would equate to an interior noise level of 45 dBA CNEL/L_{dn}. An interior noise level of 45 dB CNEL/L_{dn} is generally considered sufficient to protect against long-term sleep interference (U.S. EPA, 1974.) Within California, the California Building Code establishes a noise level of 45 dBA CNEL as the maximum acceptable interior noise level for residential uses (other than detached single family dwellings). Use of the 45 dBA CNEL threshold is further supported by recommendations provided in the State of California Office of Planning and Research's *General Plan Guidelines*, which recommend an interior noise level of 45 dB CNEL/L_{dn} as the maximum allowable interior noise level sufficient to permit "normal residential activity" (OPR 2017).

The cumulative noise exposure metric is currently the only noise metric for which there is a substantial body of research data and regulatory guidance defining the relationship between noise exposure, people's reactions, and land use compatibility. However, when evaluating environmental noise impacts involving intermittent noise events, such as aircraft overflights and train pass by, the use of cumulative noise metrics may not provide a thorough understanding of the resultant impact. The general public often finds it difficult to understand the relationship between intermittent noise events and cumulative noise exposure metrics. In such instances, supplemental use of other noise metrics, such as the L_{eq} or L_{max} descriptor, are sometimes used as a means of increasing public understanding regarding the relationship between these metrics and the extent of the resultant noise impact.

REGULATORY FRAMEWORK

Noise

Noise Control Act of 1972

The Noise Control Act of 1972 establishes a national policy to promote an environment for all Americans free from noise that jeopardizes their health and welfare. The Act also serves to (1) establish a means for effective coordination of Federal research and activities in noise control; (2) authorize the establishment of Federal noise emission standards for products distributed in commerce; and (3) provide information to the public respecting the noise emission and noise reduction characteristics of such products.

Department of Housing and Urban Development (HUD)

HUD guidelines for the acceptability of residential land use are set forth in the Code of Federal Regulations Title 24, Part 51, "Environmental Criteria and Standards." These guidelines parallel those suggested in the FICUN report: noise exposure of 65 dBA CNEL/L_{dn}, or less, is acceptable and between 65 and 75 dBA CNEL/L_{dn} noise exposure is considered normally acceptable provided appropriate sound-reduction measures are provided. Above 75 dBA CNEL/L_{dn} noise exposure is generally considered unacceptable. The guidelines also identify the recommended interior noise levels of 45 dBA CNEL/L_{dn}. These guidelines apply only to new construction supported by HUD grants and are not binding upon local communities.

California Code of Regulations, Title 24

Title 24 of the California Code of Regulations contains standards for allowable interior noise levels associated with exterior noise sources (California Building Code, 1998 edition, Volume 1, Appendix Chapter 12, Section 1208A). The standards apply to new hotels, motels, dormitories, apartment houses, and dwellings other than detached single family residences. The standards state that the interior noise level attributable to exterior sources shall not exceed 45 dBA CNEL in any habitable room. Proposed residential structures to be located where the CNEL exceeds 60 dBA are required to prepare an acoustical analysis showing that the proposed building design would achieve the prescribed allowable interior noise standard. Worst-case noise levels, either existing or future, shall be used as the basis for determining compliance with these standards.

California General Plan Guidelines

The State of California regulates vehicular and freeway noise affecting classrooms, sets standards for sound transmission and occupational noise control, and identifies noise insulation standards and airport noise/land-use compatibility criteria. The "State of California General Plan Guidelines" (OPR 2017), published by the Governor's Office of Planning and Research, also provides guidance for the acceptability of projects within specific CNEL/L_{dn} contours. The guidelines also present adjustment factors that may be used in order to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution.

2010 California Green Building Standards

The *2010 California Green Building Standards* (California Code of Regulations Title 24, Part 11, Section 5.507) requires that the wall and roof-ceiling assemblies making up a building envelope to have a minimum Sound Transmissions Class (STC) of 50, and exterior windows to have a minimum STC of 30 for any of the following building locations:

1. Within 1,000 feet of freeways
2. Within 5 miles of airports serving more than 10,000 commercial jets per year;
3. Where the sound levels at the property line regularly exceed 65 decibels, other than occasional sound due to church bells, train horns, emergency vehicles, and public warning systems.

The above standards do not apply to buildings with few or no occupants or where occupants are not likely to be affected by exterior noise (as determined by the enforcement authority), such as factories, stadiums, storage, enclosed parking structures, and utility buildings. This section also identifies a minimum STC of 40 for interior walls and floor-ceiling assemblies that separate tenant spaces and public spaces (CBSC 2010).

City of Paso Robles General Plan

Transportation Sources

The City's noise criteria for determination of future land use compatibility are presented in Figure 3. These guidelines are used to assess whether transportation noise can potentially pose a conflict with proposed land uses. For the most sensitive uses such as single-family residential, an exterior noise level of 60 dBA CNEL/L_{dn} is considered the maximum value that is "normally acceptable," 55 to 70 dBA CNEL/L_{dn} is considered the "conditionally acceptable" range, 70 to 75 dBA CNEL/L_{dn} is considered "normally unacceptable," and levels in excess of 75 dBA CNEL/L_{dn} is considered "clearly unacceptable." Proposed land uses are considered "conditionally acceptable" provided sufficient noise-reduction features have been incorporated to reduce interior noise levels to within acceptable levels.

In addition to the noise criteria for determination of land use compatibility, General Plan Policy N-1A establishes exterior and interior noise standards for transportation noise sources. Accordingly, the maximum allowable noise exposure for existing land use outdoor activity areas is 65 dBA CNEL/L_{dn} (except for parks). The maximum allowable noise exposure for existing land use interior activity areas is 45 dBA CNEL/L_{dn}. Assuming a minimum exterior-to-interior noise reduction of 20 dB, an exterior noise level of 65 dBA CNEL/L_{dn} would provide for an interior noise level of 45 dBA CNEL/L_{dn}. This interior noise standard applies to various noise-sensitive land uses, including residential dwellings, schools, hotels, motels, auditoriums, meeting halls, office buildings, nursing homes, hospitals, theaters, and libraries (City of El Paso de Robles 2003).

Stationary Sources

The City of Paso Robles has also adopted noise standards for stationary sources. The noise standards are applied at the property line of the receiving land use. The City's noise standards for stationary sources are summarized in Table 2.

Table 2
Maximum Allowable Noise Exposure-Stationary (Non-Transportation) Noise Sources[1]

	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Hourly L, dB (2)	50	45
Maximum level, dB (2)	70	65
Maximum level, dB-Impulsive Noise (3)	65	60

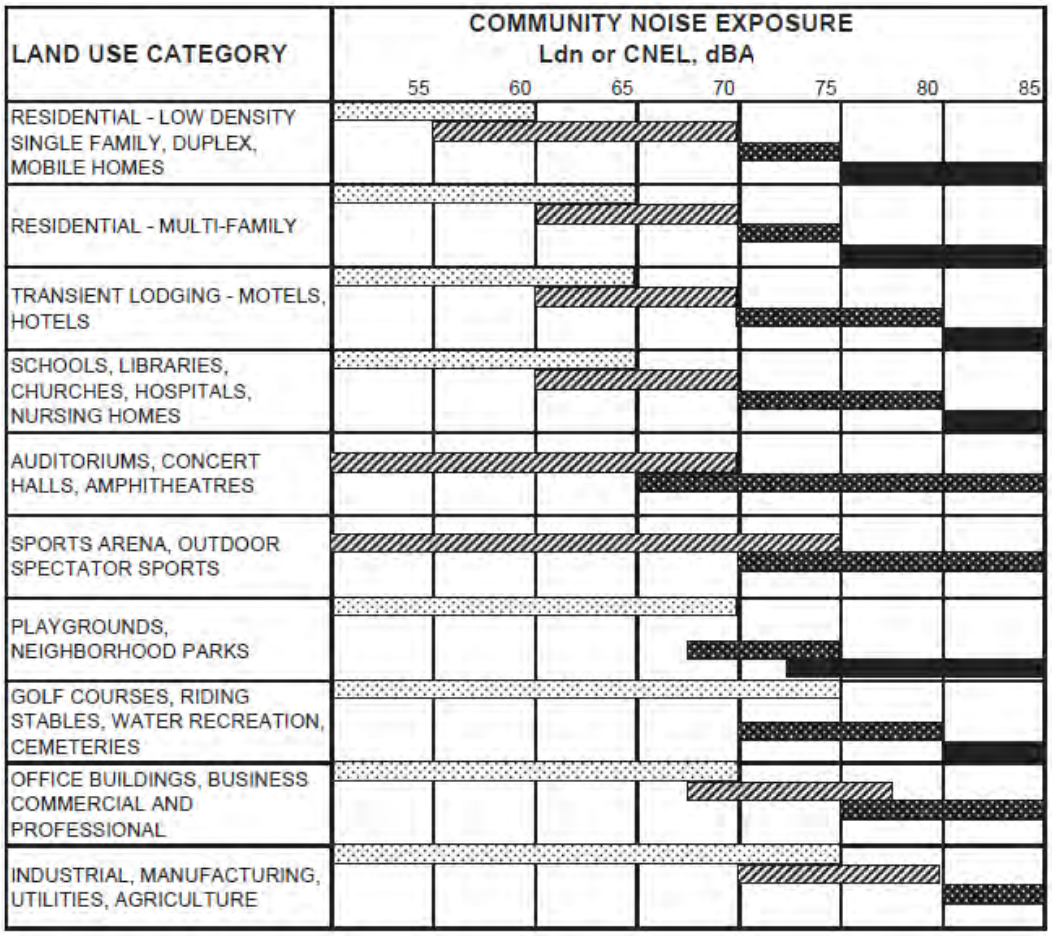
1. As determined at the property line of the receiving land use. When determining the effectiveness of noise mitigation measures, the standards may be applied on the receptor side of the noise barriers or other property line noise mitigation measures.
2. Sound level measurements shall be made with the slow meter response.
3. Sound level measurements shall be made with the fast meter response.
Source: City of El Paso de Robles 2003

Groundborne Vibration

There are no federal, state, or local regulatory standards for ground-borne vibration. However, Caltrans has developed vibration criteria based on potential structural damage risks and human annoyance. Caltrans-recommended criteria for the evaluation of groundborne vibration levels, with regard to structural damage and human annoyance, are summarized in Table 3. The criteria apply to continuous vibration sources, which include vehicle traffic, train, and most construction vibrations, with the exception of transient or intermittent construction activities, such as pile driving. All damage criteria for buildings are in terms of ground motion at the buildings' foundations. No allowance is included for the amplifying effects of structural components (Caltrans 2013).

As shown in Table 3, the threshold for architectural damage commonly applied to construction activities is a peak particle velocity (ppv) of 0.3 inches per second (in/sec) for fragile structures and 0.5 in/sec ppv for newer structures. Levels above 0.2 in/sec ppv may result in increased levels of annoyance for people in buildings (Caltrans 2013).

Figure 3
Land Use Compatibility Noise Criteria Transportation Noise Sources



NORMALLY ACCEPTABLE
Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

CONDITIONALLY ACCEPTABLE
New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

NORMALLY UNACCEPTABLE
New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design

CLEARLY UNACCEPTABLE
New construction or development should generally not be undertaken.

Source: City of El Paso de Robles 2003

Table 3
Summary of Groundborne Vibration Levels and Potential Effects

Vibration Level (in/sec ppv)	Human Reaction	Effect on Buildings
0.006-0.019	Threshold of perception; possibility of intrusion.	Vibrations unlikely to cause damage of any type.
0.08	Vibrations readily perceptible.	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected.
0.10	Level at which continuous vibrations begin to annoy people.	Virtually no risk of "architectural" damage to normal buildings.
0.20	Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relatively short periods of vibrations).	Threshold at which there is a risk of "architectural" damage to fragile buildings.
0.4-0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges.	Potential risk of "architectural" damage may occur at levels above 0.3 in/sec ppv for older residential structures and above 0.5 in/sec ppv for newer structures.
The vibration levels are based on peak particle velocity in the vertical direction for continuous vibration sources, which includes most construction activities, with the exception of transient or intermittent construction activities, such as pile driving. For pile driving, the minimum criterion level is typically considered to be 0.2 in/sec ppv. *Source: Caltrans 2013*		

AFFECTED ENVIRONMENT

Noise-Sensitive Receptors

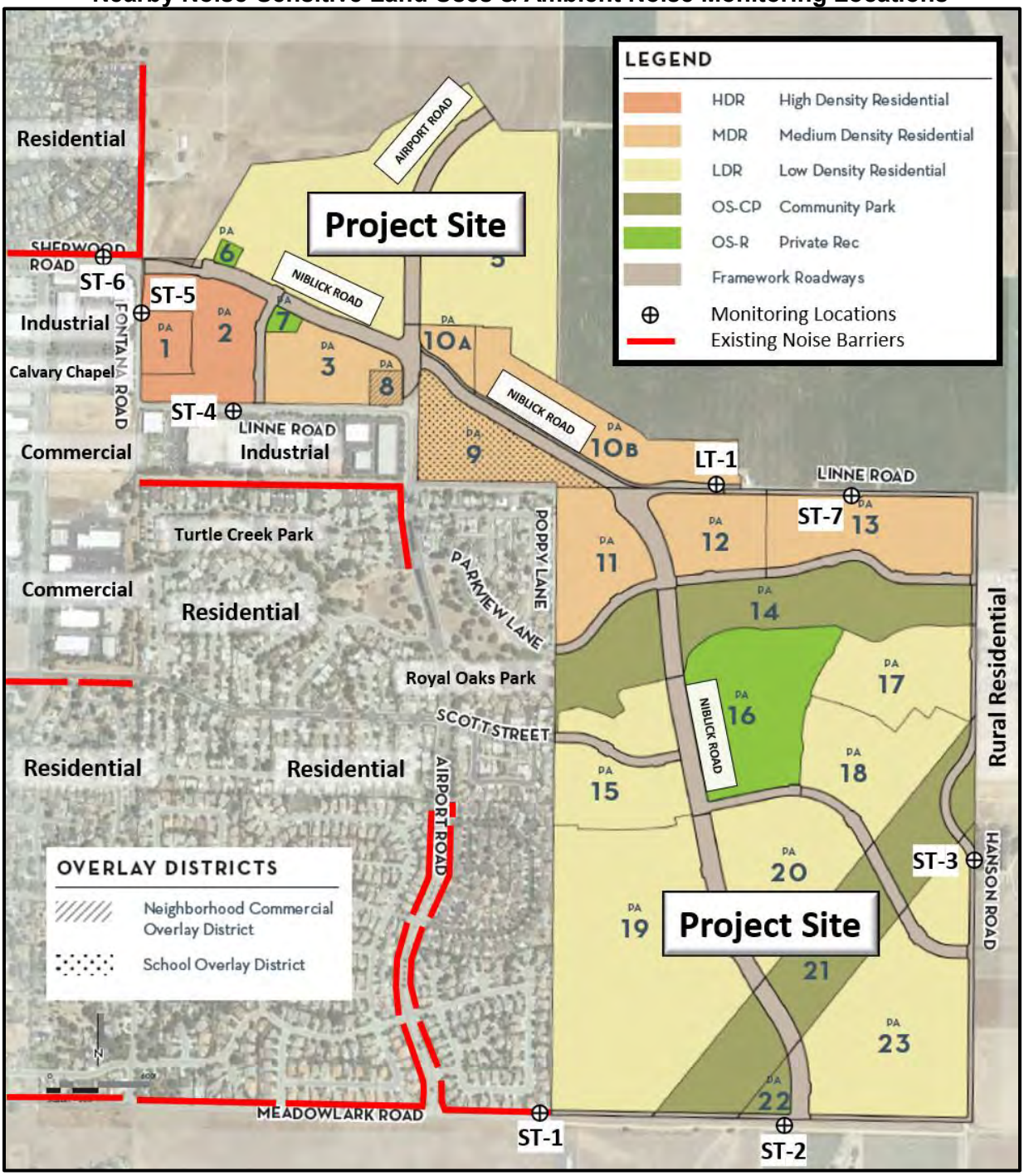
Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Additional land uses such as parks, historic sites, cemeteries, and recreation areas are also considered sensitive to increases in exterior noise levels. Schools, churches, hotels, libraries, and other places where low interior noise levels are essential are also considered noise-sensitive land uses.

The project site is generally located to the north and south of Linne Road, between Fontana Road and Hanson Road. The nearest noise-sensitive land uses consist predominantly of residential dwellings. The nearest residential land uses are located approximately 50 feet northwest of the project site, across Sherwood Road; approximately 35 feet to the east, across Hanson Road; approximately 25 feet to the south, across Meadowlark Road; and approximately 20 feet to the west, across Poppy Lane. Additional noise-sensitive land uses include Royal Oaks Park, Turtle Creek Park, and Calvary Chapel. Nearby noise-sensitive land uses are depicted in Figure 4.

Ambient Noise Environment

To document existing ambient noise levels at the project site, seven short-term (i.e., 10 minutes) and one long-term (i.e., 24-hour) ambient noise measurements were conducted. Ambient noise levels were primarily influenced by vehicular traffic on area roadways. No nearby stationary sources of noise were detectable at the project site. Noise measurements were conducted using a Larson Davis Laboratories, Type I, Model 820 integrating sound-level meter positioned at a height of approximately 5 feet above ground level from approximately 10 to 37 feet from the centerline of nearby roadways. The long-term noise measurement was conducted at approximately 15 feet from the road centerline of Linne Road. Noise measurement locations are depicted in Figure 4. Measured short-term ambient noise levels are summarized in Table 4. Measured long-term noise levels are depicted in Figure 5.

Figure 4
Nearby Noise-Sensitive Land Uses & Ambient Noise Monitoring Locations



Note: Not to Scale. All locations are approximate. Refer to Table 4 for noise measurement data.

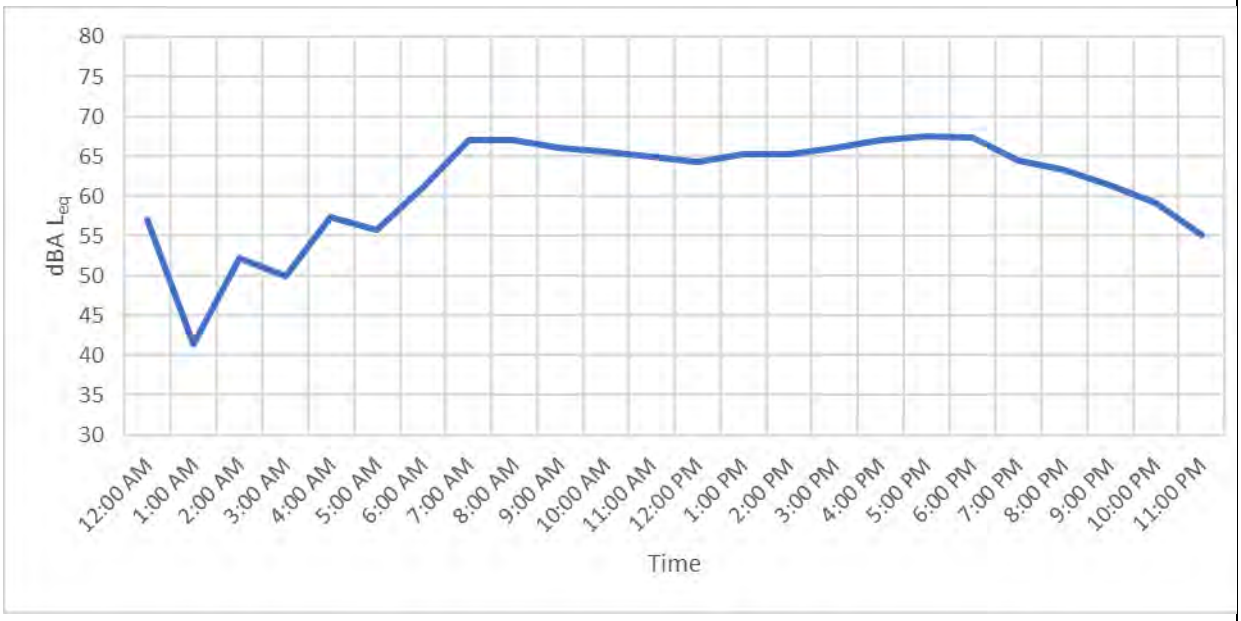
Table 4
Summary of Measured Short-Term Ambient Noise Levels

Monitoring Location	Monitoring Period	Monitoring Location	Noise Level (dBA)	
			L_{eq}	L_{max}
ST-1	1230-1240	Meadowlark Road near Airport Road, approximately 24 feet from the road centerline.	51.0	73.9
ST-2	1300-1310	Meadowlark Road, approximately 10 feet from the road centerline.	50.2	73.0
ST-3	1320-1330	Hanson Road, approximately 20 feet from the road centerline.	49.9	69.2
ST-4	1340-1350	Linne Road near Fontana Road, approximately 20 feet from the road centerline.	67.7	84.0
ST-5	1445-1455	Fontana Road near Sherwood Road, approximately 22 feet from the road centerline.	67.3	79.1
ST-6	1520-1530	Sherwood Road near Fontana Road, approximately 37 feet from the road centerline.	65.3	81.0
ST-7	1540-1550	Linne Road near Hanson Road, approximately 15 feet from the road centerline.	70.6	80.7

Noise measurement survey was conducted on January 30th and February 1st, 2019 using a Larson Davis Laboratories, Type I, Model 820 integrating sound-level meter positioned at a height of approximately 5 feet above ground level. Refer to Figure 4 for noise measurement locations.

As indicated in Table 4, measured ambient noise levels at various locations in the project area ranged from approximately 50 to 71 dBA L_{eq} during the daytime hours. Instantaneous noise levels measured during the daytime hours ranged from approximately 69 to 84 dBA L_{max}. Average hourly noise levels measured over a 24-hour period along Linne Road are depicted in Figure 5. As shown in Figure 5, the highest average hourly noise levels occurred during the peak morning and late-afternoon commute hours. In general, noise levels during the evening and night-time hours are roughly 10 dBA below daytime noise levels.

Figure 5
Measured Long-Term Ambient Noise Levels Along Linne Road



Noise measurement was conducted on February 6th, 2019 from approximately 15 feet from the road centerline of Linne Road near Aaroe Road. Refer to Figure 4 for noise measurement location.

Existing Traffic Noise Levels

As noted above, vehicle traffic on area roadways is the primary source of noise in the project area. Calculated existing traffic noise levels at 50 feet from the near-travel-lane centerline and distances to existing noise contours for area roadways are summarized in Table 5. Existing noise barriers are located along Sherwood Road, Airport Road, Scott Street, and Meadowlark Road. These existing noise barriers range in height from approximately 5.5 to 10 feet. Existing noise barrier locations are depicted in Figure 4. As shown in Table 5, existing traffic noise levels range from approximately 41 to 69 dBA CNEL/L_{dn} at 50 feet from the near-travel-lane centerline.

Table 5
Predicted Existing Traffic Noise Levels

Roadway Segment	Noise Level (dBA CNEL)				
	at 50 Feet from Near-Travel-Lane Centerline	Distance (Feet) to CNEL/L_{dn} Contours From Roadway Centerline			
		70	65	60	55
Union Road, Priska Drive to Kit Fox Lane	61.0	WR	WR	66	141
Creston Road, East of Ferro Lane	66.3	WR	68	145	313
Creston Road, East of Golden Hill Road	64.1	WR	65	133	282
Creston Road, South of Niblick Road	64.4	WR	68	140	298
Creston Road, North of Meadowlark Road	62.0	WR	WR	76	163
Golden Hill Road, South of Union Road	66.8	WR	89	188	404
Golden Hill Road, North of Union Road	66.2	WR	74	158	340
Niblick Road, East of Spring Street	68.8	63	128	273	585
Niblick Road, East of Quarterhorse Lane	67.1	WR	100	211	452
Sherwood Road, East of Creston Road	64.0	WR	64	131	278
Linne Road, Poppy Lane to Hanson Road	60.3	WR	WR	58	125
Parkview Lane, East of Airport Road	44.7	WR	WR	WR	WR
Scott Street, East of Airport Road	44.5	WR	WR	WR	WR
Linne Road, Fontana Road to Airport Road	57.5	WR	WR	WR	82
Poppy Lane, South of Linne Road	40.7	WR	WR	WR	WR
Hanson Road, Linne Road to Meadowlark Road	40.7	WR	WR	WR	WR
Meadowlark Road, West of Hanson Road	41.9	WR	WR	WR	WR

Traffic noise levels were calculated using the FHWA roadway noise prediction model based on traffic data obtained from the traffic analysis prepared for this project. WR = Within Road Right-of-Way

IMPACTS AND MITIGATION MEASURES

Significance Criteria

Criteria for determining the significance of noise impacts were developed based on information contained in the California Environmental Quality Act Guidelines (CEQA Guidelines, Appendix G). According to the guidelines, a project may have a significant effect on the environment if it would result in the following conditions:

a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

b) Generation of excessive groundborne vibration or groundborne noise levels.

c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.

Short-Term Construction Noise Impacts

The City has not adopted noise standards that apply to short-term construction activities. However, based on screening noise criteria commonly recommended by federal agencies, construction activities would generally be considered to have a potentially significant impact if average daytime noise levels would exceed 90 dBA L_{eq} when averaged over a 1-hour period ($L_{eq}^{(1)}$), or 80 dBA L_{eq} when averaged over an 8-hour period ($L_{eq}^{(8)}$) (FTA 2018). Because some activities may not occur over a full 8-hour day and to be conservative, construction-generated noise levels would be considered to have a potentially significant impact if predicted noise levels at noise-sensitive land uses would exceed 80 dBA L_{eq} when averaged over an 1-hour period.

Long-Term Operational Noise Impacts

For purposes of this analysis, a substantial increase in noise levels is defined as an increase of 3 dBA, or greater. Substantial increases in ambient noise levels at existing land uses that would exceed applicable City noise standards would be considered to have a potentially significant impact.

The *CEQA Guidelines* do not define the levels at which increases in ambient noise would be considered "substantial." As discussed previously in this section, a noise level increase of 3 dBA is barely perceptible to most people, a 5 dBA increase is readily noticeable, and a difference of 10 dBA would be perceived as a doubling of loudness. For purposes of this analysis, a substantial increase in ambient noise levels would be defined as an increase of 3 dBA, or greater. Substantial increases in ambient noise levels that would exceed applicable noise standards for existing land uses would be considered to have a potentially significant impact. For existing land uses, a substantial increase in ambient noise and exposure to transportation noise levels in excess of 65 dBA CNEL/L_{dn} within outdoor activity areas or 45 dBA CNEL/L_{dn} within interior areas would be considered a potentially significant impact. The compatibility of the proposed land uses were evaluated based on predicted future on-site noise conditions and in comparison to the City's noise exposure standards for determination of impact significance (refer to Figure 3).

Exposure to non-transportation noise sources would be considered potentially significant if noise levels would exceed the City's noise exposure standards for non-transportation noise sources (refer to Table 2).

Groundborne Vibration Impacts

The *CEQA Guidelines* also do not define the levels at which groundborne vibration levels would be considered excessive. For this reason, Caltrans' recommended groundborne vibration thresholds were used for the evaluation of impacts based on increased potential for structural damage and human annoyance, as identified in Table 3. Based on these levels, groundborne vibration levels would be considered to have a potentially significant impact with regard to potential structural damage if levels would exceed a 0.5 in/sec ppv.

Methodology

Short-Term Construction Noise

Short-term noise impacts associated with construction activities were analyzed based on typical construction equipment noise levels derived from the Federal Highway Administration (FHWA) *Roadway Construction Noise Model* and the Federal Transit Administration's (FTA) *Transit Noise and Vibration Impact Assessment Manual*. Typical equipment use for various phases of construction were based on default assumptions identified in the *California Emissions Estimator Model* (CAPCOA 2018) for representative development projects. Predicted average-hourly construction noise levels (in dBA L_{eq}) was calculated assuming the two loudest pieces of construction equipment operating simultaneously at 50 feet from source center (FTA 2018). Noise levels were predicted based on an average noise-attenuation rate of 6 dB per doubling of distance from the source.

Long-term Operational Noise

Traffic noise levels were calculated using the Federal Highway Administration (FHWA) roadway noise prediction model (FHWA-RD-77-108) based on California vehicle reference noise levels and traffic data obtained from the traffic analysis prepared for this project. Additional input data included day/night percentages of autos, medium and heavy trucks, vehicle speeds, ground attenuation factors, and roadway widths. The project's contribution to traffic noise levels along area roadways was determined by comparing the predicted noise levels with and without project-generated traffic. To be conservative, noise impacts were analyzed for the proposed 1,293 unit plus school project, given that this scenario would have the potential to generate higher traffic volumes on area roadways. Predicted noise levels associated with on-site non-transportation noise sources were calculated based on representative data obtained from similar land uses and existing literature.

Impact Discussions and Mitigation Measures

IMPACT A. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

LONG-TERM NOISE EXPOSURE

Increases in Traffic Noise Levels

Implementation of the proposed project would result in increased traffic volumes on area roadways. The increase in traffic volumes resulting from implementation of the proposed project would, therefore, contribute to increases in traffic noise levels. Predicted traffic noise levels for existing, near-term (year 2025), and future cumulative conditions (year 2045), with and without implementation of the proposed project, are discussed, as follows.

Existing Conditions

Predicted increases in traffic noise levels for existing conditions, with and without implementation of the proposed project, are depicted in Table 6. As depicted, existing increases in traffic noise levels along area roadways attributable to the proposed project would range from approximately 0.2 to 12.6 dBA CNEL/L_{dn}. As noted in Table 6, the proposed project would result in a substantial increase (i.e., 3 dBA, or greater) in existing traffic noise levels at existing noise-sensitive land uses located along Scott Street, east of Airport Road; Hanson Road, from Linne Road to Meadowlark Road; and Meadowlark Road, west of Hanson Road. However, predicted traffic noise levels at existing residential land uses located along these roadway segments would not be projected to exceed the City's exterior or interior noise standards of 65 and 45 dBA CNEL/L_{dn}, respectively. As a result, this impact is considered less than significant.

Near-Term Conditions

Predicted increases in traffic noise levels for near-term conditions, with and without implementation of the proposed project, are depicted in Table 7. As depicted, near-term increases in traffic noise levels along area roadways attributable to the proposed project would range from approximately 0.2 to 8.7 dBA CNEL/L_{dn}. As noted in Table 7, the proposed project would result in a substantial increase (i.e., 3 dBA, or greater) in near-term traffic noise levels at existing noise-sensitive land uses located along Scott Street, east of Airport Road; Hanson Road, from Linne Road to Meadowlark Road; and Meadowlark Road, west of Hanson Road. However, predicted traffic noise levels at existing residential land uses located along these roadway segments would not be projected to exceed the City's exterior or interior noise standards of 65 and 45 dBA CNEL/L_{dn}, respectively. As a result, this impact is considered less than significant.

Table 6
Predicted Increases in Traffic Noise Levels – Existing Conditions

Roadway Segment	Noise Level (dBA CNEL/L_{dn}) at 50 Feet From Near-Travel-Lane Centerline			Significant Impact?[1]
	Existing without Specific Plan	Existing with 1,293-Unit+School Specific Plan	Change	
Union Road, Priska Drive to Kit Fox Lane	61.0	61.0	0.0	No
Creston Road, East of Ferro Lane	66.3	66.5	0.2	No
Creston Road, East of Golden Hill Road	64.1	65.0	0.9	No
Creston Road, South of Niblick Road	64.4	64.7	0.3	No
Creston Road, North of Meadowlark Road	62.0	62.6	0.6	No
Golden Hill Road, South of Union Road	66.8	67.4	0.6	No
Golden Hill Road, North of Union Road	66.2	66.8	0.6	No
Niblick Road, East of Spring Street	68.8	69.3	0.5	No
Niblick Road, East of Quarterhorse Lane	67.1	68.0	0.9	No
Sherwood Road, East of Creston Road	64.0	66.7	2.7	No
Linne Road, Poppy Lane to Hanson Road	60.3	63.1	2.8	No
Parkview Lane, East of Airport Road	44.7	46.5	1.8	No
Scott Street, East of Airport Road	44.5	50.4	5.9	No
Linne Road, Fontana Road to Airport Road [3]	57.5	54.0	-3.5	No
Poppy Lane, South of Linne Road	40.7	40.7	0.0	No
Hanson Road, Linne Road to Meadowlark Road	40.7	49.4	8.7	No
Meadowlark Road, West of Hanson Road	41.9	54.5	12.6	No

Note: Traffic noise levels were calculated using the FHWA roadway noise prediction model based on traffic data obtained from the traffic analysis prepared for this project.

1. A significant impact is defined as a substantial increase (i.e., 3 dB, or greater) in traffic noise levels that would exceed the City's exterior noise standard of 65 dBA CNEL/L_{dn}. Assuming a minimum exterior-to-interior noise reduction of 20 dB (with windows closed), an exterior noise level standard of 65 dBA CNEL/L_{dn} would equate to an interior noise level of 45 dBA L_{eq}.

2. For existing land uses, exposure to transportation noise levels in excess of 65 dBA CNEL/L_{dn} within outdoor activity areas or 45 dBA CNEL/L_{dn} within interior areas would be considered an exceedance. Assuming a minimum exterior-to-interior noise reduction of 20 dB, a maximum exterior noise standard of 65 dBA CNEL/L_{dn} would provide for an interior noise level of 45 dBA CNEL/L_{dn}, or less.

3. Reductions in traffic noise levels are due to changes in vehicle distribution patterns that would occur with project implementation.

Table 7
Predicted Increases in Traffic Noise Levels – Near-Term Conditions

Roadway Segment	Noise Level (dBA CNEL/L_{dn}) at 50 Feet From Near-Travel-Lane Centerline			Significant Impact?[1]
	Near-Term without Specific Plan	Near-Term with 1,293-Unit+School Specific Plan	Change	
Union Road, Priska Drive to Kit Fox Lane	61.4	61.4	0.0	No
Creston Road, East of Ferro Lane	66.6	66.8	0.2	No
Creston Road, East of Golden Hill Road	64.7	65.5	0.8	No
Creston Road, South of Niblick Road	65.5	65.7	0.2	No
Creston Road, North of Meadowlark Road	64.5	64.8	0.3	No
Golden Hill Road, South of Union Road	67.4	67.9	0.5	No
Golden Hill Road, North of Union Road	66.8	67.3	0.5	No
Niblick Road, East of Spring Street	69.4	69.8	0.4	No
Niblick Road, East of Quarterhorse Lane	67.5	68.3	0.8	No
Sherwood Road, East of Creston Road	64.9	67.2	2.3	No
Linne Road, Poppy Lane to Hanson Road	61.6	63.9	2.3	No
Parkview Lane, East of Airport Road	45.0	46.8	1.8	No
Scott Street, East of Airport Road	44.9	50.5	5.6	No
Linne Road, Fontana Road to Airport Road[3]	58.4	54.0	-4.4	No
Poppy Lane, South of Linne Road	40.7	40.7	0.0	No
Hanson Road, Linne Road to Meadowlark Road	40.7	49.4	8.7	No
Meadowlark Road, West of Hanson Road	47.9	55.2	7.3	No

Note: Traffic noise levels were calculated using the FHWA roadway noise prediction model based on traffic data obtained from the traffic analysis prepared for this project.

1. A significant impact is defined as a substantial increase (i.e., 3 dB, or greater) in traffic noise levels that would exceed the City's exterior noise standard of 65 dBA CNEL/L_{dn}. Assuming a minimum exterior-to-interior noise reduction of 20 dB (with windows closed), an exterior noise level standard of 65 dBA CNEL/L_{dn} would equate to an interior noise level of 45 dBA L_{eq}.

2. For existing land uses, exposure to transportation noise levels in excess of 65 dBA CNEL/L_{dn} within outdoor activity areas or 45 dBA CNEL/L_{dn} within interior areas would be considered an exceedance. Assuming a minimum exterior-to-interior noise reduction of 20 dB, a maximum exterior noise standard of 65 dBA CNEL/L_{dn} would provide for an interior noise level of 45 dBA CNEL/L_{dn}, or less.

3. Reductions in traffic noise levels are due to changes in vehicle distribution patterns that would occur with project implementation.

Future Cumulative Conditions

Predicted increases in traffic noise levels for future cumulative conditions, with and without the development of the proposed project, are depicted in Table 8. As depicted in Table 8, increases in traffic noise levels along area roadways attributable to the proposed project would range from approximately 0.1 to 8.0 dBA CNEL/L_{dn}. The proposed project would result in a substantial increase (i.e., 3 dBA, or greater) in future cumulative traffic noise levels along Scott Street, east of Airport Road; Hanson Road, from Linne Road to Meadowlark Road; and Meadowlark Road, west of Hanson Road. However, predicted traffic noise levels at existing residential land uses located along these roadway segments would not be projected to exceed the City's exterior or interior noise standards of 65 and 45 dBA CNEL/L_{dn}, respectively. As a result, this impact is considered less than significant.

Table 8
Predicted Increases in Traffic Noise Levels – Future Cumulative Conditions

Roadway Segment	Noise Level (dBA CNEL/L_{dn}) at 50 Feet From Near-Travel-Lane Centerline			Significant Impact?[1]
	Cumulative without Specific Plan	Cumulative with 1,293-Unit+School Specific Plan	Change	
Union Road, Priska Drive to Kit Fox Lane	63.1	63.3	0.2	No
Creston Road, East of Ferro Lane	67.0	67.2	0.2	No
Creston Road, East of Golden Hill Road	65.7	66.0	0.3	No
Creston Road, South of Niblick Road	65.8	65.9	0.1	No
Creston Road, North of Meadowlark Road	64.7	64.9	0.2	No
Golden Hill Road, South of Union Road	68.5	68.8	0.3	No
Golden Hill Road, North of Union Road	69.3	69.5	0.2	No
Niblick Road, East of Spring Street	69.5	69.8	0.3	No
Niblick Road, East of Quarterhorse Lane	68.3	68.9	0.6	No
Sherwood Road, East of Creston Road	66.7	68.0	1.3	No
Linne Road, Poppy Lane to Hanson Road	62.1	64.5	2.4	No
Parkview Lane, East of Airport Road	47.1	48.2	1.1	No
Scott Street, East of Airport Road	46.9	50.6	3.7	No
Linne Road, Fontana Road to Airport Road[3]	60.3	55.4	-4.9	No
Poppy Lane, South of Linne Road	40.7	40.7	0.0	No
Hanson Road, Linne Road to Meadowlark Road	41.5	49.5	8.0	No
Meadowlark Road, West of Hanson Road	48.9	54.1	5.2	No

Note: Traffic noise levels were calculated using the FHWA roadway noise prediction model based on traffic data obtained from the traffic analysis prepared for this project.

1. A significant impact is defined as a substantial increase (i.e., 3 dB, or greater) in traffic noise levels that would exceed the City's exterior noise standard of 65 dBA CNEL/L_{dn}. Assuming a minimum exterior-to-interior noise reduction of 20 dB (with windows closed), an exterior noise level standard of 65 dBA CNEL/L_{dn} would equate to an interior noise level of 45 dBA L_{eq}.

2. For existing land uses, exposure to transportation noise levels in excess of 65 dBA CNEL/L_{dn} within outdoor activity areas or 45 dBA CNEL/L_{dn} within interior areas would be considered an exceedance. Assuming a minimum exterior-to-interior noise reduction of 20 dB, a maximum exterior noise standard of 65 dBA CNEL/L_{dn} would provide for an interior noise level of 45 dBA CNEL/L_{dn}, or less.

3. Reductions in traffic noise levels are due to changes in vehicle distribution patterns that would occur with project implementation.

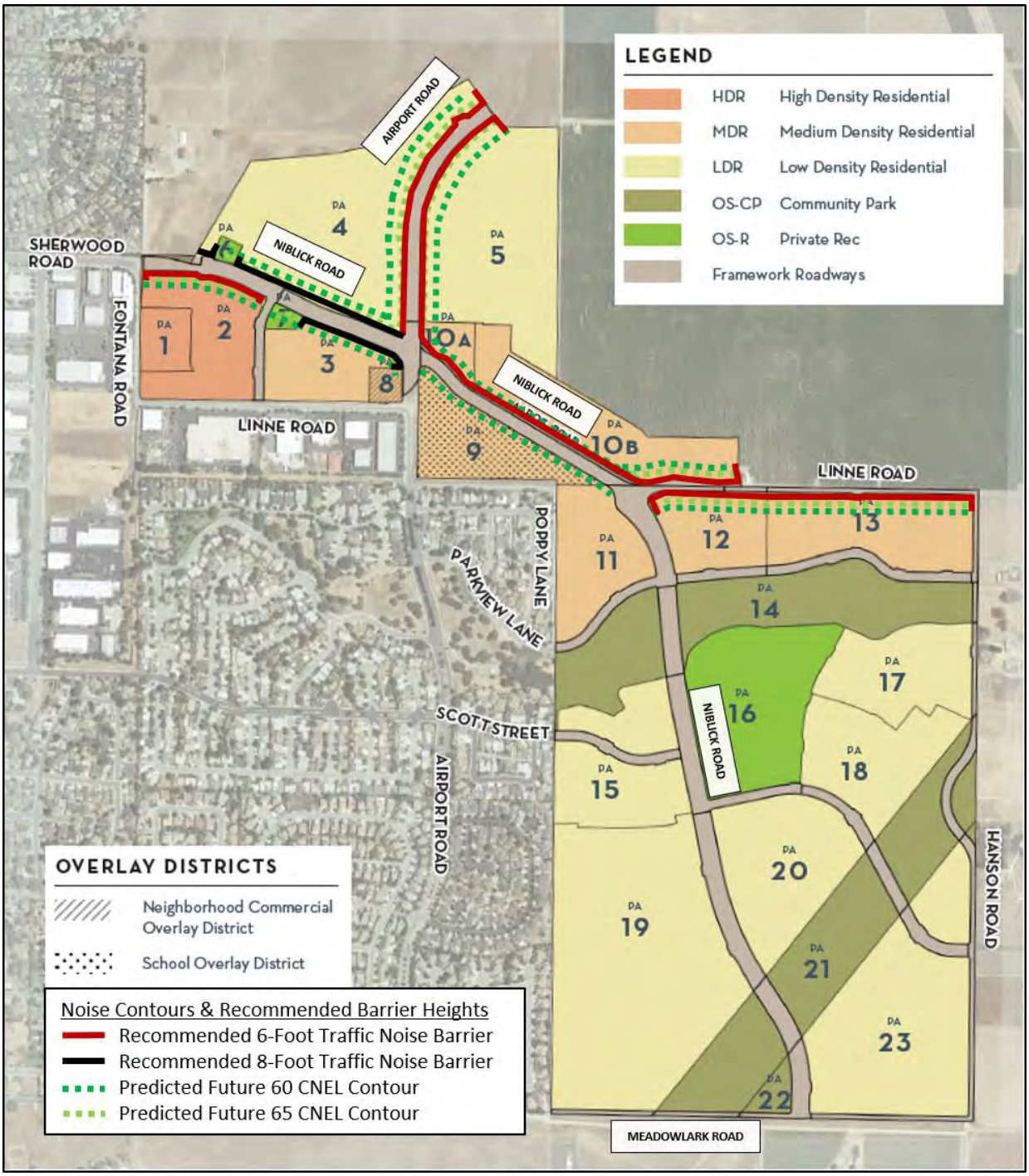
Compatibility with City's Noise Standards for Land Use Compatibility

The compatibility of the proposed land uses was evaluated based on a comparison of projected on-site future cumulative traffic noise levels with applicable City noise standards (refer to Figure 3). To be conservative, this analysis includes development of the proposed school site, which would result in slightly higher traffic noise levels along some roadway segments. As noted in Figure 3, the City's General Plan establishes a "normally acceptable" exterior noise standard of 60 dBA CNEL/L_{dn} for new single-family residential, 65 dBA CNEL/L_{dn} for new multi-family residential and schools, and 70 dBA CNEL/L_{dn} for new neighborhood parks and commercial land uses. Higher noise levels are allowed provided that noise-reduction features have been incorporated.

For land use compatibility, predicted traffic noise levels at proposed land uses were quantified based on future cumulative (year 2045) traffic conditions. Planned on-site land uses and projected on-site future cumulative traffic noise contours with implementation of the proposed project are depicted in Figure 6 and summarized in Table 9. As noted in Table 9, the predicted on-site 60 dBA CNEL/L_{dn} traffic noise contours would extend to approximately 112 feet from the centerline of Linne Road, between Poppy Lane and Hanson Road; 128 feet from Sherwood Road, east of Fontana Road; 129 feet from Airport Road, north of Sherwood Road;

and 77 feet from Aaroe Road, north of Linne Road. The predicted 65 dBA CNEL/L_{dn} on-site traffic noise contours would extend to approximately 52 feet from the centerline of Linne Road, between Poppy Lane and Hanson Road; 60 feet from Sherwood Road, east of Fontana Road; and 64 feet from Airport Road, north of Sherwood Road.

Figure 6
Predicted Future Cumulative Plus Project On-Site
Traffic Noise Contours & Recommended Traffic Noise Barrier Locations



Note: Not to scale. All locations are approximate.

Table 9
Predicted Future Cumulative Plus Project
Traffic Noise Levels & Distances to Traffic Noise Contours

Roadway Segment	Predicted CNEL/L_{dn} at 50 Feet From Near-Travel-Lane Centerline	Distance (Feet) to CNEL/L_{dn} Contours From Roadway Centerline		
		70	65	60
Linne Road, Poppy Lane to Hanson Road	64.5	WR	52	112
Parkview Lane, East of Airport Road	48.2	WR	WR	WR
Scott Street, East of Airport Road	50.6	WR	WR	WR
Linne Road, Fontana Road to Airport Road	55.4	WR	WR	WR
Poppy Lane, South of Linne Road	40.7	WR	WR	WR
Hanson Road, Linne Road to Meadowlark Road	49.5	WR	WR	WR
Meadowlark Road, West of Hanson Road	54.1	WR	WR	WR
Niblick Road, East of Fontana Road	64.8	WR	60	128
Airport Road, North of Niblick Road	63.9	WR	64	129
Niblick Road, Airport Road to Linne Road	61.5	WR	WR	77
Niblick Road, South of Linne Road	58.0	WR	WR	WR

WR = Within Road Right-of-Way

Predicted future cumulative traffic noise levels at the nearest proposed on-site residential land uses are summarized in Table 10. Under future cumulative conditions with implementation of the proposed project, predicted on-site noise levels at the nearest proposed residential land uses would exceed 60 dBA CNEL/L_{dn} along Linne Road, between Poppy Lane and Hanson Road; Niblick Road, east of Fontana Road; Airport Road, north of Niblick Road; and Niblick Road, between Airport Road and Linne Road. Depending on the setback distances of future residential land uses located along area roadways, predicted future cumulative traffic noise levels at the proposed single-family and multi-family residential land uses could potentially exceed the City's "normally acceptable" land use compatibility noise standards of 60 and 65 dBA CNEL/L_{dn}, respectively. Predicted onsite traffic noise levels at the proposed school would not be projected to exceed the City's "normally acceptable" land use compatibility noise standard of 65 dBA CNEL/L_{dn}. Predicted onsite traffic noise levels at the proposed neighborhood parks and commercial land uses would not be projected to exceed the City's "normally acceptable" land use compatibility noise standard of 70 dBA CNEL/L_{dn}. Future cumulative noise levels at the proposed residential land uses could potentially exceed the City's noise standards. As a result, this impact is considered potentially significant.

Table 10
Predicted Future Cumulative Plus Project
Traffic Noise Levels at Nearest On-Site Residential Land Uses

Roadway Segment	Minimum Setback Distance (feet) from Roadway Centerline[1]	Predicted CNEL/Ldn at Nearest On-Site Residential Land Use	
		Without Noise Barriers	With Noise Barriers
Linne Road, Poppy Lane to Hanson Road[2]	48	64.7	59.7
Parkview Lane, East of Airport Road	31	50.3	NA[4]
Scott Street, East of Airport Road	31	52.7	NA[4]
Linne Road, Fontana Road to Airport Road	24	58.6	NA[4]
Poppy Lane, South of Linne Road	13	46.6	NA[4]
Hanson Road, Linne Road to Meadowlark Road	48	49.7	NA[4]
Meadowlark Road, West of Hanson Road	48	54.3	NA[4]
Niblick Road, East of Fontana Road[3]	45	65.3	59.3
Airport Road, North of Niblick Road[2]	57	63.3	58.3
Niblick Road, Airport Road to Linne Road[2]	50	61.5	56.5
Niblick Road, South of Linne Road	50	58.0	NA[4]

1. *Setback distance is approximate based on distances derived from roadway profiles (Wallace Group 2019).*
2. *Assumes a barrier height of 6 feet.*
3. *Assumes a barrier height of 8 feet.*
4. *Noise barriers are not required.*

Mitigation Measure Noise-1:

The City shall require acoustical assessments to be prepared as part of the environmental review process for future land use development projects where noise-sensitive land uses are located within the projected future 60 dBA CNEL/L_{dn} noise contour of area roadways for single-family residential, or the projected future 65 dBA CNEL/L_{dn} noise contour of area roadways for multi-family residential (refer to Figure 6 and Table 9). Where the acoustical analysis determines that predicted future traffic noise levels would exceed applicable City noise standards, noise-reduction measures shall be incorporated sufficient to reduce operational noise levels to below the City's "normally acceptable" exterior noise standards of 60 dBA CNEL/L_{dn} for single-family residential and 65 dBA CNEL/L_{dn} for multi-family residential. Such measure may include but are not limited to, the incorporation of setbacks or noise barriers. The emphasis of such measures shall be placed upon site planning and project design. Noise barriers may consist of walls, earthen berms, or a combination of the two. Barrier walls should be constructed of masonry block, or material of similar density and usage, with no visible air gaps at the base of the barrier or between construction materials.

Significance after Mitigation

Implementation of Mitigation Measure Noise-1 would require the incorporation of noise-reduction features sufficient to achieve the City's transportation noise standards for residential land uses. Such measures may include, but are not limited to, the installation of noise barriers or increased setback distances for single-family or multi-family residential land uses located within the predicted 60 and 65 dBA CNEL/L_{dn} roadway noise contours, respectively. These roadways include the segments of Niblick Road, Airport Road, and Linne Road (refer to Table 10). Assuming that noise barriers were to be installed, recommended minimum barrier heights would vary between 6 to 8 feet above the roadway/site ground elevations for single and multi-family residential proposed along the roadways listed above (refer to Figure 6 for recommended barrier locations and heights). It is important to note that actual barrier heights and locations may vary depending on final site design and setback distances.

As noted in Table 10, implementation of recommended noise barriers would reduce predicted future cumulative exterior noise levels to approximately 60 dBA CNEL/L_{dn}, or less. With mitigation, predicted onsite noise levels would not exceed the City's noise standards. This impact would be considered less than significant with implementation of Mitigation Measure Noise-1.

Exposure to Non-Transportation Noise Levels

The proposed project includes the development of residential, commercial, community park/open space, private recreation, and school. The land uses would result in non-transportation noise sources that could potentially exceed the City's applicable noise standards at nearby noise-sensitive land uses. Noise levels typically associated with these land use and associated noise impacts are discussed separately below.

Residential Land Uses

Noise associated with proposed residential dwellings would expose other nearby residences (both existing and project related) to increases in ambient noise levels. Noise typically associated with such development includes lawn and garden equipment, voices, air conditioning equipment, and amplified music. HVAC equipment may be included in the residential developments and the generation of significant noise may occur depending on proximity to existing residences located west of PA-11, PA-15, and PA-19 (refer to Figure 3) Noise generated by the proposed residential land uses would result in increases in ambient noise levels, primarily during the day and evening hours and less frequently at night. As a result, increased noise levels associated with proposed residential land uses would be considered a potential significant impact.

Recreational Land Uses

Noise typically associated with neighborhood parks, pools, fitness center, and open space areas are typically limited to the voices of adults and children and the occasional opening and closing of vehicle doors. Noise events are typically sporadic and limited primarily to the daytime hours of operation. Parks and open space areas/corridors are typically considered to be an accepted land use within residential developments and generally do not result in noise events that are uncharacteristic of typical residential noise environments. In addition, some recreational uses, such as pools and fitness centers, may incorporate a public address (PA) system. Depending on the location of the PA system and speaker orientation, significant increases in ambient

noise levels in excess of the City's noise standards at nearby noise-sensitive land uses could potentially occur. For these reasons, noise-generated by the proposed pool and fitness center land uses would be considered to have a potential significant impact.

Commercial Land Uses

Noise sources commonly associated with commercial uses include building mechanical systems (e.g., HVAC systems), back-up power generators, and loading dock activities. Noise levels associated with building mechanical systems, such as larger air conditioning units, can range from 60 to 79 dBA L_{eq} at 5 feet. Back-up power generators can generate noise levels of approximately 79 dBA L_{eq} at 50 feet (FTA 2018. FHWA 2008). Based on measurements conducted at various commercial uses, noise levels associated with loading dock operations and material handling activities can generate noise levels of approximately 70 dBA L_{eq} at 50 feet. Assuming a maximum noise level of 79 dBA L_{eq} at 50 feet, predicted operational noise levels within approximately 825 feet of commercial land uses could exceed 45 dBA L_{eq}.

Depending on the specific uses proposed, site design, and hours of operation predicted noise levels associated with proposed commercial land uses could potentially exceed the City's stationary noise source standards at nearby noise-sensitive land uses (refer to Table 2). Areas where commercial and residential development would occur in close proximity, such as planned mixed-use development, would be of particular concern. As a result, noise generated by planned commercial uses would be considered a potentially significant impact.

Educational Land Uses

Noise generated by small playgrounds typically includes elevated children's voices and occasional adult voices. Based on measurement data obtained from similar land uses, noise levels associated with small playgrounds and recreation areas can generate intermittent noise levels of approximately 55-60 dBA L_{eq} at 50 feet. Other noise sources commonly associated with schools, include building mechanical equipment, parking lots, and exterior PA system speakers. Building mechanical equipment is typically located within the structure, enclosed, or placed on rooftop areas away from direct public exposure. Exterior PA systems and parking areas may result in increases in ambient noise levels at nearby land uses. Noise generated by onsite noise sources would be predominantly limited to the daytime hours of operations. Depending on the location of onsite noise sources, such as playgrounds, PA systems, parking lots, and building mechanical equipment, predicted operational noise levels at the nearest residential land uses (across from PA-9) could potentially exceed the City's noise standards. As a result, noise generated by the planned school land use would be considered a potentially significant impact.

Mitigation Measure Noise-2:

The City shall require acoustical assessments to be prepared as part of the environmental review process for future land use development projects where noise-sensitive land uses are located within 825 feet of planned residential, commercial, recreational, or school land uses. The acoustical assessments shall evaluate potential noise impacts attributable to the proposed project, as well as, the compatibility of proposed land uses in comparison to applicable City noise standards for stationary noise sources (refer to Table 2). Where the acoustical analysis determines that stationary-source noise levels would exceed applicable City noise standards, noise-reduction measures shall be incorporated sufficient to reduce operational noise levels to below applicable noise standards. Such measure may include but are not limited to, the incorporation of setbacks, sound barriers, berms, hourly limitations, or equipment enclosures. The emphasis of such measures shall be placed upon site planning and project design.

Significance After Mitigation

In accordance with Mitigation Measure Noise-2, acoustical assessments would be required where proposed noise-sensitive land uses are located within 825 feet of planned residential, commercial, recreational, or school land uses. This mitigation measure would apply to newly proposed stationary noise sources, as well as, proposed noise-sensitive land uses located near existing stationary noise sources. Noise-reduction measures, such as the incorporation of setbacks, sound barriers, berms, hourly limitations, or equipment enclosures, would be required sufficient to demonstrate compliance with the City's maximum allowable noise-exposure standards for stationary noise sources (refer to Table 2). With mitigation, this impact would be considered less than significant.

SHORT-TERM NOISE EXPOSURE

Construction Noise Levels

Construction noise typically occurs intermittently and varies depending upon the nature or phase of construction (e.g., land clearing, grading, excavation, and paving). Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. Although noise ranges are generally similar for all construction phases, the initial site preparation phase tends to involve the most heavy-duty equipment having a higher noise-generation potential. Noise levels associated with individual construction equipment are summarized in Table 11.

Table 11
Construction Equipment Noise Levels

Equipment	Noise Level (dBA) at 50 feet from Source Center	
	L_{max}	L_{eq}
Air Compressor	78	74
Backhoe	78	74
Front End Loader	79	75
Compactor (Ground)	83	76
Concrete Mixer Truck	79	75
Concrete Saw	90	83
Crane	81	73
Dozer	82	78
Grader	85	81
Excavator	81	77
Scraper	84	80
Generator	81	78
Gradall	83	79
Hydraulic Break Ram	90	80
Jack Hammer	89	82
Impact Hammer/Hoe Ram (Mounted)	90	83
Roller	80	73
Paver	77	74
Pneumatic Tools	85	82
Tractor	84	80
Dump Truck	77	73

Based on measured equipment noise levels. Actual noise levels are typically lower, particularly if the equipment is fitted with exhaust mufflers and engine shrouds.
Sources: FTA 2018, FHWA 2008

As depicted in Table 11, maximum noise levels generated by individual pieces of construction equipment typically range from approximately 77 dBA to 90 dBA L_{max} at 50 feet (FTA 2018). Average-hourly noise levels for individual construction equipment generally range from approximately 73 to 83 dBA L_{eq}. Based on these equipment noise levels, equipment commonly associated with community development projects, and assuming the two loudest pieces of equipment operating simultaneously in close proximity, predicted average-hourly noise levels occurring during the loudest phases of construction generally range from approximately 78 to 84 dBA L_{eq} at 50 feet (refer to Table 12). Other construction activities (e.g., painting, landscaping) typically generate lower noise levels (FTA 2018). Short-term increases in vehicle traffic, including worker commute trips and haul truck trips may also result in temporary increases in ambient noise levels at nearby receptors.

Table 12
Typical Construction Phase Equipment & Noise Levels

Construction Phase	Typical Equipment	Noise Level (dBA L_{eq}) at 50 feet from Source Center
Demolition	Concrete Saws, Excavators, Dozers	81
Site Preparation	Dozers, Tractors, Loaders, Backhoes	83
Grading	Dozers, Tractors, Loaders, Backhoes, Graders, Scrapers, Excavators	84
Building Construction/Architectural Coating	Cranes, Forklifts/Gradalls, Tractors, Loaders, Backhoes, Generators, Welders	83
Paving	Pavers, Rollers, Paving Equipment (e.g., Compactors)	78

1. Represents equipment typically associated with community development projects derived from the California Emissions Estimator Model.
2. Based on equipment noise levels identified in Table 10. Assumes the two loudest pieces of equipment operating simultaneously.
Sources: FTA 2018, FHWA 2008, CAPCOA 2016

Depending on the location and types of activities conducted (e.g., building demolition, site preparation, grading), predicted noise levels at the nearest residences, which are located adjacent to and west of the project site, could potentially exceed 80 dBA L_{eq}, particularly when activities occur within approximately 50 feet of the nearest site boundaries. Furthermore, with regard to residential land uses, activities occurring during the more noise-sensitive evening and nighttime hours could result in increased levels of annoyance and potential sleep disruption. For these reasons, noise-generating construction activities would be considered to have a potentially significant short-term noise impact.

Mitigation Measure Noise-3:

a. Unless otherwise provided for in a validly issued permit or approval, noise-generating construction activities should be limited to the hours of 7:00 a.m. and 7:00 p.m. Noise-generating construction activities should not occur on Sundays or City holidays.

b. Construction equipment should be properly maintained and equipped with noise-reduction intake and exhaust mufflers and engine shrouds, in accordance with manufacturers' recommendations. Equipment-engine shrouds should be closed during equipment operation.

c. Equipment shall be turned off when not in use for an excess of five minutes, except for equipment that requires idling to maintain performance.

d. Construction haul truck routes shall be routed away from nearby noise-sensitive land uses, to the extent possible.

e. A public liaison shall be appointed for project construction and shall be responsible for addressing public concerns about construction activities, including excessive noise. The liaison shall work directly with the construction contractor to ensure implementation of the appropriate noise-reduction measures to address public concerns and to ensure that construction-generated noise levels would not exceed commonly applied noise criteria at nearby noise-sensitive land uses (e.g., 80 dBA L_{eq}). Signage shall be posted at the site perimeter identifying the public liaison's contact information.

f. Where necessary, temporary barriers shall be installed where noise-generating construction activities would occur within 50 feet of an occupied noise-sensitive land use. Temporary noise barriers shall be constructed of sound curtains/blankets, wood, or material of similar density and usage, to a minimum height of 6 feet above ground level.

g. Staging and queuing areas shall be located at the furthest distance possible from nearby noise-sensitive land use identified in the project area at the time of construction.

h. Stationary equipment (e.g., generators, compressors) shall be located at the furthest distance possible from nearby noise-sensitive land use identified in the project area at the time of construction.

Significance After Mitigation

With the implementation of Mitigation Measure Noise-3, construction activities would be limited to the less noise-sensitive daytime hours. The proper maintenance of construction equipment and use of manufacturer-recommended mufflers and engine shrouds would reduce equipment noise levels by approximately 10 dB. The installation of temporary noise barriers, where required, would decrease noise level by approximately 5 to 10 dB. With mitigation, average-hourly construction noise levels would be reduced to less than 80 dBA L_{eq} at nearby land uses. With mitigation, this impact would be considered less than significant.

IMPACT B. Generation of excessive groundborne vibration or groundborne noise levels.

Increases in groundborne vibration levels attributable to the proposed project would be primarily associated with short-term construction-related activities. Construction activities associated with the proposed project would likely require the use of various off-road equipment, such as tractors, concrete mixers, and haul trucks.

Groundborne vibration levels associated with representative construction equipment are summarized in Table 13. Based on the vibration levels presented, ground vibration generated by construction equipment would not exceed approximately 0.09 inches per second ppv at 25 feet. Predicted vibration levels at the nearest offsite structures, which are located in excess of 25 feet from the project site, would not exceed 0.5 in/sec ppv at nearby land uses.

In addition, haul trucks traveling along project area roadways may result in perceptible increases in vibration levels. However, these vibration levels would be transient and instantaneous events, which would be typical of existing vibrations along the roadway network. Based on measurements conducted by Caltrans, on-road heavy-duty trucks would not generate substantial increases in groundborne vibration that would be expected to exceed commonly applied criteria for structural damage or annoyance (Caltrans 2013). As a result, this impact would be considered less than significant.

Table 13
Representative Construction Equipment Vibration Levels

Equipment	Vibration Level at 25 ft.	
	Peak Particle Velocity (ppv, in/sec)	VdB (micro-inch/second)
Hoe Ram/Pavement Breaker	0.089	87
Large Bulldozers	0.089	87
Loaded Trucks	0.076	86
Jackhammer	0.035	79
Small Bulldozers	0.003	58
Sources: FTA 2018, Caltrans 2013		

IMPACT C. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.

The project site is not located within two miles of a public airport or private airstrip. The nearest airport is the Paso Robles Municipal Airport, which is located approximately four miles northeast of the project site. The project site is not located within the 65 dBA CNEL contour of this airport. As a result, the project site is not subject to high levels of aircraft noise. This impact is considered less than significant.

REFERENCES

California Air Pollution Control Officers Association (CAPCOA). 2016. *California Emissions Estimator Model.* Available at website url: http://www.capcoa.org/caleemod/.

California Building Standards Commission (CBSC). June 2010. *2010 California Green Building Standards Code, California Code of Regulations, Title 24, Part 11*.

California Department of Transportation (Caltrans). 2012. *IS/EA Annotated Outline*. Available at website url: https://dot.ca.gov/programs/environmental-analysis/standard-environmental-reference-ser.

California Department of Transportation (Caltrans). 2013. *Transportation and Construction Vibration Guidance Manual.* Available at website url: https://dot.ca.gov/programs/environmental-analysis.

City of El Paso de Robles. December 16, 2003. *City of El Paso de Robles General Plan 2003 Noise Element.* Available at website url:https://www.prcity.com/313/General-Plan.

Federal Aviation Administration (FAA). July 14, 2000. *FAA Aviation Noise Abatement Policy. Federal Register Vol 65, No 136.* Available at website url: https://www.faa.gov/regulations_policies/orders_notices/index.cfm/go/document.information/documentID/1313

Federal Highway Administration (FHWA). December 8, 2008. *Roadway Construction Noise Model, version 1.1.* Available at website url: https://www.fhwa.dot.gov/environment/noise/construction_noise/rcnm/

Federal Transit Administration (FTA). September 2018. *Transit Noise and Vibration Impact Assessment Manual.* Available at website url: https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf.

Rincon Consultants. 2019. *Project Site Plan.*

State of California Department of Transportation (Caltrans). 2013. *Transportation and Construction-Induced Vibration Guidance Manual.* Available at website url: http://www1.dot.ca.gov/hq/env/noise/pub/tcvgm_sep13_verb.pdf.

State of California Governor's Office of Planning and Research (OPR). 2017. *General Plan Guidelines*. Available at website url: http://opr.ca.gov/docs/OPR_COMPLETE_7.31.17.pdf.

U.S. Environmental Protection Agency (EPA). 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety.* Available at website url: https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=2000L3LN.TXT.

Wallace Group. 2019. *Olsen-Chandler Road Sections.*

APPENDIX A
AMBIENT NOISE MONITORING SURVEYS

AMBIENT
AIR QUALITY & NOISE CONSULTING

NOISE MEASUREMENT SURVEY FORM

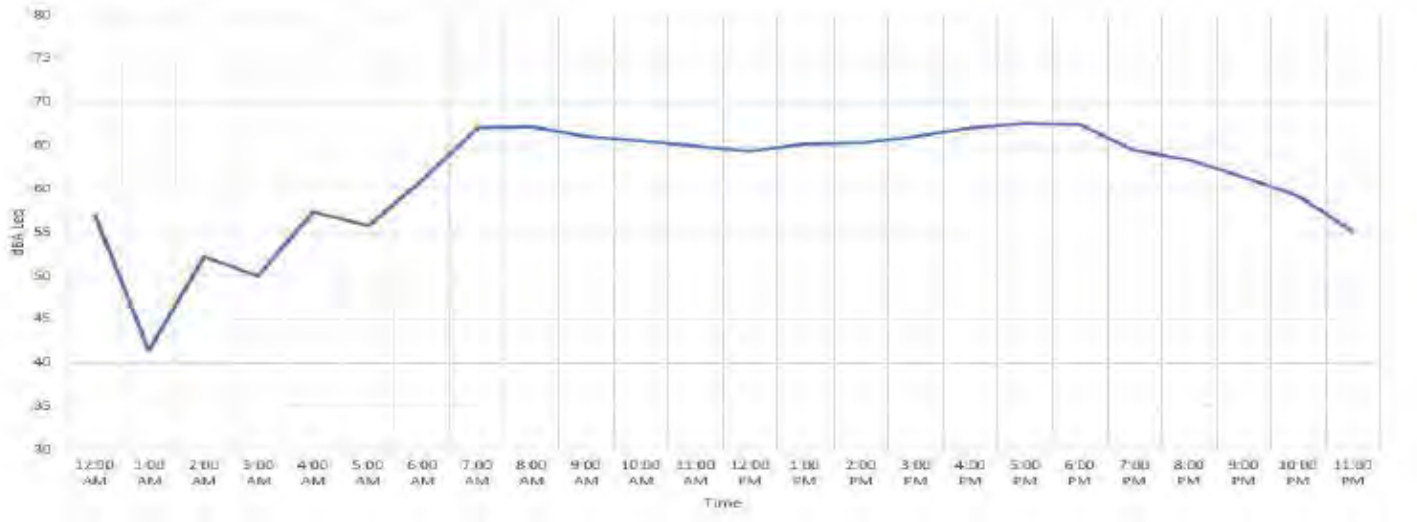
DATE:	January 30th, 2019 & February 1st, 2019
PROJECT:	Paso Robles - Olsen-Chandler Specific Plan

NOISE MONITORING LOCATION		Paso Robles
MET CONDITIONS:		TEMP: 53 - 71 F. HUMIDITY: 43 - 79 % WIND SPEED: 6 - 16 MPH SKY: Cloudy GROUND: Dry
NOISE MONITORING EQUIPMENT:		LARSON DAVIS MODEL 820, TYPE I SLM

CALIBRATED PRIOR TO AND UPON COMPLETION OF MEASUREMENTS: YES

LOCATION	MONITORING PERIOD	NOISE SOURCES NOTED	NOISE LEVEL		
			LEQ	LMIN	LMAX
ST-1 Meadowlark Road, near Airport Road	1230-1240	Vehicle Traffic	51	35.3	73.9
ST-2 Meadowlark Road	1300-1310	Vehicle Traffic	50.2	39.6	73
ST-3 Hanson Road	1320-1330	Vehicle Traffic	49.9	33	69.2
ST-4 Linne Road, near Fontana Road	1340-1350	Vehicle Traffic	67.7	34.3	84
ST-5 Fotana Road, near Sherwood Road	1445-1455	Vehicle Traffic	67.3	47.5	79.1
ST-6 Sherwood Road, near Fontana Road	1520-1530	Vehicle Traffic	65.3	52.2	81
ST-7 Linne Road, near Hanson Road	1540-1550	Vehicle Traffic	70.6	48.1	80.7

LONG-TERM NOISE MEASUREMENT AT LT-1
15 Feet from the Centerline of Linne Road
Measured Noise Level: 66.1 CNEL



APPENDIX B
TRAFFIC NOISE MODELING

Reso A - Exhibit C2 (EIR Technical Appendix)

TRAFFIC VOLUME SUMMARY

ROADWAY SEGMENT	SEGID	LANES	AHW	SPEED	EXISTING	EXISTING + 1293	EXISTING + 1293 + SCHOOL
					ADT	ADT	ADT
UNION ROAD, PRISKA DRIVE TO KIT FOX LANE	1	2	6	55	1,570	1,570	1,570
CRESTON ROAD, EAST OF FERRO LANE	2	2	6	35	16,049	16,859	16,925
CRESTON ROAD, EAST OF GOLDEN HILL ROAD	3	4	24	35	13,675	16,720	16,964
CRESTON ROAD, SOUTH OF NIBLICK ROAD	4	4	24	35	14,856	15,868	15,952
CRESTON ROAD, NORTH OF MEADOWLARK ROAD	5	4	6	35	6,008	6,921	6,996
GOLDEN HILL ROAD, SOUTH OF UNION ROAD	6	3	18	45	12,676	14,303	14,434
GOLDEN HILL ROAD, NORTH OF UNION ROAD	7	3	12	45	9,805	11,081	11,184
NIBLICK ROAD, EAST OF SPRING STREET	8	4	24	40	29,676	32,907	33,169
NIBLICK ROAD, EAST OF QUARTERHORSE	9	4	24	40	20,115	24,279	24,616
SHERWOOD ROAD, EAST OF CRESTON ROAD	10	4	24	40	9,659	17,421	18,038
LINNE ROAD, POPPY LANE TO HANSON ROAD	11	2	6	55	1,311	2,449	2,543
PARKVIEW LANE, EAST OF AIRPORT ROAD	12	2	6	25	250	370	380
SCOTT STREET, EAST OF AIRPORT ROAD	13	2	6	25	240	880	930
LINNE ROAD, FONTANA TO AIRPORT ROAD	14	2	6	25	4,750	2,080	2,110
POPPY LANE, SOUTH OF LINNE ROAD	15	2	6	25	< 100	< 100	< 100
HANSON ROAD, LINNE ROAD TO MEADOWLARK ROAD	16	2	6	25	100	690	740
MEADOWLARK ROAD, WEST OF HANSON ROAD	17	2	6	25	130	2,220	2,390
NIBLICK ROAD, EAST OF FONTANA ROAD	18	2	12	35	0	10,680	11,180
AIRPORT ROAD, NORTH OF NIBLICK ROAD	19	4	24	35	0	1,560	1,680
NIBLICK ROAD, AIRPORT ROAD TO LINNE ROAD	20	2	12	35	0	4,690	4,940
NIBLICK ROAD, SOUTH OF LINNE ROAD	21	2	12	35	0	1,900	2,040

AHW = ACTIVE HALF WIDTH

ADT = AVERAGE DAILY TRIPS

Source: City of Paso Robles General Plan Circulation Element, 2011; CCTC, 2019.

Reso A - Exhibit C2 (EIR Technical Appendix)

ROADWAY SEGMENT	SEGID	LANES	AHW	SPEED	NEAR TERM	NT + 1293	NT + 1293 + SCHOOL
					ADT	ADT	ADT
UNION ROAD, PRISKA DRIVE TO KIT FOX LANE	1	2	6	55	1,700	1,700	1,700
CRESTON ROAD, EAST OF FERRO LANE	2	2	6	35	17,400	18,210	18,276
CRESTON ROAD, EAST OF GOLDEN HILL ROAD	3	4	24	35	15,900	18,945	19,189
CRESTON ROAD, SOUTH OF NIBLICK ROAD	4	4	24	35	18,900	19,912	19,996
CRESTON ROAD, NORTH OF MEADOWLARK ROAD	5	4	6	35	10,600	11,513	11,588
GOLDEN HILL ROAD, SOUTH OF UNION ROAD	6	3	18	45	14,500	16,127	16,258
GOLDEN HILL ROAD, NORTH OF UNION ROAD	7	3	12	45	11,300	12,576	12,679
NIBLICK ROAD, EAST OF SPRING STREET	8	4	24	40	33,600	36,831	37,093
NIBLICK ROAD, EAST OF QUARTERHORSE	9	4	24	40	22,000	26,164	26,501
SHERWOOD ROAD, EAST OF CRESTON ROAD	10	4	24	40	12,000	19,762	20,379
LINNE ROAD, POPPY LANE TO HANSON ROAD	11	2	6	55	1,800	2,938	3,032
PARKVIEW LANE, EAST OF AIRPORT ROAD	12	2	6	25	270	390	400
SCOTT STREET, EAST OF AIRPORT ROAD	13	2	6	25	260	900	950
LINNE ROAD, FONTANA TO AIRPORT ROAD	14	2	6	25	5,880	2,080	2,110
POPPY LANE, SOUTH OF LINNE ROAD	15	2	6	25	< 100	< 100	< 100
HANSON ROAD, LINNE ROAD TO MEADOWLARK ROAD	16	2	6	25	100	690	740
MEADOWLARK ROAD, WEST OF HANSON ROAD	17	2	6	25	520	2,610	2,780
NIBLICK ROAD, EAST OF FONTANA ROAD	18	2	12	35	0	11,780	12,280
AIRPORT ROAD, NORTH OF NIBLICK ROAD	19	4	24	35	0	1,560	1,680
NIBLICK ROAD, AIRPORT ROAD TO LINNE ROAD	20	2	12	35	0	5,170	5,420
NIBLICK ROAD, SOUTH OF LINNE ROAD	21	2	12	35	0	1,900	2,040

AHW = ACTIVE HALF WIDTH

ADT = AVERAGE DAILY TRIPS

Source: City of Paso Robles General Plan Circulation Element, 2011; CCTC, 2019.

Reso A - Exhibit C2 (EIR Technical Appendix)

ROADWAY SEGMENT	SEGID	LANES	AHW	SPEED	CUMULATIVE ADT	CM + 1293 ADT	CM + 1293 + SCHOOL ADT
UNION ROAD, PRISKA DRIVE TO KIT FOX LANE	1	2	6	55	2,500	2,625	2,634
CRESTON ROAD, EAST OF FERRO LANE	2	2	6	35	19,200	19,954	19,983
CRESTON ROAD, EAST OF GOLDEN HILL ROAD	3	4	24	35	20,100	21,561	21,603
CRESTON ROAD, SOUTH OF NIBLICK ROAD	4	4	24	35	20,300	20,750	20,764
CRESTON ROAD, NORTH OF MEADOWLARK ROAD	5	4	6	35	11,200	11,663	11,697
GOLDEN HILL ROAD, SOUTH OF UNION ROAD	6	4	24	45	20,400	21,727	21,737
GOLDEN HILL ROAD, NORTH OF UNION ROAD	7	4	18	45	22,200	23,295	23,312
NIBLICK ROAD, EAST OF SPRING STREET	8	4	24	40	34,300	37,137	37,311
NIBLICK ROAD, EAST OF QUARTERHORSE	9	4	24	40	26,200	29,738	30,008
SHERWOOD ROAD, EAST OF CRESTON ROAD	10	4	24	40	18,200	24,066	24,534
LINNE ROAD, POPPY LANE TO HANSON ROAD	11	2	6	55	2,000	3,383	3,495
PARKVIEW LANE, EAST OF AIRPORT ROAD	12	2	6	25	430	550	560
SCOTT STREET, EAST OF AIRPORT ROAD	13	2	6	25	410	940	970
LINNE ROAD, FONTANA TO AIRPORT ROAD	14	2	6	25	8,980	2,920	2,960
POPPY LANE, SOUTH OF LINNE ROAD	15	2	6	25	< 100	< 100	< 100
HANSON ROAD, LINNE ROAD TO MEADOWLARK ROAD	16	2	6	25	120	710	760
MEADOWLARK ROAD, WEST OF HANSON ROAD	17	2	6	25	660	2,080	2,190
NIBLICK ROAD, EAST OF FONTANA ROAD	18	2	12	35	0	12,760	13,130
AIRPORT ROAD, NORTH OF NIBLICK ROAD	19	4	24	35	0	9,850	10,080
NIBLICK ROAD, AIRPORT ROAD TO LINNE ROAD	20	2	12	35	0	5,790	6,080
NIBLICK ROAD, SOUTH OF LINNE ROAD	21	2	12	35	0	2,570	2,760

AHW = ACTIVE HALF WIDTH

ADT = AVERAGE DAILY TRIPS

Source: City of Paso Robles General Plan Circulation Element, 2011; CCTC, 2019.

Reso A - Exhibit C2 (EIR Technical Appendix)

TRAFFIC NOISE SUMMARY

EXISTING

ROADWAY SEGMENT	SEGID	NOISE LEVELS				
		CNEL AT 50' FROM NEAR TRAVEL LANE CENTERLINE	70 CNEL	65 CNEL	60 CNEL	55 CNEL
UNION ROAD, PRISKA DRIVE TO KIT FOX LANE	1	61.0	WR	WR	66	141
CRESTON ROAD, EAST OF FERRO LANE	2	66.3	WR	68	145	313
CRESTON ROAD, EAST OF GOLDEN HILL ROAD	3	64.1	WR	65	133	282
CRESTON ROAD, SOUTH OF NIBLICK ROAD	4	64.4	WR	68	140	298
CRESTON ROAD, NORTH OF MEADOWLARK ROAD	5	62.0	WR	WR	76	163
GOLDEN HILL ROAD, SOUTH OF UNION ROAD	6	66.8	WR	89	188	404
GOLDEN HILL ROAD, NORTH OF UNION ROAD	7	66.2	WR	74	158	340
NIBLICK ROAD, EAST OF SPRING STREET	8	68.8	63	128	273	585
NIBLICK ROAD, EAST OF QUARTERHORSE	9	67.1	WR	100	211	452
SHERWOOD ROAD, EAST OF CRESTON ROAD	10	64.0	WR	64	131	278
LINNE ROAD, POPPY LANE TO HANSON ROAD	11	60.3	WR	WR	58	125
PARKVIEW LANE, EAST OF AIRPORT ROAD	12	44.7	WR	WR	WR	WR
SCOTT STREET, EAST OF AIRPORT ROAD	13	44.5	WR	WR	WR	WR
LINNE ROAD, FONTANA TO AIRPORT ROAD	14	57.5	WR	WR	WR	82
POPPY LANE, SOUTH OF LINNE ROAD	15	40.7	WR	WR	WR	WR
HANSON ROAD, LINNE ROAD TO MEADOWLARK ROAD	16	40.7	WR	WR	WR	WR
MEADOWLARK ROAD, WEST OF HANSON ROAD	17	41.9	WR	WR	WR	WR
NIBLICK ROAD, EAST OF FONTANA ROAD	18	0.0	WR	WR	WR	WR
AIRPORT ROAD, NORTH OF NIBLICK ROAD	19	0.0	WR	WR	WR	WR
NIBLICK ROAD, AIRPORT ROAD TO LINNE ROAD	20	0.0	WR	WR	WR	WR
NIBLICK ROAD, SOUTH OF LINNE ROAD	21	0.0	WR	WR	WR	WR

CNEL = COMMUNITY NOISE EQUIVALENT LEVEL

WR = WITHIN ROAD RIGHT-OF-WAY

Reso A - Exhibit C2 (EIR Technical Appendix)

EXISTING + 1293

ROADWAY SEGMENT	SEGID	NOISE LEVELS				
		CNEL AT 50' FROM NEAR TRAVEL LANE CENTERLINE	70 CNEL	65 CNEL	60 CNEL	55 CNEL
UNION ROAD, PRISKA DRIVE TO KIT FOX LANE	1	61.0	WR	WR	66	141
CRESTON ROAD, EAST OF FERRO LANE	2	66.5	WR	70	150	323
CRESTON ROAD, EAST OF GOLDEN HILL ROAD	3	64.9	WR	73	151	322
CRESTON ROAD, SOUTH OF NIBLICK ROAD	4	64.7	WR	71	146	311
CRESTON ROAD, NORTH OF MEADOWLARK ROAD	5	62.6	WR	WR	83	179
GOLDEN HILL ROAD, SOUTH OF UNION ROAD	6	67.4	WR	96	204	438
GOLDEN HILL ROAD, NORTH OF UNION ROAD	7	66.8	WR	80	172	369
NIBLICK ROAD, EAST OF SPRING STREET	8	69.3	67	137	292	627
NIBLICK ROAD, EAST OF QUARTERHORSE	9	68.0	57	113	239	512
SHERWOOD ROAD, EAST OF CRESTON ROAD	10	66.5	WR	92	192	411
LINNE ROAD, POPPY LANE TO HANSON ROAD	11	63.0	WR	WR	88	189
PARKVIEW LANE, EAST OF AIRPORT ROAD	12	46.4	WR	WR	WR	WR
SCOTT STREET, EAST OF AIRPORT ROAD	13	50.2	WR	WR	WR	WR
LINNE ROAD, FONTANA TO AIRPORT ROAD	14	53.9	WR	WR	WR	WR
POPPY LANE, SOUTH OF LINNE ROAD	15	40.7	WR	WR	WR	WR
HANSON ROAD, LINNE ROAD TO MEADOWLARK ROAD	16	49.1	WR	WR	WR	WR
MEADOWLARK ROAD, WEST OF HANSON ROAD	17	54.2	WR	WR	WR	WR
NIBLICK ROAD, EAST OF FONTANA ROAD	18	63.9	WR	53	111	239
AIRPORT ROAD, NORTH OF NIBLICK ROAD	19	54.6	WR	WR	WR	70
NIBLICK ROAD, AIRPORT ROAD TO LINNE ROAD	20	60.3	WR	WR	65	138
NIBLICK ROAD, SOUTH OF LINNE ROAD	21	56.4	WR	WR	WR	76

CNEL = COMMUNITY NOISE EQUIVALENT LEVEL

WR = WITHIN ROAD RIGHT-OF-WAY

Reso A - Exhibit C2 (EIR Technical Appendix)

EXISTING + 1293 + SCHOOL

ROADWAY SEGMENT	SEGID	NOISE LEVELS				
		CNEL AT 50' FROM NEAR TRAVEL LANE CENTERLINE	70 CNEL	65 CNEL	60 CNEL	55 CNEL
UNION ROAD, PRISKA DRIVE TO KIT FOX LANE	1	61.0	WR	WR	66	141
CRESTON ROAD, EAST OF FERRO LANE	2	66.5	WR	70	151	324
CRESTON ROAD, EAST OF GOLDEN HILL ROAD	3	65.0	WR	74	152	325
CRESTON ROAD, SOUTH OF NIBLICK ROAD	4	64.7	WR	71	146	312
CRESTON ROAD, NORTH OF MEADOWLARK ROAD	5	62.6	WR	WR	84	180
GOLDEN HILL ROAD, SOUTH OF UNION ROAD	6	67.4	WR	97	205	440
GOLDEN HILL ROAD, NORTH OF UNION ROAD	7	66.8	WR	81	173	372
NIBLICK ROAD, EAST OF SPRING STREET	8	69.3	67	138	293	630
NIBLICK ROAD, EAST OF QUARTERHORSE	9	68.0	57	114	241	517
SHERWOOD ROAD, EAST OF CRESTON ROAD	10	66.7	WR	94	196	420
LINNE ROAD, POPPY LANE TO HANSON ROAD	11	63.1	WR	WR	90	194
PARKVIEW LANE, EAST OF AIRPORT ROAD	12	46.5	WR	WR	WR	WR
SCOTT STREET, EAST OF AIRPORT ROAD	13	50.4	WR	WR	WR	WR
LINNE ROAD, FONTANA TO AIRPORT ROAD	14	54.0	WR	WR	WR	WR
POPPY LANE, SOUTH OF LINNE ROAD	15	40.7	WR	WR	WR	WR
HANSON ROAD, LINNE ROAD TO MEADOWLARK ROAD	16	49.4	WR	WR	WR	WR
MEADOWLARK ROAD, WEST OF HANSON ROAD	17	54.5	WR	WR	WR	52
NIBLICK ROAD, EAST OF FONTANA ROAD	18	64.1	WR	54	115	246
AIRPORT ROAD, NORTH OF NIBLICK ROAD	19	54.9	WR	WR	WR	73
NIBLICK ROAD, AIRPORT ROAD TO LINNE ROAD	20	60.6	WR	WR	67	143
NIBLICK ROAD, SOUTH OF LINNE ROAD	21	56.7	WR	WR	WR	80

CNEL = COMMUNITY NOISE EQUIVALENT LEVEL

WR = WITHIN ROAD RIGHT-OF-WAY

Reso A - Exhibit C2 (EIR Technical Appendix)

NEAR TERM

ROADWAY SEGMENT	SEGID	NOISE LEVELS				
		CNEL AT 50' FROM NEAR TRAVEL LANE CENTERLINE	70 CNEL	65 CNEL	60 CNEL	55 CNEL
UNION ROAD, PRISKA DRIVE TO KIT FOX LANE	1	61.4	WR	WR	69	149
CRESTON ROAD, EAST OF FERRO LANE	2	66.6	WR	71	153	330
CRESTON ROAD, EAST OF GOLDEN HILL ROAD	3	64.7	WR	71	146	311
CRESTON ROAD, SOUTH OF NIBLICK ROAD	4	65.5	WR	79	163	349
CRESTON ROAD, NORTH OF MEADOWLARK ROAD	5	64.5	WR	52	110	237
GOLDEN HILL ROAD, SOUTH OF UNION ROAD	6	67.4	WR	97	206	442
GOLDEN HILL ROAD, NORTH OF UNION ROAD	7	66.8	WR	82	174	374
NIBLICK ROAD, EAST OF SPRING STREET	8	69.4	68	139	296	636
NIBLICK ROAD, EAST OF QUARTERHORSE	9	67.5	WR	106	224	480
SHERWOOD ROAD, EAST OF CRESTON ROAD	10	64.9	WR	73	150	321
LINNE ROAD, POPPY LANE TO HANSON ROAD	11	61.6	WR	WR	72	154
PARKVIEW LANE, EAST OF AIRPORT ROAD	12	45.0	WR	WR	WR	WR
SCOTT STREET, EAST OF AIRPORT ROAD	13	44.9	WR	WR	WR	WR
LINNE ROAD, FONTANA TO AIRPORT ROAD	14	58.4	WR	WR	WR	94
POPPY LANE, SOUTH OF LINNE ROAD	15	40.7	WR	WR	WR	WR
HANSON ROAD, LINNE ROAD TO MEADOWLARK ROAD	16	40.7	WR	WR	WR	WR
MEADOWLARK ROAD, WEST OF HANSON ROAD	17	47.9	WR	WR	WR	WR
NIBLICK ROAD, EAST OF FONTANA ROAD	18	0.0	WR	WR	WR	WR
AIRPORT ROAD, NORTH OF NIBLICK ROAD	19	0.0	WR	WR	WR	WR
NIBLICK ROAD, AIRPORT ROAD TO LINNE ROAD	20	0.0	WR	WR	WR	WR
NIBLICK ROAD, SOUTH OF LINNE ROAD	21	0.0	WR	WR	WR	WR

CNEL = COMMUNITY NOISE EQUIVALENT LEVEL

WR = WITHIN ROAD RIGHT-OF-WAY

Reso A - Exhibit C2 (EIR Technical Appendix)

NT + 1293

ROADWAY SEGMENT	SEGID	NOISE LEVELS				
		CNEL AT 50' FROM NEAR TRAVEL LANE CENTERLINE	70 CNEL	65 CNEL	60 CNEL	55 CNEL
UNION ROAD, PRISKA DRIVE TO KIT FOX LANE	1	61.4	WR	WR	69	149
CRESTON ROAD, EAST OF FERRO LANE	2	66.8	WR	74	158	340
CRESTON ROAD, EAST OF GOLDEN HILL ROAD	3	65.5	WR	79	164	350
CRESTON ROAD, SOUTH OF NIBLICK ROAD	4	65.7	WR	81	169	361
CRESTON ROAD, NORTH OF MEADOWLARK ROAD	5	64.8	WR	54	117	251
GOLDEN HILL ROAD, SOUTH OF UNION ROAD	6	67.9	WR	104	221	474
GOLDEN HILL ROAD, NORTH OF UNION ROAD	7	67.3	WR	87	187	402
NIBLICK ROAD, EAST OF SPRING STREET	8	69.8	72	148	314	676
NIBLICK ROAD, EAST OF QUARTERHORSE	9	68.3	59	118	251	538
SHERWOOD ROAD, EAST OF CRESTON ROAD	10	67.1	WR	99	208	447
LINNE ROAD, POPPY LANE TO HANSON ROAD	11	63.8	WR	WR	99	214
PARKVIEW LANE, EAST OF AIRPORT ROAD	12	46.6	WR	WR	WR	WR
SCOTT STREET, EAST OF AIRPORT ROAD	13	50.3	WR	WR	WR	WR
LINNE ROAD, FONTANA TO AIRPORT ROAD	14	53.9	WR	WR	WR	WR
POPPY LANE, SOUTH OF LINNE ROAD	15	40.7	WR	WR	WR	WR
HANSON ROAD, LINNE ROAD TO MEADOWLARK ROAD	16	49.1	WR	WR	WR	WR
MEADOWLARK ROAD, WEST OF HANSON ROAD	17	54.9	WR	WR	WR	55
NIBLICK ROAD, EAST OF FONTANA ROAD	18	64.3	WR	56	119	255
AIRPORT ROAD, NORTH OF NIBLICK ROAD	19	54.6	WR	WR	WR	70
NIBLICK ROAD, AIRPORT ROAD TO LINNE ROAD	20	60.8	WR	WR	69	147
NIBLICK ROAD, SOUTH OF LINNE ROAD	21	56.4	WR	WR	WR	76

CNEL = COMMUNITY NOISE EQUIVALENT LEVEL

WR = WITHIN ROAD RIGHT-OF-WAY

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NT + 1293 + SCHOOL

ROADWAY SEGMENT	SEGID	NOISE LEVELS				
		CNEL AT 50' FROM NEAR TRAVEL LANE CENTERLINE	70 CNEL	65 CNEL	60 CNEL	55 CNEL
UNION ROAD, PRISKA DRIVE TO KIT FOX LANE	1	61.4	WR	WR	69	149
CRESTON ROAD, EAST OF FERRO LANE	2	66.8	WR	74	159	341
CRESTON ROAD, EAST OF GOLDEN HILL ROAD	3	65.5	WR	80	165	353
CRESTON ROAD, SOUTH OF NIBLICK ROAD	4	65.7	WR	82	170	362
CRESTON ROAD, NORTH OF MEADOWLARK ROAD	5	64.8	WR	55	117	252
GOLDEN HILL ROAD, SOUTH OF UNION ROAD	6	67.9	WR	104	222	477
GOLDEN HILL ROAD, NORTH OF UNION ROAD	7	67.3	WR	88	188	404
NIBLICK ROAD, EAST OF SPRING STREET	8	69.8	72	148	316	679
NIBLICK ROAD, EAST OF QUARTERHORSE	9	68.3	59	119	253	543
SHERWOOD ROAD, EAST OF CRESTON ROAD	10	67.2	WR	101	213	456
LINNE ROAD, POPPY LANE TO HANSON ROAD	11	63.9	WR	WR	102	218
PARKVIEW LANE, EAST OF AIRPORT ROAD	12	46.8	WR	WR	WR	WR
SCOTT STREET, EAST OF AIRPORT ROAD	13	50.5	WR	WR	WR	WR
LINNE ROAD, FONTANA TO AIRPORT ROAD	14	54.0	WR	WR	WR	WR
POPPY LANE, SOUTH OF LINNE ROAD	15	40.7	WR	WR	WR	WR
HANSON ROAD, LINNE ROAD TO MEADOWLARK ROAD	16	49.4	WR	WR	WR	WR
MEADOWLARK ROAD, WEST OF HANSON ROAD	17	55.2	WR	WR	WR	57
NIBLICK ROAD, EAST OF FONTANA ROAD	18	64.5	WR	58	122	262
AIRPORT ROAD, NORTH OF NIBLICK ROAD	19	54.9	WR	WR	WR	73
NIBLICK ROAD, AIRPORT ROAD TO LINNE ROAD	20	61.0	WR	WR	71	152
NIBLICK ROAD, SOUTH OF LINNE ROAD	21	56.7	WR	WR	WR	80

CNEL = COMMUNITY NOISE EQUIVALENT LEVEL

WR = WITHIN ROAD RIGHT-OF-WAY

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CUMULATIVE

ROADWAY SEGMENT	SEGID	NOISE LEVELS				
		CNEL AT 50' FROM NEAR TRAVEL LANE CENTERLINE	70 CNEL	65 CNEL	60 CNEL	55 CNEL
UNION ROAD, PRISKA DRIVE TO KIT FOX LANE	1	63.1	WR	WR	89	192
CRESTON ROAD, EAST OF FERRO LANE	2	67.0	WR	76	164	353
CRESTON ROAD, EAST OF GOLDEN HILL ROAD	3	65.7	WR	82	170	364
CRESTON ROAD, SOUTH OF NIBLICK ROAD	4	65.8	WR	82	171	366
CRESTON ROAD, NORTH OF MEADOWLARK ROAD	5	64.7	WR	53	114	246
GOLDEN HILL ROAD, SOUTH OF UNION ROAD	6	68.5	60	122	258	554
GOLDEN HILL ROAD, NORTH OF UNION ROAD	7	69.3	61	128	273	586
NIBLICK ROAD, EAST OF SPRING STREET	8	69.5	69	141	300	645
NIBLICK ROAD, EAST OF QUARTERHORSE	9	68.3	59	118	251	539
SHERWOOD ROAD, EAST OF CRESTON ROAD	10	66.7	WR	94	198	423
LINNE ROAD, POPPY LANE TO HANSON ROAD	11	62.1	WR	WR	77	166
PARKVIEW LANE, EAST OF AIRPORT ROAD	12	47.1	WR	WR	WR	WR
SCOTT STREET, EAST OF AIRPORT ROAD	13	46.9	WR	WR	WR	WR
LINNE ROAD, FONTANA TO AIRPORT ROAD	14	60.3	WR	WR	58	125
POPPY LANE, SOUTH OF LINNE ROAD	15	40.7	WR	WR	WR	WR
HANSON ROAD, LINNE ROAD TO MEADOWLARK ROAD	16	41.5	WR	WR	WR	WR
MEADOWLARK ROAD, WEST OF HANSON ROAD	17	48.9	WR	WR	WR	WR
NIBLICK ROAD, EAST OF FONTANA ROAD	18	0.0	WR	WR	WR	WR
AIRPORT ROAD, NORTH OF NIBLICK ROAD	19	0.0	WR	WR	WR	WR
NIBLICK ROAD, AIRPORT ROAD TO LINNE ROAD	20	0.0	WR	WR	WR	WR
NIBLICK ROAD, SOUTH OF LINNE ROAD	21	0.0	WR	WR	WR	WR

CNEL = COMMUNITY NOISE EQUIVALENT LEVEL

WR = WITHIN ROAD RIGHT-OF-WAY

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CM + 1293

ROADWAY SEGMENT	SEGID	NOISE LEVELS				
		CNEL AT 50' FROM NEAR TRAVEL LANE CENTERLINE	70 CNEL	65 CNEL	60 CNEL	55 CNEL
UNION ROAD, PRISKA DRIVE TO KIT FOX LANE	1	63.3	WR	WR	92	198
CRESTON ROAD, EAST OF FERRO LANE	2	67.2	WR	78	168	362
CRESTON ROAD, EAST OF GOLDEN HILL ROAD	3	66.0	WR	85	178	381
CRESTON ROAD, SOUTH OF NIBLICK ROAD	4	65.9	WR	83	174	371
CRESTON ROAD, NORTH OF MEADOWLARK ROAD	5	64.9	WR	55	118	253
GOLDEN HILL ROAD, SOUTH OF UNION ROAD	6	68.8	63	127	267	578
GOLDEN HILL ROAD, NORTH OF UNION ROAD	7	69.5	63	132	282	605
NIBLICK ROAD, EAST OF SPRING STREET	8	69.8	72	148	316	680
NIBLICK ROAD, EAST OF QUARTERHORSE	9	68.8	63	129	273	586
SHERWOOD ROAD, EAST OF CRESTON ROAD	10	67.9	56	112	237	509
LINNE ROAD, POPPY LANE TO HANSON ROAD	11	64.4	WR	51	109	235
PARKVIEW LANE, EAST OF AIRPORT ROAD	12	48.1	WR	WR	WR	WR
SCOTT STREET, EAST OF AIRPORT ROAD	13	50.5	WR	WR	WR	WR
LINNE ROAD, FONTANA TO AIRPORT ROAD	14	55.4	WR	WR	WR	59
POPPY LANE, SOUTH OF LINNE ROAD	15	40.7	WR	WR	WR	WR
HANSON ROAD, LINNE ROAD TO MEADOWLARK ROAD	16	49.2	WR	WR	WR	WR
MEADOWLARK ROAD, WEST OF HANSON ROAD	17	53.9	WR	WR	WR	WR
NIBLICK ROAD, EAST OF FONTANA ROAD	18	64.7	WR	59	125	269
AIRPORT ROAD, NORTH OF NIBLICK ROAD	19	63.8	WR	63	127	269
NIBLICK ROAD, AIRPORT ROAD TO LINNE ROAD	20	61.2	WR	WR	75	159
NIBLICK ROAD, SOUTH OF LINNE ROAD	21	57.7	WR	WR	WR	93

CNEL = COMMUNITY NOISE EQUIVALENT LEVEL

WR = WITHIN ROAD RIGHT-OF-WAY

Reso A - Exhibit C2 (EIR Technical Appendix)

CM + 1293 + SCHOOL

ROADWAY SEGMENT	SEGID	NOISE LEVELS				
		CNEL AT 50' FROM NEAR TRAVEL LANE CENTERLINE	70 CNEL	65 CNEL	60 CNEL	55 CNEL
UNION ROAD, PRISKA DRIVE TO KIT FOX LANE	1	63.3	WR	WR	93	199
CRESTON ROAD, EAST OF FERRO LANE	2	67.2	WR	78	168	362
CRESTON ROAD, EAST OF GOLDEN HILL ROAD	3	66.0	WR	86	178	381
CRESTON ROAD, SOUTH OF NIBLICK ROAD	4	65.9	WR	83	174	371
CRESTON ROAD, NORTH OF MEADOWLARK ROAD	5	64.9	WR	55	118	253
GOLDEN HILL ROAD, SOUTH OF UNION ROAD	6	68.8	63	127	269	578
GOLDEN HILL ROAD, NORTH OF UNION ROAD	7	69.5	63	132	282	606
NIBLICK ROAD, EAST OF SPRING STREET	8	69.8	72	149	317	682
NIBLICK ROAD, EAST OF QUARTERHORSE	9	68.9	64	129	275	590
SHERWOOD ROAD, EAST OF CRESTON ROAD	10	68.0	57	114	240	516
LINNE ROAD, POPPY LANE TO HANSON ROAD	11	64.5	WR	52	112	240
PARKVIEW LANE, EAST OF AIRPORT ROAD	12	48.2	WR	WR	WR	WR
SCOTT STREET, EAST OF AIRPORT ROAD	13	50.6	WR	WR	WR	WR
LINNE ROAD, FONTANA TO AIRPORT ROAD	14	55.4	WR	WR	WR	60
POPPY LANE, SOUTH OF LINNE ROAD	15	40.7	WR	WR	WR	WR
HANSON ROAD, LINNE ROAD TO MEADOWLARK ROAD	16	49.5	WR	WR	WR	WR
MEADOWLARK ROAD, WEST OF HANSON ROAD	17	54.1	WR	WR	WR	WR
NIBLICK ROAD, EAST OF FONTANA ROAD	18	64.8	WR	60	128	274
AIRPORT ROAD, NORTH OF NIBLICK ROAD	19	63.9	WR	64	129	274
NIBLICK ROAD, AIRPORT ROAD TO LINNE ROAD	20	61.5	WR	WR	77	164
NIBLICK ROAD, SOUTH OF LINNE ROAD	21	58.0	WR	WR	WR	97

CNEL = COMMUNITY NOISE EQUIVALENT LEVEL

WR = WITHIN ROAD RIGHT-OF-WAY

NOISE PREDICTION MODEL CALIBRATION

MODELED NOISE LEVEL: 60.3

MEASURED NOISE LEVEL: 58.3

DIFFERENCE: 2.0

ACCEPTABLE? YES

CORRECTION FACTORS APPLIED? NO

Appendix I

Transportation Impacts Assessment

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler Specific Plan – Paso Robles

Administrative Draft Transportation Impact Analysis

Central Coast Transportation Consulting

895 Napa Avenue, Suite A-6

Morro Bay, CA 93442

(805) 316-0101

July 2019

Reso A - Exhibit C2 (EIR Technical Appendix)

Executive Summary

This study evaluates the potential transportation impacts of the Olsen-Chandler Specific Plan located in the southeastern area of the City of Paso Robles. Two project alternatives were analyzed. The first alternative (1,293-Unit Project) would consist of 1,293 residential dwelling units (comprised of 1,065 single-family units and 228 multifamily units), 10,659 square feet of commercial building area, and 18,752 square feet of recreational facilities. The second alternative (1,293-Unit Project and School) would consist of the same land uses plus a 495-student elementary school.

The 1,293-Unit Project is expected to generate 11,899 total trips per weekday, including 900 AM peak hour trips and 1,213 PM peak hour trips. The 1,293-Unit Project and School is expected to generate 12,835 total trips per weekday, including 1,232 AM peak hour trips and 1,297 PM peak hour trips. The City's Transportation Impact Analysis Guidelines and Caltrans criteria are applied to identify the transportation deficiencies below.

KEY FINDINGS

The following sections summarize the recommendations and mitigation measures. Analysis supporting these recommendations is provided in the body of this report.

Intersection Operations

Table 12, Table 18, and **Table 24**, duplicated below, summarize the intersection mitigation measures.

Table 12: Existing Conditions Mitigations

Existing Conditions Mitigations							
			No	School		Cir. Elem.	Responsible
Intersection	Impact	Mitigation	Project	No[1]	Yes	and TIF[2]	Agency
3. SR 46 E/Union Rd[3]	LOS	Prohibit NB lefts	X	X	X	Yes	Caltrans
6. Golden Hill Rd/Union Rd	LOS, Queue	Install single lane roundabout	X	X	X	Yes	City
8. 13th St/Riverside Ave	Queue	Optimize corridor operations, WBR and NBR overlap	X	X	X	No	City
9. 13th St/Paso Robles St	Queue	Optimize corridor operations	X	X	X	No	City
12. Creston Rd/Niblick Rd	Queue	Add SBL & SBR	-	X	X	Yes	City
19. Niblick Rd/South River Rd	Queue	Optimize corridor operations, corridor improvements	X	X	X	Yes	City

X - Mitigation required.
1. All intersection improvements are warranted with Phase 1 of the project.
2. Intersection improvements are included in the Paso Robles Circulation Element and Traffic Impact Fee (TIF).
3. The Paso Robles Circulation Element includes improvements on State Route 46 East and in the vicinity between Buena Vista Drive and Dry Creek Road. Recommend project make a fair share contribution through the City's impact fee program for ultimate improvements on SR 46 E consistent with the RTP and other applicable documents. Ultimate improvements will be determined in the project documents.

There are existing LOS deficiencies at SR 46 E/Union Road and Golden Hill Road/Union Road which will be exacerbated by added project traffic. There are existing queue deficiencies at three signalized intersections: 13th Street/Riverside Avenue, 13th Street/Paso Robles Street, and Niblick Road/South River Road. Project development would trigger the need for an additional intersection mitigation: adding an additional southbound left turn lane and right turn lane at Creston Road/Niblick Road.

The SR 46 E corridor operates acceptably under Existing conditions with or without the addition of traffic from either project if northbound lefts are prohibited at the intersection of SR 46 E/Union Road.

Near Term intersection mitigations are summarized in **Table 18**, duplicated below. Near Term conditions include approved, pending, and pipeline projects, including the Beechwood Specific Plan. At Golden Hill Road/Union Road, a single-lane roundabout was assumed to be in place.

Table 18: Near Term Mitigations

Near Term Mitigations							
			No	School		Cir. Elem.	Responsible
Intersection	Impact	Mitigation	Project	No[1]	Yes	and TIF[2]	Agency
3. SR 46 E/Union Rd[3]	LOS	Prohibit NB lefts, RTP improvements	X	X	X	Yes	Caltrans
4. SR 46 E/Airport Rd[3]	LOS	RTP improvements	X	X	X	Yes	Caltrans
8. 13th St/Riverside Ave	Queue	Optimize corridor operations, WBR and NBR overlap	X	X	X	No	City
9. 13th St/Paso Robles St	Queue	Optimize corridor operations	X	X	X	No	City
12. Creston Rd/Niblick Rd	Queue	Add additional SBL, SBR, and EBT	-	X	X	Yes	City
13. Creston Rd/Scott St	LOS	Install traffic signal	-	X	X	Yes	City
14. Creston Rd/Stoney Creek Rd	LOS	Install traffic signal	X	X	X	Yes	City
15. Creston Rd/Meadowlark Rd	LOS	Install traffic signal	-	X	X	Yes	City
16. Creston Rd/Charolais Rd	LOS	Install all-way stop	-	X	X	No	City
18. 1st St-Niblick Rd/Spring St	Queue	Optimize corridor operations, corridor improvements	X	X	X	Yes	City
19. Niblick Rd/South River Rd	Queue	Optimize corridor operations, corridor improvements	X	X	X	Yes	City

X - Mitigation required.
1. All intersection improvements are warranted with Phase 1 of the project except Creston Rd/Charloais Rd (#16).
2. Intersection improvements are included in the Paso Robles Circulation Element and Traffic Impact Fee (TIF).
3. The Paso Robles Circulation Element includes improvements on State Route 46 East and in the vicinity between Buena Vista Drive and Dry Creek Road. Recommend project make a fair share contribution through the City's impact fee program for ultimate improvements on SR 46 E consistent with the RTP and other applicable documents. Ultimate improvements will be determined in the project documents.

Under Near Term conditions, the addition of any project traffic would worsen unacceptable operations on SR 46 E at Union Road and Airport Road. A traffic signal at Creston Road/Stoney Creek Road is needed under Near Term conditions. There are Near Term queue deficiencies at four signalized intersections: 13th Street/Riverside Avenue, 13th Street/Paso Robles Street, 1st Street-Niblick Road/Spring Street, and Niblick Road/South River Road. Project development would require four additional intersection mitigations: installation of traffic signals at Creston Road/Scott Street and Creston Road/Meadowlark Road, installation of all-way stop control at Creston Road/Charolais Road, and additional southbound lanes at Creston Road/Niblick Road.

Under Near Term conditions, no improvements were assumed on the SR 46 E corridor. Project traffic could be mitigated by the prohibition of side street left turns at Union Road and Airport Road.

For the SR 46 E corridor to operate acceptably under Near Term conditions with or without the project, the Union Road/Paso Robles Boulevard Extension to Airport Road and the Union Road eastbound on and off ramps are needed. Any improvements along SR 46 E are subject to Caltrans review and approval.

It is recommended that the project makes a fair share contribution through the City's impact fee program for ultimate improvements on SR 46 E consistent with the RTP and other applicable documents.

Cumulative intersection mitigations are summarized in **Table 24**, duplicated below. Cumulative conditions reflect buildout of local and regional land uses.

Table 24: Cumulative Mitigations

Cumulative Mitigations							
			No	School		Cir. Elem.	Responsible
Intersection	Impact	Mitigation	Project	No[1]	Yes	and TIF[2]	Agency
2. SR 46 E/Golden Hill Rd[3]	LOS	Optimize traffic signal, SBR overlap	X	X	X	Yes	Caltrans
8. 13th St/Riverside Ave	Queue	Optimize corridor operations, WBR and NBR overlap	X	X	X	No	City
9. 13th St/Paso Robles St	Queue	Optimize corridor operations	X	X	X	No	City
10. River Rd/Creston Rd	Queue	Optimize corridor operations	X	X	X	No	City
13. Creston Rd/Scott St	LOS	Install traffic signal	X	X	X	Yes	City
14. Creston Rd/Stoney Creek Rd	LOS	Install traffic signal	X	X	X	Yes	City
15. Creston Rd/Meadowlark Rd	LOS	Install traffic signal	X	X	X	Yes	City
16. Creston Rd/Charolais Rd	LOS	Install all-way stop	-	X	X	No	City
17. Riverside Ave/Pine St/ US 101 SB Ramp	LOS	Install all-way stop	X	X	X	No	Caltrans
18. 1st St-Niblick Rd/Spring St	Queue	Optimize corridor operations, corridor improvements	X	X	X	Yes	City
19. Niblick Rd/South River Rd	Queue	Optimize corridor operations, corridor improvements	X	X	X	Yes	City

X - Mitigation required.
1. All intersection improvements are warranted with Phase 1 of the project.
2. Intersection improvements are included in the Paso Robles Circulation Element and Traffic Impact Fee (TIF).
3. The Paso Robles Circulation Element includes improvements on State Route 46 East and in the vicinity between Buena Vista Drive and Dry Creek Road. Recommend project make a fair share contribution through the City's impact fee program for ultimate improvements on SR 46 E consistent with the RTP and other applicable documents. Ultimate improvements will be determined in the project documents.

Under Cumulative conditions, the following improvements were assumed to be in place:

- SR 46 E/Buena Vista Drive (#1): Second eastbound left turn lane installed
- SR 46 E/Union Road (#3): Intersection closed, eastbound on and off ramps constructed
- SR 46 E/Airport Road (#4): Turns restricted to right-in-right-out
- Golden Hill Road/Union Road (#6): Multi-lane roundabout
- Creston Road/Niblick Road (#12): Second eastbound through lane, second southbound left turn lane, dedicated southbound right turn lane

- Riverside Avenue/Pine Street/US 101 SB Ramp (#17): Pine Street converted to one-way westbound
- Golden Hill Road widened to 4-lane arterial from SR 46 E to Rolling Hills Road
- Airport Road Extension from Olsen-Chandler site to Union Road
- Gilead Lane extended east to Airport Road
- Paso Robles Boulevard overcrossing of SR 46 E and northeasterly extension to Airport Road
- US 101/SR 46W interchange: Roundabouts at northbound and southbound ramps, Vine Street realigned with Theatre Drive

Under Cumulative conditions, the addition of any project traffic would worsen operations at SR 46 E/Golden Hill Road with the Union Road Overcrossing. A traffic signal at Creston Road/Meadowlark Road, a traffic signal at Creston Road/Scott Street, a traffic signal at Creston Road/Stoney Creek Road, and all-way stop control at Riverside Avenue/Pine Street/US 101 SB Ramp are all needed under Cumulative conditions. There are Cumulative queue deficiencies at five signalized intersections: 13th Street/Riverside Avenue, 13th Street/Paso Robles Street, River Road/Creston Road, 1st Street-Niblick Road/Spring Street, and Niblick Road/South River Road. Project development would require an additional intersection mitigation: installation of all-way stop control at Creston Road/Charolais Road.

Project traffic could be mitigated by traffic signal improvements at SR 46 E/Golden Hill Road. For the intersection to operate acceptably under Cumulative conditions with or without the project, additional corridor improvements are needed.

It is recommended that the project makes a fair share contribution through the City's impact fee program for ultimate improvements on SR 46 E consistent with the RTP and other applicable documents. It is also recommended that the project makes a fair share contribution for a multi-lane roundabout at Golden Hill Road/Union Road, which is also included in the City's impact fee program.

Roadway Operations

The following roadway segments were identified as having a roadway capacity utilization over 90%:

- *Existing Conditions:* No segments identified with the addition of traffic from either project.
- *Near Term Conditions:* The Niblick Road segment east of Spring Street would operate at 90% capacity under Near Term conditions. With the addition of traffic from either project, the capacity utilization would increase but remain at or below 100%.
- *Cumulative Conditions:* The Niblick Road segment east of Spring Street would operate at 92% capacity under Cumulative conditions. With the addition of traffic from either project, the capacity utilization would increase but remain at or below 100%. The Creston Road segment east of Ferro Lane would operate at 88% capacity under Cumulative conditions. With the addition of traffic from either project, the capacity utilization would increase above 90% but remain at or below 100%.

The projected capacity utilization of 100% on Niblick Road does not justify the widening of this roadway per the City's Circulation Element. Widening the bridge to a six-lane arterial would result in a capacity utilization below 70%, which would reduce vehicle delays, but would also support higher vehicle speeds and would conflict with the City's multimodal goals and desire to maintain its small-town character.

The projected capacity utilization of 92% on Creston Road also does not justify widening. In 2018, the City Council approved a preferred alternative for the Creston Road Corridor between South River

Road and Niblick Road. The preferred alternative includes a three-lane cross section with two travel lanes and center turn lane from South River Road to Rolling Hills Road where the road transitions to a five-lane cross section with four travel lanes and a center turn lane. Also included are Class II bike lanes throughout the corridor and intersection enhancements.

Freeway Operations

A summary of freeway segments operating at LOS D or worse is shown in **Table 28**, duplicated below.

Table 28: Summary of Freeway Operations

Summary of Freeway Operations									
Direction	Location	Segment Type	Peak Hour	Existing	Ex. + Proj.	Near Term	NT + Proj.	Cumu-lative	CM + Proj.
US 101 NB	SR 46W Off Ramp	Diverge	AM	-	-	-	-	-	D
			PM	-	-	D	D	D	D
	SR 46W On Ramp	Merge	AM	-	-	-	-	D	D
			PM	D	D	D	D	E	F
	North of SR 46W	Mainline	AM	-	-	-	-	-	D
			PM	D	D	D	E	E	F
	Spring St. Off Ramp	Diverge	AM	-	-	D	D	D	D
			PM	D	D	E	E	F	F
US 101 SB	Spring St. On Ramp	Merge	AM	-	-	-	-	-	D
			PM	-	-	-	-	D	D
	North of SR 46W	Mainline	AM	D	D	D	E	E	E
			PM	D	D	D	D	E	E
	SR 46W Off Ramp	Diverge	AM	D	D	E	E	E	E
			PM	D	D	E	E	E	E
	SR 46W On Ramp	Merge	AM	-	D	D	D	D	D
			PM	-	D	D	D	D	D

Note: Segments operating acceptably are not shown in table.

Development of mitigation measures and recommendations will require Caltrans coordination. Although widening the mainline to a six-lane facility between Spring Street and Main Street would improve operations to LOS C or better for most segments, widening is difficult and is not included in the US 101 Transportation Concept Report or Regional Transportation Plan for this segment. Ramp improvements or metering may be an alternative in addition to Transportation Demand Management (TDM) and Transportation System Management (TSM) strategies.

The SLOCOG Regional Transportation Plan (RTP) identifies a future SR 46 Urban Multi-Modal Corridor Study for this area.

Site Access and On-Site Circulation

It is recommended the project provide Class II bike lanes on Scott Street consistent with the City's Bicycle and Pedestrian Master Plan. The project should provide 13 feet where parking and bike lanes are desired consistent with the City's Standard Construction Drawings.

It is also recommended that 11-foot travel lanes be provided on all arterial roadways consistent with the City's Standard Construction drawings. Airport Road, Linne Road, Niblick Road, and Sherwood Road are designated as arterials in the City's Circulation Element.

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Appendix A: Traffic Counts

Appendix B: Intersection LOS/Queue Calculation Sheets

Appendix C: Freeway LOS Calculation Sheets

Appendix D: Warrant Analysis Sheets

Introduction

This study evaluates the potential transportation impacts of the proposed Olsen-Chandler Specific Plan located in the southeastern area of the City of Paso Robles. Two project alternatives were analyzed. The first alternative (1,293-Unit Project) would consist of 1,293 residential dwelling units (comprised of 1,065 single-family units and 228 multifamily units), 10,659 square feet of commercial building area, and 18,752 square feet of recreational facilities. The second alternative (1,293-Unit Project and School) would consist of the same land uses plus a 495-student elementary school.

The project's location and study intersections are shown on **Figure 1**. **Figures 2a** and **2b** show the project site's land use and phasing plans, respectively.

The study locations, key analysis assumptions, and analysis scenarios were developed in consultation with City, County, and Caltrans staff.

The following intersections are evaluated during the weekday morning (7-9 AM) and evening (4-6 PM) time periods:

1. State Route 46 E/Buena Vista Drive
2. State Route 46 E/Golden Hill Road
3. State Route 46 E/Union Road
4. State Route 46 E/Airport Road
5. State Route 46 E/Mill Road
6. Golden Hill Road/Union Road
7. Penman Springs Road/Union Road
8. 13th Street/Riverside Avenue
9. 13th Street/Paso Robles Street
10. River Road/Creston Road
11. Creston Road/Golden Hill Road
12. Creston Road/Niblick Road
13. Creston Road/Scott Street
14. Creston Road/Stoney Creek Drive
15. Creston Road/Meadowlark Road
16. Creston Road/Charolais Road
17. Riverside Avenue/Pine Street/US 101 SB Ramp
18. 1st Street-Niblick Road/Spring Street
19. Niblick Road/South River Road
20. Sherwood Road/Commerce Way
21. Sherwood Road/Fontana Road (future)
22. Airport Road/Sherwood Road (future)
23. Airport Road/Scott Street
24. Airport Road/Meadowlark Road
25. Sherwood Road/Linne Road (future)
26. Penman Springs Road/Linne Road

The following roadway segments were evaluated using average daily traffic (ADT) volumes:

1. Union Road – Priska Drive to Kit Fox Lane
2. Creston Road – River Road to Golden Hill Road
3. Creston Road – Golden Hill Road to Niblick Road
4. Creston Road – Niblick Road to Cedarwood Drive
5. Creston Road – Cedarwood Drive to Charolais Road
6. Golden Hill Road – Creston Road to Union Road
7. Golden Hill Road – Union Road to SR 46 E
8. Niblick Road – South River Road to Spring Street
9. Niblick Road – Creston Road to South River Road
10. Sherwood Road – Fontana Road to Creston Road
11. Linne Road – Poppy Lane to Hanson Road

The following freeway facilities were evaluated during the weekday morning (7-9 AM) and evening (4-6 PM) time periods:

1. US 101 northbound off ramp at State Route 46 W
2. US 101 northbound on ramp at State Route 46 W
3. US 101 northbound mainline north of State Route 46 W
4. US 101 northbound off ramp at Spring Street
5. US 101 northbound off ramp at Paso Robles Street
6. US 101 northbound on ramp at Paso Robles Street
7. US 101 northbound mainline south of State Route 46 E
8. US 101 northbound off ramp at State Route 46 E
9. US 101 northbound on ramp at State Route 46 E
10. US 101 northbound mainline north of State Route 46 E
11. US 101 southbound mainline north of State Route 46 E
12. US 101 southbound off ramp at State Route 46 E
13. US 101 southbound on ramp at State Route 46 E
14. US 101 southbound off ramp at Riverside Avenue-17th Street
15. US 101 southbound mainline south of State Route 46 E
16. US 101 southbound on ramp at Riverside Avenue-17th Street
17. US 101 southbound off ramp at Riverside Avenue/Pine Street
18. US 101 southbound on ramp at Spring Street
19. US 101 southbound mainline north of State Route 46 W
20. US 101 southbound off ramp at State Route 46 W
21. US 101 southbound on ramp at State Route 46 W

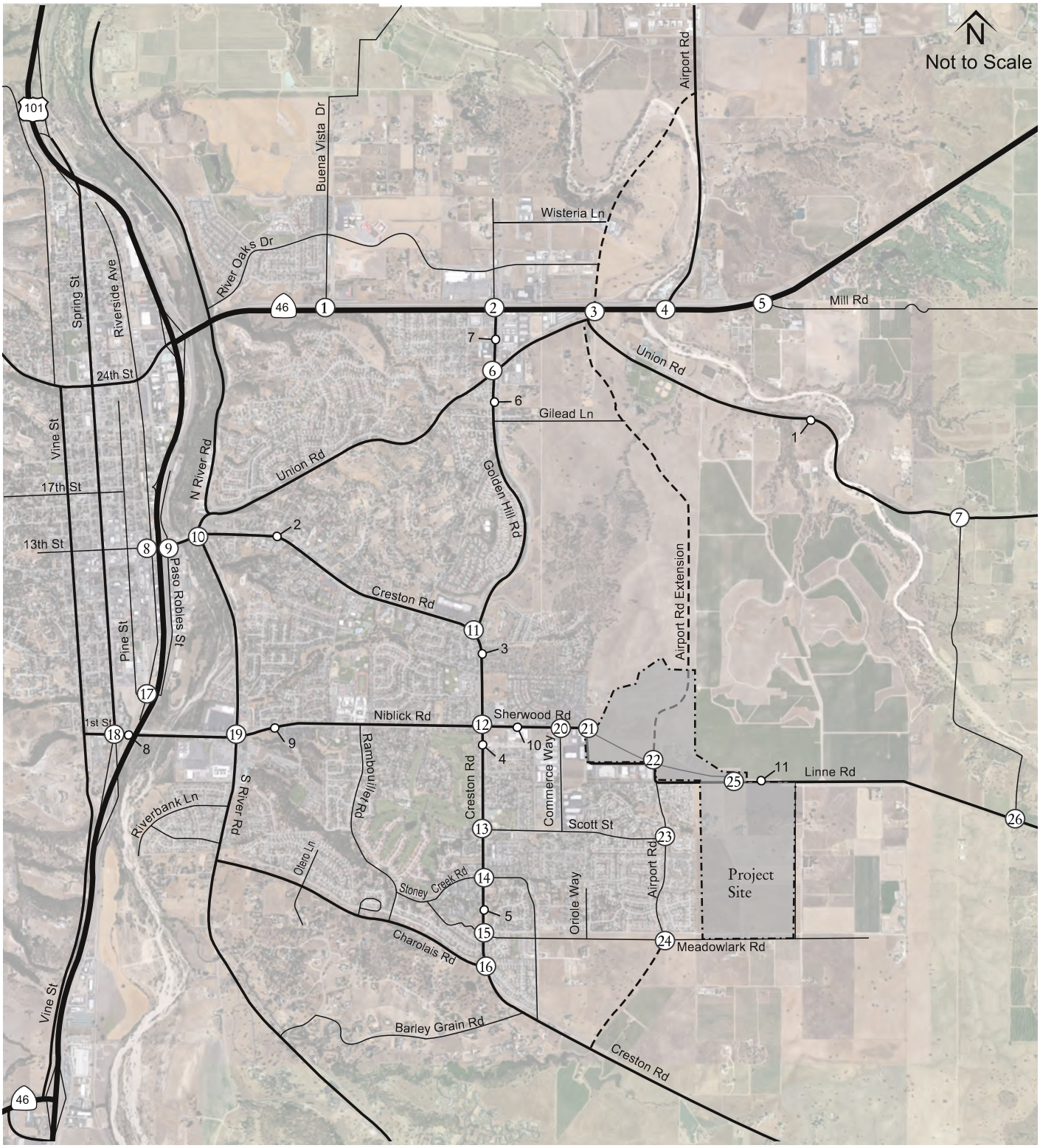
The study locations were evaluated under these scenarios:

1. **Existing Conditions** reflect recent traffic counts and the existing transportation network.
2. **Existing Plus Project** adds project generated traffic to existing volumes.
3. **Near Term Conditions** add approved and pending projects in the study area to Existing Conditions volumes.
4. **Near Term Plus Project** adds project traffic to Near Term volumes.
5. **Cumulative Conditions** represent future traffic conditions reflective of the buildout of land uses and the roadway network in the area, not including the proposed Project.
6. **Cumulative Plus Project** represents future traffic conditions reflective of the buildout of land uses and the roadway network in the area, including the proposed Project.

A description of the analysis approach follows **Figures 1, 2a,** and **2b**.

Figure 1: Project and Study Locations

Reso A - Exhibit C2 (EIR Technical Appendix)



Legend:

(x) - Study Intersection

--- - Cumulative Improvements

o— - Study Segment

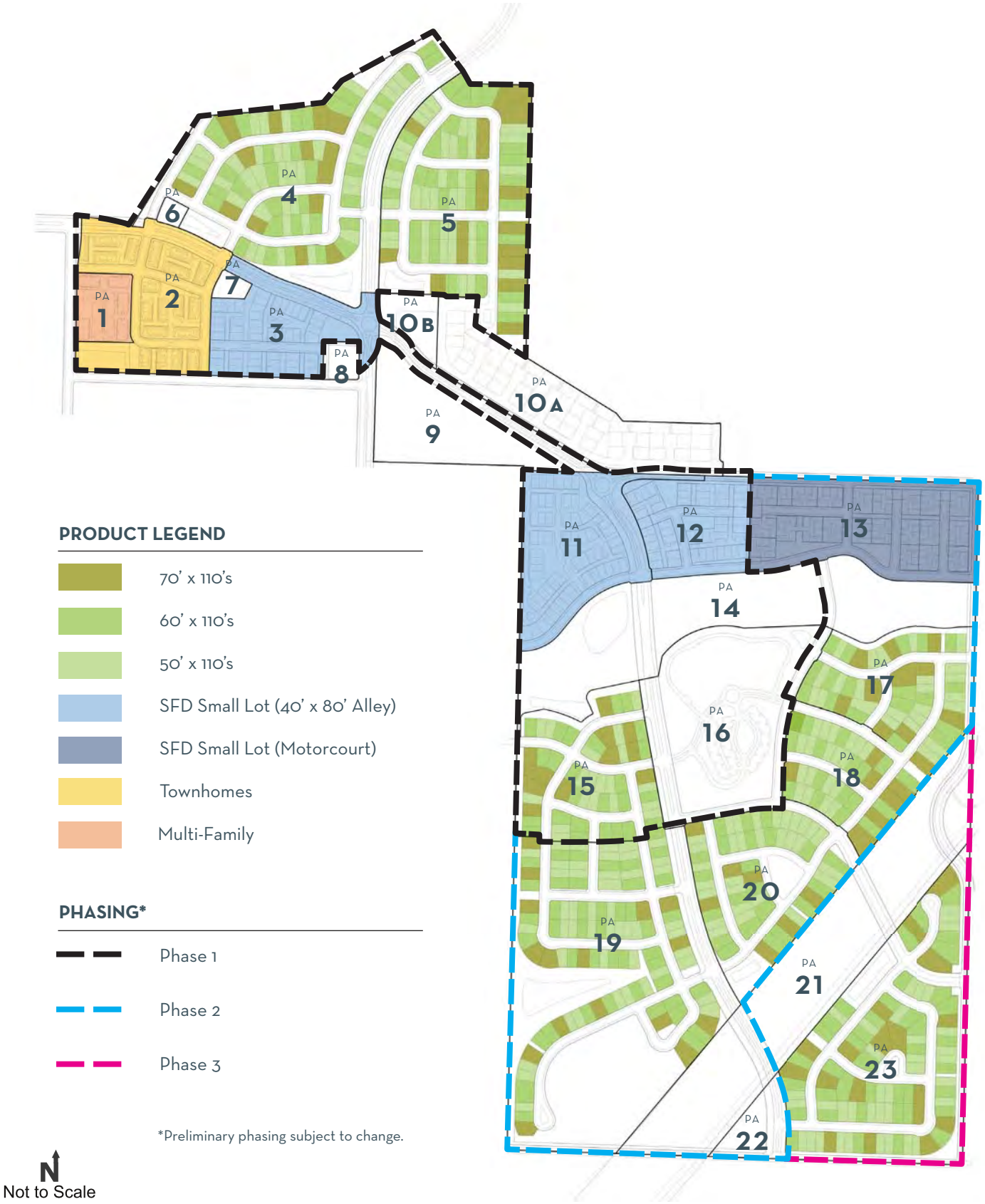
Central Coast Transportation Consulting
Traffic Engineering & Transportation Planning

Figure 2a: Project Site Land Use Plan
Reso A - Exhibit C2 (EIR Technical Appendix)

Source: Viñedo Paso Robles Specific Plan, April 2019

Central Coast Transportation Consulting
Traffic Engineering & Transportation Planning

Figure 2b: Project Site Phasing Plan
Reso A – Exhibit C2 (EIR Technical Appendix)



Source: Viñedo Paso Robles Specific Plan, April 2019

Central Coast Transportation Consulting
Traffic Engineering & Transportation Planning

ANALYSIS METHODS

The analysis approach was developed based on the City of Paso Robles' *Transportation Impact Analysis Guidelines*, County of San Luis Obispo standards, and Caltrans standards.

City of Paso Robles Facilities

The City's TIA Guidelines provide criteria for identifying mobility deficiencies reflecting the City's Circulation Element Goals. Vehicular queues that exceed existing or planned lengths of turn pockets are a deficiency criterion. However, while vehicular level of service (LOS) is a component of the evaluation criteria for stop-controlled intersections, it is not identified as a mobility deficiency criterion for signalized intersections.

The City's TIA Guidelines provide mobility deficiency criteria for a variety of study elements. **Table 1** summarizes these criteria, which are used to identify deficiencies.

Table 1: City of Paso Robles Mobility Deficiency Criteria

City of Paso Robles Mobility Deficiency Criteria[1]	
Study Element	**Deficiency Determination**
On-site Circulation and Parking	Project designs fail to meet City or industry standard guidelines, fail to provide adequate truck access, will result in unsafe conditions, or will create parking demand or supply above code requirements.
Pedestrian, Bicycle, Transit Facilities	Project fails to provide safe and accessible connections, conflicts with adopted plans, or adds trips to facility that doesn't meet current design standards.
Traffic Operations	Project causes vehicle queues that exceed turn pocket lengths, increases safety hazards, causes stop-controlled intersection to operate below LOS D and meet signal warrants, or causes vehicle demand greater than the roadway capacity.
1. Summary based on Table 5 of City's Transportation Impact Study Guidelines.	

The City's TIA Guidelines also specify the analysis time periods, noting that typically traffic operations should be studied during the peak one hour of traffic on weekday mornings (between 7-9 AM) and afternoons (between 4-6 PM).

County of San Luis Obispo Facilities

The County of San Luis Obispo has adopted the following Level of Service (LOS) standard for roadways and intersections:

- Rural areas (outside the Urban Reserve Line): LOS C is acceptable; LOS D is not.
- Urban areas (within the Urban Reserve Line): LOS D is acceptable; LOS E is not.

The segment of Union Road from Priska Drive to Kit Fox Lane lies outside of the City limits and the Urban Reserve Line and is subject to the LOS C standard.

Caltrans Facilities

Caltrans controls the intersections along State Route 46 and the freeway segments on US 101. Caltrans relies on LOS to determine deficiencies. Accordingly, Caltrans intersections have been evaluated using

LOS criteria as contained in the HCM 6. Vehicular level of service is based on control delay, which is the total of time spent decelerating when approaching an intersection, time spent stopped or moving in a queue at an intersection, and time spent accelerating after an intersection.

Caltrans strives to maintain operations at the LOS C/D threshold on state-operated facilities. If an existing State Highway facility is operating at LOS D, E, or F the existing measure of effectiveness should be maintained. Note that any improvements proposed within Caltrans right-of-way are subject to Caltrans review and approval via their project development process.

Queuing is not a measure of effectiveness at signalized and unsignalized intersections in the Caltrans Guide for the Preparation of Traffic Impact Studies; therefore, queuing impacts are not considered at Caltrans facilities in the following analysis.

Intersection Analysis

Table 2 presents the vehicular level of service thresholds for both City- and Caltrans-operated intersections based on the Highway Capacity Manual 6th Edition (HCM 6).

Table 2: Intersection Level of Service Thresholds

Intersection Level of Service Thresholds					
Signalized Intersections[1]		**Stop Sign Controlled Intersections[2]**		**Roundabout Intersections[3]**	
Control Delay (sec/vehicle)	**Level of Service**	**Control Delay (sec/vehicle)**	**Level of Service**	**Control Delay (sec/vehicle)**	**Level of Service**
≤ 10	A	≤ 10	A	≤ 10	A
> 10 - 20	B	> 10 - 15	B	> 10 - 15	B
> 20 - 35	C	> 15 - 25	C	> 15 - 25	C
> 35 - 55	D	> 25 - 35	D	> 25 - 35	D
> 55 - 80	E	> 35 - 50	E	> 35 - 50	E
> 80	F	> 50 or v/c > 1	F	> 50 or v/c > 1	F

1. Source: Exhibit 19-8 of the Highway Capacity Manual 6th Edition.
2. Source: Exhibits 20-2 and 21-8 of the Highway Capacity Manual 6th Edition.
3. Source: Exhibit 22-8 of the Highway Capacity Manual 6th Edition.

Unsignalized intersections have lower delay thresholds because users experience more uncertainty than at signals, where drivers typically expect higher levels of congestion and more predictable levels of delay.

The study intersections were analyzed with the Synchro 10 software package. The HCM 6 methodology was applied except where unique intersection configurations or signal phasing required the HCM 2000 methodology. The 95th percentile queues for key movements are reported, which reflect the queue length that will not be exceeded 95% of the time.

Segment Analysis

The roadway study segments were evaluated for capacity utilization and level of service based on average daily traffic (ADT) volumes.

Table 3 presents the vehicular level of service thresholds for basic freeway, merge/diverge, and weaving segments based on the HCM 6.

Table 3: Freeway Segment Level of Service Thresholds

Freeway Segment Level of Service Thresholds					
Basic Freeway[1]		**Merge/Diverge[4]**		**Freeway Weaving[5]**	
Density (pc/mi/ln)[2]	**Level of Service**	**Density (pc/mi/ln)**	**Level of Service**	**Density (pc/mi/ln)[2]**	**Level of Service**
≤ 11	A	≤ 10	A	≤ 10	A
>11 - 18	B	> 10 - 20	B	> 10 - 20	B
> 18 - 26	C	> 20 - 28	C	> 20 - 28	C
> 26 - 35	D	> 28 - 35	D	> 28 - 35	D
> 35 - 45	E	> 35	E	> 35 - 43	E
> 45 or (D > C)[3]	F	v/c > 1	F	> 43 or v/c > 1	F

1. Source: Exhibit 12-15 of the Highway Capacity Manual 6th Edition.
2. Demand in units of passenger car/mile/lane.
3. LOS F if demand exceeds capacity.
4. Source: Exhibit 14-3 of the Highway Capacity Manual 6th Edition.
5. Source: Exhibit 13-6 of the Highway Capacity Manual 6th Edition.

The basic freeway and merge/diverge study segments were analyzed using Highway Capacity Software (HCS 7) package, applying the HCM 6 methodology. The weaving segment was analyzed using the Leisch methodology, which required converting the truck volumes in vehicles per hour (vph) to passenger cars per hour (pcph) based on a passenger car equivalent (PCE) value of 2.

Existing Conditions

This section describes the existing transportation system and current operating conditions in the study area.

EXISTING ROADWAY NETWORK

US Highway 101 (US 101) is a major north-south interstate facility connecting California, Oregon, and Washington. In the study area, US 101 is a four-lane freeway with a full access interchange at State Route 46.

State Route 46 (SR 46) is an east-west highway connecting the Central Valley with the Central Coast. In the study area, SR 46 consists of four lanes with at-grade intersections at side streets.

Golden Hill Road is a north-south arterial with two travel lanes north of Union Road that expand into four travel lanes between Mesa Road and Dallons Drive.

Union Road is a northeast-southwest arterial with two travel lanes between SR 46 E and Creston Road. Union Road also splits into a second arterial in the northwest-southeast direction just before connecting to SR 46 E.

Airport Road is a discontinuous north-south arterial with two travel lanes which runs north of SR 46 E and between Linne Road and Meadowlark Road.

Buena Vista Drive is a north-south arterial with two travel lanes north of SR 46 E.

Mill Road is a primarily east-west local road with two travel lanes south of SR 46 E.

Riverside Avenue is a north-south collector with two travel lanes west of US 101.

Pine Street is a primarily north-south local road with two travel lanes. In the study area, Pine Street runs east-west under a railroad crossing (only wide enough for one vehicle) to the intersection of Riverside Avenue and the US 101 southbound off ramp.

Paso Robles Street is a north-south collector with two travel lanes and US 101 on and off ramps to the north and south, respectively.

Creston Road is an arterial that runs both east-west and north-south throughout the study area. The segment of Creston Road between Rolling Hills Road and Charolais Road has either three or four travel lanes, while the segment from River Road to Rolling Hills Road has two travel lanes.

13th Street is an east-west facility acting as a two-lane collector and as a two- and four-lane arterial west and east of Spring Street, respectively. 13th Street turns into Creston Road east of River Road.

Niblick Road is an east-west undivided arterial with four travel lanes between Spring Street and Creston Road. West of Spring Street, Niblick Road turns in 1st Street, and east of Creston Road, it turns into Sherwood Road.

1st Street is an east-west collector with two travel lanes between Vine Street and Spring Street.

Stoney Creek Road is an east-west collector with two travel lanes between Rambouillet Road and Creston Road.

Meadowlark Road is an east-west collector with two travel lanes. Meadowlark Road borders the Olsen-Chandler study area to the south.

Charolais Road is northwest-southeast arterial with two travel lanes between South River Road and Creston Road.

South River Road is a north-south facility acting as a two-lane collector and as a two- and four-lane arterial north and south of Niblick Road, respectively. South River Road turns into Union Road north of Creston Road before intersecting with North River Road.

Sherwood Road is an east-west undivided arterial with four travel lanes between Creston Road and Fontana Road. West of Creston Road, Sherwood Road turns into Niblick Road.

Commerce Way is a north-south collector road with two travel lanes and on-street parking on both sides between Sherwood Road and Scott Street.

Fontana Road is a north-south collector road with two travel lanes connecting Sherwood Road to the north and Linne Road to the south.

Scott Street is an east-west collector road with two travel lanes between Creston Road to Airport Road. From Creston Road to Commerce Way and from Commerce Way to Airport Road, Scott Street has a posted speed limit of 25 and 35 mph, respectively.

Linne Road is an east-west rural arterial road running from Fontana Road through the Olsen-Chandler study area and continuing beyond the City Limits.

EXISTING PEDESTRIAN AND BICYCLE FACILITIES

Pedestrian Facilities

Pedestrian facilities include sidewalks, crosswalks, multi-use paths, and pedestrian signals at signalized intersections. The existing pedestrian facilities in the project vicinity are described below:

- *Airport Road:* Continuous sidewalk on both sides of the road between Meadowlark Road and Linne Road. There is an uncontrolled crosswalk on the south leg of Running Stag Way and a stop control crosswalk on the south leg of Scott Street.
- *Beechwood Drive:* Continuous sidewalk on west side between Creston Road and Stoney Creek Road. Intermittent sidewalk on east side north of Meadowlark Road. A stop-controlled crosswalk is located on the north leg of Meadowlark Road.
- *Charolais Road:* A Class I bike path and continuous sidewalk is located on the north side of the roadway along the limits from Creston Road to River Road. Class I bikeway connects to the Salinas River Walk running parallel to the Salinas River and connecting to the Creston Road / 13th Street intersection. There are no marked crosswalks on the corridor.
- *Creston Road:* Intermittent sidewalk on both sides of roadway along the limits. Between Flag Way and Charolais Road there is continuous sidewalk on the west side and between Niblick Road/Sherwood Road and Stoney Creek Road there is a continuous sidewalk on the east side. Crosswalks are provided on all four legs of the Creston Road/Niblick Road/Sherwood Road and Creston Road/Cedarwood Drive signalized intersections. An uncontrolled crosswalk is located on the north leg of Meadowlark Road and the south leg of Myrtlewood Drive.
- *Meadowlark Road:* Continuous sidewalk on north side between Creston Road and easterly limits. South side sidewalk between Creston Road and Beechwood Drive. An uncontrolled crosswalk is located on the west leg of Falcon Drive and stop-controlled crosswalks on the west leg of Beechwood Drive and the east leg of Creston Road.

- *Niblick Road/Sherwood Road/1st Street:* Continuous sidewalk on north side between Vine Street and easterly limits. South side sidewalk intermittent. There are multiple uncontrolled and traffic signal-controlled crosswalks. Crosswalks are provided on all four legs of the Creston Road/Niblick Road/Sherwood Road signalized intersection.
- *River Road:* Continuous sidewalk on west side from north of Navajo Avenue to Charolais Road. East side sidewalk intermittent. Crosswalks are provided on all four legs of the River Road/Niblick Road intersection. A stop-controlled crosswalk is located on the north leg of Charolais Road.

Bicycle Facilities

Bicycle facilities in the study area consist of Class I, II, and III bikeways. Class I shared-use paths or bike paths are facilities with a separate right of way with crossflows by vehicles minimized. A Class II bike lane provides a striped lane for one-way bicycle travel on the side of the street adjacent to vehicle traffic. Class III bike routes consist of a roadway that is shared between bicycle and vehicle traffic with supplemental bike signage.

The City's Bicycle and Pedestrian Plan was most recently adopted on December 18, 2018. The existing and proposed bikeways in the project vicinity are described below:

- Airport Road: Existing Class II bikeways between Meadowlark Road and Linne Road. A future Class I bikeway is proposed adjacent and parallel to Airport Road connecting Creston Road and Union Road
- Beechwood Drive: Class I and II bikeways are proposed between Meadowlark Road and Creston Road.
- Charolais Road: Existing Class I bike path on the north side of the roadway along the limits from Creston Road to River Road. West of River Road the Class I bikeway connects to the Salinas River Walk running parallel to the Salinas River and connecting to the Creston Road / 13th Street intersection. The future Class I Salinas River Trail would eventually connect the River Walk to San Miguel and Santa Margarita.
- Creston Road: Existing Class II bike lanes north of Lana Street/Oak Meadow Lane and on north side of road between Beechwood Drive and Meadowlark Road. Class II bike lanes are proposed within the city limits.
- Meadowlark Road: No existing bikeways. Class II bike lanes are proposed west of Beechwood Drive. Class I and II bikeways are proposed east of Beechwood Drive.
- Niblick Road/Sherwood Road/1st Street: Existing Class II bike lanes from Vine Street to the easterly limits.
- River Road: Existing Class II bike lanes from Niblick Road to Charolais Road.

EXISTING TRANSIT SERVICE

The Paso Express provides fixed route and dial-a-ride transit service throughout the City of Paso Robles. All Paso Express trips begin and end at the North County Transportation Center, located at Pine Street/8th Street. The fixed route service operates Routes A and B, which run clockwise and counterclockwise, respectively. The nearest stops to the Olsen-Chandler study area are located on Sherwood Road at Quail Run, Fontana Road at Linne Road, Airport Road near Parkview Lane, and Airport Road at Scott Street, with hourly service from 6:45 AM to 7:05 PM on weekdays and 7:45 AM

to 6:05 PM on Saturdays. The dial-a-ride service provides curb-to-curb service on weekdays from 7:00 AM to 1:00 PM.

The San Luis Obispo Regional Transit Authority (RTA) provides regional fixed-route service to San Luis Obispo County. Route 9 serves the North County region, providing regional access between San Luis Obispo, Santa Margarita, Atascadero, Templeton, and Paso Robles, including a stop at the North County Transportation Center.

EXISTING TRAFFIC CONDITIONS

Peak hour intersection turning movement counts, peak hour freeway and ramp counts, and segment ADT counts were collected between May 2018 and January 2019 during clear weather and when local schools were in session. Field observations were conducted to observe traffic operating conditions and signal timings. The traffic count sheets are included in **Appendix A**.

The bicycle counts collected at the 13th Street/Riverside Avenue intersection (#8) were taken on the same day as the AIDS/LifeCycle event, resulting in uncharacteristically high AM southbound through volumes. The PM bicycle counts, as well as the AM bicycle counts on the unaffected approaches, show that typical bicycle demand at the intersection is not large enough to have a significant effect on the analysis results.

Hourly data from the Caltrans count station on US 101 north of Main Street shows that on midweek school days during the 2017-2018 school year, the peak hours in both directions most frequently occurred between 7:00 – 9:00 AM and 4:00 – 6:00 PM. On the counted day (Wednesday, June 6, 2018), the peak hours in both directions also occurred during these times and the peak hour volumes were all within two percent of the average. Hourly data from the Caltrans count station on SR 46 E west of McMillan Canyon Road shows that on mid-weekdays from July through September 2018, the PM peak hour in both directions most frequently occurred between 4:00 – 6:00 PM and had substantially larger volumes on average than the AM peak hour. This data indicates that 7:00 – 9:00 AM and 4:00 – 6:00 PM intersection counts are sufficient.

Figure 3 shows the existing weekday peak hour traffic volumes at the study intersections and the existing ADT on the study segments. **Figure 4** shows the existing lane configurations.

1. Intersection Operations

Table 4 presents the existing LOS for the study intersections, with detailed calculation sheets in **Appendix B** and warrant analysis sheets in **Appendix D**.

Table 4: Existing Intersection Auto Levels of Service

Existing Intersection Auto Levels of Service			
Intersection	Peak Hour	Delay[1] (sec/veh)	LOS
1. SR 46E/Buena Vista Dr	AM	16.7	B
	PM	12.0	B
2. SR 46E/Golden Hill Rd	AM	24.5	C
	PM	26.2	C
3. SR 46E/Union Rd	AM	4.2 (23.5)	- (C)
	PM	**5.6 (31.3)**	**- (D)**
4. SR 46E/Airport Rd	AM	5.7 (20.8)	- (C)
	PM	4.7 (23.3)	- (C)
5. SR 46E/Mill Rd	AM	0.1 (16.3)	- (C)
	PM	0.2 (19.3)	- (C)
6. Golden Hill Rd/Union Rd	AM	**51.3**	**F**
	PM	**50.5**	**F**
7. Penman Springs Rd/Union Rd	AM	1.8 (9.4)	- (A)
	PM	0.9 (9.6)	- (A)
8. 13th St/Riverside Ave	AM	30.0	C
	PM	37.6	D
9. 13th St/Paso Robles St	AM	15.5	B
	PM	18.0	B
10. River Rd/Creston Rd	AM	23.1	C
	PM	19.3	B
11. Creston Rd/Golden Hill Rd	AM	19.6	B
	PM	17.1	B
12. Creston Rd/Niblick Rd	AM	25.9	C
	PM	24.0	C
13. Creston Rd/Scott St	AM	2.2 (22.6)	- (C)
	PM	2.5 (22.9)	- (C)
14. Creston Rd/Stoney Creek Rd	AM	8.1 (40.8)	- (E)
	PM	3.7 (19.9)	- (C)
15. Creston Rd/Meadowlark Rd	AM	12.7	B
	PM	9.8	A
16. Creston Rd/Charolais Rd	AM	4.7 (12.8)	- (B)
	PM	5.4 (11.6)	- (B)
17. Riverside Ave/Pine St/US 101 SB Ramp	AM	3.7 (12.3)	- (B)
	PM	5.2 (12.9)	- (B)
18. 1st St-Niblick Rd/Spring St	AM	29.3	C
	PM	34.5	C
19. Niblick Rd/South River Rd	AM	33.8	C
	PM	24.6	C
20. Sherwood Rd/Commerce Way	AM	6.8	A
	PM	7.3	A
21. Sherwood Rd/Fontana Rd	AM	Future intersection	
	PM		
22. Airport Rd/Sherwood Rd	AM	Future intersection	
	PM		
23. Airport Rd/Scott St	AM	7.7	A
	PM	7.7	A
24. Airport Rd/Meadowlark Rd	AM	7.4 (8.8)	- (A)
	PM	6.8 (8.5)	- (A)
25. Sherwood Rd/Linne Rd	AM	Future intersection	
	PM		
26. Penman Springs Rd/Linne Rd	AM	0.9 (8.9)	- (A)
	PM	1.1 (8.9)	- (A)

1. HCM 6th average control delay in seconds per vehicle (HCM 2000 used for Intersections 1, 11 and 17). For side-street-stop controlled intersections the worst approach's delay is reported in parentheses next to the overall intersection delay.
Note: Unacceptable operations (LOS deficiency and/or signal warrants met) shown in **bold** text.

The following Caltrans intersection operates below the LOS C threshold:

- State Route 46 E/Union Road (#3): the northbound approach operates at LOS D during the PM peak hour due to long delays resulting from side street stop control and the high volumes along SR 46 E.

The following stop-controlled City intersections operate below LOS D:

- Golden Hill Road/Union Road (#6): operates at LOS F during the AM and PM peak hours and meets signal warrants due to high volumes from all approaches of the intersection. A single-lane roundabout is being designed for this intersection.
- Creston Road/Stoney Creek Road (#14): operates at LOS E during the AM peak hour but does not meet signal warrants. Therefore, the intersection operates acceptably per the City's TIA Guidelines.

2. Queues

Table 5 summarizes the existing vehicular queuing for key movements.

Table 5: Existing Queues

Existing Queues				
Intersection	Movement	Storage Length (ft)	Peak Hour	95th Percentile Queues (ft)[1]
1. SR 46E/Buena Vista Dr	EBL[2]	345	AM	248
			PM	197
2. SR 46E/Golden Hill Rd	NBL	160	AM	142
			PM	125
	SBL	140	AM	63
			PM	108
	EBL[2]	225	AM	127
			PM	108
	WBL[2]	125	AM	29
			PM	39
3. SR 46E/Union Rd	WBL[2]	195	AM	55
			PM	60
4. SR 46E/Airport Rd	EBL[2]	580	AM	135
			PM	35
5. SR 46E/Mill Rd	WBL[2]	305	AM	0
			PM	0
6. Golden Hill Rd/Union Rd	NBR	190	AM	103
			PM	153
	WBL	250	AM	235
			PM	203
8. 13th St/Riverside Ave	WBL	125	AM	**332**
			PM	**266**
	WBT	295	AM	268
			PM	**342**
9. 13th St/Paso Robles St	NBL	130	AM	**200**
			PM	**221**
	NBR	110	AM	42
			PM	**268**
	EBL	120	AM	85
			PM	107
	EBT	295	AM	227
			PM	**381**
10. River Rd/Creston Rd	NBL	140	AM	**182**
			PM	134
11. Creston Rd/Golden Hill Rd	EBL	125	AM	103
			PM	86
12. Creston Rd/Niblick Rd	NBL	230	AM	#214
			PM	152
	SBL	245	AM	156
			PM	141
	EBL	150	AM	124
			PM	**#196**
	WBL	170	AM	43
			PM	90
13. Creston Rd/Scott St	SBL	60	AM	5
			PM	8
18. 1st St-Niblick Rd/Spring St	NBL	165	AM	122
			PM	148
	NBR	290	AM	48
			PM	213
	SBL	305	AM	187
			PM	291
19. Niblick Rd/South River Rd	NBL	150	AM	**264**
			PM	**177**
	SBL	110	AM	**#315**
			PM	**172**
	EBL	140	AM	73
			PM	139
	WBL	80	AM	**126**
			PM	**132**
20. Sherwood Rd/Commerce Way	WBL	75	AM	7
			PM	15
24. Airport Rd/Meadowlark Rd	SBL	50	AM	0
			PM	0

1. Queue length that would not be exceeded 95 percent of the time.
2. Deceleration length of 530 feet has been subtracted from the storage length per the Highway Design Manual for 60 mph
# indicates that 95th percentile volume exceeds capacity, queue may be longer.
Bold indicates queue length longer than storage length.

The following queue deficiencies at City intersections are noted:

- 13th Street/Riverside Avenue (#8): The westbound left turn queue length exceeds storage length during the AM and PM peak hours, while the westbound through queue length exceeds storage length during the PM peak hour.
- 13th Street/Paso Robles Street (#9): Queues exceed storage length during at least one peak hour on the northbound left, northbound right, and eastbound through turning movements.
- River Road/Creston Road (#10): The northbound left turn queue length exceeds storage length during the AM peak hour.
- Creston Road/Niblick Road (#12): The eastbound left turn queue length exceeds storage length during the PM peak hour.
- Niblick Road/South River Road (#19): Queues exceed storage length during the AM and PM peak hours on the northbound left, southbound left, and westbound left turning movements.

3. Roadway Segment Operations

Table 6 shows the existing capacity utilization and LOS for the study segments.

Table 6: Existing Roadway Segment Operations

Existing Roadway Segment Operations							
Street	**ID**	**Segment**	**Facility Type**	**Lanes**	**ADT**	**LOS**	**Capacity Utilization**
Union Road	1	Priska Drive to Kit Fox Lane	Arterial	2	1,570	C	9%
Creston Road	2	East of Ferro Lane	Arterial	2*	16,049	D	74%
	3	East of Golden Hill Road	Arterial	4	13,675	A	37%
	4	South of Niblick Road	Arterial	4	14,856	A	40%
	5	North of Meadowlark Road	Arterial	4	6,008	A	16%
Golden Hill Road	6	South of Union Road	Arterial	3	12,676	C	58%
	7	North of Union Road	Arterial	3	9,805	C	45%
Niblick Road	8	East of Spring Street	Arterial	4	29,676	D	79%
	9	East of Quarterhorse	Arterial	4	20,115	A	54%
Sherwood Road	10	East of Creston Road	Arterial	4	9,659	A	26%
Linne Road	11	Poppy Lane to Hanson Road	Arterial	2	1,311	C	7%

* Note that an asterisk (*) indicates the prescence of a raised median or two-way left-turn lane on a two-lane arterial.
Source: City of Paso Robles General Plan Circulation Element, 2011; CCTC, 2019.

All City segments report a capacity utilization below 90% and the County segment on Union Road (#1) operates at LOS C.

4. Freeway Segment Operations

Table 7 shows the existing peak hour volumes at the freeway mainline and ramp locations and **Table 8** shows the existing LOS, with calculation sheets in **Appendix C**. The ramp peak hour factors (PHF) were calculated based on the individual on and off ramp peak hour volumes. The PHFs and truck percentages for the Riverside Avenue/Pine Street, Spring Street, and SR 46 W ramps were calculated using turning movement count data. The PHFs and truck percentages from the US 101 mainline count taken at the Niblick Road Bridge (per direction) were used as the baseline for all mainline segments, with modified PHFs and truck percentages north of SR 46 E based on ramp data. The Leisch method was employed to calculate the LOS for the US 101 southbound weaving segment (SR 46 E on ramp to Riverside/17th Street off ramp). For a worst-case analysis, no volume was assigned to the weave segment's ramp-to-ramp movement.

Table 7: US 101 Existing Peak Hour Volumes

US 101 Existing Peak Hour Volumes			
Direction	**Segment ID**	**Location**	**Existing**
US 101 NB	1	SR 46W Off Ramp	146 (114)
	2	SR 46W On Ramp	427 (755)
	3	Mainline North of SR 46W	2221 (3281)
	4	Spring St. Off Ramp	756 (1337)
	5	Paso Robles St. Off Ramp	323 (561)
	6	Paso Robles St. On Ramp	394 (326)
	7	Mainline South of SR 46E	1536 (1709)
	8	SR 46E Off Ramp	890 (947)
	9	SR 46E On Ramp	260 (249)
	10	Mainline North of SR 46E	906 (1011)
US 101 SB	11	Mainline North of SR 46E	850 (1361)
	12	SR 46E Off Ramp	248 (327)
	13	SR 46E to Riverside/17th St. Weave On	892 (992)
	14	SR 46E to Riverside/17th St. Weave Off	218 (303)
	15	Mainline South of SR 46E	1276 (1723)
	16	Riverside/17th St. On Ramp	298 (205)
	17	Riverside/Pine St. Off Ramp	93 (126)
	18	Spring St. On Ramp	1190 (894)
	19	Mainline North of SR 46W	3020 (3046)
	20	SR 46W Off Ramp	510 (523)
	21	SR 46W On Ramp	92 (146)
AM (PM) Peak Hour Volumes			

Table 8: Existing Freeway Operations

Existing Freeway Operations						
Direction	Location	Segment ID	Segment Type	Peak Hour	Density[1]	LOS
US 101 NB	SR 46W Off Ramp	1	Diverge	AM	22.2	C
				PM	26.2	C
	SR 46W On Ramp	2	Merge	AM	23.8	C
				PM	**30.4**	**D**
	North of SR 46W	3	Mainline	AM	19.9	C
				PM	**28.0**	**D**
	Spring St Off Ramp	4	Diverge	AM	27.1	C
				PM	**33.6**	**D**
	Paso Robles St Off Ramp	5	Diverge	AM	16.9	B
				PM	19.6	B
	Paso Robles St On Ramp	6	Merge	AM	17.7	B
				PM	17.0	B
	South of SR 46E	7	Mainline	AM	13.6	B
				PM	13.4	B
	SR 46E Off Ramp	8	Diverge	AM	18.1	B
				PM	17.8	B
	SR 46E On Ramp	9	Merge	AM	13.5	B
				PM	13.1	B
	North of SR 46E	10	Mainline	AM	10.1	A
				PM	9.7	A
US 101 SB	North of SR 46E	11	Mainline	AM	8.1	A
				PM	13.4	B
	SR 46E Off Ramp	12	Diverge	AM	12.2	B
				PM	18.3	B
	SR 46E to Riverside/17th St[2]	13-14	Weave	AM	-	A
				PM	-	B
	South of SR 46E	15	Mainline	AM	11.1	B
				PM	14.8	B
	Riverside/17th St On Ramp	16	Merge	AM	17.6	B
				PM	20.9	C
	Riverside/Pine St Off Ramp	17	Diverge	AM	18.3	B
				PM	21.7	C
	Spring St On Ramp	18	Merge	AM	23.6	C
				PM	23.9	C
	North of SR 46W	19	Mainline	AM	**28.5**	**D**
				PM	**28.6**	**D**
	SR 46W Off Ramp	20	Diverge	AM	**32.5**	**D**
				PM	**32.6**	**D**
	SR 46W On Ramp	21	Merge	AM	27.1	C
				PM	27.6	C

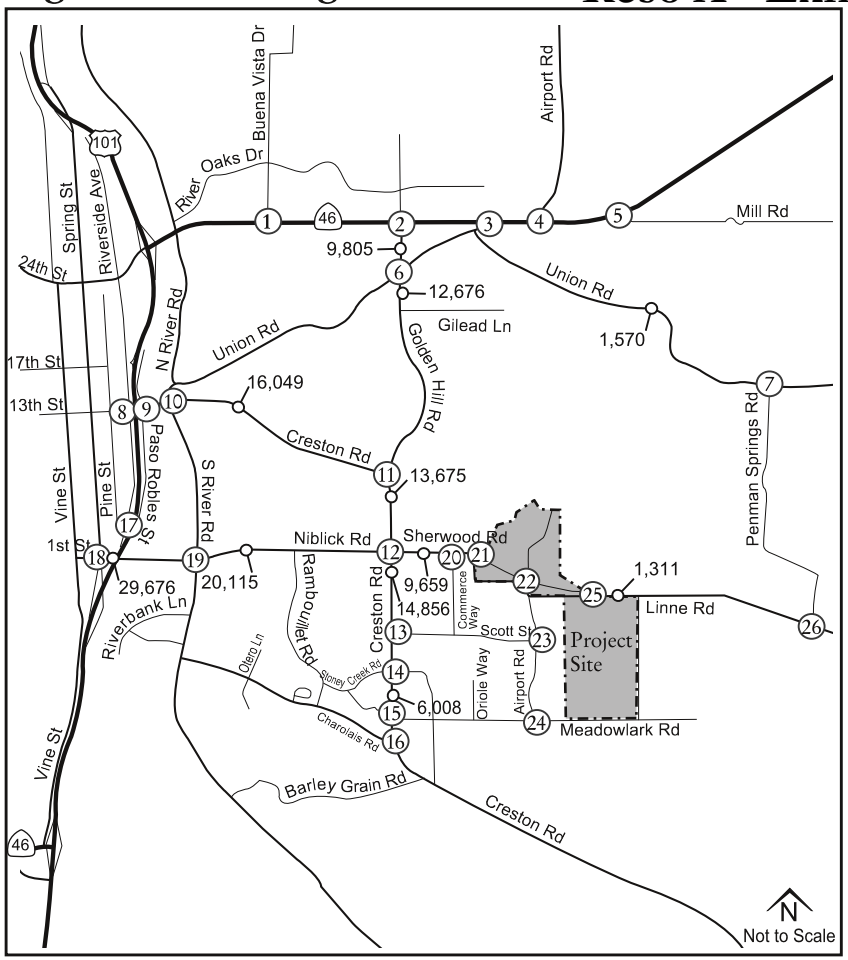
1. HCM 6 density (passenger cars per mile per lane).
2. The Leisch method used for weave section analysis does not report density.

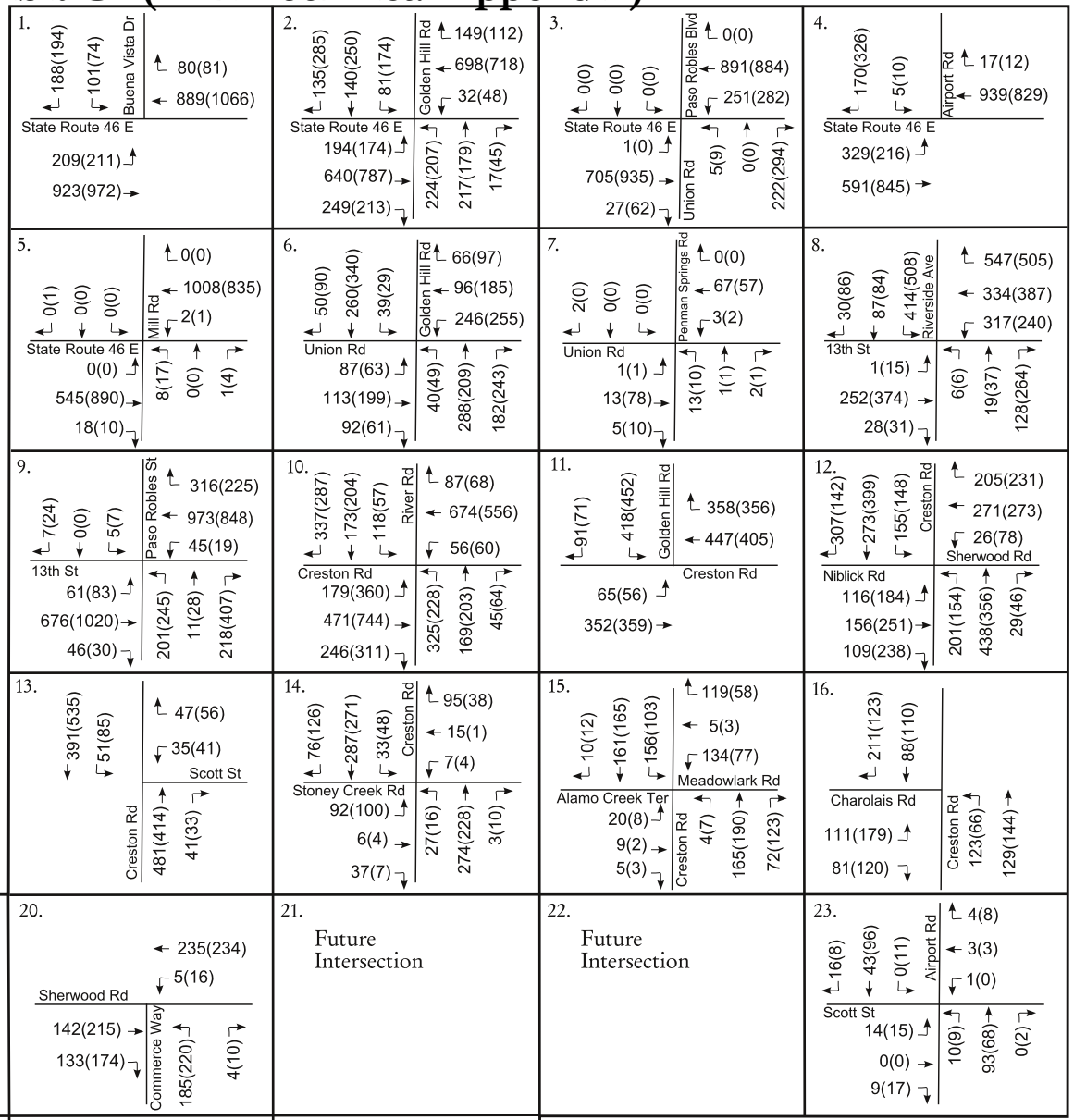
Note: Unacceptable operations shown in **bold** text.

The following freeway segments operate below the LOS C threshold:

1. SR 46 W northbound on ramp merge segment operates at LOS D during the PM peak hour.
2. US 101 mainline north of SR 46 W operates at LOS D northbound during the PM peak hour and southbound during the AM and PM peak hours.
3. Spring Street northbound off ramp diverge segment operates at LOS D during the PM peak hour.
4. SR 46 W southbound off ramp diverge segment operates at LOS D during the AM and PM peak hours.

Figure 3: Existing Traffic Volumes





Legend:

o– - Average Daily Traffic Volumes

(x) - Study Intersection

xx(yy) - AM(PM) Peak Hour Traffic Volumes

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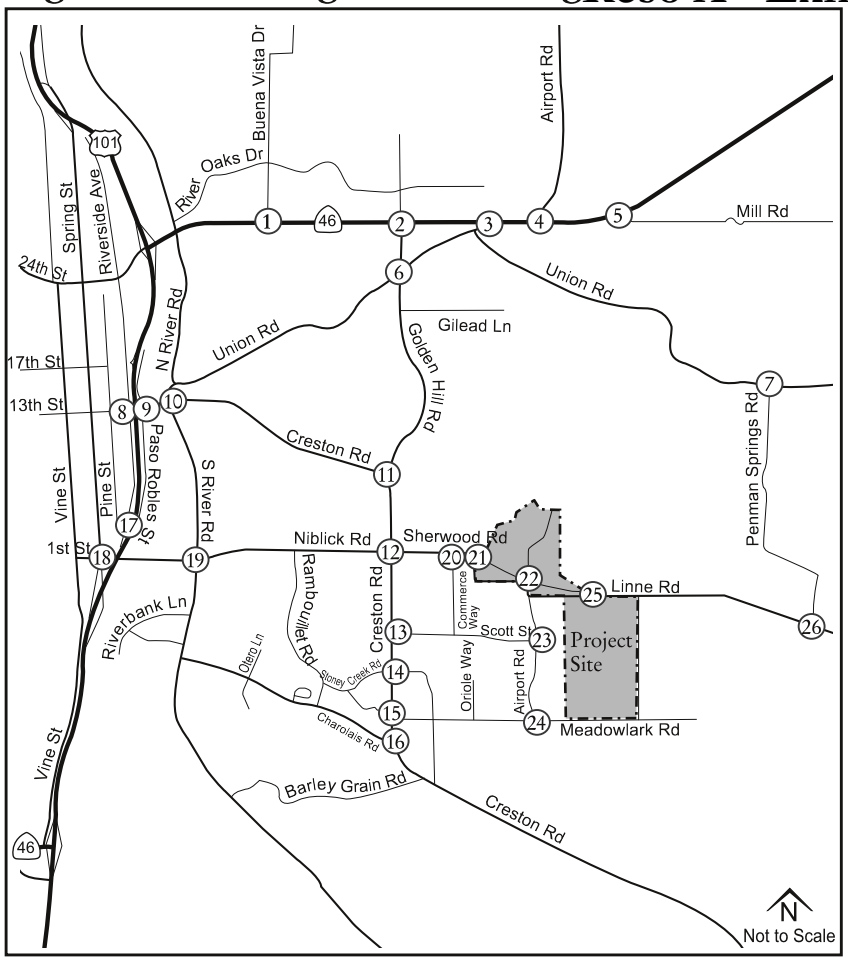
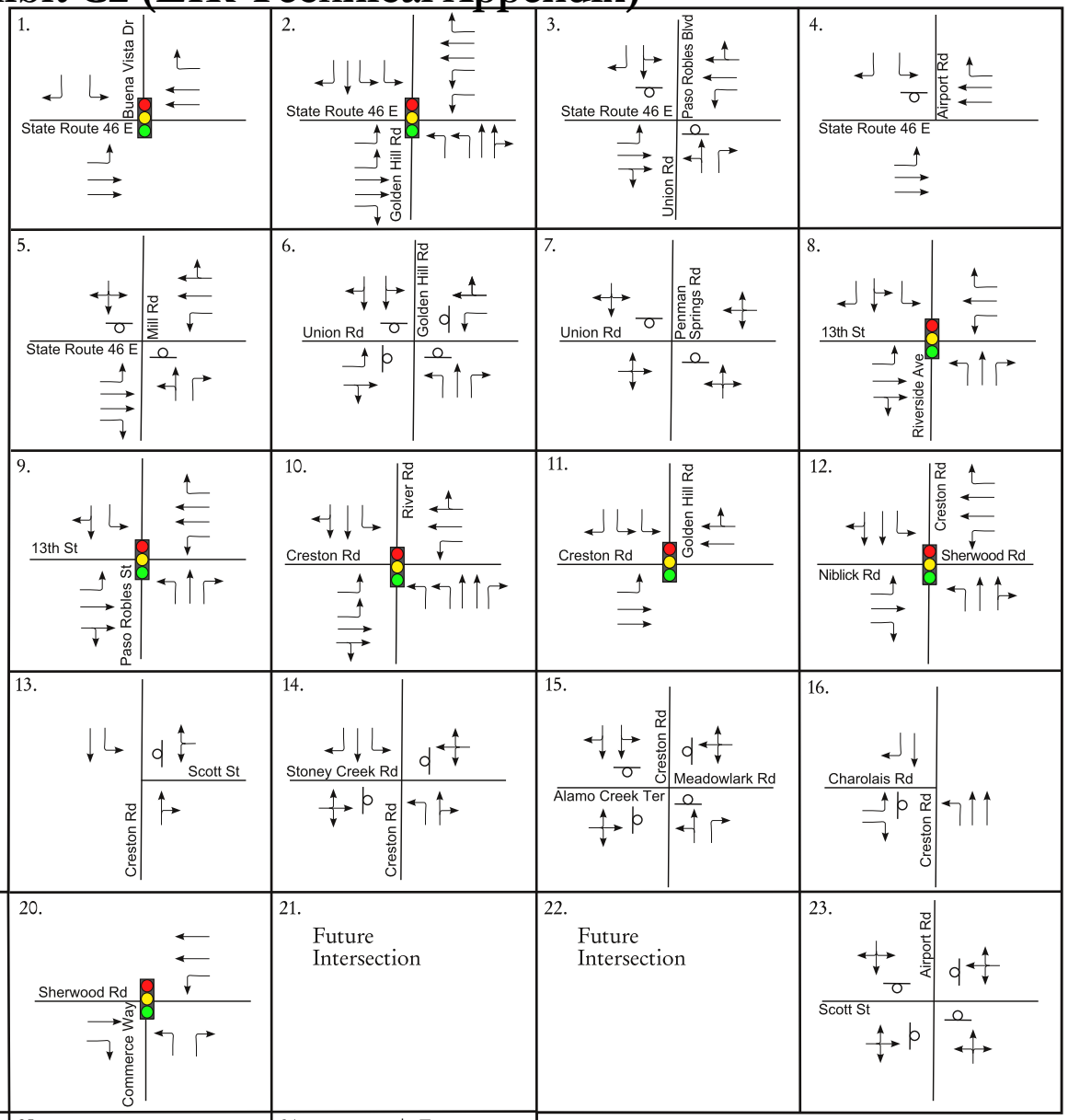
Figure 4: Existing Lane Configurations - Exhibit C2 (EIR Technical Appendix)





Legend:

- Traffic Signal
- Stop Sign
- (x) - Study Intersection

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Reso A - Exhibit C2 (EIR Technical Appendix)

Existing Plus Project Conditions

This section evaluates the impacts of the proposed project on the surrounding transportation network, including traffic operations, bicycle, pedestrian, transit, and site access deficiencies. Existing Plus Project conditions reflect existing traffic levels plus the estimated traffic generated by the proposed project.

PROJECT TRAFFIC ESTIMATES

The amount of project traffic affecting the study intersections is estimated in three steps: trip generation, trip distribution, and trip assignment. Trip generation refers to the total number of new trips generated by the site. Trip distribution identifies the general origins and destinations of these trips, and trip assignment identifies the specific routes taken to reach these origins and destinations.

Trip Generation

The project's proposed 10,659 square feet of commercial building area is comprised of neighborhood commercial (9,800 square feet) and a farm stand (859 square feet). The proposed 18,752 square feet of recreational facilities is comprised of a clubhouse and fitness center (15,332 square feet) and a spa (3,420 square feet). Additional resident-serving facilities on the project site were assumed to typically have a negligible independent trip generation during the weekday AM and PM peak hours.

The Institute of Transportation Engineers (ITE) *Trip Generation Manual* 10th Edition was used to estimate project trip generation. Internal trips were not subtracted from the total trips due to the need to analyze on-site intersections. Pass-by and diverted link trips were not applied due to low existing volumes on adjacent roads. **Table 9** summarizes the estimated trip generation for the two project sizes.

Table 9: Olsen-Chandler Specific Plan Weekday Vehicle Trip Generation

Olsen-Chandler Specific Plan Weekday Vehicle Trip Generation									
				AM			PM		
Land Use	Size	Unit[1]	Daily	In	Out	Total	In	Out	Total
1,293-Unit Project									
Single-Family Residential Housing[2]	1,065	DU	9,164	190	571	761	620	364	984
Multifamily Housing (Low-Rise)[3]	228	DU	1,683	24	80	104	77	46	123
Shopping Center[4]	10,659	s.f.	402	6	4	10	20	21	41
Health/Fitness Club[5]	18,752	s.f.	650	13	12	25	37	28	65
		Total Trips	**11,899**	**233**	**667**	**900**	**754**	**459**	**1,213**
1,293-Unit + School Project									
Single-Family Residential Housing[2]	1,065	DU	9,164	190	571	761	620	364	984
Multifamily Housing (Low-Rise)[3]	228	DU	1,683	24	80	104	77	46	123
Shopping Center[4]	10,659	s.f.	402	6	4	10	20	21	41
Health/Fitness Club[5]	18,752	s.f.	650	13	12	25	37	28	65
Elementary School[6]	495	Students	936	179	153	332	40	44	84
		Total Trips	**12,835**	**412**	**820**	**1,232**	**794**	**503**	**1,297**

1) DU = Dwelling Unit; s.f. = Square Foot of Gross Leasable Area
2) ITE Land Use Code #210, Single-Family Detached Housing. Fitted curve equation used.
3) ITE Land Use Code #220, Multifamily Housing (Low-Rise). Fitted curve equation used.
4) ITE Land Use Code #820, Shopping Center. Average rates used.
5) ITE Land Use Code #492, Health/Fitness Club. AM and PM Average rates used. Daily assumed to be ten times the PM.
6) ITE Land Use Code #520, Elementary School. Average rates used.
Source: ITE *Trip Generation Manual*, 10th Edition, 2017; CCTC, 2019.

The 1,293-Unit Project would generate 11,899 total trips per weekday, including 900 AM peak hour trips and 1,213 PM peak hour trips. The 1,293-Unit Project and School would generate 12,835 total trips per weekday, including 1,232 AM peak hour trips and 1,297 PM peak hour trips.

The proposed elementary school will likely serve nearby residents, and if built would shift area travel patterns but would not generate additional Citywide demand since that demand occurs with the development of homes. Therefore, adding these trips as net new trips presents a conservative approach in order to capture potential local circulation issues near the school.

Trip Distribution and Assignment

Project trip distribution was derived using a select zone procedure of the 2017 version of the City's Travel Demand Model (TDM, in TransCAD 7 software). The model includes the Caltrans intersections and segments. **Figure 5** displays the trip distribution for the project under Existing and Cumulative conditions. The Existing conditions distribution will also be used for Near Term conditions. **Figures 6a and 6b** display the trip assignment for the project under Existing and Near Term conditions.

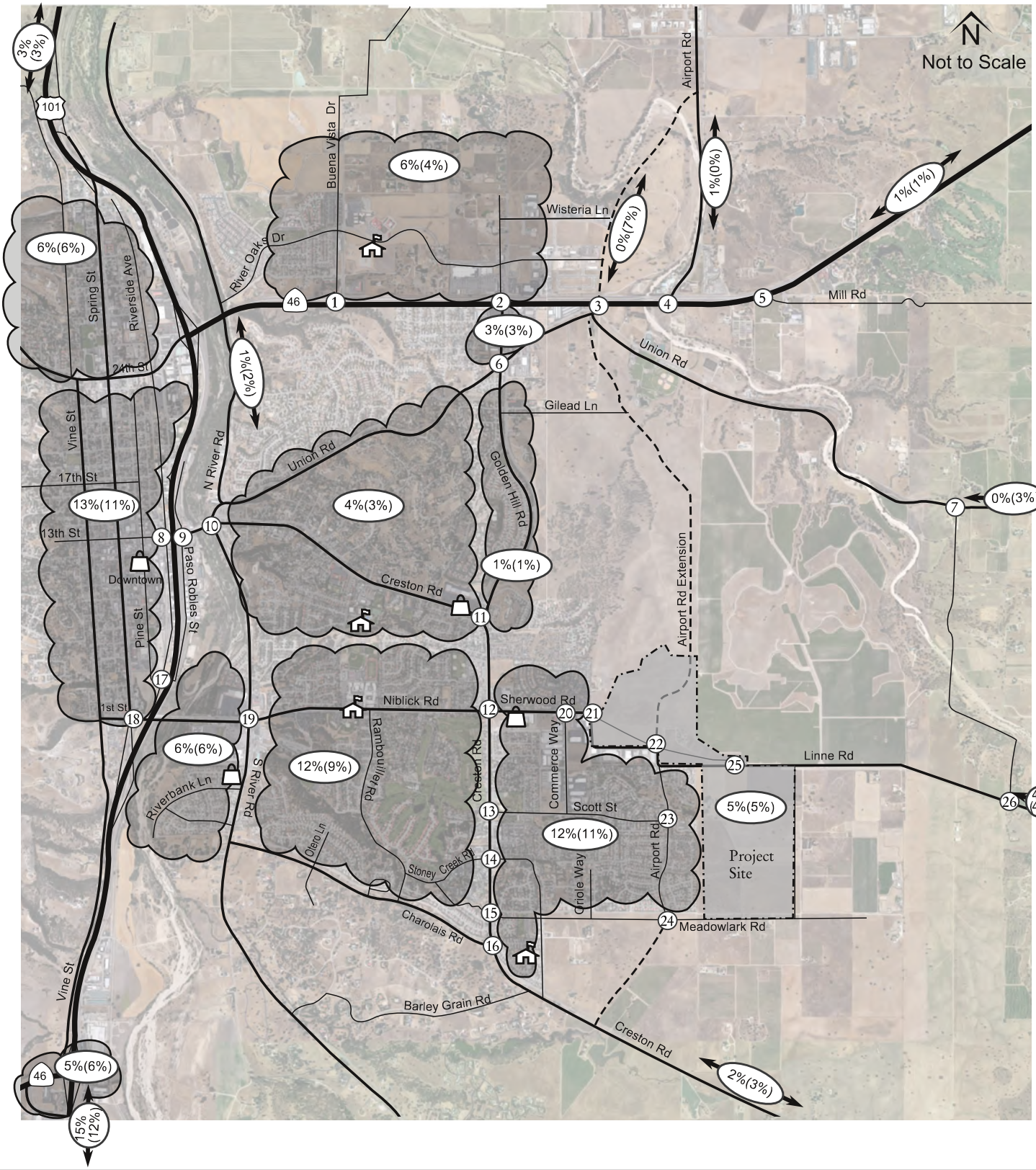
Planned Improvements

It was assumed that the following on-site study intersections would be constructed with either project size:

- Sherwood Road/Fontana Road (#21): Two-way stop control on Fontana Road approaches with 100' NBR turn pocket; two-way left turn lane on Sherwood Road with two westbound through lanes and one eastbound through lane.
- Airport Road/Sherwood Road (#22): Single lane roundabout.
- Sherwood Road/Linne Road (#25): Single lane roundabout.

Additional project improvements are discussed in detail in the Site Access and On-Site Circulation section of this report.

Figure 5: Project Trip Distribution
Reso A - Exhibit C2 (EIR Technical Appendix)



Legend:

- (x) - Study Intersection
- --- - Cumulative Improvements
- x%(y%) - Existing/Near Term % (Cumulative %) Project Trip Distribution
- School
- Retail Center

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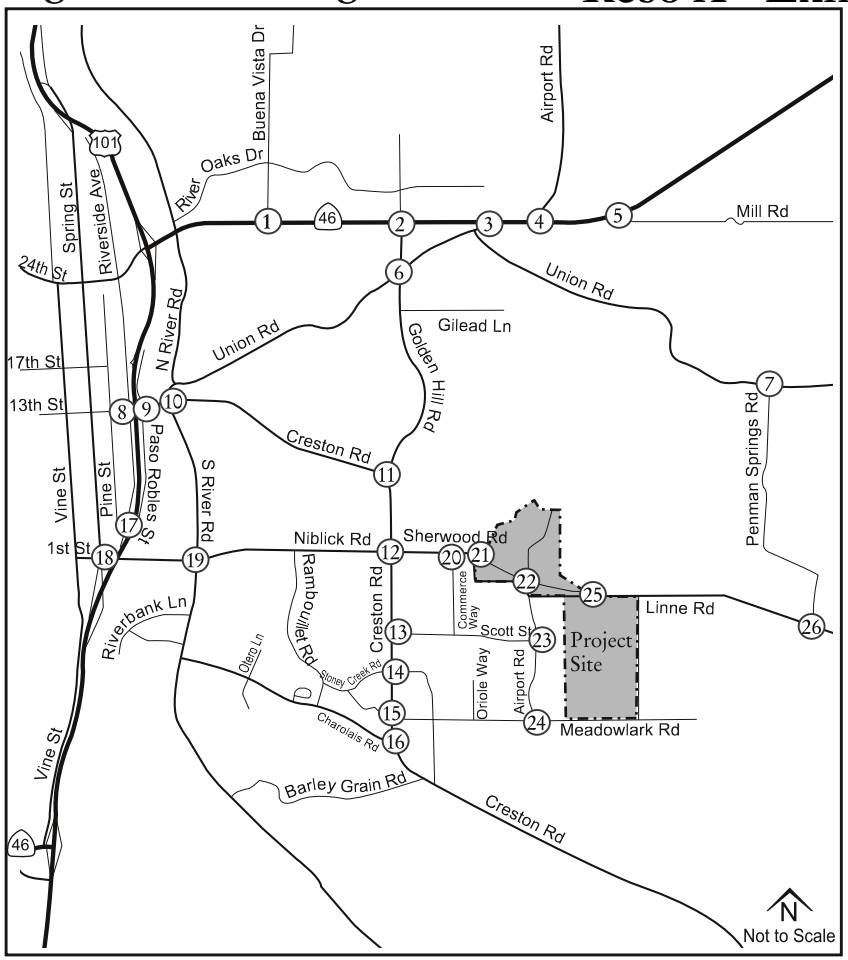
Figure 6a: Existing and Near Term 1,293-Unit Project Trip Assignment

Reso A - Exhibit C2 (EIR Technical Appendix)



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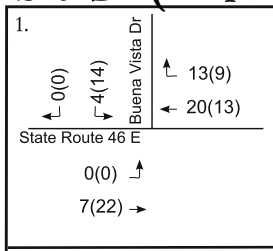

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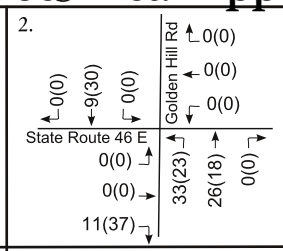

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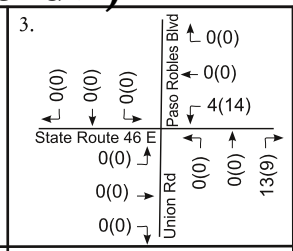

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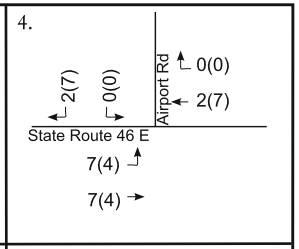

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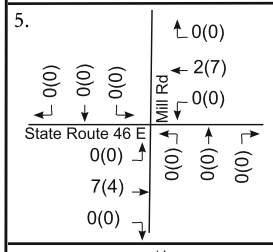

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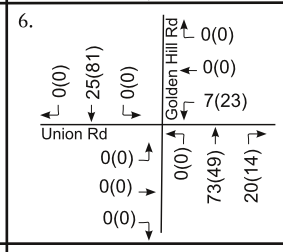

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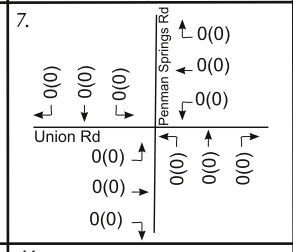

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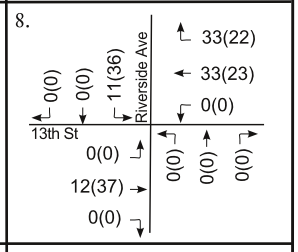

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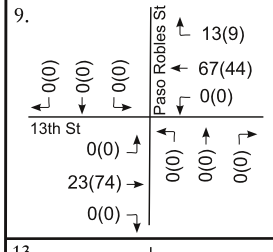

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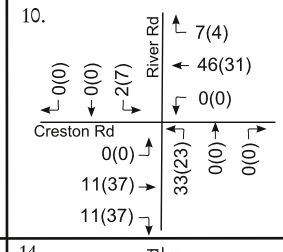

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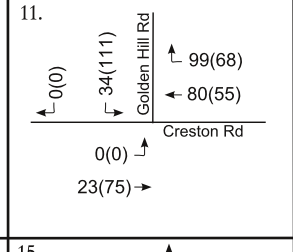

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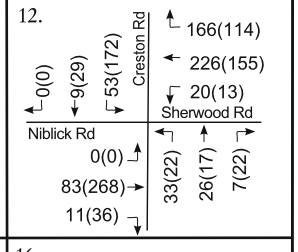

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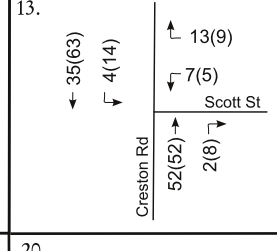

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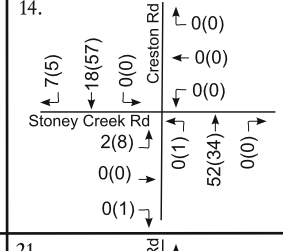

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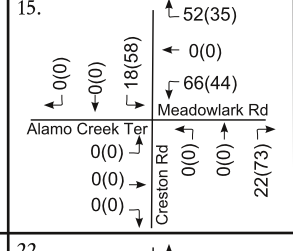

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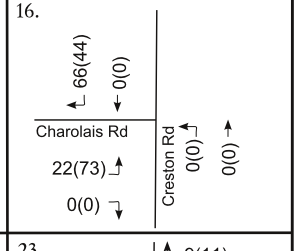

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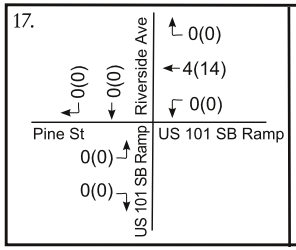

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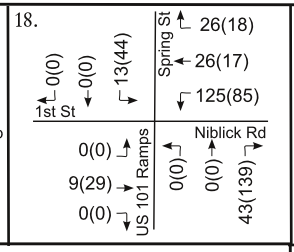

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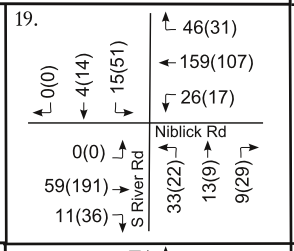

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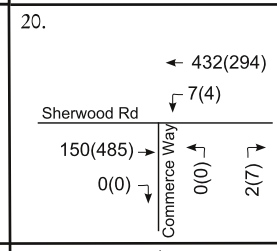

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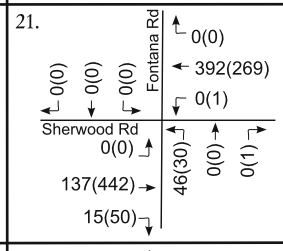

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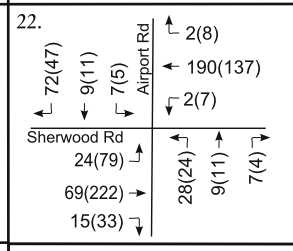

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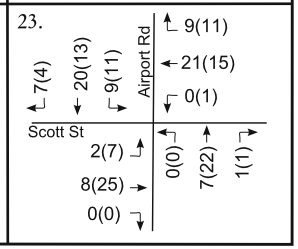

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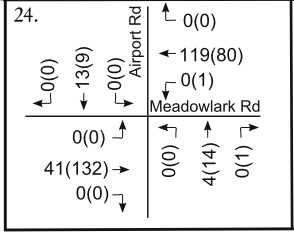

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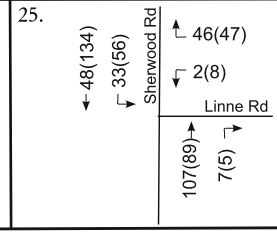

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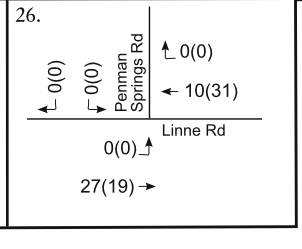

Legend:

(x) - Study Intersection

xx(yy) - AM(PM) Peak Hour Traffic Volumes

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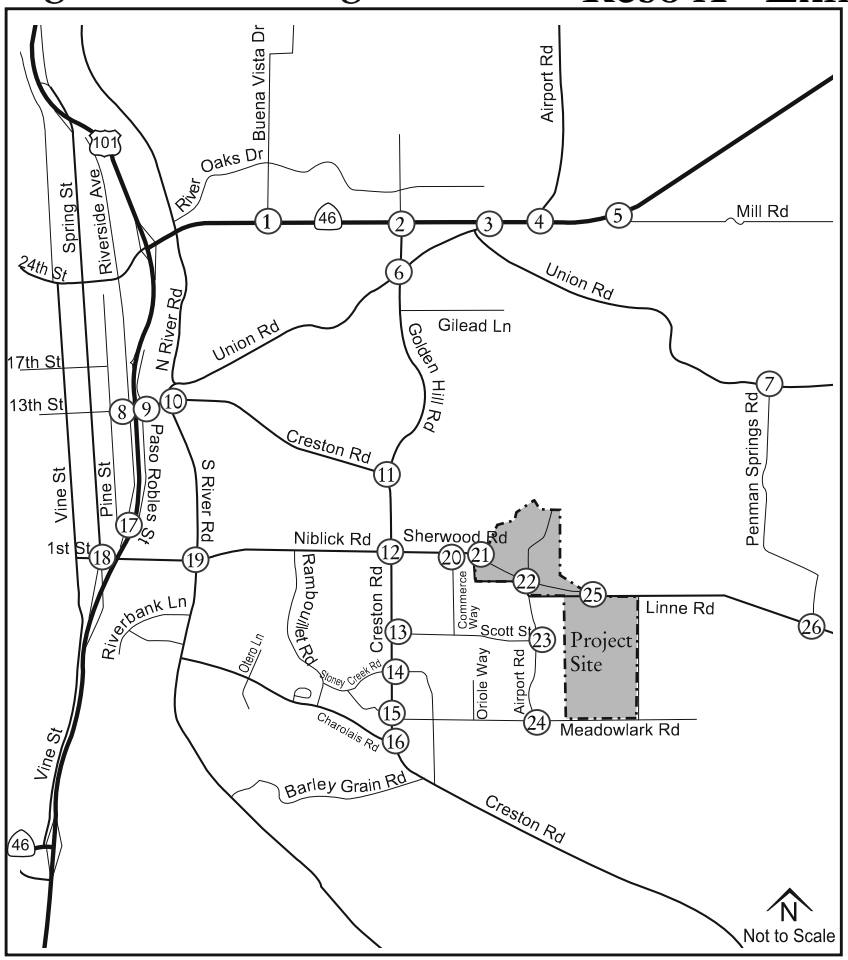
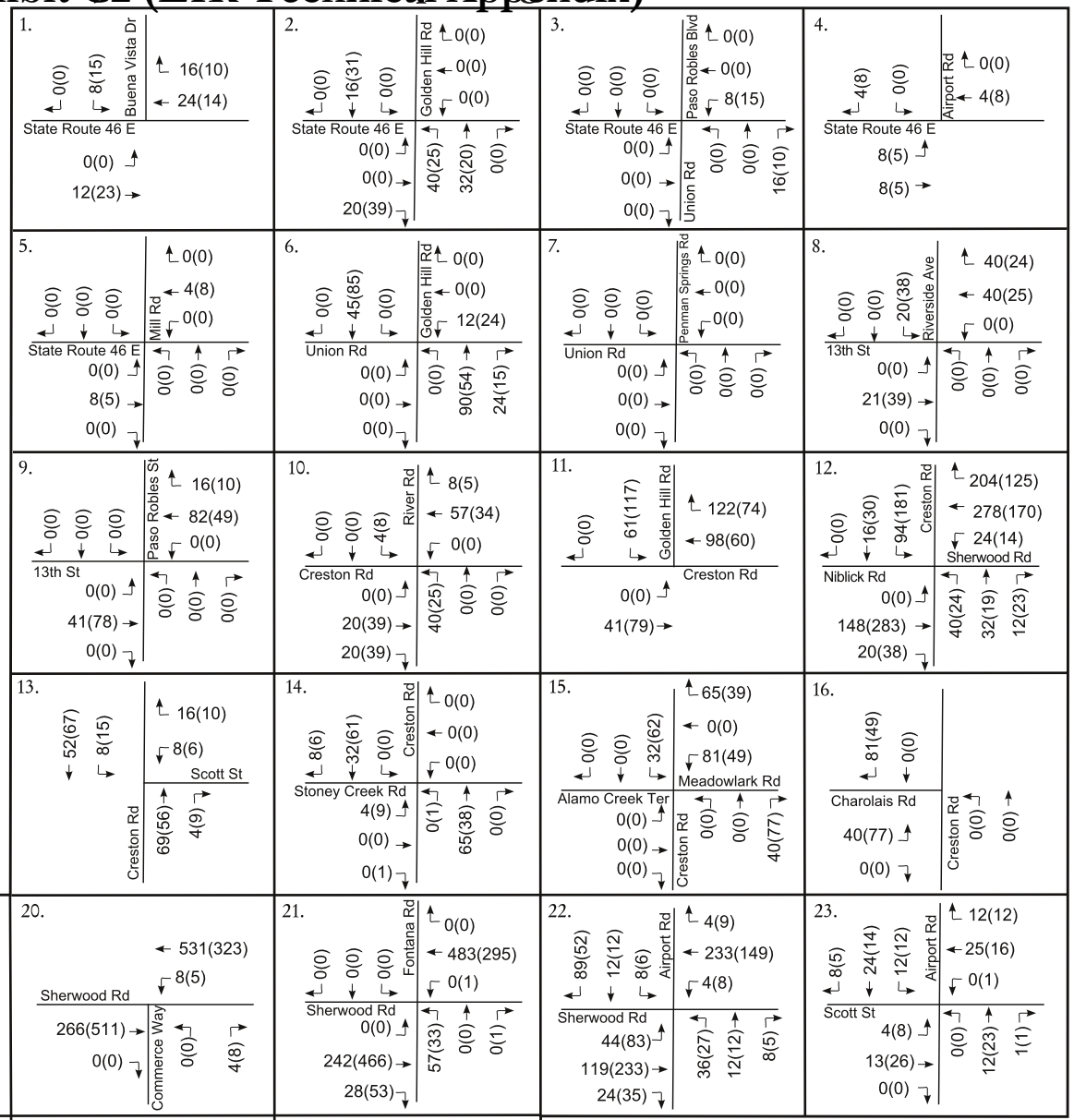
Figure 6b: Existing and Near Term 1,293-Unit Project and School Trip Assignment

Reso A - Exhibit C2 (EIR Technical Appendix)





Legend:

(x) - Study Intersection

xx(yy) - AM(PM) Peak Hour Traffic Volumes

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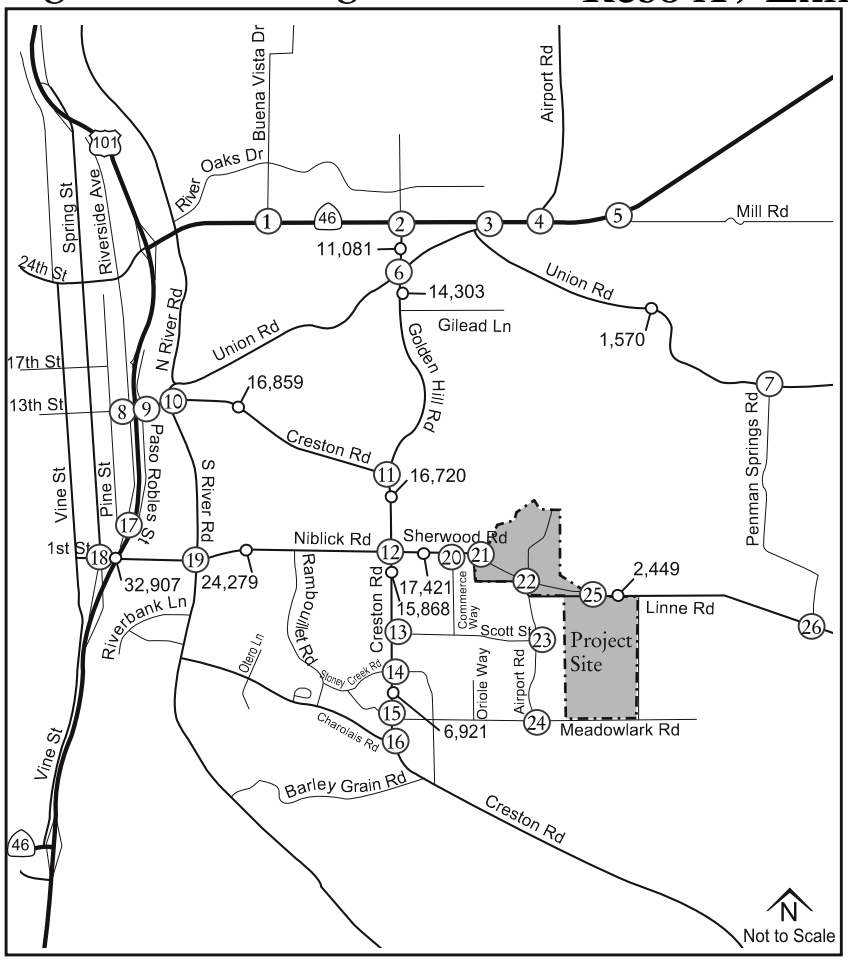
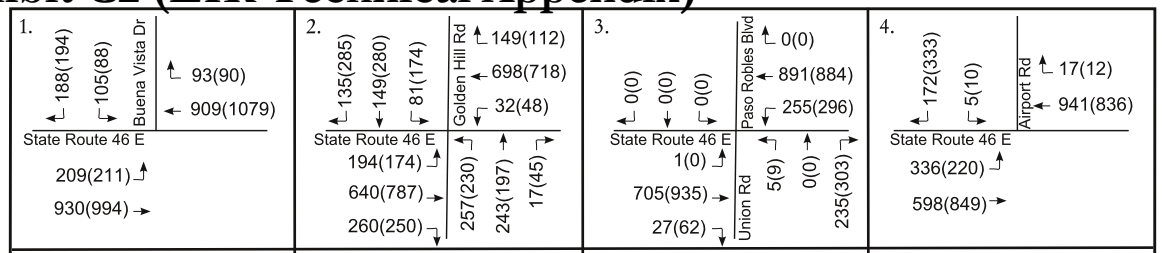
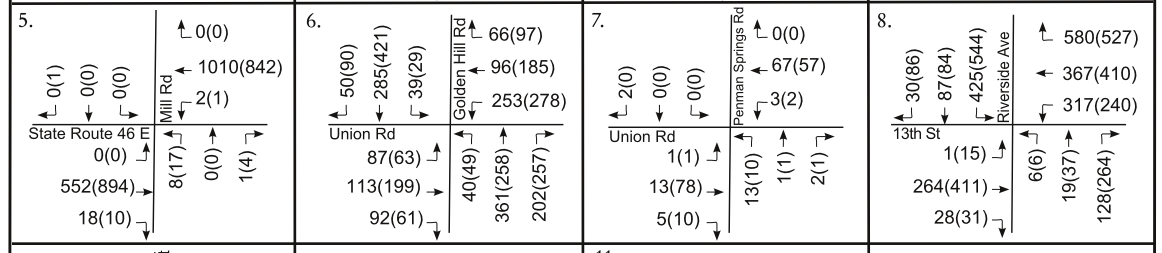
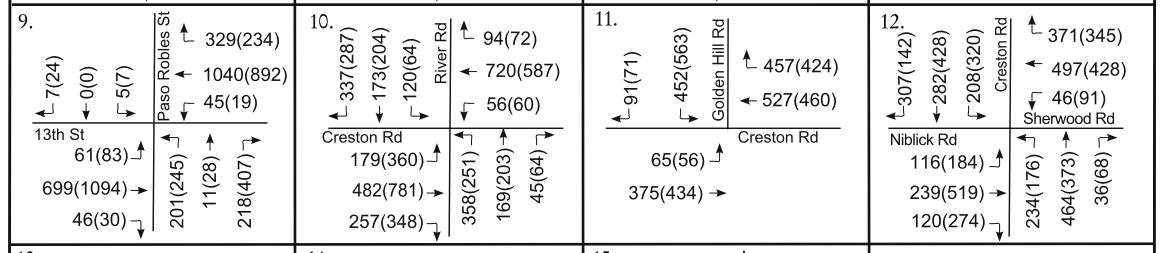
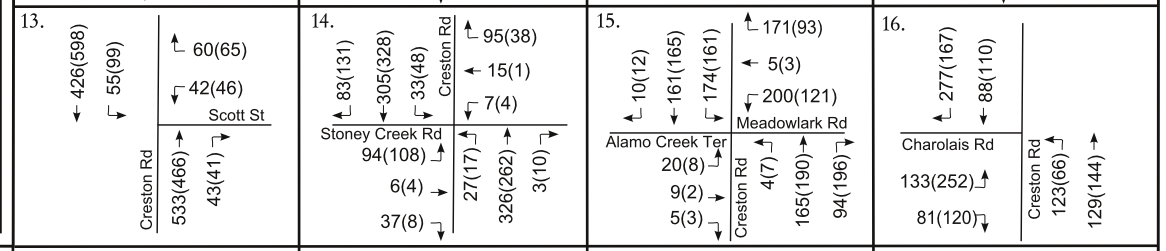
Figure 7a: Existing Plus 1,293-Unit Project Traffic Volumes

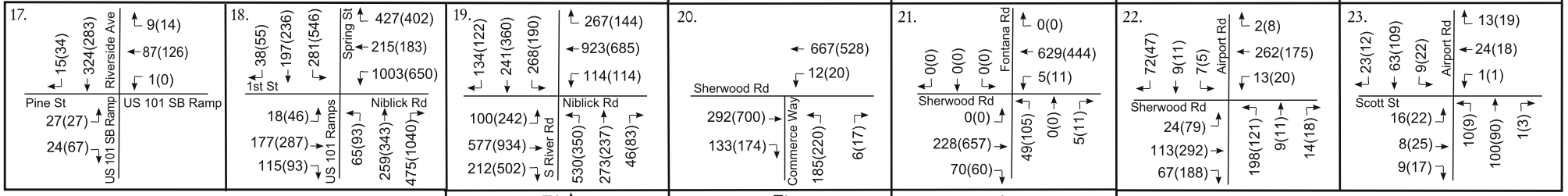


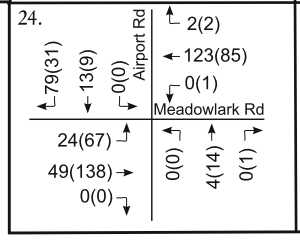


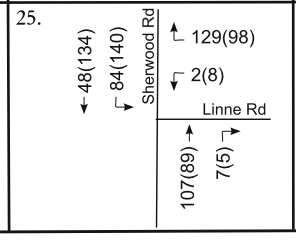


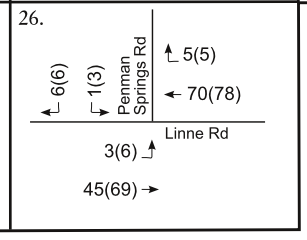












Legend:

o- - Average Daily Traffic Volumes

(x) - Study Intersection

xx(yy) - AM(PM) Peak Hour Traffic Volumes

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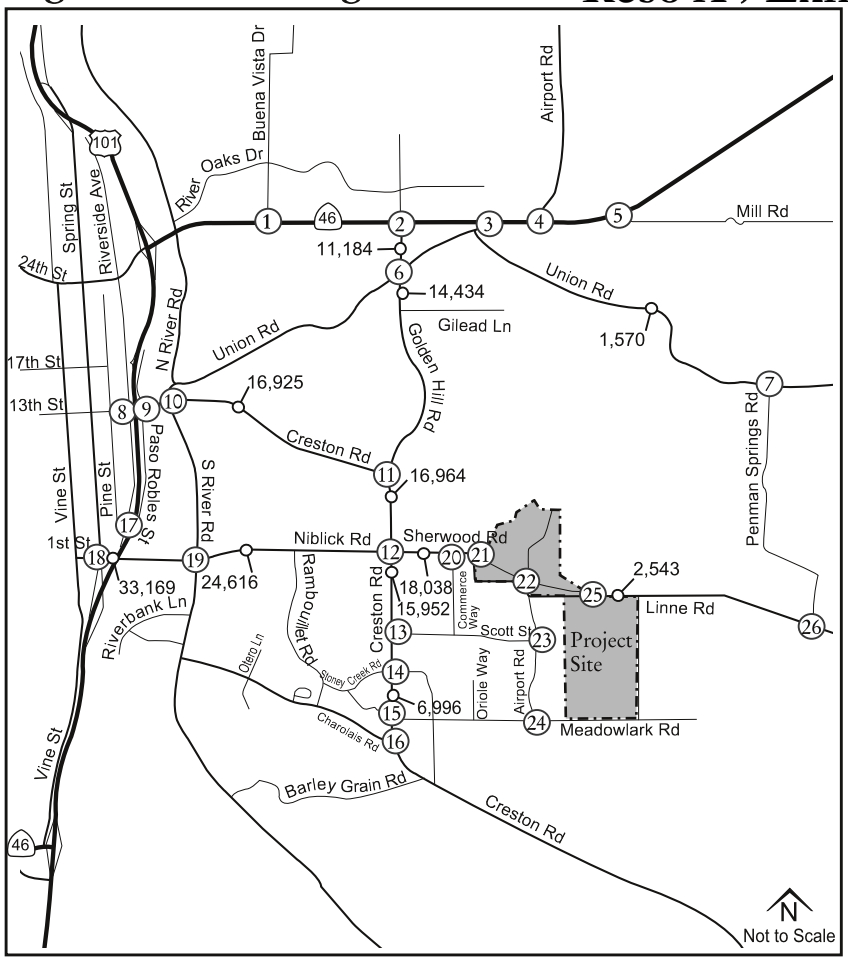
Figure 7b: Existing Plus 1,293-Unit Project and School Traffic Volumes



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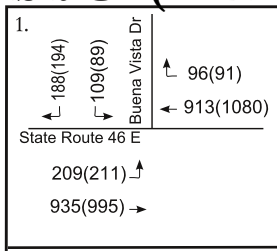

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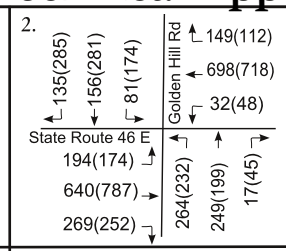

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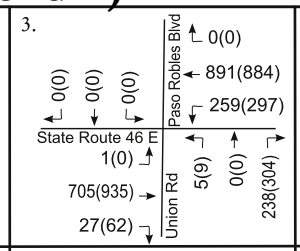

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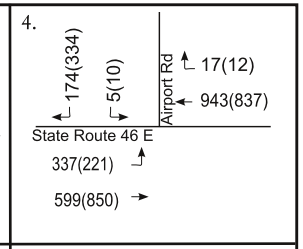

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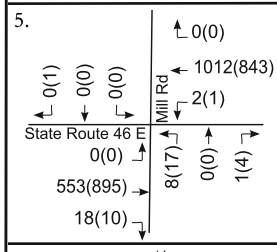

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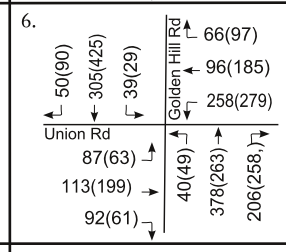

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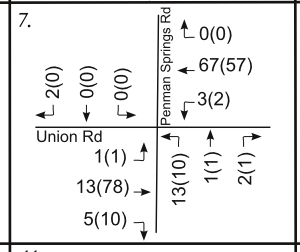

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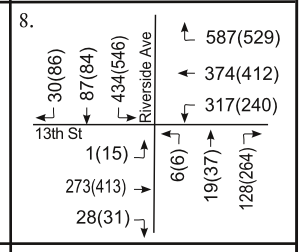

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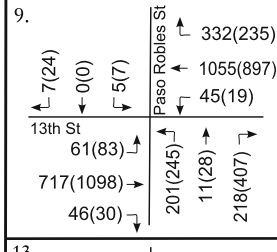

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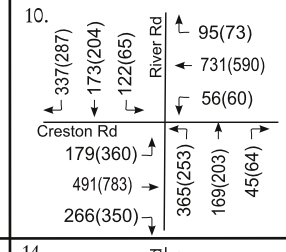

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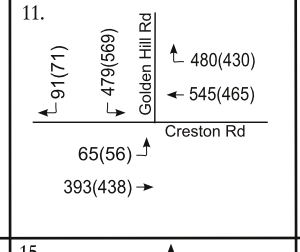

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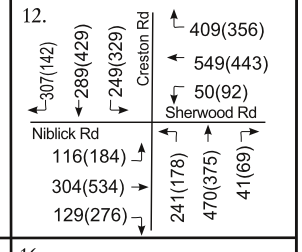

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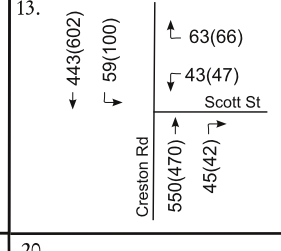

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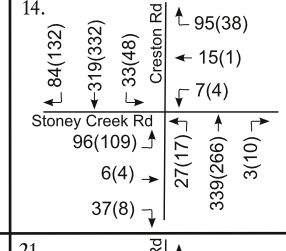

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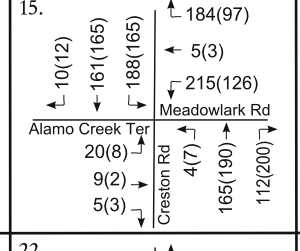

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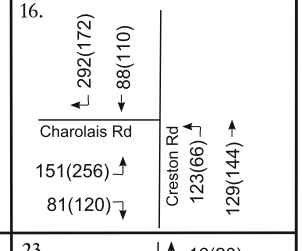

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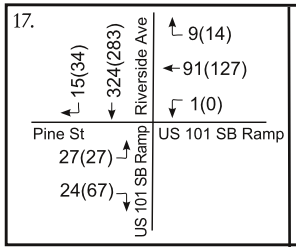

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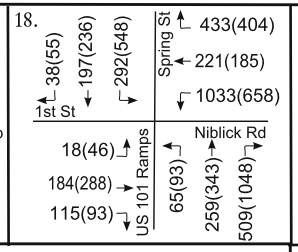

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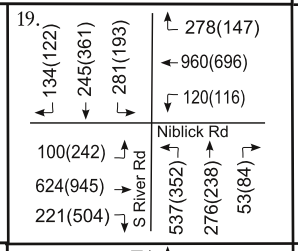

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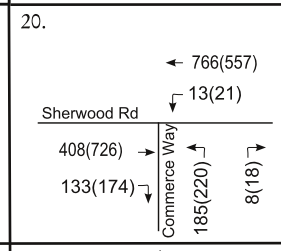

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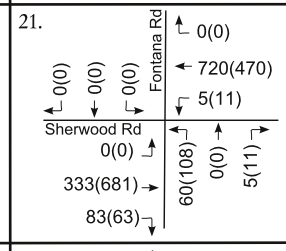

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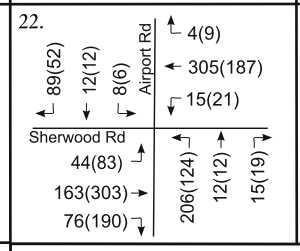

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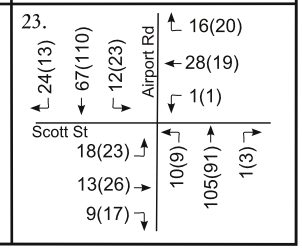

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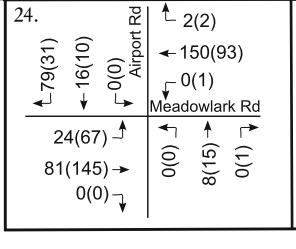

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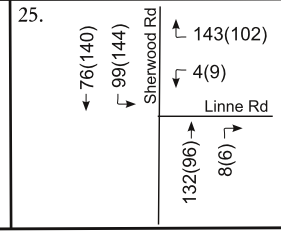

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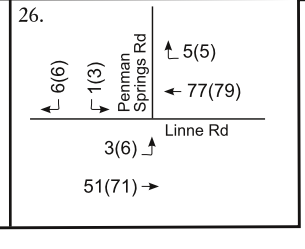

Legend:

o– - Average Daily Traffic Volumes

(x) - Study Intersection

xx(yy) - AM(PM) Peak Hour Traffic Volumes

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EXISTING PLUS PROJECT IMPACT ANALYSIS

1. Intersection Operations

Figures 7a and 7b show the traffic volumes for the study intersections during the weekday peak hours and ADT on the study segments under Existing Plus Project conditions.

Table 10 summarizes the intersection operating conditions under Existing and Existing Plus Project conditions with detailed calculation sheets in **Appendix B** and warrant analysis sheets in **Appendix D**.

Table 10: Existing and Existing Plus Project Intersection Auto Levels of Service

Existing and Existing Plus Project Intersection Auto Levels of Service							
Intersection	Peak Hour	Existing		EX + 1293		EX + 1293 + School	
		Delay[1]	LOS	Delay[1]	LOS	Delay[1]	LOS
1. SR 46E/Buena Vista Dr	AM	16.7	B	17.2	B	17.4	B
	PM	12.0	B	12.4	B	12.4	B
2. SR 46E/Golden Hill Rd	AM	24.5	C	25.3	C	25.5	C
	PM	26.2	C	26.8	C	26.8	C
3. SR 46E/Union Rd	AM	4.2 (23.5)	- (C)	4.5 (24.4)	- (C)	4.5 (24.5)	- (C)
	PM	**5.6 (31.3)**	**- (D)**	**5.9 (32.5)**	**- (D)**	**5.9 (32.5)**	**- (D)**
4. SR 46E/Airport Rd	AM	5.7 (20.8)	- (C)	5.9 (20.6)	- (C)	5.9 (20.8)	- (C)
	PM	4.7 (23.3)	- (C)	4.8 (23.7)	- (C)	4.8 (23.8)	- (C)
5. SR 46E/Mill Rd	AM	0.1 (16.3)	- (C)	0.1 (16.4)	- (C)	0.1 (16.5)	- (C)
	PM	0.2 (19.3)	- (C)	0.2 (19.3)	- (C)	0.2 (19.4)	- (C)
6. Golden Hill Rd/Union Rd	AM	**51.3**	**F**	**81.5**	**F**	**90.7**	**F**
	PM	**50.5**	**F**	**72.5**	**F**	**72.5**	**F**
7. Penman Springs Rd/Union Rd	AM	1.8 (9.4)	- (A)	1.8 (9.4)	- (A)	1.8 (9.4)	- (A)
	PM	0.9 (9.6)	- (A)	0.9 (9.6)	- (A)	0.9 (9.6)	- (A)
8. 13th St/Riverside Ave	AM	30.0	C	32.7	C	33.7	C
	PM	37.6	D	40.9	D	41.2	D
9. 13th St/Paso Robles St	AM	15.5	B	16.0	B	16.1	B
	PM	18.0	B	18.7	B	18.7	B
10. River Rd/Creston Rd	AM	23.1	C	24.5	C	24.7	C
	PM	19.3	B	19.9	B	20.0	B
11. Creston Rd/Golden Hill Rd	AM	19.6	B	22.1	C	23.1	C
	PM	17.1	B	19.1	B	19.4	B
12. Creston Rd/Niblick Rd	AM	25.9	C	39.9	D	46.6	D
	PM	24.0	C	39.0	D	41.3	D
13. Creston Rd/Scott St	AM	2.2 (22.6)	- (C)	3.1 (29.6)	- (D)	3.3 (32.8)	- (D)
	PM	2.5 (22.9)	- (C)	3.3 (31.3)	- (D)	3.5 (32.7)	- (D)
14. Creston Rd/Stoney Creek Rd	AM	8.1 (40.8)	- (E)	10.0 (58.5)	- (F)	11.3 (69.2)	- (F)
	PM	3.7 (19.9)	- (C)	4.1 (24.4)	- (C)	4.1 (24.9)	- (C)
15. Creston Rd/Meadowlark Rd	AM	12.7	B	17.5	C	20.9	C
	PM	9.8	A	11.6	B	11.8	B
16. Creston Rd/Charolais Rd	AM	4.7 (12.8)	- (B)	4.8 (13.6)	- (B)	5.1 (14.4)	- (B)
	PM	5.4 (11.6)	- (B)	6.3 (13.1)	- (B)	6.3 (13.1)	- (B)
17. Riverside Ave/Pine St/US 101 SB Ramp	AM	3.7 (12.3)	- (B)	3.8 (12.4)	- (B)	3.9 (12.5)	- (B)
	PM	5.2 (12.9)	- (B)	5.5 (13.3)	- (B)	5.6 (13.3)	- (B)
18. 1st St-Niblick Rd/Spring St	AM	29.3	C	33.1	C	35.1	D
	PM	34.5	C	37.2	D	37.4	D
19. Niblick Rd/South River Rd	AM	33.8	C	44.3	D	48.1	D
	PM	24.6	C	28.7	C	29.1	C
20. Sherwood Rd/Commerce Way	AM	6.8	A	7.2	A	7.3	A
	PM	7.3	A	8.1	A	8.2	A
21. Sherwood Rd/Fontana Rd	AM	Future intersection		0.7 (12.2)	- (B)	0.8 (13.6)	- (B)
	PM			1.8 (18.8)	- (C)	1.9 (19.8)	- (C)
22. Airport Rd/Sherwood Rd	AM	Future intersection		5.3	A	6.0	A
	PM			6.6	A	6.8	A
23. Airport Rd/Scott St	AM	7.7	A	8.0	A	8.2	A
	PM	7.7	A	8.2	A	8.2	A
24. Airport Rd/Meadowlark Rd	AM	7.4 (8.8)	- (A)	4.0 (11.2)	- (B)	3.6 (12.0)	- (B)
	PM	6.8 (8.5)	- (A)	3.2 (13.3)	- (B)	3.2 (13.6)	- (B)
25. Sherwood Rd/Linne Rd	AM	Future intersection		3.8	A	4.0	A
	PM			4.2	A	4.3	A
26. Penman Springs Rd/Linne Rd	AM	0.9 (8.9)	- (A)	0.7 (9.0)	- (A)	0.6 (9.1)	- (A)
	PM	1.1 (8.9)	- (A)	0.8 (9.2)	- (A)	0.8 (9.2)	- (A)

1. HCM 6th average control delay in seconds per vehicle (HCM 2000 used for Intersections 1, 11 and 17). For side-street-stop controlled intersections the worst approach's delay is reported in parentheses next to the overall intersection delay.

Note: Unacceptable operations (LOS deficiency and/or signal warrants met) shown in bold text.

The following Caltrans intersection operates below the LOS C threshold:

- State Route 46 E/Union Road (#3): the addition of traffic from either project would increase unacceptable delay on the side street approach during the PM peak hour. Restricting the northbound lefts at the intersection would improve operations to LOS C under either project scenario and reduce the conflict points at the intersection. Currently 5 and 9 vehicles make this turn in the AM and PM peak hour, respectively. Restricting westbound left turns is not required or recommended and could impact operations at SR 46 E/Golden Hill Road. A Project Study Report (PSR) has been prepared for this area which will ultimately construct an overcrossing and restrict left turns on SR 46 E. This improvement is consistent with the City's Circulation Element; however, the improvements are in the Caltrans right-of-way and subject to Caltrans review and approval.

  Recommendation: Restrict northbound left turns.

The following stop-controlled City intersections operate below LOS D:

- Golden Hill Road/Union Road (#6): the intersection currently operates at LOS F during the AM and PM peak hours and meets signal warrants. A single-lane roundabout would improve operations to LOS C and is consistent with the City's Circulation Element. This project is currently in design.

  Recommendation: Install single-lane roundabout.

- Creston Road/Stoney Creek Road (#14): the addition of traffic from either project would cause the intersection to operate at LOS F during the AM peak hour. However, the intersection would not meet signal warrants.

  Recommendation: None. Signal warrant not met.

2. Queues

Table 11 summarizes the vehicular queuing under Existing and Existing Plus Project conditions.

Table 11: Existing and Existing Plus Project Queues

Existing and Existing Plus Project Queues						
				95th Percentile Queues (ft)[1]		
Intersection	Movement	Storage Length (ft)	Peak Hour	Existing	Existing + 1293	Existing + 1293 + School
1. SR 46E/Buena Vista Dr	EBL[2]	345	AM	248	258	261
			PM	197	204	204
2. SR 46E/Golden Hill Rd	NBL	160	AM	142	**164**	**170**
			PM	125	142	143
	SBL	140	AM	63	64	65
			PM	108	114	114
	EBL[2]	225	AM	127	129	130
			PM	108	113	114
	WBL[2]	125	AM	29	29	29
			PM	39	41	41
3. SR 46E/Union Rd	WBL[2]	195	AM	55	58	58
			PM	60	65	65
4. SR 46E/Airport Rd	EBL[2]	580	AM	135	143	145
			PM	35	38	38
5. SR 46E/Mill Rd	WBL[2]	305	AM	0	0	0
			PM	0	0	0
6. Golden Hill Rd/Union Rd	NBR	190	AM	103	130	135
			PM	153	183	183
	WBL	250	AM	235	**260**	**278**
			PM	203	**263**	**265**
8. 13th St/Riverside Ave	WBL	125	AM	**332**	**333**	**333**
			PM	**266**	**266**	**266**
	WBT	295	AM	268	**299**	**307**
			PM	**342**	**366**	**369**
9. 13th St/Paso Robles St	NBL	130	AM	**200**	**200**	**200**
			PM	**221**	**221**	**221**
	NBR	110	AM	42	45	48
			PM	**268**	**274**	**274**
	EBL	120	AM	85	85	85
			PM	107	107	107
	EBT	295	AM	227	236	243
			PM	**381**	**420**	**421**
10. River Rd/Creston Rd	NBL	140	AM	**182**	**201**	**204**
			PM	134	**145**	**147**
11. Creston Rd/Golden Hill Rd	EBL	125	AM	103	103	103
			PM	86	88	88
12. Creston Rd/Niblick Rd	NBL	230	AM	#214	**#268**	**#279**
			PM	152	#182	#185
	SBL	245	AM	156	#238	**#304**
			PM	141	**#377**	**#391**
	EBL	150	AM	124	124	124
			PM	**#196**	**#196**	**#196**
	WBL	170	AM	43	65	70
			PM	90	101	103
13. Creston Rd/Scott St	SBL	60	AM	5	5	8
			PM	8	8	10
18. 1st St-Niblick Rd/Spring St	NBL	165	AM	122	122	122
			PM	148	149	149
	NBR	290	AM	48	59	69
			PM	213	290	**294**
	SBL	305	AM	187	196	204
			PM	291	**318**	**319**
19. Niblick Rd/South River Rd	NBL	150	AM	**264**	**285**	**289**
			PM	**177**	**189**	**191**
	SBL	110	AM	**#315**	**#344**	**#371**
			PM	**172**	**#233**	**#243**
	EBL	140	AM	73	73	73
			PM	139	139	139
	WBL	80	AM	**126**	**#159**	**#177**
			PM	**132**	**151**	**154**
20. Sherwood Rd/Commerce Way	WBL	75	AM	7	12	13
			PM	15	18	20
24. Airport Rd/Meadowlark Rd	SBL	50	AM	0	0	0
			PM	0	0	0

1. Queue length that would not be exceeded 95 percent of the time.
2. Deceleration length of 530 feet has been subtracted from the storage length per the HDM for 60 mph design speed.
# indicates that 95th percentile volume exceeds capacity, queue may be longer.
Bold indicates queue length longer than storage length.

The following queue deficiencies at City intersections are noted:

- Golden Hill Road/Union Road (#6): the westbound left turn queue length exceeds storage during both peak hours with the addition of traffic from either project. A single-lane roundabout is being designed for this intersection consistent with the City's Circulation Element.

  Recommendation: Install a single-lane roundabout.

- 13th Street/Riverside Avenue (#8): the westbound left turn and through queue lengths would further exceed storage length during both peak hours with the addition of traffic from either project. The addition of project traffic lengthens queues by one vehicle or less, an insignificant amount. Bridge widening at this location is not included in the City's Circulation Element and any widening in this location is unlikely; signal timing should be reviewed, coordinated, and optimized. With retiming and overlaps, the reported queues would improve to no project conditions. The City's Circulation Element accepts that this location will reach capacity.

  Recommendation: Review, coordinate, and optimize corridor operations. Add westbound right and northbound right turn overlap phases.

- 13th Street/Paso Robles Street (#9): the northbound left and right turn and eastbound through queue lengths would further exceed storage length during at least one peak hour with the addition of traffic from either project. The addition of project traffic lengthens queues by two vehicles or fewer. Bridge widening at this location is not included in the City's Circulation Element and any widening in this location is unlikely; signal timing should be reviewed, coordinated, and optimized. If parking is removed on the east side of Paso Robles Street north of 12th Street, the northbound right turn lane can be extended. With retiming, the reported queues would improve to no project conditions. The City's Circulation Element accepts that this location will reach capacity.

  Recommendation: Review, coordinate, and optimize corridor operations.

- River Road/Creston Road (#10): the northbound left turn queue length would further exceed storage length during at least one peak hour with the addition of traffic from either project. Additional storage is available in the striped median.

  Recommendation: None. Additional storage is available in the striped median.

- Creston Road/Niblick Road (#12): the north-, south-, and eastbound left turn queue lengths will exceed storage length during at least one peak hour with the addition of traffic from either project. With the addition of traffic from either project, the southbound left turn queue cannot be accommodated in the available storage. The City's Circulation Element includes the addition of a second southbound left turn lane and a southbound and eastbound right turn lane, allowing for two through lanes. The improvements to the southbound movements are needed with the addition of traffic from either project for the left turn queues to be accommodated in the available two-way left turn lane and bay taper storage.

  Recommendation: Add additional southbound left turn lane and right turn lane.

- 1st Street-Niblick Road/Spring Street (#18): the northbound right turn queue length would exceed storage length during the PM peak hour due to the addition of traffic from the plus

school project, while the southbound left turn queue length would exceed storage length during the PM peak hour due to the addition of traffic from either project.

Recommendation: None. Additional storage is available in both bay tapers.

- Niblick Road/South River Road (#19): the north-, south-, and westbound left turn queue lengths would further exceed storage length during both peak hours with the addition of traffic from either project. No mitigation has been identified to return queues to no project levels. The City's Circulation Element includes widening at this intersection and corridor improvements. The intersection would benefit from additional westbound left turn lane storage, additional right turn lanes, and right turn overlap phasing.

  Recommendation: Review, coordinate, and optimize corridor operations including Niblick Road complete streets corridor plan improvements.

Summary of Intersection Mitigations

Table 12 summarizes the required mitigation measures under either project.

Table 12: Existing Conditions Mitigations

Existing Conditions Mitigations							
			No	School		Cir. Elem.	Responsible
Intersection	Impact	Mitigation	Project	No[1]	Yes	and TIF[2]	Agency
3. SR 46 E/Union Rd[3]	LOS	Prohibit NB lefts	X	X	X	Yes	Caltrans
6. Golden Hill Rd/Union Rd	LOS, Queue	Install single lane roundabout	X	X	X	Yes	City
8. 13th St/Riverside Ave	Queue	Optimize corridor operations, WBR and NBR overlap	X	X	X	No	City
9. 13th St/Paso Robles St	Queue	Optimize corridor operations	X	X	X	No	City
12. Creston Rd/Niblick Rd	Queue	Add SBL & SBR	-	X	X	Yes	City
19. Niblick Rd/South River Rd	Queue	Optimize corridor operations, corridor improvements	X	X	X	Yes	City

X - Mitigation required.
1. All intersection improvements are warranted with Phase 1 of the project.
2. Intersection improvements are included in the Paso Robles Circulation Element and Traffic Impact Fee (TIF).
3. The Paso Robles Circulation Element includes improvements on State Route 46 East and in the vicinity between Buena Vista Drive and Dry Creek Road. Recommend project make a fair share contribution through the City's impact fee program for ultimate improvements on SR 46 E consistent with the RTP and other applicable documents. Ultimate improvements will be determined in the project documents.

3. Roadway Segment Operations

Table 13 shows the Existing and Existing Plus Project capacity utilization and LOS for the roadway study segments.

Table 13: Existing and Existing Plus Project Roadway Segment Operations

Existing and Existing Plus Project Roadway Segment Operations													
					Existing			Existing + 1293			Existing + 1293 + School		
Street	ID	Segment	Facility Type	Lanes	ADT	LOS	Capacity Utilization	ADT	LOS	Capacity Utilization	ADT	LOS	Capacity Utilization
Union Road	1	Priska Drive to Kit Fox Lane	Arterial	2	1,570	C	9%	1,570	C	9%	1,570	C	9%
Creston Road	2	East of Ferro Lane	Arterial	2*	16,049	D	74%	16,859	D	78%	16,925	D	78%
	3	East of Golden Hill Road	Arterial	4	13,675	A	37%	16,720	A	45%	16,964	A	45%
	4	South of Niblick Road	Arterial	4	14,856	A	40%	15,868	A	42%	15,952	A	43%
	5	North of Meadowlark Road	Arterial	4	6,008	A	16%	6,921	A	19%	6,996	A	19%
Golden Hill Road	6	South of Union Road	Arterial	3	12,676	C	58%	14,303	D	66%	14,434	D	67%
	7	North of Union Road	Arterial	3	9,805	C	45%	11,081	C	51%	11,184	C	52%
Niblick Road	8	East of Spring Street	Arterial	4	29,676	D	79%	32,907	D	88%	33,169	D	89%
	9	East of Quarterhorse	Arterial	4	20,115	A	54%	24,279	B	65%	24,616	B	66%
Sherwood Road	10	East of Creston Road	Arterial	4	9,659	A	26%	17,421	A	47%	18,038	A	48%
Linne Road	11	Poppy Lane to Hanson Road	Arterial	2	1,311	C	7%	2,449	C	14%	2,543	C	14%

* Note that an asterisk (*) indicates the prescence of a raised median or two-way left-turn lane on a two-lane arterial.
Source: City of Paso Robles General Plan Circulation Element, 2011; CCTC, 2019.

With the addition of traffic from either project, all City segments would have a capacity utilization below 90% and the County segment would operate at LOS C.

4. Freeway Segment Operations

Table 14 shows the Existing and Existing Plus Project peak hour volumes at the freeway mainline and ramp locations and **Table 15** shows the LOS, with calculation sheets in **Appendix C**.

Table 14: US 101 Existing and Existing Plus Project Peak Hour Volumes

US 101 Existing and Existing Plus Project Peak Hour Volumes					
Direction	Segment ID	Location		Existing	Existing + 1293	Existing + 1293 + School
US 101 NB	1	SR 46W Off Ramp		146 (114)	146 (114)	146 (114)
	2	SR 46W On Ramp		427 (755)	436 (785)	443 (786)
	3	Mainline North of SR 46W		2221 (3281)	2264 (3420)	2298 (3428)
	4	Spring St. Off Ramp		756 (1337)	799 (1476)	833 (1484)
	5	Paso Robles St. Off Ramp		323 (561)	323 (561)	323 (561)
	6	Paso Robles St. On Ramp		394 (326)	407 (335)	410 (336)
	7	Mainline South of SR 46E		1536 (1709)	1549 (1718)	1552 (1719)
	8	SR 46E Off Ramp		890 (947)	890 (947)	890 (947)
	9	SR 46E On Ramp		260 (249)	280 (262)	284 (263)
	10	Mainline North of SR 46E		906 (1011)	939 (1033)	946 (1035)
US 101 SB	11	Mainline North of SR 46E		850 (1361)	865 (1411)	878 (1414)
	12	SR 46E Off Ramp		248 (327)	259 (363)	268 (365)
	13	SR 46E to Riverside/17th St. Weave	On	892 (992)	892 (992)	892 (992)
	14		Off	218 (303)	218 (303)	218 (303)
	15	Mainline South of SR 46E		1276 (1723)	1280 (1737)	1284 (1738)
	16	Riverside/17th St. On Ramp		298 (205)	298 (205)	298 (205)
	17	Riverside/Pine St. Off Ramp		93 (126)	97 (140)	101 (141)
	18	Spring St. On Ramp		1190 (894)	1315 (979)	1345 (987)
	19	Mainline North of SR 46W		3020 (3046)	3145 (3131)	3175 (3139)
	20	SR 46W Off Ramp		510 (523)	536 (541)	542 (543)
	21	SR 46W On Ramp		92 (146)	92 (146)	92 (146)

AM (PM) Peak Hour Volumes

Table 15: Existing and Existing Plus Project Freeway Operations

Existing and Existing Plus Project Freeway Operations									
				Existing		Ex + 1293		Ex + 1293 + School	
Direction	Location	Segment Type	Peak Hour	Density[1]	LOS	Density[1]	LOS	Density[1]	LOS
US 101 NB	SR 46W Off Ramp	Diverge	AM	22.2	C	22.5	C	22.8	C
			PM	26.2	C	27.2	C	27.3	C
	SR 46W On Ramp	Merge	AM	23.8	C	24.2	C	24.5	C
			PM	**30.4**	**D**	**31.5**	**D**	**31.6**	**D**
	North of SR 46W	Mainline	AM	19.9	C	20.3	C	20.6	C
			PM	**28.0**	**D**	**29.8**	**D**	**30.0**	**D**
	Spring St Off Ramp	Diverge	AM	27.1	C	27.6	C	28.0	C
			PM	**33.6**	**D**	**34.9**	**D**	**35.0**	**D**
	Paso Robles St Off Ramp	Diverge	AM	16.9	B	16.9	B	16.9	B
			PM	19.6	B	19.6	B	19.6	B
	Paso Robles St On Ramp	Merge	AM	17.7	B	17.9	B	17.9	B
			PM	17.0	B	17.1	B	17.1	B
	South of SR 46E	Mainline	AM	13.6	B	13.7	B	13.8	B
			PM	13.4	B	13.5	B	13.5	B
	SR 46E Off Ramp	Diverge	AM	18.1	B	18.2	B	18.2	B
			PM	17.8	B	17.9	B	17.9	B
	SR 46E On Ramp	Merge	AM	13.5	B	13.9	B	14.0	B
			PM	13.1	B	13.3	B	13.4	B
	North of SR 46E	Mainline	AM	10.1	A	10.5	A	10.6	A
			PM	9.7	A	9.9	A	10.0	A
US 101 SB	North of SR 46E	Mainline	AM	8.1	A	8.3	A	8.4	A
			PM	13.4	B	13.9	B	13.9	B
	SR 46E Off Ramp	Diverge	AM	12.2	B	12.4	B	12.5	B
			PM	18.3	B	18.8	B	18.9	B
	SR 46E to Riverside/17th St[2]	Weave	AM	-	A	-	A	-	A
			PM	-	B	-	B	-	B
	South of SR 46E	Mainline	AM	11.1	B	11.1	B	11.2	B
			PM	14.8	B	15.0	B	15.0	B
	Riverside/17th St On Ramp	Merge	AM	17.6	B	17.6	B	17.7	B
			PM	20.9	C	21.1	C	21.1	C
	Riverside/Pine St Off Ramp	Diverge	AM	18.3	B	18.3	B	18.3	B
			PM	21.7	C	21.8	C	21.8	C
	Spring St On Ramp	Merge	AM	23.6	C	24.6	C	24.9	C
			PM	23.9	C	24.6	C	24.7	C
	North of SR 46W	Mainline	AM	**28.5**	**D**	**30.4**	**D**	**30.9**	**D**
			PM	**28.6**	**D**	**29.8**	**D**	**29.9**	**D**
	SR 46W Off Ramp	Diverge	AM	**32.5**	**D**	**33.8**	**D**	**34.1**	**D**
			PM	**32.6**	**D**	**33.4**	**D**	**33.5**	**D**
	SR 46W On Ramp	Merge	AM	27.1	C	28.0	C	**28.2**	**D**
			PM	27.6	C	**28.2**	**D**	**28.2**	**D**

1. HCM 6 density (passenger cars per mile per lane).
2. The Leisch method used for weave section analysis does not report density.
Note: Unacceptable operations shown in **bold** text.

The addition of traffic from either project would increase the density at the five freeway segments currently operating at unacceptable LOS and would cause a sixth segment to operate unacceptably during at least one peak hour. The addition of project traffic increases density by less than three passenger cars per mile per lane at the unacceptable locations.

Recommendation: Development of mitigation measures and recommendations will require Caltrans coordination. The freeway facility operations and recommendations are discussed in detail under Cumulative conditions.

SITE ACCESS AND ON-SITE CIRCULATION

This section discusses issues related to site access and on-site circulation. On-site circulation deficiencies would occur if project designs fail to meet appropriate standards, fail to provide adequate truck access, or would result in hazardous conditions.

Roadways within the development shall be designed consistent with the City's Circulation Element Policies and Standards and Specifications. Any improvements outside the City shall be consistent with San Luis Obispo County Public Improvement Standards. The circulation plan is shown on the land use and phasing plans in **Figures 2a and 2b**.

Project Driveways/Access Points

The South Chandler Ranch site is located northeast of Fontana Road and Linne Road. The Olsen Ranch site is bounded by Poppy Lane, Linne Road, Hanson Road, and Meadowlark Road. The following summarizes the access points on these roadways:

- *Airport Road Extension*: The project will extend Airport Road from Linne Road north to the project boundary. Two new four-leg intersections to the South Chandler Ranch site are proposed. A single lane roundabout is proposed at the new Airport Road/Sherwood Road intersection and the northern intersection of Airport Road/Linne Road will become a t-intersection. Additional access points to the Olsen Ranch site are proposed at Parkview Lane and Scott Street east of Airport Road.
- *Fontana Road*: Two new t-intersections accessing the South Chandler site are proposed.
- *Hanson Road*: Three new intersections are proposed for the Olsen Ranch site. Hanson Road is an existing unpaved road that will be upgraded by the project between Linne Road and Meadowlark Road.
- *Linne Road*: Two new intersections are proposed for the South Chandler site as well as the Olsen Ranch site. The intersection(s) with Airport Road will be modified and a new t-intersection at Linne Road (west)/Airport Road Extension will be created. A single lane roundabout is proposed at the Linne Road/Sherwood Road intersection with access to the Olsen Ranch site. An additional t-intersection is also proposed on Linne Road with access to the Olsen Ranch site.
- *Meadowlark Road:* One new t-intersection is proposed.
- *Parkview Lane:* Access to the Olsen Ranch site is proposed on Parkview Lane east of Airport Road.
- *Scott Street:* Access to the Olsen Ranch site is proposed on Scott Street east of Airport Road.
- *Niblick Road/Sherwood Road Extension:* The project will extend Sherwood Road from Fontana Road southeast to Linne Road with a connection to Meadowlark Road through the Olsen Ranch site. A portion of this extension is the existing Aaroe Road which will be replaced. Two new four-leg intersections to the South Chandler Ranch site are proposed. A single lane roundabout is proposed at the new Airport Road/Sherwood Road and Linne Road/Sherwood Road intersections and the northern intersection of Airport Road/Linne Road will become a t-intersection.

On-Site Circulation

In addition to the Airport Road and Niblick/Sherwood Road extensions, the proposed project will construct a network of internal streets. All proposed streets are two-lane except for the Airport Road

extension which will be four-lanes with a raised median and left turn lane. A raised median and left turn lane is also proposed on the Niblick Road/Sherwood Road extension and on Scott Street adjacent to the recreational area.

Pedestrian and bicycle facilities are proposed throughout the project. Class I paths provide a separate right-of-way for the exclusive use of bicycles and pedestrians with crossflows by motorists minimized. Class II bike lanes typically provide for one-way bicycle travel adjacent to the motor vehicle lane. The following pedestrian and bicycle facilities are proposed in the Specific Plan:

- *Airport Road Extension*: Class I and II bikeways are proposed on Airport Road within the project limits. There are existing bike lanes on Airport Road from the southern project limits to the southern terminus of Airport Road at Meadowlark Road. A detached sidewalk is also proposed on the opposite side of the road as the Class I path.
- *Hanson Road*: Class I and II bikeways are proposed on Hanson Road within the project limits from Linne Road to Meadowlark Road. No additional sidewalks are proposed.
- *Fontana Road*: There are no existing or proposed bikeways. A sidewalk is proposed along the property frontage between Niblick Road/Sherwood Road and Linne Road.
- *Linne Road*: Class I and II bikeways are proposed on Linne Road from the Niblick Road/Sherwood Road extension to the eastern project limits at Hanson Road. No sidewalk is proposed on this section. A sidewalk is proposed along the property frontage on Linne Road between Fontana Road and Airport Road.
- *Meadowlark Road:* Class I and II bikeways are proposed on Meadowlark Road from the western project limits to the eastern project limits at Hanson Road. No additional sidewalks are proposed.
- *Parkview Lane:* The Specific Plan proposes a 10-foot paved pedestrian and bike trail which meets the City's definition of a Class I bikeway per the Master Plan. In addition, the existing Turtle Creek Park Trail located west of Airport Road near Parkview Lane is also a 10-foot paved trail. Sidewalks are proposed.
- *Scott Street:* A shared lane for vehicular parking and a bike lane is proposed with detached sidewalks on both sides.
- *Niblick Road/Sherwood Road Extension:* Class I and II bikeways are proposed on the extension within the project limits from Fontana Road to Meadowlark Road. A detached sidewalk is also proposed on the opposite side of the road as the Class I path.

In addition, a series of 10 -foot wide pedestrian and bike trails are proposed throughout the project. Detached sidewalks are proposed on all local roads except alleys. It should be noted that the April 2019 Circulation Plan is not consistent with the May 2019 Wallace Group road sections. The road sections included additional bikeways not shown on the Circulation Plan.

In general, the Specific Plan is consistent with the City of Paso Robles Bicycle and Pedestrian Master Plan with the exception of Scott Street. There are existing Class II bike lanes on Scott Street west of Airport Road and the Master Plan proposes bike lanes extending east to Hanson Road. The Specific Plan proposes an eight-foot shared parking and bike lane on Scott Street which does not meet City Standards and is not wide enough to accommodate both uses.

It is recommended the project provide 13 feet where parking and a bike lane are desired, consistent with the City's Standard Construction Drawings, on Scott Street and other roadways identified in the plan.

It is also recommended that 11-foot travel lanes be provided on all arterial roadways consistent with the City's Standard Construction Drawings. Airport Road, Linne Road, Niblick Road, and Sherwood Road are designated as arterials in the City's Circulation Element. The Standard Construction Drawings do not specify cross-sections for collectors.

Near Term Conditions

Near Term conditions reflect the development of approved and pending projects in the study area.

METHODOLOGY

A list of approved, pending, and reasonably foreseeable projects was obtained from City staff. The following projects were assumed to be in place under Near Term conditions:

- Beechwood Specific Plan (676 SF units, 235 MF units, 47,000 s.f. commercial)
- Dallons Drive Homewood Suites (105 rooms)
- Black Oak Lodge Hotel (96 rooms, 2717 Black Oak Drive)
- Golden Hill Residential Care Assisted Living Facility (125 beds converted to equivalent MF units, Golden Hill Road south of Union Road)
- Furlotti Annexation/Gateway Project, NW quadrant of SR 46W/US 101 interchange (425 rooms in three hotels, 97 residential units, 73,700 s.f. commercial uses)
- Justin Vineyards Wine Storage Warehouse (54,000 s.f. warehouse on Wisteria Lane)
- Vintner's Vault wine processing/storage (56,000 s.f. warehouse on Germaine Way)
- Spring Street Village (42 MF units, 3328 Spring Street)
- Hotel Cheval Phase 2 (20 rooms, 1020 Pine Street)
- Hotel Alexa (38 rooms, Alexa Court)
- Oak Park Residential (75 MF units, 29th/Park Street)
- Truck Sales/Installation (4,950 s.f., 3527 Combine Street)
- River Oaks The Next Generation (271 SF units, Club House Drive)
- Cabernet Links RV Resort (290 RV spaces, golf course, 5151 Jardine Road)
- Mullahey Dodge expansion (3,000 s.f., Tractor/Golden Hill Road)
- Bejar Industrial (4,981 s.f., Combine Street)
- Gym/Office (4,958 s.f., 3523 Combine Street)
- Mariott Residence Inn (128 rooms, S Vine Street)
- Habitat Vine Street (9 MF units, Vine Street)
- Oaks Assisted Living (101 beds, S River/Serenade)
- Oaks Hotel Expansion (66 rooms, 3002 Riverside Drive)
- Fairfield Inn (119 rooms, 2940 Union Road)
- Sonic Burger Drive-Thru (2,000 s.f., Golden Hills Plaza)
- 301 Creston Tentative Map (4 MF units)
- Paso Robles Public Market (6 MF units, 16,500 s.f. commercial, 1803 Spring Street)
- Bellissimo Restaurant and Apartments (4 MF units, 6,000 s.f. commercial, 4th Street/Spring Street)
- Tidwell office/maintenance (9,960 s.f. office, Dallons Drive)
- Pine Street Hotel (151 rooms, 944 Pine Street)
- Riverside Wine Storage (18,500 s.f. warehouse, 3230 Riverside Avenue)
- Westco Industrial (3,948 s.f. industrial, Combine Street)
- Viborg Industrial (7,200 s.f. industrial, 1621 N River Road)
- Blue Oaks Apartments (142 MF units, 802 Experimental Station Road)

- Oxford Suites Hotel (127 rooms, 4th Street/Pine Street)
- North Vine Apartments (8 MF units, North Vine Street)
- Webb Apartments (10 MF units, 36th Street/Oak Street)
- Cava Robles RV Resort (310 RV sites, 32 cottages, north end of Golden Hill Road)
- 6th Street/Spring Street retail (4,600 s.f.)
- TTM 3098 (9 MF units, Union Road/Golden Hill Road)
- Oak Park Phase 3 Apartments (75 MF units, 3000 Park Street)
- Firestone Warehouse/Cold Block (69,000 s.f. warehouse, Ramada Drive)
- Paso Robles Inn Expansion (23 rooms, 600 12th Street)
- Buttonwillow Product Warehouse (5,000 s.f., 2203 Wisteria Lane)
- Lone Oak Hotel Conversion (37 rooms, 715 24th Street)
- Destino Resort Hotel Phase 1 (73 rooms, 3340 Airport Road)

These projects were added to the base year TDM to develop 2025 Near Term conditions. An ambient annual growth rate of one percent per year was applied to US 101 volumes and a growth rate of two percent per year was applied to SR 46 E to account for regional growth to year 2025.

Figure 8 shows the Near Term weekday peak hour traffic volumes at the study intersections and the Near Term ADT on the study segments.

Under Near Term conditions a PHF of 0.92 was used for the intersection analysis and a PHF of 0.94 was used for the freeway analysis consistent with methodologies in the HCM 6th Edition. However, if the existing PHF exceeded these respective values, the higher PHF was used.

Transportation Network

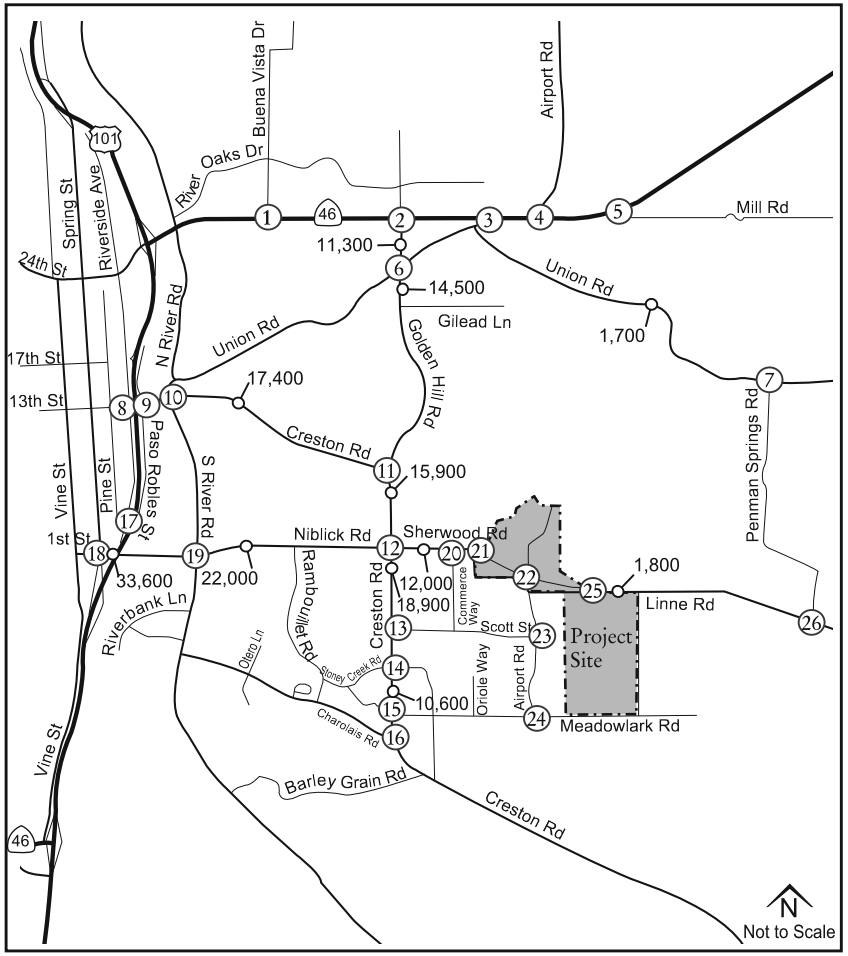
The following roadways improvements were assumed to be in place under Near Term conditions:

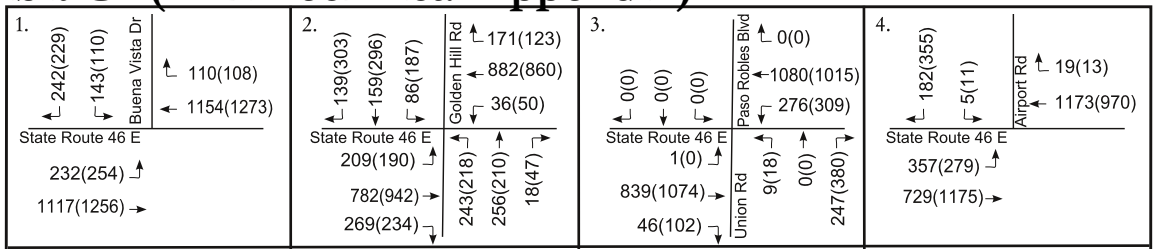
- Golden Hill Road/Union Road (#6): A single-lane roundabout is scheduled to be designed in 2019 and was assumed to be in place under Near Term conditions.
- Beechwood site buildout: Roadways internal to the Beechwood Specific Plan were assumed to be in place under Near Term conditions, including the Airport Road Extension from Meadowlark Road to Creston Road.

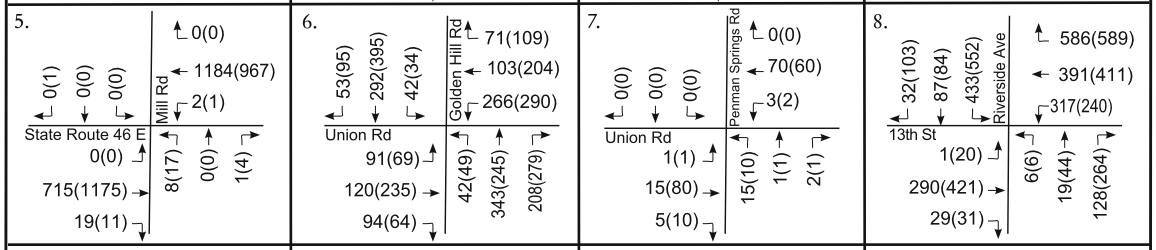
The SR 46 E overcrossing at Union Road was not assumed to be in place under Near Term conditions.

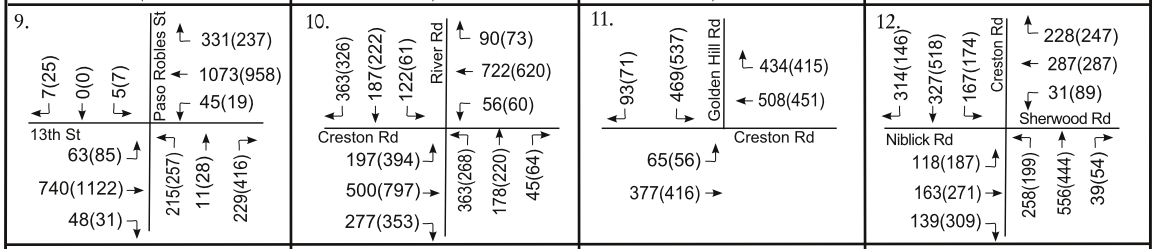
Figure 8: Near Term Traffic Volumes

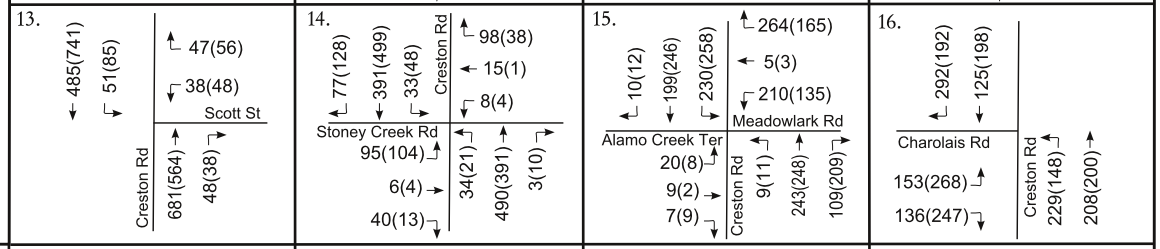
Reso A - Exhibit C2 (EIR Technical Appendix)

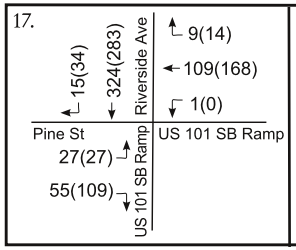


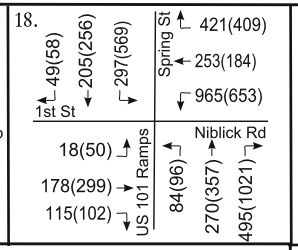


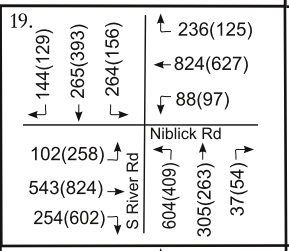


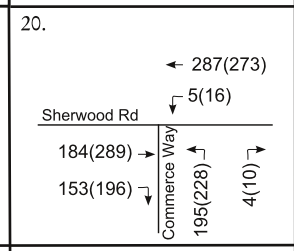






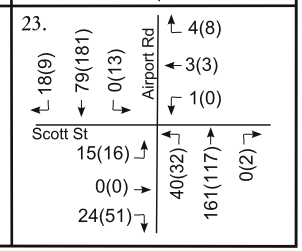


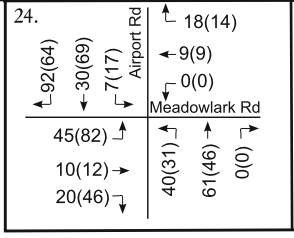




21. Future Intersection

22. Future Intersection





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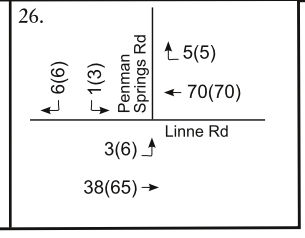

Legend:

o– - Average Daily Traffic Volumes

(x) - Study Intersection

xx(yy) - AM(PM) Peak Hour Traffic Volumes

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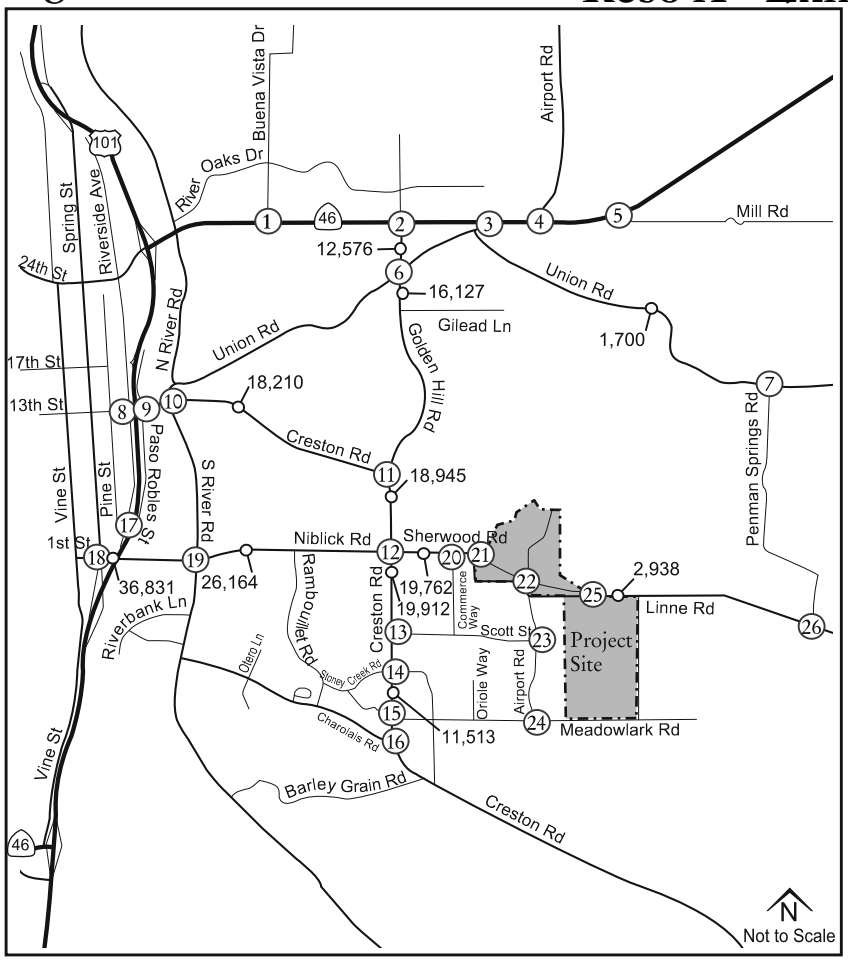
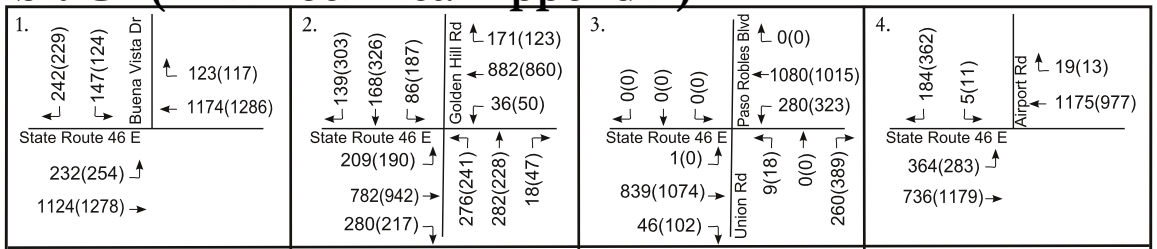
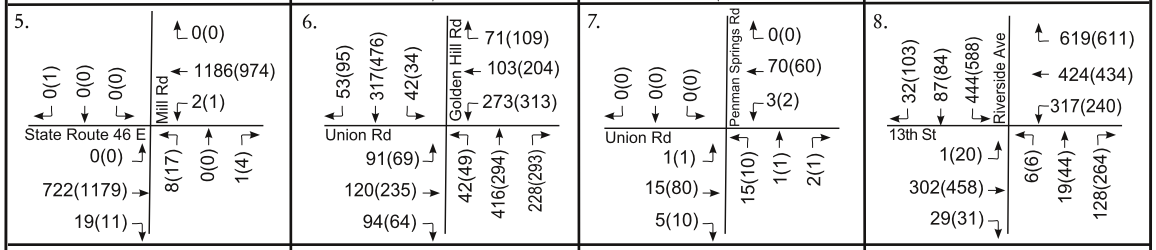
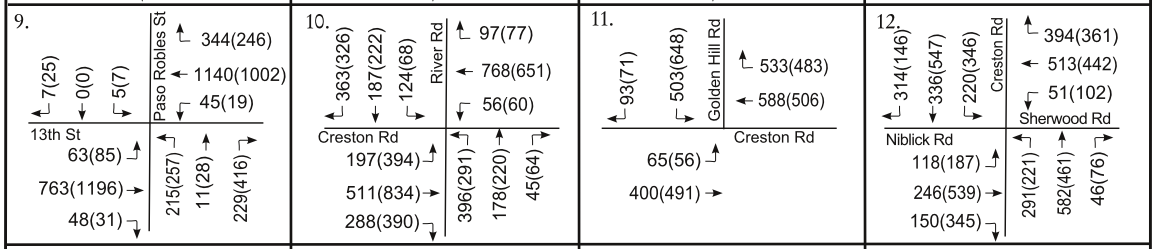
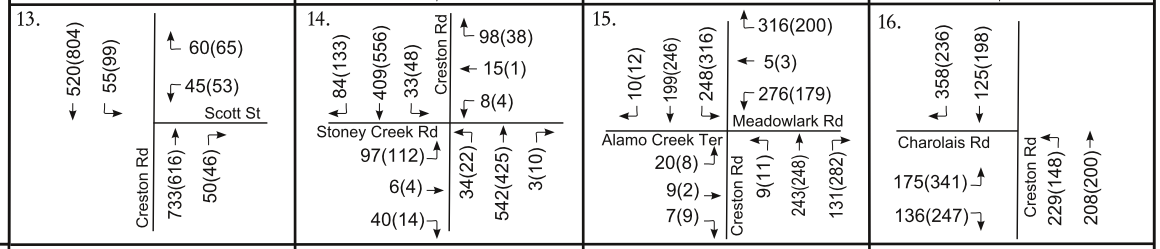
Figure 9a: Near Term Plus 1,293-Unit Project Traffic Volumes (Reso A - Exhibit C2 (EIR Technical Appendix)

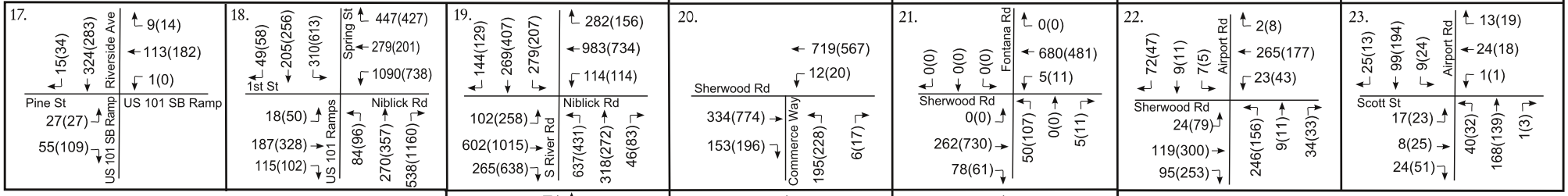


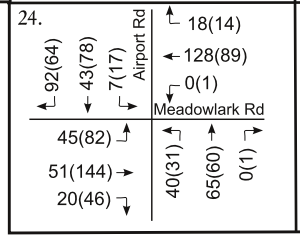


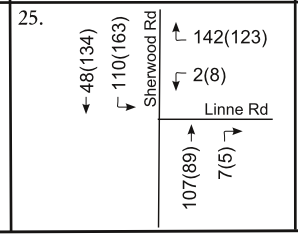


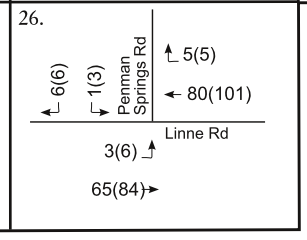












Legend:

o– - Average Daily Traffic Volumes

(x) - Study Intersection

xx(yy) - AM(PM) Peak Hour Traffic Volumes

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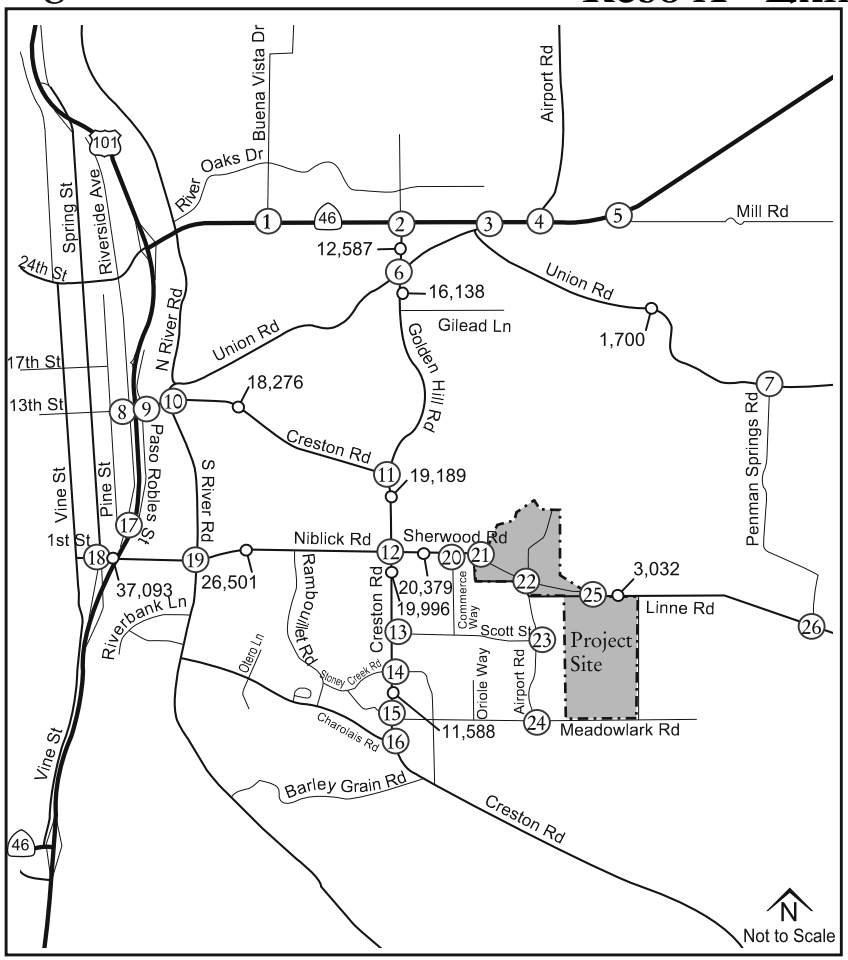
Figure 9b: Near Term Plus 1,293 Unit Project and School Traffic Volumes

Reso A - Exhibit C2 (EIR Technical Appendix)



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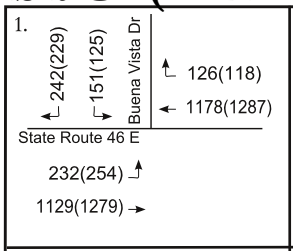

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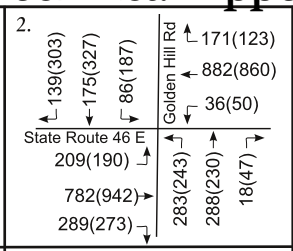

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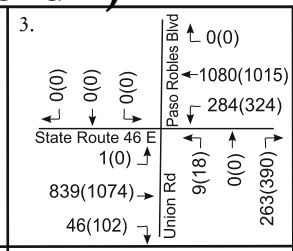

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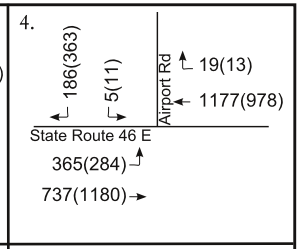

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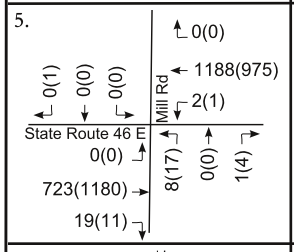

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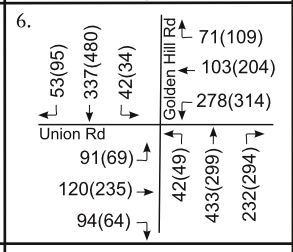

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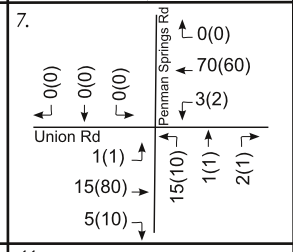

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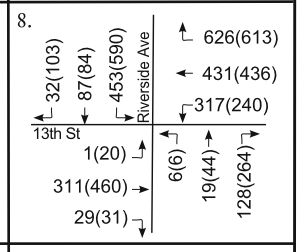

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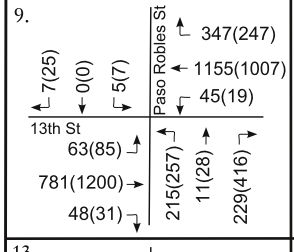

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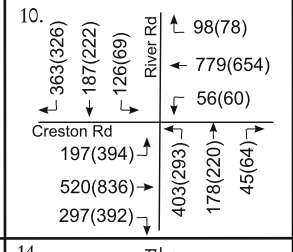

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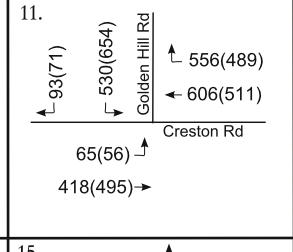

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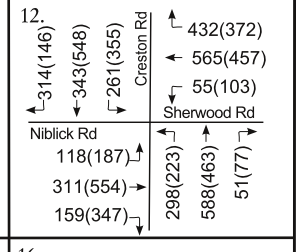

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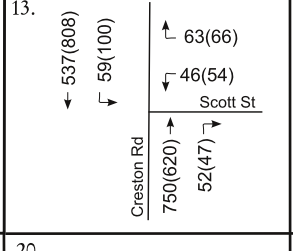

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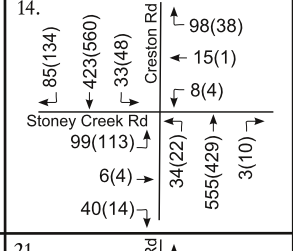

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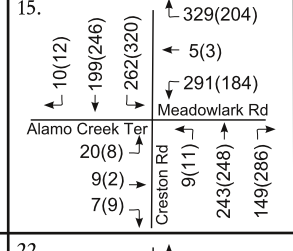

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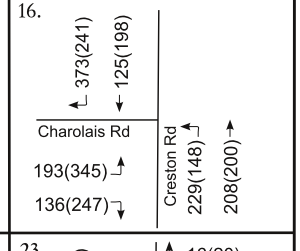

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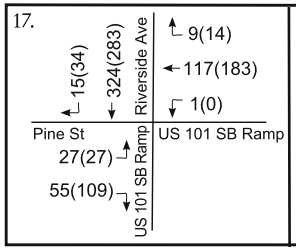

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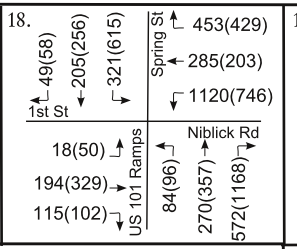

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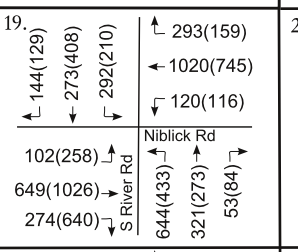

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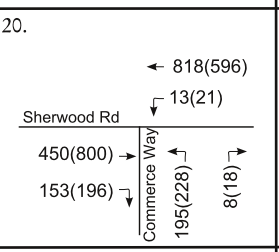

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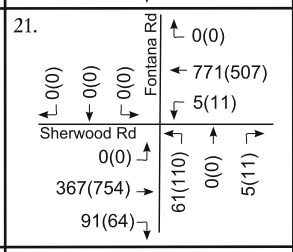

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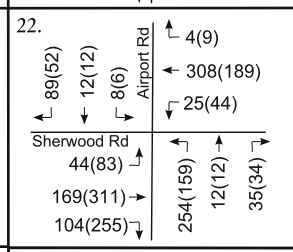

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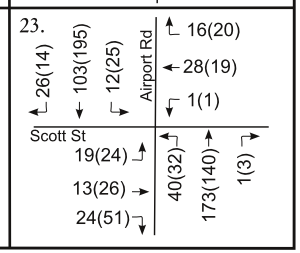

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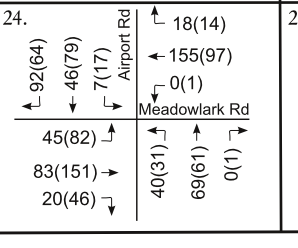

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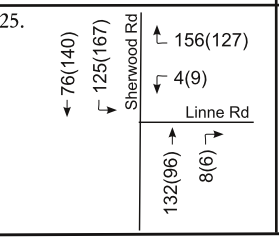

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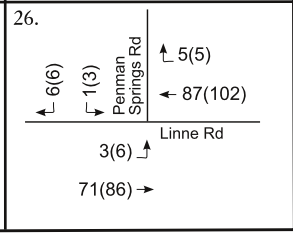

Legend:

o- - Average Daily Traffic Volumes

(x) - Study Intersection

xx(yy) - AM(PM) Peak Hour Traffic Volumes

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NEAR TERM PLUS PROJECT IMPACT ANALYSIS

1. Intersection Operations

Figures 9a and 9b show the traffic volumes for the study intersections during the weekday peak hours and ADT on the study segments under Near Term Plus Project conditions.

Table 16 summarizes the intersection operating conditions under Near Term and Near Term Plus Project conditions with detailed calculation sheets in **Appendix B** and warrant analysis sheets in **Appendix D**.

Table 16: Near Term and Near Term Plus Project Intersection Auto Levels of Service

Near Term and Near Term Plus Project Intersection Auto Levels of Service							
Intersection	Peak Hour	Near Term		NT + 1293		NT + 1293 + School	
		Delay[1]	LOS	Delay[1]	LOS	Delay[1]	LOS
1. SR 46E/Buena Vista Dr	AM	18.9	B	19.4	B	19.6	B
	PM	16.6	B	17.2	B	17.3	B
2. SR 46E/Golden Hill Rd	AM	25.4	C	26.4	C	26.8	C
	PM	30.0	C	30.7	C	30.8	C
3. SR 46E/Union Rd	AM	**5.1 (33.4)**	**- (D)**	**5.3 (33.5)**	**- (D)**	**5.5 (34.8)**	**- (D)**
	PM	**16.6 (105.2)**	**- (F)**	**18.4 (115.2)**	**- (F)**	**18.5 (115.5)**	**- (F)**
4. SR 46E/Airport Rd	AM	6.9 (24.6)	- (C)	**7.3 (25.2)**	**- (D)**	**7.4 (25.5)**	**- (D)**
	PM	**6.1 (34.5)**	**- (D)**	**6.4 (36.3)**	**- (E)**	**6.5 (36.6)**	**- (E)**
5. SR 46E/Mill Rd	AM	0.1 (18.7)	- (C)	0.1 (18.8)	- (C)	0.1 (18.8)	- (C)
	PM	**0.3 (26.8)**	**- (D)**	**0.3 (27.0)**	**- (D)**	**0.3 (27.0)**	**- (D)**
6. Golden Hill Rd/Union Rd	AM	13.0	B	15.6	C	16.6	C
	PM	17.6	C	24.6	C	25.1	D
7. Penman Springs Rd/Union Rd	AM	1.7 (9.2)	- (A)	1.7 (9.2)	- (A)	1.7 (9.2)	- (A)
	PM	0.8 (9.6)	- (A)	0.8 (9.6)	- (A)	0.8 (9.6)	- (A)
8. 13th St/Riverside Ave	AM	27.8	C	29.9	C	30.6	C
	PM	47.5	D	51.4	D	51.7	D
9. 13th St/Paso Robles St	AM	14.2	B	14.6	B	14.7	B
	PM	19.6	B	20.8	C	20.8	C
10. River Rd/Creston Rd	AM	21.8	C	22.8	C	23.1	C
	PM	21.0	C	21.7	C	21.8	C
11. Creston Rd/Golden Hill Rd	AM	20.9	C	23.4	C	24.7	C
	PM	18.7	B	22.4	C	22.6	C
12. Creston Rd/Niblick Rd	AM	30.1	C	47.5	D	55.2	E
	PM	29.4	C	50.5	D	53.8	D
13. Creston Rd/Scott St	AM	2.4 (32.1)	- (D)	3.6 (44.9)	- (E)	4.1 (51.5)	- (F)
	PM	4.1 (52.6)	- (F)	**7.4 (97.6)**	**- (F)**	**8.1 (105.9)**	**- (F)**
14. Creston Rd/Stoney Creek Rd	AM	**15.8 (123.1)**	**- (F)**	**21.7 (184.7)**	**- (F)**	**25.2 (>200)**	**- (F)**
	PM	5.9 (52.3)	- (F)	8.5 (80.5)	- (F)	9.0 (85.3)	- (F)
15. Creston Rd/Meadowlark Rd	AM	30.4	D	**61.9**	**F**	**75.5**	**F**
	PM	18.8	C	33.5	D	**35.5**	**E**
16. Creston Rd/Charolais Rd	AM	7.7 (23.1)	- (C)	8.9 (28.4)	- (D)	10.6 (33.9)	- (D)
	PM	10.7 (23.6)	- (C)	**18.4 (40.7)**	**- (E)**	**19.0 (42.1)**	**- (E)**
17. Riverside Ave/Pine St/US 101 SB Ramp	AM	4.7 (12.8)	- (B)	4.8 (12.9)	- (B)	4.9 (13.0)	- (B)
	PM	6.6 (13.6)	- (B)	6.9 (14.0)	- (B)	6.9 (14.0)	- (B)
18. 1st St-Niblick Rd/Spring St	AM	29.1	C	32.4	C	34.2	C
	PM	38.8	D	43.2	D	43.6	D
19. Niblick Rd/South River Rd	AM	37.6	D	49.2	D	53.2	D
	PM	39.4	D	43.6	D	44.2	D
20. Sherwood Rd/Commerce Way	AM	6.9	A	7.3	A	7.4	A
	PM	7.4	A	8.4	A	8.8	A
21. Sherwood Rd/Fontana Rd	AM	Future intersection		0.7 (12.6)	- (B)	0.8 (14.2)	- (B)
	PM			1.9 (21.2)	- (C)	2.0 (22.4)	- (C)
22. Airport Rd/Sherwood Rd	AM	Future intersection		5.8	A	6.7	A
	PM			7.6	A	7.9	A
23. Airport Rd/Scott St	AM	8.4	A	8.7	A	8.9	A
	PM	8.5	A	9.1	A	9.1	A
24. Airport Rd/Meadowlark Rd	AM	8.1 (11.3)	- (B)	6.6 (13.8)	- (B)	6.4 (15.1)	- (C)
	PM	8.1 (12.4)	- (B)	6.9 (16.8)	- (C)	6.9 (17.2)	- (C)
25. Sherwood Rd/Linne Rd	AM	Future intersection		3.9	A	4.2	A
	PM			4.4	A	4.5	A
26. Penman Springs Rd/Linne Rd	AM	0.7 (8.8)	- (A)	0.5 (8.9)	- (A)	0.5 (8.9)	- (A)
	PM	0.8 (9.0)	- (A)	0.6 (9.2)	- (A)	0.6 (9.2)	- (A)

1. HCM 6th average control delay in seconds per vehicle (HCM 2000 used for Intersections 1, 11 and 17). For side-street-stop controlled intersections the worst approach's delay is reported in parentheses next to the overall intersection delay.
Note: Unacceptable operations (LOS deficiency and/or signal warrants met) shown in bold text.

The following Caltrans intersections operate below the LOS C threshold:

- State Route 46 E/Union Road (#3): the addition of traffic from either project would increase unacceptable delay on the side street approach during the PM peak hour. Restricting the northbound lefts at the intersection would improve operations to at least Near Term conditions and reduce conflict points at the intersection. The restriction would impact 9 and 18 vehicles in the AM and PM peak hour, respectively. Restricting westbound left turns is not required or recommended and could impact operations at SR 46 E/Golden Hill Road. A Project Study Report has been prepared for this area which will ultimately construct an overcrossing and restrict left turns on SR 46 E. This improvement is consistent with the City's Circulation Element; however, the improvements are in the Caltrans right-of-way and subject to approval.

  Recommendation: Project makes a fair share contribution through the City's impact fee program for ultimate improvements on SR 46 E consistent with the RTP and other applicable documents.

- State Route 46 E/Airport Road (#4): the intersection would operate with unacceptable delay under Near Term conditions. Restricting the southbound lefts at the intersection would improve operations and reduce conflict points at the intersection. The restriction would impact 5 and 11 vehicles in the AM and PM peak hour, respectively. These vehicles could U-turn at Union Road. Restricting eastbound left turns is not recommended. Adding a southbound right turn lane would not improve LOS and is not recommended. A Project Study Report has been prepared for this area which will ultimately construct an overcrossing at Union Road and restrict left turns on SR 46 E at Union Road and Airport Road. This improvement is consistent with the City's Circulation Element; however, the improvements are in the Caltrans right-of-way and subject to approval.

  Recommendation: Project makes a fair share contribution through the City's impact fee program for ultimate improvements on SR 46 E consistent with the RTP and other applicable documents.

- State Route 46 E/Mill Road (#5): the intersection would operate at LOS D in the PM peak hour under Near Term conditions. Restricting the northbound lefts, installing a traffic signal, or implementing grade separation at the intersection would improve operations to at least Near Term conditions.

  Recommendation: None, traffic signal or grade separation not recommended. Secondary access is recommended if left turns are prohibited.

The following stop-controlled City intersections operate below LOS D:

- Creston Road/Scott Street (#13): the intersection operates below LOS D during the PM peak hour and the addition of traffic from either project would cause the intersection to meet signal warrants. The City's Circulation Element includes a traffic signal at this location. The intersection should be reviewed for coordination with the existing traffic signal located approximately 400' south of Scott Street at Cedarwood Drive.

  Recommendation: Project makes a fair share contribution through the City's impact fee program for installation of a traffic signal.

- Creston Road/Stoney Creek Road (#14): the intersection would operate below LOS D in the AM and PM peak hours under Near Term conditions with and without the projects. The intersection meets signal warrants during the AM peak hour without the addition of either project. The City's Circulation Element includes a traffic signal at this location. The bulb-out on the northwest corner is not recommended. The existing dedicated left, through, and right southbound turn lanes are desired for signal operations. The eastbound approach should be restriped with a dedicated left-through and right turn lane consistent with the Circulation Element. The northbound left turn lane storage should be maximized.

  Recommendation: Project makes a fair share contribution through the City's impact fee program for installation of a traffic signal.

- Creston Road/Meadowlark Road (#15): the addition of traffic from either project would cause the intersection to operate unacceptably during at least one peak hour. The intersection would meet signal warrants with either project. A traffic signal and restriping at this location are consistent with the City's Circulation Element. Storage for the southbound left turn lane should be extended.

  Recommendation: Project makes a fair share contribution through the City's impact fee program for installation of a traffic signal.

- Creston Road/Charolais Road (#16): the addition of traffic from either project would cause the intersection to operate at LOS E in the PM peak hour. The intersection would meet signal warrants with either project; however, the intersection operates at LOS C or better with installation of all-way stop control. Where traffic signals are warranted, all-way stop control is an interim measure.

  Recommendation: Recommend installation of all-way stop control with either project.

2. Queues

Table 17 summarizes the vehicular queuing under Near Term and Near Term Plus Project conditions.

Table 17: Near Term and Near Term Plus Project Queues

Near Term and Near Term Plus Project Queues						
				95th Percentile Queues (ft)[1]		
Intersection	Movement	Storage Length (ft)	Peak Hour	Near Term	Near Term + 1293	Near Term + 1293 + School
1. SR 46E/Buena Vista Dr	EBL[2]	345	AM	#340	**#353**	**#359**
			PM	300	312	312
2. SR 46E/Golden Hill Rd	NBL	160	AM	**165**	**189**	**195**
			PM	154	**170**	**171**
	SBL	140	AM	71	72	73
			PM	136	138	138
	EBL[2]	225	AM	146	148	149
			PM	138	139	139
	WBL[2]	125	AM	34	34	35
			PM	47	48	48
3. SR 46E/Union Rd	WBL[2]	195	AM	60	60	63
			PM	93	103	103
4. SR 46E/Airport Rd	EBL[2]	580	AM	183	193	195
			PM	65	68	68
5. SR 46E/Mill Rd	WBL[2]	305	AM	0	0	0
			PM	0	0	0
6. Golden Hill Rd/Union Rd	Intersection is a roundabout under Near Term Conditions					
8. 13th St/Riverside Ave	WBL	125	AM	**328**	**328**	**332**
			PM	**268**	**268**	**268**
	WBT	295	AM	**316**	**350**	**356**
			PM	**372**	**398**	**401**
9. 13th St/Paso Robles St	NBL	130	AM	**216**	**216**	**216**
			PM	**233**	**233**	**233**
	NBR	110	AM	57	57	57
			PM	**285**	**290**	**290**
	EBL	120	AM	88	88	88
			PM	109	109	109
	EBT	295	AM	251	260	267
			PM	**435**	**479**	**482**
10. River Rd/Creston Rd	NBL	140	AM	**203**	**221**	**225**
			PM	**156**	**169**	**#170**
11. Creston Rd/Golden Hill Rd	EBL	125	AM	103	103	103
			PM	88	88	88
12. Creston Rd/Niblick Rd	NBL	230	AM	**#297**	**#347**	**#358**
			PM	#219	**#252**	**#255**
	SBL	245	AM	165	**#250**	**#313**
			PM	165	**#415**	**#428**
	EBL	150	AM	124	124	124
			PM	**#200**	**#200**	**#200**
	WBL	170	AM	48	68	73
			PM	100	112	113
13. Creston Rd/Scott St	SBL	60	AM	5	5	8
			PM	8	10	10
18. 1st St-Niblick Rd/Spring St	NBL	165	AM	#158	#158	#158
			PM	154	154	154
	NBR	290	AM	57	69	80
			PM	286	**398**	**#413**
	SBL	305	AM	203	212	219
			PM	**335**	**363**	**364**
19. Niblick Rd/South River Rd	NBL	150	AM	**#359**	**#392**	**#401**
			PM	**221**	**#244**	**#246**
	SBL	110	AM	**#329**	**#358**	**#385**
			PM	**191**	**#271**	**#277**
	EBL	140	AM	74	74	74
			PM	**148**	**148**	**148**
	WBL	80	AM	**126**	**#157**	**#174**
			PM	**132**	**151**	**154**
20. Sherwood Rd/Commerce Way	WBL	75	AM	7	12	13
			PM	14	19	20
24. Airport Rd/Meadowlark Rd	SBL	50	AM	0	0	0
			PM	3	3	3

1. Queue length that would not be exceeded 95 percent of the time.
2. Deceleration length of 530 feet has been subtracted from the storage length per the HDM for 60 mph design speed.
# indicates that 95th percentile volume exceeds capacity, queue may be longer.
Bold indicates queue length longer than storage length.

The following queue deficiencies at City intersections are noted:

- 13th Street/Riverside Avenue (#8): the westbound left turn and through movement queue lengths would further exceed storage length during both peak hours with the addition of traffic from either project. Bridge widening at this location is not included in the City's Circulation Element and any widening in this location is unlikely; signal timing should be reviewed, coordinated, and optimized. With retiming and overlaps, the reported queues would improve to no project levels. The City's Circulation Element accepts that this location will reach capacity.

  Recommendation: Review, coordinate, and optimize corridor operations. Add westbound right and northbound right turn overlap phases.

- 13th Street/Paso Robles Street (#9): the northbound left and right turn and eastbound through queue lengths would further exceed storage length during at least one peak hour with the addition of traffic from either project. Bridge widening at this location is not included in the City's Circulation Element and any widening in this location is unlikely; signal timing will need to be reviewed, coordinated, and optimized. If parking is removed on the east side of Paso Robles Street north of 12th Street the northbound right turn lane could be extended. With retiming, the reported queues would improve to no project levels. The City's Circulation Element accepts that this location will reach capacity.

  Recommendation: Review, coordinate, and optimize corridor operations.

- River Road/Creston Road (#10): the northbound left turn queue length would further exceed storage length during both peak hours with the addition of traffic from either project. Additional storage is available in the striped median.

  Recommendation: None. Additional storage is available in the striped median.

- Creston Road/Niblick Road (#12): the northbound, southbound, and eastbound left turn queue lengths exceed storage in at least one peak hour under Near Term conditions. With the addition of traffic from either project, the southbound left turn queue cannot be accommodated in the available storage. The City's Circulation Element includes the addition of a second southbound left turn lane and a southbound and eastbound right turn lane, allowing for two through lanes. With these improvements, the left turn queues could be accommodated in available two-way left turn lane and bay taper storage.

  Recommendation: Project makes a fair share contribution through the City's impact fee program for improvements at this intersection.

- 1st Street-Niblick Road/Spring Street (#18): the southbound left turn and northbound right turn queue length would exceed the storage length during the PM peak hour under Near Term conditions. No feasible mitigation has been identified to return queues to no project levels. The City's Circulation Element includes corridor improvements on Niblick Road and Spring Street.

  Recommendation: Project makes a fair share contribution through the City's impact fee program for corridor improvements.

- Niblick Road/South River Road (#19): all left turn queue lengths would further exceed the storage length during one or more peak hours with the addition of traffic from either project.

No feasible mitigation has been identified to return queues to no project levels. The City's Circulation Element includes widening at this intersection and corridor improvements. The intersection would benefit from additional westbound left turn lane storage, additional right turn lanes, and right turn overlap phasing.

Recommendation: Project makes a fair share contribution through the City's impact fee program for improvements at this intersection.

Summary of Intersection Mitigations

Table 18 summarizes the required mitigation measures under either project.

Table 18: Near Term Mitigations

Near Term Mitigations							
			No	School		Cir. Elem.	Responsible
Intersection	Impact	Mitigation	Project	No[1]	Yes	and TIF[2]	Agency
3. SR 46 E/Union Rd[3]	LOS	Prohibit NB lefts, RTP improvements	X	X	X	Yes	Caltrans
4. SR 46 E/Airport Rd[3]	LOS	RTP improvements	X	X	X	Yes	Caltrans
8. 13th St/Riverside Ave	Queue	Optimize corridor operations, WBR and NBR overlap	X	X	X	No	City
9. 13th St/Paso Robles St	Queue	Optimize corridor operations	X	X	X	No	City
12. Creston Rd/Niblick Rd	Queue	Add additional SBL, SBR, and EBT	-	X	X	Yes	City
13. Creston Rd/Scott St	LOS	Install traffic signal	-	X	X	Yes	City
14. Creston Rd/Stoney Creek Rd	LOS	Install traffic signal	X	X	X	Yes	City
15. Creston Rd/Meadowlark Rd	LOS	Install traffic signal	-	X	X	Yes	City
16. Creston Rd/Charolais Rd	LOS	Install all-way stop	-	X	X	No	City
18. 1st St-Niblick Rd/Spring St	Queue	Optimize corridor operations, corridor improvements	X	X	X	Yes	City
19. Niblick Rd/South River Rd	Queue	Optimize corridor operations, corridor improvements	X	X	X	Yes	City

X - Mitigation required.
1. All intersection improvements are warranted with Phase 1 of the project except Creston Rd/Charloais Rd (#16).
2. Intersection improvements are included in the Paso Robles Circulation Element and Traffic Impact Fee (TIF).
3. The Paso Robles Circulation Element includes improvements on State Route 46 East and in the vicinity between Buena Vista Drive and Dry Creek Road. Recommend project make a fair share contribution through the City's impact fee program for ultimate improvements on SR 46 E consistent with the RTP and other applicable documents. Ultimate improvements will be determined in the project documents.

3. Roadway Segment Operations

Table 19 shows the Near Term and Near Term Plus Project capacity utilization and LOS for the roadway study segments.

Table 19: Near Term and Near Term Plus Project Roadway Segment Operations

Near Term and Near Term Plus Project Roadway Segment Operations													
					Near Term			NT + 1293			NT + 1293 + School		
Street	ID	Segment	Facility Type	Lanes	ADT	LOS	Capacity Utilization	ADT	LOS	Capacity Utilization	ADT	LOS	Capacity Utilization
Union Road	1	Priska Drive to Kit Fox Lane	Arterial	2	1,700	C	10%	1,700	C	10%	1,700	C	10%
Creston Road	2	East of Ferro Lane	Arterial	2*	17,400	D	80%	18,210	D	84%	18,276	D	84%
	3	East of Golden Hill Road	Arterial	4	15,900	A	43%	18,945	A	51%	19,189	A	51%
	4	South of Niblick Road	Arterial	4	18,900	A	51%	19,912	A	53%	19,996	A	53%
	5	North of Meadowlark Road	Arterial	4	10,600	A	28%	11,513	A	31%	11,588	A	31%
Golden Hill Road	6	South of Union Road	Arterial	3	14,500	D	67%	16,127	D	74%	16,258	D	75%
	7	North of Union Road	Arterial	3	11,300	C	52%	12,576	C	58%	12,679	C	58%
Niblick Road	8	East of Spring Street	Arterial	4	33,600	D	90%	36,831	E	98%	37,093	E	99%
	9	East of Quarterhorse	Arterial	4	22,000	A	59%	26,164	C	70%	26,501	C	71%
Sherwood Road	10	East of Creston Road	Arterial	4	12,000	A	32%	19,762	A	53%	20,379	A	54%
Linne Road	11	Poppy Lane to Hanson Road	Arterial	2	1,800	C	10%	2,938	C	17%	3,032	C	17%

* Note that an asterisk (*) indicates the prescence of a raised median or two-way left-turn lane on a two-lane arterial.
Source: City of Paso Robles General Plan Circulation Element, 2011; CCTC, 2019.

The following roadway segment operates above 90% capacity utilization:

- Niblick Road (east of Spring Street): This segment operates at 90% capacity under Near Term conditions. With the addition of traffic from either project, the capacity utilization would increase but remain at or below 100%. The projected capacity utilization of 99% on Niblick Road does not justify the widening of this roadway. Widening the bridge to a six-lane arterial would result in a capacity utilization below 70%, which would reduce vehicle delays, but would also support higher vehicle speeds and would conflict with the City's multimodal goals and desire to maintain its small-town character.

  Recommendation: None. Maximize signal operations along corridor and implement TDM measures.

4. Freeway Segment Operations

Table 20 shows the Near Term and Near Term Plus Project peak hour volumes at the freeway mainline and ramp locations and **Table 21** shows the LOS, with calculation sheets in **Appendix C**.

Table 20: US 101 Near Term and Near Term Plus Project Peak Hour Volumes

US 101 Near Term and Near Term Plus Project Peak Hour Volumes						
Direction	Segment ID	Location		Near Term	Near Term + 1293	Near Term + 1293 + School
US 101 NB	1	SR 46W Off Ramp		250 (232)	250 (232)	250 (232)
	2	SR 46W On Ramp		461 (858)	470 (888)	477 (889)
	3	Mainline North of SR 46W		2495 (3662)	2538 (3801)	2572 (3809)
	4	Spring St. Off Ramp		849 (1474)	892 (1613)	926 (1621)
	5	Paso Robles St. Off Ramp		342 (578)	342 (578)	342 (578)
	6	Paso Robles St. On Ramp		405 (350)	418 (359)	421 (360)
	7	Mainline South of SR 46E		1709 (1960)	1722 (1969)	1725 (1970)
	8	SR 46E Off Ramp		1017 (1140)	1017 (1140)	1017 (1140)
	9	SR 46E On Ramp		287 (273)	307 (286)	311 (287)
	10	Mainline North of SR 46E		979 (1093)	1012 (1115)	1019 (1117)
US 101 SB	11	Mainline North of SR 46E		908 (1457)	923 (1507)	936 (1510)
	12	SR 46E Off Ramp		264 (346)	275 (382)	284 (384)
	13	SR 46E to Riverside/17th St. Weave	On	1104 (1150)	1104 (1150)	1104 (1150)
	14		Off	218 (303)	218 (303)	218 (303)
	15	Mainline South of SR 46E		1530 (1958)	1534 (1972)	1538 (1973)
	16	Riverside/17th St. On Ramp		298 (205)	298 (205)	298 (205)
	17	Riverside/Pine St. Off Ramp		119 (182)	123 (196)	127 (197)
	18	Spring St. On Ramp		1285 (1011)	1410 (1096)	1440 (1104)
	19	Mainline North of SR 46W		3374 (3384)	3499 (3469)	3529 (3477)
	20	SR 46W Off Ramp		640 (643)	666 (661)	672 (663)
	21	SR 46W On Ramp		139 (211)	139 (211)	139 (211)
AM (PM) Peak Hour Volumes						

Table 21: Near Term and Near Term Plus Project Freeway Operations

Near Term and Near Term Plus Project Freeway Operations									
				Near Term		NT + 1293		NT + 1293 + School	
Direction	Location	Segment Type	Peak Hour	Density[1]	LOS	Density[1]	LOS	Density[1]	LOS
US 101 NB	SR 46W Off Ramp	Diverge	AM	24.7	C	25.0	C	25.3	C
			PM	**29.8**	**D**	**30.8**	**D**	**30.9**	**D**
	SR 46W On Ramp	Merge	AM	25.4	C	25.8	C	26.1	C
			PM	**33.3**	**D**	**34.5**	**D**	**34.6**	**D**
	North of SR 46W	Mainline	AM	21.6	C	22.0	C	22.4	C
			PM	**33.5**	**D**	**36.0**	**E**	**36.1**	**E**
	Spring St Off Ramp	Diverge	AM	**29.0**	**D**	**29.4**	**D**	**29.8**	**D**
			PM	**37.2**	**E**	**38.5**	**E**	**38.6**	**E**
	Paso Robles St Off Ramp	Diverge	AM	18.1	B	18.1	B	18.1	B
			PM	21.8	C	21.8	C	21.8	C
	Paso Robles St On Ramp	Merge	AM	17.9	B	18.0	B	18.0	B
			PM	19.1	B	19.1	B	19.1	B
	South of SR 46E	Mainline	AM	14.5	B	14.6	B	14.6	B
			PM	15.4	B	15.4	B	15.4	B
	SR 46E Off Ramp	Diverge	AM	19.1	B	19.2	B	19.3	B
			PM	20.1	C	20.2	C	20.2	C
	SR 46E On Ramp	Merge	AM	12.4	B	12.7	B	12.8	B
			PM	13.0	B	13.2	B	13.2	B
	North of SR 46E	Mainline	AM	9.1	A	9.4	A	9.5	A
			PM	9.6	A	9.8	A	9.8	A
US 101 SB	North of SR 46E	Mainline	AM	8.6	A	8.7	A	8.8	A
			PM	14.0	B	14.5	B	14.5	B
	SR 46E Off Ramp	Diverge	AM	12.7	B	12.9	B	13.0	B
			PM	19.0	B	19.5	B	19.6	B
	SR 46E to Riverside/17th St[2]	Weave	AM	-	A	-	A	-	B
			PM	-	B	-	B	-	B
	South of SR 46E	Mainline	AM	13.1	B	13.2	B	13.2	B
			PM	16.5	B	16.6	B	16.6	B
	Riverside/17th St On Ramp	Merge	AM	19.7	B	19.8	B	19.8	B
			PM	22.5	C	22.6	C	22.6	C
	Riverside/Pine St Off Ramp	Diverge	AM	20.6	C	20.6	C	20.7	C
			PM	23.5	C	23.7	C	23.7	C
	Spring St On Ramp	Merge	AM	26.2	C	27.2	C	27.4	C
			PM	26.1	C	26.7	C	26.8	C
	North of SR 46W	Mainline	AM	**33.6**	**D**	**36.0**	**E**	**36.7**	**E**
			PM	**32.7**	**D**	**34.2**	**D**	**34.4**	**D**
	SR 46W Off Ramp	Diverge	AM	**35.7**	**E**	**36.9**	**E**	**37.2**	**E**
			PM	**35.2**	**E**	**36.0**	**E**	**36.1**	**E**
	SR 46W On Ramp	Merge	AM	**29.2**	**D**	**30.1**	**D**	**30.3**	**D**
			PM	**29.4**	**D**	**30.0**	**D**	**30.0**	**D**

1. HCM 6 density (passenger cars per mile per lane).
2. The Leisch method used for weave section analysis does not report density.
Note: Unacceptable operations shown in **bold** text.

The addition of traffic from either project would increase the density at the seven freeway segments operating at unacceptable LOS. No additional freeway segments would operate unacceptably. The addition of project traffic increases density by less than four passenger cars per mile per lane at the unacceptable locations.

Recommendation: Development of mitigation measures and recommendations will require Caltrans coordination. The freeway facility operations and recommendations are discussed in detail under Cumulative conditions.

Reso A - Exhibit C2 (EIR Technical Appendix)

Cumulative Conditions

Cumulative conditions represent build-out of the land uses in the region.

METHODOLOGY

Cumulative conditions for the year 2045 were developed using the City and SLOCOG TDMs, which include planned network and land use changes expected upon buildout of the City's General Plan. As with Near Term conditions, the Beechwood Specific Plan 911-unit project was assumed to be in place. **Figure 10** shows the Cumulative weekday peak hour traffic volumes at the study intersections and the Cumulative ADT on the study segments. **Figures 11a and 11b** display the trip assignment for the project under Cumulative conditions.

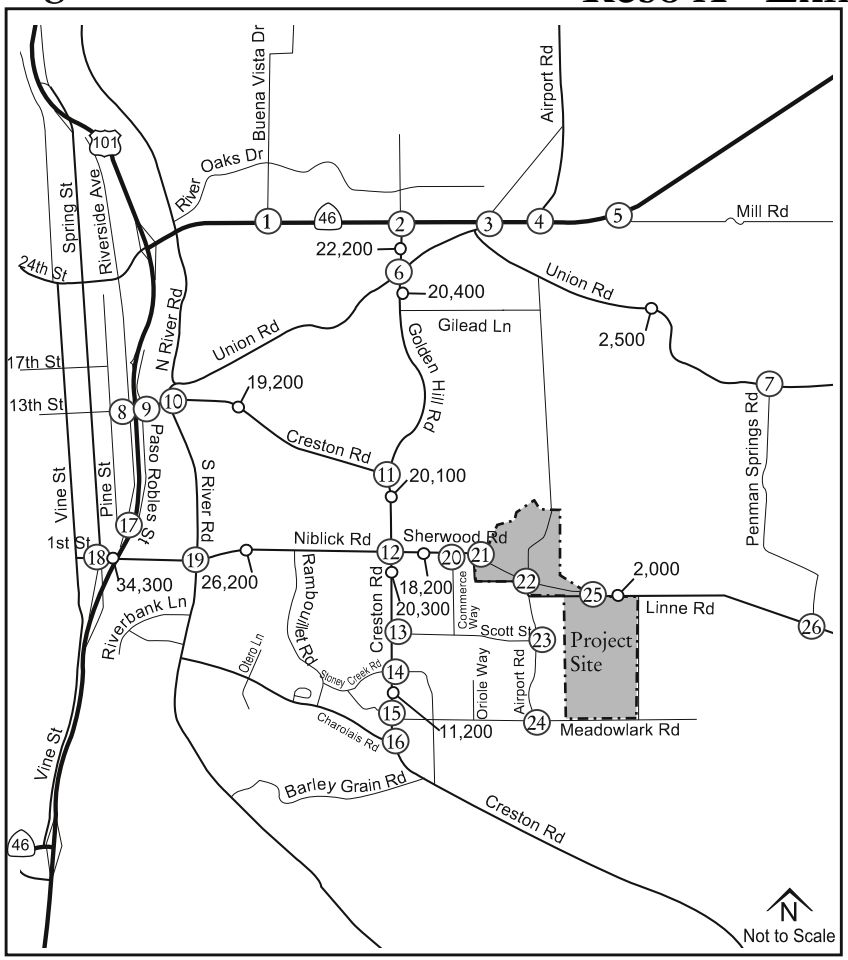
As with Near Term conditions, under Cumulative conditions a PHF of 0.92 was used for the intersection analysis and a PHF of 0.94 was used for the freeway analysis. However, if the existing PHF exceeded these respective values the higher PHF was used.

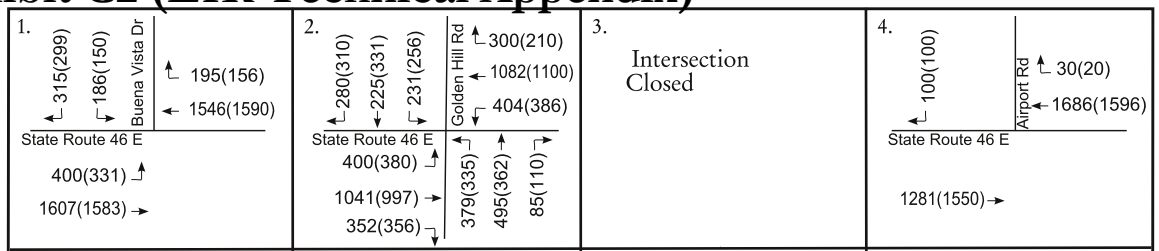
Transportation Network

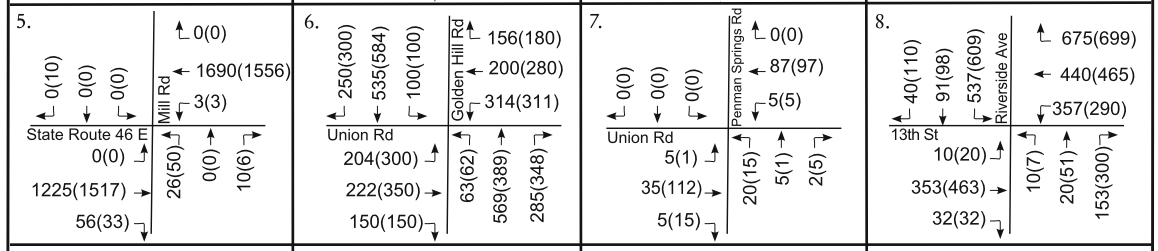
In addition to the changes for the Near Term network, the following roadways improvements were assumed to be in place under Cumulative conditions. Alternative 1 of the on-going Union Road/SR 46 E PA/ED was assumed to be in place under Cumulative conditions.

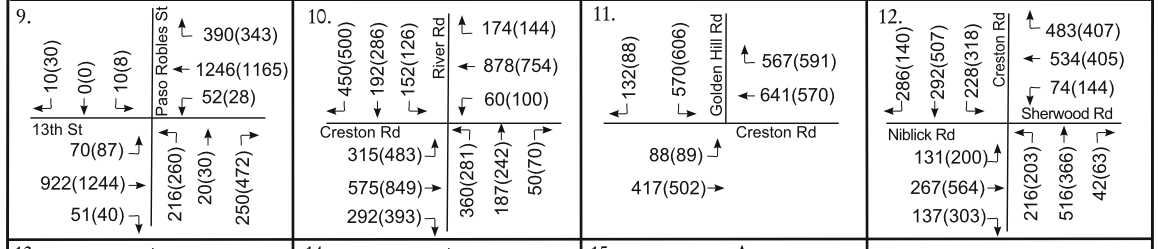
- SR 46 E/Buena Vista Drive (#1): Second eastbound left turn lane installed
- SR 46 E/Union Road (#3): Intersection closed, eastbound on and off ramps constructed
- SR 46 E/Airport Road (#4): Turns restricted to right-in-right-out
- Golden Hill Road/Union Road (#6): Multi-lane roundabout
- Creston Road/Niblick Road (#12): Second eastbound through lane, second southbound left turn lane, dedicated southbound right turn lane
- Riverside Avenue/Pine Street/US 101 SB Ramp (#17): Pine Street converted to one-way westbound
- Golden Hill Road widened to 4-lane arterial from SR 46 E to Rolling Hills Road
- Airport Road Extension from Olsen-Chandler site to Union Road
- Gilead Lane extended east to Airport Road
- Paso Robles Boulevard overcrossing of SR 46 E and northeasterly extension to Airport Road
- US 101/SR 46W interchange: Roundabouts at northbound and southbound ramps, Vine Street realigned with Theatre Drive

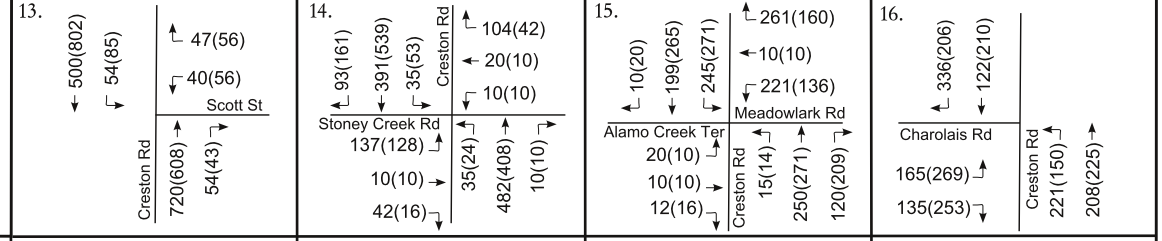
Figure 10: Cumulative Traffic Volumes - Reso A - Exhibit C2 (EIR Technical Appendix)

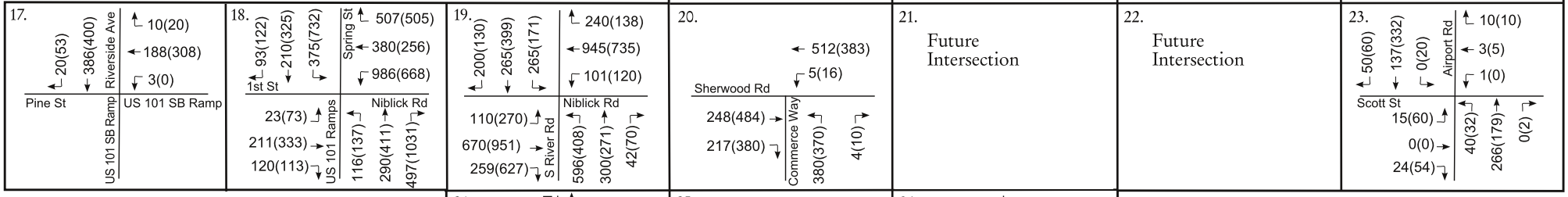


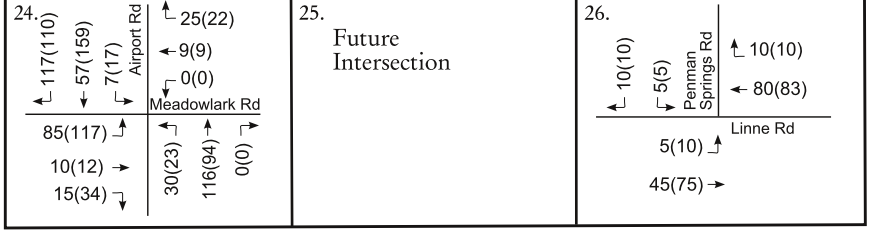












Legend:

o– - Average Daily Traffic Volumes

(x) - Study Intersection

xx(yy) - AM(PM) Peak Hour Traffic Volumes

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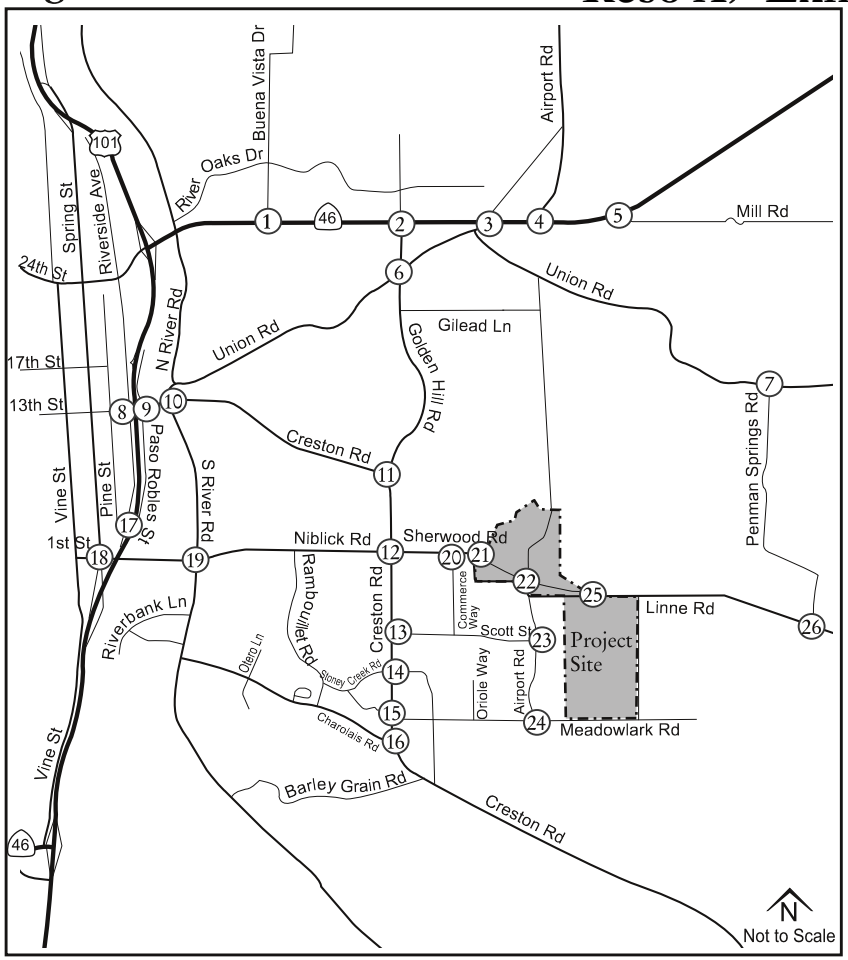
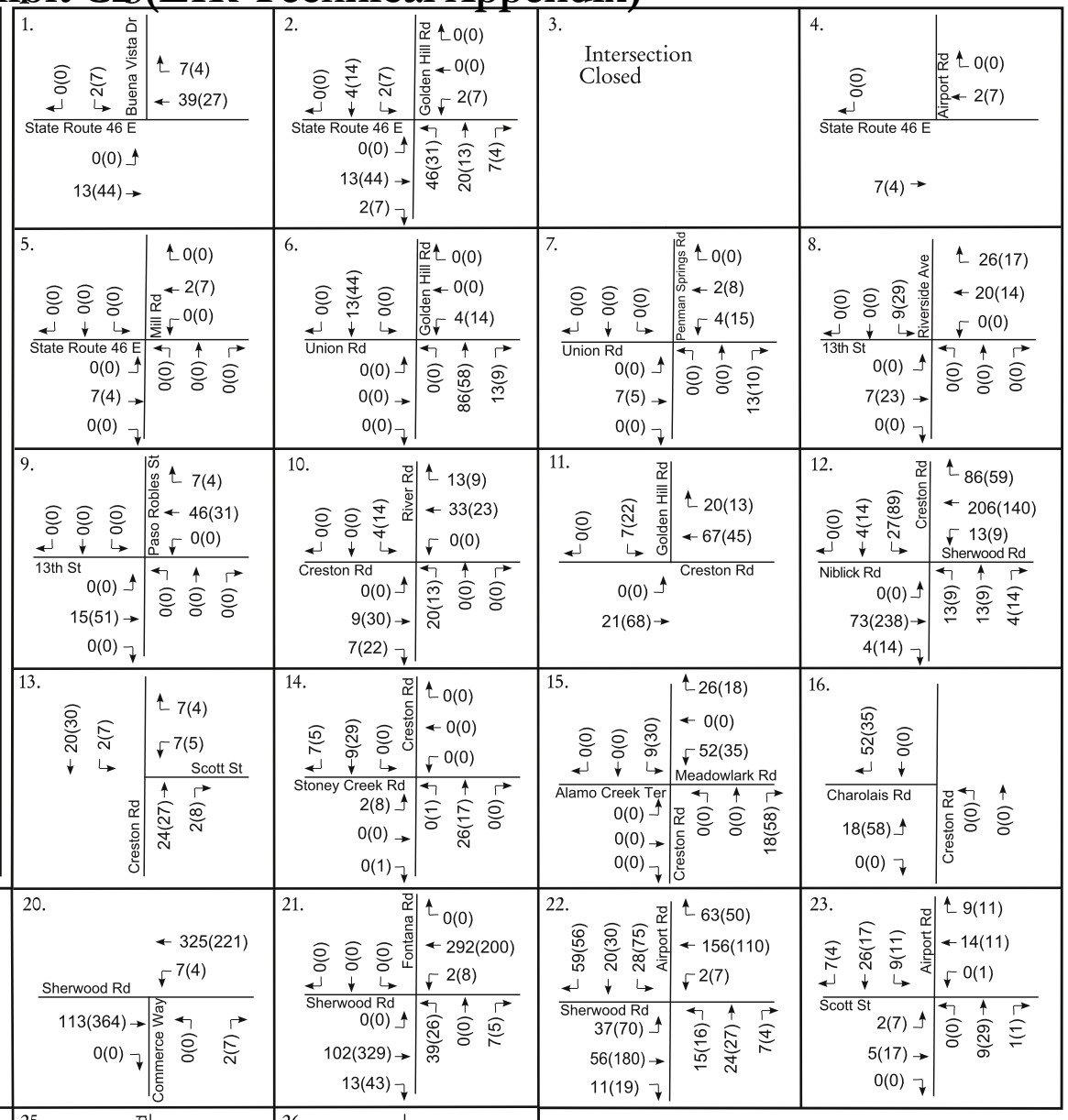
Figure 11a: Cumulative 1,293-Unit Project Trip Assignment (Reso A) - Exhibit C2 (EIR Technical Appendix)





Legend:

(x) - Study Intersection

xx(yy) - AM(PM) Peak Hour Traffic Volumes

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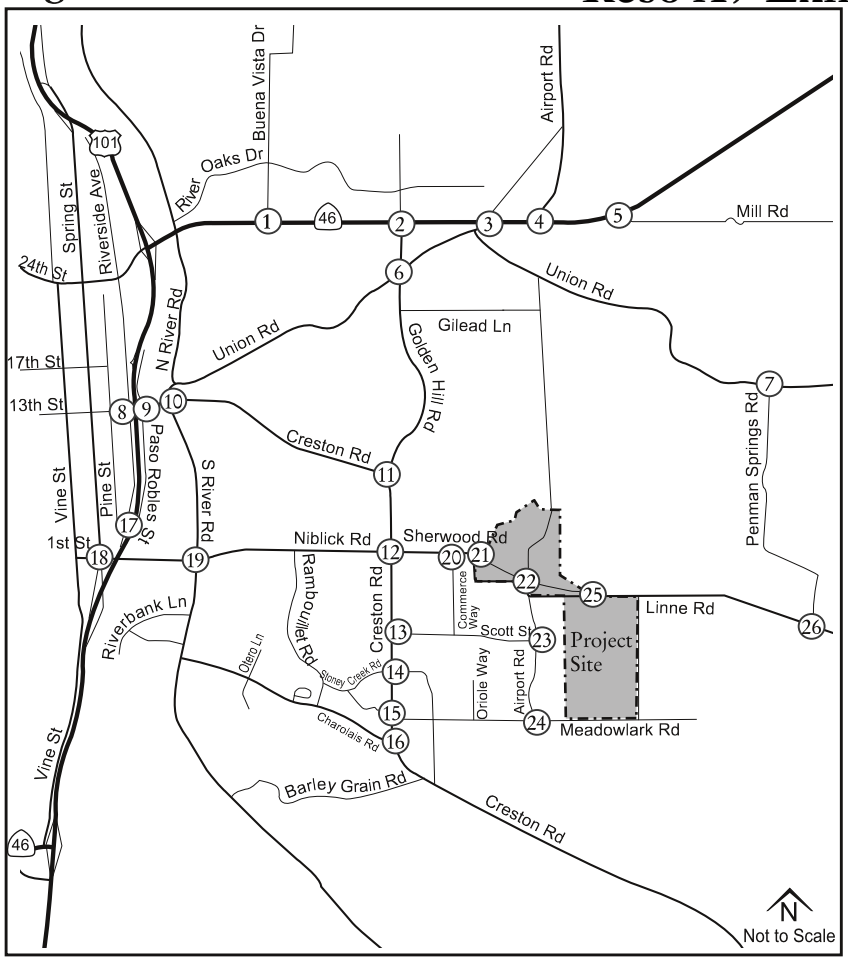
Figure 11b: Cumulative 1,293-Unit Project and School Trip Assignment



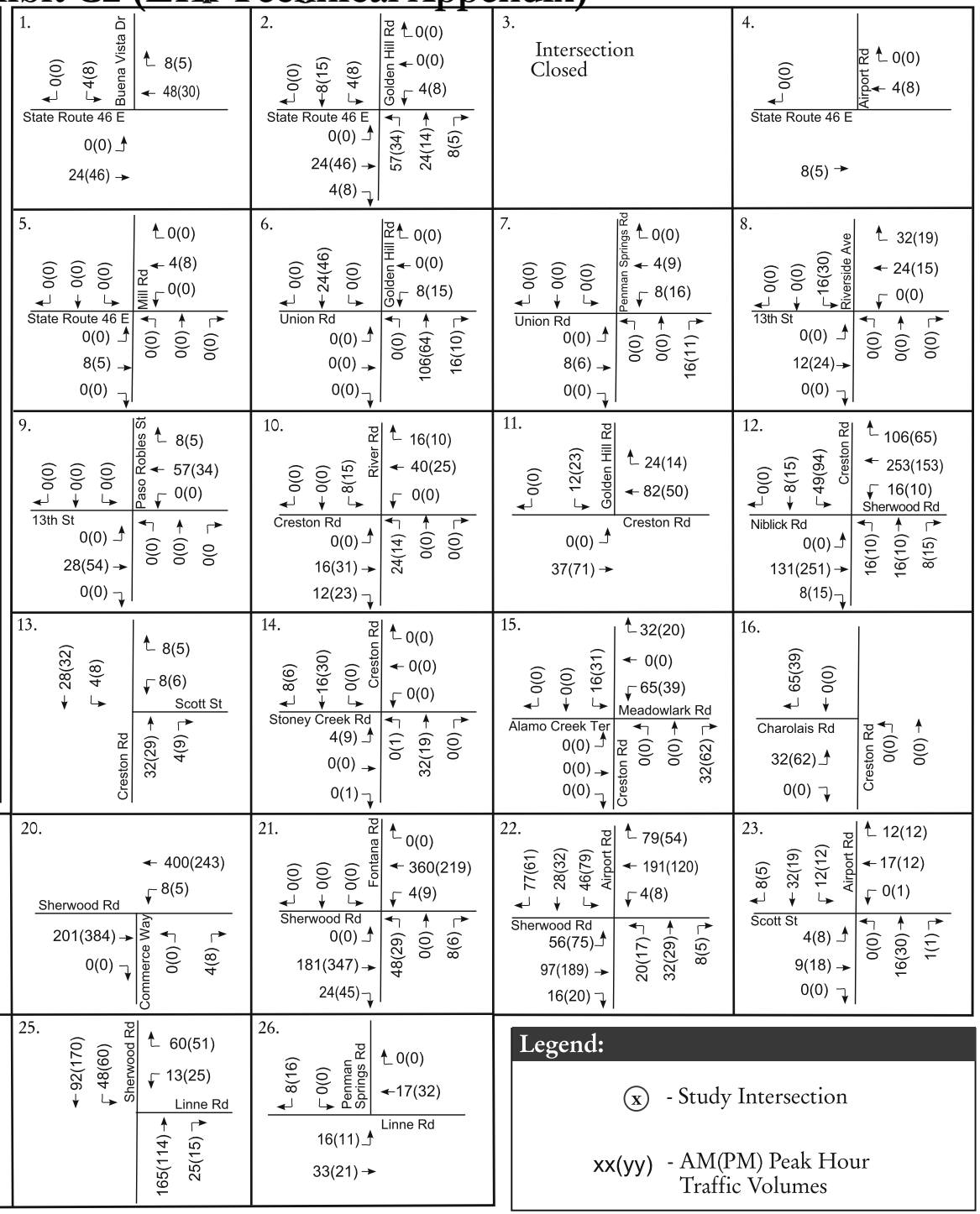


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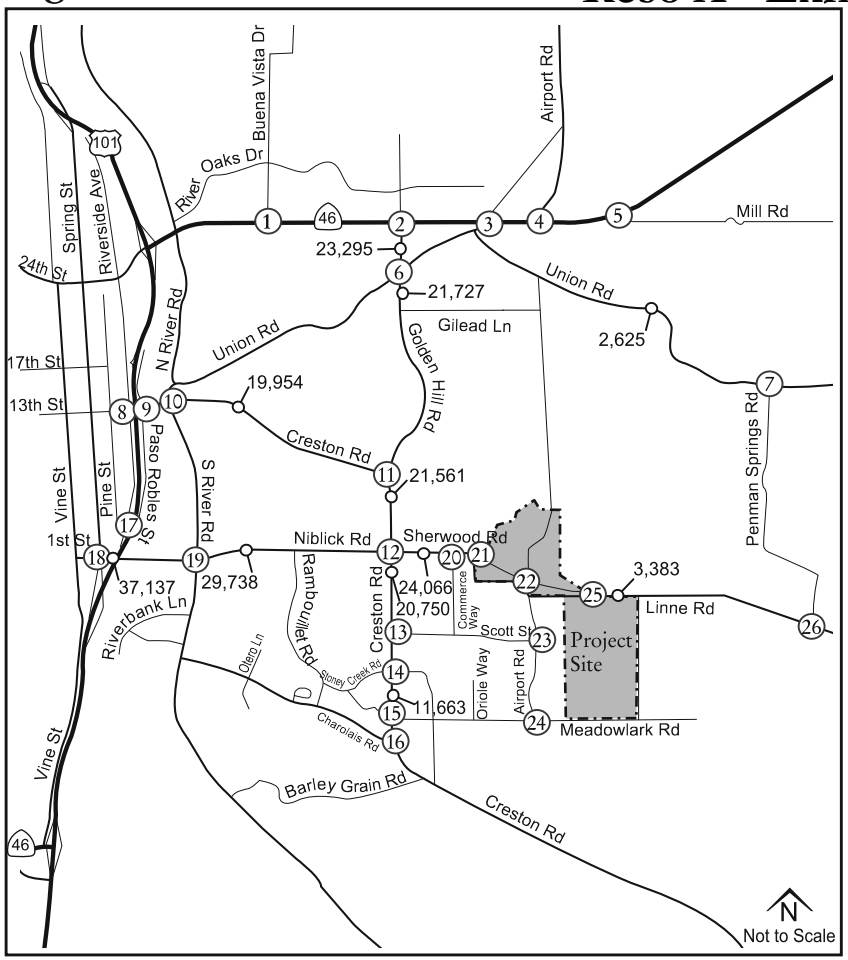
Figure 12a: Cumulative Plus 1,293-Unit Project Traffic Volumes



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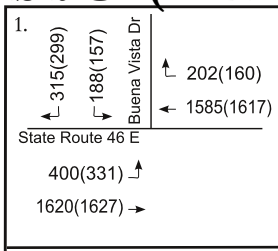

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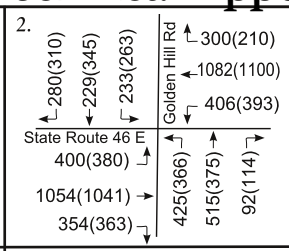

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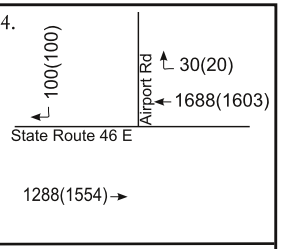

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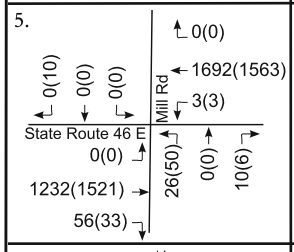

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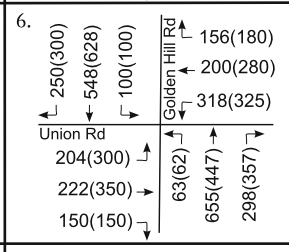

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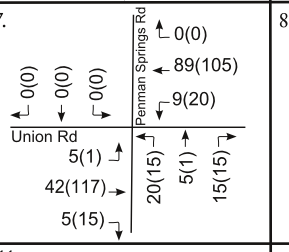

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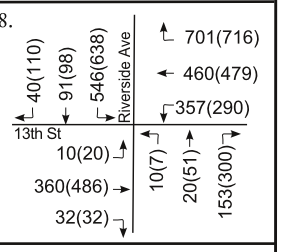

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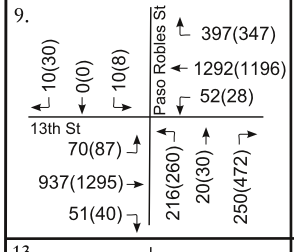

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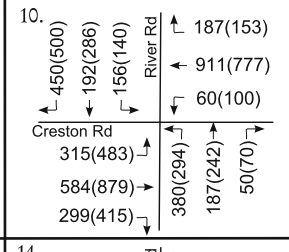

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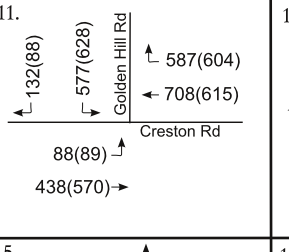

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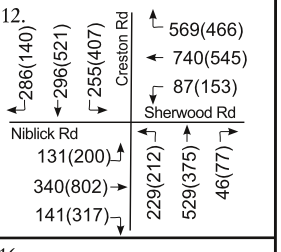

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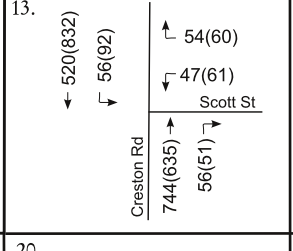

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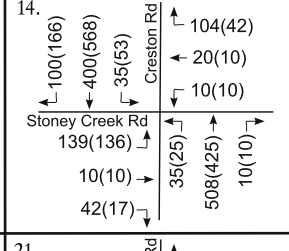

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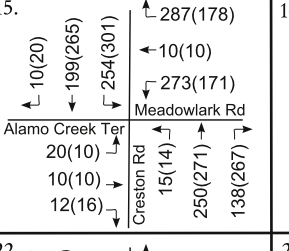

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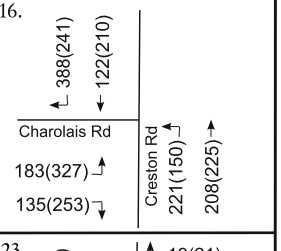

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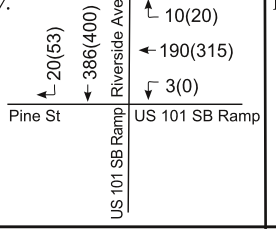

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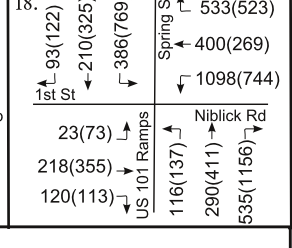

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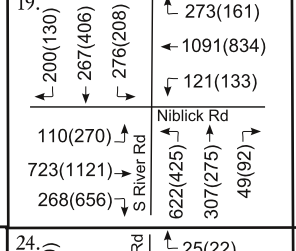

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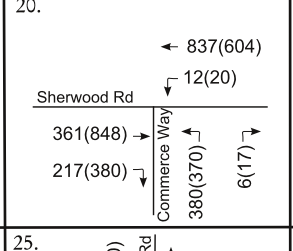

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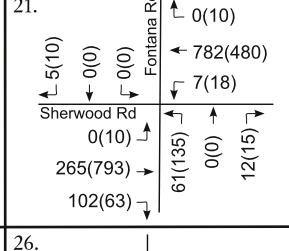

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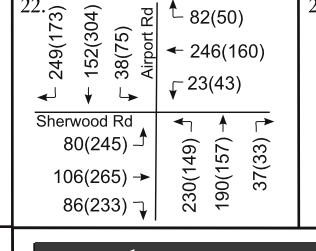

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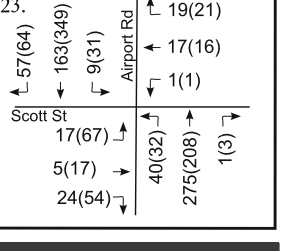

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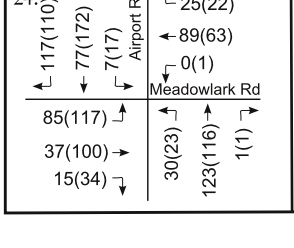

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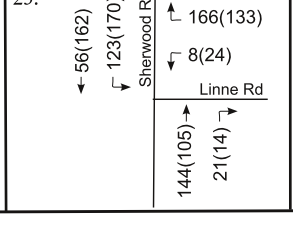

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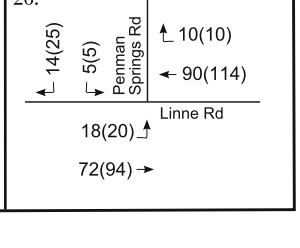

Legend:

o— - Average Daily Traffic Volumes

(x) - Study Intersection

xx(yy) - AM(PM) Peak Hour Traffic Volumes

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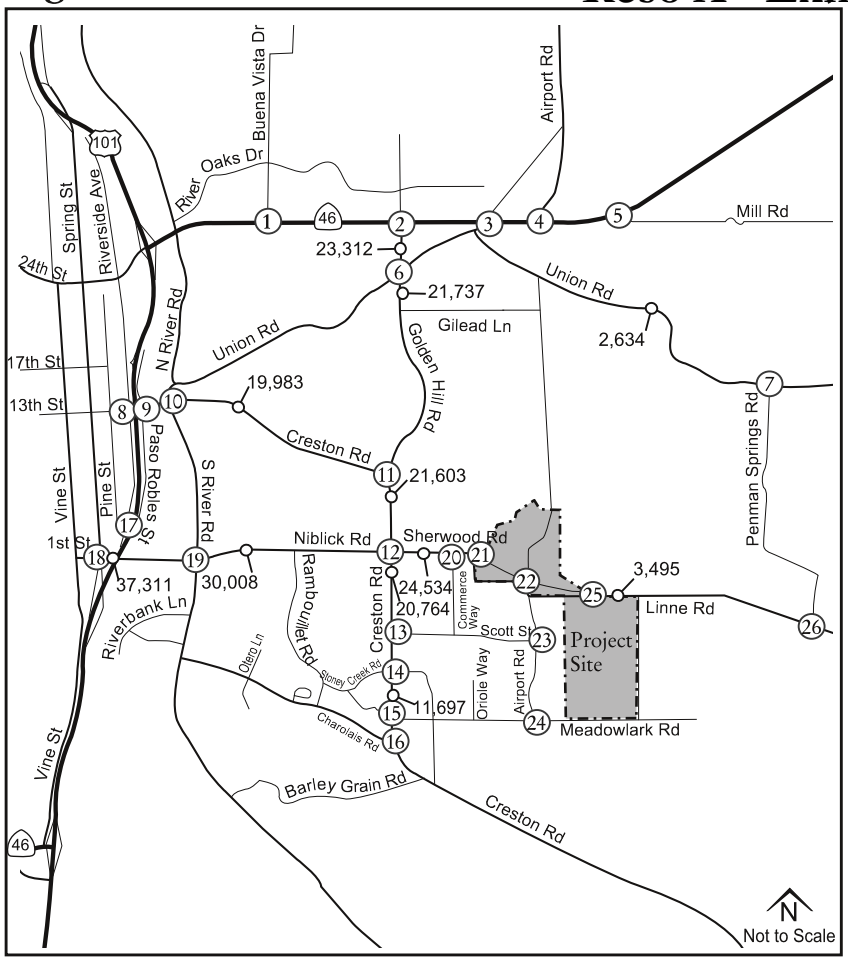
Figure 12b: Cumulative Plus 1,293 Unit Project and School Traffic Volumes

Reso A - Exhibit C2 (EIR Technical Appendix)



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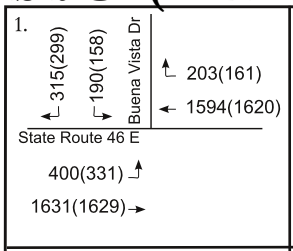

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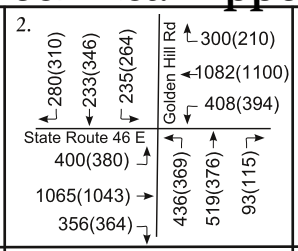

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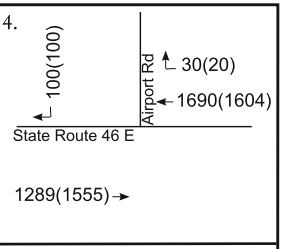

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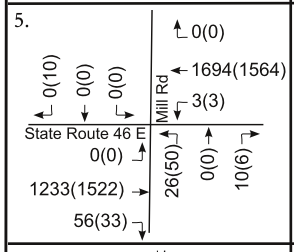

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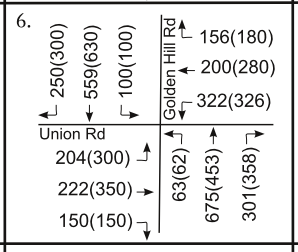

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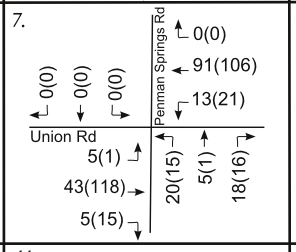

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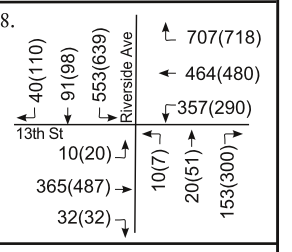

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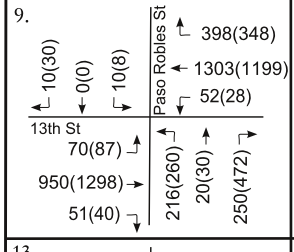

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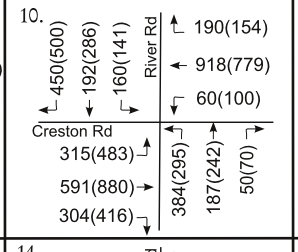

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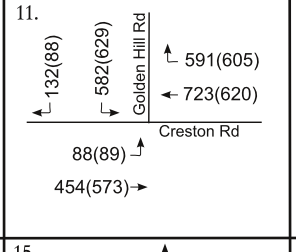

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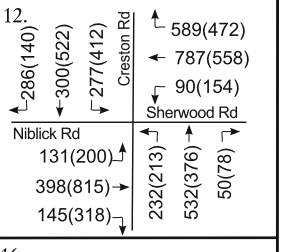

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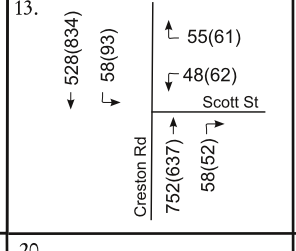

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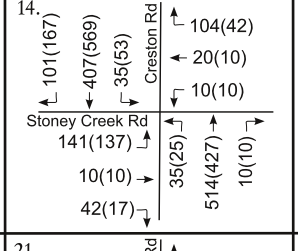

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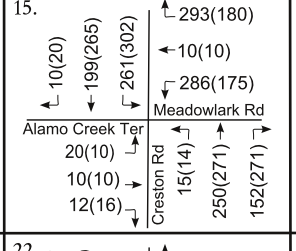

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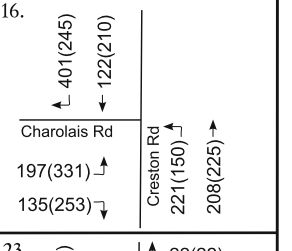

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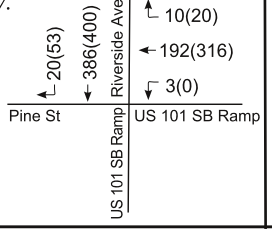

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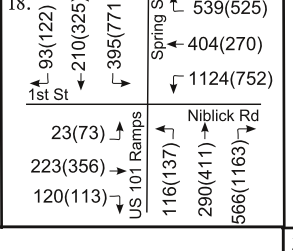

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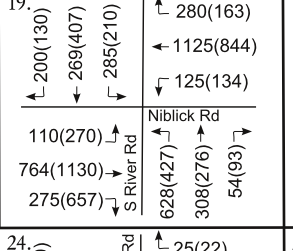

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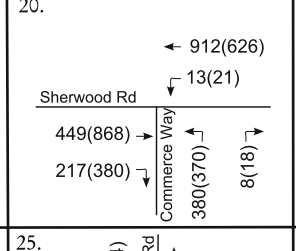

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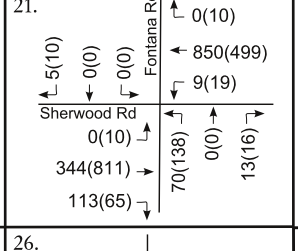

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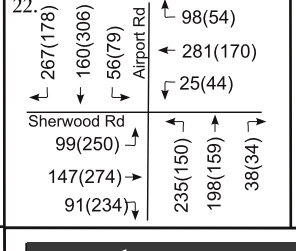

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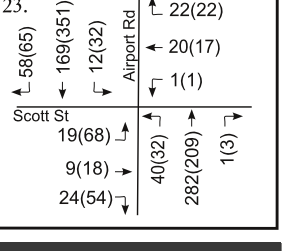

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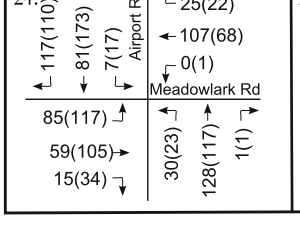

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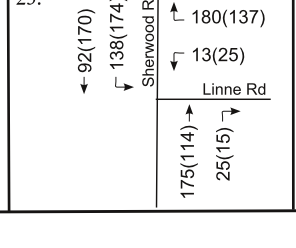

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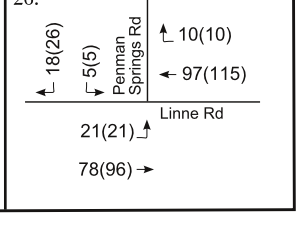

Legend:

o- - Average Daily Traffic Volumes

(x) - Study Intersection

xx(yy) - AM(PM) Peak Hour Traffic Volumes

Central Coast Transportation Consulting
Traffic Engineering & Transportation Planning

CUMULATIVE PLUS PROJECT IMPACT ANALYSIS

1. Intersection Operations

Figures 12a and 12b show the traffic volumes for the study intersections during the weekday peak hours and ADT on the study segments under Cumulative Plus Project conditions.

Table 22 summarizes the intersection operating conditions under Cumulative and Cumulative Plus Project conditions with detailed calculation sheets in **Appendix B** and warrant analysis sheets in **Appendix D**.

Table 22: Cumulative and Cumulative Plus Project Intersection Auto Levels of Service

Cumulative and Cumulative Plus Project Intersection Auto Levels of Service							
Intersection	Peak Hour	Cumulative		CM + 1293		CM + 1293 + School	
		Delay[1]	LOS	Delay[1]	LOS	Delay[1]	LOS
1. SR 46E/Buena Vista Dr	AM	27.7	C	28.8	C	29.2	C
	PM	19.7	B	20.3	C	20.4	C
2. SR 46E/Golden Hill Rd	AM	**77.4**	**E**	**82.4**	**F**	**84.6**	**F**
	PM	**56.7**	**E**	**62.2**	**E**	**62.7**	**E**
3. SR 46E/Union Rd	AM	Intersection closed					
	PM						
4. SR 46E/Airport Rd	AM	**0.9 (28.6)**	**- (D)**	**0.9 (28.6)**	**- (D)**	**0.9 (28.6)**	**- (D)**
	PM	0.8 (24.5)	- (C)	0.8 (24.7)	- (C)	0.8 (24.7)	- (C)
5. SR 46E/Mill Rd	AM	**0.4 (35.3)**	**- (E)**	**0.4 (35.6)**	**- (E)**	**0.4 (35.6)**	**- (E)**
	PM	**1.4 (73.9)**	**- (F)**	**1.4 (75.3)**	**- (F)**	**1.4 (75.3)**	**- (F)**
6. Golden Hill Rd/Union Rd	AM	24.8	C	33.2	D	36.8	E
	PM	29.4	D	38.7	E	39.6	E
7. Penman Springs Rd/Union Rd	AM	2.0 (9.7)	- (A)	2.6 (9.6)	- (A)	2.7 (9.6)	- (A)
	PM	1.1 (10.0)	- (B)	1.6 (10.0)	- (B)	1.7 (10.0)	- (B)
8. 13th St/Riverside Ave	AM	44.6	D	47.7	D	48.7	D
	PM	70.7	E	75.3	E	75.7	E
9. 13th St/Paso Robles St	AM	16.0	B	16.3	B	16.4	B
	PM	27.6	C	28.8	C	28.9	C
10. River Rd/Creston Rd	AM	27.6	C	29.3	C	29.8	C
	PM	27.2	C	28.2	C	28.3	C
11. Creston Rd/Golden Hill Rd	AM	27.5	C	29.3	C	29.7	C
	PM	24.8	C	25.7	C	25.8	C
12. Creston Rd/Niblick Rd	AM	42.3	D	50.3	D	52.4	D
	PM	33.3	C	38.2	D	38.7	D
13. Creston Rd/Scott St	AM	2.7 (38.2)	- (E)	3.7 (49.0)	- (E)	4.0 (52.7)	- (F)
	PM	**6.5 (89.2)**	**- (F)**	**10.4 (141.8)**	**- (F)**	**11.1 (149.3)**	**- (F)**
14. Creston Rd/Stoney Creek Rd	AM	**43.9 (>200)**	**- (F)**	**51.6 (>200)**	**- (F)**	**54.9 (>200)**	**- (F)**
	PM	**14.7 (122.7)**	**- (F)**	**20.3 (170.8)**	**- (F)**	**20.9 (176.2)**	**- (F)**
15. Creston Rd/Meadowlark Rd	AM	**36.7**	**E**	**56.3**	**F**	**64.5**	**F**
	PM	22.7	C	32.1	D	33.1	D
16. Creston Rd/Charolais Rd	AM	7.9 (24.2)	- (C)	9.0 (28.7)	- (D)	10.2 (32.8)	- (D)
	PM	11.4 (26.1)	- (D)	**18.0 (41.4)**	**- (E)**	**18.6 (42.9)**	**- (E)**
17. Riverside Ave/Pine St/US 101 SB Ramp	AM	5.4 (16.4)	- (C)	5.5 (16.6)	- (C)	5.6 (16.6)	- (C)
	PM	**11.9 (28.3)**	**- (D)**	**12.5 (29.3)**	**- (D)**	**12.5 (29.5)**	**- (D)**
18. 1st St-Niblick Rd/Spring St	AM	34.3	C	38.2	D	39.9	D
	PM	45.7	D	50.5	D	50.9	D
19. Niblick Rd/South River Rd	AM	45.5	D	56.9	E	60.0	E
	PM	40.9	D	46.5	D	47.0	D
20. Sherwood Rd/Commerce Way	AM	8.5	A	9.2	A	9.5	A
	PM	9.3	A	15.2	B	16.2	B
21. Sherwood Rd/Fontana Rd	AM	Future intersection		1.0 (13.3)	- (B)	1.0 (14.7)	- (B)
	PM			3.1 (28.6)	- (D)	3.3 (30.6)	- (D)
22. Airport Rd/Sherwood Rd	AM	Future intersection		10.8	B	13.5	B
	PM			25.6	D	28.5	D
23. Airport Rd/Scott St	AM	9.7	A	10.2	B	10.4	B
	PM	11.6	B	13.5	B	13.6	B
24. Airport Rd/Meadowlark Rd	AM	9.5 (13.4)	- (B)	9.2 (16.0)	- (C)	9.2 (17.4)	- (C)
	PM	11.3 (15.3)	- (C)	12.2 (21.0)	- (C)	12.4 (21.5)	- (C)
25. Sherwood Rd/Linne Rd	AM	Future intersection		4.3	A	4.6	A
	PM			4.7	A	4.8	A
26. Penman Springs Rd/Linne Rd	AM	1.1 (9.0)	- (A)	1.5 (9.2)	- (A)	1.6 (9.2)	- (A)
	PM	1.1 (9.1)	- (A)	1.6 (9.3)	- (A)	1.7 (9.3)	- (A)

1. HCM 6th average control delay in seconds per vehicle (HCM 2000 used for Intersections 1, 11 and 17). For side-street-stop controlled intersections the worst approach's delay is reported in parentheses next to the overall intersection delay.
Note: Unacceptable operations (LOS deficiency and/or signal warrants met) shown in bold text.

The following Caltrans intersections operate below the LOS C threshold:

- State Route 46 E/Golden Hill Road (#2): the addition of traffic from either project would increase unacceptable delay at the intersection during the AM and PM peak hours. Installation of a southbound right turn overlap phase and time of day operations would improve intersection operations to at least Cumulative conditions. Eastbound U-turns would need to be prohibited with implementation of a southbound right turn overlap. 285 vehicles make a southbound right turn under existing PM peak hour conditions and intersection operations will benefit. Northbound U-turns are allowed at Golden Hill Road and the commercial project driveway north of SR 46 E. A Project Study Report has been prepared for this area which will ultimately construct an overcrossing east of this location. The full interchange alternative is needed to improve operations at this location which would restrict access at this intersection to right-in, right-out. This improvement is consistent with the City's Circulation Element; however, the improvements are in the Caltrans right-of-way and subject to approval.

  Recommendation: Project makes a fair share contribution through the City's impact fee program for ultimate improvements on SR 46 E consistent with the RTP and other applicable documents.

- State Route 46 E/Airport Road (#4): the intersection would operate with unacceptable delay in the AM peak hour under Cumulative conditions with right-in-right-out operations. The addition of project traffic does not degrade the intersection operations during the AM peak hour. A Project Study Report has been prepared for this area which will ultimately construct an overcrossing at Union Road and restrict left turns on SR 46 E at Union Road and Airport Road. The full interchange alternative is needed to improve operations at this location which would close the intersection. This improvement is consistent with the City's Circulation Element.

  Recommendation: None.

- State Route 46 E/Mill Road (#5): the intersection would operate with unacceptable delay in both peak hours under Cumulative conditions. Restricting the northbound lefts, installing a traffic signal, or implementing grade separation at the intersection would improve operations to at least Cumulative conditions.

  Recommendation: None, traffic signal or grade separation not recommended. Secondary access is recommended if left turns are prohibited.

- Riverside Avenue/Pine Street/US 101 Southbound Ramps (#17): the intersection would operate at LOS D in the PM peak hour under Cumulative conditions with Pine Street west of Riverside Avenue one-way westbound. Although the typical all-way stop control and traffic signal warrants would not be met, the intersection has two legs with equal volumes and would operate at LOS C or better with all-way (southbound and westbound) stop control.

  Recommendation: Install all-way stop control.

The following stop-controlled City intersections operate below LOS D:

- Golden Hill Road/Union Road (#6): the intersection would operate at LOS E during the PM peak hour with the addition of traffic from either project under Cumulative conditions. Cumulative conditions assume the multi-lane roundabout in the City's Circulation Element.

The ultimate lane configuration of the roundabout will depend on access to SR 46 E at Golden Hill Road and Union Road.

Recommendation: Project makes a fair share contribution through the City's impact fee program for a roundabout at this intersection.

- Creston Road/Scott Street (#13): the addition of traffic from either project would worsen unacceptable operations during the PM peak hour, which meets signal warrants with or without the projects. The City's Circulation Element includes a traffic signal at this location. The intersection should be reviewed for coordination with the existing traffic signal located approximately 400' south of Scott Street at Cedarwood Drive.

  Recommendation: Project makes a fair share contribution through the City's impact fee program for installation of a traffic signal.

- Creston Road/Stoney Creek Road (#14): the addition of traffic from either project would worsen unacceptable operations during both peak hours. This intersection meets signal warrants with or without the projects in both peak hours. The City's Circulation Element includes a traffic signal at this location. The bulb-out on the northwest corner is not recommended. The existing dedicated left, through, and right southbound turn lanes are desired for signal operations. The eastbound approach should be restriped with a dedicated left-through and right turn lane consistent with the Circulation Element. The northbound left turn lane storage should be maximized.

  Recommendation: Project makes a fair share contribution through the City's impact fee program for installation of a traffic signal.

- Creston Road/Meadowlark Road (#15): the addition of traffic from either project would worsen unacceptable operations during the AM peak hour, which meets signal warrants with or without the projects. A traffic signal and restriping at this location are consistent with the City's Circulation Element. Storage for the southbound left turn lane should be extended.

  Recommendation: Project makes a fair share contribution through the City's impact fee program for installation of a traffic signal.

- Creston Road/Charolais Road (#16): the intersection would operate at LOS E during the PM peak with the addition of traffic from either project and would meet signal warrants. However, the intersection operates at LOS C in both peak hours with the installation of all-way stop control. Where traffic signals are warranted, all-way stop control is an interim measure.

  Recommendation: Install all-way stop control with either project.

2. Queues

Table 23 summarizes the vehicular queuing under Cumulative and Cumulative Plus Project conditions.

Table 23: Cumulative and Cumulative Plus Project Queues

Cumulative and Cumulative Plus Project Queues						
				95th Percentile Queues (ft)[1]		
Intersection	Movement	Storage Length (ft)	Peak Hour	Cumulative	Cumulative + 1293	Cumulative + 1293 + School
1. SR 46E/Buena Vista Dr	EBL[2]	345	AM	298	298	298
			PM	223	224	225
2. SR 46E/Golden Hill Rd	NBL	160	AM	**#382**	**#446**	**#461**
			PM	**#289**	**#330**	**#334**
	SBL	140	AM	**192**	**193**	**194**
			PM	**200**	**205**	**206**
	EBL[2]	225	AM	**#434**	**#434**	**#434**
			PM	**#372**	**#372**	**#372**
	WBL[2]	125	AM	**#439**	**#441**	**#445**
			PM	**#360**	**#388**	**#390**
3. SR 46E/Union Rd	Intersection closed					
4. SR 46E/Airport Rd	Intersection is right-in-right-out under Cumulative Conditions					
5. SR 46E/Mill Rd	WBL[2]	305	AM	0	0	0
			PM	0	0	0
6. Golden Hill Rd/Union Rd	Intersection is a roundabout under Cumulative Conditions					
8. 13th St/Riverside Ave	WBL	125	AM	**#419**	**#419**	**#419**
			PM	**#358**	**#358**	**#358**
	WBT	295	AM	**376**	**398**	**403**
			PM	**445**	**463**	**464**
9. 13th St/Paso Robles St	NBL	130	AM	**228**	**228**	**228**
			PM	**246**	**246**	**246**
	NBR	110	AM	95	97	99
			PM	**#415**	**#418**	**#418**
	EBL	120	AM	98	98	98
			PM	**#122**	**#122**	**#122**
	EBT	295	AM	**305**	**312**	**318**
			PM	**490**	**522**	**524**
10. River Rd/Creston Rd	NBL	140	AM	**#229**	**#249**	**#253**
			PM	**#175**	**#187**	**#189**
	SBL	225	AM	#222	**#230**	**#240**
			PM	#177	#204	#207
11. Creston Rd/Golden Hill Rd	EBL	125	AM	**#183**	**#183**	**#183**
			PM	**#168**	**#168**	**#168**
12. Creston Rd/Niblick Rd	NBL	230	AM	**#277**	**#303**	**#309**
			PM	**239**	**252**	**254**
	SBL	245	AM	139	154	#175
			PM	171	219	221
	EBL	150	AM	**#190**	**#190**	**#190**
			PM	**239**	**241**	**241**
	WBL	170	AM	110	127	130
			PM	**183**	**195**	**196**
13. Creston Rd/Scott St	SBL	60	AM	5	8	8
			PM	8	10	10
18. 1st St-Niblick Rd/Spring St	NBL	165	AM	**189**	**189**	**189**
			PM	**207**	**207**	**207**
	NBR	290	AM	75	86	94
			PM	**317**	**431**	**#442**
	SBL	305	AM	256	264	270
			PM	**444**	**#496**	**#498**
19. Niblick Rd/South River Rd	NBL	150	AM	**#398**	**#424**	**#430**
			PM	**#235**	**#251**	**#253**
	SBL	110	AM	**#373**	**#396**	**#415**
			PM	**209**	**#283**	**#287**
	EBL	140	AM	#104	#104	#104
			PM	**#170**	**#170**	**#170**
	WBL	80	AM	**145**	**#188**	**#196**
			PM	**#177**	**#206**	**#208**
20. Sherwood Rd/Commerce Way	WBL	75	AM	7	12	13
			PM	14	23	24
24. Airport Rd/Meadowlark Rd	SBL	50	AM	0	3	3
			PM	3	5	5

1. Queue length that would not be exceeded 95 percent of the time.
2. Deceleration length of 530 feet has been subtracted from the storage length per the HDM for 60 mph design speed.
# indicates that 95th percentile volume exceeds capacity, queue may be longer.
Bold indicates queue length longer than storage length.

The following queue deficiencies at City intersections are noted:

- 13th Street/Riverside Avenue (#8): the westbound left turn and through movement queue lengths would further exceed storage during both peak hours with the addition of traffic from either project. Bridge widening at this location is not included in the City's Circulation Element and any widening in this location is unlikely; signal timing should be coordinated and optimized. With retiming and overlaps, queues would improve to no project levels. The City's Circulation Element accepts that this location will reach capacity.

  Recommendation: Review, coordinate, and optimize traffic signal operations. Add westbound right and northbound right turn overlap phases.

- 13th Street/Paso Robles Street (#9): the northbound and eastbound queue lengths would further exceed storage length during at least one peak hour with the addition of traffic from either project. Bridge widening at this location is not included in the City's Circulation Element and any widening in this location is unlikely; signal timing should be reviewed, coordinated, and optimized. If parking is removed on the east side of Paso Robles Street north of 12th Street the northbound right turn lane could be extended. With retiming and overlaps, queues would improve to no project levels. The City's Circulation Element accepts that this location will reach capacity.

  Recommendation: Review, coordinate, and optimize traffic signal operations.

- River Road/Creston Road (#10): the northbound and southbound left turn queue lengths would further exceed storage during both peak hours with the addition of traffic from either project. Bridge widening at this location is not included in the City's Circulation Element; signal timing should be reviewed, coordinated, and optimized. The intersection would benefit from restriping of the southbound lanes to a dedicated left, through, and right turn lane. With retiming and restriping, queues could be accommodated in the existing bay taper. The City's Circulation Element accepts that this location will reach capacity.

  Recommendation: Review, coordinate, and optimize traffic signal operations.

- Creston Road/Golden Hill Road (#11): the eastbound left turn queue length exceeds storage under Cumulative conditions. The addition of project traffic does not degrade the intersection operations. The intersection would benefit from a dedicated westbound right turn lane.

  Recommendation: None.

- Creston Road/Niblick Road (#12): the northbound, westbound, and eastbound left turn queue length exceeds storage in at least one peak hour under Cumulative conditions with the proposed widening included in the City's Circulation Element. The left turn queues could be accommodated in the existing two-way left turn lane and bay taper storage.

  Recommendation: None. Available storage in the existing two-way left turn lanes.

- 1st Street-Niblick Road/Spring Street (#18): the southbound left turn and northbound right and left turn queue lengths would further exceed the storage length during the PM peak hour under Cumulative conditions. No feasible mitigation has been identified to return queues to no project levels. The City's Circulation Element includes corridor improvements on Niblick Road and Spring Street.

Recommendation: Project makes a fair share contribution through the City's impact fee program for corridor improvements.

- Niblick Road/South River Road (#19): all left turn lengths would exceed storage in one or more peak hours under Cumulative conditions. No feasible mitigation has been identified to return queues to no project levels. The City's Circulation Element includes widening at this intersection and corridor improvements. The intersection would benefit from additional westbound left turn lane storage, additional right turn lanes, and right turn overlap phasing.

  Recommendation: Project makes a fair share contribution through the City's impact fee program for improvements at this intersection.

Summary of Intersection Mitigations

Table 24 summarizes the required mitigation under either project.

Table 24: Cumulative Mitigations

Cumulative Mitigations							
			No	School		Cir. Elem.	Responsible
Intersection	Impact	Mitigation	Project	No[1]	Yes	and TIF[2]	Agency
2. SR 46 E/Golden Hill Rd[3]	LOS	Optimize traffic signal, SBR overlap	X	X	X	Yes	Caltrans
8. 13th St/Riverside Ave	Queue	Optimize corridor operations, WBR and NBR overlap	X	X	X	No	City
9. 13th St/Paso Robles St	Queue	Optimize corridor operations	X	X	X	No	City
10. River Rd/Creston Rd	Queue	Optimize corridor operations	X	X	X	No	City
13. Creston Rd/Scott St	LOS	Install traffic signal	X	X	X	Yes	City
14. Creston Rd/Stoney Creek Rd	LOS	Install traffic signal	X	X	X	Yes	City
15. Creston Rd/Meadowlark Rd	LOS	Install traffic signal	X	X	X	Yes	City
16. Creston Rd/Charolais Rd	LOS	Install all-way stop	-	X	X	No	City
17. Riverside Ave/Pine St/ US 101 SB Ramp	LOS	Install all-way stop	X	X	X	No	Caltrans
18. 1st St-Niblick Rd/Spring St	Queue	Optimize corridor operations, corridor improvements	X	X	X	Yes	City
19. Niblick Rd/South River Rd	Queue	Optimize corridor operations, corridor improvements	X	X	X	Yes	City

X - Mitigation required.
1. All intersection improvements are warranted with Phase 1 of the project.
2. Intersection improvements are included in the Paso Robles Circulation Element and Traffic Impact Fee (TIF).
3. The Paso Robles Circulation Element includes improvements on State Route 46 East and in the vicinity between Buena Vista Drive and Dry Creek Road. Recommend project make a fair share contribution through the City's impact fee program for ultimate improvements on SR 46 E consistent with the RTP and other applicable documents. Ultimate improvements will be determined in the project documents.

3. Roadway Segment Operations

Table 25 shows the Cumulative and Cumulative Plus Project capacity utilization and LOS for the roadway study segments.

Table 25: Cumulative and Cumulative Plus Project Roadway Segment Operations

Cumulative and Cumulative Plus Project Roadway Segment Operations													
					Cumulative			CM + 1293			CM + 1293 + School		
Street	ID	Segment	Facility Type	Lanes	ADT	LOS	Capacity Utilization	ADT	LOS	Capacity Utilization	ADT	LOS	Capacity Utilization
Union Road	1	Priska Drive to Kit Fox Lane	Arterial	2	2,500	C	14%	2,625	C	15%	2,634	C	15%
Creston Road	2	East of Ferro Lane	Arterial	2*	19,200	D	88%	19,954	D	92%	19,983	D	92%
	3	East of Golden Hill Road	Arterial	4	20,100	A	54%	21,561	A	58%	21,603	A	58%
	4	South of Niblick Road	Arterial	4	20,300	A	54%	20,750	A	55%	20,764	A	56%
	5	North of Meadowlark Road	Arterial	4	11,200	A	30%	11,663	A	31%	11,697	A	31%
Golden Hill Road	6	South of Union Road	Arterial	4	20,400	A	55%	21,727	A	58%	21,737	A	58%
	7	North of Union Road	Arterial	4	22,200	B	59%	23,295	B	62%	23,312	B	62%
Niblick Road	8	East of Spring Street	Arterial	4	34,300	D	92%	37,137	E	99%	37,311	E	100%
	9	East of Quarterhorse	Arterial	4	26,200	C	70%	29,738	D	80%	30,008	D	80%
Sherwood Road	10	East of Creston Road	Arterial	4	18,200	A	49%	24,066	B	64%	24,534	B	66%
Linne Road	11	Poppy Lane to Hanson Road	Arterial	2	2,000	C	11%	3,383	C	19%	3,495	C	20%

* Note that an asterisk (*) indicates the prescence of a raised median or two-way left-turn lane on a two-lane arterial.
Source: City of Paso Robles General Plan Circulation Element, 2011; CCTC, 2019.

The following roadway segments operate above 90% capacity utilization:

- Niblick Road (east of Spring Street): This segment operates at 92% capacity under Cumulative conditions. With the addition of traffic from either project, the capacity utilization would increase but remain at or below 100%. The projected capacity utilization of 100% on Niblick Road does not justify the widening of this roadway per the City's Circulation Element. Widening the bridge to a six-lane arterial would result in a capacity utilization below 70%, which would reduce vehicle delays, but would also support higher vehicle speeds and would conflict with the City's multimodal goals and desire to maintain its small-town character.

  Recommendation: None. Maximize signal operations along corridor.

- Creston Road (east of Ferro Lane): This segment would operate at 88% capacity under Cumulative conditions. With the addition of traffic from either project, the capacity utilization would increase above 90% but remain at or below 100%. The projected capacity utilization of 92% does not justify widening per the City's multimodal goals. Corridor improvements including a center left turn lane and bike lanes have been adopted by the City.

  Recommendation: None. Maximize signal operations along corridor.

4. Freeway Segment Operations

Table 26 shows the Cumulative and Cumulative Plus Project peak hour volumes at the freeway mainline and ramp locations and **Table 27** shows the LOS, with calculation sheets in **Appendix C**.

Table 26: US 101 Cumulative and Cumulative Plus Project Peak Hour Volumes

US 101 Cumulative and Cumulative Plus Project Peak Hour Volumes					
Direction	Segment ID	Location	Cumulative	Cumulative + 1293	Cumulative + 1293 + School
US 101 NB	1	SR 46W Off Ramp	300 (300)	300 (300)	300 (300)
	2	SR 46W On Ramp	571 (1017)	582 (1054)	591 (1056)
	3	Mainline North of SR 46W	2857 (4092)	2895 (4217)	2926 (4224)
	4	Spring St. Off Ramp	903 (1579)	941 (1704)	972 (1711)
	5	Paso Robles St. Off Ramp	423 (734)	423 (734)	423 (734)
	6	Paso Robles St. On Ramp	480 (460)	487 (464)	488 (465)
	7	Mainline South of SR 46E	2011 (2239)	2018 (2243)	2019 (2244)
	8	SR 46E Off Ramp	1164 (1239)	1164 (1239)	1164 (1239)
	9	SR 46E On Ramp	345 (330)	358 (339)	361 (340)
	10	Mainline North of SR 46E	1192 (1330)	1212 (1343)	1216 (1345)
US 101 SB	11	Mainline North of SR 46E	1115 (1791)	1121 (1812)	1127 (1814)
	12	SR 46E Off Ramp	326 (434)	330 (448)	334 (449)
	13	SR 46E to Riverside/17th St. Weave On	1167 (1298)	1167 (1298)	1167 (1298)
	14	SR 46E to Riverside/17th St. Weave Off	285 (396)	285 (396)	285 (396)
	15	Mainline South of SR 46E	1671 (2259)	1673 (2266)	1675 (2267)
	16	Riverside/17th St. On Ramp	390 (268)	390 (268)	390 (268)
	17	Riverside/Pine St. Off Ramp	201 (328)	203 (335)	205 (336)
	18	Spring St. On Ramp	1316 (1106)	1428 (1182)	1454 (1190)
	19	Mainline North of SR 46W	3565 (3705)	3677 (3781)	3703 (3789)
	20	SR 46W Off Ramp	692 (703)	725 (726)	732 (728)
	21	SR 46W On Ramp	200 (300)	200 (300)	200 (300)
AM (PM) Peak Hour Volumes					

Table 27: Cumulative and Cumulative Plus Project Freeway Operations

Cumulative and Cumulative Plus Project Freeway Operations									
				Cumulative		CM + 1293		CM + 1293 + School	
Direction	Location	Segment Type	Peak Hour	Density[1]	LOS	Density[1]	LOS	Density[1]	LOS
US 101 NB	SR 46W Off Ramp	Diverge	AM	27.7	C	28.0	C	**28.2**	**D**
			PM	**32.9**	**D**	**33.7**	**D**	**33.8**	**D**
	SR 46W On Ramp	Merge	AM	**28.6**	**D**	**28.9**	**D**	**29.2**	**D**
			PM	**36.9**	**E**	**v/c > 1**	**F**	**v/c > 1**	**F**
	North of SR 46W	Mainline	AM	25.7	C	**26.2**	**D**	**26.6**	**D**
			PM	**42.1**	**E**	**v/c > 1**	**F**	**v/c > 1**	**F**
	Spring St Off Ramp	Diverge	AM	**32.8**	**D**	**33.2**	**D**	**33.6**	**D**
			PM	**v/c > 1**	**F**	**v/c > 1**	**F**	**v/c > 1**	**F**
	Paso Robles St Off Ramp	Diverge	AM	21.1	C	21.1	C	21.1	C
			PM	24.7	C	24.7	C	24.7	C
	Paso Robles St On Ramp	Merge	AM	20.5	C	20.6	C	20.6	C
			PM	21.3	C	21.3	C	21.3	C
	South of SR 46E	Mainline	AM	17.1	B	17.1	B	17.1	B
			PM	17.5	B	17.6	B	17.6	B
	SR 46E Off Ramp	Diverge	AM	22.1	C	22.2	C	22.2	C
			PM	22.7	C	22.7	C	22.7	C
	SR 46E On Ramp	Merge	AM	14.5	B	14.7	B	14.7	B
			PM	15.2	B	15.3	B	15.3	B
	North of SR 46E	Mainline	AM	11.0	A	11.2	B	11.3	B
			PM	11.7	B	11.8	B	11.8	B
US 101 SB	North of SR 46E	Mainline	AM	10.6	A	10.6	A	10.7	A
			PM	17.2	B	17.4	B	17.5	B
	SR 46E Off Ramp	Diverge	AM	15.0	B	15.1	B	15.1	B
			PM	22.7	C	22.9	C	22.9	C
	SR 46E to Riverside/17th St[2]	Weave	AM	-	B	-	B	-	B
			PM	-	C	-	C	-	C
	South of SR 46E	Mainline	AM	14.3	B	14.4	B	14.4	B
			PM	19.1	C	19.2	C	19.2	C
	Riverside/17th St On Ramp	Merge	AM	21.7	C	21.8	C	21.8	C
			PM	25.7	C	25.7	C	25.7	C
	Riverside/Pine St Off Ramp	Diverge	AM	22.9	C	22.9	C	22.9	C
			PM	27.1	C	27.1	C	27.1	C
	Spring St On Ramp	Merge	AM	27.9	C	**28.7**	**D**	**28.9**	**D**
			PM	**28.8**	**D**	**29.4**	**D**	**29.5**	**D**
	North of SR 46W	Mainline	AM	**37.4**	**E**	**39.8**	**E**	**40.5**	**E**
			PM	**39.0**	**E**	**40.7**	**E**	**40.9**	**E**
	SR 46W Off Ramp	Diverge	AM	**37.6**	**E**	**38.7**	**E**	**38.9**	**E**
			PM	**38.3**	**E**	**39.0**	**E**	**39.1**	**E**
	SR 46W On Ramp	Merge	AM	**31.0**	**D**	**31.7**	**D**	**31.9**	**D**
			PM	**32.4**	**D**	**32.9**	**D**	**32.9**	**D**

1. HCM 6 density (passenger cars per mile per lane).
2. The Leisch method used for weave section analysis does not report density.
Note: Unacceptable operations shown in **bold** text.

The addition of traffic from either project would worsen operations at the eight freeway segments operating at unacceptable LOS. No additional freeway segments would operate unacceptably. The addition of project traffic increases density by less than four passenger cars per mile per lane at the unacceptable locations within capacity and increases V/C by 0.03 or less at the unacceptable locations that exceed capacity.

Recommendation: Development of mitigation measures and recommendations will require Caltrans coordination. See below for additional discussion on the findings and recommendations.

Summary of Freeway Operations and Recommendations

A summary of freeway segments operating at LOS D or worse is shown in **Table 28**.

Table 28: Summary of Freeway Operations

Summary of Freeway Operations									
Direction	Location	Segment Type	Peak Hour	Existing	Ex. + Proj.	Near Term	NT + Proj.	Cumu-lative	CM + Proj.
US 101 NB	SR 46W Off Ramp	Diverge	AM	-	-	-	-	-	D
			PM	-	-	D	D	D	D
	SR 46W On Ramp	Merge	AM	-	-	-	-	D	D
			PM	D	D	D	D	E	F
	North of SR 46W	Mainline	AM	-	-	-	-	-	D
			PM	D	D	D	E	E	F
	Spring St. Off Ramp	Diverge	AM	-	-	D	D	D	D
			PM	D	D	E	E	F	F
US 101 SB	Spring St. On Ramp	Merge	AM	-	-	-	-	-	D
			PM	-	-	-	-	D	D
	North of SR 46W	Mainline	AM	D	D	D	E	E	E
			PM	D	D	D	D	E	E
	SR 46W Off Ramp	Diverge	AM	D	D	E	E	E	E
			PM	D	D	E	E	E	E
	SR 46W On Ramp	Merge	AM	-	D	D	D	D	D
			PM	-	D	D	D	D	D

Note: Segments operating acceptably are not shown in table.

Widening the mainline to a six-lane facility between Spring Street and Main Street would improve mainline and ramp operations to LOS C or better for all segments except the US 101 NB Spring Street off-ramp with or without the proposed project under Near Term or Cumulative conditions. An additional lane at the US 101 NB Spring Street off-ramp is needed under Near Term and Cumulative conditions for acceptable operations. However, widening to a six-lane facility has not been identified in SLOCOG or Caltrans studies.

The US 101 Corridor Mobility Study identified LOS D-E for the northbound segments and LOS D for the southbound off-ramp diverge under 2035 conditions; however, no improvements were identified.

The US 101 Transportation Concept Report for this segment found that in the year 2035, demand is projected to exceed capacity in both the northbound and southbound directions between the urbanized area of Atascadero and south of the Paso Robles urban boundary. The report identifies the following improvement options:

- Interchange improvements
- Parallel route development
- Ramp and auxiliary lane improvements
- Enhanced transit and rail service
- Transportation Demand Management (TDM)
- Transportation System Management (TSM)

The SLOCOG Regional Transportation Plan identifies a future SR 46 Urban Multi-Modal Corridor Study for this area.

Development of mitigation measures and recommendations will require Caltrans coordination. Ramp improvements or metering may be an alternative in addition to Transportation Demand Management (TDM) and Transportation System Management (TSM) strategies.

Reso A - Exhibit C2 (EIR Technical Appendix)

References

California Department of Transportation. 2002. Guide for the Preparation of Traffic Impact Studies.

_____. 2008. US Highway 101/State Route 46 West Interchange Modification Project Initial Study with Proposed Mitigated Negative Declaration/Environmental Assessment.

_____. 2012, 2018. Highway Design Manual.

_____. 2014, Revision 4. California Manual on Uniform Traffic Control Devices.

California Department of Transportation, District 5. 2009. State Route 46 Corridor System Management Plan.

_____. 2014. US Highway 101 Transportation Concept Report.

City of El Paso De Robles. 2017. Bicycle & Pedestrian Master Plan.

_____. 2018. General Plan Circulation Element.

_____. 2013. Transportation Impact Analysis Guidelines.

Fehr & Peers. 2008. Final SR 46E Parallel Routes Study.

Hatch Mott MacDonald. 2012. Highway 46 PSR- Traffic Operations Analysis.

Institute of Transportation Engineers (ITE). 2017. Trip Generation Handbook, 3rd Edition.

_____. 2017. Trip Generation Manual, 10th Edition.

San Luis Obispo Council of Governments (SLOCOG). 2014. Regional Transportation Plan/Sustainable Communities Strategy.

_____. 2014. US 101 Corridor Mobility Master Plan.

Transportation Research Board. 2017. Highway Capacity Manual, 6th Edition.

Appendix A: Traffic Counts

Intersection Turning Movement Counts

Reso A - Exhibit C2 (EIR Technical Appendix)

Turning Movement Report

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Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION SR46 @ Buena Vista Dr **LATITUDE** 35.6446

COUNTY San Luis Obispo **LONGITUDE** -120.6722

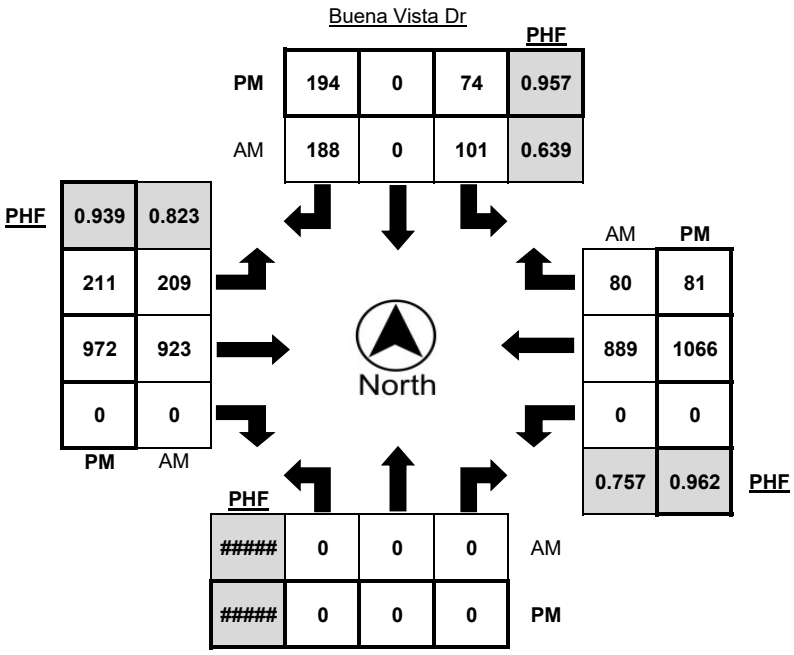
COLLECTION DATE Tuesday, October 23, 2018 **WEATHER** Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	0	0	0	0	5	0	22	0	18	147	0	21	0	178	7	26
7:15 AM - 7:30 AM	0	0	0	0	15	0	28	0	21	181	0	27	0	197	12	22
7:30 AM - 7:45 AM	0	0	0	0	15	0	27	1	34	171	0	26	0	215	19	23
7:45 AM - 8:00 AM	0	0	0	0	27	0	70	3	67	277	0	27	0	300	20	63
8:00 AM - 8:15 AM	0	0	0	0	53	0	60	4	62	243	0	41	0	191	24	34
8:15 AM - 8:30 AM	0	0	0	0	6	0	31	0	46	232	0	28	0	183	17	22
8:30 AM - 8:45 AM	0	0	0	0	13	0	33	1	38	200	0	30	0	170	11	33
8:45 AM - 9:00 AM	0	0	0	0	13	0	25	2	63	205	0	36	0	161	22	37
TOTAL	**0**	**0**	**0**	**0**	**147**	**0**	**296**	**11**	**349**	**1656**	**0**	**236**	**0**	**1595**	**132**	**260**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
2:00 PM - 2:15 PM	0	0	0	0	11	0	40	1	39	220	0	33	0	262	26	24
2:15 PM - 2:30 PM	0	0	0	0	7	0	32	0	42	197	0	26	0	243	34	25
2:30 PM - 2:45 PM	0	0	0	0	36	0	39	3	39	240	0	44	0	233	34	24
2:45 PM - 3:00 PM	0	0	0	0	38	0	64	2	35	241	0	29	0	230	11	16
3:00 PM - 3:15 PM	0	0	0	0	19	0	43	1	33	231	0	25	0	227	9	27
3:15 PM - 3:30 PM	0	0	0	0	18	0	46	1	34	249	0	39	0	258	13	36
3:30 PM - 3:45 PM	0	0	0	0	14	0	52	1	39	240	0	24	0	285	12	24
3:45 PM - 4:00 PM	0	0	0	0	17	0	46	2	35	256	0	33	0	256	16	12
4:00 PM - 4:15 PM	0	0	0	0	15	0	55	3	62	225	0	26	0	261	24	21
4:15 PM - 4:30 PM	0	0	0	0	20	0	43	1	44	238	0	35	0	279	19	25
4:30 PM - 4:45 PM	0	0	0	0	18	0	48	1	53	262	0	26	0	260	14	21
4:45 PM - 5:00 PM	0	0	0	0	21	0	48	0	52	247	0	27	0	266	24	23
5:00 PM - 5:15 PM	0	0	0	0	20	0	47	1	60	256	0	23	0	232	23	17
5:15 PM - 5:30 PM	0	0	0	0	19	0	44	1	49	222	0	30	0	265	28	15
5:30 PM - 5:45 PM	0	0	0	0	30	0	36	1	35	228	0	20	0	194	14	17
5:45 PM - 6:00 PM	0	0	0	0	7	0	39	0	31	232	0	19	0	188	18	9
TOTAL	**0**	**0**	**0**	**0**	**310**	**0**	**722**	**19**	**682**	**3784**	**0**	**459**	**0**	**3939**	**319**	**336**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:30 AM - 8:30 AM	0	0	0	0	101	0	188	8	209	923	0	122	0	889	80	142
4:00 PM - 5:00 PM	0	0	0	0	74	0	194	5	211	972	0	114	0	1066	81	90

	PHF	Trucks
AM	0.785	11.4%
PM	0.987	8.0%



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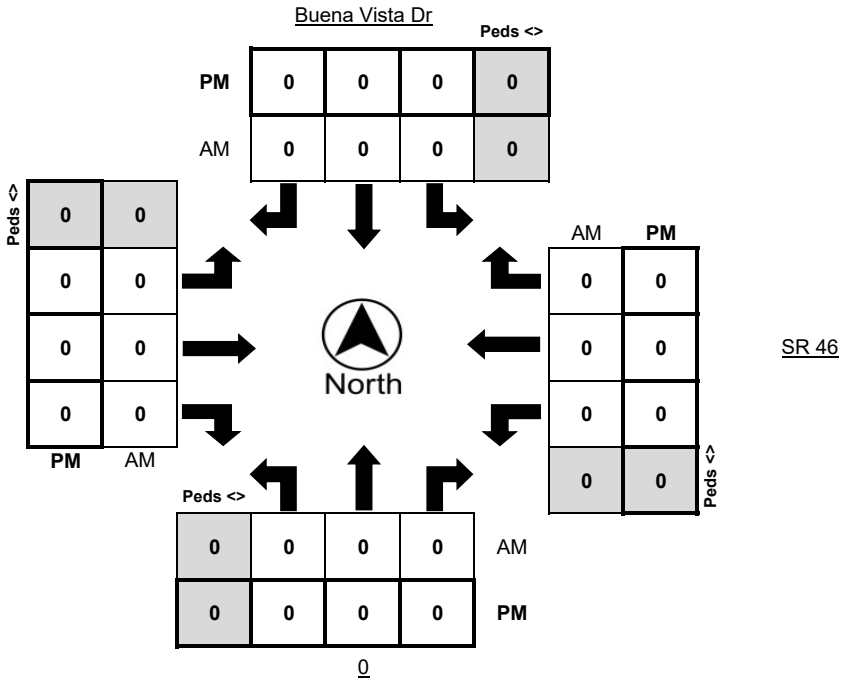
LOCATION SR46 @ Buena Vista Dr
LATITUDE 35.6446
COUNTY San Luis Obispo
LONGITUDE -120.6722
COLLECTION DATE Tuesday, October 23, 2018
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
2:00 PM - 2:15 PM	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
2:15 PM - 2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM - 2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM - 3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM - 3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM - 3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM - 3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM - 4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:30 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Bikes	Peds
AM Peak Total	0	0
PM Peak Total	0	0



Turning Movement Report

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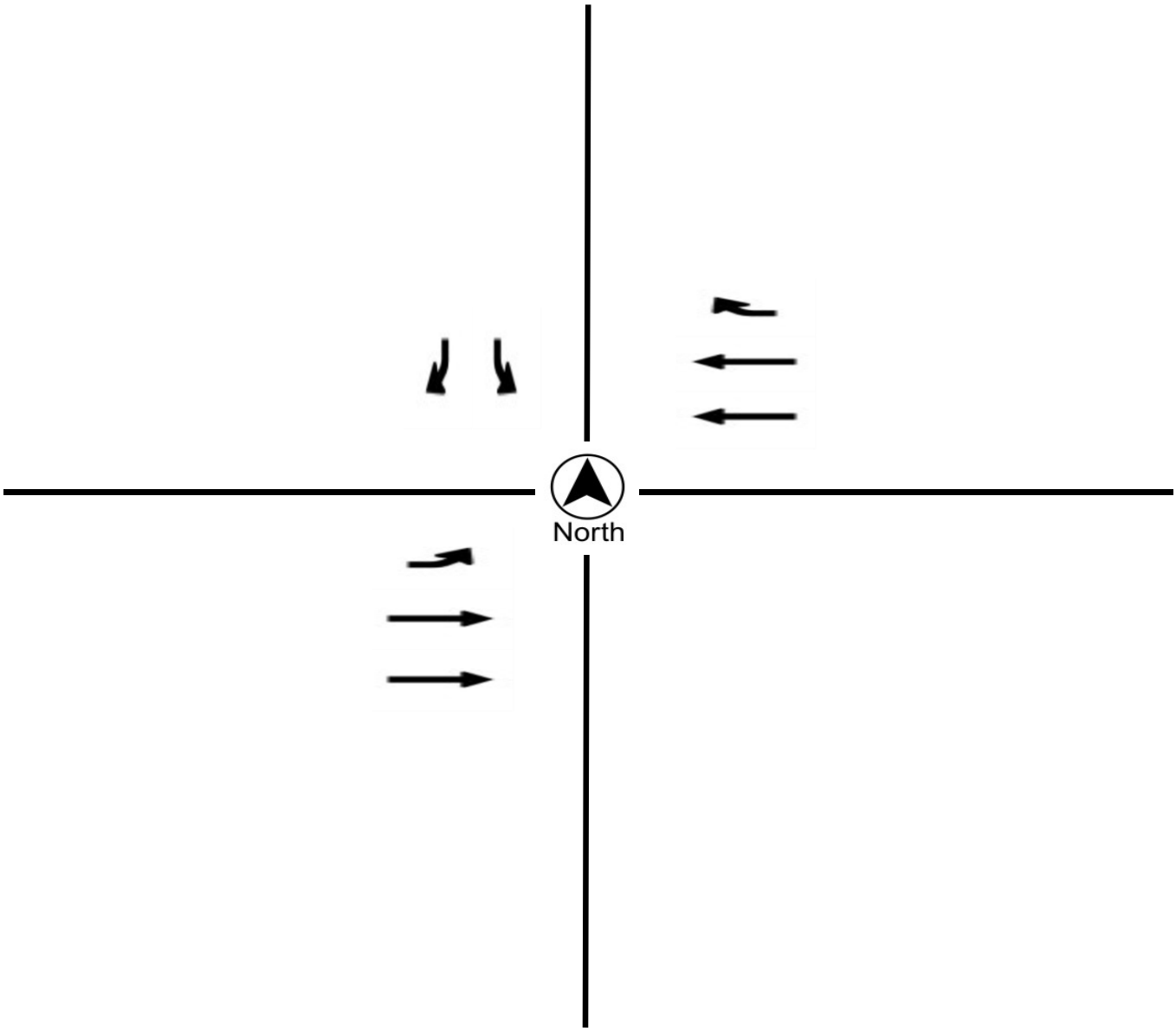
Morro Bay, CA 93442

LOCATION	SR46 @ Buena Vista Dr	**N/S STREET**	Buena Vista Dr
COUNTY	San Luis Obispo	**E/W STREET**	SR 46
COLLECTION DATE	Tuesday, October 23, 2018	**WEATHER**	Clear
CYCLE TIME	95 Seconds	**CONTROL TYPE**	Signal

COMMENTS Eastbound left turns are protected.



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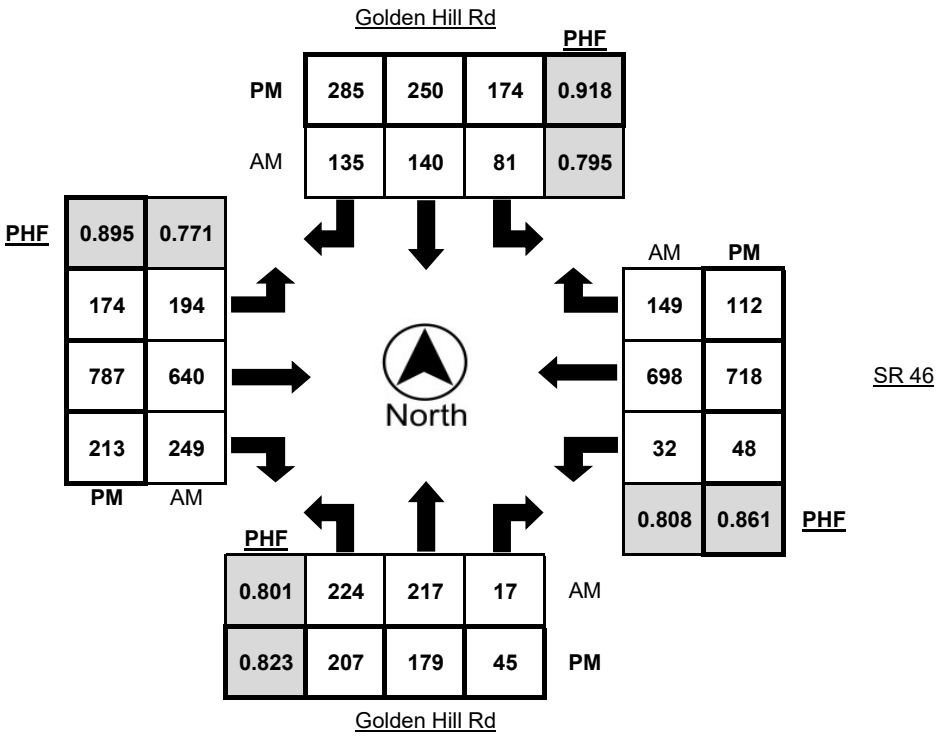
LOCATION SR 46 @ Golden Hill Rd
LATITUDE 35.6446
COUNTY San Luis Obispo
LONGITUDE -120.6581
COLLECTION DATE Wednesday, June 6, 2018
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	21	43	1	3	16	12	34	10	43	72	20	13	9	122	29	22
7:15 AM - 7:30 AM	37	41	2	2	18	20	33	10	38	139	47	32	3	147	38	20
7:30 AM - 7:45 AM	50	49	6	5	16	33	36	7	31	132	46	24	12	182	44	26
7:45 AM - 8:00 AM	79	62	2	0	10	33	24	7	61	203	87	31	10	226	36	35
8:00 AM - 8:15 AM	64	45	5	2	31	37	44	9	50	156	62	38	7	140	44	22
8:15 AM - 8:30 AM	31	61	4	4	24	37	31	10	52	149	54	35	3	150	25	36
8:30 AM - 8:45 AM	23	37	6	3	25	33	44	17	34	145	40	34	4	131	22	36
8:45 AM - 9:00 AM	26	37	8	1	9	39	43	5	48	132	34	35	4	117	24	19
TOTAL	**331**	**375**	**34**	**20**	**149**	**244**	**289**	**75**	**357**	**1128**	**390**	**242**	**52**	**1215**	**262**	**216**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	49	42	3	1	32	50	67	7	43	158	41	20	13	180	30	19
4:15 PM - 4:30 PM	43	46	14	1	46	70	64	5	47	211	70	33	11	151	30	13
4:30 PM - 4:45 PM	49	54	9	1	35	64	69	8	50	184	51	24	11	206	38	23
4:45 PM - 5:00 PM	47	35	3	1	45	49	74	7	38	191	42	26	14	202	28	21
5:00 PM - 5:15 PM	68	44	19	2	48	67	78	0	39	201	50	23	12	159	16	15
5:15 PM - 5:30 PM	40	31	11	1	30	60	66	8	41	188	64	15	7	177	31	19
5:30 PM - 5:45 PM	42	57	18	0	40	52	48	3	24	246	43	21	11	145	19	17
5:45 PM - 6:00 PM	32	34	10	0	37	30	45	2	34	196	30	22	9	121	24	15
TOTAL	**370**	**343**	**87**	**7**	**313**	**442**	**511**	**40**	**316**	**1575**	**391**	**184**	**88**	**1341**	**216**	**142**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:30 AM - 8:30 AM	224	217	17	11	81	140	135	33	194	640	249	128	32	698	149	119
4:15 PM - 5:15 PM	207	179	45	5	174	250	285	20	174	787	213	106	48	718	112	72

	PHF	Trucks
AM	0.833	10.5%
PM	0.973	6.4%



Turning Movement Report

Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

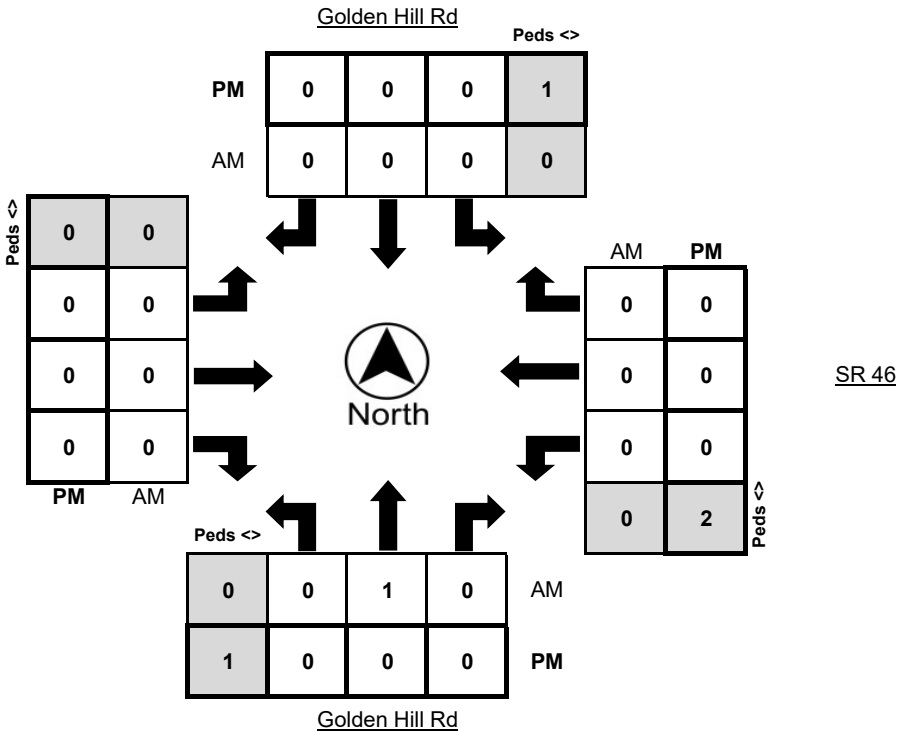
LOCATION SR 46 @ Golden Hill Rd
LATITUDE 35.6446
COUNTY San Luis Obispo
LONGITUDE -120.6581
COLLECTION DATE Wednesday, June 6, 2018
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
4:00 PM - 4:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**1**	**0**	**2**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:30 AM - 8:30 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 5:15 PM	0	0	0	1	0	0	0	1	0	0	0	2	0	0	0	0

	Bikes	Peds
AM Peak Total	1	0
PM Peak Total	0	4



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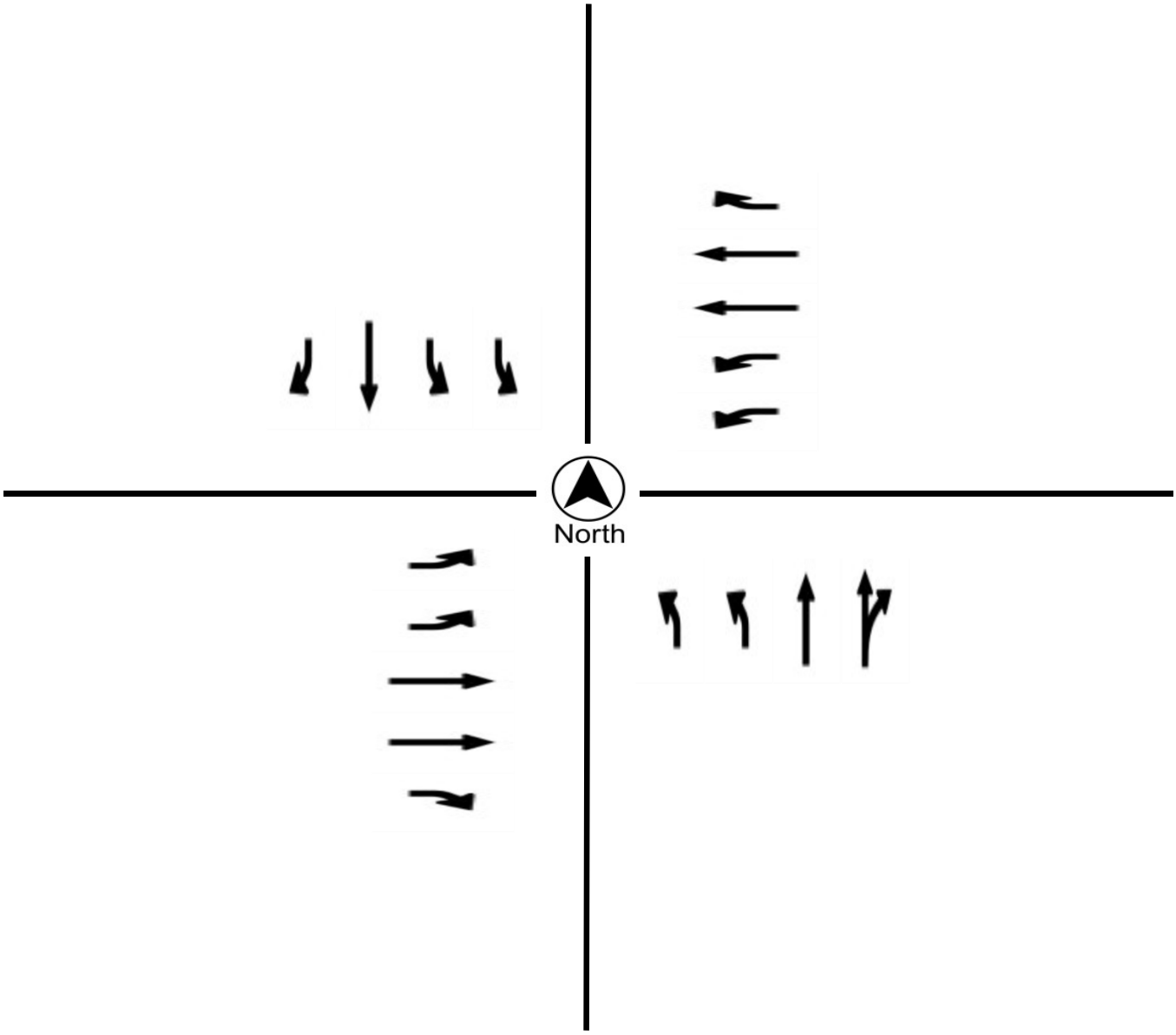
Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION	SR 46 @ Golden Hill Rd	**N/S STREET**	Golden Hill Rd / Golden Hill Rd
COUNTY	San Luis Obispo	**E/W STREET**	SR 46 / SR 46
COLLECTION DATE	Wednesday, June 6, 2018	**WEATHER**	Clear
CYCLE TIME	169 Seconds	**CONTROL TYPE**	Signal

COMMENTS All approaches have protected left turns.



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Morro Bay, CA 93442

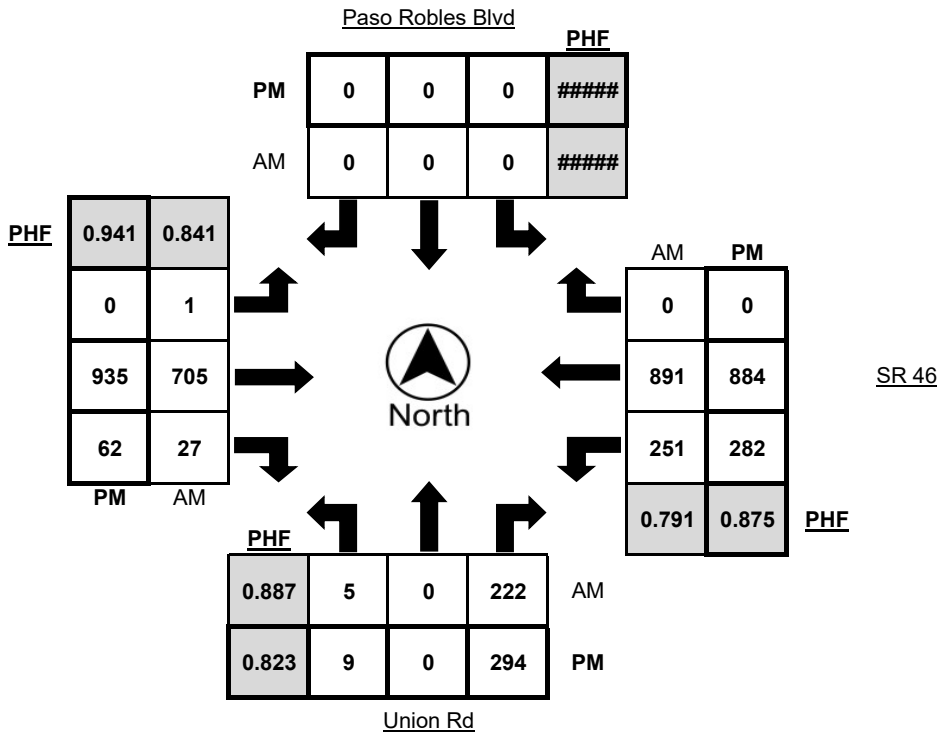
LOCATION SR 46 @ Union Rd
LATITUDE 35.6445
COUNTY San Luis Obispo
LONGITUDE -120.6494
COLLECTION DATE Wednesday, June 6, 2018
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
7:00 AM - 7:15 AM	0	0	42	1	0	0	0	0	0	90	2	11	34	177	0	25
7:15 AM - 7:30 AM	1	0	47	2	0	0	0	0	0	159	5	36	58	180	0	25
7:30 AM - 7:45 AM	1	0	41	1	0	0	0	0	0	143	3	22	91	245	0	23
7:45 AM - 8:00 AM	0	0	60	1	0	0	0	0	0	212	6	25	72	289	0	37
8:00 AM - 8:15 AM	3	0	58	1	0	0	0	0	0	183	10	32	48	180	0	24
8:15 AM - 8:30 AM	1	0	63	1	0	0	0	0	1	167	8	27	40	177	0	35
8:30 AM - 8:45 AM	0	0	39	2	0	1	0	0	0	167	5	37	53	165	0	36
8:45 AM - 9:00 AM	1	0	45	2	0	0	0	0	0	134	10	28	40	142	0	17
TOTAL	**7**	**0**	**395**	**11**	**0**	**1**	**0**	**0**	**1**	**1255**	**49**	**218**	**436**	**1555**	**0**	**222**

	Northbound				Southbound				Eastbound				Westbound			
Time	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	1	0	74	2	0	0	0	0	0	188	9	18	52	228	0	20
4:15 PM - 4:30 PM	3	0	60	0	0	0	0	0	0	250	15	27	54	208	0	12
4:30 PM - 4:45 PM	2	0	65	0	0	0	0	0	0	222	13	21	76	257	0	23
4:45 PM - 5:00 PM	3	0	89	0	0	0	0	0	0	211	21	29	78	232	0	20
5:00 PM - 5:15 PM	1	0	80	0	0	0	0	0	0	252	13	23	74	187	0	10
5:15 PM - 5:30 PM	3	0	68	0	0	0	0	0	0	220	12	14	70	211	0	18
5:30 PM - 5:45 PM	5	0	67	0	0	0	0	0	0	279	22	17	59	167	0	16
5:45 PM - 6:00 PM	9	0	70	0	0	0	0	0	0	241	12	18	39	155	0	21
TOTAL	**27**	**0**	**573**	**2**	**0**	**0**	**0**	**0**	**0**	**1863**	**117**	**167**	**502**	**1645**	**0**	**140**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
7:30 AM - 8:30 AM	5	0	222	4	0	0	0	0	1	705	27	106	251	891	0	119
4:15 PM - 5:15 PM	9	0	294	0	0	0	0	0	0	935	62	100	282	884	0	65

	PHF	Trucks
AM	0.822	10.9%
PM	0.971	6.7%



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Prepared For:
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Morro Bay, CA 93442

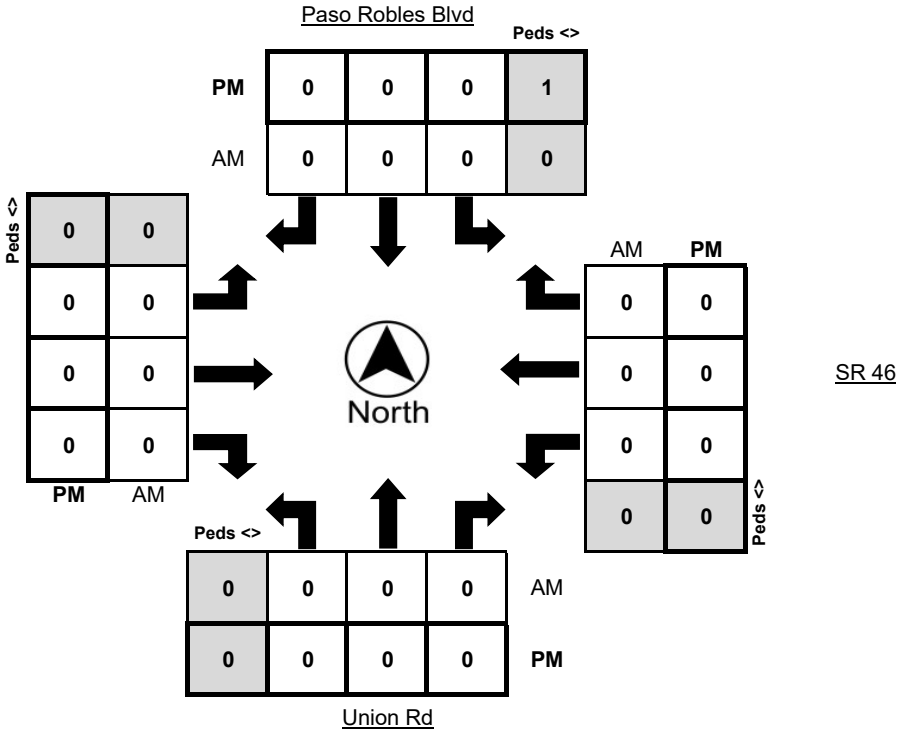
LOCATION SR 46 @ Union Rd
LATITUDE 35.6445
COUNTY San Luis Obispo
LONGITUDE -120.6494
COLLECTION DATE Wednesday, June 6, 2018
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:30 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 5:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0

	Bikes	Peds
AM Peak Total	0	0
PM Peak Total	0	1



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Prepared For:
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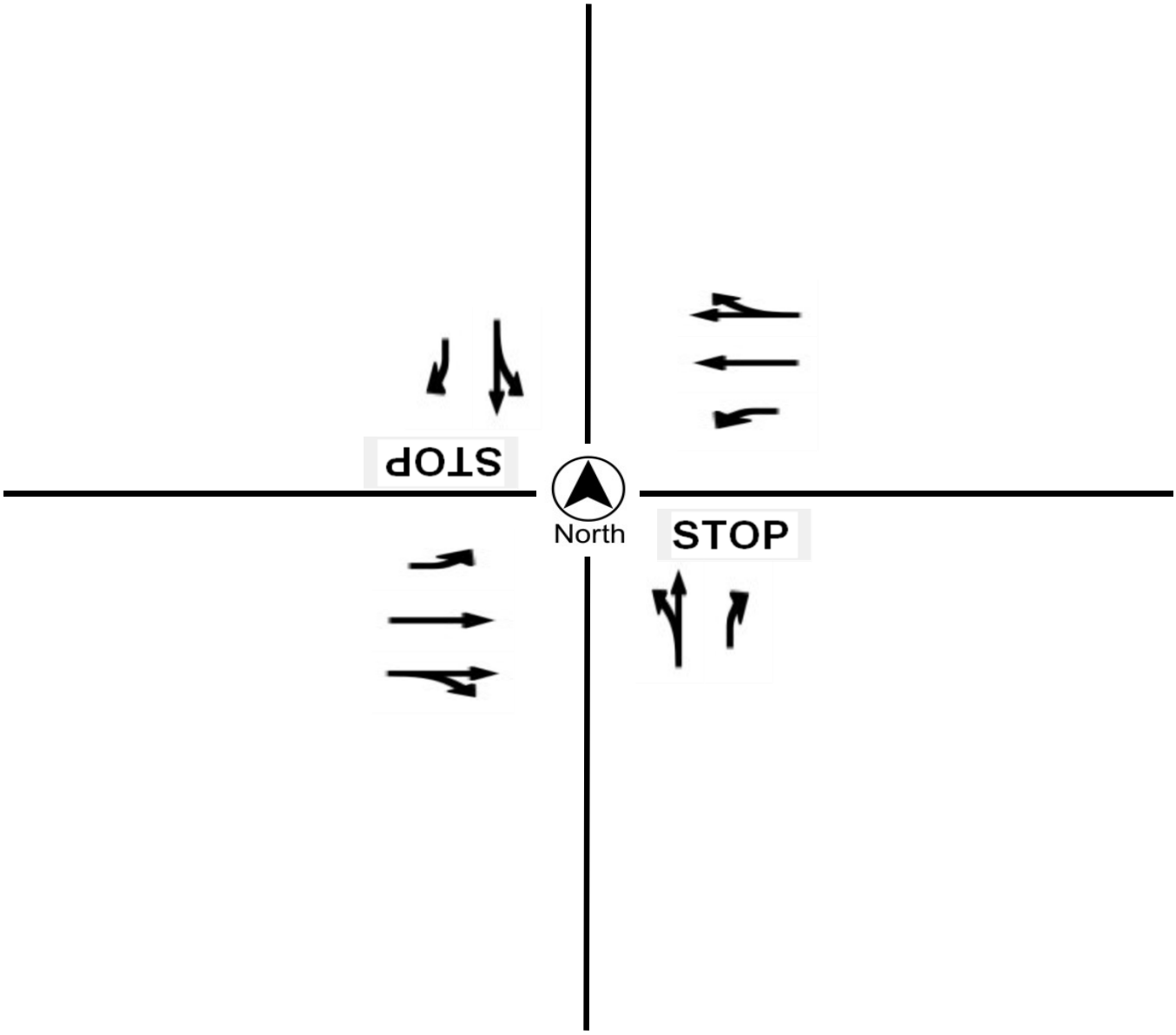
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION	SR 46 @ Union Rd	**N/S STREET**	Paso Robles Blvd / Union Rd
COUNTY	San Luis Obispo	**E/W STREET**	SR 46 / SR 46
COLLECTION DATE	Wednesday, June 6, 2018	**WEATHER**	Clear
CYCLE TIME	N/A	**CONTROL TYPE**	Two-Way Stop

COMMENTS



Reso A - Exhibit C2 (EIR Technical Appendix)

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Prepared For:
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Morro Bay, CA 93442

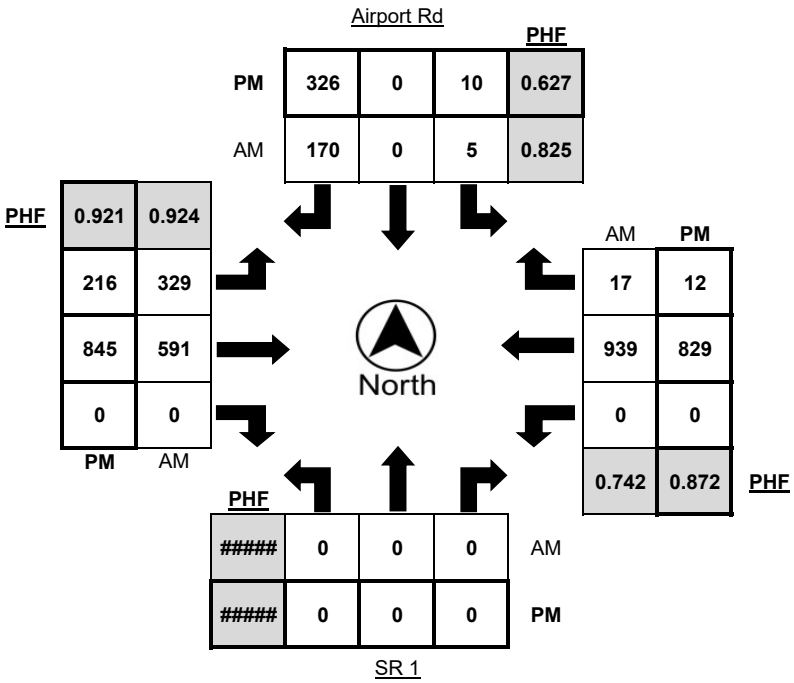
LOCATION SR46 @ Airport Rd
LATITUDE 35.6445
COUNTY San Luis Obispo
LONGITUDE -120.6433
COLLECTION DATE Tuesday, October 23, 2018
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	0	0	0	0	1	0	21	1	52	111	0	15	0	184	3	24
7:15 AM - 7:30 AM	0	0	0	0	0	0	36	3	41	122	0	26	0	203	2	22
7:30 AM - 7:45 AM	0	0	0	0	1	0	41	2	65	134	0	30	0	283	1	24
7:45 AM - 8:00 AM	0	0	0	0	0	0	53	1	111	123	0	25	0	311	11	21
8:00 AM - 8:15 AM	0	0	0	0	4	0	42	9	90	159	0	29	0	183	4	22
8:15 AM - 8:30 AM	0	0	0	0	0	0	34	2	63	175	0	19	0	162	1	20
8:30 AM - 8:45 AM	0	0	0	0	1	0	30	3	51	148	0	38	0	179	0	38
8:45 AM - 9:00 AM	0	0	0	0	3	0	34	4	40	125	0	28	0	156	1	28
TOTAL	**0**	**0**	**0**	**0**	**10**	**0**	**291**	**25**	**513**	**1097**	**0**	**210**	**0**	**1661**	**23**	**199**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
2:00 PM - 2:15 PM	0	0	0	0	6	0	53	4	32	166	0	37	0	216	3	33
2:15 PM - 2:30 PM	0	0	0	0	2	0	55	4	49	185	0	27	0	227	0	25
2:30 PM - 2:45 PM	0	0	0	0	3	0	79	9	39	190	0	45	0	221	4	29
2:45 PM - 3:00 PM	0	0	0	0	4	0	45	3	51	232	0	27	0	190	2	21
3:00 PM - 3:15 PM	0	0	0	0	1	0	47	4	52	188	0	29	0	197	2	29
3:15 PM - 3:30 PM	0	0	0	0	1	0	50	6	58	215	0	30	0	195	6	39
3:30 PM - 3:45 PM	0	0	0	0	3	0	131	1	48	200	0	30	0	209	5	21
3:45 PM - 4:00 PM	0	0	0	0	2	0	67	8	64	224	0	29	0	192	3	17
4:00 PM - 4:15 PM	0	0	0	0	1	0	60	3	49	222	0	23	0	190	1	25
4:15 PM - 4:30 PM	0	0	0	0	4	0	68	3	55	199	0	29	0	238	3	23
4:30 PM - 4:45 PM	0	0	0	0	1	0	99	0	48	220	0	25	0	205	4	21
4:45 PM - 5:00 PM	0	0	0	0	2	0	81	3	41	234	0	25	0	197	1	27
5:00 PM - 5:15 PM	0	0	0	0	4	0	102	4	42	215	0	19	0	169	3	17
5:15 PM - 5:30 PM	0	0	0	0	4	0	58	2	36	226	0	34	0	175	1	13
5:30 PM - 5:45 PM	0	0	0	0	1	0	48	0	53	209	0	20	0	149	1	20
5:45 PM - 6:00 PM	0	0	0	0	1	0	35	0	52	204	0	18	0	146	2	8
TOTAL	**0**	**0**	**0**	**0**	**40**	**0**	**1078**	**54**	**769**	**3329**	**0**	**447**	**0**	**3116**	**41**	**368**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:30 AM - 8:30 AM	0	0	0	0	5	0	170	14	329	591	0	103	0	939	17	87
3:30 PM - 4:30 PM	0	0	0	0	10	0	326	15	216	845	0	111	0	829	12	86

	PHF	Trucks
AM	0.842	9.9%
PM	0.939	9.5%



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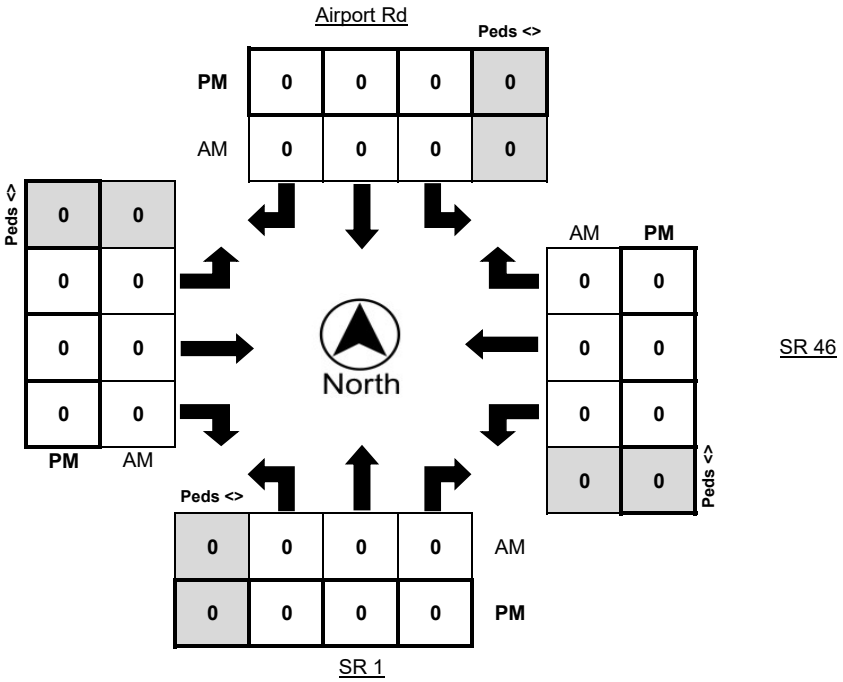
LOCATION SR46 @ Airport Rd
LATITUDE 35.6445
COUNTY San Luis Obispo
LONGITUDE -120.6433
COLLECTION DATE Tuesday, October 23, 2018
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
2:00 PM - 2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM - 2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM - 2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM - 3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM - 3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM - 3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM - 3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM - 4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:30 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Bikes	Peds
AM Peak Total	0	0
PM Peak Total	0	0



Turning Movement Report

Metro Traffic Data Inc.
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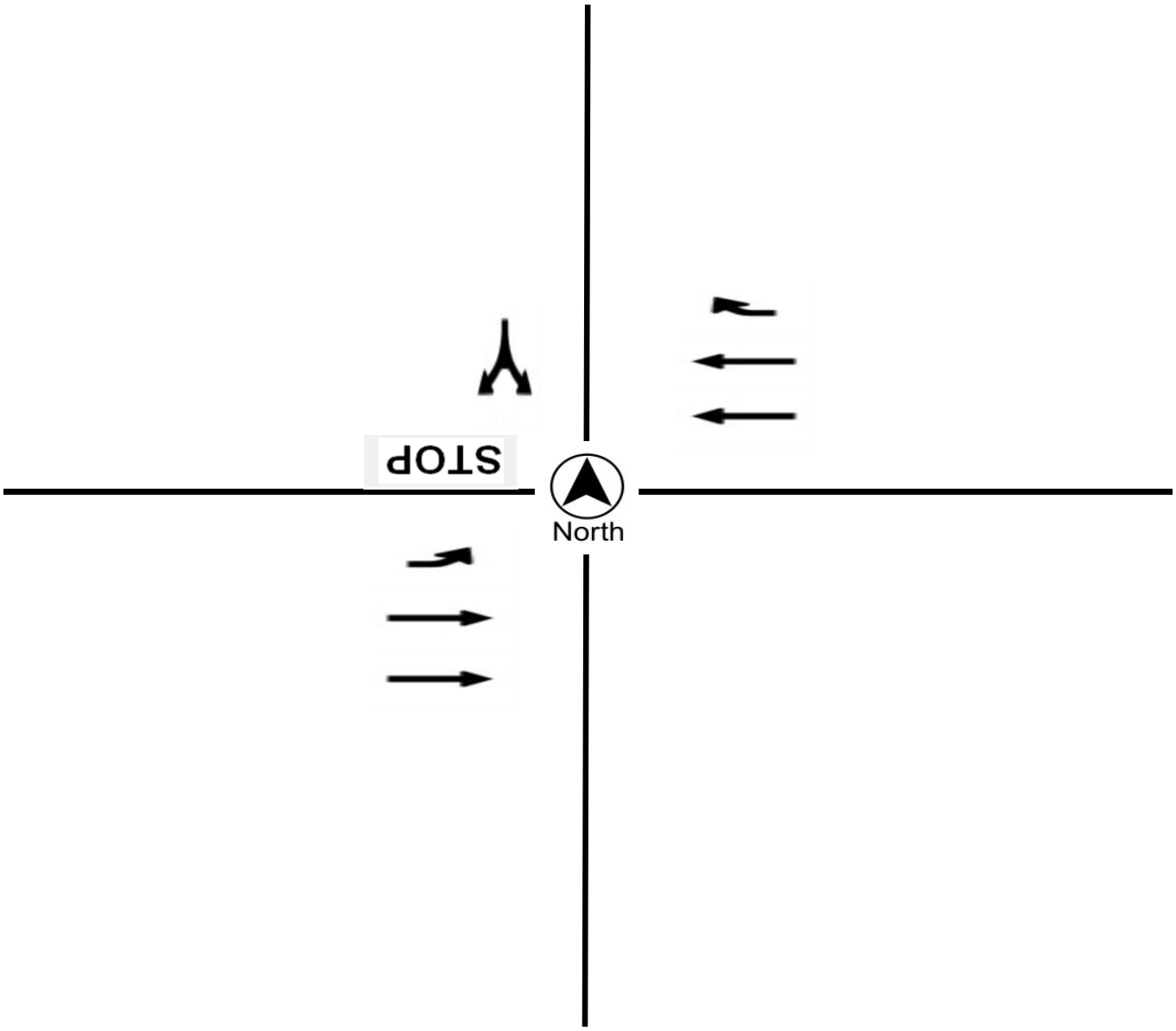
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION	SR46 @ Airport Rd	**N/S STREET**	Airport Rd
COUNTY	San Luis Obispo	**E/W STREET**	SR 46
COLLECTION DATE	Tuesday, October 23, 2018	**WEATHER**	Clear
CYCLE TIME	N/A	**CONTROL TYPE**	One-Way Stop

COMMENTS



Reso A - Exhibit C2 (EIR Technical Appendix)

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Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

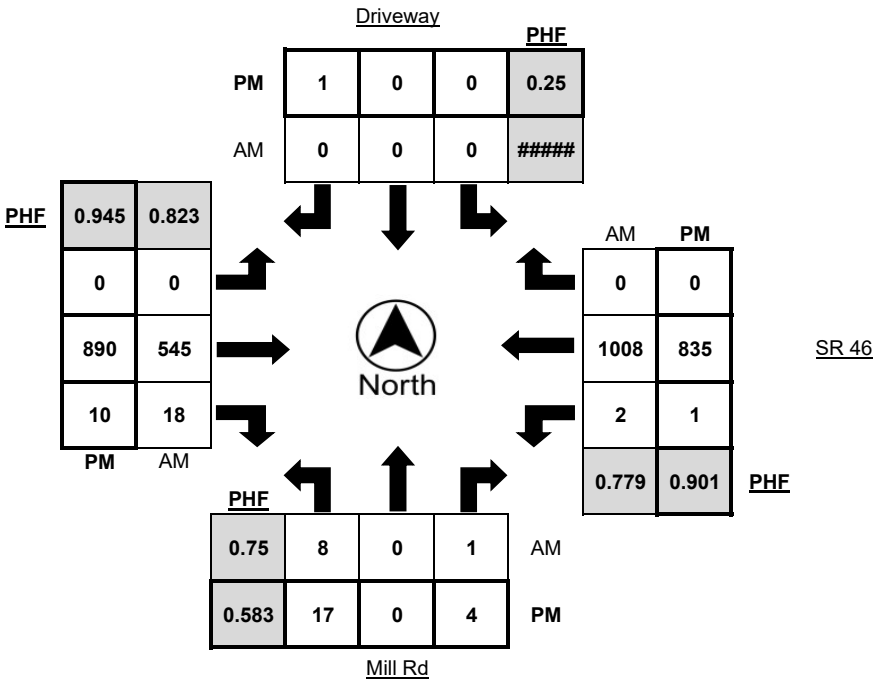
LOCATION SR46 @ Mill Rd
LATITUDE 35.6453
COUNTY San Luis Obispo
LONGITUDE -120.6342
COLLECTION DATE Tuesday, October 23, 2018
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	2	0	0	0	0	0	0	0	0	111	0	14	0	177	0	24
7:15 AM - 7:30 AM	3	0	0	0	0	0	0	0	0	126	3	25	0	208	0	21
7:30 AM - 7:45 AM	3	0	0	0	0	0	0	0	0	130	4	28	1	294	0	22
7:45 AM - 8:00 AM	1	0	0	0	0	0	0	0	0	124	5	24	1	323	0	18
8:00 AM - 8:15 AM	1	0	1	0	0	0	0	0	0	165	6	32	0	183	0	20
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	170	3	18	0	163	0	23
8:30 AM - 8:45 AM	3	0	1	2	0	0	0	0	0	149	3	34	0	188	0	31
8:45 AM - 9:00 AM	2	0	1	1	0	0	0	0	0	125	4	29	2	152	0	29
TOTAL	**15**	**0**	**3**	**3**	**0**	**0**	**0**	**0**	**0**	**1100**	**28**	**204**	**4**	**1688**	**0**	**188**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
2:00 PM - 2:15 PM	2	0	3	0	0	0	0	0	0	166	6	37	1	225	0	31
2:15 PM - 2:30 PM	4	0	0	0	0	0	0	0	0	185	3	24	0	215	0	25
2:30 PM - 2:45 PM	1	0	1	0	0	0	0	0	0	182	3	44	2	231	0	29
2:45 PM - 3:00 PM	6	0	1	0	0	0	0	0	0	229	2	25	1	175	0	30
3:00 PM - 3:15 PM	11	0	2	3	0	0	0	0	0	193	7	21	2	195	0	30
3:15 PM - 3:30 PM	3	0	0	0	0	0	0	0	0	207	2	32	1	198	0	33
3:30 PM - 3:45 PM	6	0	1	0	0	0	0	0	0	197	3	23	1	209	0	20
3:45 PM - 4:00 PM	6	0	3	0	0	0	0	0	0	225	2	27	3	197	0	13
4:00 PM - 4:15 PM	2	0	1	0	0	0	1	0	0	224	2	23	0	202	0	29
4:15 PM - 4:30 PM	3	0	1	1	0	0	0	0	0	212	4	28	0	232	0	21
4:30 PM - 4:45 PM	8	0	1	0	0	0	0	0	0	217	3	24	1	198	0	22
4:45 PM - 5:00 PM	4	0	1	0	0	0	0	0	0	237	1	25	0	203	0	28
5:00 PM - 5:15 PM	5	0	0	0	0	0	0	0	0	233	1	19	0	166	0	15
5:15 PM - 5:30 PM	6	0	2	0	0	0	0	0	0	231	5	33	0	175	0	15
5:30 PM - 5:45 PM	5	0	0	0	0	0	0	0	0	215	2	18	1	146	0	17
5:45 PM - 6:00 PM	2	0	0	0	0	0	0	0	0	202	1	19	0	146	0	9
TOTAL	**74**	**0**	**17**	**4**	**0**	**0**	**1**	**0**	**0**	**3355**	**47**	**422**	**13**	**3113**	**0**	**367**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:15 AM - 8:15 AM	8	0	1	0	0	0	0	0	0	545	18	109	2	1008	0	81
4:00 PM - 5:00 PM	17	0	4	1	0	0	1	0	0	890	10	100	1	835	0	100

	PHF	Trucks
AM	0.871	12.0%
PM	0.972	11.4%



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Morro Bay, CA 93442

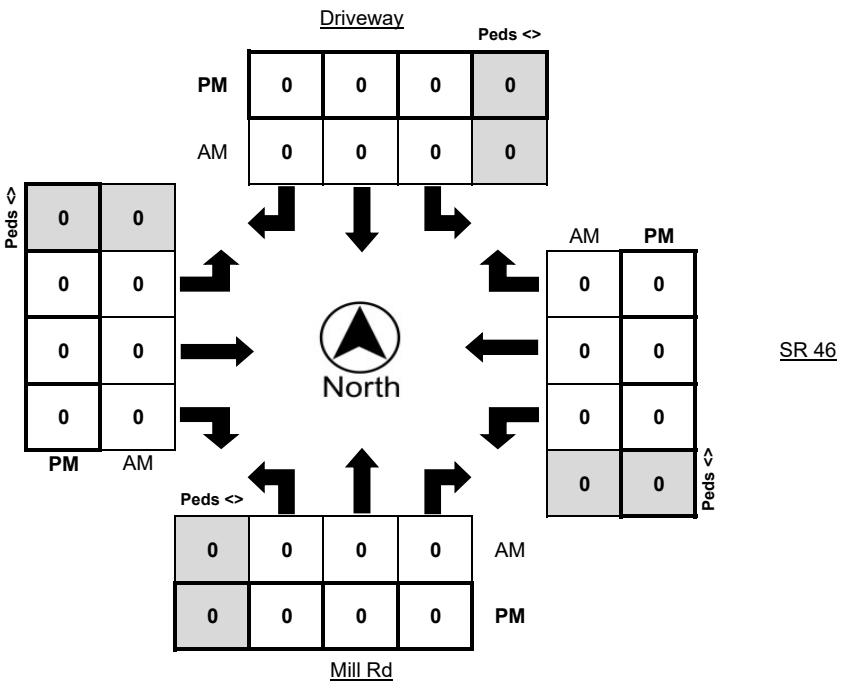
LOCATION SR46 @ Mill Rd
LATITUDE 35.6453
COUNTY San Luis Obispo
LONGITUDE -120.6342
COLLECTION DATE Tuesday, October 23, 2018
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
2:00 PM - 2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM - 2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM - 2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM - 3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM - 3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM - 3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM - 3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM - 4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:15 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Bikes	Peds
AM Peak Total	0	0
PM Peak Total	**0**	**0**



Turning Movement Report

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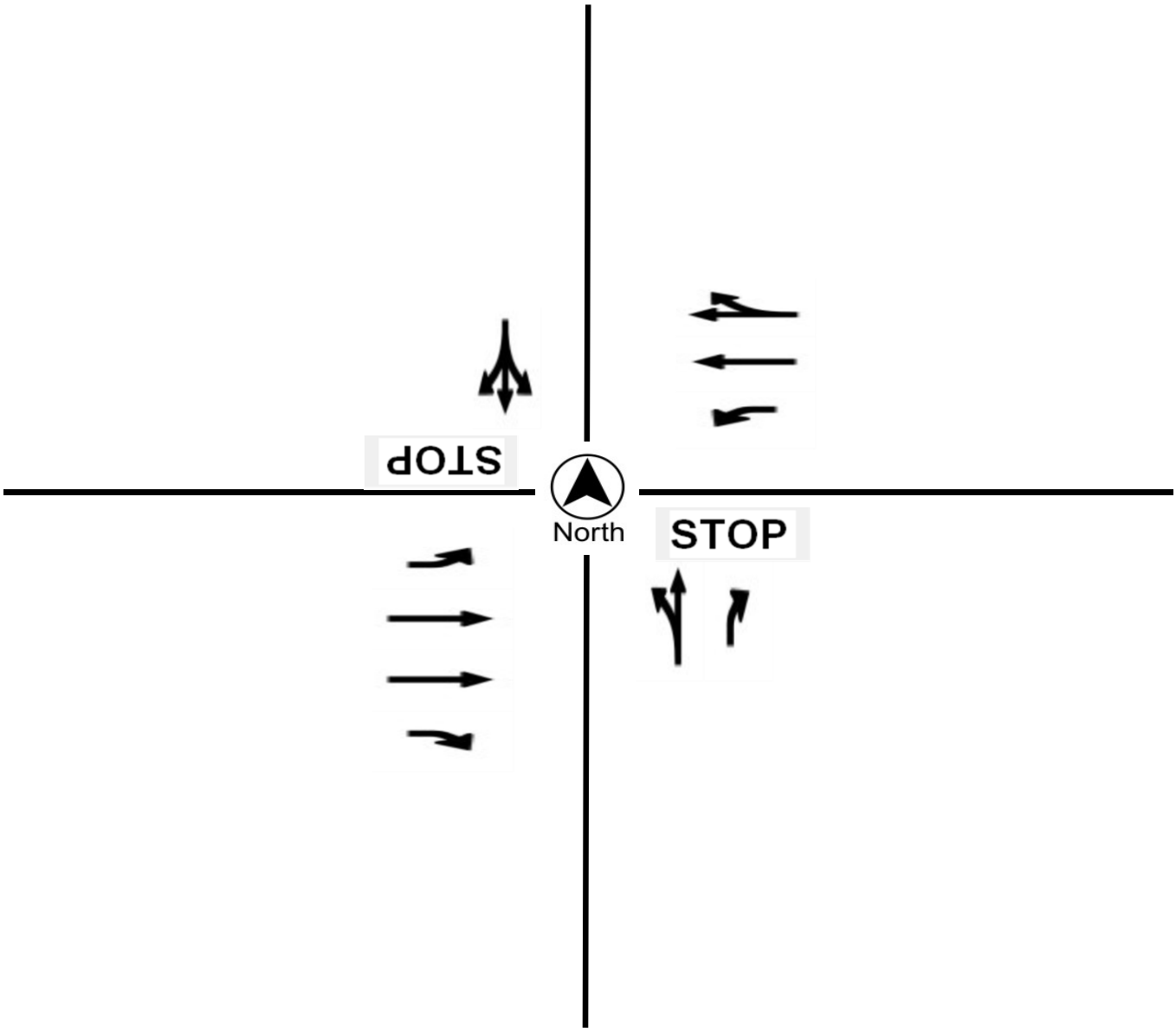
www.metrotrafficdata.com

Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION	SR46 @ Mill Rd	**N/S STREET**	Mill Rd
COUNTY	San Luis Obispo	**E/W STREET**	SR 46
COLLECTION DATE	Tuesday, October 23, 2018	**WEATHER**	Clear
CYCLE TIME	N/A	**CONTROL TYPE**	Two-Way Stop

COMMENTS



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Prepared For:
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895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

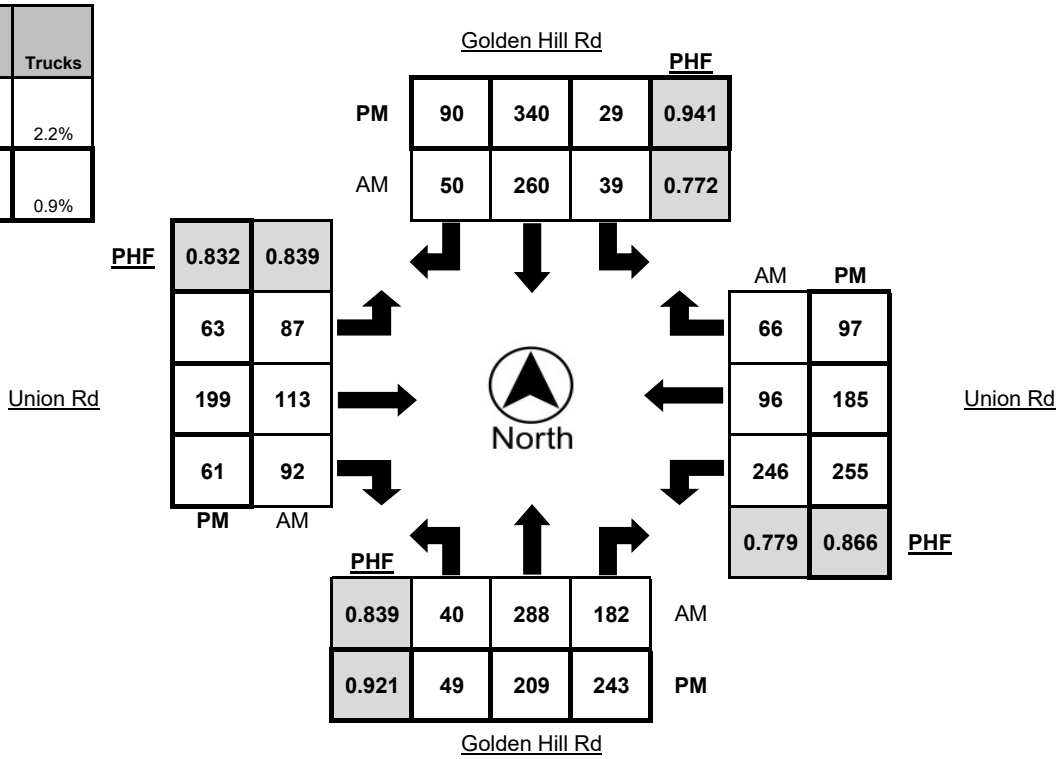
LOCATION Golden Hill Rd @ Union Rd
LATITUDE 35.6402
COUNTY San Luis Obispo
LONGITUDE -120.6581
COLLECTION DATE Wednesday, June 6, 2018
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	5	39	29	4	5	30	3	3	17	19	9	2	33	15	13	2
7:15 AM - 7:30 AM	7	48	42	1	12	49	3	0	14	26	23	1	53	21	22	6
7:30 AM - 7:45 AM	6	74	32	2	3	60	11	2	19	29	27	0	74	25	10	2
7:45 AM - 8:00 AM	13	82	54	1	12	85	16	6	32	27	28	0	76	32	23	0
8:00 AM - 8:15 AM	14	84	54	2	12	66	20	5	22	31	14	2	43	18	11	5
8:15 AM - 8:30 AM	16	51	46	1	9	49	15	6	12	29	15	0	32	23	15	4
8:30 AM - 8:45 AM	15	37	32	2	9	45	12	6	15	19	9	1	44	27	12	4
8:45 AM - 9:00 AM	6	39	36	3	7	50	10	4	14	23	12	0	26	30	12	2
TOTAL	**82**	**454**	**325**	**16**	**69**	**434**	**90**	**32**	**145**	**203**	**137**	**6**	**381**	**191**	**118**	**25**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	9	50	54	3	13	53	23	2	24	50	14	2	60	40	20	2
4:15 PM - 4:30 PM	6	61	41	0	16	101	23	7	17	48	14	0	49	39	16	3
4:30 PM - 4:45 PM	12	61	50	0	10	85	24	3	11	47	10	1	61	41	29	2
4:45 PM - 5:00 PM	9	44	83	1	4	80	17	0	23	54	20	2	59	48	15	0
5:00 PM - 5:15 PM	15	54	65	1	10	85	27	0	15	48	16	1	69	50	36	1
5:15 PM - 5:30 PM	13	50	45	0	5	90	22	4	14	50	15	0	66	46	17	1
5:30 PM - 5:45 PM	10	66	57	0	8	83	13	2	15	31	16	0	45	40	23	0
5:45 PM - 6:00 PM	4	43	72	0	7	44	13	1	13	47	16	0	34	30	12	0
TOTAL	**78**	**429**	**467**	**5**	**73**	**621**	**162**	**19**	**132**	**375**	**121**	**6**	**443**	**334**	**168**	**9**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:15 AM - 8:15 AM	40	288	182	6	39	260	50	13	87	113	92	3	246	96	66	13
4:30 PM - 5:30 PM	49	209	243	2	29	340	90	7	63	199	61	4	255	185	97	4

	PHF	Trucks
AM	0.812	2.2%
PM	0.929	0.9%



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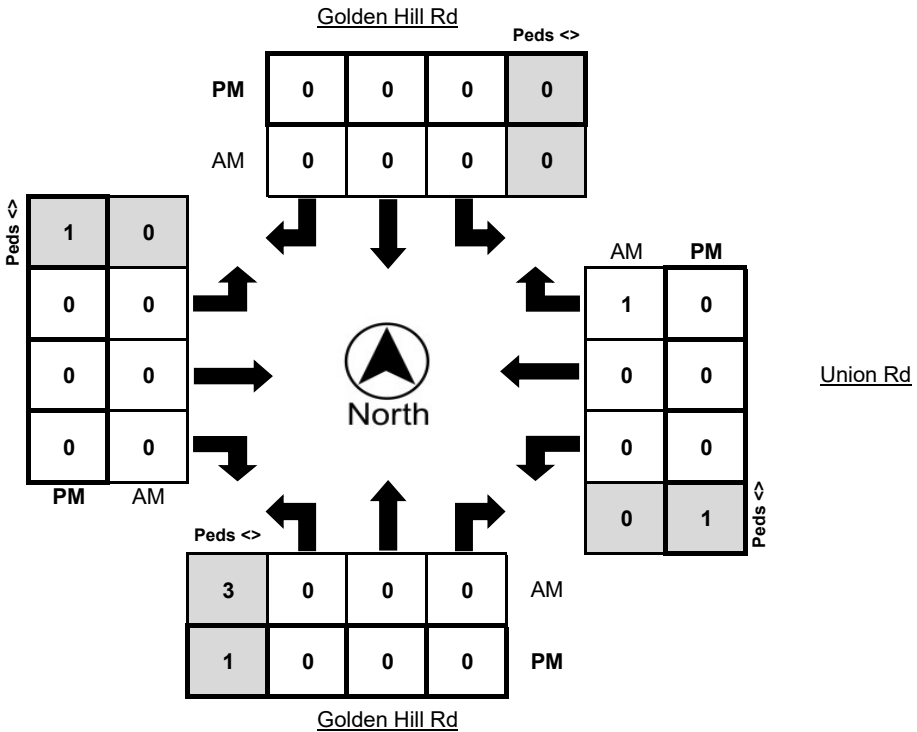
LOCATION Golden Hill Rd @ Union Rd
LATITUDE 35.6402
COUNTY San Luis Obispo
LONGITUDE -120.6581
COLLECTION DATE Wednesday, June 6, 2018
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	3	0	0	0	0	0	0	1	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	2	0	0	1	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**0**	**1**	**1**	**0**	**0**	**1**	**1**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**1**	**1**	**1**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:15 AM - 8:15 AM	0	0	0	0	0	0	0	3	0	0	0	0	0	0	1	0
4:30 PM - 5:30 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	1

	Bikes	Peds
AM Peak Total	1	3
PM Peak Total	0	3



Turning Movement Report

Metro Traffic Data Inc.
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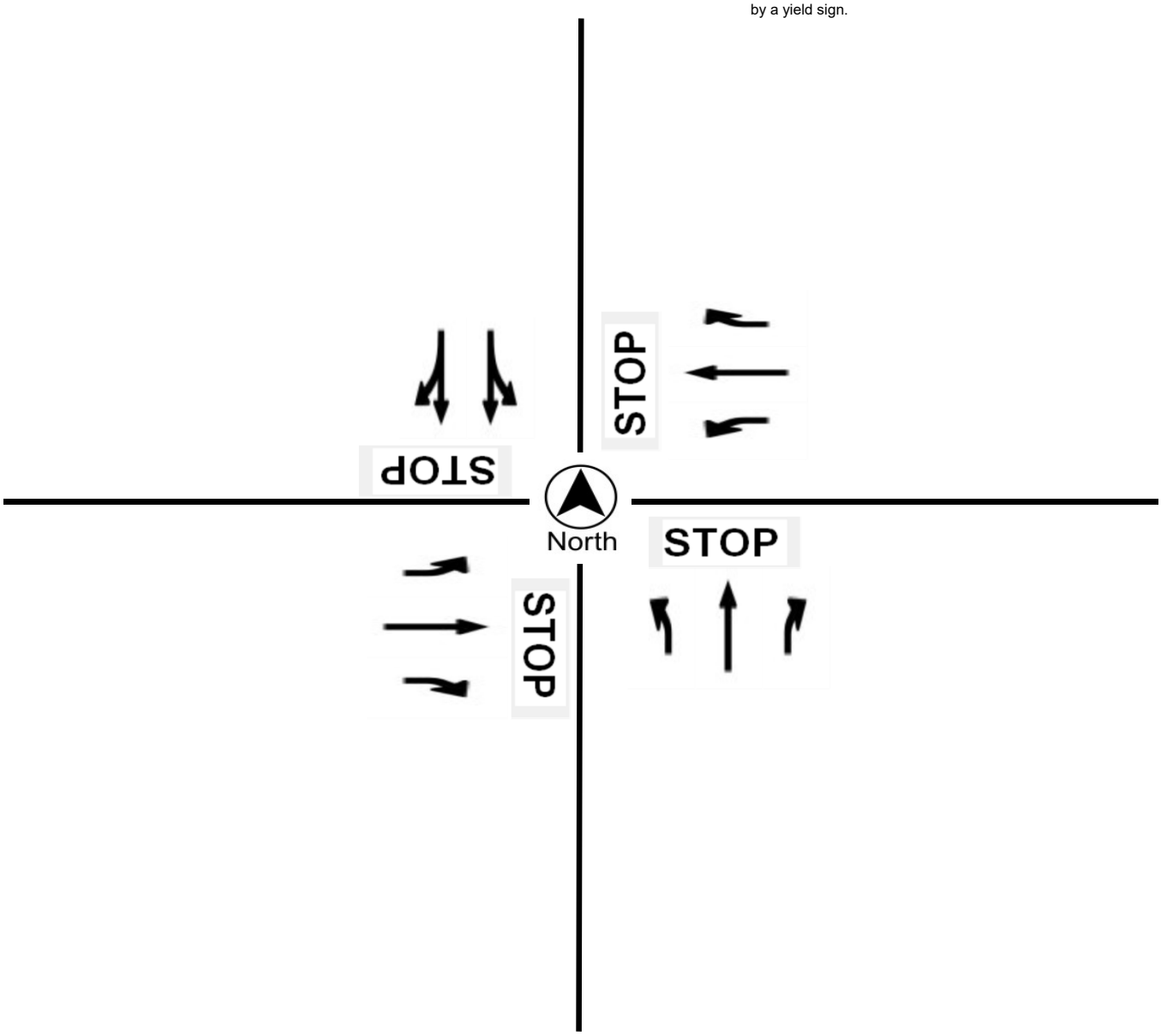
800-975-6938 Phone/Fax
www.metrotrafficdata.com

Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION	Golden Hill Rd @ Union Rd	**N/S STREET**	Golden Hill Rd / Golden Hill Rd
COUNTY	San Luis Obispo	**E/W STREET**	Union Rd / Union Rd
COLLECTION DATE	Wednesday, June 6, 2018	**WEATHER**	Clear
CYCLE TIME	N/A	**CONTROL TYPE**	All-Way Stop

COMMENTS Eastbound and westbound right turns controlled by a yield sign.



Reso A - Exhibit C2 (EIR Technical Appendix)

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Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

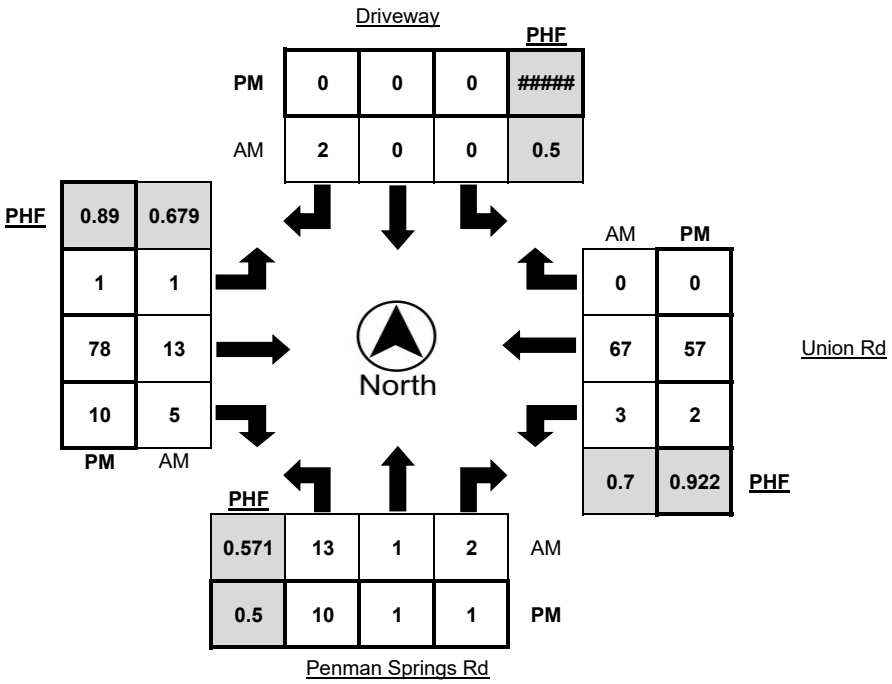
LOCATION Penman Springs Rd @ Union Rd
LATITUDE 35.6301
COUNTY San Luis Obispo
LONGITUDE -120.6143
COLLECTION DATE Thursday, January 24, 2019
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	4	0	0	0	0	0	0	0	1	3	3	1	0	15	0	2
7:15 AM - 7:30 AM	0	0	0	1	0	0	0	0	0	1	0	0	1	18	0	0
7:30 AM - 7:45 AM	6	1	0	1	0	0	1	0	0	4	1	0	1	24	0	3
7:45 AM - 8:00 AM	3	0	2	0	0	0	1	0	0	5	1	0	1	10	0	0
8:00 AM - 8:15 AM	1	0	0	0	0	0	0	0	1	10	0	0	2	8	0	0
8:15 AM - 8:30 AM	1	0	0	0	0	0	0	0	0	8	2	0	0	10	0	0
8:30 AM - 8:45 AM	1	0	1	0	0	0	0	0	1	11	0	0	2	7	0	0
8:45 AM - 9:00 AM	1	1	1	0	0	0	1	0	0	8	2	0	0	8	0	0
TOTAL	**17**	**2**	**4**	**2**	**0**	**0**	**3**	**0**	**3**	**50**	**9**	**1**	**7**	**100**	**0**	**5**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
2:00 PM - 2:15 PM	1	0	1	0	0	0	1	0	0	6	2	0	0	11	0	0
2:15 PM - 2:30 PM	2	0	0	0	0	0	0	0	0	10	1	0	1	6	0	0
2:30 PM - 2:45 PM	2	0	1	0	0	0	0	0	0	11	2	0	1	12	0	0
2:45 PM - 3:00 PM	3	0	0	0	0	0	0	0	0	15	1	0	0	16	0	0
3:00 PM - 3:15 PM	0	0	0	0	0	0	0	0	1	19	5	2	1	12	0	2
3:15 PM - 3:30 PM	1	1	1	0	0	0	0	0	0	20	3	0	0	14	0	0
3:30 PM - 3:45 PM	6	0	0	0	0	0	0	0	0	24	1	1	1	15	0	0
3:45 PM - 4:00 PM	3	1	0	0	0	0	0	0	0	17	2	0	1	9	0	0
4:00 PM - 4:15 PM	1	0	1	0	0	0	0	0	1	17	3	0	0	11	0	2
4:15 PM - 4:30 PM	0	0	1	0	0	0	1	0	1	16	2	0	0	9	0	1
4:30 PM - 4:45 PM	1	0	1	0	0	0	0	0	0	14	3	0	1	14	0	0
4:45 PM - 5:00 PM	3	0	0	0	0	0	0	0	0	21	1	0	1	13	0	0
5:00 PM - 5:15 PM	3	0	1	0	0	0	0	0	0	21	1	0	1	11	0	0
5:15 PM - 5:30 PM	3	0	0	0	0	0	0	0	0	16	0	0	2	14	0	0
5:30 PM - 5:45 PM	1	0	2	0	0	0	0	0	0	25	3	0	0	8	0	0
5:45 PM - 6:00 PM	0	0	1	0	0	0	0	0	0	8	1	0	0	8	0	0
TOTAL	**30**	**2**	**10**	**0**	**0**	**0**	**2**	**0**	**3**	**260**	**31**	**3**	**10**	**183**	**0**	**5**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 8:00 AM	13	1	2	2	0	0	2	0	1	13	5	1	3	67	0	5
2:45 PM - 3:45 PM	10	1	1	0	0	0	0	0	1	78	10	3	2	57	0	2

	PHF	Trucks
AM	0.704	7.5%
PM	0.851	3.1%



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Morro Bay, CA 93442

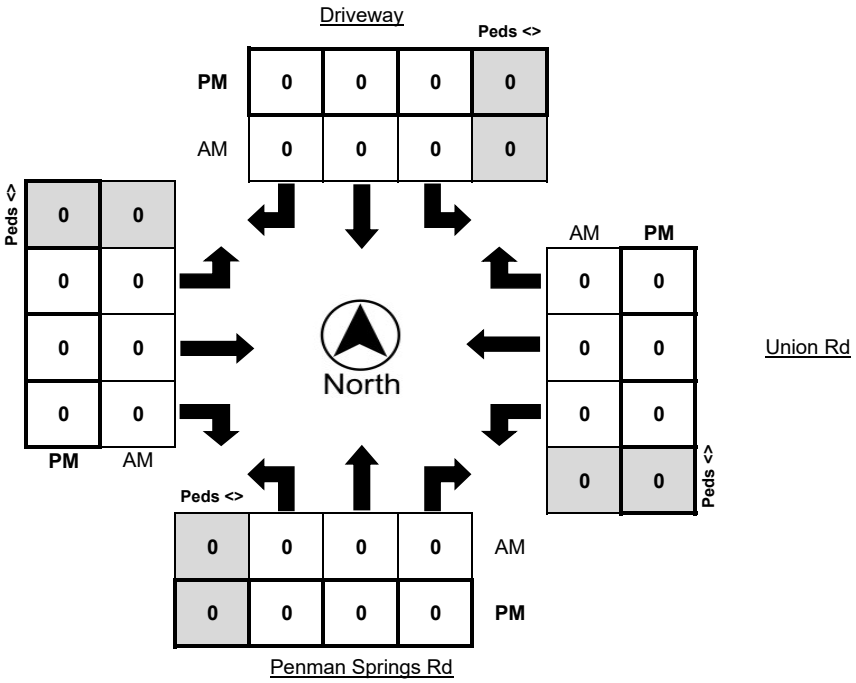
LOCATION Penman Springs Rd @ Union Rd
LATITUDE 35.6301
COUNTY San Luis Obispo
LONGITUDE -120.6143
COLLECTION DATE Thursday, January 24, 2019
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
2:00 PM - 2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM - 2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM - 2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM - 3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM - 3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM - 3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM - 3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM - 4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM - 3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Bikes	Peds
AM Peak Total	0	0
PM Peak Total	0	0



Turning Movement Report

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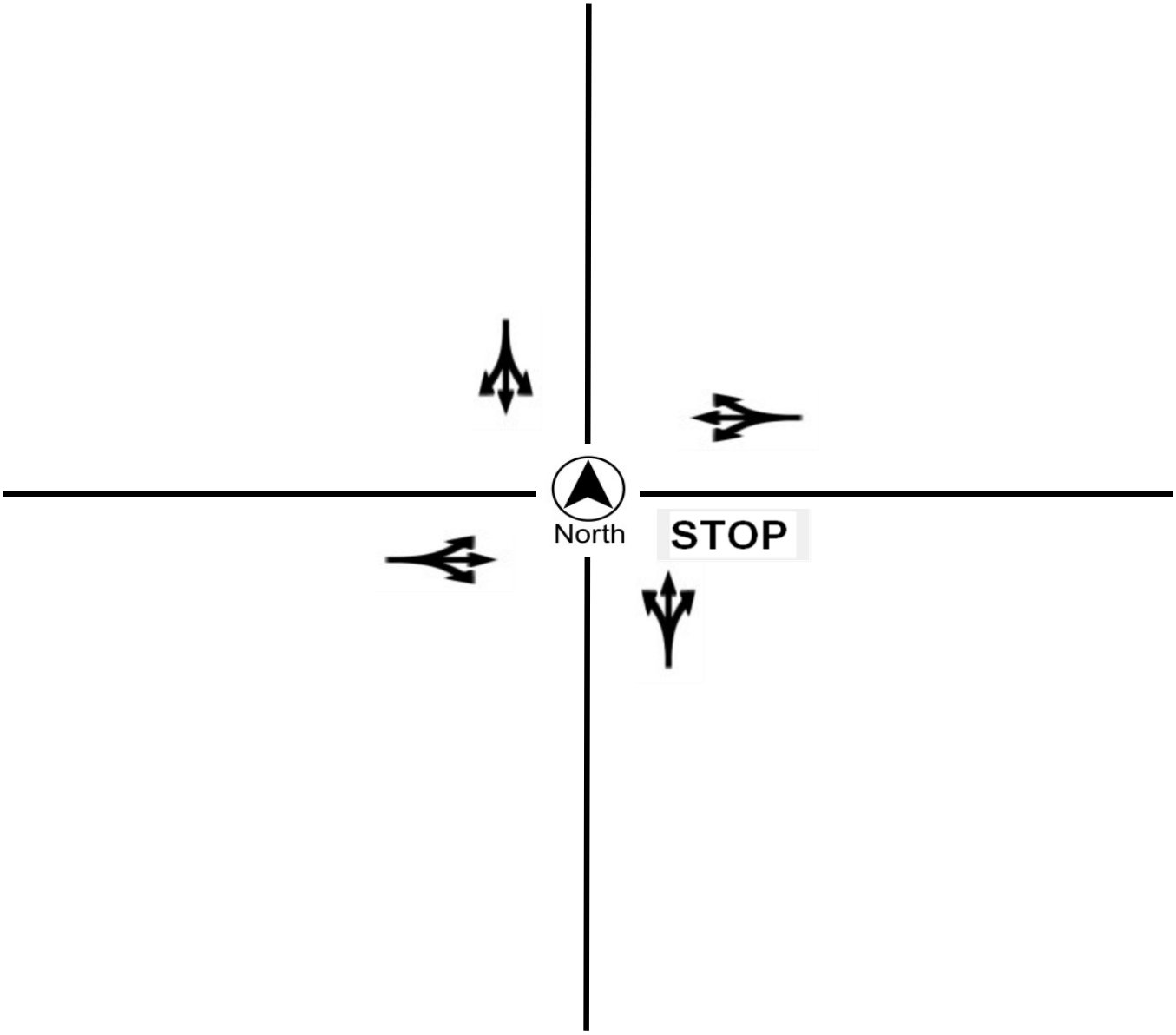
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION	Penman Springs Rd @ Union Rd	**N/S STREET**	Driveway / Penman Springs Rd
COUNTY	San Luis Obispo	**E/W STREET**	Union Rd / Union Rd
COLLECTION DATE	Thursday, January 24, 2019	**WEATHER**	Clear
CYCLE TIME	N/A	**CONTROL TYPE**	One-Way stop

COMMENTS



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Prepared For:
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895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

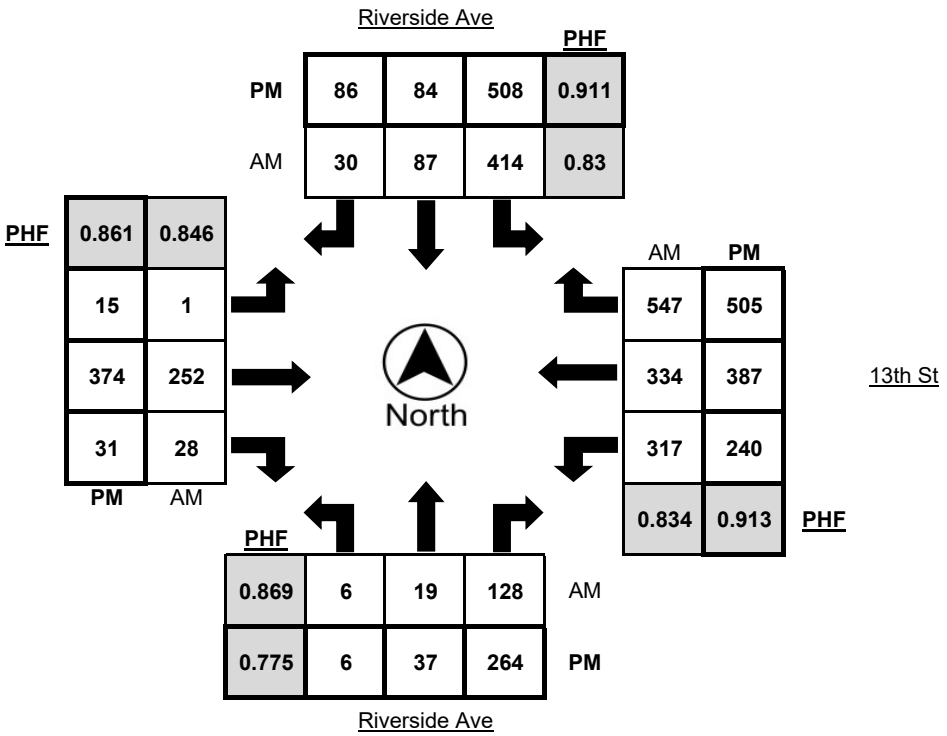
LOCATION 13th St @ Riverisde Ave
LATITUDE 35.6280
COUNTY San Luis Obispo
LONGITUDE -120.6870
COLLECTION DATE Wednesday, June 6, 2018
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
7:00 AM - 7:15 AM	0	7	14	1	42	14	3	3	0	31	8	1	52	43	60	9
7:15 AM - 7:30 AM	1	7	19	3	78	25	3	3	1	46	10	2	75	58	76	4
7:30 AM - 7:45 AM	2	2	30	4	126	17	8	3	0	53	7	1	80	61	117	5
7:45 AM - 8:00 AM	0	6	38	2	121	31	8	4	1	68	5	1	94	97	168	5
8:00 AM - 8:15 AM	1	6	26	0	84	19	6	4	0	57	7	1	81	90	156	6
8:15 AM - 8:30 AM	3	5	34	1	83	20	8	5	0	74	9	2	62	86	106	5
8:30 AM - 8:45 AM	1	8	26	4	55	23	12	3	5	50	12	1	58	77	88	7
8:45 AM - 9:00 AM	0	8	33	0	57	15	13	2	4	49	6	1	63	125	97	6
TOTAL	**8**	**49**	**220**	**15**	**646**	**164**	**61**	**27**	**11**	**428**	**64**	**10**	**565**	**637**	**868**	**47**

	Northbound				Southbound				Eastbound				Westbound			
Time	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	0	9	69	0	89	18	14	6	2	98	10	3	55	101	93	1
4:15 PM - 4:30 PM	2	10	67	0	119	21	16	0	4	93	9	0	64	88	101	2
4:30 PM - 4:45 PM	1	7	61	1	91	22	13	1	2	93	12	0	62	104	98	1
4:45 PM - 5:00 PM	2	10	61	1	137	24	25	0	5	94	6	0	63	107	140	1
5:00 PM - 5:15 PM	0	9	90	1	135	19	26	3	7	74	5	0	50	83	134	1
5:15 PM - 5:30 PM	3	11	52	2	145	19	22	1	1	113	8	1	65	93	133	1
5:30 PM - 5:45 PM	1	10	67	1	105	9	16	1	5	74	6	0	60	100	106	4
5:45 PM - 6:00 PM	0	4	33	1	104	13	14	1	1	71	6	0	47	101	123	1
TOTAL	**9**	**70**	**500**	**7**	**925**	**145**	**146**	**13**	**27**	**710**	**62**	**4**	**466**	**777**	**928**	**12**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
7:30 AM - 8:30 AM	6	19	128	7	414	87	30	16	1	252	28	5	317	334	547	21
4:30 PM - 5:30 PM	6	37	264	5	508	84	86	5	15	374	31	1	240	387	505	4

	PHF	Trucks
AM	0.849	2.3%
PM	0.941	0.6%



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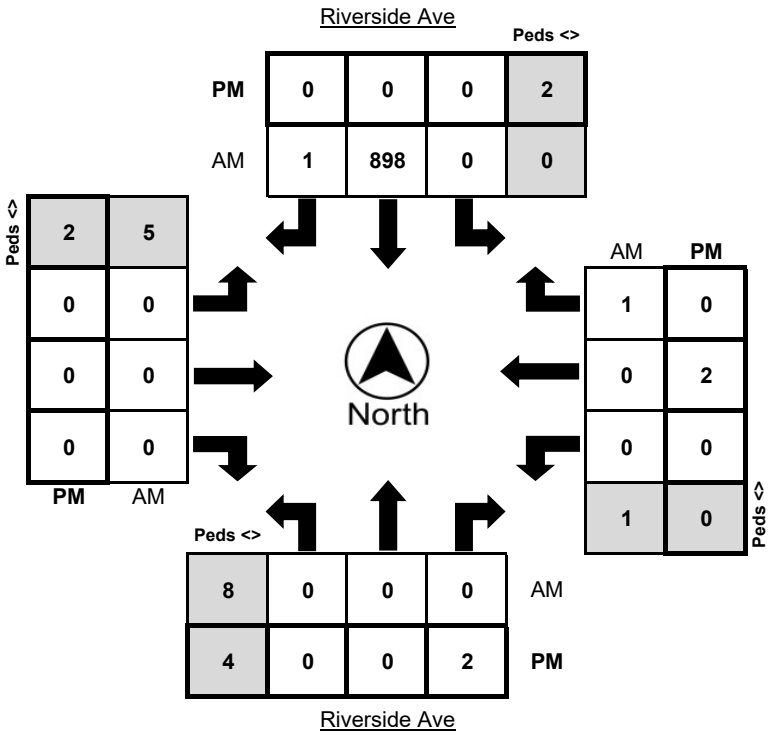
LOCATION 13th St @ Riverisde Ave
LATITUDE 35.6280
COUNTY San Luis Obispo
LONGITUDE -120.6870
COLLECTION DATE Wednesday, June 6, 2018
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	1	0	0	344	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	308	3	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	232	0	1	0	0	0	0	0	0	0	1
7:45 AM - 8:00 AM	0	0	0	0	0	209	0	0	0	0	0	0	0	0	1	1
8:00 AM - 8:15 AM	0	0	0	0	0	228	0	2	0	0	0	0	0	0	0	2
8:15 AM - 8:30 AM	0	0	0	0	0	229	1	5	0	0	0	1	0	0	0	1
8:30 AM - 8:45 AM	0	0	0	0	0	24	0	0	0	0	0	0	0	0	0	1
8:45 AM - 9:00 AM	0	0	0	2	0	0	0	2	0	0	0	0	1	0	0	1
TOTAL	**0**	**0**	**1**	**2**	**0**	**1574**	**4**	**10**	**0**	**0**	**0**	**1**	**1**	**0**	**1**	**7**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	1	0	2
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	1	0	0	0	0	3	0	0	0	0	0	2	0	0
4:45 PM - 5:00 PM	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1
5:00 PM - 5:15 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
5:30 PM - 5:45 PM	0	0	1	1	0	0	0	5	0	0	0	0	1	0	0	0
5:45 PM - 6:00 PM	0	0	0	1	0	0	0	4	0	0	0	0	0	0	0	3
TOTAL	**0**	**0**	**3**	**4**	**0**	**0**	**0**	**15**	**0**	**0**	**0**	**0**	**1**	**3**	**0**	**7**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:30 AM - 8:30 AM	0	0	0	0	0	898	1	8	0	0	0	1	0	0	1	5
4:30 PM - 5:30 PM	0	0	2	2	0	0	0	4	0	0	0	0	0	2	0	2

	Bikes	Peds
AM Peak Total	900	14
PM Peak Total	4	8



Turning Movement Report

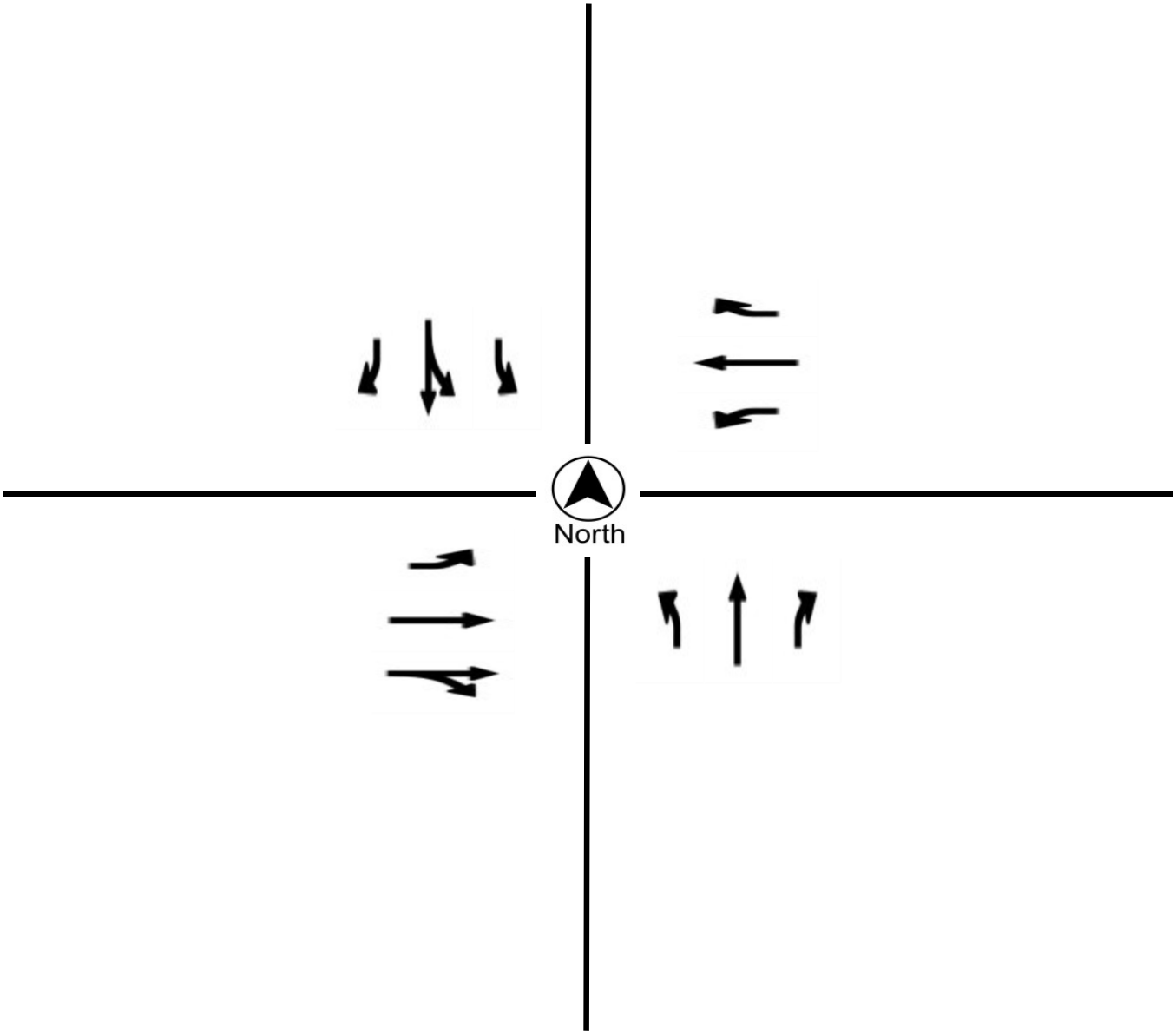
Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION	13th St @ Riverisde Ave	**N/S STREET**	Riverside Ave / Riverside Ave
COUNTY	San Luis Obispo	**E/W STREET**	13th St / 13th St
COLLECTION DATE	Wednesday, June 6, 2018	**WEATHER**	Clear
CYCLE TIME	104 Seconds	**CONTROL TYPE**	Signal

COMMENTS All approaches have protected left turns.



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Prepared For:
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895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

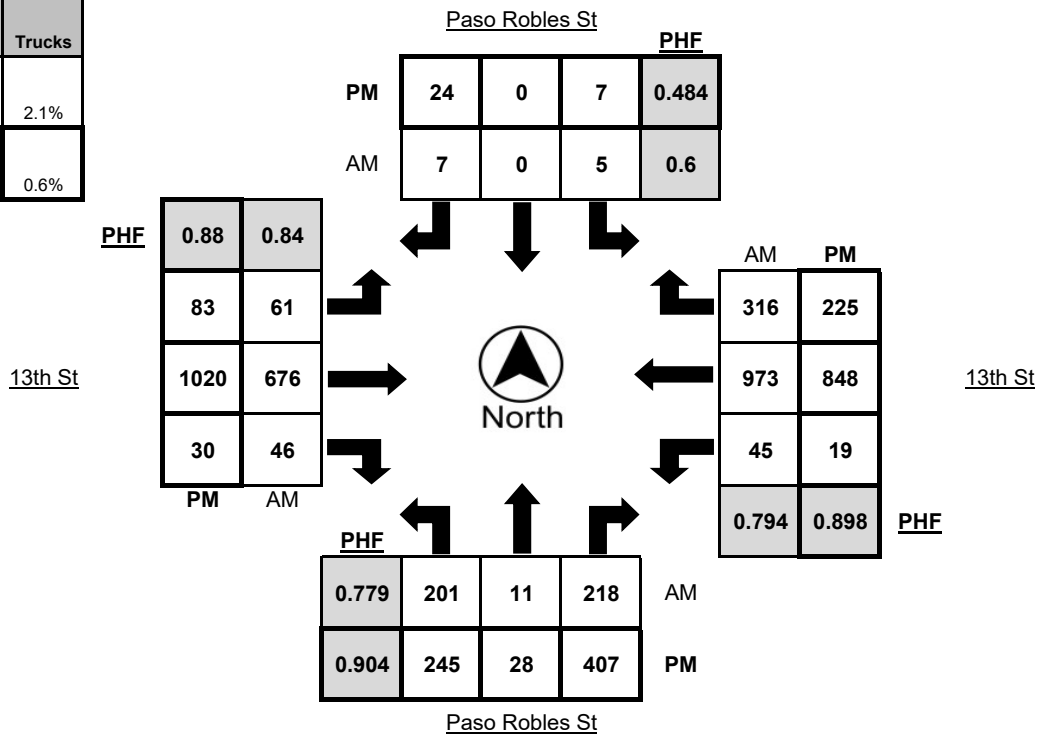
LOCATION 13th St @ Paso Robles St
LATITUDE 35.6281
COUNTY San Luis Obispo
LONGITUDE -120.6857
COLLECTION DATE Wednesday, June 6, 2018
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	19	0	22	3	1	0	0	0	11	68	7	2	9	141	47	8
7:15 AM - 7:30 AM	29	5	35	1	1	0	1	1	14	125	6	6	6	165	51	2
7:30 AM - 7:45 AM	36	0	47	5	2	0	1	0	15	172	9	6	5	224	89	3
7:45 AM - 8:00 AM	55	4	79	5	2	0	2	1	24	192	17	6	18	291	111	4
8:00 AM - 8:15 AM	58	5	51	2	1	0	4	0	12	134	7	4	9	262	83	4
8:15 AM - 8:30 AM	52	2	41	4	0	0	0	0	10	178	13	5	13	196	33	6
8:30 AM - 8:45 AM	54	2	35	3	1	0	1	1	14	106	9	6	15	160	31	4
8:45 AM - 9:00 AM	70	5	52	5	0	0	4	0	15	105	14	4	11	211	39	6
TOTAL	**373**	**23**	**362**	**28**	**8**	**0**	**13**	**3**	**115**	**1080**	**82**	**39**	**86**	**1650**	**484**	**37**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	50	5	72	2	0	0	3	0	25	224	10	6	14	183	44	2
4:15 PM - 4:30 PM	61	5	98	2	2	0	2	0	23	242	2	1	4	183	51	0
4:30 PM - 4:45 PM	54	9	93	1	5	0	11	0	17	220	11	1	8	197	60	0
4:45 PM - 5:00 PM	52	5	105	2	0	0	3	0	20	261	10	1	4	245	55	1
5:00 PM - 5:15 PM	66	7	101	3	1	0	6	0	26	243	3	3	3	194	53	2
5:15 PM - 5:30 PM	73	7	108	1	1	0	4	0	20	296	6	2	4	212	57	0
5:30 PM - 5:45 PM	58	4	98	1	0	0	4	0	21	219	1	1	3	200	51	2
5:45 PM - 6:00 PM	50	3	77	0	0	0	2	0	8	201	3	3	3	215	40	1
TOTAL	**464**	**45**	**752**	**12**	**9**	**0**	**35**	**0**	**160**	**1906**	**46**	**18**	**43**	**1629**	**411**	**8**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:30 AM - 8:30 AM	201	11	218	16	5	0	7	1	61	676	46	21	45	973	316	17
4:30 PM - 5:30 PM	245	28	407	7	7	0	24	0	83	1020	30	7	19	848	225	3

	PHF	Trucks
AM	0.805	2.1%
PM	0.931	0.6%



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Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

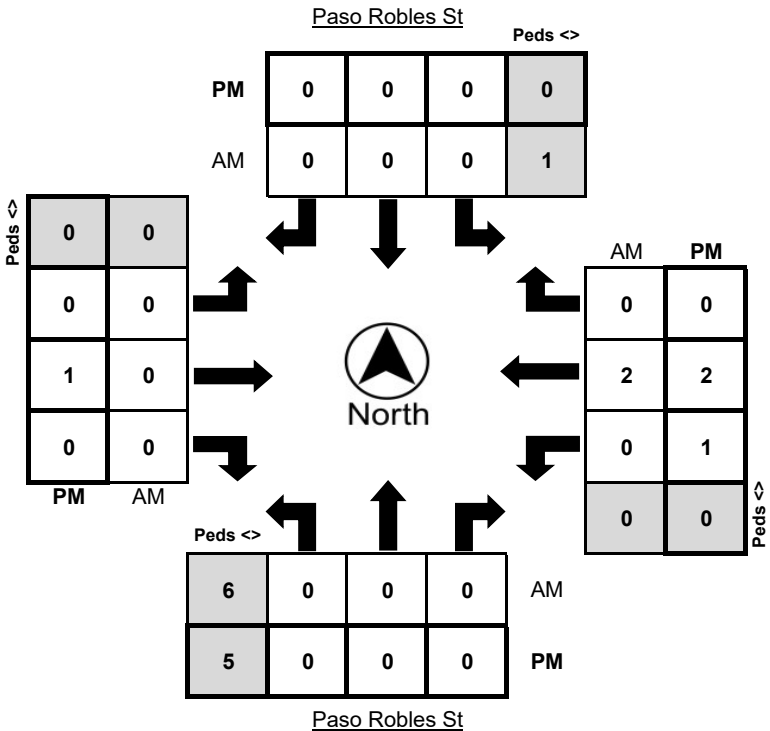
LOCATION 13th St @ Paso Robles St
LATITUDE 35.6281
COUNTY San Luis Obispo
LONGITUDE -120.6857
COLLECTION DATE Wednesday, June 6, 2018
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	3	0	0	0	0	0	1	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
8:45 AM - 9:00 AM	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**7**	**0**	**1**	**0**	**0**	**0**	**3**	**1**	**1**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	3	0	1	0	0	0	2	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	1	0	0	0	3	1	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**12**	**1**	**2**	**0**	**0**	**1**	**2**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:30 AM - 8:30 AM	0	0	0	1	0	0	0	6	0	0	0	0	0	2	0	0
4:30 PM - 5:30 PM	0	0	0	0	0	0	0	5	0	1	0	0	1	2	0	0

	Bikes	Peds
AM Peak Total	2	7
PM Peak Total	4	5



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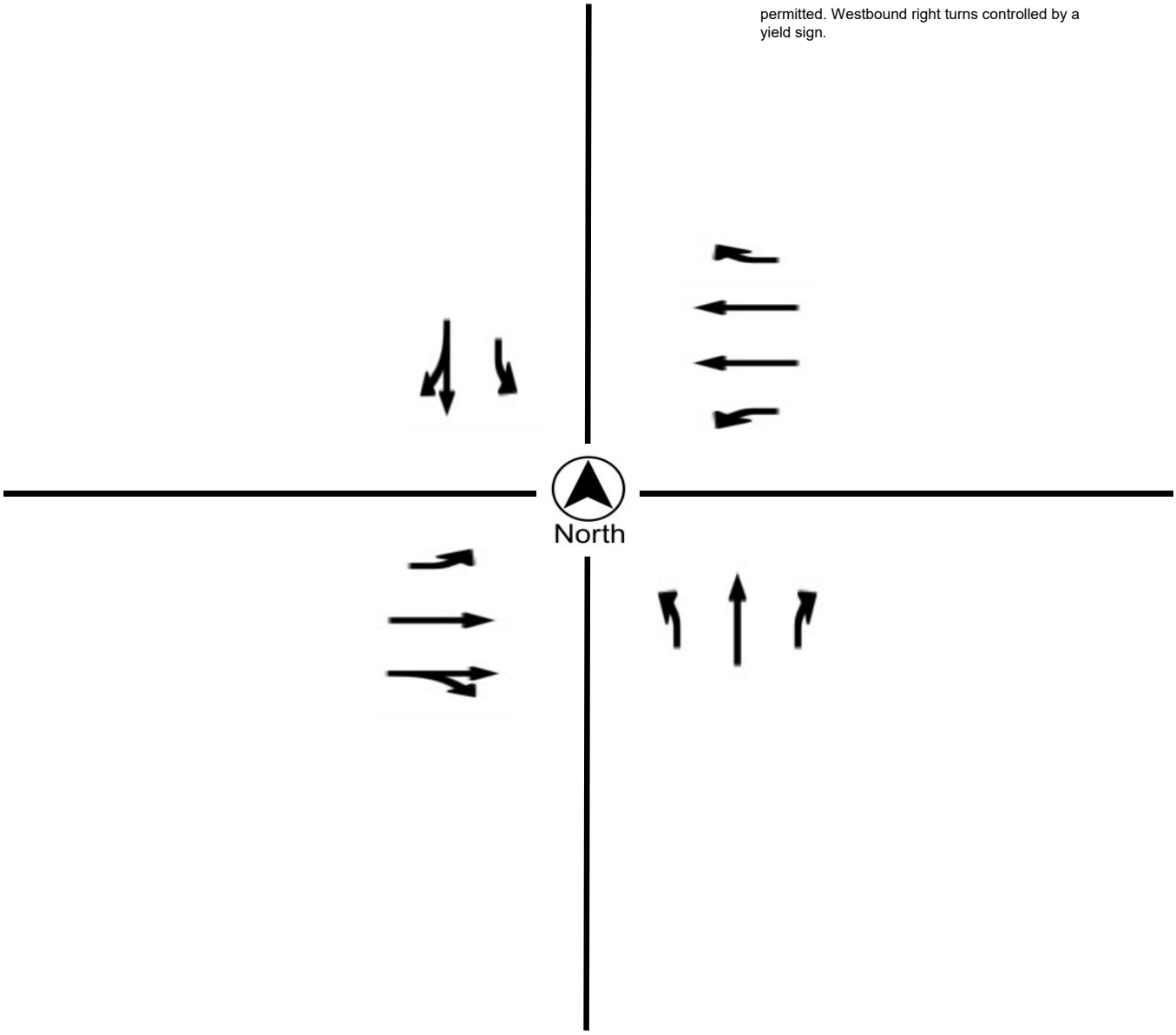
800-975-6938 Phone/Fax
www.metrotrafficdata.com

Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION	13th St @ Paso Robles St	**N/S STREET**	Paso Robles St / Paso Robles St
COUNTY	San Luis Obispo	**E/W STREET**	13th St / 13th St
COLLECTION DATE	Wednesday, June 6, 2018	**WEATHER**	Clear
CYCLE TIME	89 Seconds	**CONTROL TYPE**	Signal

COMMENTS Eastbound and westbound left turns are protected. Northbound and southbound left turns are permitted. Westbound right turns controlled by a yield sign.



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800-975-6938 Phone/Fax
www.metrotrafficdata.com

Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

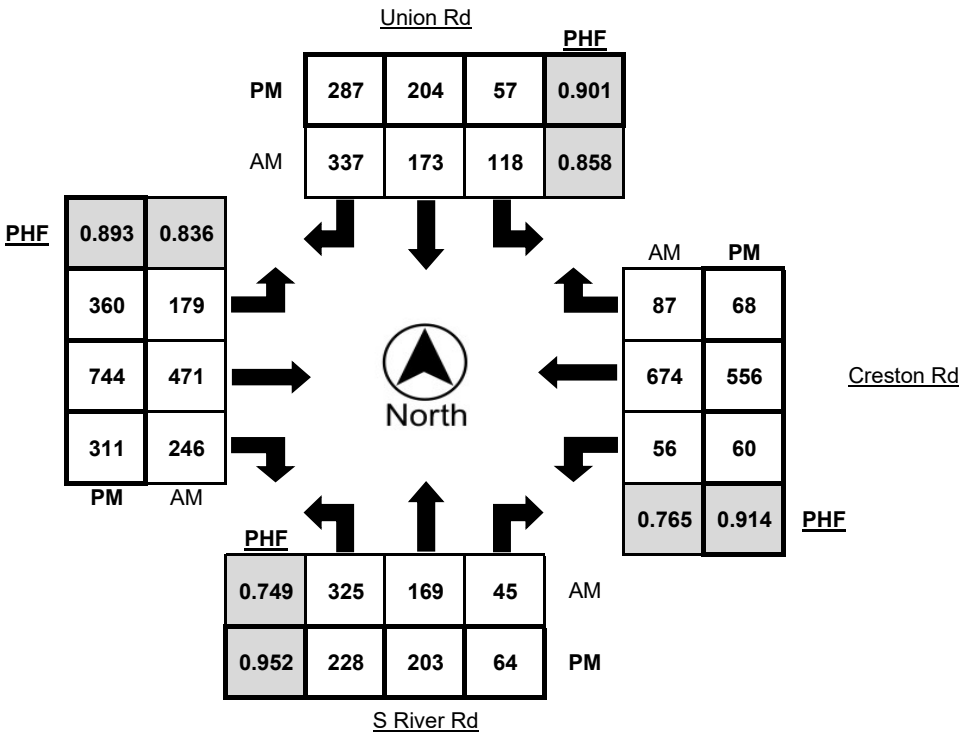
LOCATION Creston Rd @ Union Rd/River Rd
LATITUDE 35.6291
COUNTY San Luis Obispo
LONGITUDE -120.6833
COLLECTION DATE Wednesday, June 6, 2018
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
7:00 AM - 7:15 AM	38	18	4	1	6	20	62	8	18	46	25	2	8	91	5	1
7:15 AM - 7:30 AM	43	22	5	2	14	38	82	2	32	67	55	6	5	112	6	1
7:30 AM - 7:45 AM	80	42	13	1	27	53	79	2	32	119	71	6	14	165	21	0
7:45 AM - 8:00 AM	105	55	20	3	36	44	103	1	54	140	74	11	11	222	34	1
8:00 AM - 8:15 AM	88	46	6	1	37	49	89	3	38	101	55	4	22	155	19	2
8:15 AM - 8:30 AM	52	26	6	2	18	27	66	4	55	111	46	7	9	132	13	2
8:30 AM - 8:45 AM	39	21	5	2	4	34	58	3	47	71	27	8	13	113	8	2
8:45 AM - 9:00 AM	59	21	8	4	4	30	63	1	44	75	36	5	12	119	6	2
TOTAL	**504**	**251**	**67**	**16**	**146**	**295**	**602**	**24**	**320**	**730**	**389**	**49**	**94**	**1109**	**112**	**11**

	Northbound				Southbound				Eastbound				Westbound			
Time	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	54	54	12	0	11	45	78	1	70	146	72	3	6	108	12	1
4:15 PM - 4:30 PM	54	46	20	1	12	43	71	1	96	196	65	1	21	117	15	0
4:30 PM - 4:45 PM	51	48	18	0	13	46	74	0	81	151	78	2	19	147	21	1
4:45 PM - 5:00 PM	61	47	18	0	12	42	73	1	90	192	76	0	17	149	21	0
5:00 PM - 5:15 PM	57	49	16	0	12	69	55	0	90	190	71	5	6	150	8	2
5:15 PM - 5:30 PM	59	59	12	1	20	47	85	0	99	211	86	2	18	110	18	0
5:30 PM - 5:45 PM	56	52	17	1	8	34	61	0	58	159	80	1	12	135	10	2
5:45 PM - 6:00 PM	48	53	17	2	8	42	77	0	67	146	79	0	15	126	17	0
TOTAL	**440**	**408**	**130**	**5**	**96**	**368**	**574**	**3**	**651**	**1391**	**607**	**14**	**114**	**1042**	**122**	**6**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
7:30 AM - 8:30 AM	325	169	45	7	118	173	337	10	179	471	246	28	56	674	87	5
4:30 PM - 5:30 PM	228	203	64	1	57	204	287	1	360	744	311	9	60	556	68	3

	PHF	Trucks
AM	0.802	1.7%
PM	0.953	0.4%



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Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

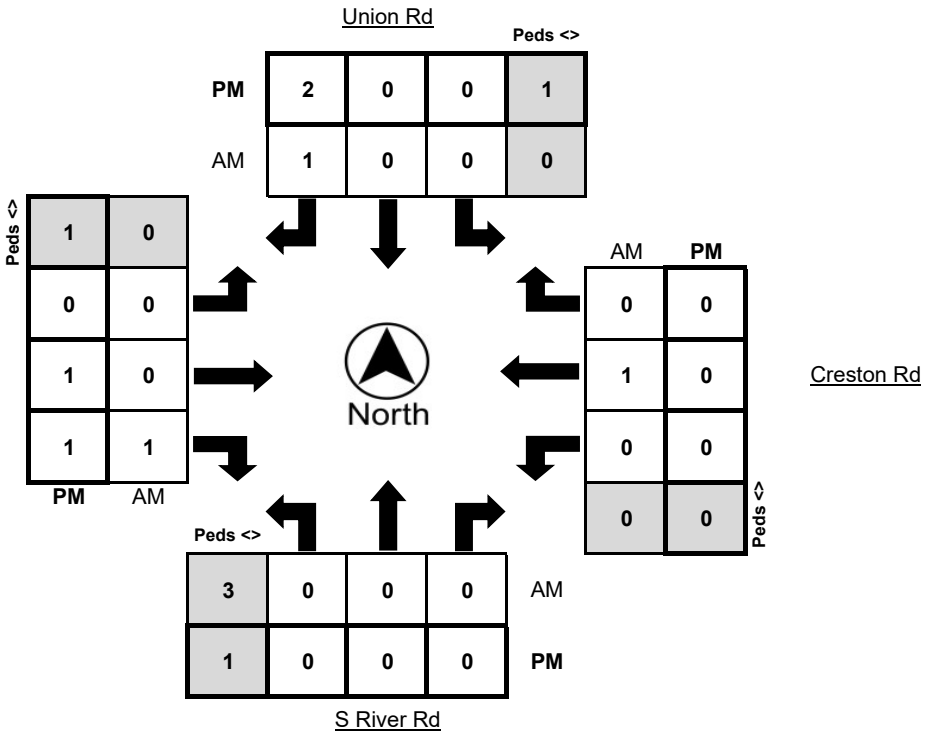
LOCATION Creston Rd @ Union Rd/River Rd
LATITUDE 35.6291
COUNTY San Luis Obispo
LONGITUDE -120.6833
COLLECTION DATE Wednesday, June 6, 2018
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**1**	**0**	**0**	**2**	**4**	**0**	**1**	**1**	**0**	**0**	**1**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	1	0	0	2	0	0	0	1	0	0	0	0	1
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**2**	**0**	**0**	**2**	**1**	**0**	**3**	**1**	**0**	**0**	**0**	**0**	**1**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:30 AM - 8:30 AM	0	0	0	0	0	0	1	3	0	0	1	0	0	1	0	0
4:30 PM - 5:30 PM	0	0	0	1	0	0	2	1	0	1	1	0	0	0	0	1

	Bikes	Peds
AM Peak Total	3	3
PM Peak Total	4	3



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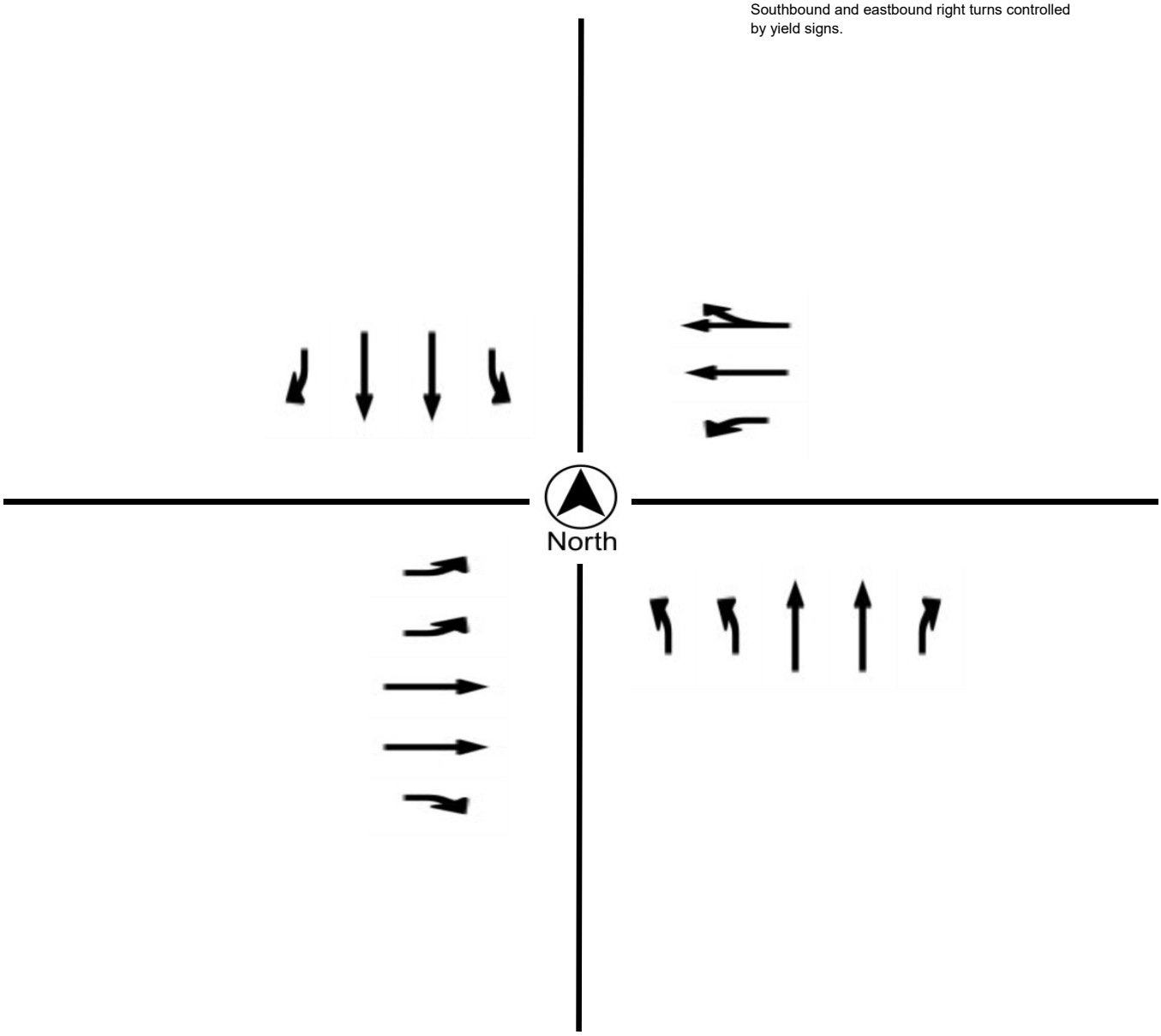
Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION	Creston Rd @ Union Rd/River Rd	**N/S STREET**	Union Rd / S River Rd
COUNTY	San Luis Obispo	**E/W STREET**	Creston Rd / 13th St
COLLECTION DATE	Wednesday, June 6, 2018	**WEATHER**	Clear
CYCLE TIME	118 Seconds	**CONTROL TYPE**	Signal

COMMENTS All approaches have protected left turns. Southbound and eastbound right turns controlled by yield signs.



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Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

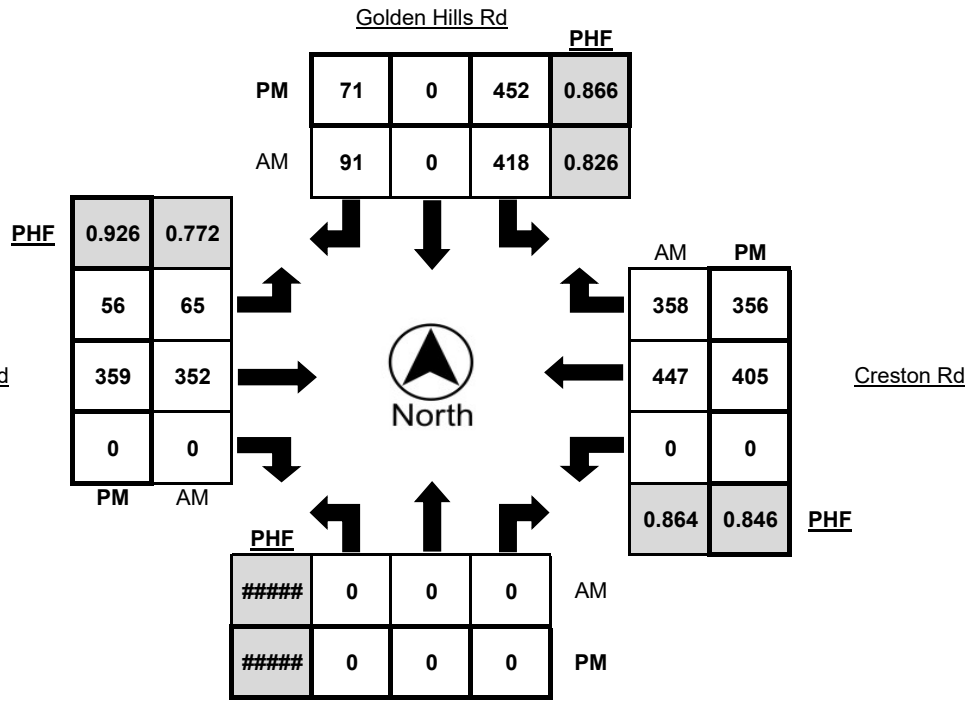
LOCATION Creston Rd @ Golden Hill Rd
LATITUDE 35.6223
COUNTY San Luis Obispo
LONGITUDE -120.6597
COLLECTION DATE Thursday, June 7, 2018
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
7:00 AM - 7:15 AM	0	0	0	0	39	0	8	4	5	43	0	1	0	49	58	3
7:15 AM - 7:30 AM	0	0	0	0	65	0	12	4	9	52	0	4	0	62	53	0
7:30 AM - 7:45 AM	0	0	0	0	111	0	36	4	12	77	0	3	0	112	75	4
7:45 AM - 8:00 AM	0	0	0	0	127	0	27	5	22	89	0	1	0	116	117	4
8:00 AM - 8:15 AM	0	0	0	0	107	0	14	5	21	114	0	1	0	140	89	10
8:15 AM - 8:30 AM	0	0	0	0	73	0	14	3	10	72	0	5	0	79	77	5
8:30 AM - 8:45 AM	0	0	0	0	52	0	7	3	6	44	0	0	0	56	55	1
8:45 AM - 9:00 AM	0	0	0	0	54	0	4	4	7	56	0	1	0	83	57	1
TOTAL	**0**	**0**	**0**	**0**	**628**	**0**	**122**	**32**	**92**	**547**	**0**	**16**	**0**	**697**	**581**	**28**

	Northbound				Southbound				Eastbound				Westbound			
Time	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	0	0	0	0	87	0	16	0	6	90	0	2	0	104	94	1
4:15 PM - 4:30 PM	0	0	0	0	99	0	12	2	6	85	0	1	0	116	88	0
4:30 PM - 4:45 PM	0	0	0	0	97	0	17	1	12	88	0	1	0	120	105	2
4:45 PM - 5:00 PM	0	0	0	0	132	0	19	1	19	76	0	0	0	89	79	1
5:00 PM - 5:15 PM	0	0	0	0	116	0	14	0	11	101	0	1	0	101	92	1
5:15 PM - 5:30 PM	0	0	0	0	107	0	21	1	14	94	0	1	0	95	80	0
5:30 PM - 5:45 PM	0	0	0	0	117	0	21	1	13	97	0	1	0	96	77	3
5:45 PM - 6:00 PM	0	0	0	0	88	0	18	1	12	79	0	1	0	74	75	0
TOTAL	**0**	**0**	**0**	**0**	**843**	**0**	**138**	**7**	**93**	**710**	**0**	**8**	**0**	**795**	**690**	**8**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
7:30 AM - 8:30 AM	0	0	0	0	418	0	91	17	65	352	0	10	0	447	358	23
4:30 PM - 5:30 PM	0	0	0	0	452	0	71	3	56	359	0	3	0	405	356	4

	PHF	Trucks
AM	0.869	2.9%
PM	0.968	0.6%



Turning Movement Report

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800-975-6938 Phone/Fax
www.metrotrafficdata.com

Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

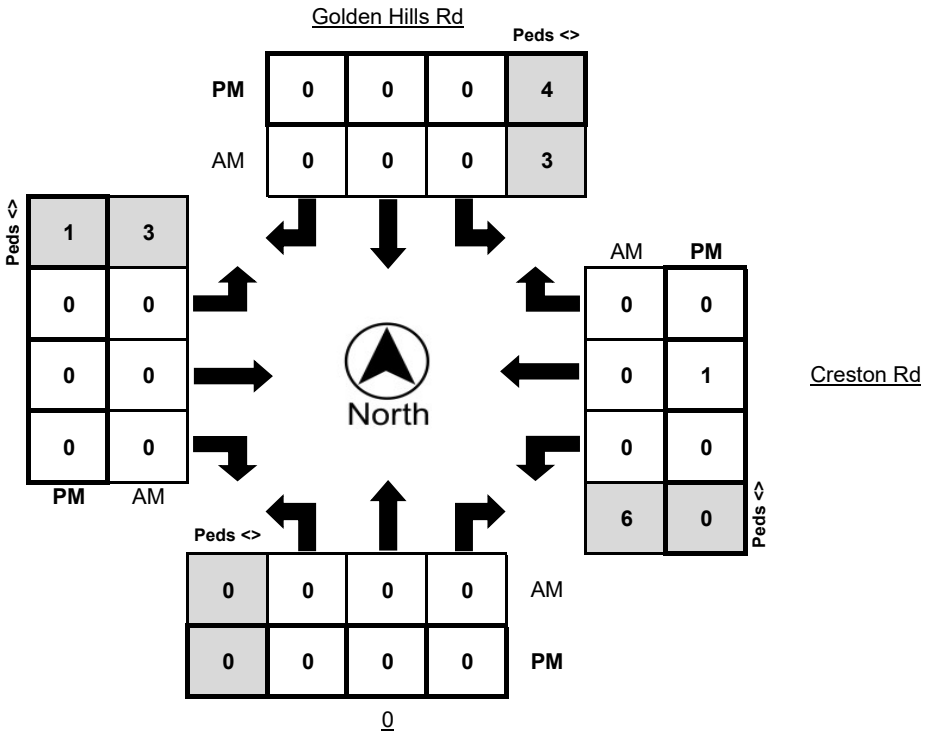
LOCATION Creston Rd @ Golden Hill Rd
LATITUDE 35.6223
COUNTY San Luis Obispo
LONGITUDE -120.6597
COLLECTION DATE Thursday, June 7, 2018
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	1
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:30 AM - 8:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2
TOTAL	**0**	**0**	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**0**	**0**	**5**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1
5:45 PM - 6:00 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**2**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:30 AM - 8:30 AM	0	0	0	3	0	0	0	0	0	0	0	6	0	0	0	3
4:30 PM - 5:30 PM	0	0	0	4	0	0	0	0	0	0	0	0	0	1	0	1

	Bikes	Peds
AM Peak Total	0	12
PM Peak Total	1	5



Turning Movement Report

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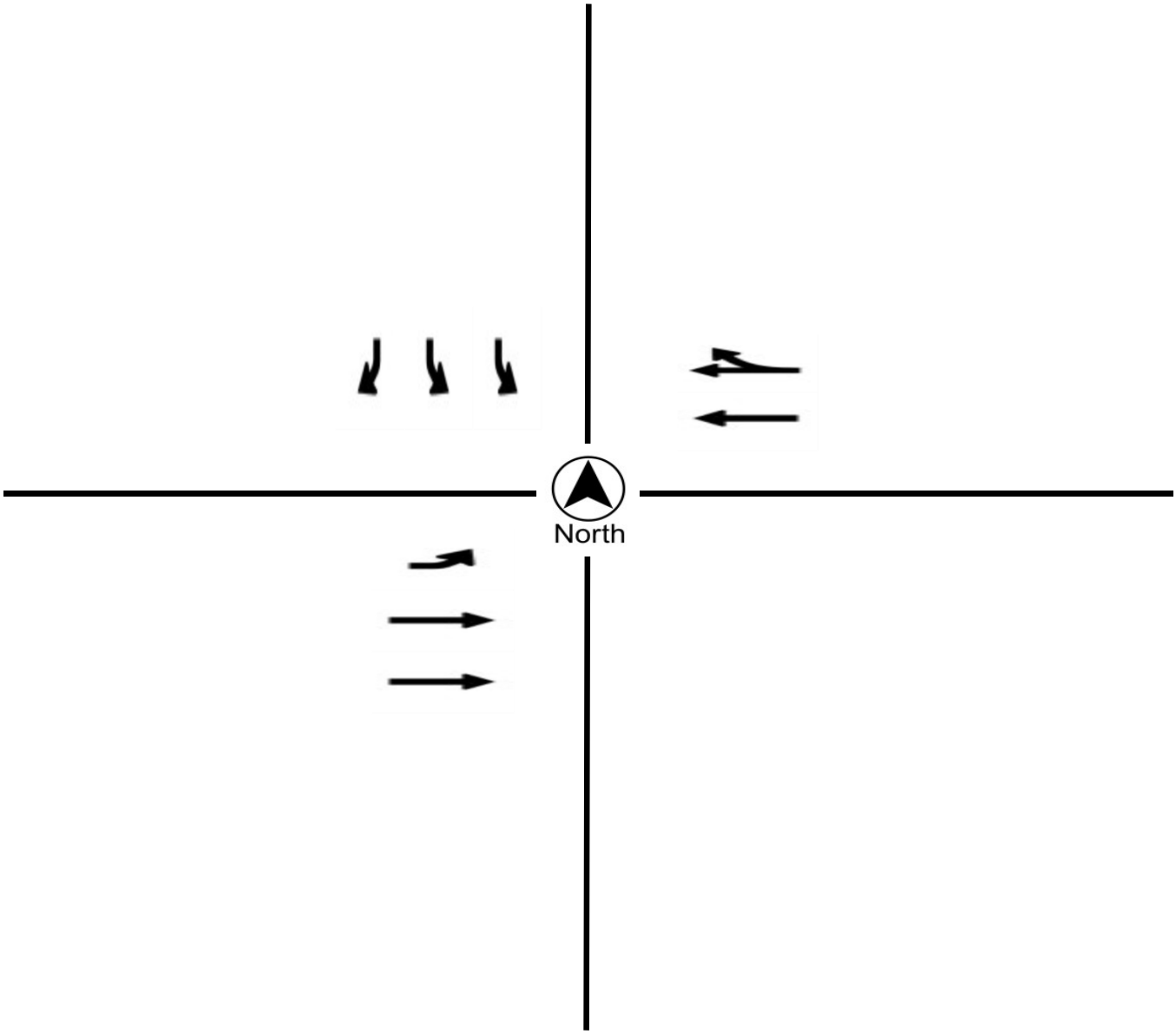
Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION	Creston Rd @ Golden Hill Rd	**N/S STREET**	Golden Hills Rd /
COUNTY	San Luis Obispo	**E/W STREET**	Creston Rd / Creston Rd
COLLECTION DATE	Thursday, June 7, 2018	**WEATHER**	Clear
CYCLE TIME	76 Seconds	**CONTROL TYPE**	Signal

COMMENTS Eastbound left turns are protected.



Reso A - Exhibit C2 (EIR Technical Appendix)

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Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

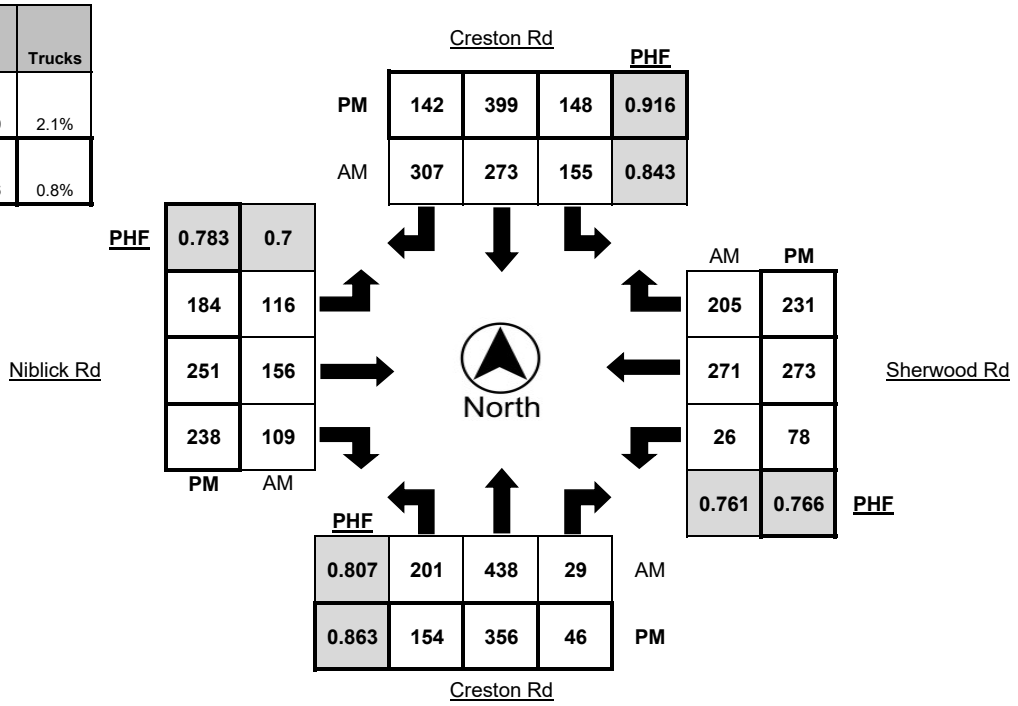
LOCATION Creston Rd @ Niblick Rd
LATITUDE 35.6157
COUNTY San Luis Obispo
LONGITUDE -120.6591
COLLECTION DATE Thursday, January 24, 2019
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	36	51	8	0	25	26	23	2	18	38	14	1	0	55	22	0
7:15 AM - 7:30 AM	51	89	7	2	19	32	63	4	28	37	20	1	3	80	36	1
7:30 AM - 7:45 AM	71	129	7	3	34	53	109	2	26	23	19	6	3	105	57	3
7:45 AM - 8:00 AM	37	118	4	1	57	90	60	7	36	61	39	4	10	43	62	2
8:00 AM - 8:15 AM	42	102	11	3	45	98	75	5	26	35	31	1	10	43	50	4
8:15 AM - 8:30 AM	44	63	10	5	32	50	27	0	18	46	24	0	11	47	27	2
8:30 AM - 8:45 AM	31	56	5	0	18	37	15	0	19	29	13	0	8	39	39	6
8:45 AM - 9:00 AM	24	54	8	4	13	29	27	0	22	23	15	2	13	46	38	2
TOTAL	**336**	**662**	**60**	**18**	**243**	**415**	**399**	**20**	**193**	**292**	**175**	**15**	**58**	**458**	**331**	**20**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
2:00 PM - 2:15 PM	30	59	7	0	32	45	31	4	26	41	39	0	20	42	44	4
2:15 PM - 2:30 PM	22	62	5	2	26	62	37	4	28	40	28	0	7	46	33	3
2:30 PM - 2:45 PM	37	95	4	2	36	61	54	8	35	43	18	0	13	52	38	1
2:45 PM - 3:00 PM	51	102	10	3	53	60	66	13	32	41	35	3	16	57	47	3
3:00 PM - 3:15 PM	40	71	11	3	45	74	52	5	47	62	36	0	18	65	37	6
3:15 PM - 3:30 PM	37	69	9	0	37	73	34	3	39	81	53	5	18	53	46	7
3:30 PM - 3:45 PM	36	60	5	3	65	71	30	2	39	47	42	5	19	66	78	6
3:45 PM - 4:00 PM	46	70	12	3	51	85	41	5	29	51	35	1	20	60	57	3
4:00 PM - 4:15 PM	28	90	10	1	32	86	45	0	46	53	38	1	16	55	45	0
4:15 PM - 4:30 PM	48	58	14	2	44	70	29	2	37	60	44	0	16	62	38	2
4:30 PM - 4:45 PM	44	73	5	3	47	112	29	4	38	54	50	0	22	94	74	3
4:45 PM - 5:00 PM	33	101	19	0	23	82	39	0	40	63	55	0	20	57	55	2
5:00 PM - 5:15 PM	32	76	12	1	38	109	35	0	36	65	57	0	15	69	59	1
5:15 PM - 5:30 PM	45	106	10	0	40	96	39	4	70	69	76	0	21	53	43	1
5:30 PM - 5:45 PM	32	68	14	1	34	75	40	2	55	62	50	2	26	51	53	2
5:45 PM - 6:00 PM	29	74	18	1	28	71	32	0	30	58	32	0	21	38	40	1
TOTAL	**590**	**1234**	**165**	**25**	**631**	**1232**	**633**	**56**	**627**	**890**	**688**	**17**	**288**	**920**	**787**	**45**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:15 AM - 8:15 AM	201	438	29	9	155	273	307	18	116	156	109	12	26	271	205	10
4:30 PM - 5:30 PM	154	356	46	4	148	399	142	8	184	251	238	0	78	273	231	7

	PHF	Trucks
AM	0.899	2.1%
PM	0.936	0.8%



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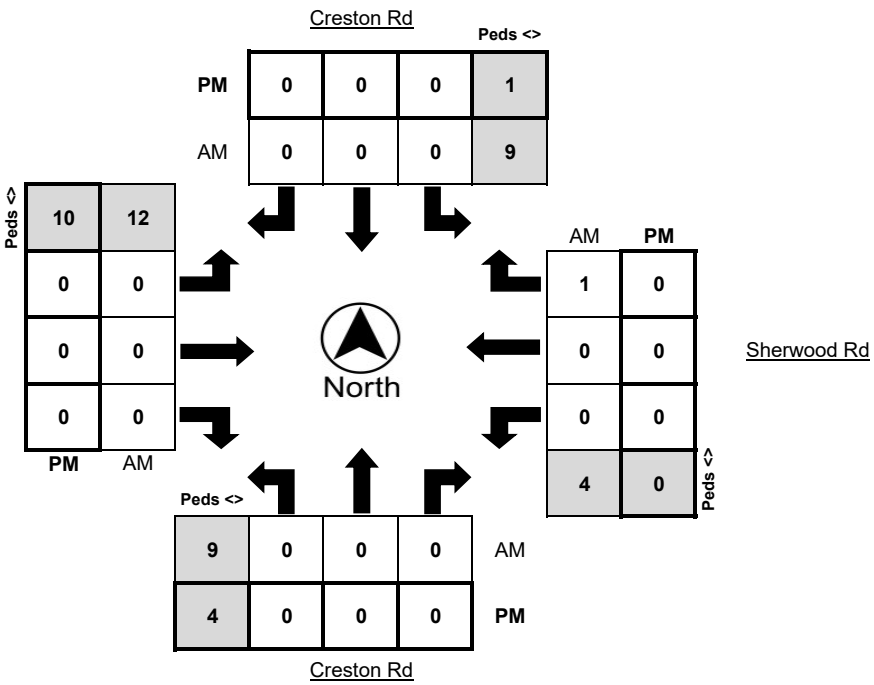
LOCATION Creston Rd @ Niblick Rd
LATITUDE 35.6157
COUNTY San Luis Obispo
LONGITUDE -120.6591
COLLECTION DATE Thursday, January 24, 2019
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	5
7:15 AM - 7:30 AM	0	0	0	3	0	0	0	4	0	0	0	3	0	0	0	5
7:30 AM - 7:45 AM	0	0	0	5	0	0	0	2	0	0	0	1	0	0	0	3
7:45 AM - 8:00 AM	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	2
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	5	0	0	0	2	0	0	0	2
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**10**	**0**	**0**	**0**	**16**	**0**	**0**	**0**	**7**	**0**	**0**	**1**	**20**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
2:00 PM - 2:15 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
2:15 PM - 2:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
2:30 PM - 2:45 PM	0	0	0	2	0	0	0	1	0	0	0	1	0	0	0	0
2:45 PM - 3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
3:00 PM - 3:15 PM	0	1	0	0	0	0	0	5	0	0	0	1	0	0	0	6
3:15 PM - 3:30 PM	0	0	0	1	0	0	0	15	0	0	0	0	0	1	0	13
3:30 PM - 3:45 PM	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	11
3:45 PM - 4:00 PM	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	3
4:00 PM - 4:15 PM	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	1
4:15 PM - 4:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:30 PM - 4:45 PM	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	2
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	4
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
TOTAL	**0**	**2**	**0**	**6**	**0**	**0**	**0**	**36**	**0**	**0**	**0**	**7**	**0**	**2**	**0**	**48**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:15 AM - 8:15 AM	0	0	0	9	0	0	0	9	0	0	0	4	0	0	1	12
4:30 PM - 5:30 PM	0	0	0	1	0	0	0	4	0	0	0	0	0	0	0	10

	Bikes	Peds
AM Peak Total	1	34
PM Peak Total	0	15



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Prepared For:
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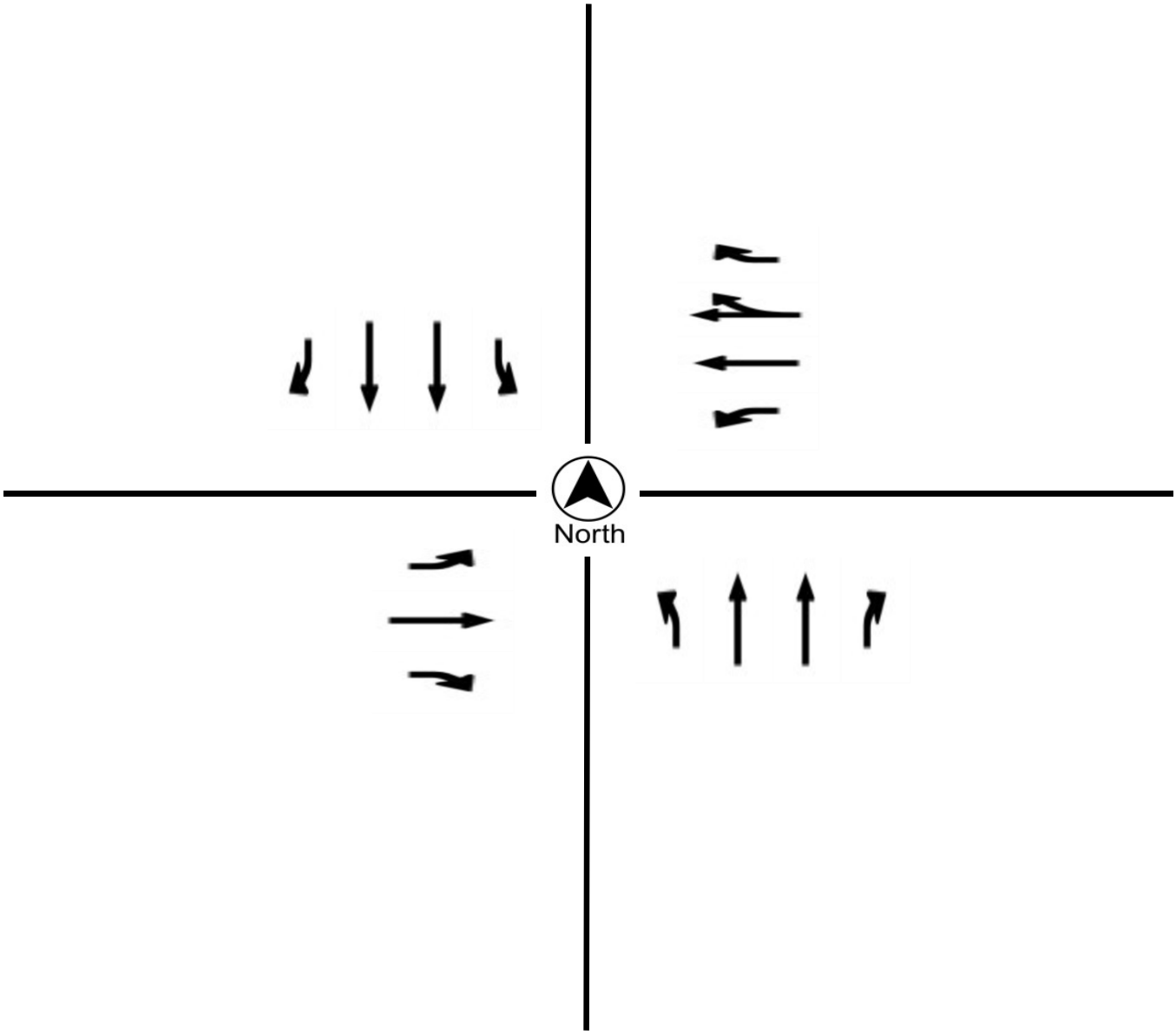
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION	Creston Rd @ Niblick Rd	**N/S STREET**	Creston Rd / Creston Rd
COUNTY	San Luis Obispo	**E/W STREET**	Sherwood Rd / Niblick Rd
COLLECTION DATE	Thursday, January 24, 2019	**WEATHER**	Clear
CYCLE TIME	107 Seconds	**CONTROL TYPE**	Signal

COMMENTS All approaches have protected left turns.



Reso A - Exhibit C2 (EIR Technical Appendix)

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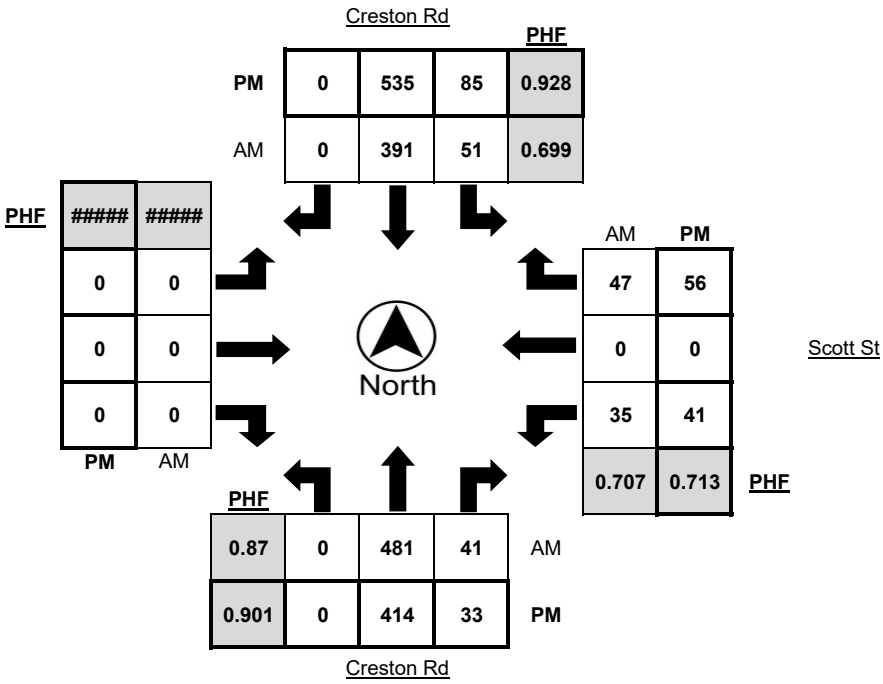
LOCATION Creston Rd @ Scott St
LATITUDE 35.6085
COUNTY San Luis Obispo
LONGITUDE -120.6590
COLLECTION DATE Thursday, January 24, 2019
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	0	67	7	0	5	38	0	2	0	0	0	0	2	0	3	0
7:15 AM - 7:30 AM	0	111	4	0	4	51	0	0	0	0	0	0	7	0	15	2
7:30 AM - 7:45 AM	0	141	9	2	6	69	0	0	0	0	0	0	13	0	16	0
7:45 AM - 8:00 AM	0	120	12	1	19	139	0	2	0	0	0	0	8	0	12	0
8:00 AM - 8:15 AM	0	131	11	3	14	112	0	1	0	0	0	0	8	0	9	0
8:15 AM - 8:30 AM	0	89	9	3	12	71	0	0	0	0	0	0	6	0	10	1
8:30 AM - 8:45 AM	0	61	4	1	6	45	0	1	0	0	0	0	5	0	13	0
8:45 AM - 9:00 AM	0	69	9	3	10	48	0	0	0	0	0	0	5	0	5	1
TOTAL	**0**	**789**	**65**	**13**	**76**	**573**	**0**	**6**	**0**	**0**	**0**	**0**	**54**	**0**	**83**	**4**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
2:00 PM - 2:15 PM	0	67	4	0	17	77	0	2	0	0	0	0	6	0	12	0
2:15 PM - 2:30 PM	0	62	6	1	12	86	0	3	0	0	0	0	13	0	13	0
2:30 PM - 2:45 PM	0	105	2	1	8	82	0	1	0	0	0	0	4	0	21	0
2:45 PM - 3:00 PM	0	123	7	2	16	79	0	2	0	0	0	0	4	0	21	0
3:00 PM - 3:15 PM	0	100	13	2	14	101	0	1	0	0	0	0	9	0	14	0
3:15 PM - 3:30 PM	0	94	14	0	15	107	0	0	0	0	0	0	4	0	10	0
3:30 PM - 3:45 PM	0	66	6	2	18	111	0	2	0	0	0	0	14	0	15	0
3:45 PM - 4:00 PM	0	89	6	1	13	109	0	0	0	0	0	0	6	0	17	0
4:00 PM - 4:15 PM	0	94	8	0	15	119	0	0	0	0	0	0	11	0	22	0
4:15 PM - 4:30 PM	0	86	9	1	15	105	0	0	0	0	0	0	8	0	18	0
4:30 PM - 4:45 PM	0	91	7	0	23	140	0	0	0	0	0	0	12	0	22	0
4:45 PM - 5:00 PM	0	113	8	0	17	110	0	0	0	0	0	0	12	0	14	0
5:00 PM - 5:15 PM	0	93	11	0	25	138	0	0	0	0	0	0	9	0	7	0
5:15 PM - 5:30 PM	0	117	7	1	20	147	0	0	0	0	0	0	8	0	13	1
5:30 PM - 5:45 PM	0	88	3	0	8	130	0	0	0	0	0	0	3	0	5	0
5:45 PM - 6:00 PM	0	92	2	0	9	96	0	0	0	0	0	0	5	0	8	0
TOTAL	**0**	**1480**	**113**	**11**	**245**	**1737**	**0**	**11**	**0**	**0**	**0**	**0**	**128**	**0**	**232**	**1**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:30 AM - 8:30 AM	0	481	41	9	51	391	0	3	0	0	0	0	35	0	47	1
4:30 PM - 5:30 PM	0	414	33	1	85	535	0	0	0	0	0	0	41	0	56	1

	PHF	Trucks
AM	0.844	1.2%
PM	0.933	0.2%



Turning Movement Report

Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

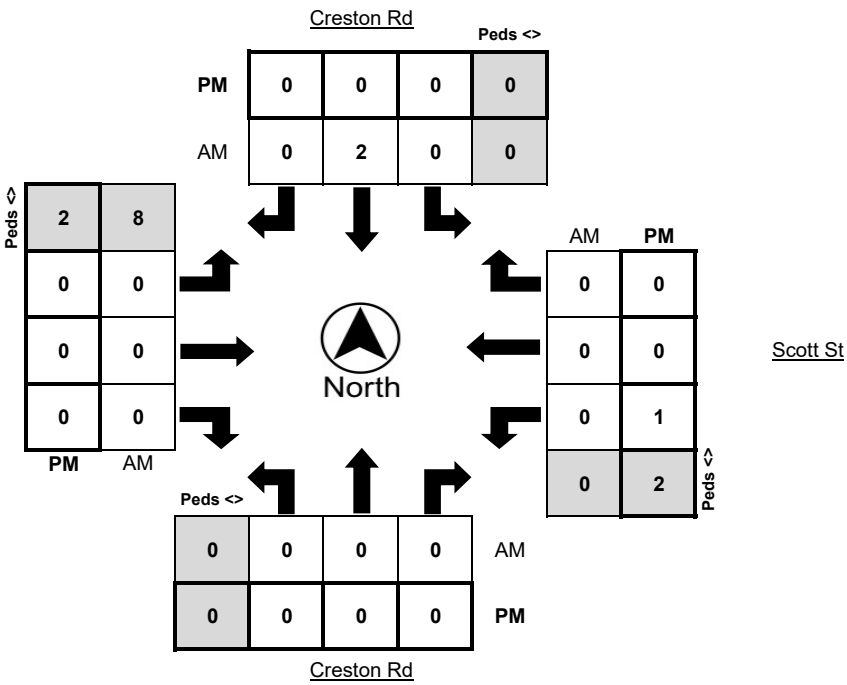
LOCATION Creston Rd @ Scott St
LATITUDE 35.6085
COUNTY San Luis Obispo
LONGITUDE -120.6590
COLLECTION DATE Thursday, January 24, 2019
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**9**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
2:00 PM - 2:15 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM - 2:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
2:30 PM - 2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM - 3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM - 3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
3:15 PM - 3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM - 3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM - 4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**1**	**1**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**2**	**1**	**0**	**0**	**11**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:30 AM - 8:30 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	8
4:30 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	2

	Bikes	Peds
AM Peak Total	2	8
PM Peak Total	1	4



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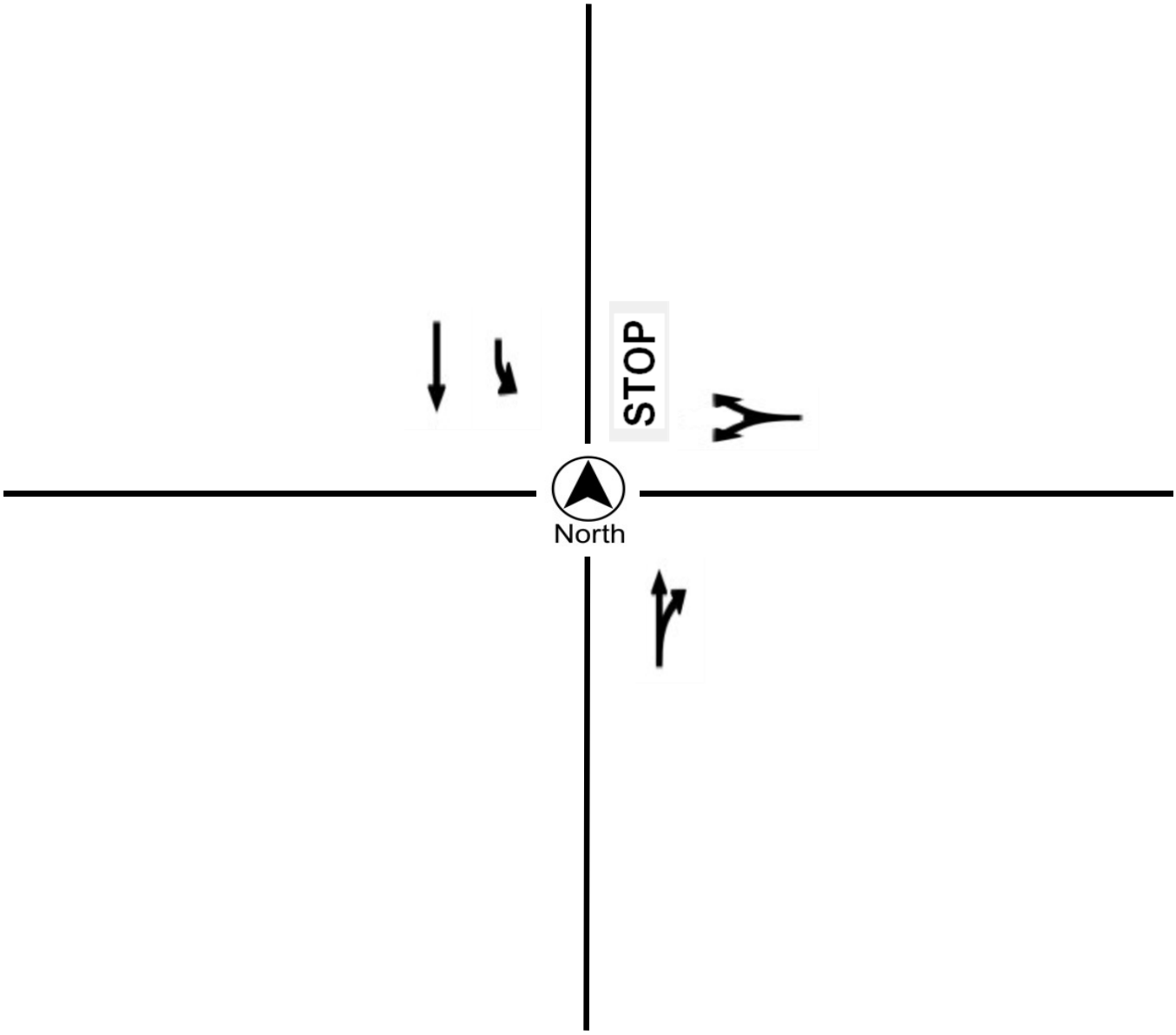
Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION	Creston Rd @ Scott St	**N/S STREET**	Creston Rd / Creston Rd
COUNTY	San Luis Obispo	**E/W STREET**	Scott St
COLLECTION DATE	Thursday, January 24, 2019	**WEATHER**	Clear
CYCLE TIME	N/A	**CONTROL TYPE**	One-Way stop

COMMENTS



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Prepared For:
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Morro Bay, CA 93442

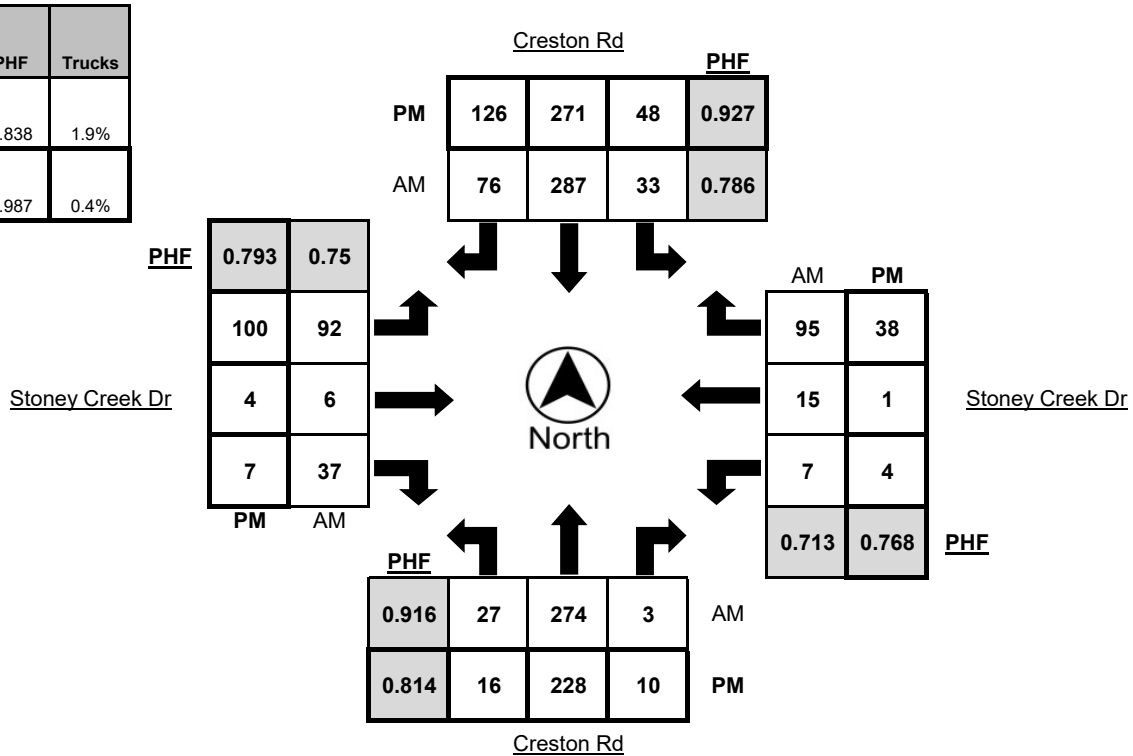
LOCATION Creston Rd @ Stoney Creek Rd
LATITUDE 35.6052
COUNTY San Luis Obispo
LONGITUDE -120.6590
COLLECTION DATE Thursday, June 7, 2018
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
7:00 AM - 7:15 AM	0	36	1	1	1	37	8	1	16	0	0	0	0	1	11	0
7:15 AM - 7:30 AM	2	53	0	0	6	37	11	1	14	1	2	1	1	4	11	0
7:30 AM - 7:45 AM	5	65	1	0	4	57	24	0	29	0	7	2	1	6	17	0
7:45 AM - 8:00 AM	6	71	1	0	9	89	22	5	26	0	19	1	4	6	28	0
8:00 AM - 8:15 AM	11	71	1	4	13	91	22	1	19	5	10	0	0	3	38	1
8:15 AM - 8:30 AM	5	67	0	2	7	50	8	2	18	1	1	0	2	0	12	0
8:30 AM - 8:45 AM	1	37	0	0	2	35	8	1	15	0	2	1	1	1	8	0
8:45 AM - 9:00 AM	1	36	0	0	6	39	7	2	16	1	0	0	0	1	9	0
TOTAL	**31**	**436**	**4**	**7**	**48**	**435**	**110**	**13**	**153**	**8**	**41**	**5**	**9**	**22**	**134**	**1**

	Northbound				Southbound				Eastbound				Westbound			
Time	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	5	67	3	1	10	60	28	0	19	2	2	0	0	1	8	0
4:15 PM - 4:30 PM	6	79	1	0	8	45	34	1	27	2	3	1	0	0	3	0
4:30 PM - 4:45 PM	4	72	2	0	10	56	37	0	24	1	0	0	2	0	8	0
4:45 PM - 5:00 PM	4	50	0	0	9	77	34	0	20	0	1	0	0	1	12	0
5:00 PM - 5:15 PM	1	60	2	0	14	73	28	1	28	1	1	0	0	0	6	0
5:15 PM - 5:30 PM	7	46	6	0	15	65	27	1	28	2	5	1	2	0	12	0
5:30 PM - 5:45 PM	9	50	5	1	9	57	29	4	21	1	5	0	1	1	15	0
5:45 PM - 6:00 PM	0	49	2	0	10	55	37	0	32	2	0	0	1	0	12	0
TOTAL	**36**	**473**	**21**	**2**	**85**	**488**	**254**	**7**	**199**	**11**	**17**	**2**	**6**	**3**	**76**	**0**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
7:30 AM - 8:30 AM	27	274	3	6	33	287	76	8	92	6	37	3	7	15	95	1
4:30 PM - 5:30 PM	16	228	10	0	48	271	126	2	100	4	7	1	4	1	38	0

	PHF	Trucks
AM	0.838	1.9%
PM	0.987	0.4%



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Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

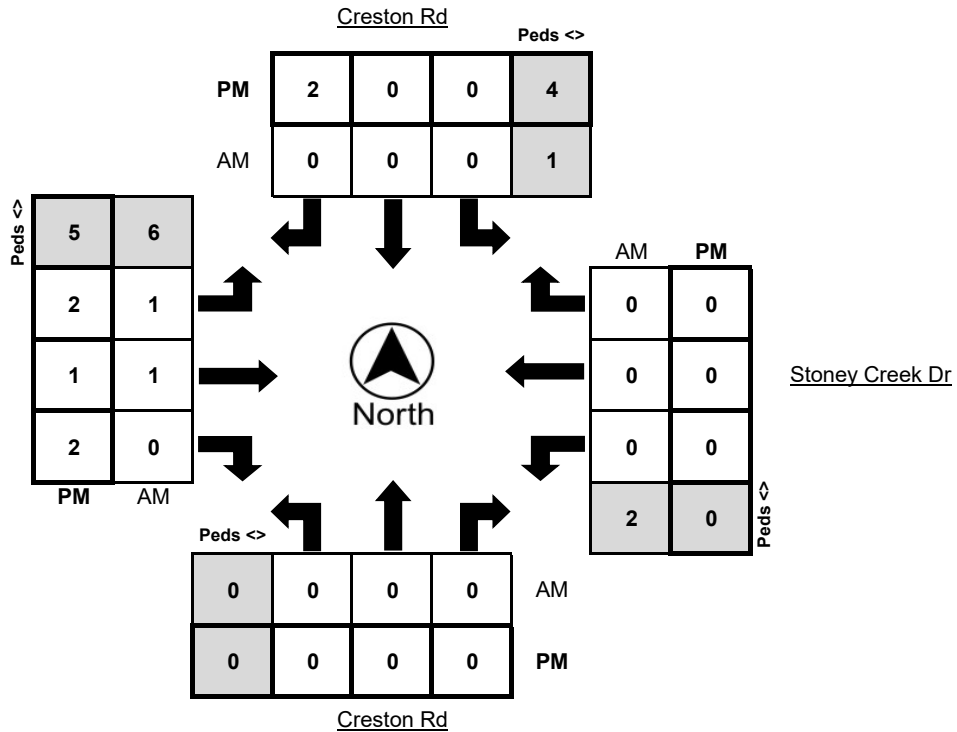
LOCATION Creston Rd @ Stoney Creek Rd
LATITUDE 35.6052
COUNTY San Luis Obispo
LONGITUDE -120.6590
COLLECTION DATE Thursday, June 7, 2018
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1
7:15 AM - 7:30 AM	0	0	0	2	0	0	0	0	2	0	0	0	0	0	0	3
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:15 AM - 8:30 AM	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	2
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
TOTAL	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**2**	**4**	**1**	**0**	**3**	**0**	**0**	**0**	**12**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
4:30 PM - 4:45 PM	0	0	0	1	0	0	1	0	1	1	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	3
5:00 PM - 5:15 PM	0	0	0	2	0	0	1	0	0	0	2	0	0	0	0	2
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	4	0	0	0	3	1	0	0	3	0	0	0	3
5:45 PM - 6:00 PM	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	1
TOTAL	**1**	**0**	**0**	**9**	**0**	**1**	**3**	**3**	**3**	**1**	**2**	**3**	**0**	**1**	**0**	**10**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:30 AM - 8:30 AM	0	0	0	1	0	0	0	0	1	1	0	2	0	0	0	6
4:30 PM - 5:30 PM	0	0	0	4	0	0	2	0	2	1	2	0	0	0	0	5

	Bikes	Peds
AM Peak Total	2	9
PM Peak Total	7	9



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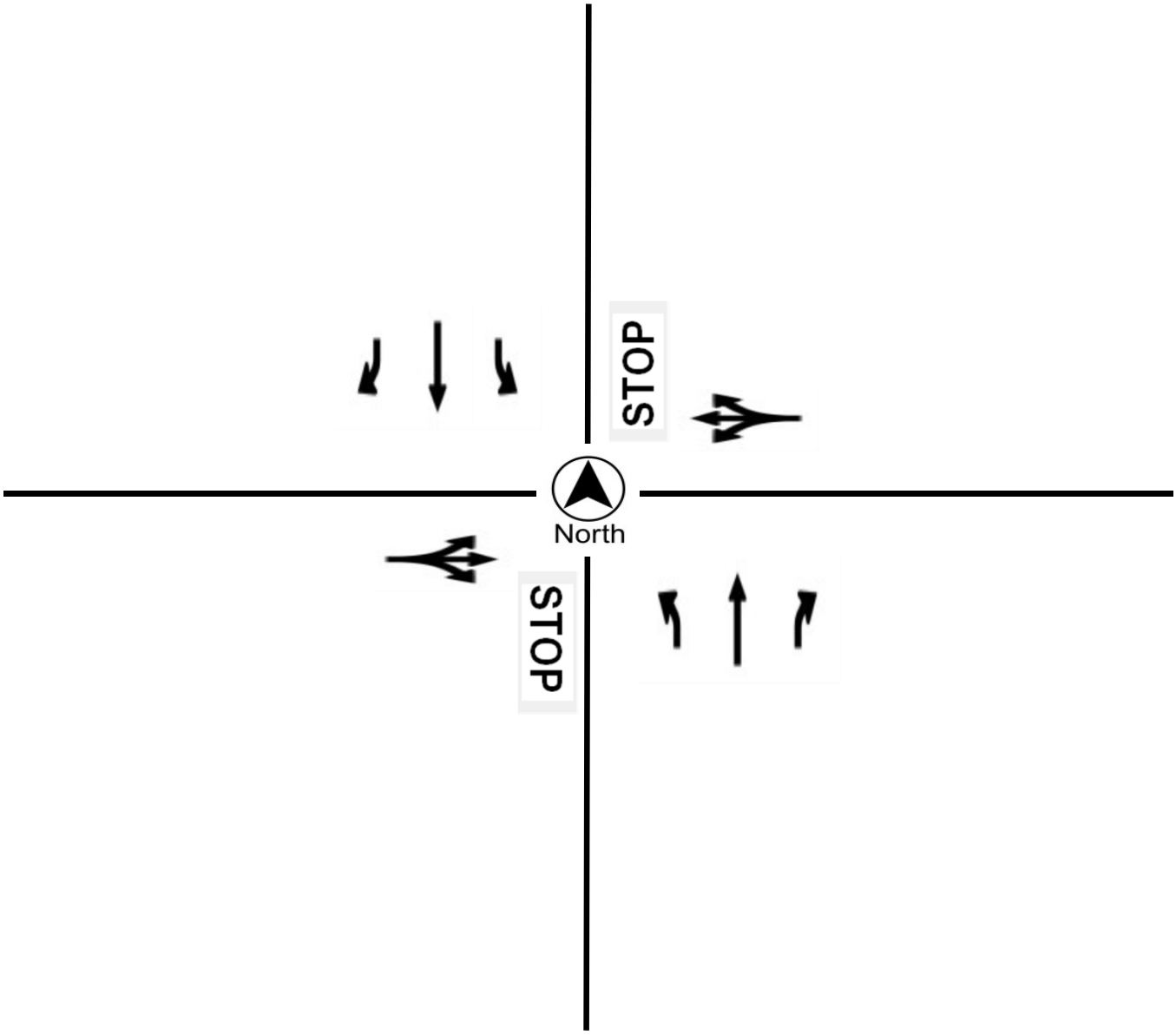
Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION	Creston Rd @ Stoney Creek Rd	**N/S STREET**	Creston Rd / Creston Rd
COUNTY	San Luis Obispo	**E/W STREET**	Stoney Creek Dr / Stoney Creek Dr
COLLECTION DATE	Thursday, June 7, 2018	**WEATHER**	Clear
CYCLE TIME	N/A	**CONTROL TYPE**	Two-Way Stop

COMMENTS



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Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

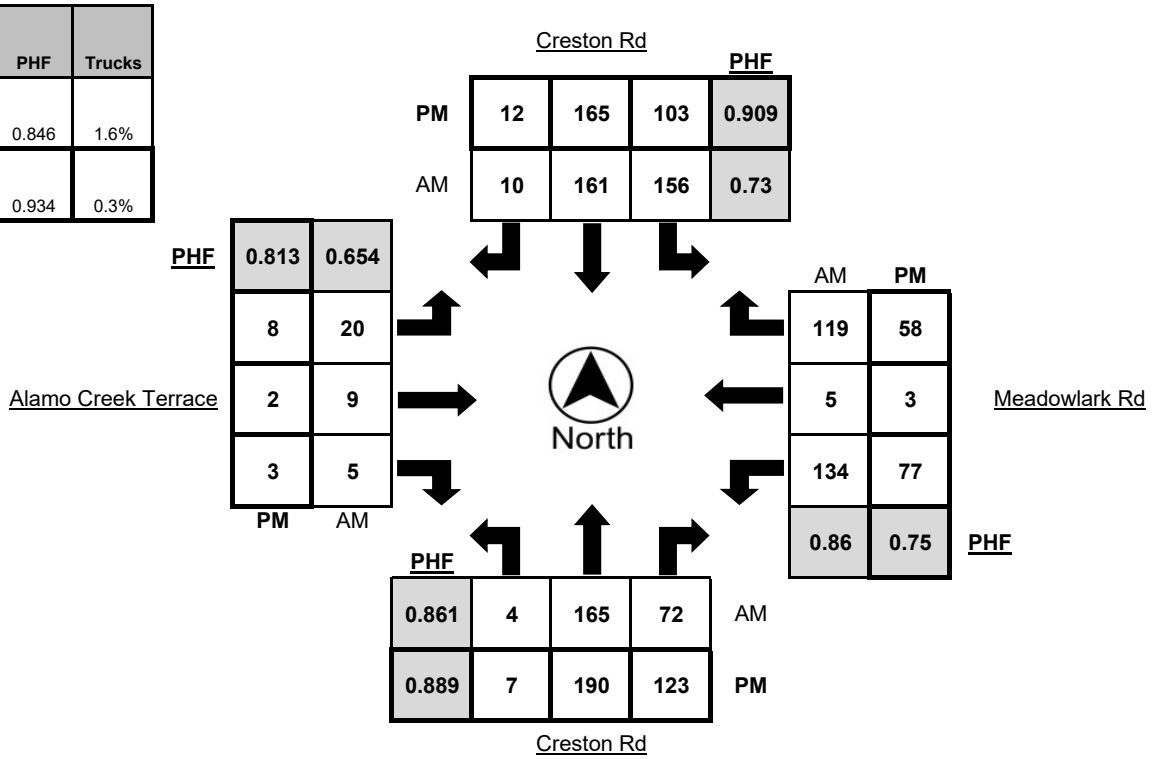
LOCATION Creston Rd @ Meadowlark Rd
LATITUDE 35.6013
COUNTY San Luis Obispo
LONGITUDE -120.6590
COLLECTION DATE Thursday, June 7, 2018
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	1	31	3	1	7	31	1	1	0	0	4	0	20	0	10	0
7:15 AM - 7:30 AM	2	34	4	0	16	21	1	0	2	0	0	0	31	1	18	0
7:30 AM - 7:45 AM	0	42	14	0	29	32	1	1	7	0	3	0	44	1	30	0
7:45 AM - 8:00 AM	1	45	21	0	63	48	1	4	8	4	1	0	40	0	22	0
8:00 AM - 8:15 AM	1	44	25	5	53	42	7	1	3	4	1	0	28	2	37	0
8:15 AM - 8:30 AM	2	34	12	1	11	39	1	1	2	1	0	0	22	2	30	1
8:30 AM - 8:45 AM	0	25	12	0	11	25	2	1	0	0	2	0	16	1	10	0
8:45 AM - 9:00 AM	0	31	5	0	13	26	0	2	3	0	0	0	23	0	9	1
TOTAL	**7**	**286**	**96**	**7**	**203**	**264**	**14**	**11**	**25**	**9**	**11**	**0**	**224**	**7**	**166**	**2**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	2	52	29	1	15	41	4	0	3	1	1	0	12	0	23	0
4:15 PM - 4:30 PM	1	56	23	0	17	32	0	0	1	0	0	0	14	0	24	0
4:30 PM - 4:45 PM	0	62	28	0	21	33	3	0	0	1	1	0	16	0	16	0
4:45 PM - 5:00 PM	3	42	31	0	27	48	2	0	3	1	0	0	19	2	9	0
5:00 PM - 5:15 PM	3	44	30	0	23	48	3	1	3	0	1	0	27	0	19	0
5:15 PM - 5:30 PM	1	42	34	1	32	36	4	0	2	0	1	0	15	1	14	0
5:30 PM - 5:45 PM	0	33	28	1	24	34	5	1	2	0	0	0	10	0	24	0
5:45 PM - 6:00 PM	1	34	20	0	17	34	4	0	3	2	1	0	10	0	13	0
TOTAL	**11**	**365**	**223**	**3**	**176**	**306**	**25**	**2**	**17**	**5**	**5**	**0**	**123**	**3**	**142**	**0**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:30 AM - 8:30 AM	4	165	72	6	156	161	10	7	20	9	5	0	134	5	119	1
4:30 PM - 5:30 PM	7	190	123	1	103	165	12	1	8	2	3	0	77	3	58	0

	PHF	Trucks
AM	0.846	1.6%
PM	0.934	0.3%



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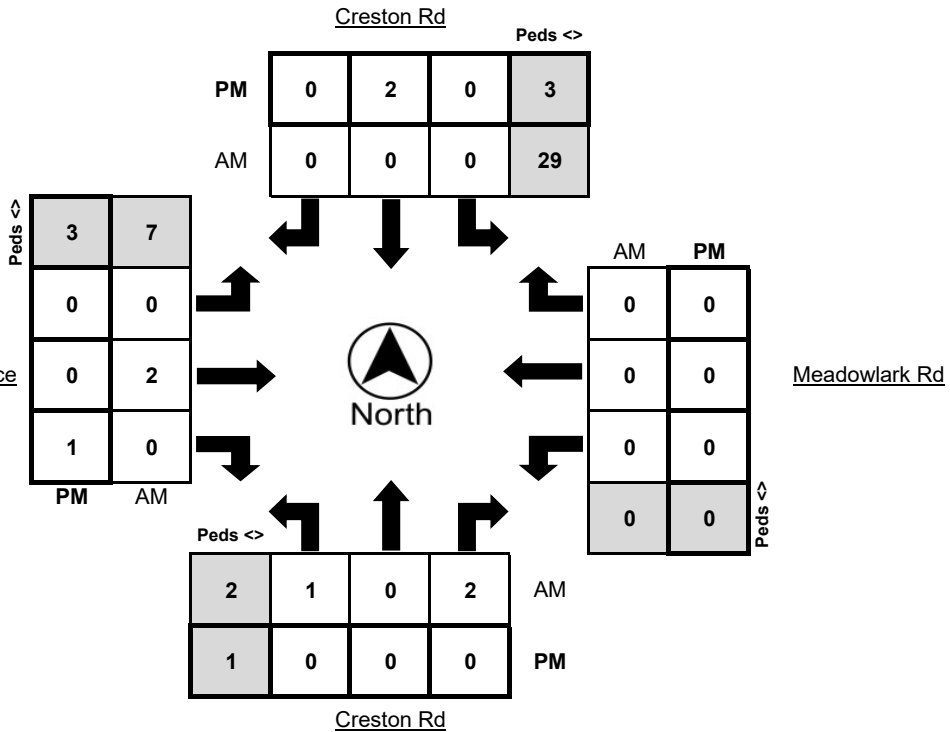
LOCATION Creston Rd @ Meadowlark Rd
LATITUDE 35.6013
COUNTY San Luis Obispo
LONGITUDE -120.6590
COLLECTION DATE Thursday, June 7, 2018
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	4	0	0	0	0	0	0	0	0	2	0	0	5
7:30 AM - 7:45 AM	0	0	2	5	0	0	0	2	0	0	0	0	0	0	0	1
7:45 AM - 8:00 AM	0	0	0	19	0	0	0	0	0	2	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	4
8:15 AM - 8:30 AM	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2
8:30 AM - 8:45 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
TOTAL	**1**	**0**	**2**	**34**	**0**	**0**	**0**	**2**	**0**	**2**	**0**	**0**	**2**	**0**	**0**	**15**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
4:00 PM - 4:15 PM	0	0	0	4	0	0	0	0	0	0	0	2	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	3	0	0	0	0	0	0	1	0	0	0	0	3
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:45 PM - 6:00 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2
TOTAL	**0**	**0**	**0**	**8**	**0**	**2**	**0**	**1**	**0**	**0**	**1**	**2**	**0**	**0**	**0**	**6**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:30 AM - 8:30 AM	1	0	2	29	0	0	0	2	0	2	0	0	0	0	0	7
4:30 PM - 5:30 PM	0	0	0	3	0	2	0	1	0	0	1	0	0	0	0	3

	Bikes	Peds
AM Peak Total	5	38
PM Peak Total	3	7



Turning Movement Report

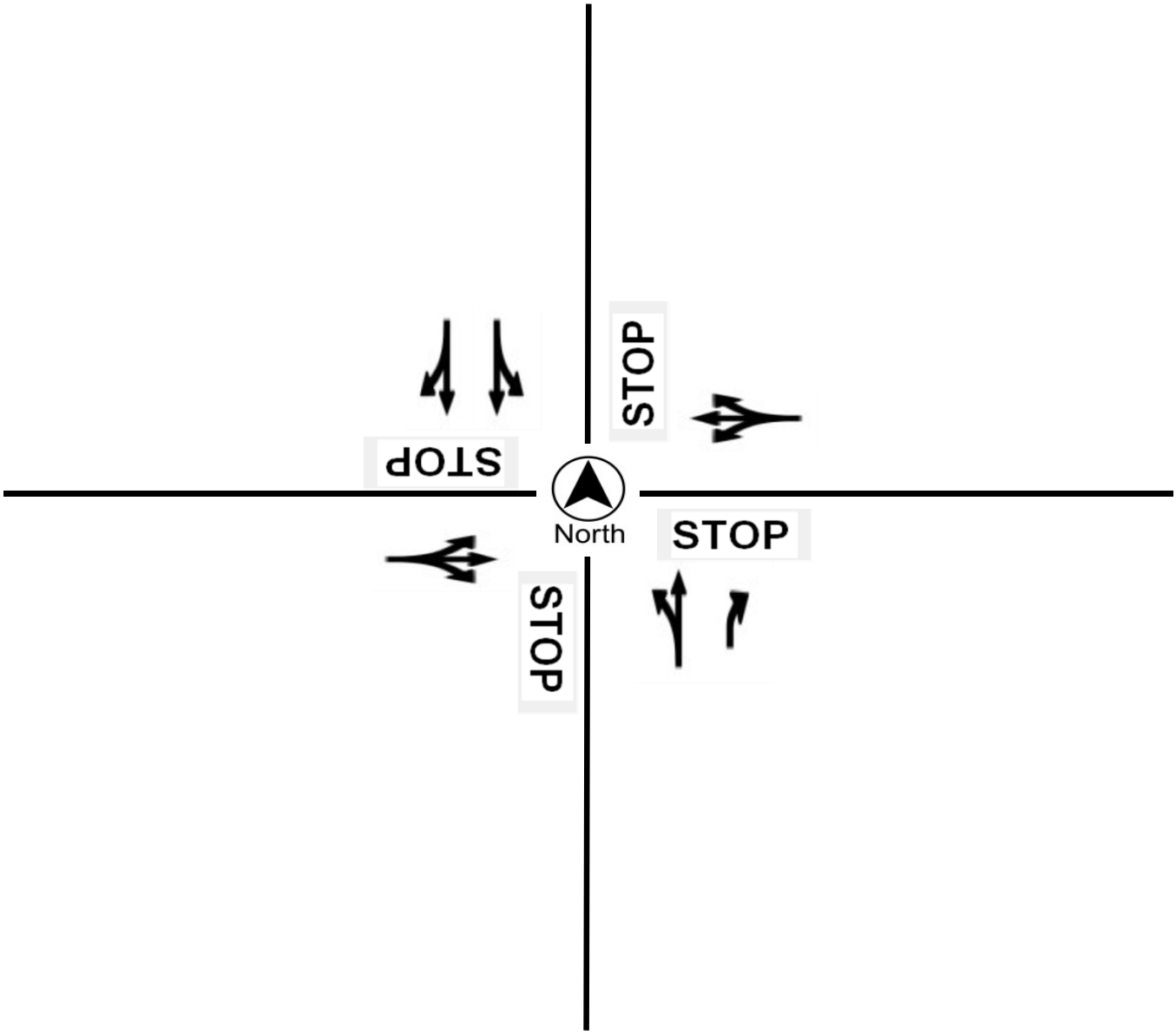
Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION	Creston Rd @ Meadowlark Rd	**N/S STREET**	Creston Rd / Creston Rd
COUNTY	San Luis Obispo	**E/W STREET**	Meadowlark Rd / Alamo Creek Terrace
COLLECTION DATE	Thursday, June 7, 2018	**WEATHER**	Clear
CYCLE TIME	N/A	**CONTROL TYPE**	All-Way Stop

COMMENTS



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Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

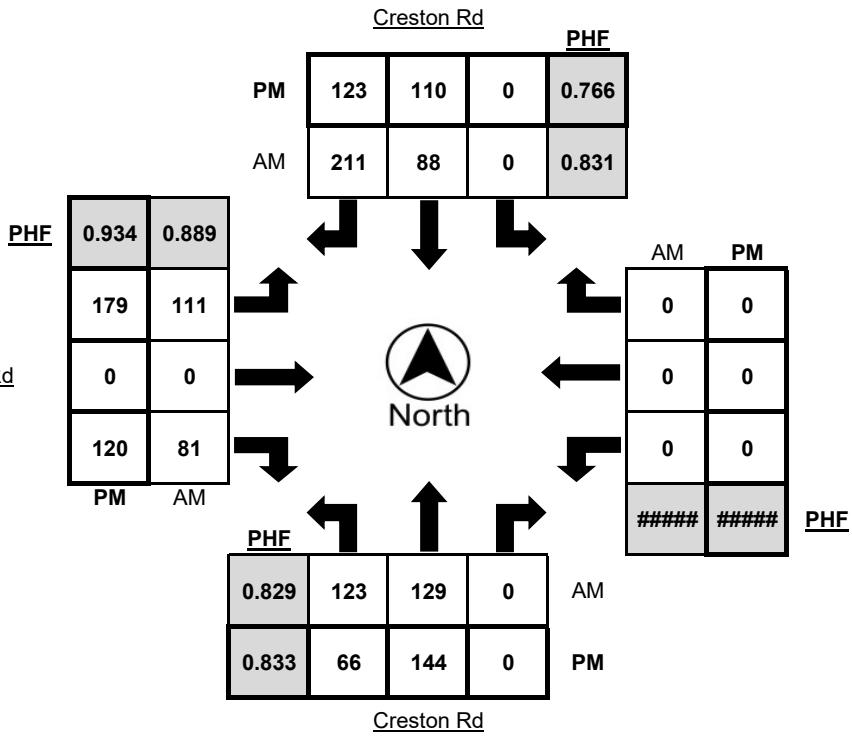
LOCATION Creston Rd @ Charolais Rd
LATITUDE 35.5991
COUNTY San Luis Obispo
LONGITUDE -120.6590
COLLECTION DATE Thursday, June 7, 2018
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	12	24	0	2	0	23	31	1	11	0	8	1	0	0	0	0
7:15 AM - 7:30 AM	24	32	0	0	0	13	39	0	9	0	6	0	0	0	0	0
7:30 AM - 7:45 AM	28	29	0	1	0	12	66	1	31	0	17	2	0	0	0	0
7:45 AM - 8:00 AM	39	37	0	0	0	27	63	4	26	0	23	0	0	0	0	0
8:00 AM - 8:15 AM	36	38	0	4	0	25	42	0	31	0	23	2	0	0	0	0
8:15 AM - 8:30 AM	20	25	0	2	0	24	40	2	23	0	18	0	0	0	0	0
8:30 AM - 8:45 AM	23	21	0	0	0	18	25	1	18	0	11	0	0	0	0	0
8:45 AM - 9:00 AM	21	21	0	0	0	16	30	1	14	0	6	0	0	0	0	0
TOTAL	**203**	**227**	**0**	**9**	**0**	**158**	**336**	**10**	**163**	**0**	**112**	**5**	**0**	**0**	**0**	**0**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	20	38	0	1	0	28	30	1	45	0	26	0	0	0	0	0
4:15 PM - 4:30 PM	20	43	0	0	0	23	21	0	36	0	35	0	0	0	0	0
4:30 PM - 4:45 PM	15	47	0	1	0	20	29	0	45	0	26	0	0	0	0	0
4:45 PM - 5:00 PM	19	27	0	0	0	30	34	0	47	0	33	0	0	0	0	0
5:00 PM - 5:15 PM	12	27	0	0	0	37	39	2	51	0	26	0	0	0	0	0
5:15 PM - 5:30 PM	15	28	0	0	0	30	24	0	48	0	30	0	0	0	0	0
5:30 PM - 5:45 PM	21	20	0	0	0	29	17	1	48	0	34	0	0	0	0	0
5:45 PM - 6:00 PM	18	19	0	0	0	24	19	0	34	0	29	0	0	0	0	0
TOTAL	**140**	**249**	**0**	**2**	**0**	**221**	**213**	**4**	**354**	**0**	**239**	**0**	**0**	**0**	**0**	**0**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:30 AM - 8:30 AM	123	129	0	7	0	88	211	7	111	0	81	4	0	0	0	0
4:15 PM - 5:15 PM	66	144	0	1	0	110	123	2	179	0	120	0	0	0	0	0

	PHF	Trucks
AM	0.864	2.4%
PM	0.966	0.4%



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Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

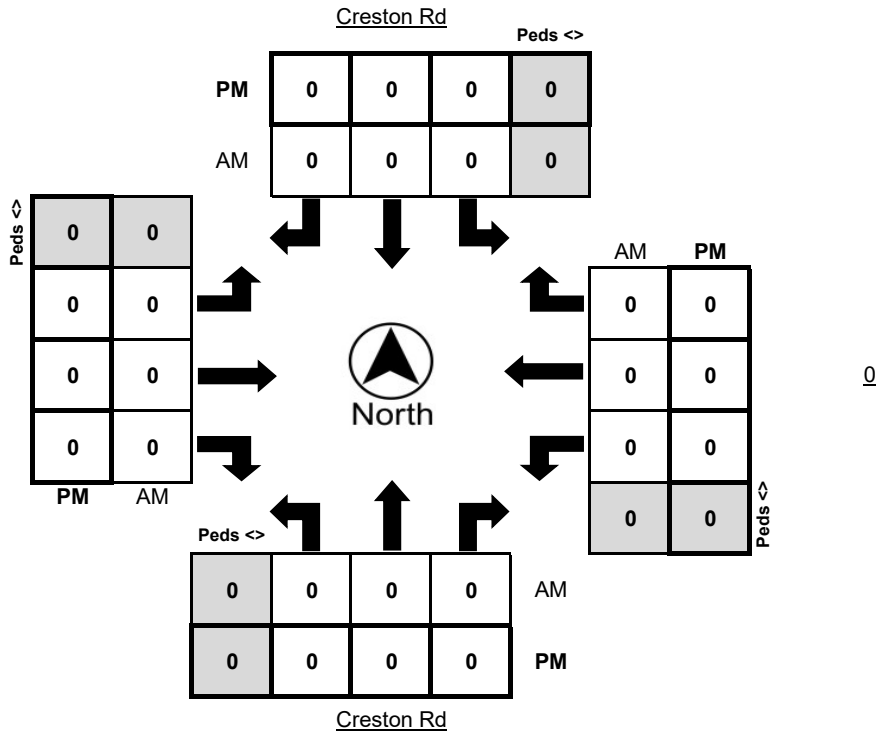
LOCATION Creston Rd @ Charolais Rd
LATITUDE 35.5991
COUNTY San Luis Obispo
LONGITUDE -120.6590
COLLECTION DATE Thursday, June 7, 2018
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:30 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Bikes	Peds
AM Peak Total	0	0
PM Peak Total	0	0



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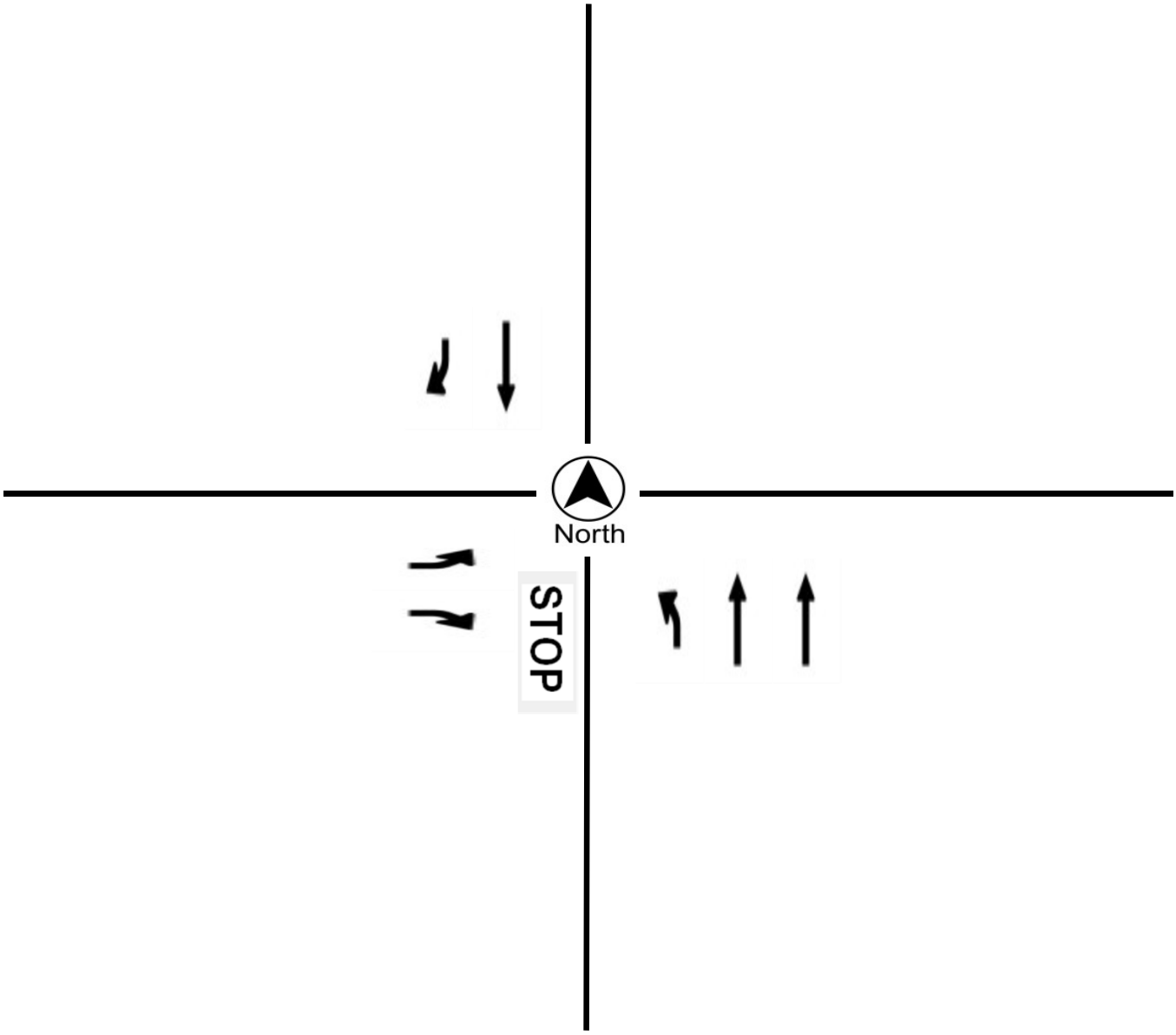
Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION	Creston Rd @ Charolais Rd	**N/S STREET**	Creston Rd / Creston Rd
COUNTY	San Luis Obispo	**E/W STREET**	/ Charolais Rd
COLLECTION DATE	Thursday, June 7, 2018	**WEATHER**	Clear
CYCLE TIME	N/A	**CONTROL TYPE**	One-Way Stop

COMMENTS



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Prepared For:
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895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

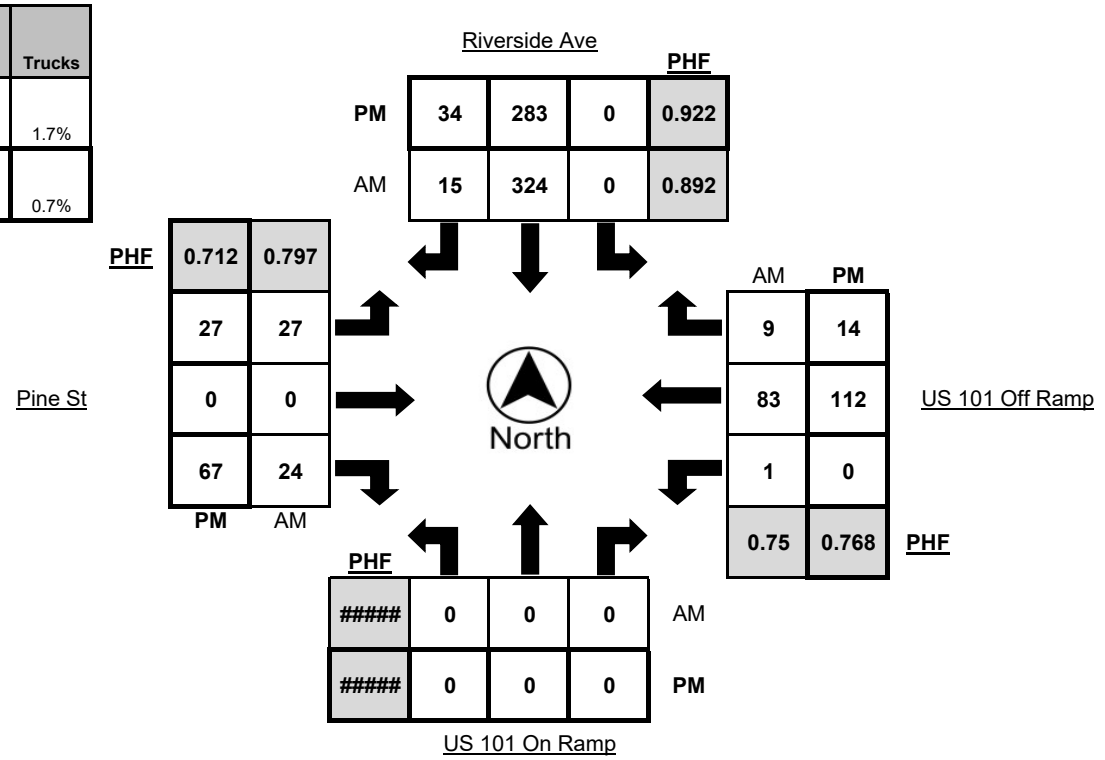
LOCATION Riverside Ave @ Pine St/101 SB Ramps
LATITUDE 35.6177
COUNTY San Luis Obispo
LONGITUDE -120.6876
COLLECTION DATE Wednesday, June 6, 2018
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
7:00 AM - 7:15 AM	0	0	0	0	0	51	2	0	3	0	5	0	0	9	3	1
7:15 AM - 7:30 AM	0	0	0	0	0	77	5	3	4	0	8	0	0	16	2	1
7:30 AM - 7:45 AM	0	0	0	0	0	93	2	1	5	0	3	0	0	19	1	0
7:45 AM - 8:00 AM	0	0	0	0	0	71	5	0	7	0	8	0	1	21	2	1
8:00 AM - 8:15 AM	0	0	0	0	0	83	3	2	11	0	5	0	0	27	4	0
8:15 AM - 8:30 AM	0	0	0	0	0	68	2	4	4	0	11	0	0	20	2	0
8:30 AM - 8:45 AM	0	0	0	0	0	59	2	5	7	0	13	0	0	15	5	4
8:45 AM - 9:00 AM	0	0	0	0	0	57	3	2	2	0	6	0	0	21	11	1
TOTAL	**0**	**0**	**0**	**0**	**0**	**559**	**24**	**17**	**43**	**0**	**59**	**0**	**1**	**148**	**30**	**8**

	Northbound				Southbound				Eastbound				Westbound			
Time	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	0	0	0	0	0	56	4	1	5	0	17	0	0	13	2	0
4:15 PM - 4:30 PM	0	0	0	0	0	74	9	1	7	0	9	0	0	30	3	0
4:30 PM - 4:45 PM	0	0	0	0	0	66	10	1	8	0	16	0	0	23	3	0
4:45 PM - 5:00 PM	0	0	0	0	0	63	9	0	5	0	16	0	0	25	1	0
5:00 PM - 5:15 PM	0	0	0	0	0	80	6	1	7	0	26	0	0	34	7	1
5:15 PM - 5:30 PM	0	0	0	0	0	64	10	0	4	0	19	0	0	18	5	0
5:30 PM - 5:45 PM	0	0	0	0	0	60	10	0	7	0	11	0	0	10	5	0
5:45 PM - 6:00 PM	0	0	0	0	0	59	7	0	0	0	11	0	0	25	4	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**522**	**65**	**4**	**43**	**0**	**125**	**0**	**0**	**178**	**30**	**1**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
7:15 AM - 8:15 AM	0	0	0	0	0	324	15	6	27	0	24	0	1	83	9	2
4:15 PM - 5:15 PM	0	0	0	0	0	283	34	3	27	0	67	0	0	112	14	1

	PHF	Trucks
AM	0.908	1.7%
PM	0.839	0.7%



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Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

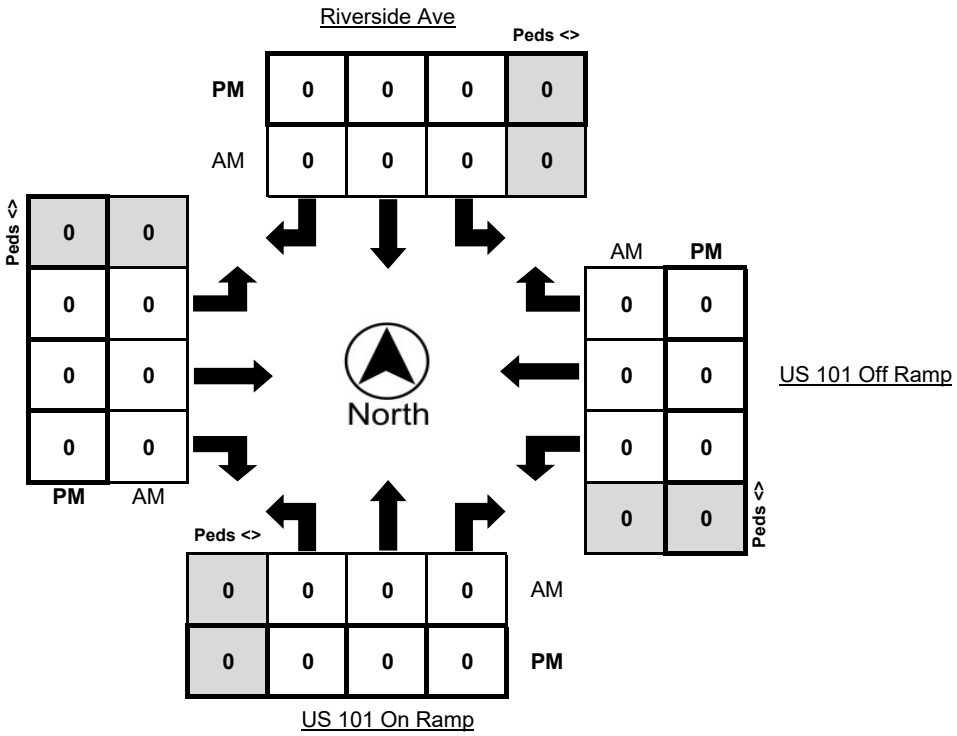
LOCATION Riverside Ave @ Pine St/101 SB Ramps
LATITUDE 35.6177
COUNTY San Luis Obispo
LONGITUDE -120.6876
COLLECTION DATE Wednesday, June 6, 2018
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:15 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Bikes	Peds
AM Peak Total	0	0
PM Peak Total	0	0



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Prepared For:
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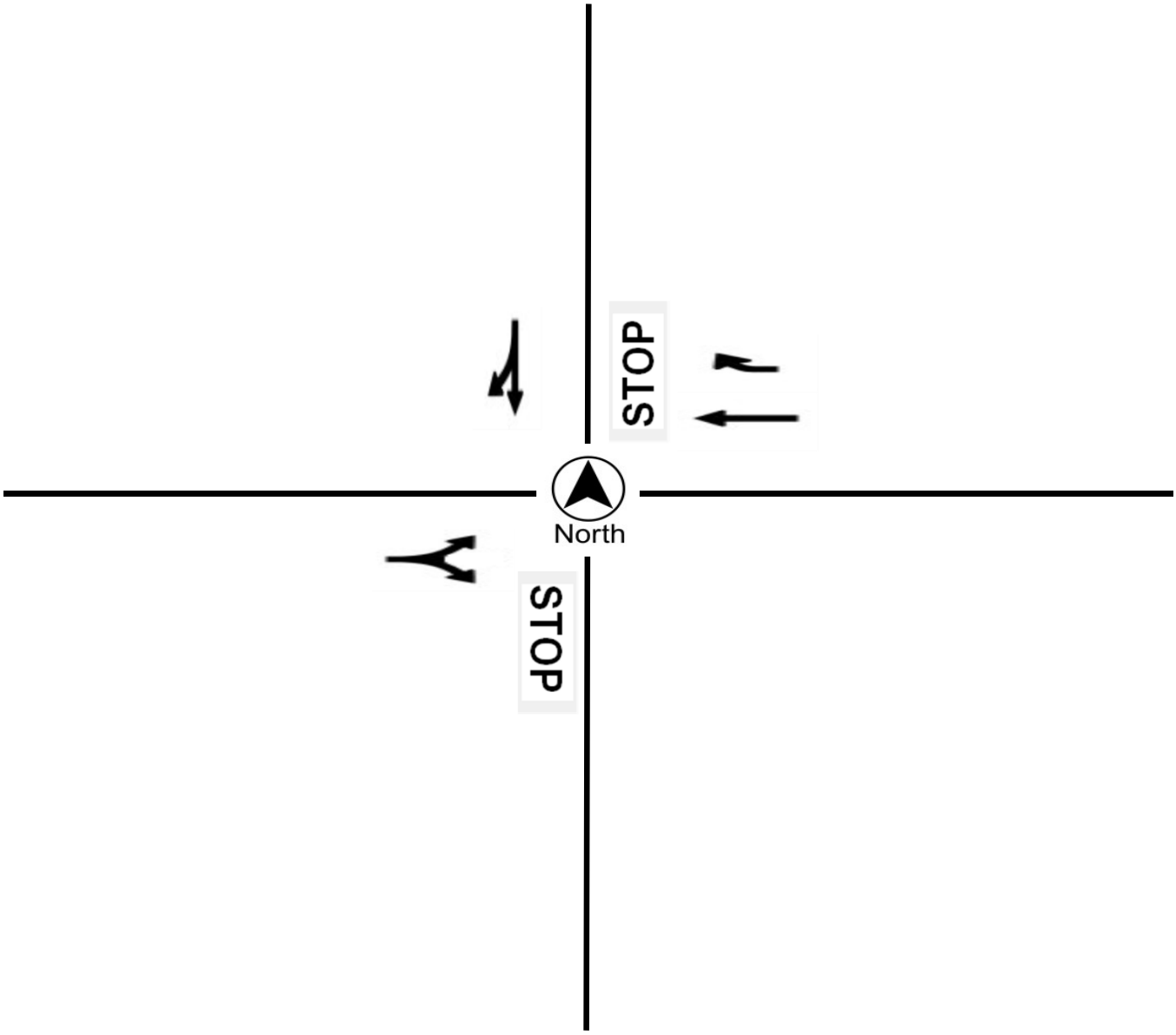
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION	Riverside Ave @ Pine St/101 SB Ramps	**N/S STREET**	Riverside Ave / US 101 On Ramp
COUNTY	San Luis Obispo	**E/W STREET**	US 101 Off Ramp / Pine St
COLLECTION DATE	Wednesday, June 6, 2018	**WEATHER**	Clear
CYCLE TIME	N/A	**CONTROL TYPE**	Two-Way Stop

COMMENTS



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Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

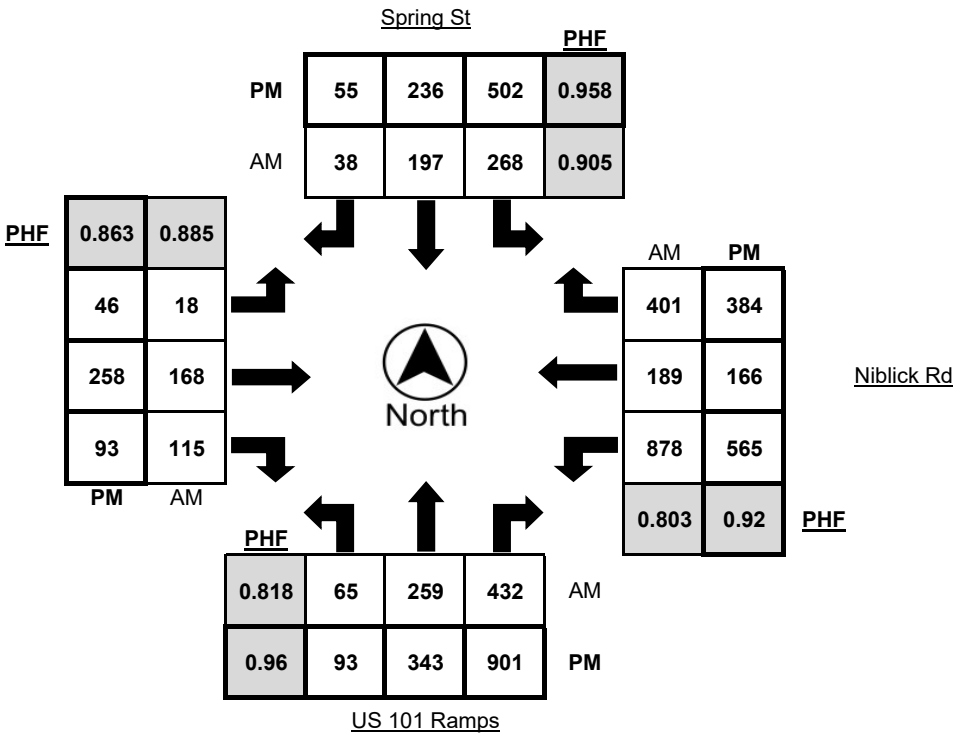
LOCATION 1st St / Niblick Rd @ Spring St
LATITUDE 35.6153
COUNTY San Luis Obispo
LONGITUDE -120.6905
COLLECTION DATE Wednesday, June 6, 2018
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
7:00 AM - 7:15 AM	8	41	58	8	24	29	8	1	4	9	13	0	190	7	30	1
7:15 AM - 7:30 AM	12	41	83	3	42	43	7	4	4	24	19	3	223	20	50	3
7:30 AM - 7:45 AM	11	40	103	3	75	43	9	3	10	37	34	2	260	38	71	3
7:45 AM - 8:00 AM	24	81	126	5	73	54	12	2	1	48	25	0	255	65	137	11
8:00 AM - 8:15 AM	13	80	103	2	58	48	8	0	3	51	31	1	197	49	121	4
8:15 AM - 8:30 AM	17	58	100	4	62	52	9	2	4	32	25	1	166	37	72	2
8:30 AM - 8:45 AM	9	70	94	1	64	41	7	3	5	32	29	2	167	26	73	5
8:45 AM - 9:00 AM	18	91	90	4	64	44	8	3	5	32	20	0	121	33	63	2
TOTAL	**112**	**502**	**757**	**30**	**462**	**354**	**68**	**18**	**36**	**265**	**196**	**9**	**1579**	**275**	**617**	**31**

	Northbound				Southbound				Eastbound				Westbound			
Time	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	28	99	212	3	109	56	16	3	7	48	22	1	131	33	94	3
4:15 PM - 4:30 PM	13	85	220	3	97	69	11	4	12	51	18	1	127	38	106	1
4:30 PM - 4:45 PM	28	82	201	4	127	69	11	1	12	45	18	1	146	55	102	6
4:45 PM - 5:00 PM	22	93	223	2	116	51	19	0	17	76	22	0	148	27	118	3
5:00 PM - 5:15 PM	18	87	235	3	128	55	15	0	7	79	29	0	108	37	79	1
5:15 PM - 5:30 PM	25	81	242	1	131	61	10	2	10	58	24	1	163	47	85	0
5:30 PM - 5:45 PM	19	76	241	1	79	56	17	1	12	59	16	0	146	53	96	3
5:45 PM - 6:00 PM	15	68	199	1	80	37	7	1	9	37	15	1	129	40	85	1
TOTAL	**168**	**671**	**1773**	**18**	**867**	**454**	**106**	**12**	**86**	**453**	**164**	**5**	**1098**	**330**	**765**	**18**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
7:30 AM - 8:30 AM	65	259	432	14	268	197	38	7	18	168	115	4	878	189	401	20
4:30 PM - 5:30 PM	93	343	901	10	502	236	55	3	46	258	93	2	565	166	384	10

	PHF	Trucks
AM	0.840	1.5%
PM	0.972	0.7%



Turning Movement Report

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Hanford, CA 93230

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Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

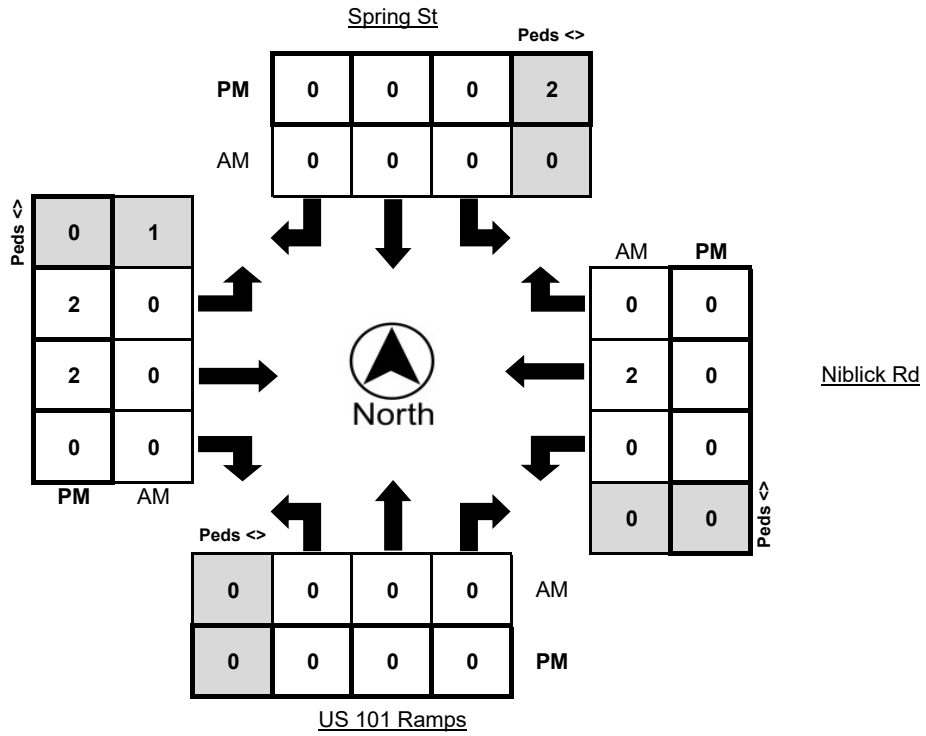
LOCATION 1st St / Niblick Rd @ Spring St
LATITUDE 35.6153
COUNTY San Luis Obispo
LONGITUDE -120.6905
COLLECTION DATE Wednesday, June 6, 2018
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
8:30 AM - 8:45 AM	0	0	0	3	0	0	0	0	0	5	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	1	1	0	1	0	0	1	0	0	0	2	0	0
TOTAL	**0**	**0**	**0**	**9**	**1**	**0**	**1**	**0**	**0**	**6**	**0**	**0**	**0**	**4**	**0**	**1**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**4**	**0**	**0**	**0**	**0**	**3**	**2**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:30 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1
4:30 PM - 5:30 PM	0	0	0	2	0	0	0	0	2	2	0	0	0	0	0	0

	Bikes	Peds
AM Peak Total	2	1
PM Peak Total	4	2



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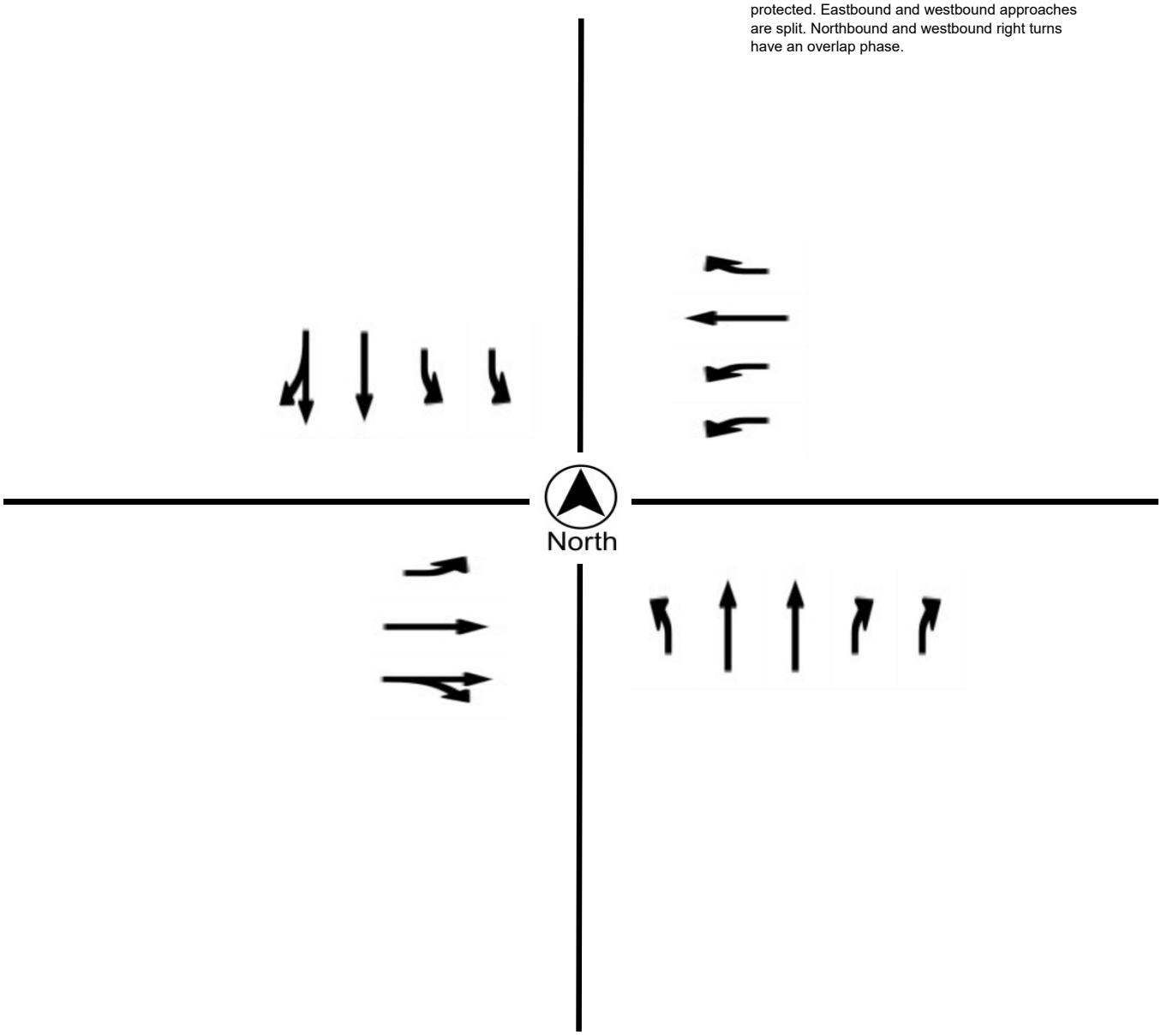
Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION	1st St / Niblick Rd @ Spring St	**N/S STREET**	Spring St / US 101 Ramps
COUNTY	San Luis Obispo	**E/W STREET**	Niblick Rd / 1st st
COLLECTION DATE	Wednesday, June 6, 2018	**WEATHER**	Clear
CYCLE TIME	138 Seconds	**CONTROL TYPE**	Signal

COMMENTS Northbound and southbound left turns are protected. Eastbound and westbound approaches are split. Northbound and westbound right turns have an overlap phase.



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Morro Bay, CA 93442

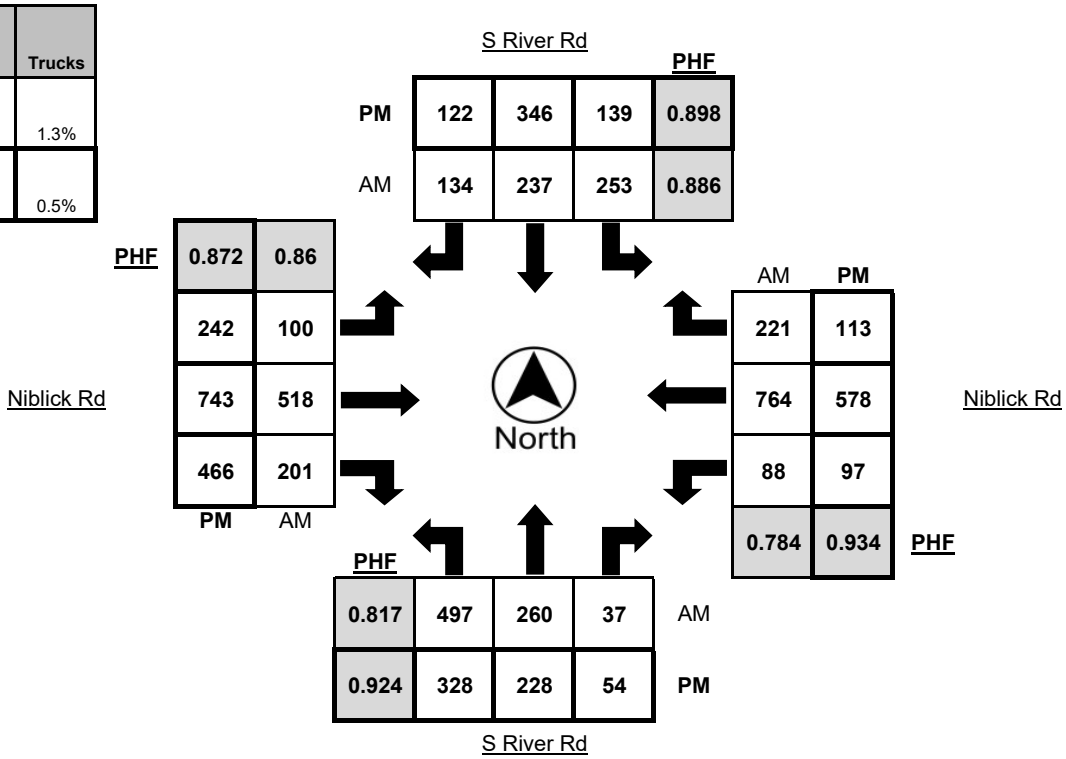
LOCATION Niblick Rd @ S River Rd
LATITUDE 35.6150
COUNTY San Luis Obispo
LONGITUDE -120.6802
COLLECTION DATE Thursday, June 7, 2018
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	81	27	1	0	17	35	25	0	9	67	19	7	10	103	16	2
7:15 AM - 7:30 AM	102	48	23	0	50	28	26	4	14	106	29	8	11	156	29	0
7:30 AM - 7:45 AM	138	73	13	4	86	47	23	2	25	166	47	6	12	212	56	3
7:45 AM - 8:00 AM	160	74	9	1	63	63	32	2	22	140	46	2	18	243	81	5
8:00 AM - 8:15 AM	109	73	6	2	59	71	46	2	26	110	53	1	29	170	56	3
8:15 AM - 8:30 AM	90	40	9	0	45	56	33	3	27	102	55	5	29	139	28	2
8:30 AM - 8:45 AM	93	36	7	0	31	52	27	1	23	98	44	4	16	138	24	6
8:45 AM - 9:00 AM	77	56	6	1	16	54	22	3	15	73	37	4	25	104	21	4
TOTAL	**850**	**427**	**74**	**8**	**367**	**406**	**234**	**17**	**161**	**862**	**330**	**37**	**150**	**1265**	**311**	**25**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	63	54	9	1	22	82	42	1	51	163	97	1	18	133	17	0
4:15 PM - 4:30 PM	78	45	12	0	21	89	20	0	70	185	91	3	23	144	22	3
4:30 PM - 4:45 PM	76	46	12	1	36	70	27	0	57	171	95	2	23	137	28	5
4:45 PM - 5:00 PM	86	62	17	0	33	76	34	1	55	159	106	1	24	142	32	2
5:00 PM - 5:15 PM	103	51	11	2	30	104	26	1	58	189	130	1	22	147	33	2
5:15 PM - 5:30 PM	65	54	16	0	39	76	20	0	66	228	122	1	30	158	23	2
5:30 PM - 5:45 PM	74	61	10	0	37	90	42	2	63	167	108	1	21	131	25	0
5:45 PM - 6:00 PM	69	42	12	0	45	73	28	0	55	168	89	1	20	122	34	0
TOTAL	**614**	**415**	**99**	**4**	**263**	**660**	**239**	**5**	**475**	**1430**	**838**	**11**	**181**	**1114**	**214**	**14**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:30 AM - 8:30 AM	497	260	37	7	253	237	134	9	100	518	201	14	88	764	221	13
4:45 PM - 5:45 PM	328	228	54	2	139	346	122	4	242	743	466	4	97	578	113	6

	PHF	Trucks
AM	0.870	1.3%
PM	0.956	0.5%



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Morro Bay, CA 93442

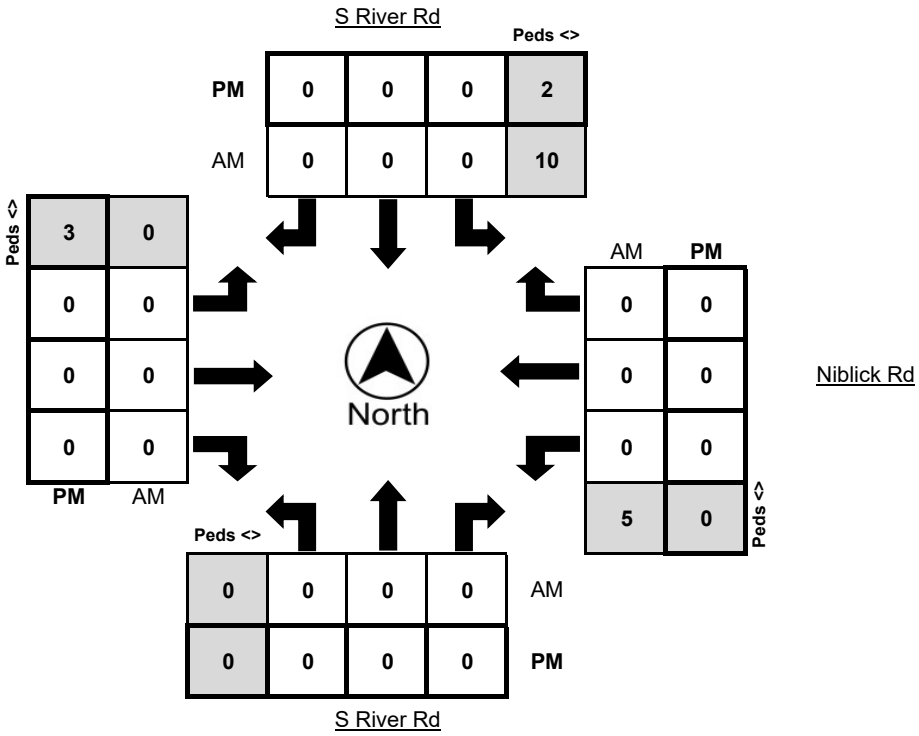
LOCATION Niblick Rd @ S River Rd
LATITUDE 35.6150
COUNTY San Luis Obispo
LONGITUDE -120.6802
COLLECTION DATE Thursday, June 7, 2018
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	3	0	0	0	1	0	0	0	1
7:30 AM - 7:45 AM	0	0	0	4	0	0	0	0	0	0	0	2	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	3	0	0	0	0	0	0	0	1	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	3	0	0	0	0	0	0	0	2	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
8:45 AM - 9:00 AM	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0
TOTAL	**0**	**1**	**0**	**11**	**0**	**0**	**1**	**4**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**3**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
4:00 PM - 4:15 PM	0	0	0	3	0	0	0	2	0	0	0	3	0	0	0	2
4:15 PM - 4:30 PM	0	0	0	5	0	0	0	1	0	0	0	0	0	1	0	7
4:30 PM - 4:45 PM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1
5:45 PM - 6:00 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**12**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**4**	**0**	**1**	**0**	**12**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:30 AM - 8:30 AM	0	0	0	10	0	0	0	0	0	0	0	5	0	0	0	0
4:45 PM - 5:45 PM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	3

	Bikes	Peds
AM Peak Total	0	15
PM Peak Total	0	5



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Prepared For:
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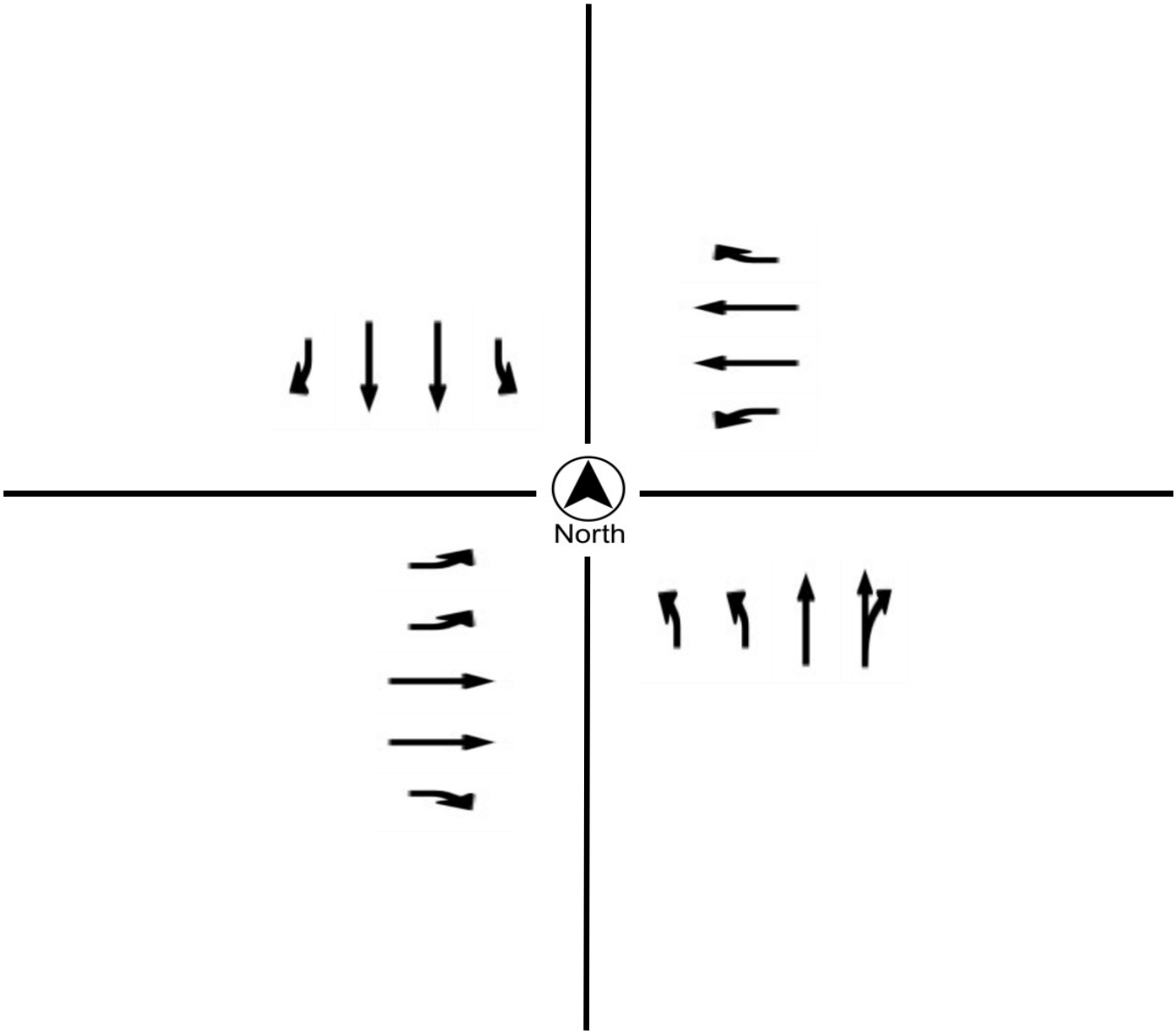
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION	Niblick Rd @ S River Rd	**N/S STREET**	S River Rd / S River Rd
COUNTY	San Luis Obispo	**E/W STREET**	Niblick Rd / Niblick Rd
COLLECTION DATE	Thursday, June 7, 2018	**WEATHER**	Clear
CYCLE TIME	125 Seconds	**CONTROL TYPE**	Signal

COMMENTS All approaches have protected left turns.



Reso A - Exhibit C2 (EIR Technical Appendix)

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Prepared For:
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895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

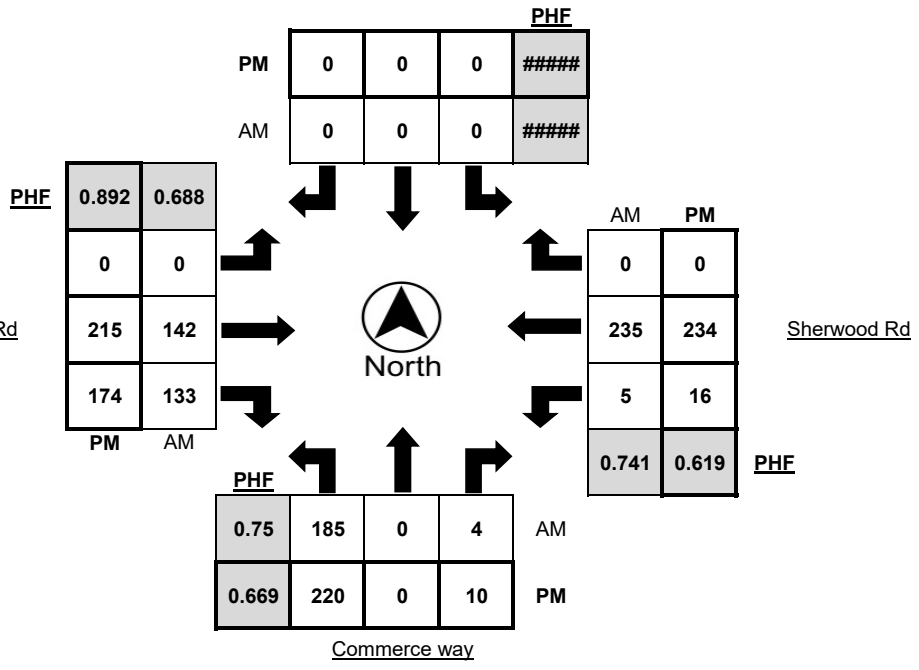
LOCATION Sherwood Rd @ Commerce Wy
LATITUDE 35.6157
COUNTY San Luis Obispo
LONGITUDE -120.6523
COLLECTION DATE Thursday, January 24, 2019
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	27	0	1	0	0	0	0	0	0	9	55	0	1	39	0	0
7:15 AM - 7:30 AM	43	0	1	1	0	0	0	0	0	26	24	3	1	63	0	0
7:30 AM - 7:45 AM	63	0	0	1	0	0	0	0	0	26	22	2	1	80	0	2
7:45 AM - 8:00 AM	41	0	2	2	0	0	0	0	0	47	53	4	2	49	0	0
8:00 AM - 8:15 AM	38	0	1	1	0	0	0	0	0	43	34	2	1	43	0	1
8:15 AM - 8:30 AM	25	0	2	3	0	0	0	0	0	41	29	4	0	29	0	2
8:30 AM - 8:45 AM	31	0	3	0	0	0	0	0	0	25	21	4	3	47	0	1
8:45 AM - 9:00 AM	32	0	4	0	0	0	0	0	0	21	16	0	1	42	0	1
TOTAL	**300**	**0**	**14**	**8**	**0**	**0**	**0**	**0**	**0**	**238**	**254**	**19**	**10**	**392**	**0**	**7**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
2:00 PM - 2:15 PM	29	0	1	2	0	0	0	0	0	33	29	3	2	27	0	0
2:15 PM - 2:30 PM	18	0	5	2	0	0	0	0	0	36	28	4	3	33	0	0
2:30 PM - 2:45 PM	40	0	3	0	0	0	0	0	0	40	17	8	3	50	0	1
2:45 PM - 3:00 PM	37	0	4	3	0	0	0	0	0	58	30	4	4	40	0	0
3:00 PM - 3:15 PM	34	0	4	3	0	0	0	0	0	43	38	1	9	92	0	4
3:15 PM - 3:30 PM	35	0	0	2	0	0	0	0	0	71	38	5	3	48	0	1
3:30 PM - 3:45 PM	83	0	3	1	0	0	0	0	0	53	47	4	3	54	0	4
3:45 PM - 4:00 PM	68	0	3	3	0	0	0	0	0	48	51	1	1	40	0	1
4:00 PM - 4:15 PM	43	0	5	0	0	0	0	0	0	41	37	2	3	45	0	0
4:15 PM - 4:30 PM	50	0	2	1	0	0	0	0	0	50	39	2	1	41	0	1
4:30 PM - 4:45 PM	89	0	3	1	0	0	0	0	0	54	38	0	4	81	0	2
4:45 PM - 5:00 PM	52	0	0	2	0	0	0	0	0	50	30	2	0	42	0	0
5:00 PM - 5:15 PM	82	0	3	0	0	0	0	0	0	50	32	1	1	46	0	0
5:15 PM - 5:30 PM	34	0	1	1	0	0	0	0	0	55	39	2	2	45	0	0
5:30 PM - 5:45 PM	50	0	0	1	0	0	0	0	0	50	42	0	0	46	0	1
5:45 PM - 6:00 PM	29	0	0	2	0	0	0	0	0	48	36	0	0	40	0	0
TOTAL	**773**	**0**	**37**	**24**	**0**	**0**	**0**	**0**	**0**	**780**	**571**	**39**	**39**	**770**	**0**	**15**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:15 AM - 8:15 AM	185	0	4	5	0	0	0	0	0	142	133	11	5	235	0	3
3:00 PM - 4:00 PM	220	0	10	9	0	0	0	0	0	215	174	11	16	234	0	10

	PHF	Trucks
AM	0.907	2.7%
PM	0.894	3.5%



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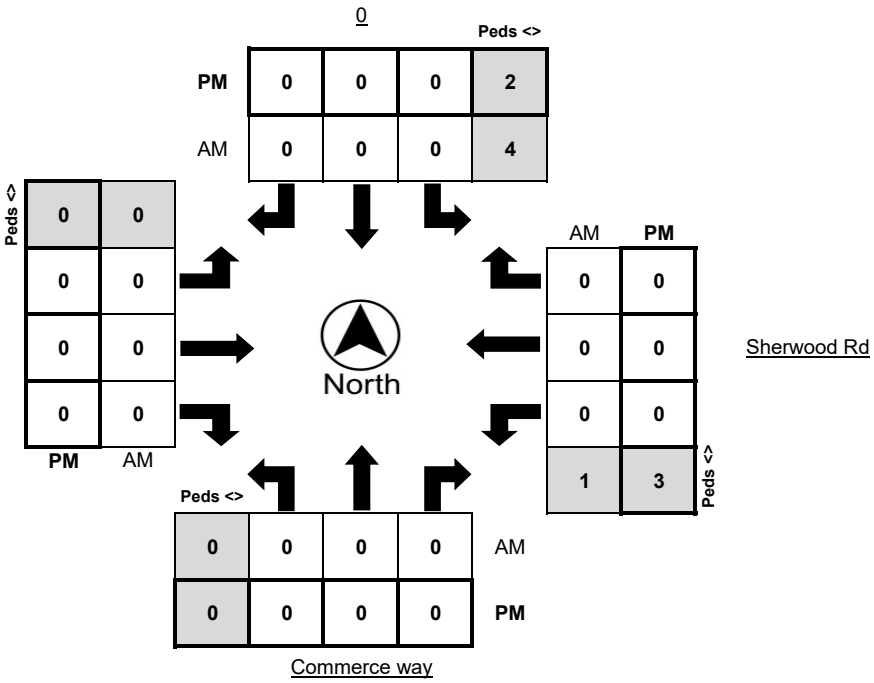
LOCATION Sherwood Rd @ Commerce Wy
LATITUDE 35.6157
COUNTY San Luis Obispo
LONGITUDE -120.6523
COLLECTION DATE Thursday, January 24, 2019
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
2:00 PM - 2:15 PM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
2:15 PM - 2:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM - 2:45 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
2:45 PM - 3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM - 3:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM - 3:30 PM	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
3:30 PM - 3:45 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0
3:45 PM - 4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM - 4:15 PM	0	0	0	1	0	0	0	0	0	0	0	3	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**9**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:15 AM - 8:15 AM	0	0	0	4	0	0	0	0	0	0	0	1	0	0	0	0
3:00 PM - 4:00 PM	0	0	0	2	0	0	0	0	0	0	0	3	0	0	0	0

	Bikes	Peds
AM Peak Total	0	5
PM Peak Total	0	5



Turning Movement Report

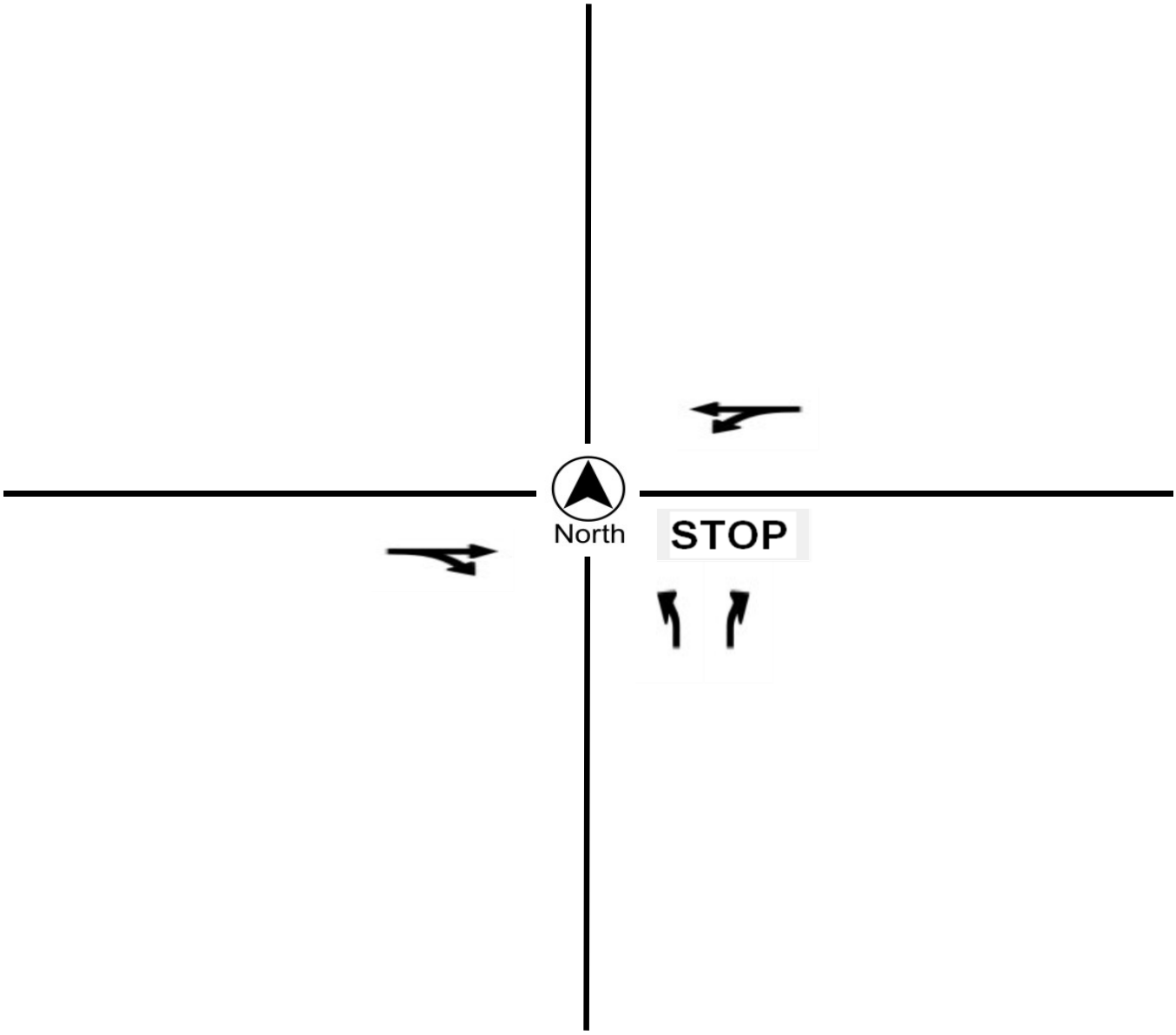
Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION	Sherwood Rd @ Commerce Wy	**N/S STREET**	/ Commerce way
COUNTY	San Luis Obispo	**E/W STREET**	Sherwood Rd / Sherwood Rd
COLLECTION DATE	Thursday, January 24, 2019	**WEATHER**	Clear
CYCLE TIME	N/A	**CONTROL TYPE**	One-Way stop

COMMENTS



Reso A - Exhibit C2 (EIR Technical Appendix)

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Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

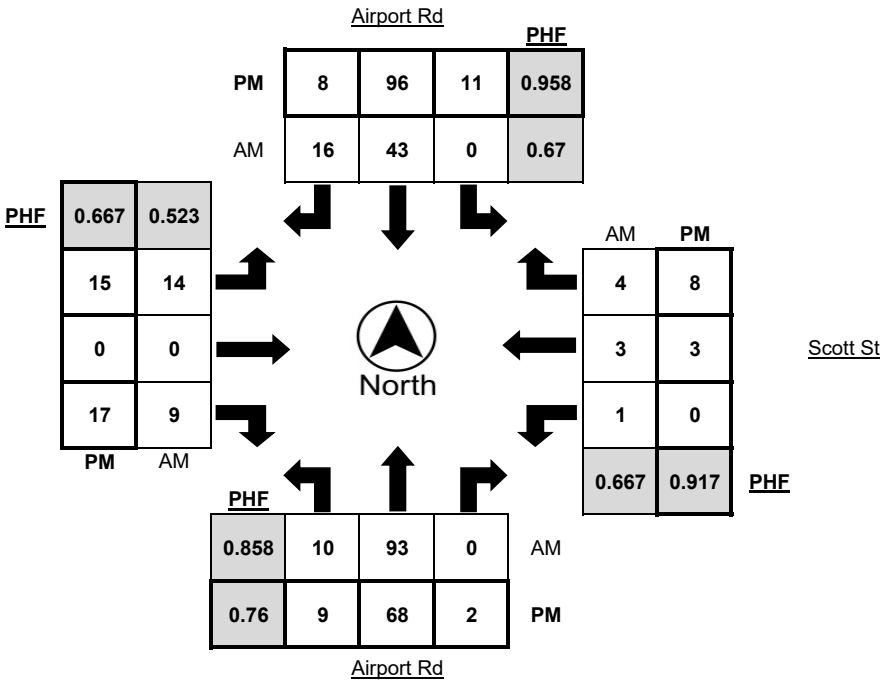
LOCATION Airport Rd @ Scott St
LATITUDE 35.6079
COUNTY San Luis Obispo
LONGITUDE -120.6435
COLLECTION DATE Thursday, January 24, 2019
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	3	16	0	0	1	3	1	0	1	0	0	0	0	0	1	0
7:15 AM - 7:30 AM	3	25	0	1	0	4	6	1	2	0	1	1	1	0	1	0
7:30 AM - 7:45 AM	3	27	0	0	0	11	3	2	6	0	5	4	0	2	1	0
7:45 AM - 8:00 AM	2	22	0	1	0	16	6	2	2	0	1	0	0	0	1	0
8:00 AM - 8:15 AM	2	19	0	0	0	12	1	1	4	0	2	1	0	1	1	0
8:15 AM - 8:30 AM	1	13	0	1	0	9	1	1	0	0	3	1	0	0	0	0
8:30 AM - 8:45 AM	1	22	0	0	0	8	2	0	3	1	2	2	1	1	2	1
8:45 AM - 9:00 AM	0	9	0	0	1	1	1	0	3	0	1	0	3	2	2	0
TOTAL	**15**	**153**	**0**	**3**	**2**	**64**	**21**	**7**	**21**	**1**	**15**	**9**	**5**	**6**	**9**	**1**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
2:00 PM - 2:15 PM	1	10	0	0	3	10	4	1	4	1	3	0	0	0	3	0
2:15 PM - 2:30 PM	2	11	0	1	2	16	3	0	3	6	2	0	1	3	2	0
2:30 PM - 2:45 PM	0	11	1	0	0	11	3	0	3	1	7	1	0	2	1	0
2:45 PM - 3:00 PM	2	13	0	0	3	8	1	0	3	0	6	0	0	0	2	0
3:00 PM - 3:15 PM	4	14	0	1	1	14	3	0	3	2	4	0	0	0	0	0
3:15 PM - 3:30 PM	1	14	0	1	3	22	6	0	2	1	4	0	2	0	2	0
3:30 PM - 3:45 PM	1	14	2	0	0	22	5	0	4	0	3	2	0	1	1	0
3:45 PM - 4:00 PM	2	14	0	1	1	16	3	1	0	0	2	0	0	0	2	0
4:00 PM - 4:15 PM	2	6	1	0	2	20	2	0	4	1	6	0	0	0	1	0
4:15 PM - 4:30 PM	2	10	0	0	3	17	5	0	5	0	4	0	0	0	1	0
4:30 PM - 4:45 PM	1	10	1	0	3	17	5	1	4	1	5	1	1	0	2	0
4:45 PM - 5:00 PM	0	12	0	0	3	12	3	0	3	0	2	0	1	1	1	0
5:00 PM - 5:15 PM	2	11	1	0	2	24	2	0	4	0	4	0	0	2	1	0
5:15 PM - 5:30 PM	2	18	1	0	3	22	2	1	4	0	5	0	0	1	1	0
5:30 PM - 5:45 PM	2	24	0	0	2	27	1	0	5	0	7	1	0	0	3	0
5:45 PM - 6:00 PM	3	15	0	0	4	23	3	0	2	0	1	0	0	0	3	0
TOTAL	**27**	**207**	**7**	**4**	**35**	**281**	**51**	**4**	**53**	**13**	**65**	**5**	**5**	**10**	**26**	**0**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:15 AM - 8:15 AM	10	93	0	2	0	43	16	6	14	0	9	6	1	3	4	0
5:00 PM - 6:00 PM	9	68	2	0	11	96	8	1	15	0	17	1	0	3	8	0

	PHF	Trucks
AM	0.832	7.3%
PM	0.835	0.8%



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Prepared For:
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Morro Bay, CA 93442

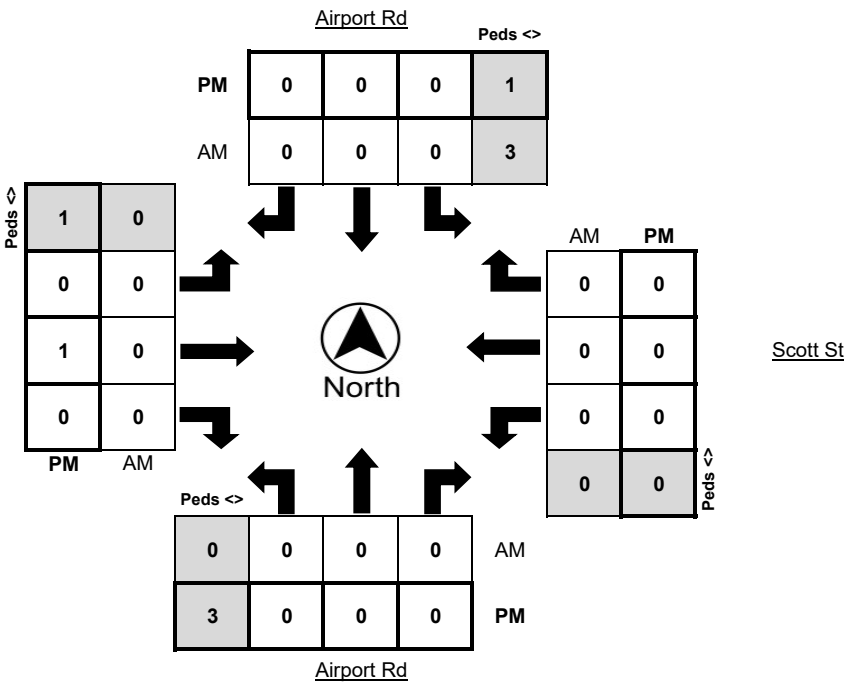
LOCATION Airport Rd @ Scott St
LATITUDE 35.6079
COUNTY San Luis Obispo
LONGITUDE -120.6435
COLLECTION DATE Thursday, January 24, 2019
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
2:00 PM - 2:15 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM - 2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM - 2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM - 3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM - 3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM - 3:30 PM	0	1	0	0	0	0	0	0	0	0	0	4	0	0	0	3
3:30 PM - 3:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM - 4:00 PM	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	1	0	0	0	0	0	3	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
5:15 PM - 5:30 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	2	0	1	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**1**	**0**	**3**	**0**	**2**	**0**	**3**	**0**	**1**	**0**	**11**	**0**	**0**	**0**	**4**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:15 AM - 8:15 AM	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 6:00 PM	0	0	0	1	0	0	0	3	0	1	0	0	0	0	0	1

	Bikes	Peds
AM Peak Total	0	3
PM Peak Total	1	5



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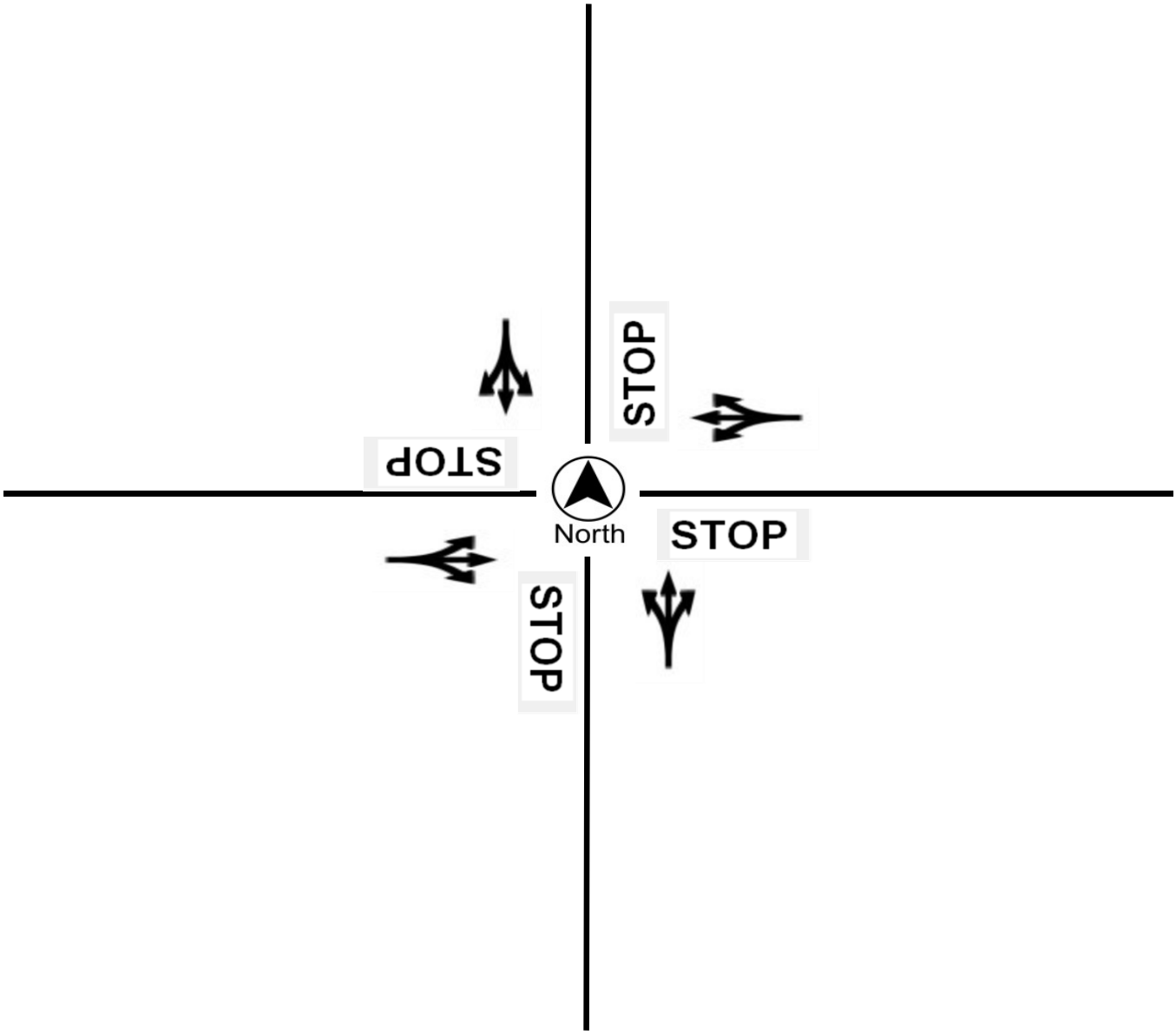
800-975-6938 Phone/Fax
www.metrotrafficdata.com

Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION	Airport Rd @ Scott St	**N/S STREET**	Airport Rd / Airport Rd
COUNTY	San Luis Obispo	**E/W STREET**	Scott St / Scott St
COLLECTION DATE	Thursday, January 24, 2019	**WEATHER**	Clear
CYCLE TIME	N/A	**CONTROL TYPE**	All-Way Stop

COMMENTS



Reso A - Exhibit C2 (EIR Technical Appendix)

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Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

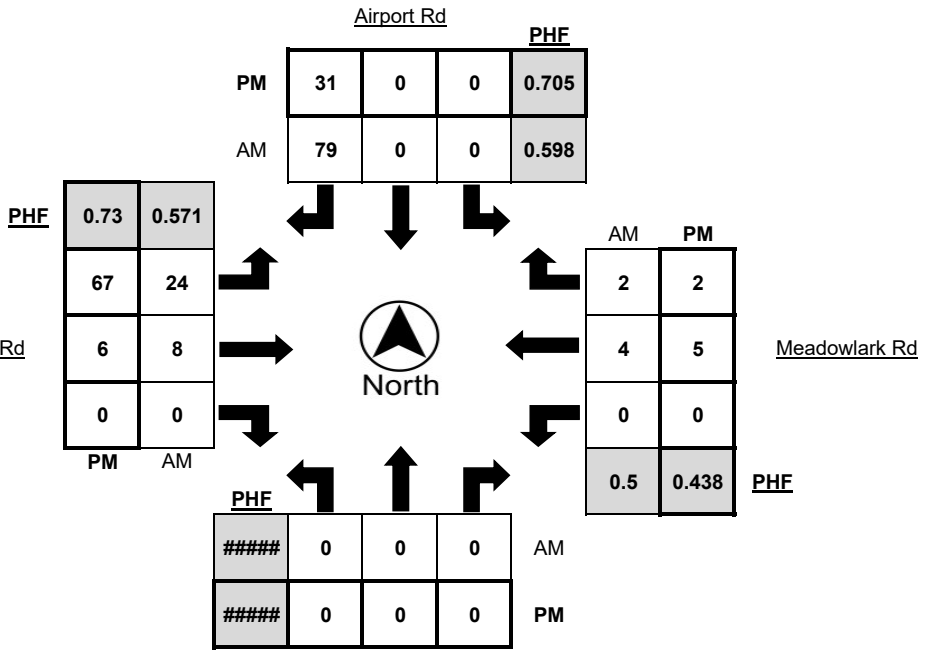
LOCATION Airport Rd @ Meadowlark Rd
LATITUDE 35.6011
COUNTY San Luis Obispo
LONGITUDE -120.6437
COLLECTION DATE Thursday, January 24, 2019
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	25	0	4	0	0	0	0	2	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	33	2	5	2	0	0	0	1	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	14	1	10	4	0	1	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	7	0	5	2	0	0	0	1	2	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	7	0	4	2	0	0	0	2	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	10	0	4	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**96**	**3**	**32**	**10**	**0**	**1**	**0**	**6**	**2**	**0**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
2:00 PM - 2:15 PM	0	0	0	0	0	0	6	0	5	2	0	0	0	0	0	0
2:15 PM - 2:30 PM	0	0	0	0	1	0	17	1	5	1	0	0	0	0	0	0
2:30 PM - 2:45 PM	0	0	0	0	1	0	9	0	11	0	0	0	0	2	0	0
2:45 PM - 3:00 PM	0	0	0	0	1	0	9	0	13	3	0	0	0	4	1	0
3:00 PM - 3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM - 3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM - 3:45 PM	0	0	0	0	0	0	11	1	10	1	0	0	0	0	1	0
3:45 PM - 4:00 PM	0	0	0	0	0	0	7	0	12	2	0	1	0	2	0	0
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	10	0	12	0	0	0	0	2	0	0
4:45 PM - 5:00 PM	0	0	0	0	2	0	6	0	6	1	0	0	0	2	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	3	0	15	3	0	0	0	0	1	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	8	0	14	0	0	0	0	4	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	11	0	23	2	0	0	0	1	1	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	9	0	15	1	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**5**	**0**	**106**	**2**	**141**	**16**	**0**	**1**	**0**	**17**	**4**	**0**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:30 AM - 8:30 AM	0	0	0	0	0	0	79	3	24	8	0	1	0	4	2	0
5:00 PM - 6:00 PM	0	0	0	0	0	0	31	0	67	6	0	0	0	5	2	0

	PHF	Trucks
AM	0.713	3.4%
PM	0.730	0.0%



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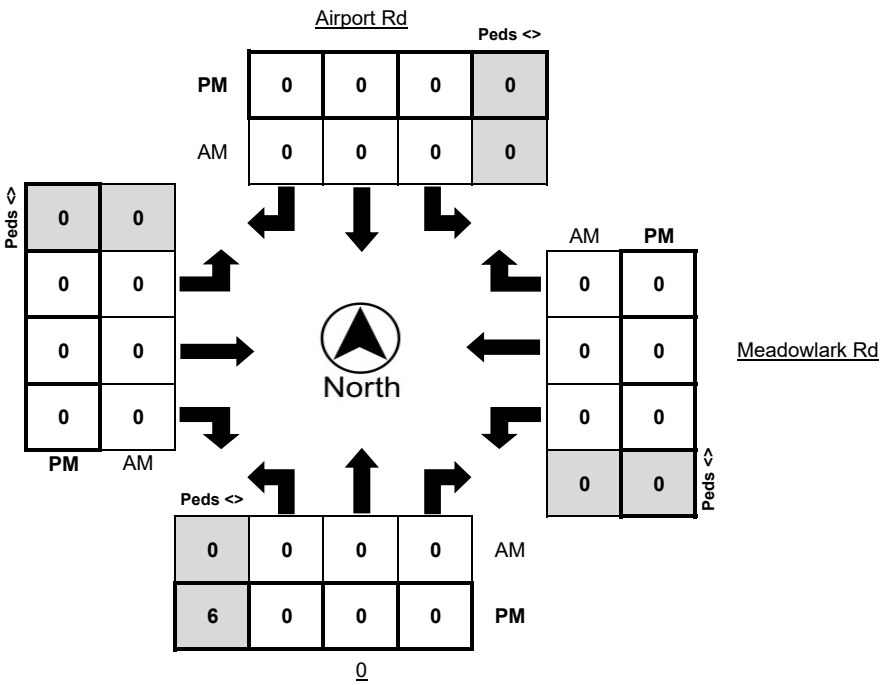
LATITUDE 35.6011
COUNTY San Luis Obispo
LONGITUDE -120.6437
COLLECTION DATE Thursday, January 24, 2019
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
2:00 PM - 2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM - 2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM - 2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM - 3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM - 3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM - 3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM - 3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
3:45 PM - 4:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:30 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 6:00 PM	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0

	Bikes	Peds
AM Peak Total	0	0
PM Peak Total	0	6



Turning Movement Report

Metro Traffic Data Inc.
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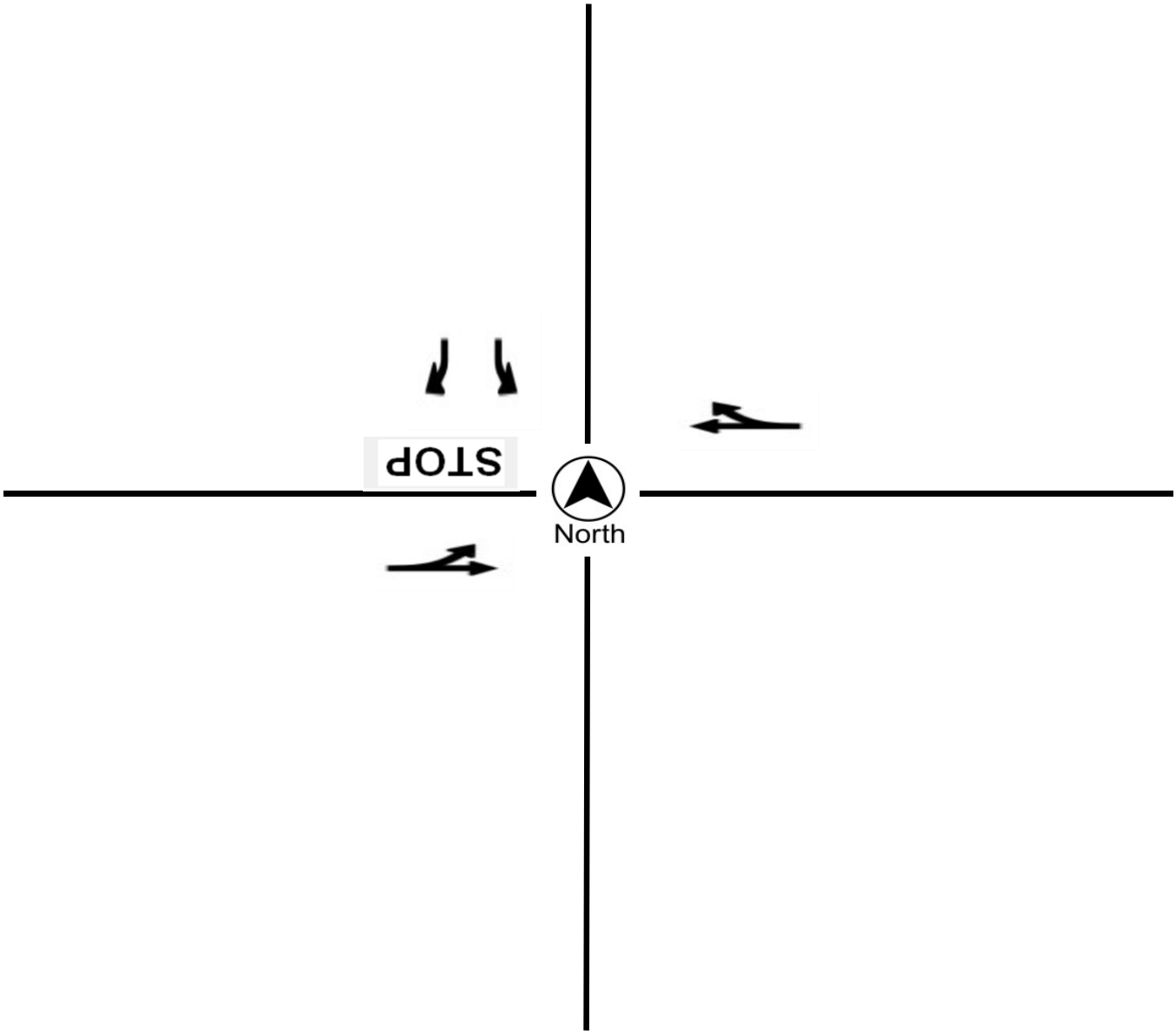
800-975-6938 Phone/Fax
www.metrotrafficdata.com

Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION	Airport Rd @ Meadowlark Rd	**N/S STREET**	Airport Rd /
COUNTY	San Luis Obispo	**E/W STREET**	Meadowlark Rd / Meadowlark Rd
COLLECTION DATE	Thursday, January 24, 2019	**WEATHER**	Clear
CYCLE TIME	N/A	**CONTROL TYPE**	One-Way stop

COMMENTS



Reso A - Exhibit C2 (EIR Technical Appendix)

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Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

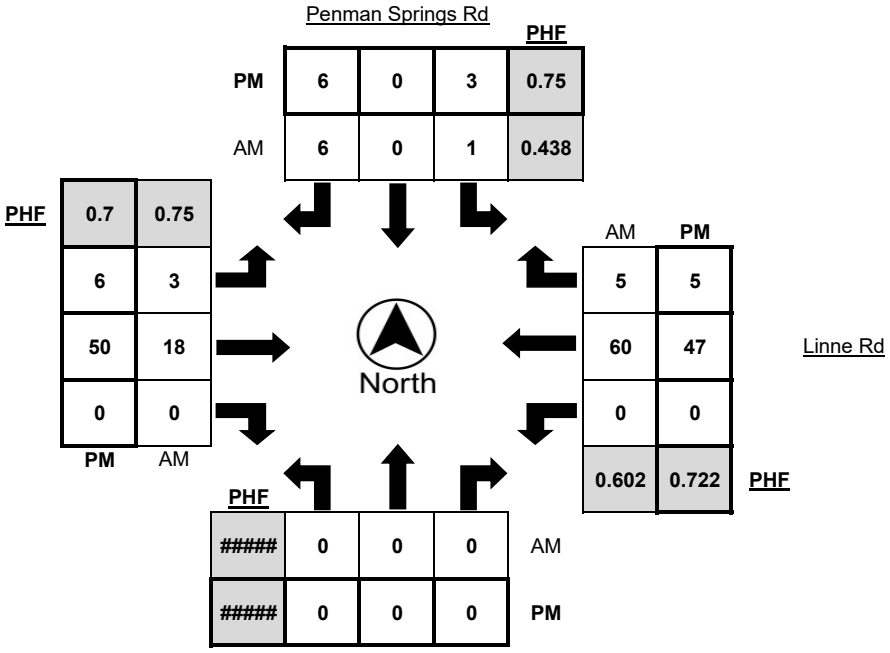
LOCATION Penman Springs Rd @ Linne Rd
LATITUDE 35.6081
COUNTY San Luis Obispo
LONGITUDE -120.6095
COLLECTION DATE Thursday, January 24, 2019
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	0	0	0	0	0	0	1	0	0	1	0	1	0	10	1	1
7:15 AM - 7:30 AM	0	0	0	0	1	0	0	0	1	1	0	0	0	20	1	1
7:30 AM - 7:45 AM	0	0	0	0	0	0	4	1	1	5	0	0	0	25	2	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	1	0	1	5	0	0	0	8	2	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	1	0	0	7	0	0	0	7	0	0
8:15 AM - 8:30 AM	0	0	0	0	2	0	0	0	0	3	0	0	0	7	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	1	0	0	7	0	0	0	7	0	0
8:45 AM - 9:00 AM	0	0	0	0	1	0	3	0	0	7	0	0	0	14	2	0
TOTAL	**0**	**0**	**0**	**0**	**4**	**0**	**11**	**1**	**3**	**36**	**0**	**1**	**0**	**98**	**8**	**2**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
2:00 PM - 2:15 PM	0	0	0	0	1	0	2	0	2	8	0	0	0	6	1	0
2:15 PM - 2:30 PM	0	0	0	0	1	0	1	0	0	12	0	0	0	8	1	0
2:30 PM - 2:45 PM	0	0	0	0	0	0	0	0	0	9	0	0	0	6	1	0
2:45 PM - 3:00 PM	0	0	0	0	0	0	0	0	1	10	0	0	0	10	1	0
3:00 PM - 3:15 PM	0	0	0	0	2	0	1	0	0	12	0	0	0	10	0	0
3:15 PM - 3:30 PM	0	0	0	0	1	0	1	0	2	8	0	0	0	9	1	0
3:30 PM - 3:45 PM	0	0	0	0	2	0	1	0	2	11	0	0	0	7	0	0
3:45 PM - 4:00 PM	0	0	0	0	1	0	2	0	2	12	0	1	0	7	2	1
4:00 PM - 4:15 PM	0	0	0	0	1	0	0	1	2	18	0	0	0	17	1	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	2	0	2	8	0	0	0	12	1	0
4:30 PM - 4:45 PM	0	0	0	0	1	0	2	1	0	12	0	0	0	11	1	0
4:45 PM - 5:00 PM	0	0	0	0	2	0	1	0	1	11	0	0	0	8	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	1	0	0	13	0	0	0	8	2	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	2	0	1	18	0	0	0	8	0	0
5:30 PM - 5:45 PM	0	0	0	0	1	0	2	0	4	7	0	0	0	8	1	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	2	0	2	5	0	1	0	2	0	0
TOTAL	**0**	**0**	**0**	**0**	**13**	**0**	**20**	**2**	**21**	**174**	**0**	**2**	**0**	**137**	**13**	**1**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:15 AM - 8:15 AM	0	0	0	0	1	0	6	1	3	18	0	0	0	60	5	1
3:45 PM - 4:45 PM	0	0	0	0	3	0	6	2	6	50	0	1	0	47	5	1

	PHF	Trucks
AM	0.628	2.2%
PM	0.750	3.4%



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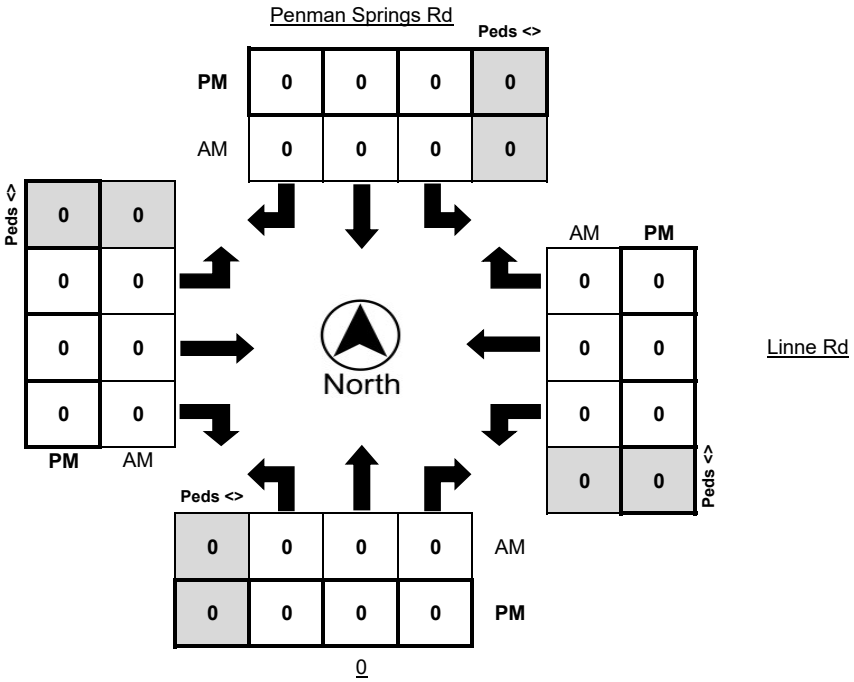
LOCATION Penman Springs Rd @ Linne Rd
LATITUDE 35.6081
COUNTY San Luis Obispo
LONGITUDE -120.6095
COLLECTION DATE Thursday, January 24, 2019
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
2:00 PM - 2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM - 2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM - 2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM - 3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM - 3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM - 3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
3:30 PM - 3:45 PM	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0
3:45 PM - 4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:15 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Bikes	Peds
AM Peak Total	0	0
PM Peak Total	0	0



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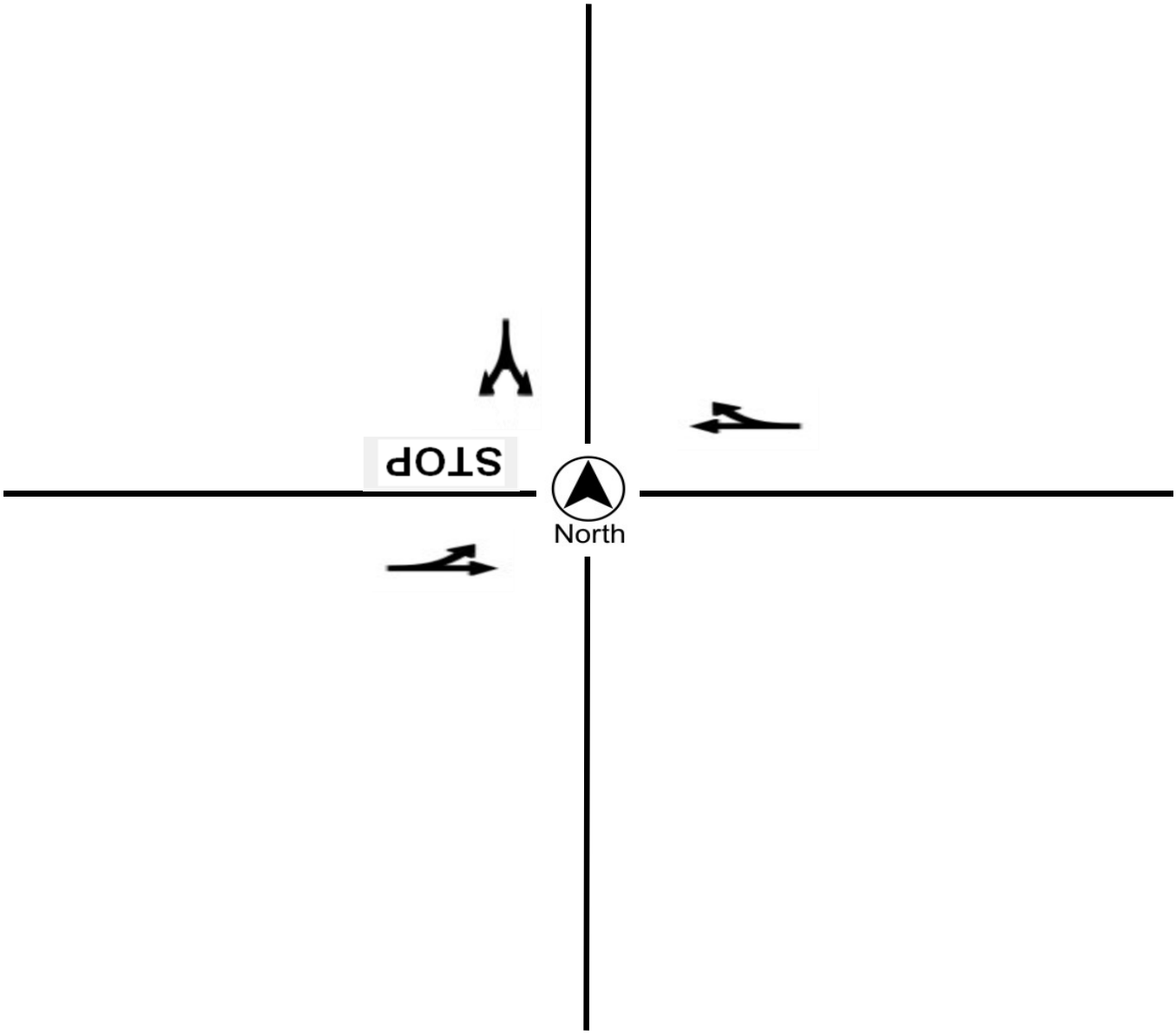
www.metrotrafficdata.com

Prepared For:
Central Coast Transportation Consulting
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION	Penman Springs Rd @ Linne Rd	**N/S STREET**	Penman Springs Rd /
COUNTY	San Luis Obispo	**E/W STREET**	Linne Rd / Linne Rd
COLLECTION DATE	Thursday, January 24, 2019	**WEATHER**	Clear
CYCLE TIME	N/A	**CONTROL TYPE**	One-Way stop

COMMENTS



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800-975-6938 Phone/Fax
www.metrotrafficdata.com

Prepared For:

OMNI-Means
943 Reserve Drive
Roseville, CA 95678

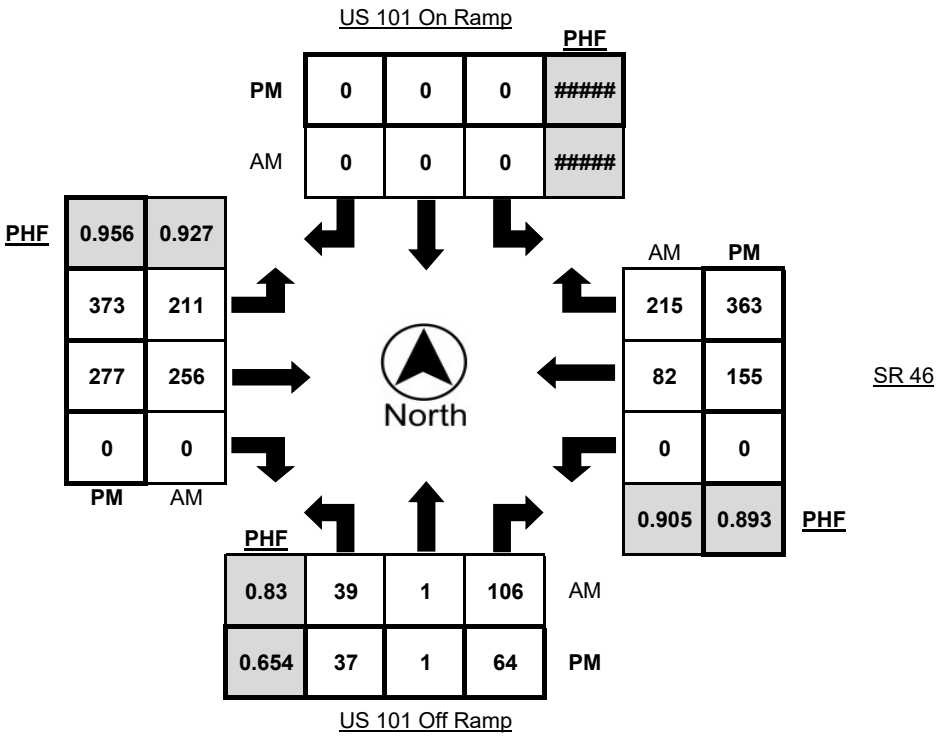
LOCATION SR 46W @ US 101 NB Ramps
LATITUDE 35.5893
COUNTY San Luis Obispo
LONGITUDE -120.6950
COLLECTION DATE Tuesday, May 22, 2018
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	4	0	20	0	0	0	0	0	36	54	0	6	0	15	27	8
7:15 AM - 7:30 AM	4	0	37	1	0	0	0	0	22	62	0	10	0	11	35	12
7:30 AM - 7:45 AM	2	0	25	3	0	0	0	0	40	90	0	5	0	17	39	8
7:45 AM - 8:00 AM	10	1	24	3	0	0	0	0	44	91	0	8	0	18	34	7
8:00 AM - 8:15 AM	11	0	26	4	0	0	0	0	65	61	0	11	0	17	47	21
8:15 AM - 8:30 AM	9	1	34	1	0	0	0	0	55	51	0	8	0	19	60	13
8:30 AM - 8:45 AM	6	0	17	0	0	0	0	0	38	81	0	14	0	28	44	11
8:45 AM - 9:00 AM	13	0	29	3	0	0	0	0	53	63	0	10	0	18	64	17
TOTAL	**59**	**2**	**212**	**15**	**0**	**0**	**0**	**0**	**353**	**553**	**0**	**72**	**0**	**143**	**350**	**97**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	6	0	16	0	0	0	0	0	89	81	0	5	0	31	88	4
4:15 PM - 4:30 PM	13	0	26	1	0	0	0	0	90	76	0	12	0	38	75	7
4:30 PM - 4:45 PM	11	1	10	0	0	0	0	0	101	56	0	9	0	42	103	4
4:45 PM - 5:00 PM	7	0	12	0	0	0	0	0	93	64	0	7	0	44	97	8
5:00 PM - 5:15 PM	13	1	20	0	0	0	0	0	104	44	0	16	0	47	73	6
5:15 PM - 5:30 PM	17	0	11	1	0	0	0	0	103	46	0	14	0	41	79	6
5:30 PM - 5:45 PM	6	1	10	0	0	0	0	0	111	24	0	9	0	42	60	4
5:45 PM - 6:00 PM	11	0	12	0	0	0	0	0	96	29	0	4	0	24	58	4
TOTAL	**84**	**3**	**117**	**2**	**0**	**0**	**0**	**0**	**787**	**420**	**0**	**76**	**0**	**309**	**633**	**43**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
8:00 AM - 9:00 AM	39	1	106	8	0	0	0	0	211	256	0	43	0	82	215	62
4:00 PM - 5:00 PM	37	1	64	1	0	0	0	0	373	277	0	33	0	155	363	23

	PHF	Trucks
AM	0.948	12.4%
PM	0.980	4.5%



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Roseville, CA 95678

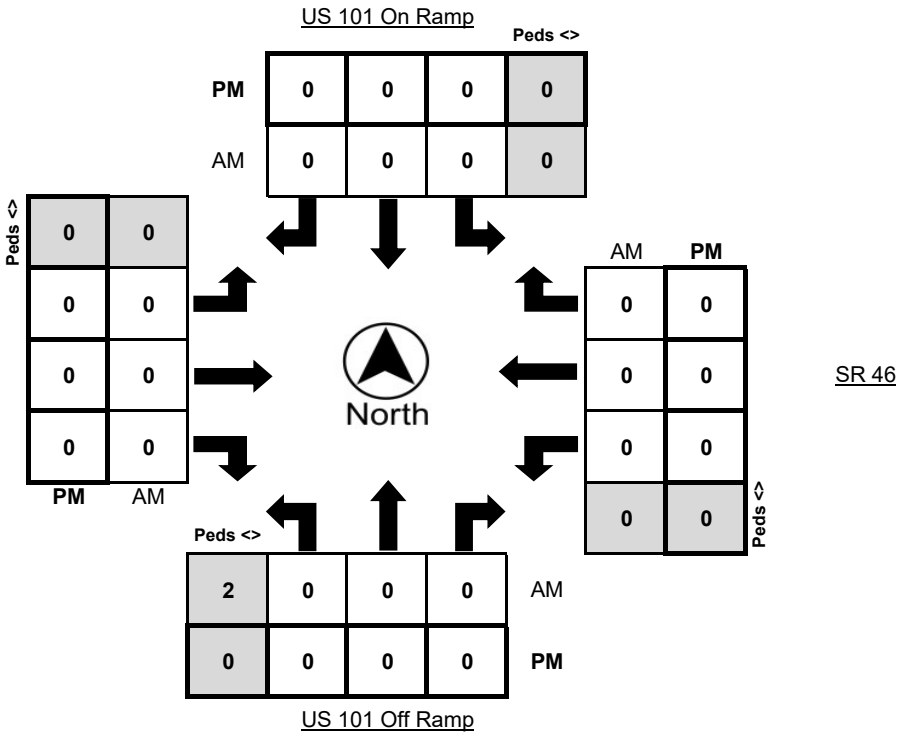
LOCATION SR 46W @ US 101 NB Ramps
LATITUDE 35.5893
COUNTY San Luis Obispo
LONGITUDE -120.6950
COLLECTION DATE Tuesday, May 22, 2018
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
8:00 AM - 9:00 AM	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
4:00 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Bikes	Peds
AM Peak Total	0	2
PM Peak Total	0	0



Turning Movement Report

Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

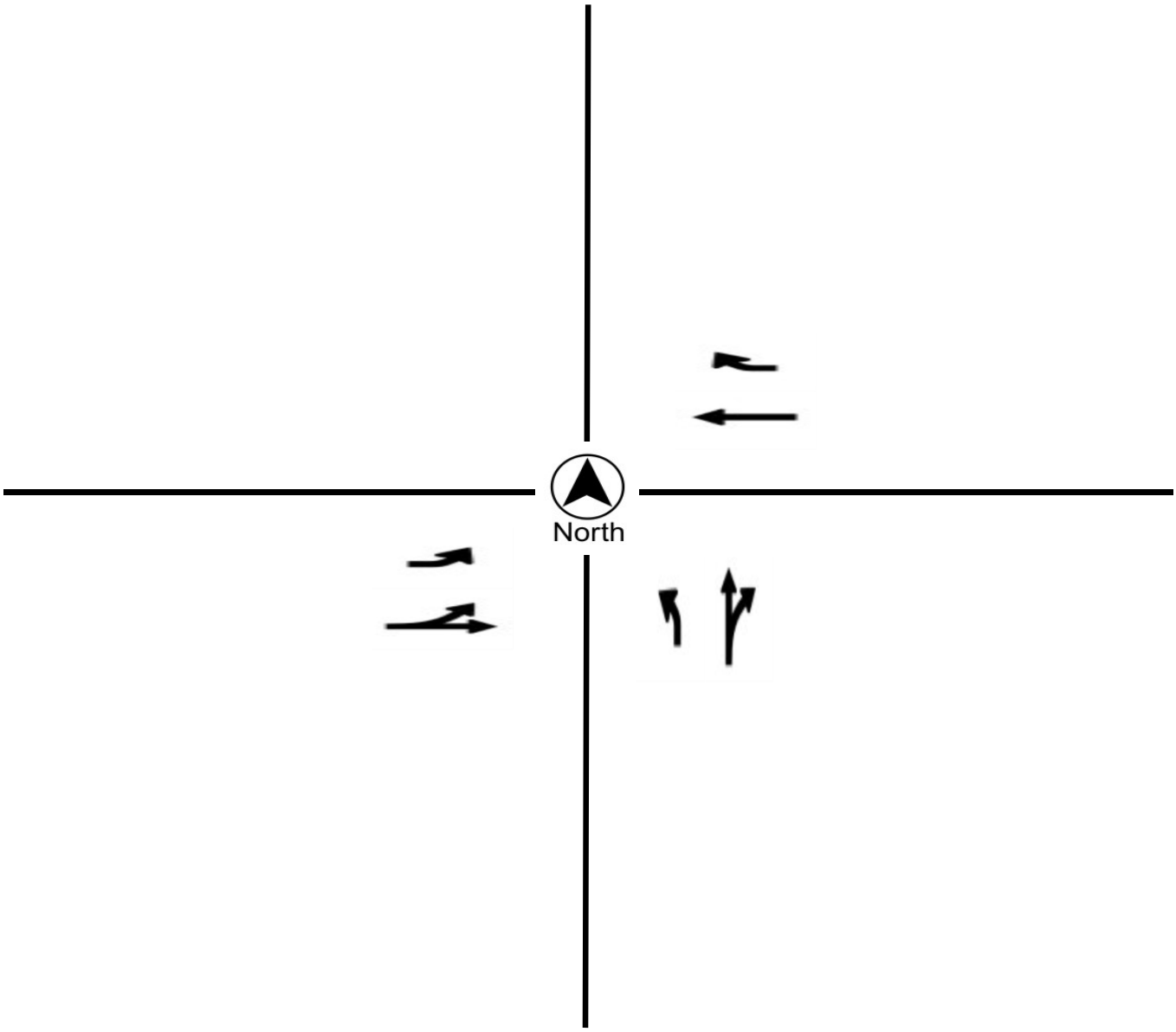
800-975-6938 Phone/Fax
www.metrotrafficdata.com

Prepared For:

OMNI-Means
943 Reserve Drive
Roseville, CA 95678

LOCATION	SR 46W @ US 101 NB Ramps	**N/S STREET**	US 101 On Ramp / US 101 Off Ramp
COUNTY	San Luis Obispo	**E/W STREET**	SR 46 / SR 46
COLLECTION DATE	Tuesday, May 22, 2018	**WEATHER**	Clear
CYCLE TIME	98 Seconds	**CONTROL TYPE**	Signal

COMMENTS Eastbound left turns are protected.



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Prepared For:

OMNI-Means
943 Reserve Drive
Roseville, CA 95678

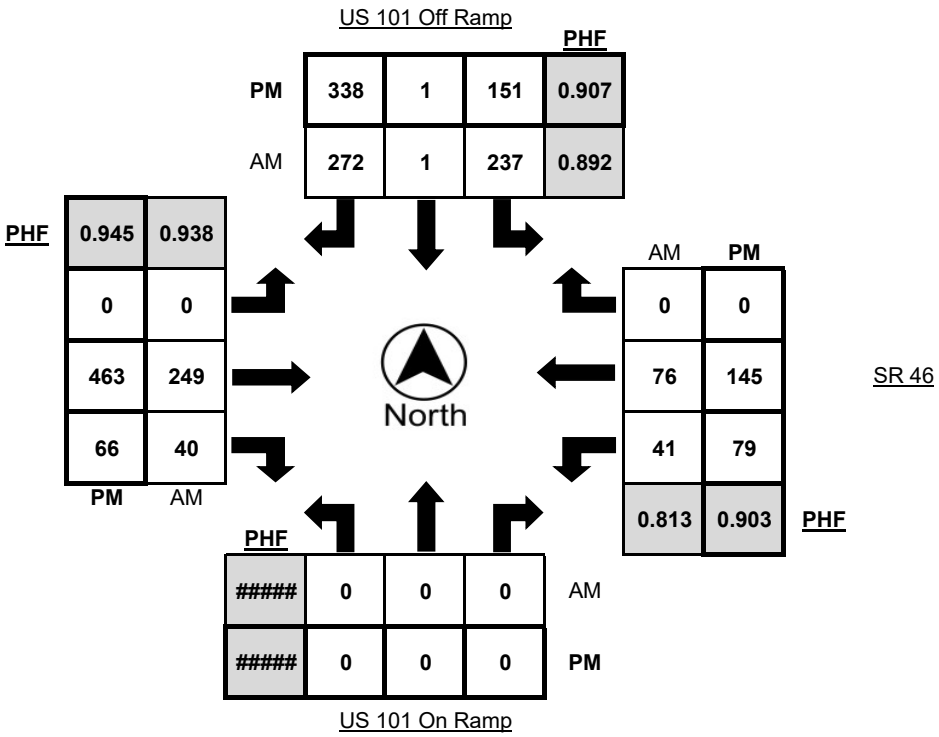
LOCATION SR 46W @ US 101 SB Ramps
LATITUDE 35.5894
COUNTY San Luis Obispo
LONGITUDE -120.6961
COLLECTION DATE Tuesday, May 22, 2018
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:00 AM - 7:15 AM	0	0	0	0	53	1	33	5	0	35	5	0	2	14	0	2
7:15 AM - 7:30 AM	0	0	0	0	51	1	49	8	0	33	21	3	5	9	0	2
7:30 AM - 7:45 AM	0	0	0	0	46	0	51	14	0	83	15	2	7	14	0	3
7:45 AM - 8:00 AM	0	0	0	0	69	0	74	7	0	66	9	1	7	20	0	3
8:00 AM - 8:15 AM	0	0	0	0	65	0	74	8	0	61	10	2	9	19	0	1
8:15 AM - 8:30 AM	0	0	0	0	54	0	69	8	0	53	13	2	9	17	0	4
8:30 AM - 8:45 AM	0	0	0	0	49	1	55	5	0	69	8	4	16	20	0	2
8:45 AM - 9:00 AM	0	0	0	0	58	0	79	14	0	57	15	5	11	23	0	1
TOTAL	**0**	**0**	**0**	**0**	**445**	**3**	**484**	**69**	**0**	**457**	**96**	**19**	**66**	**136**	**0**	**18**

	Northbound				Southbound				Eastbound				Westbound			
Time	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
4:00 PM - 4:15 PM	0	0	0	0	44	0	108	7	0	126	6	3	12	26	0	1
4:15 PM - 4:30 PM	0	0	0	0	44	0	89	7	0	119	15	4	18	30	0	1
4:30 PM - 4:45 PM	0	0	0	0	37	0	76	6	0	120	13	1	20	35	0	2
4:45 PM - 5:00 PM	0	0	0	0	39	0	82	5	0	120	10	3	21	28	0	0
5:00 PM - 5:15 PM	0	0	0	0	39	1	95	4	0	107	19	3	18	40	0	4
5:15 PM - 5:30 PM	0	0	0	0	36	0	85	2	0	116	24	3	20	42	0	1
5:30 PM - 5:45 PM	0	0	0	0	38	0	108	2	0	93	8	1	14	29	0	1
5:45 PM - 6:00 PM	0	0	0	0	20	0	75	3	0	105	7	2	9	24	0	2
TOTAL	**0**	**0**	**0**	**0**	**297**	**1**	**718**	**36**	**0**	**906**	**102**	**20**	**132**	**254**	**0**	**12**

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**	**Left**	**Thru**	**Right**	**Trucks**
7:45 AM - 8:45 AM	0	0	0	0	237	1	272	28	0	249	40	9	41	76	0	10
4:30 PM - 5:30 PM	0	0	0	0	151	1	338	17	0	463	66	10	79	145	0	7

	PHF	Trucks
AM	0.935	5.1%
PM	0.962	2.7%



Turning Movement Report

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Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Prepared For:

OMNI-Means
943 Reserve Drive
Roseville, CA 95678

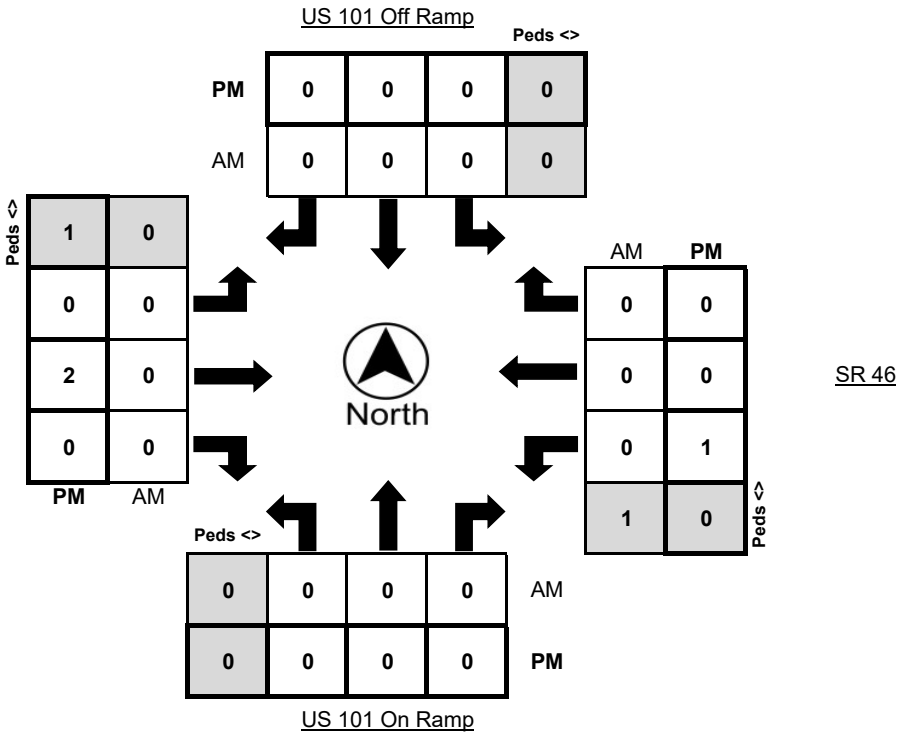
LOCATION SR 46W @ US 101 SB Ramps
LATITUDE 35.5894
COUNTY San Luis Obispo
LONGITUDE -120.6961
COLLECTION DATE Tuesday, May 22, 2018
WEATHER Clear

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**2**	**0**	**0**	**1**

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
PEAK HOUR	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:45 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
4:30 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	1

	Bikes	Peds
AM Peak Total	0	1
PM Peak Total	3	1



Turning Movement Report

Metro Traffic Data Inc.
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Hanford, CA 93230

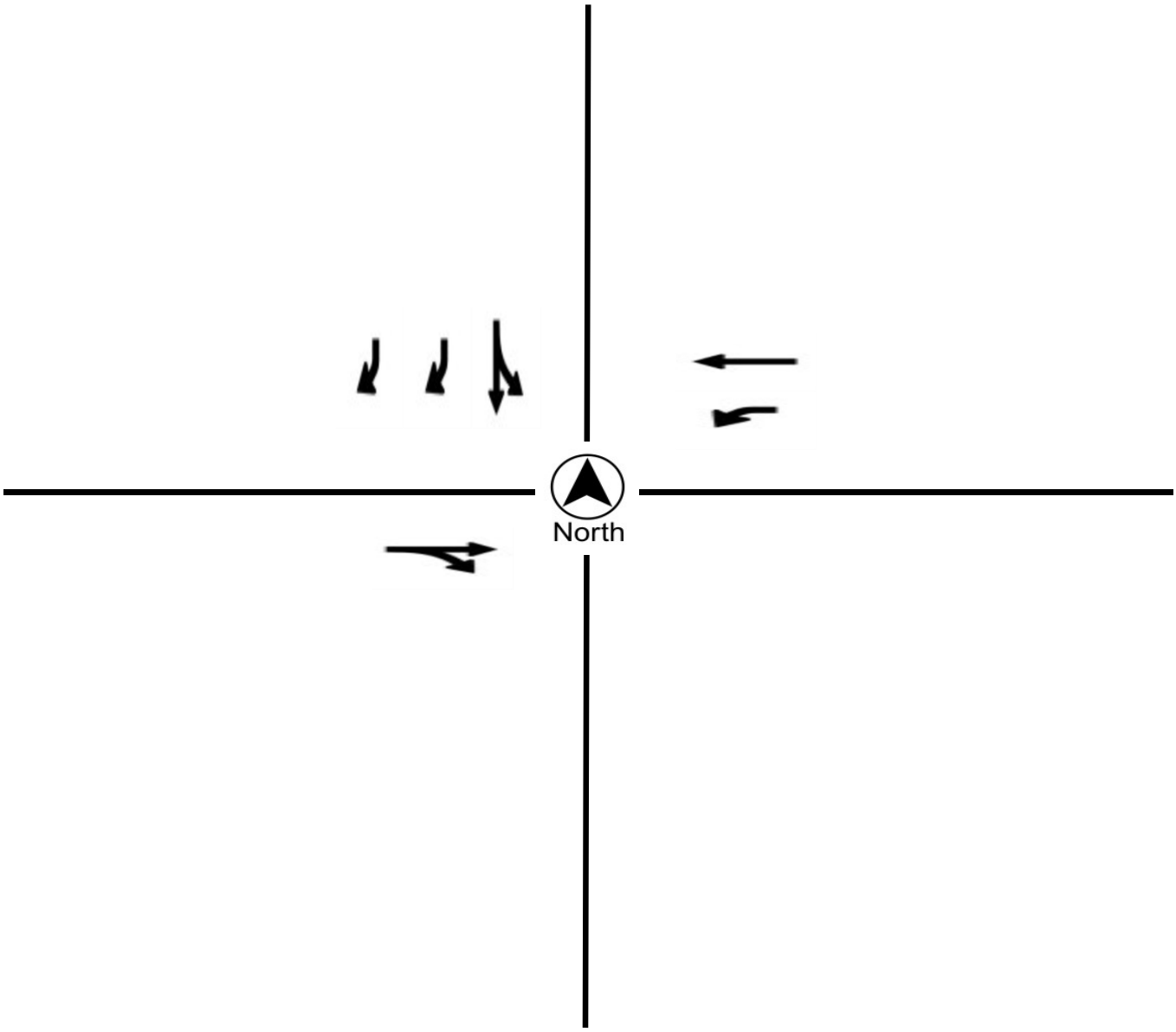
800-975-6938 Phone/Fax
www.metrotrafficdata.com

Prepared For:

OMNI-Means
943 Reserve Drive
Roseville, CA 95678

LOCATION	SR 46W @ US 101 SB Ramps	**N/S STREET**	US 101 Off Ramp / US 101 On Ramp
COUNTY	San Luis Obispo	**E/W STREET**	SR 46 / SR 46
COLLECTION DATE	Tuesday, May 22, 2018	**WEATHER**	Clear
CYCLE TIME	71 Seconds	**CONTROL TYPE**	Signal

COMMENTS Westbound left turns are protected.



Freeway Counts

Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Peak Hour Volume

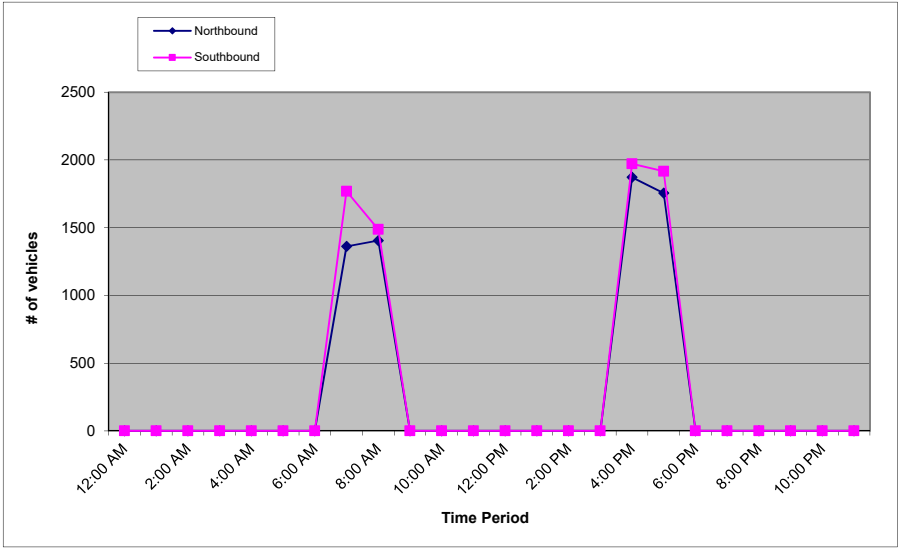
Prepared For: **Central Coast Trans. Consulting**
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION 101 Mainline @ Niblick Rd Bridge
COUNTY San Luis Obispo
COLLECTION DATE Wednesday, June 6, 2018
NUMBER OF LANES 4

LATITUDE 35.6154332
LONGITUDE -120.688532
WEATHER Clear

	Northbound					Southbound					Hourly
Hour	1st	2nd	3rd	4th	**Total**	1st	2nd	3rd	4th	**Total**	**Totals**
12:00 AM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
1:00 AM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
2:00 AM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
3:00 AM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
4:00 AM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
5:00 AM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
6:00 AM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
7:00 AM	237	309	395	421	**1362**	340	472	465	492	**1769**	**3131**
8:00 AM	340	366	358	341	**1405**	401	392	334	360	**1487**	**2892**
9:00 AM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
10:00 AM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
11:00 AM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
12:00 PM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
1:00 PM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
2:00 PM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
3:00 PM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
4:00 PM	414	467	497	494	**1872**	442	446	546	538	**1972**	**3844**
5:00 PM	471	482	425	377	**1755**	584	484	406	442	**1916**	**3671**
6:00 PM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
7:00 PM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
8:00 PM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
9:00 PM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
10:00 PM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
11:00 PM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
Total	**47.2%**				**6394**	**52.8%**				**7144**	
	13538										

AM%	**44.5%**	**AM Peak**	**3295**	**7:15 am to 8:15 am**	**AM P.H.F.**	**0.90**
PM%	**55.5%**	**PM Peak**	**4096**	**4:30 pm to 5:30 pm**	**PM P.H.F.**	**0.97**



Reso A - Exhibit C2 (EIR Technical Appendix)

Location: US 101 Mainline at Niblick Rd Bridge
Date: 6/6/2018

	Northbound		Southbound			
Interval	**ALL Vehicles**	**Trucks**	**All Vehicles**	**Trucks**	**TOTAL**	**Truck %**
7:00 AM	237	19	340	26	**577**	**8%**
7:15 AM	309	18	472	28	**781**	**6%**
7:30 AM	395	26	465	38	**860**	**7%**
7:45 AM	421	29	492	35	**913**	**7%**
8:00 AM	340	21	401	39	**741**	**8%**
8:15 AM	366	34	392	38	**758**	**9%**
8:30 AM	358	40	334	23	**692**	**9%**
8:45 AM	341	28	360	31	**701**	**8%**
Totals:	**2767**	**215**	**3256**	**258**	**6023**	**8%**

Peak Hour Values

7:15 AM - 8:15 AM	1465	94	1830	140	3295	7%

	Northbound		Southbound			
Interval	**ALL Vehicles**	**Trucks**	**All Vehicles**	**Trucks**	**TOTAL**	**Truck %**
4:00 PM	414	22	442	30	**856**	**6%**
4:15 PM	467	25	446	32	**913**	**6%**
4:30 PM	497	24	546	28	**1043**	**5%**
4:45 PM	494	15	538	21	**1032**	**3%**
5:00 PM	471	19	584	38	**1055**	**5%**
5:15 PM	482	18	484	32	**966**	**5%**
5:30 PM	425	18	406	20	**831**	**5%**
5:45 PM	377	13	442	15	**819**	**3%**
Totals:	**3627**	**154**	**3888**	**216**	**7515**	**5%**

Peak Hour Values

4:30 PM - 5:30 PM	1944	76	2152	119	4096	5%

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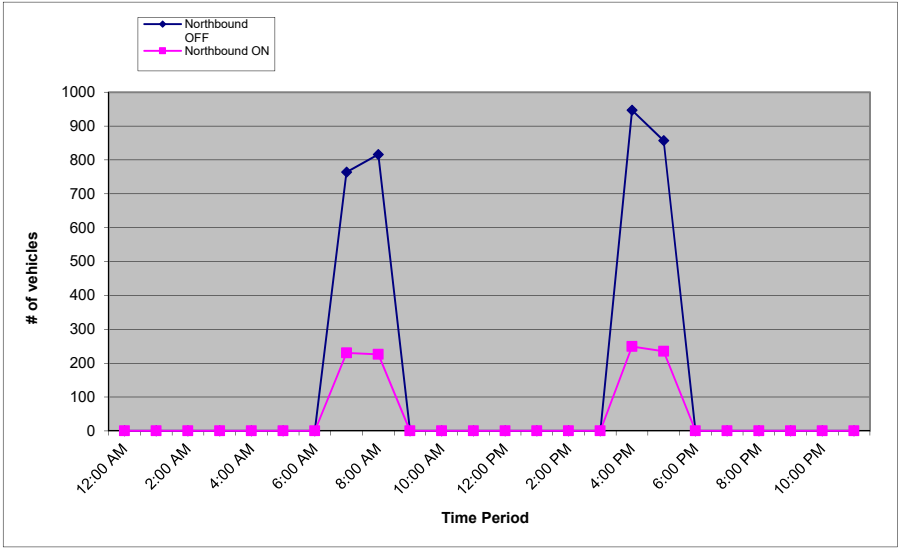
Peak Hour Volume

Prepared For: **Central Coast Trans. Consulting**
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION 101 NB Ramps @ SR 46 E
LATITUDE 35.6428285
COUNTY San Luis Obispo
LONGITUDE -120.6843692
COLLECTION DATE Wednesday, June 6, 2018
WEATHER Clear
NUMBER OF LANES 2 OFF / 1 ON

	Northbound OFF					Northbound ON					Hourly
Hour	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Totals
12:00 AM	-	-	-	-	0	-	-	-	-	0	0
1:00 AM	-	-	-	-	0	-	-	-	-	0	0
2:00 AM	-	-	-	-	0	-	-	-	-	0	0
3:00 AM	-	-	-	-	0	-	-	-	-	0	0
4:00 AM	-	-	-	-	0	-	-	-	-	0	0
5:00 AM	-	-	-	-	0	-	-	-	-	0	0
6:00 AM	-	-	-	-	0	-	-	-	-	0	0
7:00 AM	135	161	205	263	764	44	46	55	85	230	994
8:00 AM	223	199	179	215	816	68	52	60	46	226	1042
9:00 AM	-	-	-	-	0	-	-	-	-	0	0
10:00 AM	-	-	-	-	0	-	-	-	-	0	0
11:00 AM	-	-	-	-	0	-	-	-	-	0	0
12:00 PM	-	-	-	-	0	-	-	-	-	0	0
1:00 PM	-	-	-	-	0	-	-	-	-	0	0
2:00 PM	-	-	-	-	0	-	-	-	-	0	0
3:00 PM	-	-	-	-	0	-	-	-	-	0	0
4:00 PM	235	223	246	243	947	65	55	72	57	249	1196
5:00 PM	224	225	219	189	857	59	59	70	47	235	1092
6:00 PM	-	-	-	-	0	-	-	-	-	0	0
7:00 PM	-	-	-	-	0	-	-	-	-	0	0
8:00 PM	-	-	-	-	0	-	-	-	-	0	0
9:00 PM	-	-	-	-	0	-	-	-	-	0	0
10:00 PM	-	-	-	-	0	-	-	-	-	0	0
11:00 PM	-	-	-	-	0	-	-	-	-	0	0
Total	78.3%				3384	21.7%				940	
	4324										

AM%	47.1%	AM Peak 1150	7:30 am to 8:30 am	AM P.H.F.	0.83
PM%	52.9%	PM Peak 1196	4:00 pm to 5:00 pm	PM P.H.F.	0.94



Reso A - Exhibit C2 (EIR Technical Appendix)

Location: 101 NB Ramps @ SR 46 E
Date: 6/6/2018

	NB OFF		NB ON			
Interval	**ALL Vehicles**	**Trucks**	**All Vehicles**	**Trucks**	**TOTAL**	**Truck %**
7:00 AM	135	7	44	10	**179**	**9%**
7:15 AM	161	5	46	9	**207**	**7%**
7:30 AM	205	4	55	6	**260**	**4%**
7:45 AM	263	19	85	14	**348**	**9%**
8:00 AM	223	11	68	4	**291**	**5%**
8:15 AM	199	9	52	14	**251**	**9%**
8:30 AM	179	17	60	14	**239**	**13%**
8:45 AM	215	13	46	10	**261**	**9%**
Totals:	**1580**	**85**	**456**	**81**	**2036**	**8%**

Peak Hour Values

7:30 AM - 8:30 AM	890	43	260	38	1150	7%

	NB OFF		NB ON			
Interval	**ALL Vehicles**	**Trucks**	**All Vehicles**	**Trucks**	**TOTAL**	**Truck %**
4:00 PM	235	8	65	10	**300**	**6%**
4:15 PM	223	5	55	5	**278**	**4%**
4:30 PM	246	5	72	8	**318**	**4%**
4:45 PM	243	4	57	5	**300**	**3%**
5:00 PM	224	6	59	8	**283**	**5%**
5:15 PM	225	7	59	10	**284**	**6%**
5:30 PM	219	5	70	11	**289**	**6%**
5:45 PM	189	7	47	8	**236**	**6%**
Totals:	**1804**	**47**	**484**	**65**	**2288**	**5%**

Peak Hour Values

4:00 PM - 5:00 PM	947	22	249	28	1196	4%

Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

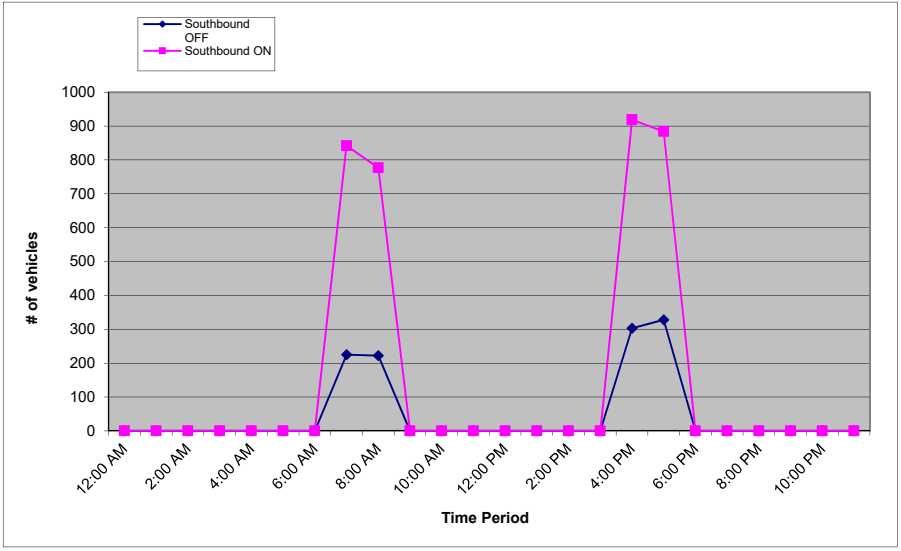
Peak Hour Volume

Prepared For: **Central Coast Trans. Consulting**
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION US 101 SB Ramps @ SR 46 E
LATITUDE 35.6424274
COUNTY San Luis Obispo
LONGITUDE -120.6856352
COLLECTION DATE Wednesday, June 6, 2018
WEATHER Clear
NUMBER OF LANES 2 OFF / 2 ON

	Southbound OFF					Southbound ON					Hourly
Hour	1st	2nd	3rd	4th	**Total**	1st	2nd	3rd	4th	**Total**	**Totals**
12:00 AM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
1:00 AM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
2:00 AM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
3:00 AM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
4:00 AM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
5:00 AM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
6:00 AM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
7:00 AM	38	64	58	65	**225**	164	224	205	249	**842**	**1067**
8:00 AM	61	53	59	49	**222**	214	213	179	171	**777**	**999**
9:00 AM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
10:00 AM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
11:00 AM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
12:00 PM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
1:00 PM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
2:00 PM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
3:00 PM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
4:00 PM	67	70	75	91	**303**	230	198	245	246	**919**	**1222**
5:00 PM	79	82	91	76	**328**	246	255	160	223	**884**	**1212**
6:00 PM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
7:00 PM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
8:00 PM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
9:00 PM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
10:00 PM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
11:00 PM	-	-	-	-	**0**	-	-	-	-	**0**	**0**
Total	**24.0%**				**1078**	**76.0%**				**3422**	
	4500										

AM% 45.9% **AM Peak** 1140 **7:15 am to 8:15 am** **AM P.H.F.** 0.91
PM% 54.1% **PM Peak** 1319 **4:30 pm to 5:30 pm** **PM P.H.F.** 0.98



Reso A - Exhibit C2 (EIR Technical Appendix)

Location: US 101 SB @ SR 46 E
Date: 6/6/2018

	SB OFF		SB ON			
Interval	**ALL Vehicles**	**Trucks**	**All Vehicles**	**Trucks**	**TOTAL**	**Truck %**
7:00 AM	38	10	164	16	**202**	**13%**
7:15 AM	64	14	224	9	**288**	**8%**
7:30 AM	58	9	205	13	**263**	**8%**
7:45 AM	65	11	249	13	**314**	**8%**
8:00 AM	61	13	214	24	**275**	**13%**
8:15 AM	53	12	213	20	**266**	**12%**
8:30 AM	59	15	179	10	**238**	**11%**
8:45 AM	49	11	171	24	**220**	**16%**
Totals:	**447**	**95**	**1619**	**129**	**2066**	**11%**

Peak Hour Values

7:15 AM - 8:15 AM	248	47	892	59	1140	9%

	SB OFF		SB ON			
Interval	**ALL Vehicles**	**Trucks**	**All Vehicles**	**Trucks**	**TOTAL**	**Truck %**
4:00 PM	67	15	230	5	**297**	**7%**
4:15 PM	70	12	198	12	**268**	**9%**
4:30 PM	75	19	245	9	**320**	**9%**
4:45 PM	91	18	246	8	**337**	**8%**
5:00 PM	79	16	246	9	**325**	**8%**
5:15 PM	82	15	255	6	**337**	**6%**
5:30 PM	91	21	160	3	**251**	**10%**
5:45 PM	76	17	223	5	**299**	**7%**
Totals:	**631**	**133**	**1803**	**57**	**2434**	**8%**

Peak Hour Values

4:30 PM - 5:30 PM	327	68	992	32	1319	8%

Metro Traffic Data Inc.
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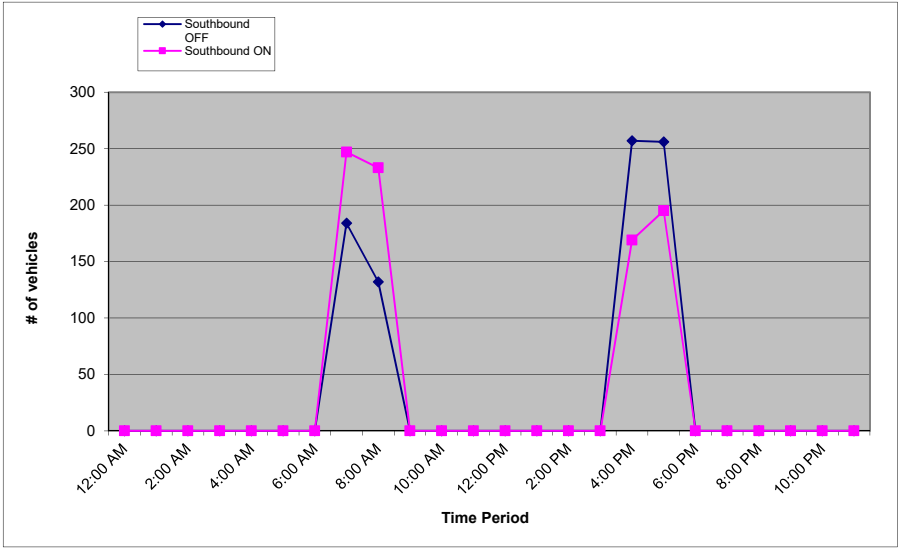
Peak Hour Volume

Prepared For: **Central Coast Trans. Consulting**
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION US 101 SB Ramps @ Riverside Ave/17th St
LATITUDE 35.6320947
COUNTY San Luis Obispo
LONGITUDE -120.6873304
COLLECTION DATE Wednesday, June 6, 2018
WEATHER Clear
NUMBER OF LANES 1 OFF / 1 ON

	Southbound OFF					Southbound ON					Hourly
Hour	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Totals
12:00 AM	-	-	-	-	0	-	-	-	-	0	0
1:00 AM	-	-	-	-	0	-	-	-	-	0	0
2:00 AM	-	-	-	-	0	-	-	-	-	0	0
3:00 AM	-	-	-	-	0	-	-	-	-	0	0
4:00 AM	-	-	-	-	0	-	-	-	-	0	0
5:00 AM	-	-	-	-	0	-	-	-	-	0	0
6:00 AM	-	-	-	-	0	-	-	-	-	0	0
7:00 AM	18	44	58	64	184	38	57	73	79	247	431
8:00 AM	55	41	26	10	132	73	73	43	44	233	365
9:00 AM	-	-	-	-	0	-	-	-	-	0	0
10:00 AM	-	-	-	-	0	-	-	-	-	0	0
11:00 AM	-	-	-	-	0	-	-	-	-	0	0
12:00 PM	-	-	-	-	0	-	-	-	-	0	0
1:00 PM	-	-	-	-	0	-	-	-	-	0	0
2:00 PM	-	-	-	-	0	-	-	-	-	0	0
3:00 PM	-	-	-	-	0	-	-	-	-	0	0
4:00 PM	43	59	60	95	257	34	35	54	46	169	426
5:00 PM	80	68	49	59	256	60	45	49	41	195	451
6:00 PM	-	-	-	-	0	-	-	-	-	0	0
7:00 PM	-	-	-	-	0	-	-	-	-	0	0
8:00 PM	-	-	-	-	0	-	-	-	-	0	0
9:00 PM	-	-	-	-	0	-	-	-	-	0	0
10:00 PM	-	-	-	-	0	-	-	-	-	0	0
11:00 PM	-	-	-	-	0	-	-	-	-	0	0
Total	49.6%				829	50.4%				844	
	1673										

AM%	47.6%	AM Peak	516	7:30 am to 8:30 am	AM P.H.F.	0.90
PM%	52.4%	PM Peak	508	4:30 pm to 5:30 pm	PM P.H.F.	0.90



Reso A - Exhibit C2 (EIR Technical Appendix)

Location: US 101 SB Ramps @ Riverside Ave/17th St
Date: 6/6/2018

	SB OFF		SB ON			
Interval	**ALL Vehicles**	**Trucks**	**All Vehicles**	**Trucks**	**TOTAL**	**Truck %**
7:00 AM	18	0	38	3	**56**	**5%**
7:15 AM	44	0	57	5	**101**	**5%**
7:30 AM	58	0	73	1	**131**	**1%**
7:45 AM	64	0	79	1	**143**	**1%**
8:00 AM	55	0	73	1	**128**	**1%**
8:15 AM	41	0	73	1	**114**	**1%**
8:30 AM	26	0	43	1	**69**	**1%**
8:45 AM	10	1	44	0	**54**	**2%**
Totals:	**316**	**1**	**480**	**13**	**796**	**2%**

Peak Hour Values

7:30 AM - 8:30 AM	218	0	298	4	516	1%

	SB OFF		SB ON			
Interval	**ALL Vehicles**	**Trucks**	**All Vehicles**	**Trucks**	**TOTAL**	**Truck %**
4:00 PM	43	0	34	0	**77**	**0%**
4:15 PM	59	0	35	0	**94**	**0%**
4:30 PM	60	0	54	1	**114**	**1%**
4:45 PM	95	0	46	0	**141**	**0%**
5:00 PM	80	1	60	0	**140**	**1%**
5:15 PM	68	0	45	0	**113**	**0%**
5:30 PM	49	0	49	0	**98**	**0%**
5:45 PM	59	1	41	0	**100**	**1%**
Totals:	**513**	**2**	**364**	**1**	**877**	**0%**

Peak Hour Values

4:30 PM - 5:30 PM	303	1	205	1	508	0%

Metro Traffic Data Inc.
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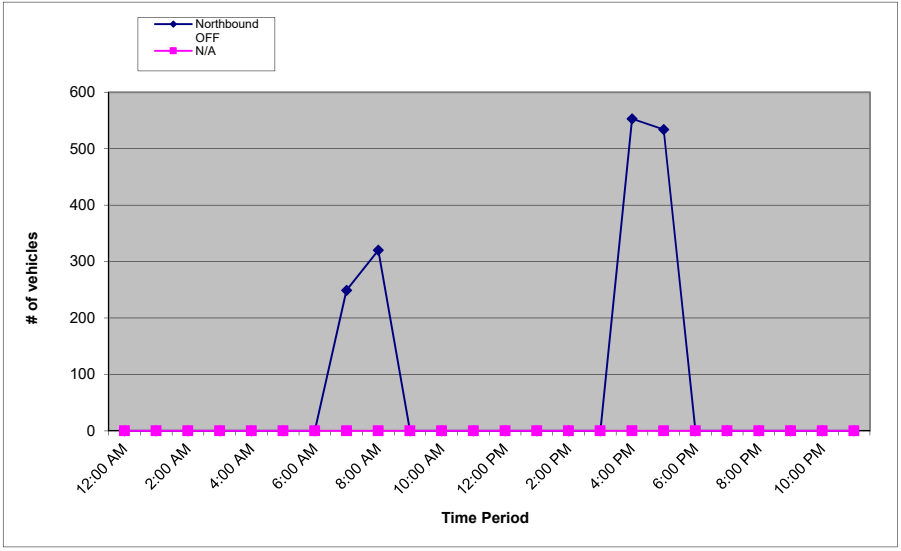
Peak Hour Volume

Prepared For: **Central Coast Trans. Consulting**
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION US 101 NB Offramp @ Paso Robles St
LATITUDE 35.6210237
COUNTY San Luis Obispo
LONGITUDE -120.6854367
COLLECTION DATE Thursday, June 7, 2018
WEATHER Clear
NUMBER OF LANES 1 OFF

	Northbound OFF					N/A					Hourly
Hour	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Totals
12:00 AM	-	-	-	-	0	-	-	-	-	0	0
1:00 AM	-	-	-	-	0	-	-	-	-	0	0
2:00 AM	-	-	-	-	0	-	-	-	-	0	0
3:00 AM	-	-	-	-	0	-	-	-	-	0	0
4:00 AM	-	-	-	-	0	-	-	-	-	0	0
5:00 AM	-	-	-	-	0	-	-	-	-	0	0
6:00 AM	-	-	-	-	0	-	-	-	-	0	0
7:00 AM	44	58	61	86	249	-	-	-	-	0	249
8:00 AM	86	81	70	83	320	-	-	-	-	0	320
9:00 AM	-	-	-	-	0	-	-	-	-	0	0
10:00 AM	-	-	-	-	0	-	-	-	-	0	0
11:00 AM	-	-	-	-	0	-	-	-	-	0	0
12:00 PM	-	-	-	-	0	-	-	-	-	0	0
1:00 PM	-	-	-	-	0	-	-	-	-	0	0
2:00 PM	-	-	-	-	0	-	-	-	-	0	0
3:00 PM	-	-	-	-	0	-	-	-	-	0	0
4:00 PM	133	147	137	136	553	-	-	-	-	0	553
5:00 PM	141	147	113	133	534	-	-	-	-	0	534
6:00 PM	-	-	-	-	0	-	-	-	-	0	0
7:00 PM	-	-	-	-	0	-	-	-	-	0	0
8:00 PM	-	-	-	-	0	-	-	-	-	0	0
9:00 PM	-	-	-	-	0	-	-	-	-	0	0
10:00 PM	-	-	-	-	0	-	-	-	-	0	0
11:00 PM	-	-	-	-	0	-	-	-	-	0	0
Total	100.0%				1656	0.0%				0	
	1656										

AM%	34.4%	AM Peak	323	7:45 am to 8:45 am	AM P.H.F.	0.94
PM%	65.6%	PM Peak	561	4:30 pm to 5:30 pm	PM P.H.F.	0.95



Reso A - Exhibit C2 (EIR Technical Appendix)

Location: US 101 NB Offramp @ Paso Robles St
Date: 6/7/2018

	NB OFF		NB ON			
Interval	**ALL Vehicles**	**Trucks**	**All Vehicles**	**Trucks**	**TOTAL**	**Truck %**
7:00 AM	44	0	-	-	**44**	**0%**
7:15 AM	58	2	-	-	**58**	**3%**
7:30 AM	61	0	-	-	**61**	**0%**
7:45 AM	86	1	-	-	**86**	**1%**
8:00 AM	86	3	-	-	**86**	**3%**
8:15 AM	81	1	-	-	**81**	**1%**
8:30 AM	70	2	-	-	**70**	**3%**
8:45 AM	83	0	-	-	**83**	**0%**
Totals:	**569**	**9**	**-**	**-**	**569**	**2%**

Peak Hour Values

7:45 AM - 8:45 AM	323	7	-	-	323	2%

	NB OFF		NB ON			
Interval	**ALL Vehicles**	**Trucks**	**All Vehicles**	**Trucks**	**TOTAL**	**Truck %**
4:00 PM	133	0	-	-	**133**	**0%**
4:15 PM	147	2	-	-	**147**	**1%**
4:30 PM	137	0	-	-	**137**	**0%**
4:45 PM	136	0	-	-	**136**	**0%**
5:00 PM	141	0	-	-	**141**	**0%**
5:15 PM	147	0	-	-	**147**	**0%**
5:30 PM	113	0	-	-	**113**	**0%**
5:45 PM	133	0	-	-	**133**	**0%**
Totals:	**1087**	**2**	**-**	**-**	**1087**	**0%**

Peak Hour Values

4:30 PM - 5:30 PM	561	0	-	-	561	0%

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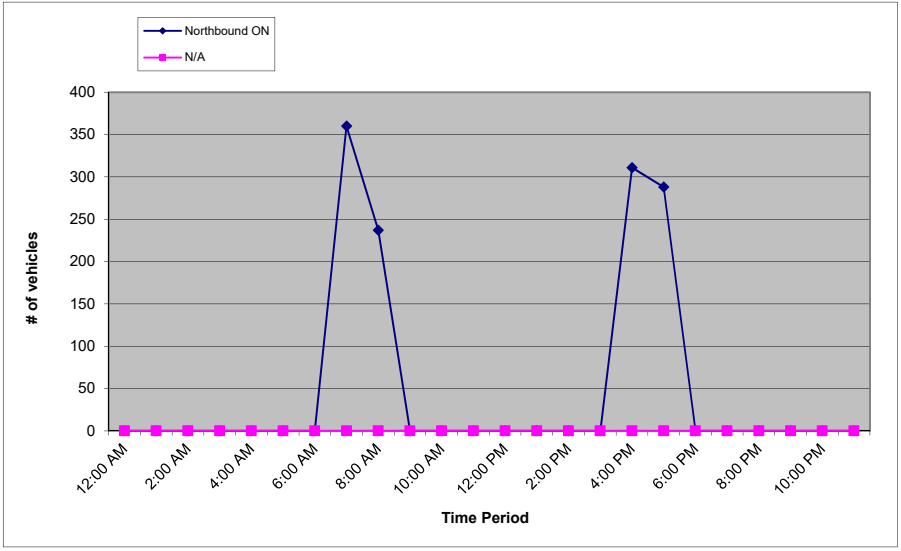
Peak Hour Volume

Prepared For: **Central Coast Trans. Consulting**
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION US 101 NB Onramp @ Paso Robles St
LATITUDE 35.6298427
COUNTY San Luis Obispo
LONGITUDE -120.6864345
COLLECTION DATE Wednesday, June 6, 2018
WEATHER Clear
NUMBER OF LANES 1 ON

	Northbound ON					N/A					Hourly
Hour	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Totals
12:00 AM	-	-	-	-	0	-	-	-	-	0	0
1:00 AM	-	-	-	-	0	-	-	-	-	0	0
2:00 AM	-	-	-	-	0	-	-	-	-	0	0
3:00 AM	-	-	-	-	0	-	-	-	-	0	0
4:00 AM	-	-	-	-	0	-	-	-	-	0	0
5:00 AM	-	-	-	-	0	-	-	-	-	0	0
6:00 AM	-	-	-	-	0	-	-	-	-	0	0
7:00 AM	59	64	102	135	360	-	-	-	-	0	360
8:00 AM	93	43	45	56	237	-	-	-	-	0	237
9:00 AM	-	-	-	-	0	-	-	-	-	0	0
10:00 AM	-	-	-	-	0	-	-	-	-	0	0
11:00 AM	-	-	-	-	0	-	-	-	-	0	0
12:00 PM	-	-	-	-	0	-	-	-	-	0	0
1:00 PM	-	-	-	-	0	-	-	-	-	0	0
2:00 PM	-	-	-	-	0	-	-	-	-	0	0
3:00 PM	-	-	-	-	0	-	-	-	-	0	0
4:00 PM	74	74	85	78	311	-	-	-	-	0	311
5:00 PM	84	79	74	51	288	-	-	-	-	0	288
6:00 PM	-	-	-	-	0	-	-	-	-	0	0
7:00 PM	-	-	-	-	0	-	-	-	-	0	0
8:00 PM	-	-	-	-	0	-	-	-	-	0	0
9:00 PM	-	-	-	-	0	-	-	-	-	0	0
10:00 PM	-	-	-	-	0	-	-	-	-	0	0
11:00 PM	-	-	-	-	0	-	-	-	-	0	0
Total	100.0%				1196	0.0%				0	
	1196										

AM%	49.9%	AM Peak	394	7:15 am to 8:15 am	AM P.H.F.	0.73
PM%	50.1%	PM Peak	326	4:30 pm to 5:30 pm	PM P.H.F.	0.96



Reso A - Exhibit C2 (EIR Technical Appendix)

Location: US 101 NB Onramp @ Paso Robles St
Date: 6/6/2018

	NB OFF		NB ON			
Interval	**ALL Vehicles**	**Trucks**	**All Vehicles**	**Trucks**	**TOTAL**	**Truck %**
7:00 AM	-	-	59	1	**59**	**2%**
7:15 AM	-	-	64	3	**64**	**5%**
7:30 AM	-	-	102	3	**102**	**3%**
7:45 AM	-	-	135	3	**135**	**2%**
8:00 AM	-	-	93	0	**93**	**0%**
8:15 AM	-	-	43	1	**43**	**2%**
8:30 AM	-	-	45	2	**45**	**4%**
8:45 AM	-	-	56	2	**56**	**4%**
Totals:	**-**	**-**	**597**	**15**	**597**	**3%**

Peak Hour Values

7:15 AM - 8:15 AM	-	-	394	9	394	2%

	NB OFF		NB ON			
Interval	**ALL Vehicles**	**Trucks**	**All Vehicles**	**Trucks**	**TOTAL**	**Truck %**
4:00 PM	-	-	74	2	**74**	**3%**
4:15 PM	-	-	74	1	**74**	**1%**
4:30 PM	-	-	85	0	**85**	**0%**
4:45 PM	-	-	78	2	**78**	**3%**
5:00 PM	-	-	84	2	**84**	**2%**
5:15 PM	-	-	79	0	**79**	**0%**
5:30 PM	-	-	74	0	**74**	**0%**
5:45 PM	-	-	51	2	**51**	**4%**
Totals:	**-**	**-**	**599**	**9**	**599**	**2%**

Peak Hour Values

4:30 PM - 5:30 PM	-	-	326	4	326	1%

Reso A - Exhibit C2 (EIR Technical Appendix)

Segment Counts

Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

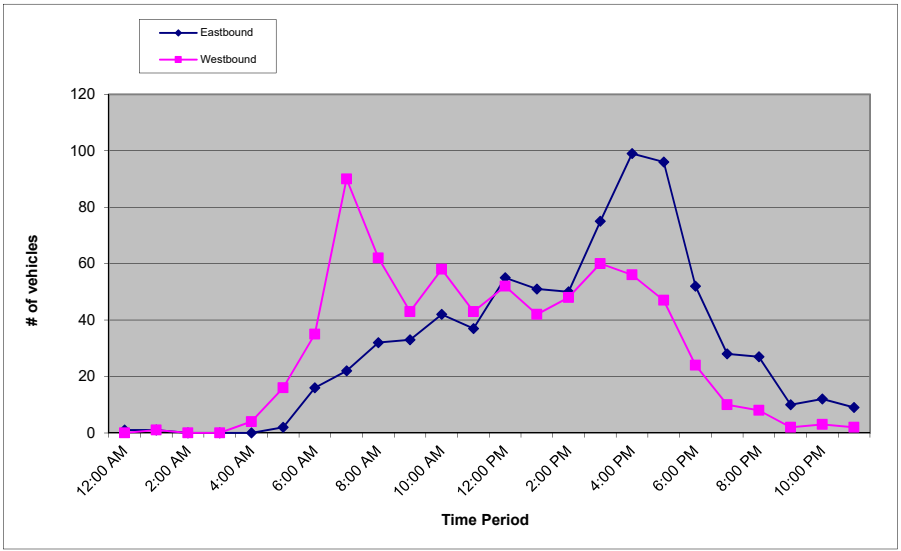
24 Hour Count Report

Prepared For: **Central Coast Transportation Consulting**
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION Union Rd - Priska Dr to Kit Fox Ln
LATITUDE 35.6383294
COUNTY San Luis Obispo
LONGITUDE -120.6396774
COLLECTION DATE Wednesday, January 23, 2019
WEATHER Clear
NUMBER OF LANES 2

	Eastbound					Westbound					Hourly
Hour	1st	2nd	3rd	4th	**Total**	1st	2nd	3rd	4th	**Total**	**Totals**
12:00 AM	0	0	1	0	**1**	0	0	0	0	**0**	**1**
1:00 AM	1	0	0	0	**1**	1	0	0	0	**1**	**2**
2:00 AM	0	0	0	0	**0**	0	0	0	0	**0**	**0**
3:00 AM	0	0	0	0	**0**	0	0	0	0	**0**	**0**
4:00 AM	0	0	0	0	**0**	0	0	2	2	**4**	**4**
5:00 AM	0	0	0	2	**2**	2	3	5	6	**16**	**18**
6:00 AM	0	2	10	4	**16**	5	5	9	16	**35**	**51**
7:00 AM	2	8	6	6	**22**	13	28	31	18	**90**	**112**
8:00 AM	6	8	12	6	**32**	23	16	11	12	**62**	**94**
9:00 AM	8	8	9	8	**33**	13	8	9	13	**43**	**76**
10:00 AM	7	14	12	9	**42**	9	17	16	16	**58**	**100**
11:00 AM	8	10	7	12	**37**	13	15	12	3	**43**	**80**
12:00 PM	13	13	14	15	**55**	10	11	12	19	**52**	**107**
1:00 PM	14	16	11	10	**51**	12	10	10	10	**42**	**93**
2:00 PM	6	16	15	13	**50**	13	15	10	10	**48**	**98**
3:00 PM	17	23	17	18	**75**	9	15	16	20	**60**	**135**
4:00 PM	23	23	21	32	**99**	14	14	9	19	**56**	**155**
5:00 PM	25	26	22	23	**96**	9	12	12	14	**47**	**143**
6:00 PM	13	15	11	13	**52**	3	7	8	6	**24**	**76**
7:00 PM	12	6	6	4	**28**	3	3	4	0	**10**	**38**
8:00 PM	7	14	1	5	**27**	1	1	4	2	**8**	**35**
9:00 PM	3	4	1	2	**10**	0	0	2	0	**2**	**12**
10:00 PM	4	3	3	2	**12**	2	1	0	0	**3**	**15**
11:00 PM	2	3	1	3	**9**	1	1	0	0	**2**	**11**
Total	**51.5%**				**750**	**48.5%**				**706**	
	1456										

AM%	**37.0%**	**AM Peak**	**126**	**7:15 am to 8:15 am**	**AM P.H.F.**	**0.85**
PM%	**63.0%**	**PM Peak**	**157**	**4:45 pm to 5:45 pm**	**PM P.H.F.**	**0.77**



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

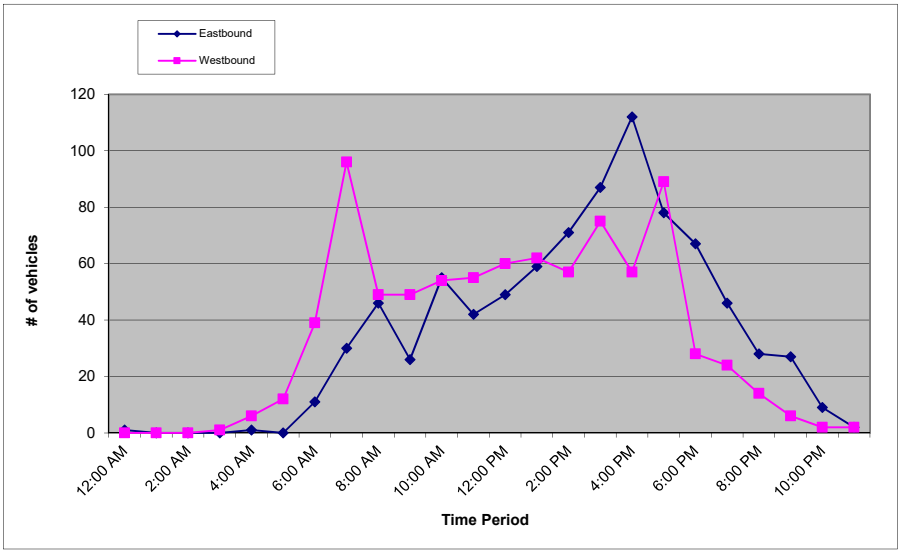
24 Hour Count Report

Prepared For: **Central Coast Transportation Consulting**
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION Union Rd - Priska Dr to Kit Fox Ln
LATITUDE 35.6383294
COUNTY San Luis Obispo
LONGITUDE -120.6396774
COLLECTION DATE Thursday, January 24, 2019
WEATHER Clear
NUMBER OF LANES 2

	Eastbound					Westbound					Hourly
Hour	1st	2nd	3rd	4th	**Total**	1st	2nd	3rd	4th	**Total**	**Totals**
12:00 AM	0	0	0	1	**1**	0	0	0	0	**0**	**1**
1:00 AM	0	0	0	0	**0**	0	0	0	0	**0**	**0**
2:00 AM	0	0	0	0	**0**	0	0	0	0	**0**	**0**
3:00 AM	0	0	0	0	**0**	1	0	0	0	**1**	**1**
4:00 AM	0	0	1	0	**1**	0	3	1	2	**6**	**7**
5:00 AM	0	0	0	0	**0**	2	1	1	8	**12**	**12**
6:00 AM	0	3	5	3	**11**	10	4	14	11	**39**	**50**
7:00 AM	9	2	7	12	**30**	21	18	41	16	**96**	**126**
8:00 AM	15	14	9	8	**46**	13	17	8	11	**49**	**95**
9:00 AM	6	8	7	5	**26**	6	14	10	19	**49**	**75**
10:00 AM	11	9	19	16	**55**	10	22	9	13	**54**	**109**
11:00 AM	10	5	16	11	**42**	16	10	14	15	**55**	**97**
12:00 PM	10	13	17	9	**49**	10	18	20	12	**60**	**109**
1:00 PM	18	16	8	17	**59**	14	18	14	16	**62**	**121**
2:00 PM	17	25	19	10	**71**	13	13	12	19	**57**	**128**
3:00 PM	24	16	30	17	**87**	22	17	19	17	**75**	**162**
4:00 PM	32	24	31	25	**112**	12	15	15	15	**57**	**169**
5:00 PM	23	19	18	18	**78**	21	23	23	22	**89**	**167**
6:00 PM	25	12	17	13	**67**	5	9	5	9	**28**	**95**
7:00 PM	15	12	10	9	**46**	6	3	6	9	**24**	**70**
8:00 PM	8	5	9	6	**28**	4	4	6	0	**14**	**42**
9:00 PM	8	10	6	3	**27**	1	1	3	1	**6**	**33**
10:00 PM	2	2	2	3	**9**	0	1	1	0	**2**	**11**
11:00 PM	0	1	1	0	**2**	1	0	0	1	**2**	**4**
Total	**50.3%**				**847**	**49.7%**				**837**	
	1684										

AM%	**34.0%**	**AM Peak**	**135**	**7:30 am to 8:30 am**	**AM P.H.F.**	**0.70**
PM%	**66.0%**	**PM Peak**	**172**	**4:30 pm to 5:30 pm**	**PM P.H.F.**	**0.93**



Metro Traffic Data Inc.
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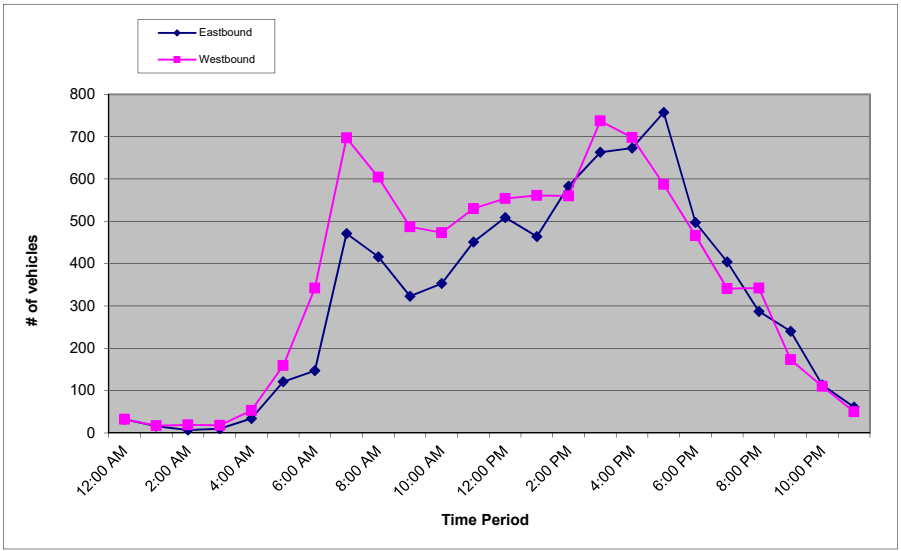
24 Hour Count Report

Prepared For: **Central Coast Transportation Consulting**
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION Creston Rd e/o Ferro Ln
LATITUDE 35.6289445
COUNTY San Luis Obispo
LONGITUDE -120.6777817
COLLECTION DATE Tuesday, June 5, 2018
WEATHER Clear
NUMBER OF LANES 2

	Eastbound					Westbound					Hourly
Hour	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Totals
12:00 AM	9	10	5	8	32	15	7	3	7	32	64
1:00 AM	2	6	5	3	16	4	5	5	3	17	33
2:00 AM	1	1	3	2	7	4	6	6	3	19	26
3:00 AM	0	2	4	4	10	3	3	2	10	18	28
4:00 AM	3	7	7	17	34	6	10	16	21	53	87
5:00 AM	17	16	30	58	121	23	38	40	58	159	280
6:00 AM	21	34	36	56	147	59	79	91	113	342	489
7:00 AM	47	91	157	176	471	99	132	204	262	697	1168
8:00 AM	144	102	84	86	416	201	147	106	150	604	1020
9:00 AM	65	88	88	82	323	118	116	114	139	487	810
10:00 AM	84	76	74	119	353	127	117	106	123	473	826
11:00 AM	112	102	111	126	451	133	122	143	132	530	981
12:00 PM	133	139	109	128	509	164	139	122	129	554	1063
1:00 PM	130	105	119	110	464	143	127	132	159	561	1025
2:00 PM	107	131	144	201	583	135	132	140	153	560	1143
3:00 PM	146	190	152	175	663	187	210	176	164	737	1400
4:00 PM	172	152	158	191	673	183	183	165	167	698	1371
5:00 PM	184	213	214	146	757	162	153	136	136	587	1344
6:00 PM	125	131	119	122	497	132	117	115	102	466	963
7:00 PM	129	88	95	92	404	89	82	73	97	341	745
8:00 PM	82	54	74	77	287	98	96	82	66	342	629
9:00 PM	76	50	55	59	240	48	51	40	34	173	413
10:00 PM	40	33	19	21	113	33	31	24	22	110	223
11:00 PM	18	23	9	11	61	21	11	10	8	50	111
Total	47.0%				7632	53.0%				8610	
	16242										

AM%	35.8%	AM Peak	1393	7:30 am to 8:30 am	AM P.H.F.	0.80
PM%	64.2%	PM Peak	1422	3:15 pm to 4:15 pm	PM P.H.F.	0.89



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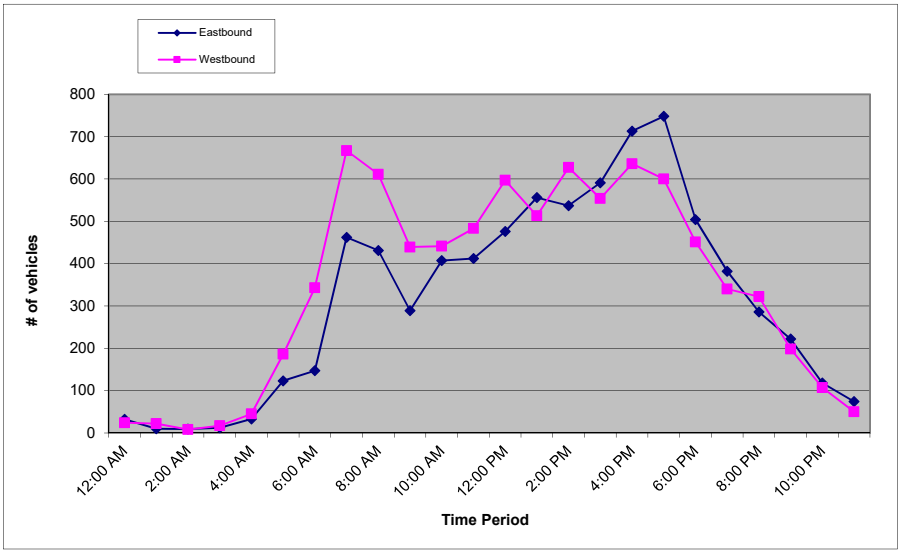
24 Hour Count Report

Prepared For: **Central Coast Transportation Consulting**
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION Creston Rd e/o Ferro Ln
LATITUDE 35.6289445
COUNTY San Luis Obispo
LONGITUDE -120.6777817
COLLECTION DATE Wednesday, June 6, 2018
WEATHER Clear
NUMBER OF LANES 2

	Eastbound					Westbound					Hourly
Hour	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Totals
12:00 AM	9	15	7	1	32	10	7	3	4	24	56
1:00 AM	6	3	0	1	10	5	5	8	4	22	32
2:00 AM	3	2	3	1	9	2	2	1	3	8	17
3:00 AM	4	1	1	6	12	1	5	3	8	17	29
4:00 AM	2	5	12	14	33	5	7	12	21	45	78
5:00 AM	10	20	31	62	123	30	47	44	65	186	309
6:00 AM	20	35	48	44	147	60	63	106	114	343	490
7:00 AM	52	83	154	173	462	99	130	189	249	667	1129
8:00 AM	145	139	67	80	431	194	139	136	142	611	1042
9:00 AM	70	69	74	76	289	127	111	100	101	439	728
10:00 AM	99	100	100	108	407	111	112	102	116	441	848
11:00 AM	77	102	103	130	412	110	103	115	155	483	895
12:00 PM	156	107	103	110	476	161	183	145	108	597	1073
1:00 PM	109	120	128	199	556	118	157	105	133	513	1069
2:00 PM	147	138	122	130	537	174	161	151	141	627	1164
3:00 PM	143	142	158	148	591	151	142	138	123	554	1145
4:00 PM	153	197	175	188	713	118	160	182	176	636	1349
5:00 PM	193	221	183	151	748	161	147	153	139	600	1348
6:00 PM	140	139	104	121	504	137	108	105	101	451	955
7:00 PM	120	99	90	73	382	86	96	79	79	340	722
8:00 PM	74	76	75	61	286	83	72	81	86	322	608
9:00 PM	67	55	57	43	222	71	62	41	24	198	420
10:00 PM	42	28	29	19	118	35	22	23	27	107	225
11:00 PM	26	9	19	20	74	19	13	10	8	50	124
Total	47.8%				7574	52.2%				8281	
	15855										

AM%	35.7%	AM Peak	1382	7:30 am to 8:30 am	AM P.H.F.	0.82
PM%	64.3%	PM Peak	1443	4:30 pm to 5:30 pm	PM P.H.F.	0.98



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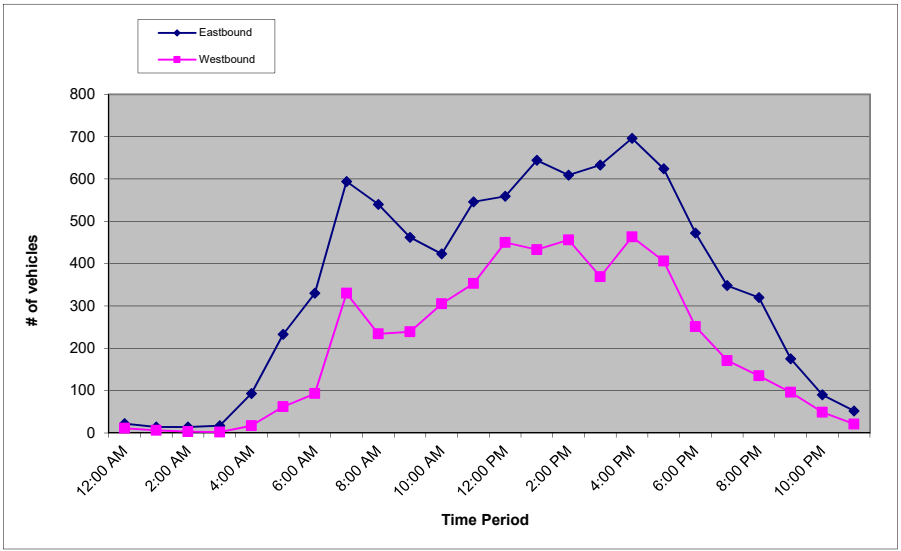
24 Hour Count Report

Prepared For: **Central Coast Transportation Consulting**
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION Creston Rd e/o Golden Hill Rd
LATITUDE 35.6218359
COUNTY San Luis Obispo
LONGITUDE -120.6593804
COLLECTION DATE Wednesday, June 6, 2018
WEATHER Clear
NUMBER OF LANES 4

	Eastbound					Westbound					Hourly
Hour	1st	2nd	3rd	4th	**Total**	1st	2nd	3rd	4th	**Total**	**Totals**
12:00 AM	9	6	3	4	**22**	1	3	5	2	**11**	**33**
1:00 AM	3	4	4	3	**14**	1	1	2	2	**6**	**20**
2:00 AM	0	3	6	5	**14**	0	1	2	0	**3**	**17**
3:00 AM	1	4	5	7	**17**	0	0	1	1	**2**	**19**
4:00 AM	15	15	26	37	**93**	1	3	6	7	**17**	**110**
5:00 AM	36	58	75	64	**233**	8	7	21	26	**62**	**295**
6:00 AM	60	76	98	96	**330**	15	13	32	33	**93**	**423**
7:00 AM	110	115	166	203	**594**	41	67	105	117	**330**	**924**
8:00 AM	170	135	106	129	**540**	89	68	35	42	**234**	**774**
9:00 AM	120	110	124	108	**462**	55	68	55	61	**239**	**701**
10:00 AM	97	97	111	118	**423**	87	72	83	63	**305**	**728**
11:00 AM	125	120	144	157	**546**	80	87	92	94	**353**	**899**
12:00 PM	133	155	137	134	**559**	112	123	109	106	**450**	**1009**
1:00 PM	144	143	170	187	**644**	103	123	87	120	**433**	**1077**
2:00 PM	177	123	171	138	**609**	118	149	102	87	**456**	**1065**
3:00 PM	171	152	177	133	**633**	75	89	105	100	**369**	**1002**
4:00 PM	162	166	197	171	**696**	98	117	111	137	**463**	**1159**
5:00 PM	168	183	138	135	**624**	125	123	88	70	**406**	**1030**
6:00 PM	141	122	100	109	**472**	84	65	49	53	**251**	**723**
7:00 PM	102	95	65	86	**348**	60	38	38	35	**171**	**519**
8:00 PM	84	81	77	78	**320**	35	16	47	37	**135**	**455**
9:00 PM	64	42	39	30	**175**	30	24	24	18	**96**	**271**
10:00 PM	30	21	27	12	**90**	14	13	14	8	**49**	**139**
11:00 PM	20	15	12	5	**52**	4	6	5	6	**21**	**73**
Total	**63.2%**				**8510**	**36.8%**				**4955**	
	13465										

AM% 36.7% **AM Peak** 1053 **7:30 am to 8:30 am** **AM P.H.F.** 0.82
PM% 63.3% **PM Peak** 1215 **4:30 pm to 5:30 pm** **PM P.H.F.** 0.99



Metro Traffic Data Inc.
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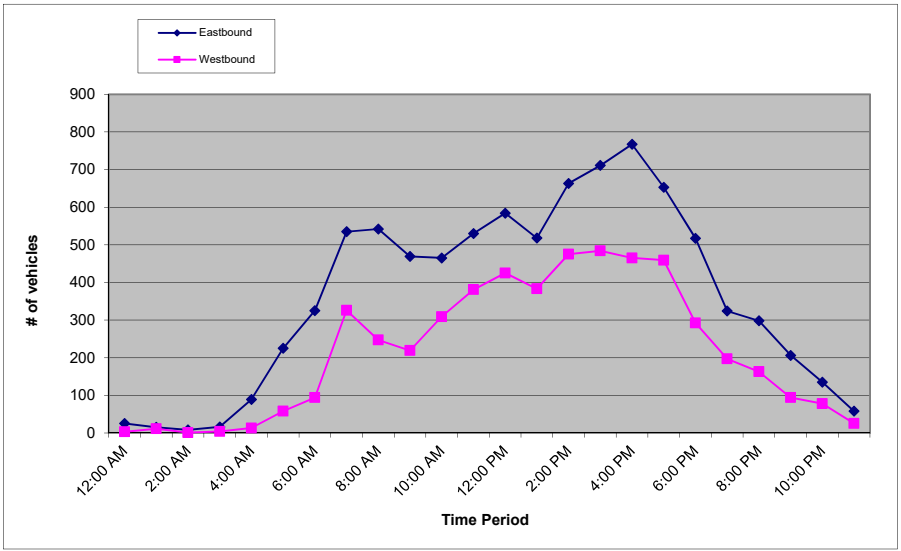
24 Hour Count Report

Prepared For: **Central Coast Transportation Consulting**
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION Creston Rd e/o Golden Hill Rd
LATITUDE 35.6218359
COUNTY San Luis Obispo
LONGITUDE -120.6593804
COLLECTION DATE Thursday, June 7, 2018
WEATHER Clear
NUMBER OF LANES 4

	Eastbound					Westbound					Hourly
Hour	1st	2nd	3rd	4th	**Total**	1st	2nd	3rd	4th	**Total**	**Totals**
12:00 AM	7	9	2	7	**25**	0	2	1	0	**3**	**28**
1:00 AM	9	0	0	6	**15**	3	6	0	2	**11**	**26**
2:00 AM	0	3	3	2	**8**	1	0	0	0	**1**	**9**
3:00 AM	2	2	6	6	**16**	1	1	0	2	**4**	**20**
4:00 AM	18	14	25	32	**89**	3	0	3	7	**13**	**102**
5:00 AM	33	55	60	77	**225**	5	9	14	30	**58**	**283**
6:00 AM	60	75	86	104	**325**	16	16	24	38	**94**	**419**
7:00 AM	97	104	143	191	**535**	38	63	103	122	**326**	**861**
8:00 AM	185	125	101	131	**542**	90	57	43	57	**247**	**789**
9:00 AM	133	104	113	119	**469**	57	61	46	55	**219**	**688**
10:00 AM	104	118	108	135	**465**	71	72	80	86	**309**	**774**
11:00 AM	102	134	144	150	**530**	88	97	89	107	**381**	**911**
12:00 PM	126	166	131	161	**584**	124	94	115	92	**425**	**1009**
1:00 PM	128	129	119	142	**518**	89	90	94	110	**383**	**901**
2:00 PM	129	141	195	198	**663**	103	112	123	137	**475**	**1138**
3:00 PM	183	166	187	175	**711**	134	117	113	120	**484**	**1195**
4:00 PM	184	214	207	162	**767**	121	108	110	126	**465**	**1232**
5:00 PM	180	168	153	152	**653**	127	126	105	101	**459**	**1112**
6:00 PM	129	139	132	117	**517**	84	80	70	58	**292**	**809**
7:00 PM	100	78	79	67	**324**	60	41	47	49	**197**	**521**
8:00 PM	75	75	72	76	**298**	45	50	41	27	**163**	**461**
9:00 PM	54	53	45	54	**206**	31	31	16	16	**94**	**300**
10:00 PM	47	33	33	22	**135**	30	16	18	14	**78**	**213**
11:00 PM	23	9	13	13	**58**	10	8	3	4	**25**	**83**
Total	**62.5%**				**8678**	**37.5%**				**5206**	
	13884										

AM%	**35.4%**	**AM Peak**	**911**	**11:00 am to 12:00 pm**	**AM P.H.F.**	**0.89**
PM%	**64.6%**	**PM Peak**	**1239**	**3:45 pm to 4:45 pm**	**PM P.H.F.**	**0.96**



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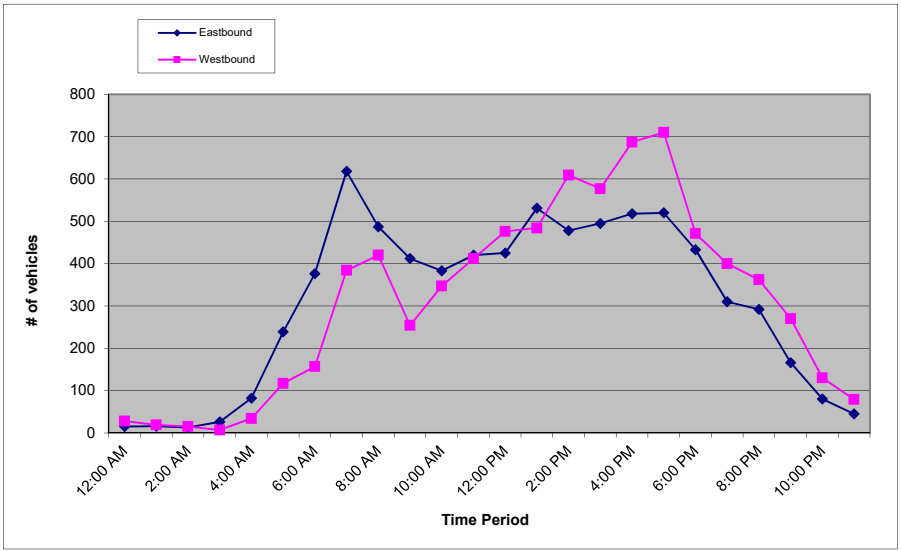
24 Hour Count Report

Prepared For: **Central Coast Transportation Consulting**
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION Creston Rd s/o Niblick Rd
LATITUDE 35.6146144
COUNTY San Luis Obispo
LONGITUDE -120.6590371
COLLECTION DATE Wednesday, June 6, 2018
WEATHER Clear
NUMBER OF LANES 4

	Eastbound					Westbound					Hourly
Hour	1st	2nd	3rd	4th	**Total**	1st	2nd	3rd	4th	**Total**	**Totals**
12:00 AM	6	5	2	2	**15**	9	6	7	6	**28**	**43**
1:00 AM	4	5	4	3	**16**	3	6	7	3	**19**	**35**
2:00 AM	4	1	4	4	**13**	7	2	4	2	**15**	**28**
3:00 AM	2	8	6	10	**26**	3	2	0	2	**7**	**33**
4:00 AM	10	13	22	37	**82**	3	6	16	9	**34**	**116**
5:00 AM	41	56	71	71	**239**	16	19	47	35	**117**	**356**
6:00 AM	63	87	112	114	**376**	37	27	43	50	**157**	**533**
7:00 AM	111	160	155	192	**618**	53	70	89	172	**384**	**1002**
8:00 AM	168	111	94	114	**487**	161	115	66	78	**420**	**907**
9:00 AM	105	104	104	99	**412**	53	78	52	71	**254**	**666**
10:00 AM	99	83	103	98	**383**	77	91	89	90	**347**	**730**
11:00 AM	98	109	104	109	**420**	97	94	124	97	**412**	**832**
12:00 PM	113	104	100	108	**425**	109	132	110	125	**476**	**901**
1:00 PM	101	107	165	158	**531**	110	123	125	126	**484**	**1015**
2:00 PM	135	95	136	112	**478**	158	191	128	132	**609**	**1087**
3:00 PM	140	123	116	116	**495**	146	116	156	159	**577**	**1072**
4:00 PM	105	121	169	123	**518**	158	155	192	182	**687**	**1205**
5:00 PM	134	145	128	113	**520**	193	177	184	156	**710**	**1230**
6:00 PM	126	102	107	98	**433**	156	103	107	105	**471**	**904**
7:00 PM	86	79	76	69	**310**	103	105	97	95	**400**	**710**
8:00 PM	86	73	67	66	**292**	77	71	115	99	**362**	**654**
9:00 PM	61	47	31	27	**166**	86	63	59	62	**270**	**436**
10:00 PM	29	23	17	11	**80**	43	38	28	21	**130**	**210**
11:00 PM	16	15	6	8	**45**	21	19	25	14	**79**	**124**
Total	**49.8%**				**7380**	**50.2%**				**7449**	
	14829										

AM%	**35.6%**	**AM Peak**	**1167**	**7:15 am to 8:15 am**	**AM P.H.F.**	**0.80**
PM%	**64.4%**	**PM Peak**	**1315**	**4:30 pm to 5:30 pm**	**PM P.H.F.**	**0.91**



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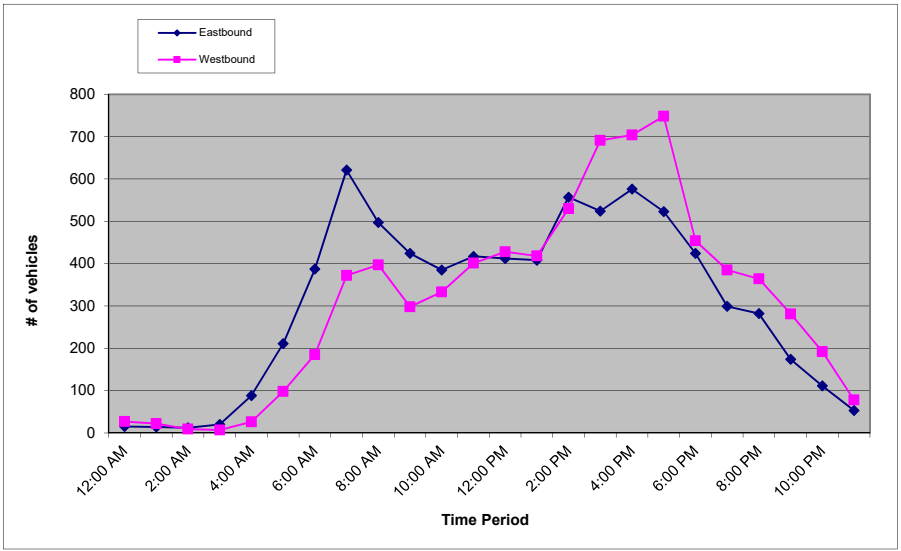
24 Hour Count Report

Prepared For: **Central Coast Transportation Consulting**
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION Creston Rd s/o Niblick Rd
LATITUDE 35.6146144
COUNTY San Luis Obispo
LONGITUDE -120.6590371
COLLECTION DATE Thursday, June 7, 2018
WEATHER Clear
NUMBER OF LANES 4

	Eastbound					Westbound					Hourly
Hour	1st	2nd	3rd	4th	**Total**	1st	2nd	3rd	4th	**Total**	**Totals**
12:00 AM	5	3	1	6	**15**	6	7	6	8	**27**	**42**
1:00 AM	6	3	2	3	**14**	3	10	4	5	**22**	**36**
2:00 AM	3	4	2	3	**12**	3	4	0	2	**9**	**21**
3:00 AM	3	5	6	6	**20**	3	1	1	2	**7**	**27**
4:00 AM	12	16	21	39	**88**	3	3	5	15	**26**	**114**
5:00 AM	26	58	64	63	**211**	16	19	32	31	**98**	**309**
6:00 AM	65	98	106	118	**387**	35	37	54	59	**185**	**572**
7:00 AM	112	151	182	176	**621**	48	58	114	152	**372**	**993**
8:00 AM	169	126	93	109	**497**	142	105	71	79	**397**	**894**
9:00 AM	116	92	119	97	**424**	81	64	79	74	**298**	**722**
10:00 AM	92	95	108	90	**385**	68	73	96	96	**333**	**718**
11:00 AM	97	99	99	122	**417**	90	93	92	126	**401**	**818**
12:00 PM	99	99	103	111	**412**	114	102	120	92	**428**	**840**
1:00 PM	101	102	104	101	**408**	110	96	97	115	**418**	**826**
2:00 PM	107	131	151	168	**557**	123	110	152	145	**530**	**1087**
3:00 PM	134	130	130	130	**524**	187	184	163	157	**691**	**1215**
4:00 PM	132	159	164	121	**576**	186	161	171	186	**704**	**1280**
5:00 PM	137	135	122	129	**523**	184	189	198	177	**748**	**1271**
6:00 PM	96	127	118	83	**424**	130	107	106	111	**454**	**878**
7:00 PM	95	64	78	62	**299**	94	86	100	105	**385**	**684**
8:00 PM	75	72	70	65	**282**	89	102	100	73	**364**	**646**
9:00 PM	43	43	44	44	**174**	81	78	67	55	**281**	**455**
10:00 PM	45	28	26	12	**111**	55	45	56	36	**192**	**303**
11:00 PM	17	10	14	12	**53**	33	27	10	8	**78**	**131**
Total	**50.0%**				**7434**	**50.0%**				**7448**	
	14882										

AM%	**35.4%**	**AM Peak**	**1166**	**7:30 am to 8:30 am**	**AM P.H.F.**	**0.89**
PM%	**64.6%**	**PM Peak**	**1287**	**4:30 pm to 5:30 pm**	**PM P.H.F.**	**0.96**



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

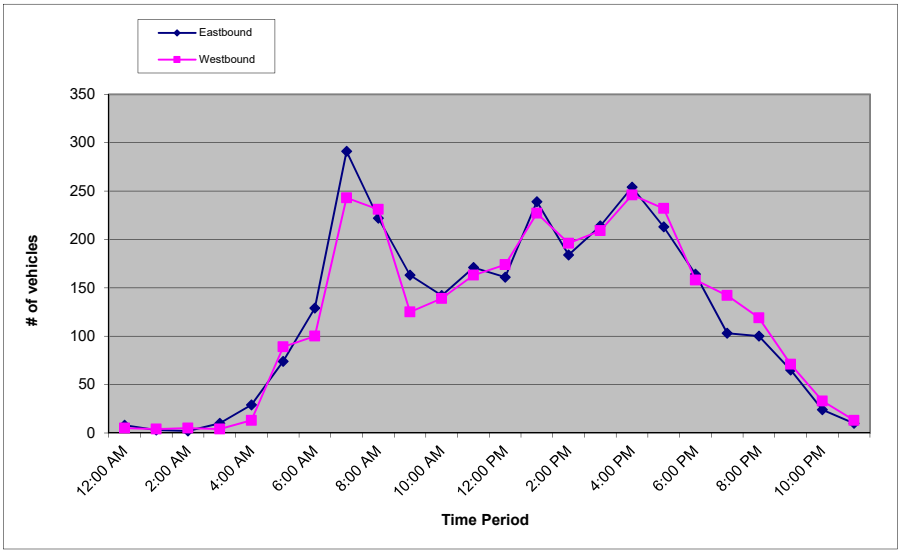
24 Hour Count Report

Prepared For: **Central Coast Transportation Consulting**
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION Creston Rd n/o Meadowlark
LATITUDE 35.6031866
COUNTY San Luis Obispo
LONGITUDE -120.6589848
COLLECTION DATE Wednesday, June 6, 2018
WEATHER Clear
NUMBER OF LANES 2

	Eastbound					Westbound					Hourly
Hour	1st	2nd	3rd	4th	**Total**	1st	2nd	3rd	4th	**Total**	**Totals**
12:00 AM	4	3	1	0	**8**	2	1	2	0	**5**	**13**
1:00 AM	0	2	1	0	**3**	2	2	0	0	**4**	**7**
2:00 AM	1	0	1	0	**2**	2	0	1	2	**5**	**7**
3:00 AM	0	3	4	3	**10**	1	1	0	2	**4**	**14**
4:00 AM	3	5	8	13	**29**	1	2	6	4	**13**	**42**
5:00 AM	14	18	17	25	**74**	13	13	44	19	**89**	**163**
6:00 AM	22	32	39	36	**129**	26	14	30	30	**100**	**229**
7:00 AM	50	61	92	88	**291**	29	38	74	102	**243**	**534**
8:00 AM	83	49	46	44	**222**	98	59	38	36	**231**	**453**
9:00 AM	52	36	40	35	**163**	30	32	30	33	**125**	**288**
10:00 AM	28	27	48	39	**142**	37	36	31	35	**139**	**281**
11:00 AM	44	41	42	44	**171**	33	38	42	50	**163**	**334**
12:00 PM	50	34	38	39	**161**	39	47	41	47	**174**	**335**
1:00 PM	34	45	94	66	**239**	54	69	59	45	**227**	**466**
2:00 PM	51	32	46	55	**184**	58	57	43	38	**196**	**380**
3:00 PM	57	53	50	54	**214**	43	56	59	51	**209**	**423**
4:00 PM	50	65	83	56	**254**	56	58	63	69	**246**	**500**
5:00 PM	52	63	52	46	**213**	62	50	57	63	**232**	**445**
6:00 PM	51	47	34	32	**164**	54	38	30	36	**158**	**322**
7:00 PM	26	26	23	28	**103**	38	34	31	39	**142**	**245**
8:00 PM	26	24	27	23	**100**	27	17	41	34	**119**	**219**
9:00 PM	23	20	10	12	**65**	24	21	16	10	**71**	**136**
10:00 PM	8	5	9	2	**24**	11	4	10	8	**33**	**57**
11:00 PM	1	5	0	4	**10**	0	3	8	2	**13**	**23**
Total	**50.3%**				**2975**	**49.7%**				**2941**	
	5916										

AM%	**40.0%**	**AM Peak**	**645**	**7:30 am to 8:30 am**	**AM P.H.F.**	**0.85**
PM%	**60.0%**	**PM Peak**	**508**	**4:15 pm to 5:15 pm**	**PM P.H.F.**	**0.87**



Metro Traffic Data Inc.
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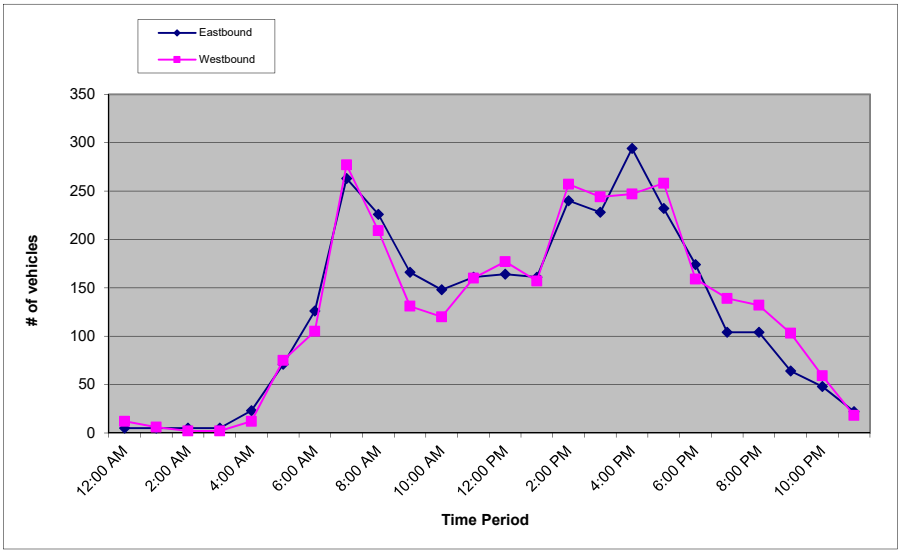
24 Hour Count Report

Prepared For: **Central Coast Transportation Consulting**
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION Creston Rd n/o Meadowlark
LATITUDE 35.6031866
COUNTY San Luis Obispo
LONGITUDE -120.6589848
COLLECTION DATE Thursday, June 7, 2018
WEATHER Clear
NUMBER OF LANES 2

	Eastbound					Westbound					Hourly
Hour	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	Totals
12:00 AM	1	0	3	1	**5**	5	2	2	3	**12**	**17**
1:00 AM	2	0	2	1	**5**	1	3	2	0	**6**	**11**
2:00 AM	1	1	0	3	**5**	0	0	0	2	**2**	**7**
3:00 AM	0	2	1	2	**5**	1	1	0	0	**2**	**7**
4:00 AM	6	3	5	9	**23**	3	1	1	7	**12**	**35**
5:00 AM	11	22	16	22	**71**	11	11	29	24	**75**	**146**
6:00 AM	19	30	36	41	**126**	21	24	24	36	**105**	**231**
7:00 AM	41	58	87	77	**263**	33	54	79	111	**277**	**540**
8:00 AM	83	64	31	48	**226**	82	54	36	37	**209**	**435**
9:00 AM	44	47	42	33	**166**	36	23	33	39	**131**	**297**
10:00 AM	40	33	46	29	**148**	21	34	41	24	**120**	**268**
11:00 AM	33	38	47	43	**161**	33	39	37	51	**160**	**321**
12:00 PM	50	36	41	37	**164**	45	29	54	49	**177**	**341**
1:00 PM	44	34	39	44	**161**	49	36	28	44	**157**	**318**
2:00 PM	46	37	91	66	**240**	51	59	85	62	**257**	**497**
3:00 PM	67	44	55	62	**228**	62	57	64	61	**244**	**472**
4:00 PM	87	67	83	57	**294**	60	47	61	79	**247**	**541**
5:00 PM	63	61	58	50	**232**	66	77	64	51	**258**	**490**
6:00 PM	39	47	50	38	**174**	44	44	29	42	**159**	**333**
7:00 PM	26	24	33	21	**104**	39	24	42	34	**139**	**243**
8:00 PM	33	19	25	27	**104**	29	39	36	28	**132**	**236**
9:00 PM	17	16	14	17	**64**	27	27	31	18	**103**	**167**
10:00 PM	17	12	12	7	**48**	26	12	11	10	**59**	**107**
11:00 PM	4	5	8	5	**22**	9	6	1	2	**18**	**40**
Total	**49.8%**				**3039**	**50.2%**				**3061**	
	6100										

AM%	**38.0%**	**AM Peak**	**637**	**7:30 am to 8:30 am**	**AM P.H.F.**	**0.85**
PM%	**62.0%**	**PM Peak**	**547**	**4:30 pm to 5:30 pm**	**PM P.H.F.**	**0.95**



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24 Hour Count Report

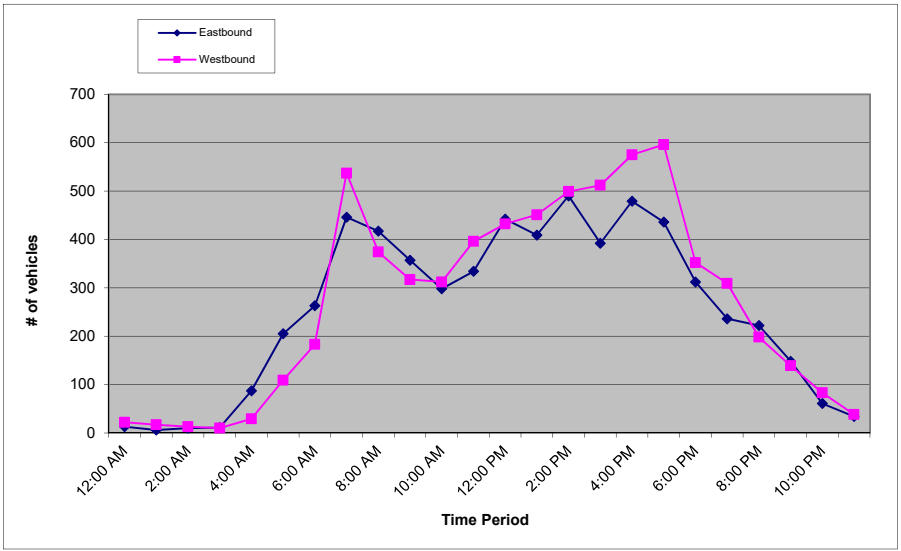
Prepared For: **Central Coast Transportation Consulting**
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION Golden Hill Rd s/o Union Rd
COUNTY San Luis Obispo
COLLECTION DATE Wednesday, June 6, 2018
NUMBER OF LANES 3

LATITUDE 35.6388503
LONGITUDE -120.6581385
WEATHER Clear

	Eastbound					Westbound					Hourly
Hour	1st	2nd	3rd	4th	**Total**	1st	2nd	3rd	4th	**Total**	**Totals**
12:00 AM	6	4	2	1	**13**	5	4	8	5	**22**	**35**
1:00 AM	1	1	3	1	**6**	2	2	9	4	**17**	**23**
2:00 AM	0	2	3	5	**10**	6	4	1	2	**13**	**23**
3:00 AM	2	2	3	4	**11**	3	1	3	3	**10**	**21**
4:00 AM	14	11	27	35	**87**	3	3	16	7	**29**	**116**
5:00 AM	23	58	61	63	**205**	16	20	34	39	**109**	**314**
6:00 AM	52	50	62	99	**263**	35	32	53	63	**183**	**446**
7:00 AM	70	96	113	167	**446**	72	117	164	184	**537**	**983**
8:00 AM	169	111	56	81	**417**	130	117	69	58	**374**	**791**
9:00 AM	91	91	77	98	**357**	64	96	83	74	**317**	**674**
10:00 AM	75	76	72	75	**298**	81	77	72	82	**312**	**610**
11:00 AM	87	79	72	96	**334**	85	97	112	102	**396**	**730**
12:00 PM	105	134	88	115	**442**	114	113	97	108	**432**	**874**
1:00 PM	79	106	106	118	**409**	115	108	96	132	**451**	**860**
2:00 PM	136	147	103	104	**490**	125	141	122	111	**499**	**989**
3:00 PM	101	105	98	88	**392**	96	125	161	130	**512**	**904**
4:00 PM	131	109	117	122	**479**	139	119	159	158	**575**	**1054**
5:00 PM	117	110	95	114	**436**	172	179	133	112	**596**	**1032**
6:00 PM	82	91	72	67	**312**	113	75	85	79	**352**	**664**
7:00 PM	63	61	61	51	**236**	104	85	49	71	**309**	**545**
8:00 PM	48	58	59	57	**222**	51	29	64	54	**198**	**420**
9:00 PM	48	28	48	24	**148**	53	24	42	20	**139**	**287**
10:00 PM	24	17	13	7	**61**	28	24	13	18	**83**	**144**
11:00 PM	8	8	10	8	**34**	8	10	13	7	**38**	**72**
Total	**48.4%**				**6108**	**51.6%**				**6503**	
	12611										

AM%	**37.8%**	**AM Peak 1155**	**7:30 am to 8:30 am**	**AM P.H.F.**	**0.82**
PM%	**62.2%**	**PM Peak 1134**	**4:30 pm to 5:30 pm**	**PM P.H.F.**	**0.98**



Metro Traffic Data Inc.
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Hanford, CA 93230

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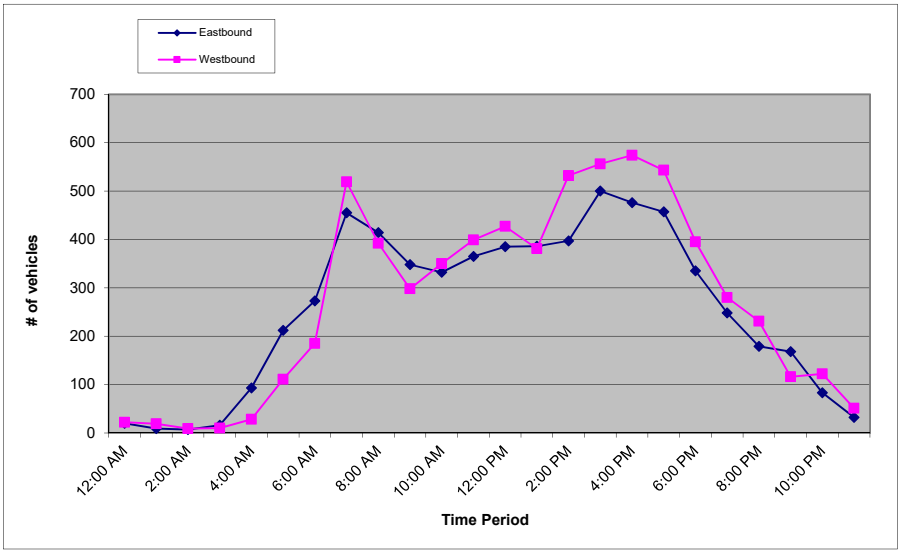
24 Hour Count Report

Prepared For: **Central Coast Transportation Consulting**
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION Golden Hill Rd s/o Union Rd
LATITUDE 35.6388503
COUNTY San Luis Obispo
LONGITUDE -120.6581385
COLLECTION DATE Thursday, June 7, 2018
WEATHER Clear
NUMBER OF LANES 3

	Eastbound					Westbound					Hourly
Hour	1st	2nd	3rd	4th	**Total**	1st	2nd	3rd	4th	**Total**	**Totals**
12:00 AM	4	7	5	4	**20**	8	6	3	5	**22**	**42**
1:00 AM	0	3	2	4	**9**	3	5	6	5	**19**	**28**
2:00 AM	0	1	4	2	**7**	4	2	1	2	**9**	**16**
3:00 AM	1	1	8	6	**16**	5	2	1	2	**10**	**26**
4:00 AM	10	22	20	41	**93**	6	1	11	10	**28**	**121**
5:00 AM	24	56	60	72	**212**	10	15	36	50	**111**	**323**
6:00 AM	57	58	62	96	**273**	25	32	55	73	**185**	**458**
7:00 AM	85	86	112	172	**455**	63	112	172	172	**519**	**974**
8:00 AM	137	122	78	77	**414**	147	99	75	71	**392**	**806**
9:00 AM	83	96	82	87	**348**	93	78	64	63	**298**	**646**
10:00 AM	78	83	79	92	**332**	72	86	107	85	**350**	**682**
11:00 AM	75	80	112	98	**365**	94	104	89	112	**399**	**764**
12:00 PM	77	120	83	105	**385**	129	95	96	107	**427**	**812**
1:00 PM	107	95	83	101	**386**	95	84	88	114	**381**	**767**
2:00 PM	111	82	98	106	**397**	115	114	138	165	**532**	**929**
3:00 PM	132	131	127	110	**500**	147	127	151	131	**556**	**1056**
4:00 PM	127	113	121	115	**476**	131	128	144	171	**574**	**1050**
5:00 PM	112	116	115	114	**457**	159	150	147	87	**543**	**1000**
6:00 PM	84	77	96	78	**335**	101	91	112	91	**395**	**730**
7:00 PM	76	61	54	57	**248**	79	69	57	75	**280**	**528**
8:00 PM	39	48	52	40	**179**	60	57	67	47	**231**	**410**
9:00 PM	48	48	35	37	**168**	37	25	27	27	**116**	**284**
10:00 PM	34	16	18	15	**83**	41	36	28	17	**122**	**205**
11:00 PM	10	12	6	4	**32**	20	15	6	10	**51**	**83**
Total	**48.6%**				**6190**	**51.4%**				**6550**	
	12740										

AM%	**38.4%**	**AM Peak**	**1133**	**7:30 am to 8:30 am**	**AM P.H.F.**	**0.82**
PM%	**61.6%**	**PM Peak**	**1086**	**2:45 pm to 3:45 pm**	**PM P.H.F.**	**0.97**



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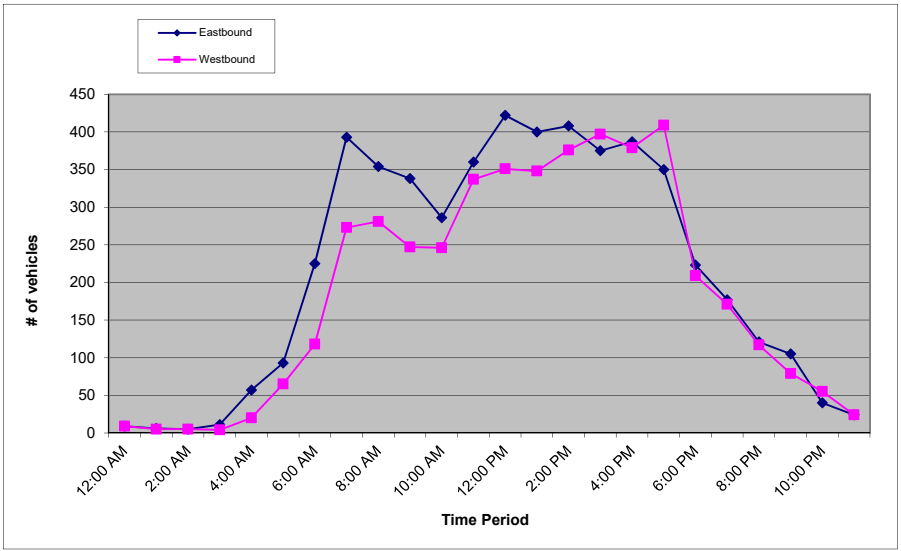
24 Hour Count Report

Prepared For: **Central Coast Transportation Consulting**
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION Golden Hill Rd n/o Union Rd
LATITUDE 35.6409015
COUNTY San Luis Obispo
LONGITUDE -120.6581332
COLLECTION DATE Wednesday, June 6, 2018
WEATHER Clear
NUMBER OF LANES 3

	Eastbound					Westbound					Hourly
Hour	1st	2nd	3rd	4th	**Total**	1st	2nd	3rd	4th	**Total**	**Totals**
12:00 AM	2	5	1	1	**9**	2	2	0	5	**9**	**18**
1:00 AM	2	1	2	1	**6**	2	1	2	0	**5**	**11**
2:00 AM	0	1	2	2	**5**	2	1	1	1	**5**	**10**
3:00 AM	1	1	4	5	**11**	1	0	1	2	**4**	**15**
4:00 AM	10	16	15	16	**57**	3	4	8	5	**20**	**77**
5:00 AM	17	21	18	37	**93**	7	15	15	28	**65**	**158**
6:00 AM	38	49	61	77	**225**	21	21	29	47	**118**	**343**
7:00 AM	55	81	99	158	**393**	43	51	70	109	**273**	**666**
8:00 AM	126	90	69	69	**354**	91	87	58	45	**281**	**635**
9:00 AM	61	108	73	96	**338**	58	72	63	54	**247**	**585**
10:00 AM	77	76	64	69	**286**	67	62	57	60	**246**	**532**
11:00 AM	90	93	83	94	**360**	65	82	102	88	**337**	**697**
12:00 PM	82	111	123	106	**422**	92	89	82	88	**351**	**773**
1:00 PM	99	109	94	98	**400**	90	79	66	113	**348**	**748**
2:00 PM	111	98	105	94	**408**	106	97	91	82	**376**	**784**
3:00 PM	94	105	100	76	**375**	85	104	107	101	**397**	**772**
4:00 PM	82	88	107	110	**387**	91	77	119	92	**379**	**766**
5:00 PM	104	104	78	64	**350**	111	117	97	84	**409**	**759**
6:00 PM	71	66	50	36	**223**	68	38	53	50	**209**	**432**
7:00 PM	54	50	32	41	**177**	53	47	24	47	**171**	**348**
8:00 PM	18	36	40	27	**121**	26	18	39	34	**117**	**238**
9:00 PM	35	20	32	18	**105**	24	17	26	12	**79**	**184**
10:00 PM	17	10	6	7	**40**	20	14	9	12	**55**	**95**
11:00 PM	4	7	6	7	**24**	6	6	7	5	**24**	**48**
Total	**53.3%**				**5169**	**46.7%**				**4525**	
	9694										

AM%	**38.7%**	**AM Peak**	**697**	**11:00 am to 12:00 pm**	**AM P.H.F.**	**0.94**
PM%	**61.3%**	**PM Peak**	**819**	**1:45 pm to 2:45 pm**	**PM P.H.F.**	**0.94**



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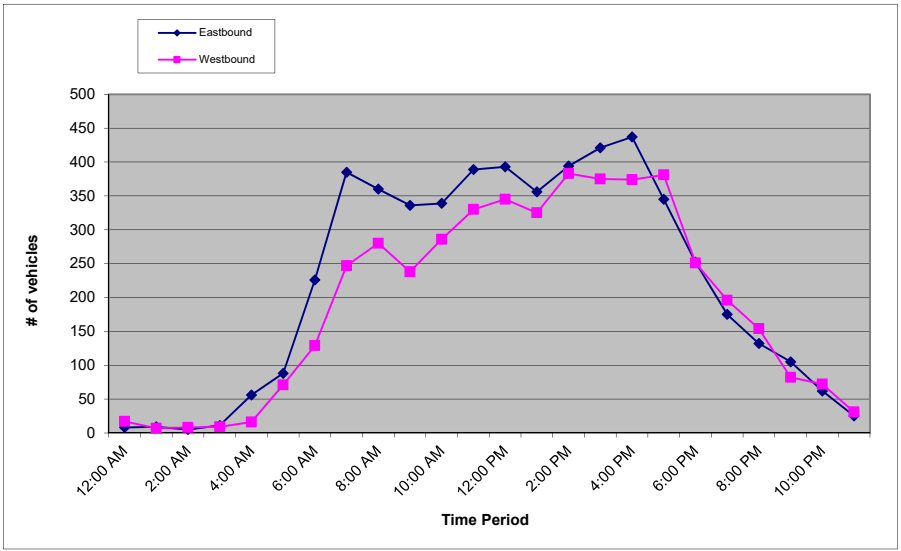
24 Hour Count Report

Prepared For: **Central Coast Transportation Consulting**
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION Golden Hill Rd n/o Union Rd
LATITUDE 35.6409015
COUNTY San Luis Obispo
LONGITUDE -120.6581332
COLLECTION DATE Thursday, June 7, 2018
WEATHER Clear
NUMBER OF LANES 3

	Eastbound					Westbound					Hourly
Hour	1st	2nd	3rd	4th	**Total**	1st	2nd	3rd	4th	**Total**	**Totals**
12:00 AM	3	2	2	1	**8**	7	5	0	5	**17**	**25**
1:00 AM	0	3	1	5	**9**	0	2	2	3	**7**	**16**
2:00 AM	1	1	2	1	**5**	4	2	1	1	**8**	**13**
3:00 AM	2	0	4	5	**11**	4	2	1	2	**9**	**20**
4:00 AM	7	15	12	22	**56**	3	2	5	6	**16**	**72**
5:00 AM	13	17	22	36	**88**	5	18	18	30	**71**	**159**
6:00 AM	41	45	64	76	**226**	26	23	36	44	**129**	**355**
7:00 AM	78	70	95	142	**385**	31	55	69	92	**247**	**632**
8:00 AM	107	101	89	63	**360**	88	68	66	58	**280**	**640**
9:00 AM	70	76	97	93	**336**	68	54	64	52	**238**	**574**
10:00 AM	99	68	79	93	**339**	65	73	79	69	**286**	**625**
11:00 AM	82	85	126	96	**389**	68	84	85	93	**330**	**719**
12:00 PM	102	111	79	101	**393**	103	69	96	77	**345**	**738**
1:00 PM	95	95	83	83	**356**	74	87	84	80	**325**	**681**
2:00 PM	115	106	83	90	**394**	86	83	100	114	**383**	**777**
3:00 PM	109	114	101	97	**421**	118	86	78	93	**375**	**796**
4:00 PM	99	113	124	101	**437**	90	77	99	108	**374**	**811**
5:00 PM	100	92	91	62	**345**	104	99	90	88	**381**	**726**
6:00 PM	64	61	63	64	**252**	68	59	68	56	**251**	**503**
7:00 PM	56	34	46	39	**175**	48	58	36	54	**196**	**371**
8:00 PM	31	32	34	35	**132**	42	41	39	32	**154**	**286**
9:00 PM	26	31	22	26	**105**	21	21	23	17	**82**	**187**
10:00 PM	23	21	7	11	**62**	30	9	17	16	**72**	**134**
11:00 PM	8	10	2	5	**25**	10	11	1	9	**31**	**56**
Total	**53.5%**				**5309**	**46.5%**				**4607**	
	9916										

AM%	**38.8%**	**AM Peak**	**719**	**11:00 am to 12:00 pm**	**AM P.H.F.**	**0.85**
PM%	**61.2%**	**PM Peak**	**827**	**4:30 pm to 5:30 pm**	**PM P.H.F.**	**0.93**



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

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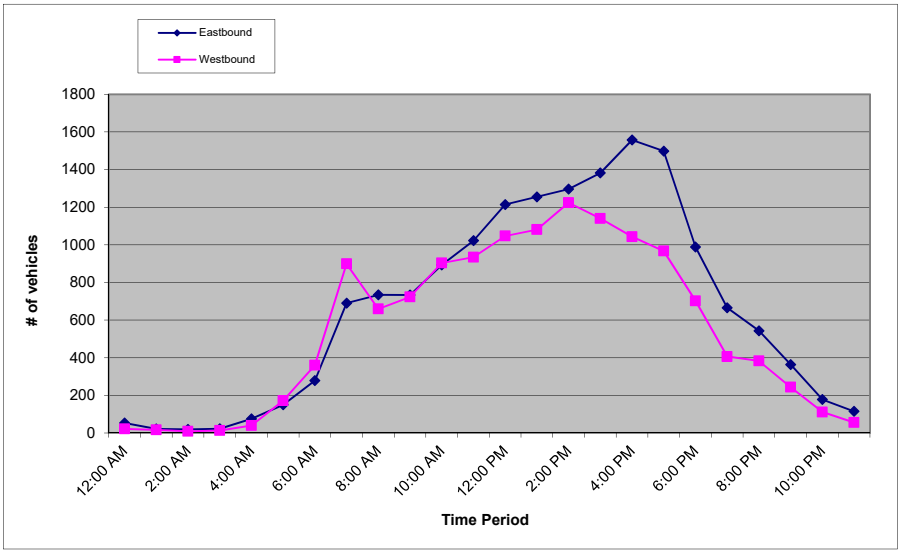
24 Hour Count Report

Prepared For: **Central Coast Transportation Consulting**
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION Niblick Rd e/o Spring St
LATITUDE 35.6151235
COUNTY San Luis Obispo
LONGITUDE -120.6849338
COLLECTION DATE Wednesday, June 6, 2018
WEATHER Clear
NUMBER OF LANES 4

	Eastbound					Westbound					Hourly
Hour	1st	2nd	3rd	4th	**Total**	1st	2nd	3rd	4th	**Total**	**Totals**
12:00 AM	15	20	10	8	**53**	6	4	6	5	**21**	**74**
1:00 AM	5	11	2	3	**21**	5	4	4	3	**16**	**37**
2:00 AM	4	3	6	6	**19**	2	1	5	1	**9**	**28**
3:00 AM	4	5	7	6	**22**	2	6	1	4	**13**	**35**
4:00 AM	3	17	15	40	**75**	4	9	13	13	**39**	**114**
5:00 AM	25	27	53	45	**150**	34	41	41	56	**172**	**322**
6:00 AM	45	57	75	101	**278**	74	65	117	104	**360**	**638**
7:00 AM	97	145	223	225	**690**	136	166	264	333	**899**	**1589**
8:00 AM	190	187	171	186	**734**	191	177	151	140	**659**	**1393**
9:00 AM	156	191	190	196	**733**	151	153	208	211	**723**	**1456**
10:00 AM	226	206	216	245	**893**	228	204	241	230	**903**	**1796**
11:00 AM	254	257	262	249	**1022**	226	233	235	240	**934**	**1956**
12:00 PM	312	287	278	337	**1214**	283	247	246	271	**1047**	**2261**
1:00 PM	331	290	317	317	**1255**	231	275	283	292	**1081**	**2336**
2:00 PM	310	341	317	328	**1296**	326	354	288	256	**1224**	**2520**
3:00 PM	321	346	358	357	**1382**	297	293	282	268	**1140**	**2522**
4:00 PM	371	381	383	422	**1557**	260	261	293	229	**1043**	**2600**
5:00 PM	444	405	377	272	**1498**	234	260	267	206	**967**	**2465**
6:00 PM	312	256	220	200	**988**	194	193	173	142	**702**	**1690**
7:00 PM	171	170	164	160	**665**	121	105	94	86	**406**	**1071**
8:00 PM	129	149	137	128	**543**	111	92	103	77	**383**	**926**
9:00 PM	139	84	78	62	**363**	82	51	63	47	**243**	**606**
10:00 PM	52	58	35	33	**178**	45	31	20	15	**111**	**289**
11:00 PM	41	30	27	17	**115**	19	20	10	6	**55**	**170**
Total	**54.5%**				**15744**	**45.5%**				**13150**	
	28894										

AM%	**32.7%**	**AM Peak**	**1956**	**11:00 am to 12:00 pm**	**AM P.H.F.**	**0.98**
PM%	**67.3%**	**PM Peak**	**2670**	**4:30 pm to 5:30 pm**	**PM P.H.F.**	**0.98**



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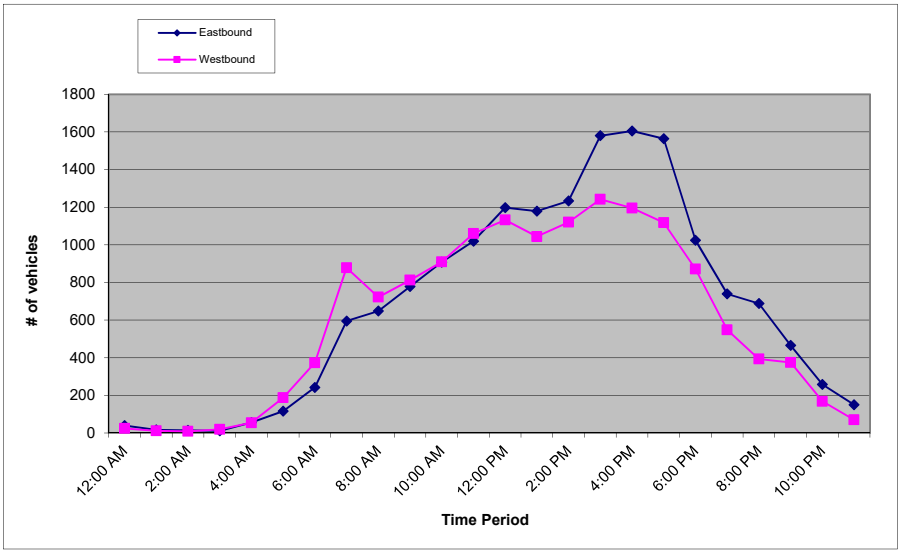
24 Hour Count Report

Prepared For: **Central Coast Transportation Consulting**
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION Niblick Rd e/o Spring St
LATITUDE 35.6151235
COUNTY San Luis Obispo
LONGITUDE -120.6849338
COLLECTION DATE Thursday, June 7, 2018
WEATHER Clear
NUMBER OF LANES 4

	Eastbound					Westbound					Hourly
Hour	1st	2nd	3rd	4th	**Total**	1st	2nd	3rd	4th	**Total**	**Totals**
12:00 AM	8	12	7	12	**39**	5	10	3	6	**24**	**63**
1:00 AM	3	3	6	4	**16**	3	3	2	3	**11**	**27**
2:00 AM	3	2	3	6	**14**	4	2	3	0	**9**	**23**
3:00 AM	1	5	0	5	**11**	5	2	5	7	**19**	**30**
4:00 AM	4	13	13	25	**55**	7	7	12	28	**54**	**109**
5:00 AM	12	24	47	33	**116**	28	35	58	66	**187**	**303**
6:00 AM	36	53	60	93	**242**	70	77	119	107	**373**	**615**
7:00 AM	78	135	201	181	**595**	150	178	264	286	**878**	**1473**
8:00 AM	177	180	140	151	**648**	213	182	183	144	**722**	**1370**
9:00 AM	183	201	183	211	**778**	164	186	235	227	**812**	**1590**
10:00 AM	226	240	208	234	**908**	229	230	225	225	**909**	**1817**
11:00 AM	232	245	264	278	**1019**	272	234	268	286	**1060**	**2079**
12:00 PM	317	313	281	287	**1198**	289	267	304	272	**1132**	**2330**
1:00 PM	284	283	299	313	**1179**	244	290	224	286	**1044**	**2223**
2:00 PM	288	307	293	345	**1233**	275	259	293	293	**1120**	**2353**
3:00 PM	362	390	419	409	**1580**	321	345	305	271	**1242**	**2822**
4:00 PM	392	404	415	394	**1605**	294	292	303	306	**1195**	**2800**
5:00 PM	458	427	343	336	**1564**	337	277	250	254	**1118**	**2682**
6:00 PM	280	258	259	227	**1024**	236	244	187	204	**871**	**1895**
7:00 PM	199	191	174	175	**739**	165	135	123	125	**548**	**1287**
8:00 PM	180	198	164	146	**688**	104	108	108	73	**393**	**1081**
9:00 PM	133	123	118	91	**465**	98	93	113	70	**374**	**839**
10:00 PM	79	79	64	36	**258**	57	45	41	25	**168**	**426**
11:00 PM	47	46	41	16	**150**	24	24	12	10	**70**	**220**
Total	**52.9%**				**16124**	**47.1%**				**14333**	
	30457										

AM%	**31.2%**	**AM Peak**	**2079**	**11:00 am to 12:00 pm**	**AM P.H.F.**	**0.92**
PM%	**68.8%**	**PM Peak**	**2825**	**3:15 pm to 4:15 pm**	**PM P.H.F.**	**0.96**



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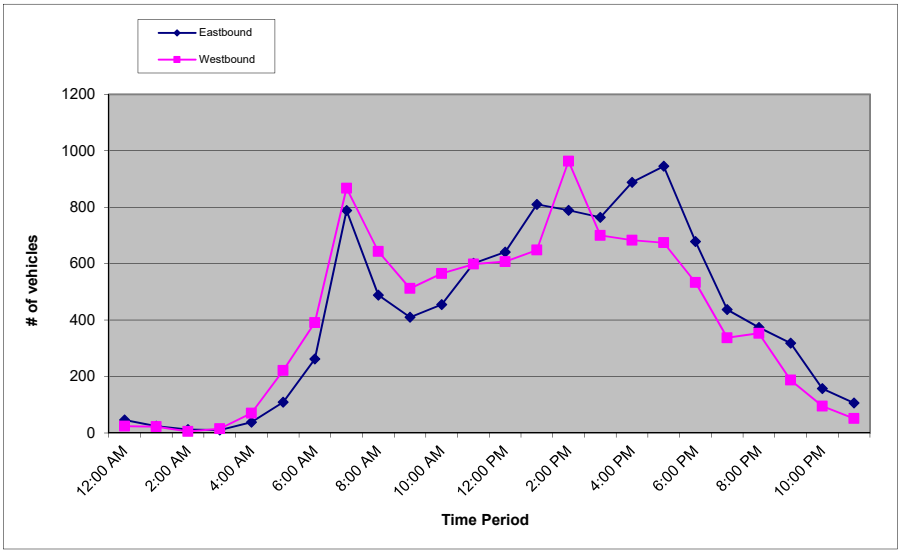
24 Hour Count Report

Prepared For: **Central Coast Transportation Consulting**
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION Niblick Rd e/o Quarterhorse
LATITUDE 35.6157842
COUNTY San Luis Obispo
LONGITUDE -120.6766149
COLLECTION DATE Wednesday, June 6, 2018
WEATHER Clear
NUMBER OF LANES 4

	Eastbound					Westbound					Hourly
Hour	1st	2nd	3rd	4th	**Total**	1st	2nd	3rd	4th	**Total**	**Totals**
12:00 AM	11	13	15	7	**46**	8	6	5	5	**24**	**70**
1:00 AM	5	8	4	7	**24**	10	3	4	5	**22**	**46**
2:00 AM	2	2	4	4	**12**	1	1	2	1	**5**	**17**
3:00 AM	3	1	2	4	**10**	2	7	1	5	**15**	**25**
4:00 AM	4	6	12	16	**38**	9	16	17	28	**70**	**108**
5:00 AM	13	13	38	45	**109**	40	49	55	77	**221**	**330**
6:00 AM	45	43	82	92	**262**	68	81	113	129	**391**	**653**
7:00 AM	73	209	259	247	**788**	134	178	282	273	**867**	**1655**
8:00 AM	149	131	106	102	**488**	210	170	141	122	**643**	**1131**
9:00 AM	92	105	111	102	**410**	133	121	135	123	**512**	**922**
10:00 AM	129	111	101	114	**455**	169	126	148	122	**565**	**1020**
11:00 AM	145	147	168	141	**601**	130	137	168	163	**598**	**1199**
12:00 PM	154	144	168	175	**641**	156	151	146	154	**607**	**1248**
1:00 PM	199	194	185	232	**810**	136	124	189	199	**648**	**1458**
2:00 PM	215	197	186	191	**789**	372	239	192	160	**963**	**1752**
3:00 PM	201	153	195	215	**764**	165	187	185	163	**700**	**1464**
4:00 PM	213	214	224	237	**888**	179	137	221	146	**683**	**1571**
5:00 PM	240	261	232	212	**945**	177	180	170	147	**674**	**1619**
6:00 PM	174	174	164	166	**678**	150	131	139	113	**533**	**1211**
7:00 PM	106	131	102	98	**437**	89	95	64	89	**337**	**774**
8:00 PM	96	84	98	96	**374**	83	87	90	93	**353**	**727**
9:00 PM	99	80	77	62	**318**	58	54	45	30	**187**	**505**
10:00 PM	50	51	26	30	**157**	23	33	21	18	**95**	**252**
11:00 PM	36	27	21	22	**106**	13	18	13	7	**51**	**157**
Total	**51.0%**				**10150**	**49.0%**				**9764**	
	19914										

AM%	**36.0%**	**AM Peak**	**1807**	**7:15 am to 8:15 am**	**AM P.H.F.**	**0.84**
PM%	**64.0%**	**PM Peak**	**1832**	**1:45 pm to 2:45 pm**	**PM P.H.F.**	**0.78**



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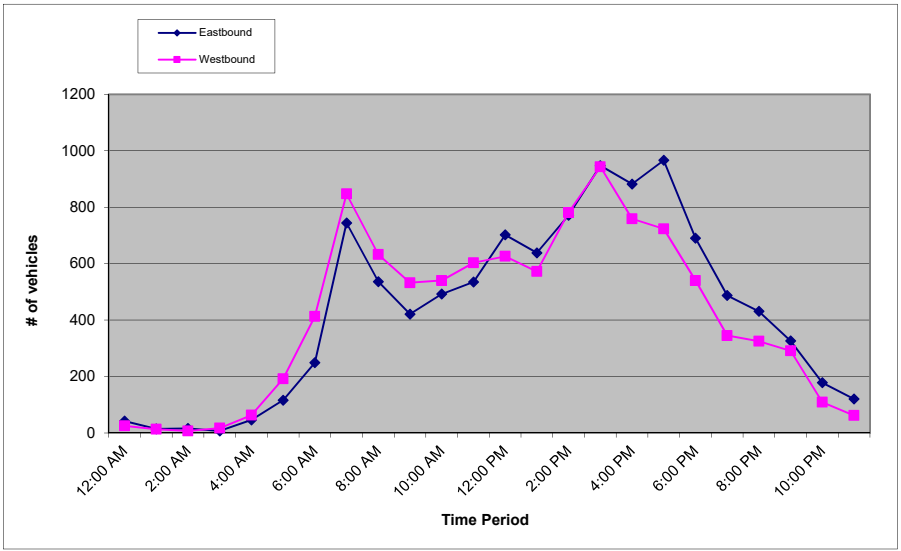
24 Hour Count Report

Prepared For: **Central Coast Transportation Consulting**
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION Niblick Rd e/o Quarterhorse
LATITUDE 35.6157842
COUNTY San Luis Obispo
LONGITUDE -120.6766149
COLLECTION DATE Thursday, June 7, 2018
WEATHER Clear
NUMBER OF LANES 4

	Eastbound					Westbound					Hourly
Hour	1st	2nd	3rd	4th	**Total**	1st	2nd	3rd	4th	**Total**	**Totals**
12:00 AM	12	18	8	4	**42**	10	5	4	6	**25**	**67**
1:00 AM	3	4	4	3	**14**	3	4	3	3	**13**	**27**
2:00 AM	3	3	4	6	**16**	3	4	0	0	**7**	**23**
3:00 AM	1	0	2	4	**7**	4	4	4	5	**17**	**24**
4:00 AM	3	5	15	23	**46**	6	11	14	32	**63**	**109**
5:00 AM	15	22	38	41	**116**	32	40	53	67	**192**	**308**
6:00 AM	38	48	68	95	**249**	71	101	120	121	**413**	**662**
7:00 AM	96	200	255	193	**744**	132	188	288	239	**847**	**1591**
8:00 AM	168	150	122	96	**536**	179	163	154	136	**632**	**1168**
9:00 AM	107	96	105	113	**421**	129	121	148	134	**532**	**953**
10:00 AM	124	116	123	129	**492**	138	117	158	127	**540**	**1032**
11:00 AM	127	126	146	136	**535**	147	145	157	154	**603**	**1138**
12:00 PM	186	171	172	173	**702**	153	172	160	141	**626**	**1328**
1:00 PM	157	141	165	175	**638**	143	147	126	156	**572**	**1210**
2:00 PM	175	152	208	236	**771**	184	159	241	197	**781**	**1552**
3:00 PM	242	231	218	256	**947**	324	237	202	180	**943**	**1890**
4:00 PM	211	214	235	222	**882**	180	177	205	197	**759**	**1641**
5:00 PM	244	262	226	234	**966**	196	181	154	192	**723**	**1689**
6:00 PM	157	180	179	174	**690**	147	162	122	109	**540**	**1230**
7:00 PM	135	122	109	121	**487**	104	87	74	80	**345**	**832**
8:00 PM	99	125	108	99	**431**	85	85	89	66	**325**	**756**
9:00 PM	101	87	68	70	**326**	58	80	111	42	**291**	**617**
10:00 PM	60	37	54	27	**178**	42	30	24	13	**109**	**287**
11:00 PM	39	39	30	12	**120**	20	17	11	14	**62**	**182**
Total	**51.0%**				**10356**	**49.0%**				**9960**	
	20316										

AM%	**35.0%**	**AM Peak**	**1710**	**7:15 am to 8:15 am**	**AM P.H.F.**	**0.79**
PM%	**65.0%**	**PM Peak**	**1916**	**2:30 pm to 3:30 pm**	**PM P.H.F.**	**0.85**



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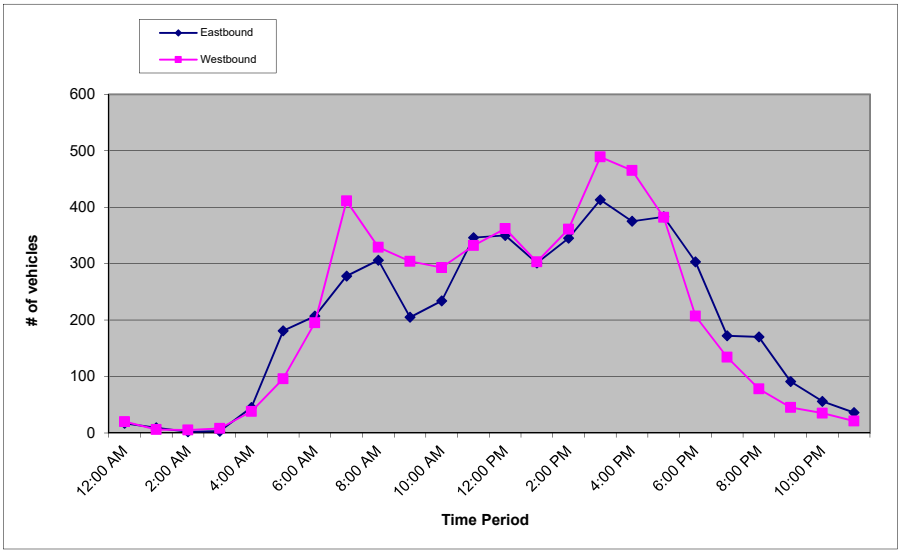
24 Hour Count Report

Prepared For: **Central Coast Transportation Consulting**
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION Sherwood Rd - Fontana rd to Creston Rd
LATITUDE 35.6157483
COUNTY San Luis Obispo
LONGITUDE -120.6566803
COLLECTION DATE Wednesday, January 23, 2019
WEATHER Clear
NUMBER OF LANES 2

	Eastbound					Westbound					Hourly
Hour	1st	2nd	3rd	4th	**Total**	1st	2nd	3rd	4th	**Total**	**Totals**
12:00 AM	4	5	6	2	**17**	9	2	5	4	**20**	**37**
1:00 AM	4	4	1	0	**9**	5	1	0	0	**6**	**15**
2:00 AM	0	0	2	0	**2**	2	1	1	1	**5**	**7**
3:00 AM	0	0	0	3	**3**	2	1	0	5	**8**	**11**
4:00 AM	1	7	8	29	**45**	4	13	7	14	**38**	**83**
5:00 AM	17	10	34	120	**181**	7	23	27	39	**96**	**277**
6:00 AM	31	39	52	85	**207**	33	36	50	76	**195**	**402**
7:00 AM	67	56	53	102	**278**	60	94	153	104	**411**	**689**
8:00 AM	101	99	54	52	**306**	74	71	99	85	**329**	**635**
9:00 AM	50	53	57	45	**205**	78	67	77	82	**304**	**509**
10:00 AM	49	57	62	66	**234**	63	67	93	70	**293**	**527**
11:00 AM	91	68	88	99	**346**	87	75	89	81	**332**	**678**
12:00 PM	91	82	81	96	**350**	104	87	82	89	**362**	**712**
1:00 PM	89	65	74	73	**301**	84	76	82	61	**303**	**604**
2:00 PM	91	79	76	99	**345**	82	69	118	92	**361**	**706**
3:00 PM	101	109	96	107	**413**	115	92	160	122	**489**	**902**
4:00 PM	88	89	98	100	**375**	111	86	173	95	**465**	**840**
5:00 PM	108	92	107	76	**383**	140	75	93	74	**382**	**765**
6:00 PM	84	92	67	60	**303**	55	72	42	38	**207**	**510**
7:00 PM	48	31	45	48	**172**	28	30	36	40	**134**	**306**
8:00 PM	59	45	38	28	**170**	27	20	13	18	**78**	**248**
9:00 PM	25	24	23	19	**91**	12	18	5	10	**45**	**136**
10:00 PM	22	18	9	7	**56**	15	7	7	6	**35**	**91**
11:00 PM	10	5	7	14	**36**	13	2	1	5	**21**	**57**
Total	**49.5%**				**4828**	**50.5%**				**4919**	
	9747										

AM%	**39.7%**	**AM Peak**	**757**	**7:30 am to 8:30 am**	**AM P.H.F.**	**0.92**
PM%	**60.3%**	**PM Peak**	**902**	**3:00 pm to 4:00 pm**	**PM P.H.F.**	**0.88**



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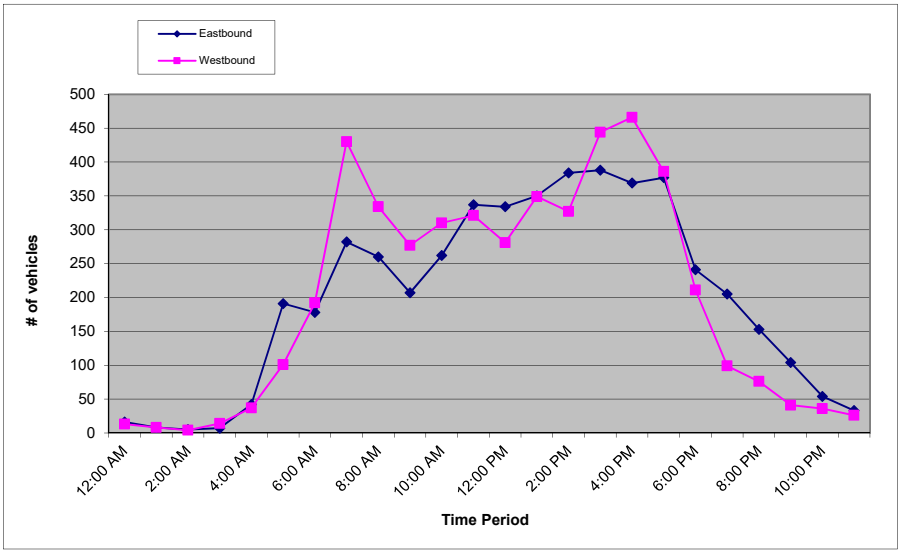
24 Hour Count Report

Prepared For: **Central Coast Transportation Consulting**
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION Sherwood Rd - Fontana rd to Creston Rd
LATITUDE 35.6157483
COUNTY San Luis Obispo
LONGITUDE -120.6566803
COLLECTION DATE Thursday, January 24, 2019
WEATHER Clear
NUMBER OF LANES 2

	Eastbound					Westbound					Hourly
Hour	1st	2nd	3rd	4th	**Total**	1st	2nd	3rd	4th	**Total**	**Totals**
12:00 AM	5	7	1	3	**16**	7	2	1	3	**13**	**29**
1:00 AM	3	2	1	2	**8**	4	2	0	2	**8**	**16**
2:00 AM	1	1	2	1	**5**	2	1	1	0	**4**	**9**
3:00 AM	2	1	1	3	**7**	2	6	0	6	**14**	**21**
4:00 AM	0	6	7	29	**42**	13	7	7	10	**37**	**79**
5:00 AM	23	9	30	129	**191**	15	10	31	45	**101**	**292**
6:00 AM	24	37	43	74	**178**	28	37	61	66	**192**	**370**
7:00 AM	67	54	54	107	**282**	73	109	152	96	**430**	**712**
8:00 AM	92	79	50	39	**260**	96	66	96	76	**334**	**594**
9:00 AM	56	43	52	56	**207**	79	73	69	56	**277**	**484**
10:00 AM	54	69	58	81	**262**	80	65	92	73	**310**	**572**
11:00 AM	72	95	86	84	**337**	76	74	89	82	**321**	**658**
12:00 PM	86	81	81	86	**334**	81	64	88	48	**281**	**615**
1:00 PM	85	95	87	83	**350**	79	91	95	84	**349**	**699**
2:00 PM	86	124	83	91	**384**	74	93	90	70	**327**	**711**
3:00 PM	84	101	92	111	**388**	81	92	142	129	**444**	**832**
4:00 PM	90	91	80	108	**369**	105	75	179	107	**466**	**835**
5:00 PM	93	103	96	85	**377**	132	95	95	64	**386**	**763**
6:00 PM	78	73	55	35	**241**	64	62	43	42	**211**	**452**
7:00 PM	54	62	43	46	**205**	27	24	28	20	**99**	**304**
8:00 PM	39	43	39	32	**153**	16	20	21	19	**76**	**229**
9:00 PM	28	26	32	18	**104**	14	14	5	8	**41**	**145**
10:00 PM	20	13	12	9	**54**	15	7	8	6	**36**	**90**
11:00 PM	8	10	7	8	**33**	13	5	2	6	**26**	**59**
Total	**50.0%**				**4787**	**50.0%**				**4783**	
	9570										

AM%	**40.1%**	**AM Peak**	**760**	**7:15 am to 8:15 am**	**AM P.H.F.**	**0.92**
PM%	**59.9%**	**PM Peak**	**897**	**4:30 pm to 5:30 pm**	**PM P.H.F.**	**0.87**



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

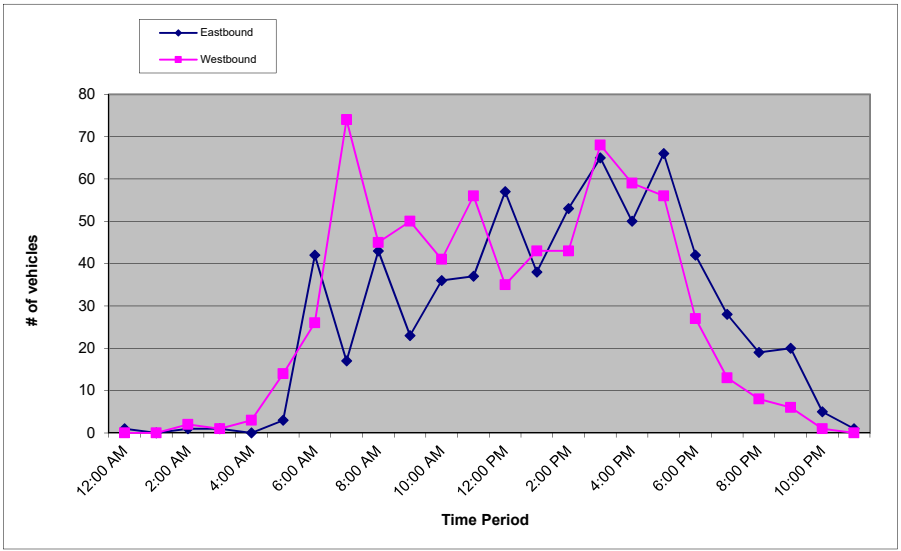
24 Hour Count Report

Prepared For: **Central Coast Transportation Consulting**
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION Linne Rd - Poppy Ln to Hanson Rd
LATITUDE 35.6119509
COUNTY San Luis Obispo
LONGITUDE -120.6387723
COLLECTION DATE Wednesday, January 23, 2019
WEATHER Clear
NUMBER OF LANES 2

	Eastbound					Westbound					Hourly
Hour	1st	2nd	3rd	4th	**Total**	1st	2nd	3rd	4th	**Total**	**Totals**
12:00 AM	0	0	1	0	**1**	0	0	0	0	**0**	**1**
1:00 AM	0	0	0	0	**0**	0	0	0	0	**0**	**0**
2:00 AM	0	0	1	0	**1**	1	1	0	0	**2**	**3**
3:00 AM	0	0	0	1	**1**	0	1	0	0	**1**	**2**
4:00 AM	0	0	0	0	**0**	1	1	0	1	**3**	**3**
5:00 AM	0	1	0	2	**3**	1	5	4	4	**14**	**17**
6:00 AM	2	5	19	16	**42**	4	4	7	11	**26**	**68**
7:00 AM	5	2	0	10	**17**	8	19	29	18	**74**	**91**
8:00 AM	16	12	9	6	**43**	8	11	8	18	**45**	**88**
9:00 AM	3	4	5	11	**23**	13	13	12	12	**50**	**73**
10:00 AM	9	11	5	11	**36**	10	9	14	8	**41**	**77**
11:00 AM	7	5	12	13	**37**	15	24	4	13	**56**	**93**
12:00 PM	11	11	10	25	**57**	12	7	4	12	**35**	**92**
1:00 PM	13	4	11	10	**38**	13	7	11	12	**43**	**81**
2:00 PM	14	12	12	15	**53**	11	13	8	11	**43**	**96**
3:00 PM	14	13	14	24	**65**	22	21	14	11	**68**	**133**
4:00 PM	16	11	15	8	**50**	20	16	13	10	**59**	**109**
5:00 PM	23	16	17	10	**66**	20	13	15	8	**56**	**122**
6:00 PM	9	17	7	9	**42**	8	6	8	5	**27**	**69**
7:00 PM	9	6	2	11	**28**	3	2	5	3	**13**	**41**
8:00 PM	3	12	2	2	**19**	3	1	2	2	**8**	**27**
9:00 PM	5	10	3	2	**20**	2	2	1	1	**6**	**26**
10:00 PM	2	2	1	0	**5**	0	1	0	0	**1**	**6**
11:00 PM	1	0	0	0	**1**	0	0	0	0	**0**	**1**
Total	**49.1%**				**648**	**50.9%**				**671**	
	1319										

AM%	**39.1%**	**AM Peak**	**93**	**11:00 am to 12:00 pm**	**AM P.H.F.**	**0.80**
PM%	**60.9%**	**PM Peak**	**133**	**3:15 pm to 4:15 pm**	**PM P.H.F.**	**0.92**



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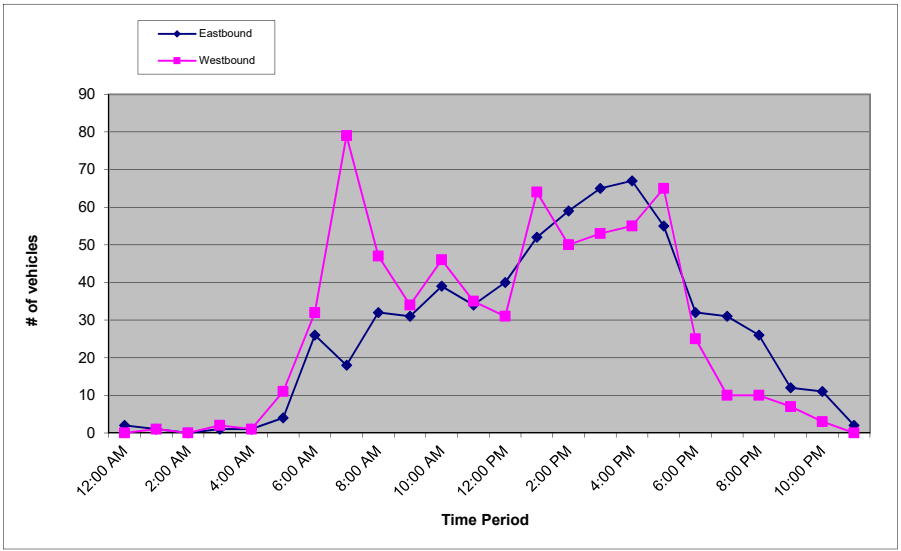
24 Hour Count Report

Prepared For: **Central Coast Transportation Consulting**
895 Napa Avenue, Suite A-6
Morro Bay, CA 93442

LOCATION Linne Rd - Poppy Ln to Hanson Rd
LATITUDE 35.6119509
COUNTY San Luis Obispo
LONGITUDE -120.6387723
COLLECTION DATE Thursday, January 24, 2019
WEATHER Clear
NUMBER OF LANES 2

	Eastbound					Westbound					Hourly
Hour	1st	2nd	3rd	4th	**Total**	1st	2nd	3rd	4th	**Total**	**Totals**
12:00 AM	1	0	1	0	**2**	0	0	0	0	**0**	**2**
1:00 AM	0	0	0	1	**1**	0	0	0	1	**1**	**2**
2:00 AM	0	0	0	0	**0**	0	0	0	0	**0**	**0**
3:00 AM	0	0	1	0	**1**	1	0	1	0	**2**	**3**
4:00 AM	0	0	0	1	**1**	1	0	0	0	**1**	**2**
5:00 AM	1	0	1	2	**4**	3	1	6	1	**11**	**15**
6:00 AM	0	6	8	12	**26**	9	6	8	9	**32**	**58**
7:00 AM	0	3	7	8	**18**	10	26	28	15	**79**	**97**
8:00 AM	10	6	7	9	**32**	10	9	9	19	**47**	**79**
9:00 AM	4	9	11	7	**31**	9	8	8	9	**34**	**65**
10:00 AM	9	8	15	7	**39**	12	7	9	18	**46**	**85**
11:00 AM	10	15	6	3	**34**	10	10	10	5	**35**	**69**
12:00 PM	10	10	10	10	**40**	6	10	6	9	**31**	**71**
1:00 PM	14	13	13	12	**52**	10	28	11	15	**64**	**116**
2:00 PM	11	15	19	14	**59**	11	9	16	14	**50**	**109**
3:00 PM	18	16	16	15	**65**	17	14	12	10	**53**	**118**
4:00 PM	21	19	13	14	**67**	15	10	13	17	**55**	**122**
5:00 PM	14	13	16	12	**55**	16	25	18	6	**65**	**120**
6:00 PM	11	11	5	5	**32**	7	9	7	2	**25**	**57**
7:00 PM	8	6	8	9	**31**	2	3	3	2	**10**	**41**
8:00 PM	10	5	9	2	**26**	1	3	4	2	**10**	**36**
9:00 PM	6	3	2	1	**12**	1	2	1	3	**7**	**19**
10:00 PM	7	1	2	1	**11**	0	1	0	2	**3**	**14**
11:00 PM	1	1	0	0	**2**	0	0	0	0	**0**	**2**
Total	**49.2%**				**641**	**50.8%**				**661**	
	1302										

AM%	**36.6%**	**AM Peak**	**107**	**7:15 am to 8:15 am**	**AM P.H.F.**	**0.76**
PM%	**63.4%**	**PM Peak**	**133**	**4:45 pm to 5:45 pm**	**PM P.H.F.**	**0.88**



Appendix B: Intersection LOS & Queue Calculation Sheets

Existing

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	265	1168	1125	101	128	238
v/c Ratio	0.66	0.36	0.80	0.15	0.54	0.35
Control Delay	43.8	0.3	29.0	4.2	50.5	14.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.8	0.3	29.0	4.2	50.5	14.9
Queue Length 50th (ft)	145	0	306	0	74	63
Queue Length 95th (ft)	248	0	378	21	137	121
Internal Link Dist (ft)		942	856		514	
Turn Bay Length (ft)	345			330	450	
Base Capacity (vph)	520	3223	2885	1301	520	1015
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.36	0.39	0.08	0.25	0.23

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	209	923	889	80	101	188
Future Volume (vph)	209	923	889	80	101	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0	7.3	7.3	4.2	3.7
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1612	3223	3223	1442	1612	1442
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1612	3223	3223	1442	1612	1442
Peak-hour factor, PHF	0.79	0.79	0.79	0.79	0.79	0.79
Adj. Flow (vph)	265	1168	1125	101	128	238
RTOR Reduction (vph)	0	0	0	56	0	39
Lane Group Flow (vph)	265	1168	1125	45	128	199
Heavy Vehicles (%)	12%	12%	12%	12%	12%	12%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	8	Free!	6		7!	4
Permitted Phases				6		4
Actuated Green, G (s)	24.5	96.4	42.5	42.5	14.4	42.9
Effective Green, g (s)	24.5	96.4	42.5	42.5	14.4	42.9
Actuated g/C Ratio	0.25	1.00	0.44	0.44	0.15	0.45
Clearance Time (s)	3.5		7.3	7.3	4.2	3.7
Vehicle Extension (s)	3.0		4.0	4.0	3.5	3.0
Lane Grp Cap (vph)	409	3223	1420	635	240	641
v/s Ratio Prot	c0.16	0.36	c0.35		c0.08	0.14
v/s Ratio Perm				0.03		
v/c Ratio	0.65	0.36	0.79	0.07	0.53	0.31
Uniform Delay, d1	32.1	0.0	23.2	15.5	37.9	17.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.5	0.3	3.3	0.1	2.6	0.3
Delay (s)	35.6	0.3	26.5	15.6	40.5	17.5
Level of Service	D	A	C	B	D	B
Approach Delay (s)		6.8	25.6		25.5	
Approach LOS		A	C		C	

Intersection Summary				
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	96.4	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	55.7%	ICU Level of Service	B	
Analysis Period (min)	15			

! Phase conflict between lane groups.
c Critical Lane Group

HCM 6th Edition methodology cannot be performed with phasing conflicts.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	234	771	300	39	841	180	270	281	98	169	163
v/c Ratio	0.54	0.59	0.39	0.11	0.78	0.30	0.57	0.39	0.34	0.60	0.43
Control Delay	48.2	29.7	5.0	43.1	36.6	5.4	47.4	35.7	51.0	50.8	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.2	29.7	5.0	43.1	36.6	5.4	47.4	35.7	51.0	50.8	10.5
Queue Length 50th (ft)	72	226	0	11	248	0	82	78	30	100	0
Queue Length 95th (ft)	127	326	43	29	354	37	142	131	63	186	46
Internal Link Dist (ft)		1323			2509			853		451	
Turn Bay Length (ft)	225		485	125		390	160		140		
Base Capacity (vph)	591	2373	1142	600	2373	1110	658	1376	658	731	715
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.32	0.26	0.07	0.35	0.16	0.41	0.20	0.15	0.23	0.23

Intersection Summary

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Existing AM
2: Golden Hill Road & SR 46 E — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	194	640	249	32	698	149	224	217	17	81	140	135
Future Volume (vph)	194	640	249	32	698	149	224	217	17	81	140	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3155	3252	1455	3155	3252	1455	3155	3215		3155	1712	1455
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3155	3252	1455	3155	3252	1455	3155	3215		3155	1712	1455
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	234	771	300	39	841	180	270	261	20	98	169	163
RTOR Reduction (vph)	0	0	182	0	0	117	0	3	0	0	0	136
Lane Group Flow (vph)	234	771	118	39	841	63	270	278	0	98	169	27
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	13.7	39.8	39.8	9.2	35.3	35.3	14.9	22.3		9.1	16.5	16.5
Effective Green, g (s)	13.7	39.8	39.8	9.2	35.3	35.3	14.9	22.3		9.1	16.5	16.5
Actuated g/C Ratio	0.14	0.39	0.39	0.09	0.35	0.35	0.15	0.22		0.09	0.16	0.16
Clearance Time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	427	1281	573	287	1136	508	465	709		284	279	237
v/s Ratio Prot	0.07	c0.24		0.01	c0.26		c0.09	0.09		0.03	c0.10	
v/s Ratio Perm			0.08			0.04						0.02
v/c Ratio	0.55	0.60	0.21	0.14	0.74	0.12	0.58	0.39		0.35	0.61	0.11
Uniform Delay, d1	40.8	24.3	20.2	42.2	28.8	22.3	40.1	33.6		43.2	39.2	36.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.4	0.8	0.2	0.1	2.6	0.1	1.8	0.4		0.7	3.7	0.2
Delay (s)	42.2	25.1	20.4	42.3	31.5	22.4	42.0	33.9		43.9	42.9	36.2
Level of Service	D	C	C	D	C	C	D	C		D	D	D
Approach Delay (s)		27.1			30.3			37.9			40.6	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	31.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	101.0	Sum of lost time (s)	20.6	
Intersection Capacity Utilization	55.8%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Olsen-Chandler SP — Existing AM
2: Golden Hill Road & SR 46 E — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	194	640	249	32	698	149	224	217	17	81	140	135
Future Volume (veh/h)	194	640	249	32	698	149	224	217	17	81	140	135
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1737	1737	1737	1737	1737	1737	1737	1737	1737	1737	1737	1737
Adj Flow Rate, veh/h	234	771	300	39	841	180	270	261	20	98	169	163
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	334	1069	477	252	1133	505	377	678	52	167	266	225
Arrive On Green	0.10	0.32	0.32	0.08	0.34	0.34	0.12	0.22	0.22	0.05	0.15	0.15
Sat Flow, veh/h	3209	3300	1472	3209	3300	1472	3209	3105	236	3209	1737	1472
Grp Volume(v), veh/h	234	771	300	39	841	180	270	138	143	98	169	163
Grp Sat Flow(s),veh/h/ln	1605	1650	1472	1605	1650	1472	1605	1650	1691	1605	1737	1472
Q Serve(g_s), s	5.1	15.1	7.6	0.8	16.4	6.7	5.9	5.2	5.3	2.2	6.7	7.7
Cycle Q Clear(g_c), s	5.1	15.1	7.6	0.8	16.4	6.7	5.9	5.2	5.3	2.2	6.7	7.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.14	1.00		1.00
Lane Grp Cap(c), veh/h	334	1069	477	252	1133	505	377	360	369	167	266	225
V/C Ratio(X)	0.70	0.72	0.63	0.15	0.74	0.36	0.72	0.38	0.39	0.59	0.64	0.72
Avail Cap(c_a), veh/h	791	3163	1411	791	3163	1411	879	926	949	879	975	826
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.6	21.8	7.5	31.4	21.1	17.9	31.0	24.3	24.4	33.9	29.0	29.5
Incr Delay (d2), s/veh	2.7	0.9	1.4	0.1	1.0	0.4	2.5	0.7	0.7	3.3	2.5	4.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	5.0	3.7	0.3	5.4	2.1	2.3	1.9	2.0	0.9	2.8	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.3	22.7	8.9	31.5	22.1	18.4	33.6	25.0	25.0	37.1	31.6	33.9
LnGrp LOS	C	C	A	C	C	B	C	C	C	D	C	C
Approach Vol, veh/h		1305			1060			551			430	
Approach Delay, s/veh		21.6			21.8			29.2			33.7	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	30.9	12.6	16.5	11.6	32.4	7.8	21.3
Change Period (Y+Rc), s	7.3	* 7.3	4.0	5.3	4.0	7.3	4.0	5.3
Max Green Setting (Gmax), s	18.0	* 70	20.0	41.0	18.0	70.0	20.0	41.0
Max Q Clear Time (g_c+I1), s	2.8	17.1	7.9	9.7	7.1	18.4	4.2	7.3
Green Ext Time (p_c), s	0.0	6.6	0.7	1.5	0.5	6.7	0.2	1.6

Intersection Summary	
HCM 6th Ctrl Delay	24.5
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	705	27	251	891	0	5	0	222	0	0	0
Future Volume (Veh/h)	1	705	27	251	891	0	5	0	222	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	1	860	33	306	1087	0	6	0	271	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									1			1
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1087			893			2034	2578	446	2131	2594	544
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1087			893			2034	2578	446	2131	2594	544
tC, single (s)	4.3			4.3			7.7	6.7	7.1	7.7	6.7	7.1
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			56			69	100	49	100	100	100
cM capacity (veh/h)	587			701			20	12	535	8	12	461

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	1	573	320	306	725	362	277	0
Volume Left	1	0	0	306	0	0	6	0
Volume Right	0	0	33	0	0	0	271	0
cSH	587	1700	1700	701	1700	1700	547	1700
Volume to Capacity	0.00	0.34	0.19	0.44	0.43	0.21	0.51	0.00
Queue Length 95th (ft)	0	0	0	56	0	0	71	0
Control Delay (s)	11.1	0.0	0.0	14.1	0.0	0.0	23.5	0.0
Lane LOS	B			B			C	A
Approach Delay (s)	0.0			3.1			23.5	0.0
Approach LOS							C	A

Intersection Summary				
Average Delay		4.2		
Intersection Capacity Utilization	47.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	705	27	251	891	0	5	0	222	0	0	0
Future Vol, veh/h	1	705	27	251	891	0	5	0	222	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	340	-	-	195	-	-	-	-	25	-	-	25
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	11	11	11	11	11	11	11	11	11	11	11	11
Mvmt Flow	1	860	33	306	1087	0	6	0	271	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1087	0	0	893	0	0	2035	2578	447	2131	2594	544
Stage 1	-	-	-	-	-	-	879	879	-	1699	1699	-
Stage 2	-	-	-	-	-	-	1156	1699	-	432	895	-
Critical Hdwy	4.32	-	-	4.32	-	-	7.72	6.72	7.12	7.72	6.72	7.12
Critical Hdwy Stg 1	-	-	-	-	-	-	6.72	5.72	-	6.72	5.72	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.72	5.72	-	6.72	5.72	-
Follow-up Hdwy	2.31	-	-	2.31	-	-	3.61	4.11	3.41	3.61	4.11	3.41
Pot Cap-1 Maneuver	587	-	-	701	-	-	30	22	535	25	22	461
Stage 1	-	-	-	-	-	-	291	343	-	87	133	-
Stage 2	-	-	-	-	-	-	195	133	-	549	337	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	587	-	-	701	-	-	20	12	535	8	12	461
Mov Cap-2 Maneuver	-	-	-	-	-	-	20	12	-	8	12	-
Stage 1	-	-	-	-	-	-	290	342	-	87	75	-
Stage 2	-	-	-	-	-	-	110	75	-	271	336	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3.1	23.5	0
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	20	535	587	-	-	701	-	-	-	-
HCM Lane V/C Ratio	0.305	0.506	0.002	-	-	0.437	-	-	-	-
HCM Control Delay (s)	250.3	18.4	11.1	-	-	14.1	-	-	0	0
HCM Lane LOS	F	C	B	-	-	B	-	-	A	A
HCM 95th %tile Q(veh)	0.9	2.8	0	-	-	2.2	-	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	329	591	939	17	5	170
Future Volume (Veh/h)	329	591	939	17	5	170
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	392	704	1118	20	6	202
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1138				2254	559
vC1, stage 1 conf vol					1118	
vC2, stage 2 conf vol					1136	
vCu, unblocked vol	1138				2254	559
tC, single (s)	4.3				7.0	7.1
tC, 2 stage (s)					6.0	
tF (s)	2.3				3.6	3.4
p0 queue free %	31				92	55
cM capacity (veh/h)	566				72	453

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	392	352	352	559	559	20	208
Volume Left	392	0	0	0	0	0	6
Volume Right	0	0	0	0	0	20	202
cSH	566	1700	1700	1700	1700	1700	466
Volume to Capacity	0.69	0.21	0.21	0.33	0.33	0.01	0.45
Queue Length 95th (ft)	135	0	0	0	0	0	57
Control Delay (s)	24.5	0.0	0.0	0.0	0.0	0.0	20.4
Lane LOS	C						C
Approach Delay (s)	8.8			0.0			20.4
Approach LOS							C

Intersection Summary			
Average Delay		5.7	
Intersection Capacity Utilization		57.5%	ICU Level of Service B
Analysis Period (min)		15	

Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	329	591	939	17	5	170
Future Vol, veh/h	329	591	939	17	5	170
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	580	-	-	165	0	25
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	392	704	1118	20	6	202

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1138	0	-	0	2254	559
Stage 1	-	-	-	-	1118	-
Stage 2	-	-	-	-	1136	-
Critical Hdwy	4.3	-	-	-	7	7.1
Critical Hdwy Stg 1	-	-	-	-	6	-
Critical Hdwy Stg 2	-	-	-	-	6	-
Follow-up Hdwy	2.3	-	-	-	3.6	3.4
Pot Cap-1 Maneuver	566	-	-	-	31	453
Stage 1	-	-	-	-	258	-
Stage 2	-	-	-	-	252	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	566	-	-	-	10	453
Mov Cap-2 Maneuver	-	-	-	-	71	-
Stage 1	-	-	-	-	79	-
Stage 2	-	-	-	-	252	-

Approach	EB	WB	SB
HCM Control Delay, s	8.7	0	20.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	566	-	-	-	71	453
HCM Lane V/C Ratio	0.692	-	-	-	0.084	0.447
HCM Control Delay (s)	24.4	-	-	-	60.3	19.2
HCM Lane LOS	C	-	-	-	F	C
HCM 95th %tile Q(veh)	5.4	-	-	-	0.3	2.3

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	545	18	2	1008	0	8	0	1	0	0	0
Future Volume (Veh/h)	0	545	18	2	1008	0	8	0	1	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	0	626	21	2	1159	0	9	0	1	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									1			
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1159			647			1210	1789	313	1476	1810	580
vC1, stage 1 conf vol							626	626		1163	1163	
vC2, stage 2 conf vol							584	1163		314	647	
vCu, unblocked vol	1159			647			1210	1789	313	1476	1810	580
tC, single (s)	4.4			4.4			7.8	6.8	7.2	7.8	6.8	7.2
tC, 2 stage (s)							6.8	5.8		6.8	5.8	
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			100			97	100	100	100	100	100
cM capacity (veh/h)	540			864			317	218	651	181	216	431

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	313	313	21	2	773	386	10	0
Volume Left	0	0	0	0	2	0	0	9	0
Volume Right	0	0	0	21	0	0	0	1	0
cSH	1700	1700	1700	1700	864	1700	1700	353	1700
Volume to Capacity	0.00	0.18	0.18	0.01	0.00	0.45	0.23	0.03	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	0	2	0
Control Delay (s)	0.0	0.0	0.0	0.0	9.2	0.0	0.0	16.1	0.0
Lane LOS					A			C	A
Approach Delay (s)	0.0				0.0			16.1	0.0
Approach LOS								C	A

Intersection Summary				
Average Delay		0.1		
Intersection Capacity Utilization		37.9%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	545	18	2	1008	0	8	0	1	0	0	0
Future Vol, veh/h	0	545	18	2	1008	0	8	0	1	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	275	305	-	-	-	-	25	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	13	13	13	13	13	13	13	13	13	13	13	13
Mvmt Flow	0	626	21	2	1159	0	9	0	1	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1159	0	0	647	0	0	1210	1789	313	1476	1810	580
Stage 1	-	-	-	-	-	-	626	626	-	1163	1163	-
Stage 2	-	-	-	-	-	-	584	1163	-	313	647	-
Critical Hdwy	4.36	-	-	4.36	-	-	7.76	6.76	7.16	7.76	6.76	7.16
Critical Hdwy Stg 1	-	-	-	-	-	-	6.76	5.76	-	6.76	5.76	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.76	5.76	-	6.76	5.76	-
Follow-up Hdwy	2.33	-	-	2.33	-	-	3.63	4.13	3.43	3.63	4.13	3.43
Pot Cap-1 Maneuver	540	-	-	864	-	-	126	71	651	79	69	431
Stage 1	-	-	-	-	-	-	413	449	-	190	246	-
Stage 2	-	-	-	-	-	-	438	246	-	643	439	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	540	-	-	864	-	-	126	71	651	79	69	431
Mov Cap-2 Maneuver	-	-	-	-	-	-	308	212	-	177	211	-
Stage 1	-	-	-	-	-	-	413	449	-	190	246	-
Stage 2	-	-	-	-	-	-	437	246	-	642	439	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	16.3	0
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	308	651	540	-	-	864	-	-	-
HCM Lane V/C Ratio	0.03	0.002	-	-	-	0.003	-	-	-
HCM Control Delay (s)	17	10.5	0	-	-	9.2	-	-	0
HCM Lane LOS	C	B	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0	0	-	-	0	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.
Channelized right turn lanes are not counted.

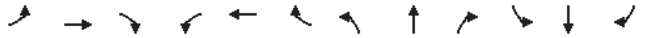
Intersection	
Intersection Delay, s/veh	51.3
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	87	113	92	246	96	66	40	288	182	39	260	50
Future Vol, veh/h	87	113	92	246	96	66	40	288	182	39	260	50
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	107	140	114	304	119	81	49	356	225	48	321	62
Number of Lanes	1	1	0	1	1	0	1	1	1	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	3	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	2	2	2
HCM Control Delay	37	55	68.5	33.8
HCM LOS	E	F	F	D

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	100%	0%	23%	0%
Vol Thru, %	0%	100%	0%	0%	55%	0%	59%	77%	72%
Vol Right, %	0%	0%	100%	0%	45%	0%	41%	0%	28%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	40	288	182	87	205	246	162	169	180
LT Vol	40	0	0	87	0	246	0	39	0
Through Vol	0	288	0	0	113	0	96	130	130
RT Vol	0	0	182	0	92	0	66	0	50
Lane Flow Rate	49	356	225	107	253	304	200	209	222
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.155	1.064	0.627	0.35	0.772	0.944	0.582	0.646	0.675
Departure Headway (Hd)	11.297	10.773	10.039	12.15	11.296	11.613	10.792	11.578	11.25
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	319	338	362	298	321	316	336	315	322
Service Time	9.025	8.501	7.767	9.85	8.996	9.313	8.492	9.278	8.95
HCM Lane V/C Ratio	0.154	1.053	0.622	0.359	0.788	0.962	0.595	0.663	0.689
HCM Control Delay	16.1	101.2	28.3	21.3	43.7	73.1	27.5	33.2	34.4
HCM Lane LOS	C	F	D	C	E	F	D	D	D
HCM 95th-tile Q	0.5	12.9	4.1	1.5	6.1	9.4	3.5	4.2	4.6

Reso A - Exhibit C2 (EIR Technical Appendix)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Volume (veh/h)	1	13	5	3	67	0	13	1	2	0	0	2
Future Volume (Veh/h)	1	13	5	3	67	0	13	1	2	0	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Hourly flow rate (vph)	1	19	7	4	96	0	19	1	3	0	0	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	96			26			132	128	22	132	132	96
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	96			26			132	128	22	132	132	96
tC, single (s)	4.2			4.2			7.2	6.6	6.3	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			100			98	100	100	100	100	100
cM capacity (veh/h)	1461			1550			822	749	1037	821	745	944

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	27	100	23	3
Volume Left	1	4	19	0
Volume Right	7	0	3	3
cSH	1461	1550	841	944
Volume to Capacity	0.00	0.00	0.03	0.00
Queue Length 95th (ft)	0	0	2	0
Control Delay (s)	0.3	0.3	9.4	8.8
Lane LOS	A	A	A	A
Approach Delay (s)	0.3	0.3	9.4	8.8
Approach LOS			A	A

Intersection Summary					
Average Delay	1.8				
Intersection Capacity Utilization	18.7%	ICU Level of Service		A	
Analysis Period (min)	15				

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Vol, veh/h	1	13	5	3	67	0	13	1	2	0	0	2
Future Vol, veh/h	1	13	5	3	67	0	13	1	2	0	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	70	70	70	70	70	70	70	70	70	70	70	70
Heavy Vehicles, %	8	8	8	8	8	8	8	8	8	8	8	8
Mvmt Flow	1	19	7	4	96	0	19	1	3	0	0	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	96	0	0	26	0	0	131	129	23	131	132	96
Stage 1	-	-	-	-	-	-	25	25	-	104	104	-
Stage 2	-	-	-	-	-	-	106	104	-	27	28	-
Critical Hdwy	4.18	-	-	4.18	-	-	7.18	6.58	6.28	7.18	6.58	6.28
Critical Hdwy Stg 1	-	-	-	-	-	-	6.18	5.58	-	6.18	5.58	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.18	5.58	-	6.18	5.58	-
Follow-up Hdwy	2.272	-	-	2.272	-	-	3.572	4.072	3.372	3.572	4.072	3.372
Pot Cap-1 Maneuver	1461	-	-	1550	-	-	828	751	1037	828	748	944
Stage 1	-	-	-	-	-	-	978	863	-	887	798	-
Stage 2	-	-	-	-	-	-	885	798	-	975	860	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1461	-	-	1550	-	-	823	748	1037	822	745	944
Mov Cap-2 Maneuver	-	-	-	-	-	-	823	748	-	822	745	-
Stage 1	-	-	-	-	-	-	977	862	-	886	796	-
Stage 2	-	-	-	-	-	-	880	796	-	970	859	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.3	9.4	8.8
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	839	1461	-	-	1550	-	-	944
HCM Lane V/C Ratio	0.027	0.001	-	-	0.003	-	-	0.003
HCM Control Delay (s)	9.4	7.5	0	-	7.3	0	-	8.8
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Existing AM
8: Riverside Ave & 13th Street — Queues

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1	329	373	393	644	7	22	151	292	297	35
v/c Ratio	0.01	0.57	0.76	0.44	0.59	0.05	0.14	0.56	0.71	0.71	0.07
Control Delay	49.0	38.6	41.8	18.2	4.0	44.2	45.1	16.3	42.1	41.9	0.3
Queue Delay	0.0	0.0	0.2	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.0	38.6	42.0	18.6	4.3	44.2	45.1	16.3	42.1	41.9	0.3
Queue Length 50th (ft)	1	85	182	127	0	4	11	0	149	152	0
Queue Length 95th (ft)	6	146	332	268	44	18	38	51	286	289	0
Internal Link Dist (ft)		346		307			744			674	
Turn Bay Length (ft)	65		125			140		165	150		185
Base Capacity (vph)	106	963	689	1131	1210	382	402	454	574	585	612
Starvation Cap Reductn	0	0	33	329	163	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.34	0.57	0.49	0.62	0.02	0.05	0.33	0.51	0.51	0.06

Intersection Summary

Olsen-Chandler SP — Existing AM
8: Riverside Ave & 13th Street — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	252	28	317	334	547	6	19	128	414	87	30
Future Volume (vph)	1	252	28	317	334	547	6	19	128	414	87	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (prot)	1752	3440		1752	1845	1568	1752	1845	1544	1665	1697	1521
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (perm)	1752	3440		1752	1845	1568	1752	1845	1544	1665	1697	1521
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	1	296	33	373	393	644	7	22	151	487	102	35
RTOR Reduction (vph)	0	7	0	0	0	343	0	0	138	0	0	27
Lane Group Flow (vph)	1	322	0	373	393	301	7	22	13	292	297	8
Confl. Peds. (#/hr)			8						1			5
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	0.8	18.6		24.3	42.1	42.1	7.6	7.6	7.6	21.6	21.6	21.6
Effective Green, g (s)	0.8	18.6		24.3	42.1	42.1	7.6	7.6	7.6	21.6	21.6	21.6
Actuated g/C Ratio	0.01	0.21		0.27	0.47	0.47	0.08	0.08	0.08	0.24	0.24	0.24
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	15	710		472	862	732	147	155	130	399	406	364
v/s Ratio Prot	0.00	0.09		c0.21	c0.21		0.00	c0.01		c0.18	0.18	
v/s Ratio Perm						0.19			0.01			0.01
v/c Ratio	0.07	0.45		0.79	0.46	0.41	0.05	0.14	0.10	0.73	0.73	0.02
Uniform Delay, d1	44.3	31.3		30.5	16.2	15.8	37.9	38.2	38.1	31.6	31.6	26.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	0.5		8.8	0.4	0.4	0.1	0.4	0.3	6.8	6.7	0.0
Delay (s)	46.2	31.8		39.3	16.6	16.2	38.1	38.7	38.4	38.4	38.2	26.2
Level of Service	D	C		D	B	B	D	D	D	D	D	C
Approach Delay (s)		31.8			22.4			38.4			37.6	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	28.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	90.1	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	59.6%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
8: Riverside Ave & 13th Street

Existing AM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	252	28	317	334	547	6	19	128	414	87	30
Future Volume (veh/h)	1	252	28	317	334	547	6	19	128	414	87	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	1	296	33	373	393	644	7	22	151	560	0	35
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	2	706	78	423	852	722	212	223	188	712	0	313
Arrive On Green	0.00	0.22	0.22	0.24	0.46	0.46	0.12	0.12	0.12	0.20	0.00	0.20
Sat Flow, veh/h	1767	3194	353	1767	1856	1572	1767	1856	1569	3534	0	1553
Grp Volume(v), veh/h	1	162	167	373	393	644	7	22	151	560	0	35
Grp Sat Flow(s),veh/h/ln	1767	1763	1784	1767	1856	1572	1767	1856	1569	1767	0	1553
Q Serve(g_s), s	0.0	6.5	6.6	16.8	12.0	31.0	0.3	0.9	7.7	12.4	0.0	1.5
Cycle Q Clear(g_c), s	0.0	6.5	6.6	16.8	12.0	31.0	0.3	0.9	7.7	12.4	0.0	1.5
Prop In Lane	1.00		0.20	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	2	389	394	423	852	722	212	223	188	712	0	313
V/C Ratio(X)	0.41	0.42	0.42	0.88	0.46	0.89	0.03	0.10	0.80	0.79	0.00	0.11
Avail Cap(c_a), veh/h	107	491	497	695	1134	961	385	404	342	1219	0	536
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.2	27.6	27.7	30.3	15.3	20.5	32.1	32.4	35.4	31.3	0.0	26.9
Incr Delay (d2), s/veh	85.0	0.7	0.7	7.5	0.4	8.5	0.1	0.2	7.7	2.0	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	2.8	2.9	7.8	4.8	12.1	0.1	0.4	3.3	5.3	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	126.2	28.3	28.4	37.8	15.7	28.9	32.2	32.6	43.1	33.3	0.0	27.1
LnGrp LOS	F	C	C	D	B	C	C	C	D	C	A	C
Approach Vol, veh/h		330			1410			180			595	
Approach Delay, s/veh		28.7			27.6			41.4			32.9	
Approach LOS		C			C			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	24.3	22.8		21.2	4.6	42.4		14.4				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	32.5	23.0		28.5	5.0	50.5		18.0				
Max Q Clear Time (g_c+I1), s	18.8	8.6		14.4	2.0	33.0		9.7				
Green Ext Time (p_c), s	1.0	1.7		1.9	0.0	4.9		0.3				

Intersection Summary												
HCM 6th Ctrl Delay			30.0									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

Olsen-Chandler SP
9: Paso Robles Street & 13th Street

Existing AM
Queues

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	76	903	56	1216	395	251	14	273	6	9
v/c Ratio	0.40	0.51	0.32	0.70	0.44	0.70	0.03	0.46	0.02	0.02
Control Delay	48.1	16.1	47.4	20.2	6.7	42.7	27.1	7.1	27.0	0.0
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.1	16.4	47.4	20.2	6.7	42.7	27.1	7.1	27.0	0.0
Queue Length 50th (ft)	43	173	32	274	36	135	6	4	3	0
Queue Length 95th (ft)	85	227	67	342	78	200	19	42	12	0
Internal Link Dist (ft)		307		269			836			575
Turn Bay Length (ft)	120		220		145	130		110	95	
Base Capacity (vph)	250	2243	226	2237	1075	578	769	807	575	772
Starvation Cap Reductn	0	611	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.55	0.25	0.54	0.37	0.43	0.02	0.34	0.01	0.01

Intersection Summary

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Existing AM
9: Paso Robles Street & 13th Street — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	676	46	45	973	316	201	11	218	5	0	7
Future Volume (vph)	61	676	46	45	973	316	201	11	218	5	0	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1752	3464		1752	3505	1530	1752	1845	1568	1752	1568	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.75	1.00	1.00	0.75	1.00	
Satd. Flow (perm)	1752	3464		1752	3505	1530	1387	1845	1568	1380	1568	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	76	845	58	56	1216	395	251	14	272	6	0	9
RTOR Reduction (vph)	0	4	0	0	0	138	0	0	195	0	7	0
Lane Group Flow (vph)	76	899	0	56	1216	257	251	14	78	6	2	0
Confl. Peds. (#/hr)			6			1						
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		
Actuated Green, G (s)	6.8	42.1		6.1	41.4	41.4	21.4	21.4	21.4	21.4	21.4	
Effective Green, g (s)	6.8	42.1		6.1	41.4	41.4	21.4	21.4	21.4	21.4	21.4	
Actuated g/C Ratio	0.08	0.51		0.07	0.50	0.50	0.26	0.26	0.26	0.26	0.26	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	143	1754		128	1746	762	357	475	403	355	403	
v/s Ratio Prot	c0.04	0.26		0.03	c0.35			0.01			0.00	
v/s Ratio Perm						0.17	c0.18		0.05	0.00		
v/c Ratio	0.53	0.51		0.44	0.70	0.34	0.70	0.03	0.19	0.02	0.01	
Uniform Delay, d1	36.6	13.7		36.9	16.0	12.6	28.0	23.1	24.1	23.0	22.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.8	0.3		2.4	1.2	0.3	6.2	0.0	0.2	0.0	0.0	
Delay (s)	40.4	13.9		39.2	17.2	12.8	34.1	23.1	24.3	23.0	22.9	
Level of Service	D	B		D	B	B	C	C	C	C	C	
Approach Delay (s)		16.0			16.9			28.9			23.0	
Approach LOS		B			B			C			C	

Intersection Summary				
HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	83.1	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	60.1%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Olsen-Chandler SP — Existing AM
9: Paso Robles Street & 13th Street — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	676	46	45	973	316	201	11	218	5	0	7
Future Volume (veh/h)	61	676	46	45	973	316	201	11	218	5	0	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	76	845	58	56	1216	0	251	14	272	6	0	9
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	105	1660	114	89	1718		437	433	367	364	0	367
Arrive On Green	0.06	0.50	0.50	0.05	0.49	0.00	0.23	0.23	0.23	0.23	0.00	0.23
Sat Flow, veh/h	1767	3346	230	1767	3526	1572	1395	1856	1572	1085	0	1572
Grp Volume(v), veh/h	76	445	458	56	1216	0	251	14	272	6	0	9
Grp Sat Flow(s),veh/h/ln	1767	1763	1813	1767	1763	1572	1395	1856	1572	1085	0	1572
Q Serve(g_s), s	2.6	10.4	10.4	1.9	16.5	0.0	10.4	0.4	9.8	0.3	0.0	0.3
Cycle Q Clear(g_c), s	2.6	10.4	10.4	1.9	16.5	0.0	10.6	0.4	9.8	0.6	0.0	0.3
Prop In Lane	1.00		0.13	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	105	875	900	89	1718		437	433	367	364	0	367
V/C Ratio(X)	0.73	0.51	0.51	0.63	0.71		0.57	0.03	0.74	0.02	0.00	0.02
Avail Cap(c_a), veh/h	303	1476	1517	274	2894		810	930	788	655	0	788
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.3	10.4	10.4	28.5	12.3	0.0	22.2	18.1	21.8	18.4	0.0	18.1
Incr Delay (d2), s/veh	9.2	0.5	0.4	7.2	0.5	0.0	1.2	0.0	3.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	3.5	3.6	0.9	5.6	0.0	3.2	0.1	3.6	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.5	10.9	10.8	35.8	12.8	0.0	23.4	18.2	24.7	18.4	0.0	18.1
LnGrp LOS	D	B	B	D	B		C	B	C	B	A	B
Approach Vol, veh/h		979			1272	A		537			15	
Approach Delay, s/veh		12.9			13.9			24.0			18.2	
Approach LOS		B			B			C			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.6	34.9		18.8	8.1	34.4		18.8				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	9.5	51.3		30.7	10.5	50.3		30.7				
Max Q Clear Time (g_c+I1), s	3.9	12.4		2.6	4.6	18.5		12.6				
Green Ext Time (p_c), s	0.0	7.0		0.0	0.1	11.3		1.7				

Intersection Summary				
HCM 6th Ctrl Delay	15.5			
HCM 6th LOS	B			

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	224	897	70	952	406	211	56	148	637
v/c Ratio	0.59	0.66	0.46	0.80	0.71	0.26	0.13	0.62	0.89dr
Control Delay	53.4	27.2	59.5	36.5	49.8	35.1	2.4	56.7	36.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.4	27.2	59.5	36.5	49.8	35.1	2.4	56.7	36.3
Queue Length 50th (ft)	75	245	46	304	136	61	0	97	153
Queue Length 95th (ft)	113	290	89	348	182	93	2	155	198
Internal Link Dist (ft)		353		673		608			523
Turn Bay Length (ft)	295		235		140		130	225	
Base Capacity (vph)	433	1583	187	1534	711	989	510	330	968
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.57	0.37	0.62	0.57	0.21	0.11	0.45	0.66

Intersection Summary

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	179	471	246	56	674	87	325	169	45	118	173	337
Future Volume (vph)	179	471	246	56	674	87	325	169	45	118	173	337
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.98		1.00	1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	3339		1770	3473		3433	3539	1583	1770	3188	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	3339		1770	3473		3433	3539	1583	1770	3188	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	224	589	308	70	842	109	406	211	56	148	216	421
RTOR Reduction (vph)	0	55	0	0	8	0	0	0	43	0	159	0
Lane Group Flow (vph)	224	842	0	70	944	0	406	211	13	148	478	0
Confl. Peds. (#/hr)			3									
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	11.3	40.3		7.2	36.2		17.1	23.7	23.7	13.8	20.4	
Effective Green, g (s)	11.3	40.3		7.2	36.2		17.1	23.7	23.7	13.8	20.4	
Actuated g/C Ratio	0.11	0.39		0.07	0.35		0.17	0.23	0.23	0.13	0.20	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	376	1306		123	1220		569	814	364	237	631	
v/s Ratio Prot	c0.07	c0.25		0.04	c0.27		c0.12	c0.06		0.08	c0.15	
v/s Ratio Perm									0.01			
v/c Ratio	0.60	0.64		0.57	0.77		0.71	0.26	0.04	0.62	0.89dr	
Uniform Delay, d1	43.7	25.5		46.4	29.7		40.6	32.5	30.8	42.2	39.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.5	1.1		5.9	3.1		4.2	0.2	0.0	5.1	5.2	
Delay (s)	46.2	26.6		52.3	32.9		44.9	32.6	30.8	47.2	44.2	
Level of Service	D	C		D	C		D	C	C	D	D	
Approach Delay (s)		30.5			34.2			39.9			44.7	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	36.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	103.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	66.4%	ICU Level of Service	C	
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
10: River Road/Union Road & Creston Road

Existing AM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	179	471	246	56	674	87	325	169	45	118	173	337
Future Volume (veh/h)	179	471	246	56	674	87	325	169	45	118	173	337
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	224	589	0	70	842	109	406	211	56	148	216	0
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	336	1444		98	1150	149	550	557	248	191	373	
Arrive On Green	0.10	0.41	0.00	0.05	0.36	0.36	0.16	0.16	0.16	0.11	0.11	0.00
Sat Flow, veh/h	3456	3647	0	1781	3159	409	3456	3554	1585	1781	3647	0
Grp Volume(v), veh/h	224	589	0	70	474	477	406	211	56	148	216	0
Grp Sat Flow(s),veh/h/ln	1728	1777	0	1781	1777	1791	1728	1777	1585	1781	1777	0
Q Serve(g_s), s	4.1	7.7	0.0	2.5	15.2	15.2	7.3	3.5	2.0	5.3	3.8	0.0
Cycle Q Clear(g_c), s	4.1	7.7	0.0	2.5	15.2	15.2	7.3	3.5	2.0	5.3	3.8	0.0
Prop In Lane	1.00		0.00	1.00		0.23	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	336	1444		98	647	652	550	557	248	191	373	
V/C Ratio(X)	0.67	0.41		0.72	0.73	0.73	0.74	0.38	0.23	0.77	0.58	
Avail Cap(c_a), veh/h	659	2466		285	1179	1188	1081	1491	665	503	1382	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.6	13.8	0.0	30.5	18.1	18.1	26.3	24.8	24.2	28.5	28.0	0.0
Incr Delay (d2), s/veh	2.3	0.2	0.0	9.3	1.6	1.6	2.0	0.4	0.5	6.5	1.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	2.8	0.0	1.3	5.8	5.8	2.9	1.4	0.7	2.4	1.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.8	14.0	0.0	39.8	19.7	19.7	28.2	25.2	24.6	35.0	29.4	0.0
LnGrp LOS	C	B		D	B	B	C	C	C	C	C	
Approach Vol, veh/h		813	A		1021			673			364	A
Approach Delay, s/veh		18.7			21.1			27.0			31.7	
Approach LOS		B			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.1	31.1	14.9	11.4	10.9	28.4	11.5	14.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	45.5	20.5	25.5	12.5	43.5	18.5	27.5
Max Q Clear Time (g_c+I1), s	4.5	9.7	9.3	5.8	6.1	17.2	7.3	5.5
Green Ext Time (p_c), s	0.1	4.5	1.1	1.1	0.4	6.6	0.3	1.3

Intersection Summary	
HCM 6th Ctrl Delay	23.1
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Olsen-Chandler SP
11: Creston Road & Golden Hill Road

Existing AM
Queues

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	75	405	925	480	105
v/c Ratio	0.31	0.22	0.68	0.57	0.22
Control Delay	39.2	10.0	19.1	29.6	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	39.2	10.0	19.1	29.6	8.7
Queue Length 50th (ft)	26	31	114	79	0
Queue Length 95th (ft)	103	126	332	230	43
Internal Link Dist (ft)		1151	2310	505	
Turn Bay Length (ft)	125			120	
Base Capacity (vph)	329	2930	2245	1431	720
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.23	0.14	0.41	0.34	0.15

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	65	352	447	358	418	91
Future Volume (vph)	65	352	447	358	418	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.93		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1752	3505	3250		3400	1568
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1752	3505	3250		3400	1568
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	75	405	514	411	480	105
RTOR Reduction (vph)	0	0	117	0	0	80
Lane Group Flow (vph)	75	405	808	0	480	25
Confl. Peds. (#/hr)				3		
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	NA		Perm	Perm
Protected Phases	5	2	6			
Permitted Phases					4	4
Actuated Green, G (s)	6.9	37.1	25.7		16.7	16.7
Effective Green, g (s)	6.9	37.1	25.7		16.7	16.7
Actuated g/C Ratio	0.10	0.53	0.37		0.24	0.24
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	171	1849	1188		807	372
v/s Ratio Prot	c0.04	0.12	c0.25			
v/s Ratio Perm					c0.14	0.02
v/c Ratio	0.44	0.22	0.68		0.59	0.07
Uniform Delay, d1	29.9	8.9	18.8		23.8	20.8
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.8	0.1	1.6		1.2	0.1
Delay (s)	31.7	8.9	20.5		25.0	20.8
Level of Service	C	A	C		C	C
Approach Delay (s)		12.5	20.5		24.2	
Approach LOS		B	C		C	

Intersection Summary			
HCM 2000 Control Delay	19.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	70.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	51.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	129	173	121	29	301	228	223	519	172	644
v/c Ratio	0.48	0.31	0.22	0.17	0.46	0.48	0.63	0.60	0.55	0.68
Control Delay	37.5	22.6	5.7	37.9	29.6	8.3	37.9	27.7	37.2	18.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.5	22.6	5.7	37.9	29.6	8.3	37.9	27.7	37.2	18.1
Queue Length 50th (ft)	52	49	0	12	63	0	89	104	69	70
Queue Length 95th (ft)	124	131	36	43	115	57	#214	186	156	148
Internal Link Dist (ft)		1092			186			1440		2310
Turn Bay Length (ft)	150			170		140	230		245	
Base Capacity (vph)	378	790	727	193	1120	644	462	1280	434	1313
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.22	0.17	0.15	0.27	0.35	0.48	0.41	0.40	0.49

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	156	109	26	271	205	201	438	29	155	273	307
Future Volume (vph)	116	156	109	26	271	205	201	438	29	155	273	307
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1845	1534	1752	3505	1535	1752	3469		1752	3184	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1845	1534	1752	3505	1535	1752	3469		1752	3184	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	129	173	121	29	301	228	223	487	32	172	303	341
RTOR Reduction (vph)	0	0	85	0	0	180	0	5	0	0	235	0
Lane Group Flow (vph)	129	173	36	29	301	48	223	514	0	172	409	0
Confl. Peds. (#/hr)			9			9			4			12
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	8.3	20.8	20.8	2.2	14.7	14.7	13.8	16.9		12.2	15.3	
Effective Green, g (s)	8.3	20.8	20.8	2.2	14.7	14.7	13.8	16.9		12.2	15.3	
Actuated g/C Ratio	0.12	0.30	0.30	0.03	0.21	0.21	0.20	0.24		0.17	0.22	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	207	547	455	54	735	321	344	836		304	694	
v/s Ratio Prot	c0.07	0.09		0.02	c0.09		c0.13	c0.15		0.10	0.13	
v/s Ratio Perm			0.02			0.03						
v/c Ratio	0.62	0.32	0.08	0.54	0.41	0.15	0.65	0.61		0.57	0.59	
Uniform Delay, d1	29.4	19.1	17.8	33.4	23.9	22.6	25.9	23.7		26.5	24.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.7	0.3	0.1	9.9	0.4	0.2	4.2	1.3		2.4	1.3	
Delay (s)	35.1	19.5	17.8	43.3	24.3	22.8	30.1	25.0		28.9	25.9	
Level of Service	D	B	B	D	C	C	C	C		C	C	
Approach Delay (s)		23.8			24.7			26.6			26.5	
Approach LOS		C			C			C			C	

Intersection Summary

HCM 2000 Control Delay	25.7	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	70.1	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	60.5%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
12: Creston Road & Niblick Road/Sherwood Road

Existing AM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	116	156	109	26	271	205	201	438	29	155	273	307
Future Volume (veh/h)	116	156	109	26	271	205	201	438	29	155	273	307
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	129	173	121	29	301	228	223	487	32	172	303	341
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	166	506	424	55	739	325	273	1014	66	217	477	420
Arrive On Green	0.09	0.27	0.27	0.03	0.21	0.21	0.15	0.30	0.30	0.12	0.27	0.27
Sat Flow, veh/h	1767	1856	1557	1767	3526	1552	1767	3358	220	1767	1763	1552
Grp Volume(v), veh/h	129	173	121	29	301	228	223	255	264	172	303	341
Grp Sat Flow(s),veh/h/ln	1767	1856	1557	1767	1763	1552	1767	1763	1815	1767	1763	1552
Q Serve(g_s), s	4.7	5.0	4.1	1.1	4.9	9.0	8.1	7.8	7.9	6.3	10.1	13.6
Cycle Q Clear(g_c), s	4.7	5.0	4.1	1.1	4.9	9.0	8.1	7.8	7.9	6.3	10.1	13.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.12	1.00		1.00
Lane Grp Cap(c), veh/h	166	506	424	55	739	325	273	532	548	217	477	420
V/C Ratio(X)	0.78	0.34	0.29	0.53	0.41	0.70	0.82	0.48	0.48	0.79	0.64	0.81
Avail Cap(c_a), veh/h	359	744	624	184	1062	468	439	611	629	413	584	514
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.4	19.4	19.0	31.7	22.7	24.3	27.1	18.9	18.9	28.3	21.3	22.6
Incr Delay (d2), s/veh	7.5	0.4	0.4	7.6	0.4	2.7	6.2	0.7	0.7	6.3	1.6	8.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	2.0	1.4	0.5	1.9	3.2	3.7	3.0	3.1	2.9	4.0	5.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.9	19.8	19.4	39.2	23.0	27.0	33.4	19.6	19.6	34.6	22.9	30.7
LnGrp LOS	D	B	B	D	C	C	C	B	B	C	C	C
Approach Vol, veh/h		423			558			742			816	
Approach Delay, s/veh		24.9			25.5			23.7			28.6	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.7	24.5	6.6	22.6	14.8	22.4	10.7	18.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.5	23.0	6.9	26.6	16.5	22.0	13.5	20.0
Max Q Clear Time (g_c+I1), s	8.3	9.9	3.1	7.0	10.1	15.6	6.7	11.0
Green Ext Time (p_c), s	0.2	2.5	0.0	1.2	0.3	2.1	0.2	1.8

Intersection Summary	
HCM 6th Ctrl Delay	25.9
HCM 6th LOS	C

Olsen-Chandler SP
13: Creston Road & Scott Street

Existing AM
HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	35	47	481	41	51	391
Future Volume (Veh/h)	35	47	481	41	51	391
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	42	56	573	49	61	465
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1184	598			622	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1184	598			622	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	79	89			94	
cM capacity (veh/h)	196	503			959	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	98	622	61	465
Volume Left	42	0	61	0
Volume Right	56	49	0	0
cSH	301	1700	959	1700
Volume to Capacity	0.33	0.37	0.06	0.27
Queue Length 95th (ft)	34	0	5	0
Control Delay (s)	22.7	0.0	9.0	0.0
Lane LOS	C		A	
Approach Delay (s)	22.7	0.0	1.0	
Approach LOS	C			

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	46.0%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	2.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	35	47	481	41	51	391
Future Vol, veh/h	35	47	481	41	51	391
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	42	56	573	49	61	465

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1185	598	0	0	622	0
Stage 1	598	-	-	-	-	-
Stage 2	587	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	209	502	-	-	959	-
Stage 1	549	-	-	-	-	-
Stage 2	556	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	196	502	-	-	959	-
Mov Cap-2 Maneuver	196	-	-	-	-	-
Stage 1	549	-	-	-	-	-
Stage 2	520	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	22.6	0	1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	301	959	-
HCM Lane V/C Ratio	-	-	0.324	0.063	-
HCM Control Delay (s)	-	-	22.6	9	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	1.4	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	92	6	37	7	15	95	27	274	3	33	287	76
Future Volume (Veh/h)	92	6	37	7	15	95	27	274	3	33	287	76
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	110	7	44	8	18	113	32	326	4	39	342	90
Pedestrians		6			2						1	
Lane Width (ft)		12.0			12.0						12.0	
Walking Speed (ft/s)		3.5			3.5						3.5	
Percent Blockage		1			0						0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	939	822	348	862	910	331	438			332		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	939	822	348	862	910	331	438			332		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	40	98	94	97	93	84	97			97		
cM capacity (veh/h)	183	288	691	240	256	709	1115			1225		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	161	139	32	330	39	342	90
Volume Left	110	8	32	0	39	0	0
Volume Right	44	113	0	4	0	0	90
cSH	234	528	1115	1700	1225	1700	1700
Volume to Capacity	0.69	0.26	0.03	0.19	0.03	0.20	0.05
Queue Length 95th (ft)	111	26	2	0	2	0	0
Control Delay (s)	48.7	14.2	8.3	0.0	8.0	0.0	0.0
Lane LOS	E	B	A		A		
Approach Delay (s)	48.7	14.2	0.7		0.7		
Approach LOS	E	B					

Intersection Summary					
Average Delay	9.2				
Intersection Capacity Utilization	42.8%	ICU Level of Service		A	
Analysis Period (min)	15				

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	8.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	92	6	37	7	15	95	27	274	3	33	287	76
Future Vol, veh/h	92	6	37	7	15	95	27	274	3	33	287	76
Conflicting Peds, #/hr	1	0	0	0	0	1	6	0	2	2	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	30	-	-	70	-	60
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	110	7	44	8	18	113	32	326	4	39	342	90

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	885	822	348	885	910	331	438	0	0	332	0	0
Stage 1	426	426	-	394	394	-	-	-	-	-	-	-
Stage 2	459	396	-	491	516	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	266	309	695	266	275	711	1122	-	-	1227	-	-
Stage 1	606	586	-	631	605	-	-	-	-	-	-	-
Stage 2	582	604	-	559	534	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	201	288	691	233	256	709	1116	-	-	1225	-	-
Mov Cap-2 Maneuver	201	288	-	233	256	-	-	-	-	-	-	-
Stage 1	585	564	-	611	586	-	-	-	-	-	-	-
Stage 2	460	585	-	500	514	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	40.8	14.3	0.7	0.7
HCM LOS	E	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1116	-	-	254	526	1225	-	-
HCM Lane V/C Ratio	0.029	-	-	0.633	0.265	0.032	-	-
HCM Control Delay (s)	8.3	-	-	40.8	14.3	8	-	-
HCM Lane LOS	A	-	-	E	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	3.9	1.1	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	20	9	5	134	5	119	4	165	72	156	161	10
Future Volume (vph)	20	9	5	134	5	119	4	165	72	156	161	10
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	24	11	6	158	6	140	5	194	85	184	189	12

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	41	304	199	85	279	107
Volume Left (vph)	24	158	5	0	184	0
Volume Right (vph)	6	140	0	85	0	12
Hadj (s)	0.06	-0.14	0.05	-0.67	0.36	-0.04
Departure Headway (s)	6.3	5.5	6.2	5.4	6.3	5.9
Degree Utilization, x	0.07	0.47	0.34	0.13	0.49	0.17
Capacity (veh/h)	490	609	553	618	546	580
Control Delay (s)	9.8	13.3	11.1	8.0	14.0	9.0
Approach Delay (s)	9.8	13.3	10.2		12.6	
Approach LOS	A	B	B		B	

Intersection Summary				
Delay	12.0			
Level of Service	B			
Intersection Capacity Utilization	47.6%	ICU Level of Service		A
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	12.7
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Vol, veh/h	20	9	5	134	5	119	0	4	165	72	156	161
Future Vol, veh/h	20	9	5	134	5	119	0	4	165	72	156	161
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.92	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	24	11	6	158	6	140	0	5	194	85	184	189
Number of Lanes	0	1	0	0	1	0	0	0	1	1	0	2

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	9.9	13.5	11.2	13.5
HCM LOS	A	B	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	2%	0%	59%	52%	66%	0%
Vol Thru, %	98%	0%	26%	2%	34%	89%
Vol Right, %	0%	100%	15%	46%	0%	11%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	169	72	34	258	237	91
LT Vol	4	0	20	134	156	0
Through Vol	165	0	9	5	81	81
RT Vol	0	72	5	119	0	10
Lane Flow Rate	199	85	40	304	278	106
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.34	0.128	0.071	0.471	0.487	0.174
Departure Headway (Hd)	6.149	5.425	6.376	5.582	6.304	5.891
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	585	659	559	643	570	608
Service Time	3.899	3.174	4.447	3.631	4.051	3.637
HCM Lane V/C Ratio	0.34	0.129	0.072	0.473	0.488	0.174
HCM Control Delay	12.1	9	9.9	13.5	14.9	9.9
HCM Lane LOS	B	A	A	B	B	A
HCM 95th-tile Q	1.5	0.4	0.2	2.5	2.7	0.6

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBR
Lane Configurations	
Traffic Vol, veh/h	10
Future Vol, veh/h	10
Peak Hour Factor	0.85
Heavy Vehicles, %	2
Mvmt Flow	12
Number of Lanes	0

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	111	81	123	129	88	211
Future Volume (Veh/h)	111	81	123	129	88	211
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	129	94	143	150	102	245
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	463	102	347			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	463	102	347			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	72	90	88			
cM capacity (veh/h)	463	930	1201			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	223	143	75	75	102	245
Volume Left	129	143	0	0	0	0
Volume Right	94	0	0	0	0	245
cSH	800	1201	1700	1700	1700	1700
Volume to Capacity	0.28	0.12	0.04	0.04	0.06	0.14
Queue Length 95th (ft)	29	10	0	0	0	0
Control Delay (s)	13.0	8.4	0.0	0.0	0.0	0.0
Lane LOS	B	A				
Approach Delay (s)	13.0	4.1			0.0	
Approach LOS	B					

Intersection Summary			
Average Delay		4.8	
Intersection Capacity Utilization		26.5%	ICU Level of Service A
Analysis Period (min)		15	

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	111	81	123	129	88	211
Future Vol, veh/h	111	81	123	129	88	211
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	145	105	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	129	94	143	150	102	245

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	463	102	347	0	-	0
Stage 1	102	-	-	-	-	-
Stage 2	361	-	-	-	-	-
Critical Hdwy	6.645	6.245	4.145	-	-	-
Critical Hdwy Stg 1	5.445	-	-	-	-	-
Critical Hdwy Stg 2	5.845	-	-	-	-	-
Follow-up Hdwy	3.5285	3.3285	2.2285	-	-	-
Pot Cap-1 Maneuver	540	950	1204	-	-	-
Stage 1	919	-	-	-	-	-
Stage 2	674	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	476	950	1204	-	-	-
Mov Cap-2 Maneuver	476	-	-	-	-	-
Stage 1	810	-	-	-	-	-
Stage 2	674	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.8	4.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1204	-	476	950	-	-
HCM Lane V/C Ratio	0.119	-	0.271	0.099	-	-
HCM Control Delay (s)	8.4	-	15.4	9.2	-	-
HCM Lane LOS	A	-	C	A	-	-
HCM 95th %tile Q(veh)	0.4	-	1.1	0.3	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	0	24	1	83	9	0	0	0	0	324	15
Future Volume (Veh/h)	27	0	24	1	83	9	0	0	0	0	324	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	30	0	26	1	91	10	0	0	0	0	356	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	414	364	364	390	372	0	372			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	414	364	364	390	372	0	372			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	100	96	100	84	99	100			100		
cM capacity (veh/h)	475	564	681	547	558	1085	1186			1623		

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	56	102	372
Volume Left	30	1	0
Volume Right	26	10	16
cSH	553	619	1700
Volume to Capacity	0.10	0.16	0.22
Queue Length 95th (ft)	8	15	0
Control Delay (s)	12.2	12.3	0.0
Lane LOS	B	B	
Approach Delay (s)	12.2	12.3	0.0
Approach LOS	B	B	

Intersection Summary					
Average Delay		3.7			
Intersection Capacity Utilization	34.3%	ICU Level of Service		A	
Analysis Period (min)		15			

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	0	24	1	83	9	0	0	0	0	324	15
Future Vol, veh/h	27	0	24	1	83	9	0	0	0	0	324	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	30	0	26	1	91	10	0	0	0	0	356	16

Major/Minor	Minor2			Minor1						Major2		
Conflicting Flow All	415	364	364	377	372	0				-	-	0
Stage 1	364	364	-	0	0	-				-	-	-
Stage 2	51	0	-	377	372	-				-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22				-	-	-
Critical Hdwy Stg 1	6.12	5.52	-	-	-	-				-	-	-
Critical Hdwy Stg 2	-	-	-	6.12	5.52	-				-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318				-	-	-
Pot Cap-1 Maneuver	548	564	681	580	558	-				0	-	-
Stage 1	655	624	-	-	-	-				0	-	-
Stage 2	-	-	-	644	619	-				0	-	-
Platoon blocked, %											-	-
Mov Cap-1 Maneuver	-	564	681	557	558	-				-	-	-
Mov Cap-2 Maneuver	-	564	-	557	558	-				-	-	-
Stage 1	655	624	-	-	-	-				-	-	-
Stage 2	-	-	-	619	619	-				-	-	-

Approach	EB	WB	SB
HCM Control Delay, s			0
HCM LOS	-	-	

Minor Lane/Major Mvmt	EBLn1	WBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	-	558	-	-	-
HCM Lane V/C Ratio	-	0.165	-	-	-
HCM Control Delay (s)	-	12.7	-	-	-
HCM Lane LOS	-	B	-	-	-
HCM 95th %tile Q(veh)	-	0.6	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	21	337	1045	225	477	77	308	514	319	280
v/c Ratio	0.10	0.69	0.73	0.29	0.44	0.51	0.63	0.31	0.63	0.35
Control Delay	54.6	46.0	34.1	25.9	2.6	71.9	58.1	4.6	56.9	42.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.6	46.0	34.1	25.9	2.6	71.9	58.1	4.6	56.9	42.0
Queue Length 50th (ft)	15	98	347	115	5	60	124	30	125	98
Queue Length 95th (ft)	43	157	473	196	34	122	186	48	187	147
Internal Link Dist (ft)		521		1372			611			680
Turn Bay Length (ft)	115		515		115	165		290	305	
Base Capacity (vph)	314	667	1839	997	1161	187	714	1904	725	1065
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.51	0.57	0.23	0.41	0.41	0.43	0.27	0.44	0.26

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	168	115	878	189	401	65	259	432	268	197	38
Future Volume (vph)	18	168	115	878	189	401	65	259	432	268	197	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.95	0.88	0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3323		3433	1863	1568	1770	3539	2787	3433	3441	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3323		3433	1863	1568	1770	3539	2787	3433	3441	
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	21	200	137	1045	225	477	77	308	514	319	235	45
RTOR Reduction (vph)	0	83	0	0	0	203	0	0	92	0	11	0
Lane Group Flow (vph)	21	254	0	1045	225	274	77	308	422	319	269	0
Confl. Peds. (#/hr)												1
Confl. Bikes (#/hr)						2						
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	14.8	14.8		49.8	49.8	67.5	8.3	18.2	68.0	17.7	27.6	
Effective Green, g (s)	14.8	14.8		49.8	49.8	67.5	8.3	18.2	68.0	17.7	27.6	
Actuated g/C Ratio	0.12	0.12		0.41	0.41	0.56	0.07	0.15	0.56	0.15	0.23	
Clearance Time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	216	406		1412	766	874	121	532	1566	502	784	
v/s Ratio Prot	0.01	c0.08		c0.30	0.12	0.05	0.04	c0.09	0.11	c0.09	0.08	
v/s Ratio Perm						0.13			0.04			
v/c Ratio	0.10	0.62		0.74	0.29	0.31	0.64	0.58	0.27	0.64	0.34	
Uniform Delay, d1	47.2	50.5		30.1	23.8	14.3	54.9	47.8	13.7	48.6	39.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	3.0		2.1	0.2	0.2	10.5	1.5	0.1	2.6	0.3	
Delay (s)	47.4	53.4		32.2	24.0	14.5	65.4	49.4	13.8	51.2	39.4	
Level of Service	D	D		C	C	B	E	D	B	D	D	
Approach Delay (s)		53.1			26.4			30.4			45.7	
Approach LOS		D			C			C			D	

Intersection Summary				
HCM 2000 Control Delay	33.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	121.0	Sum of lost time (s)	20.5	
Intersection Capacity Utilization	65.3%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Existing AM
18: US 101 Ramps/Spring Street & 1st Street/Niblick Road — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	168	115	878	189	401	65	259	432	268	197	38
Future Volume (veh/h)	18	168	115	878	189	401	65	259	432	268	197	38
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	21	200	137	1045	225	477	77	308	514	319	235	45
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	237	275	179	1315	711	785	100	555	1497	413	623	117
Arrive On Green	0.13	0.13	0.13	0.38	0.38	0.38	0.06	0.16	0.16	0.12	0.21	0.21
Sat Flow, veh/h	1781	2061	1344	3456	1870	1564	1781	3554	2790	3456	2983	562
Grp Volume(v), veh/h	21	171	166	1045	225	477	77	308	514	319	138	142
Grp Sat Flow(s),veh/h/ln	1781	1777	1628	1728	1870	1564	1781	1777	1395	1728	1777	1768
Q Serve(g_s), s	1.0	9.0	9.6	26.2	8.3	21.4	4.2	7.8	10.2	8.7	6.5	6.7
Cycle Q Clear(g_c), s	1.0	9.0	9.6	26.2	8.3	21.4	4.2	7.8	10.2	8.7	6.5	6.7
Prop In Lane	1.00		0.83	1.00		1.00	1.00		1.00	1.00		0.32
Lane Grp Cap(c), veh/h	237	237	217	1315	711	785	100	555	1497	413	371	369
V/C Ratio(X)	0.09	0.72	0.76	0.79	0.32	0.61	0.77	0.55	0.34	0.77	0.37	0.38
Avail Cap(c_a), veh/h	373	372	341	2186	1183	1179	223	846	1726	862	644	641
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.0	40.5	40.7	26.8	21.3	17.5	45.4	38.0	12.8	41.6	33.1	33.1
Incr Delay (d2), s/veh	0.2	4.1	5.5	1.1	0.3	0.8	11.9	0.9	0.1	3.1	0.6	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	4.2	4.2	10.3	3.5	7.2	2.1	3.3	6.1	3.9	2.8	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.2	44.6	46.3	27.9	21.5	18.3	57.3	38.8	13.0	44.7	33.7	33.8
LnGrp LOS	D	D	D	C	C	B	E	D	B	D	C	C
Approach Vol, veh/h		358			1747			899			599	
Approach Delay, s/veh		45.0			24.5			25.6			39.6	
Approach LOS		D			C			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	16.3	21.0		17.6	11.2	26.1		42.4				
Change Period (Y+Rc), s	* 4.7	5.8		4.6	5.8	* 5.8		5.4				
Max Green Setting (Gmax), s	* 24	23.2		20.4	12.2	* 35		61.6				
Max Q Clear Time (g_c+I1), s	10.7	12.2		11.6	6.2	8.7		28.2				
Green Ext Time (p_c), s	0.9	3.0		1.4	0.1	1.6		8.9				

Intersection Summary												
HCM 6th Ctrl Delay			29.3									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Olsen-Chandler SP — Existing AM
19: S. River Road & Niblick Road — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	115	595	231	101	1132	571	342	291	426
v/c Ratio	0.52	0.49	0.33	0.55	0.85	0.78	0.59	0.79	0.70
Control Delay	59.3	29.6	5.2	57.9	36.0	48.1	44.1	56.4	40.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.3	29.6	5.2	57.9	36.0	48.1	44.1	56.4	40.0
Queue Length 50th (ft)	40	166	0	67	351	192	114	190	120
Queue Length 95th (ft)	73	242	50	126	475	264	158	#315	170
Internal Link Dist (ft)		1510			1609		962		896
Turn Bay Length (ft)	140			80		150		110	
Base Capacity (vph)	220	1312	732	236	1507	826	898	440	958
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.45	0.32	0.43	0.75	0.69	0.38	0.66	0.44

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
19: S. River Road & Niblick Road

Existing AM
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	518	201	88	764	221	497	260	37	253	237	134
Future Volume (vph)	100	518	201	88	764	221	497	260	37	253	237	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3539	1583	1770	3402		3433	3464		1770	3347	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	3539	1583	1770	3402		3433	3464		1770	3347	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	115	595	231	101	878	254	571	299	43	291	272	154
RTOR Reduction (vph)	0	0	151	0	21	0	0	10	0	0	71	0
Lane Group Flow (vph)	115	595	80	101	1111	0	571	332	0	291	355	0
Confl. Peds. (#/hr)						10			5			
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	6.6	35.5	35.5	10.8	39.7		21.9	16.9		21.5	16.5	
Effective Green, g (s)	6.6	35.5	35.5	10.8	39.7		21.9	16.9		21.5	16.5	
Actuated g/C Ratio	0.06	0.35	0.35	0.11	0.39		0.21	0.16		0.21	0.16	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	220	1223	547	186	1315		732	570		370	537	
v/s Ratio Prot	0.03	0.17		c0.06	c0.33		c0.17	0.10		c0.16	0.11	
v/s Ratio Perm			0.05									
v/c Ratio	0.52	0.49	0.15	0.54	0.84		0.78	0.58		0.79	0.66	
Uniform Delay, d1	46.5	26.4	23.2	43.6	28.7		38.1	39.6		38.4	40.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.2	0.3	0.1	3.2	5.2		5.4	1.5		10.5	3.0	
Delay (s)	48.8	26.7	23.3	46.8	33.8		43.5	41.2		49.0	43.5	
Level of Service	D	C	C	D	C		D	D		D	D	
Approach Delay (s)		28.6			34.9			42.6			45.7	
Approach LOS		C			C			D			D	

Intersection Summary					
HCM 2000 Control Delay	37.2	HCM 2000 Level of Service		D	
HCM 2000 Volume to Capacity ratio	0.83				
Actuated Cycle Length (s)	102.7	Sum of lost time (s)		18.0	
Intersection Capacity Utilization	72.6%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

Olsen-Chandler SP
19: S. River Road & Niblick Road

Existing AM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	518	201	88	764	221	497	260	37	253	237	134
Future Volume (veh/h)	100	518	201	88	764	221	497	260	37	253	237	134
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	115	595	231	101	878	254	571	299	43	291	272	154
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	179	1296	578	129	1046	302	675	564	80	332	380	209
Arrive On Green	0.05	0.36	0.36	0.07	0.39	0.39	0.20	0.18	0.18	0.19	0.17	0.17
Sat Flow, veh/h	3456	3554	1585	1781	2715	784	3456	3119	444	1781	2213	1216
Grp Volume(v), veh/h	115	595	231	101	574	558	571	169	173	291	217	209
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1781	1777	1722	1728	1777	1786	1781	1777	1652
Q Serve(g_s), s	3.0	11.8	5.4	5.1	27.0	27.1	14.7	7.9	8.1	14.6	10.6	11.1
Cycle Q Clear(g_c), s	3.0	11.8	5.4	5.1	27.0	27.1	14.7	7.9	8.1	14.6	10.6	11.1
Prop In Lane	1.00		1.00	1.00		0.46	1.00		0.25	1.00		0.74
Lane Grp Cap(c), veh/h	179	1296	578	129	685	664	675	321	323	332	305	284
V/C Ratio(X)	0.64	0.46	0.40	0.78	0.84	0.84	0.85	0.53	0.54	0.88	0.71	0.74
Avail Cap(c_a), veh/h	244	1439	642	261	854	828	904	501	504	487	523	486
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.8	22.3	6.3	42.0	25.7	25.7	35.7	34.2	34.2	36.4	36.0	36.2
Incr Delay (d2), s/veh	3.8	0.3	0.4	9.7	6.1	6.4	5.7	1.3	1.4	11.7	3.0	3.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	4.7	3.3	2.5	11.7	11.4	6.4	3.4	3.5	7.2	4.7	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.6	22.6	6.8	51.8	31.8	32.1	41.4	35.5	35.6	48.1	39.0	39.9
LnGrp LOS	D	C	A	D	C	C	D	D	D	D	D	D
Approach Vol, veh/h		941			1233			913			717	
Approach Delay, s/veh		21.6			33.6			39.2			43.0	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.2	38.1	22.5	20.3	9.3	40.0	21.7	21.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	13.5	37.3	24.1	27.1	6.5	44.3	25.2	26.0
Max Q Clear Time (g_c+I1), s	7.1	13.8	16.7	13.1	5.0	29.1	16.6	10.1
Green Ext Time (p_c), s	0.1	4.7	1.3	2.0	0.0	6.4	0.6	1.6

Intersection Summary	
HCM 6th Ctrl Delay	33.8
HCM 6th LOS	C

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	156	146	5	258	203	4
v/c Ratio	0.22	0.22	0.01	0.19	0.39	0.01
Control Delay	9.9	3.3	9.2	9.0	12.4	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.9	3.3	9.2	9.0	12.4	7.0
Queue Length 50th (ft)	15	0	1	13	20	0
Queue Length 95th (ft)	72	28	7	53	95	5
Internal Link Dist (ft)	1629			570	669	
Turn Bay Length (ft)			75			50
Base Capacity (vph)	1606	1349	1052	3052	1456	1304
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.11	0.00	0.08	0.14	0.00

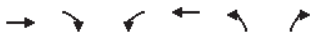
Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	142	133	5	235	185	4
Future Volume (vph)	142	133	5	235	185	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1845	1533	1749	3505	1752	1568
Flt Permitted	1.00	1.00	0.66	1.00	0.95	1.00
Satd. Flow (perm)	1845	1533	1211	3505	1752	1568
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	156	146	5	258	203	4
RTOR Reduction (vph)	0	87	0	0	0	3
Lane Group Flow (vph)	156	59	5	258	203	1
Confl. Peds. (#/hr)		4	4		1	
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Turn Type	NA	Perm	Perm	NA	Perm	Prot
Protected Phases	2			6		8
Permitted Phases		2	6		8	
Actuated Green, G (s)	14.8	14.8	14.8	14.8	11.3	11.3
Effective Green, g (s)	14.8	14.8	14.8	14.8	11.3	11.3
Actuated g/C Ratio	0.40	0.40	0.40	0.40	0.31	0.31
Clearance Time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	740	614	485	1405	536	480
v/s Ratio Prot	c0.08			0.07		0.00
v/s Ratio Perm		0.04	0.00		c0.12	
v/c Ratio	0.21	0.10	0.01	0.18	0.38	0.00
Uniform Delay, d1	7.2	6.9	6.6	7.1	10.0	8.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.0	0.0	0.0	0.2	0.0
Delay (s)	7.3	6.9	6.6	7.2	10.2	8.9
Level of Service	A	A	A	A	B	A
Approach Delay (s)	7.1			7.2	10.2	
Approach LOS	A			A	B	

Intersection Summary				
HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.28		
Actuated Cycle Length (s)	36.9	Sum of lost time (s)	10.8
Intersection Capacity Utilization	28.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	142	133	5	235	185	4
Future Volume (veh/h)	142	133	5	235	185	4
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	156	146	5	258	203	4
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	623	525	575	1184	426	379
Arrive On Green	0.34	0.34	0.34	0.34	0.24	0.24
Sat Flow, veh/h	1856	1563	1065	3618	1767	1572
Grp Volume(v), veh/h	156	146	5	258	203	4
Grp Sat Flow(s),veh/h/ln	1856	1563	1065	1763	1767	1572
Q Serve(g_s), s	1.6	1.7	0.1	1.3	2.5	0.0
Cycle Q Clear(g_c), s	1.6	1.7	1.6	1.3	2.5	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	623	525	575	1184	426	379
V/C Ratio(X)	0.25	0.28	0.01	0.22	0.48	0.01
Avail Cap(c_a), veh/h	2515	2119	1661	4779	2049	1823
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	6.1	6.2	6.7	6.1	8.3	7.4
Incr Delay (d2), s/veh	0.1	0.1	0.0	0.0	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.2	0.0	0.2	0.5	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	6.2	6.3	6.7	6.1	8.6	7.4
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h	302			263	207	
Approach Delay, s/veh	6.3			6.1	8.6	
Approach LOS	A			A	A	

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	14.0				14.0	11.6
Change Period (Y+Rc), s	5.4				5.4	5.4
Max Green Setting (Gmax), s	34.6				34.6	29.6
Max Q Clear Time (g_c+I1), s	3.7				3.6	4.5
Green Ext Time (p_c), s	0.7				1.0	0.3

Intersection Summary			
HCM 6th Ctrl Delay		6.8	
HCM 6th LOS		A	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	14	0	9	1	3	4	10	93	0	0	43	16
Future Volume (vph)	14	0	9	1	3	4	10	93	0	0	43	16
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	17	0	11	1	4	5	12	112	0	0	52	19

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	28	10	124	71
Volume Left (vph)	17	1	12	0
Volume Right (vph)	11	5	0	19
Hadj (s)	0.02	-0.14	0.16	-0.02
Departure Headway (s)	4.4	4.2	4.2	4.1
Degree Utilization, x	0.03	0.01	0.15	0.08
Capacity (veh/h)	786	810	836	865
Control Delay (s)	7.5	7.3	7.9	7.4
Approach Delay (s)	7.5	7.3	7.9	7.4
Approach LOS	A	A	A	A

Intersection Summary					
Delay		7.7			
Level of Service		A			
Intersection Capacity Utilization		23.3%	ICU Level of Service		A
Analysis Period (min)		15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	14	0	9	1	3	4	10	93	0	0	43	16
Future Vol, veh/h	14	0	9	1	3	4	10	93	0	0	43	16
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	8	8	8	8	8	8	8	8	8	8	8	8
Mvmt Flow	17	0	11	1	4	5	12	112	0	0	52	19
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.5	7.3	7.9	7.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	10%	61%	12%	0%
Vol Thru, %	90%	0%	38%	73%
Vol Right, %	0%	39%	50%	27%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	103	23	8	59
LT Vol	10	14	1	0
Through Vol	93	0	3	43
RT Vol	0	9	4	16
Lane Flow Rate	124	28	10	71
Geometry Grp	1	1	1	1
Degree of Util (X)	0.144	0.033	0.011	0.08
Departure Headway (Hd)	4.175	4.266	4.223	4.033
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	858	825	853	883
Service Time	2.21	2.364	2.223	2.082
HCM Lane V/C Ratio	0.145	0.034	0.012	0.08
HCM Control Delay	7.9	7.5	7.3	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.5	0.1	0	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	8	0	0	4	2	0	0	0	0	0	79
Future Volume (Veh/h)	24	8	0	0	4	2	0	0	0	0	0	79
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	34	11	0	0	6	3	0	0	0	0	0	111
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	9			11			198	88	11	86	86	8
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	9			11			198	88	11	86	86	8
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			100	100	100	100	100	90
cM capacity (veh/h)	1598			1595			667	781	1064	880	783	1069

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	45	9	0	0	111
Volume Left	34	0	0	0	0
Volume Right	0	3	0	0	111
cSH	1598	1595	1700	1700	1069
Volume to Capacity	0.02	0.00	0.00	0.00	0.10
Queue Length 95th (ft)	2	0	0	0	9
Control Delay (s)	5.6	0.0	0.0	0.0	8.8
Lane LOS	A		A	A	A
Approach Delay (s)	5.6	0.0	0.0	8.8	
Approach LOS			A	A	

Intersection Summary					
Average Delay			7.4		
Intersection Capacity Utilization			20.0%	ICU Level of Service	A
Analysis Period (min)			15		

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	7.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	24	8	0	0	4	2	0	0	0	0	0	79
Future Vol, veh/h	24	8	0	0	4	2	0	0	0	0	0	79
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	71	71	71	71	71	71	71	71	71
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	34	11	0	0	6	3	0	0	0	0	0	111

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	9	0	0	11	0	0	142	88	11	87	87	8
Stage 1	-	-	-	-	-	-	79	79	-	8	8	-
Stage 2	-	-	-	-	-	-	63	9	-	79	79	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	1598	-	-	1595	-	-	823	798	1064	894	799	1068
Stage 1	-	-	-	-	-	-	925	825	-	1008	885	-
Stage 2	-	-	-	-	-	-	943	884	-	925	825	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1598	-	-	1595	-	-	725	781	1064	880	782	1068
Mov Cap-2 Maneuver	-	-	-	-	-	-	725	781	-	880	782	-
Stage 1	-	-	-	-	-	-	906	808	-	987	885	-
Stage 2	-	-	-	-	-	-	845	884	-	906	808	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	5.5	0	0	8.8
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1598	-	-	1595	-	-	-	1068
HCM Lane V/C Ratio	-	0.021	-	-	-	-	-	-	0.104
HCM Control Delay (s)	0	7.3	0	-	0	-	-	0	8.8
HCM Lane LOS	A	A	A	-	A	-	-	A	A
HCM 95th %tile Q(veh)	-	0.1	-	-	0	-	-	-	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	18	60	5	1	6
Future Volume (Veh/h)	3	18	60	5	1	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63
Hourly flow rate (vph)	5	29	95	8	2	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	103				138	99
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	103				138	99
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1483				850	954

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	34	103	12
Volume Left	5	0	2
Volume Right	0	8	10
cSH	1483	1700	935
Volume to Capacity	0.00	0.06	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	1.1	0.0	8.9
Lane LOS	A		A
Approach Delay (s)	1.1	0.0	8.9
Approach LOS			A

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	13.5%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	18	60	5	1	6
Future Vol, veh/h	3	18	60	5	1	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	63	63	63	63	63	63
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	5	29	95	8	2	10

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	103	0	-	0	138	99
Stage 1	-	-	-	-	99	-
Stage 2	-	-	-	-	39	-
Critical Hdwy	4.13	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.227	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	1483	-	-	-	853	954
Stage 1	-	-	-	-	922	-
Stage 2	-	-	-	-	981	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1483	-	-	-	850	954
Mov Cap-2 Maneuver	-	-	-	-	850	-
Stage 1	-	-	-	-	919	-
Stage 2	-	-	-	-	981	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1483	-	-	-	938
HCM Lane V/C Ratio	0.003	-	-	-	0.012
HCM Control Delay (s)	7.4	0	-	-	8.9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	213	982	1077	82	75	196
v/c Ratio	0.57	0.30	0.70	0.11	0.31	0.33
Control Delay	35.8	0.2	20.2	4.0	38.7	12.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.8	0.2	20.2	4.0	38.7	12.1
Queue Length 50th (ft)	91	0	207	0	33	35
Queue Length 95th (ft)	197	0	362	25	90	97
Internal Link Dist (ft)		1017	748		574	
Turn Bay Length (ft)	345			330	450	
Base Capacity (vph)	716	3312	3228	1447	716	1246
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.30	0.33	0.06	0.10	0.16

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	211	972	1066	81	74	194
Future Volume (vph)	211	972	1066	81	74	194
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0	7.3	7.3	4.2	3.7
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1656	3312	3312	1482	1656	1482
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1656	3312	3312	1482	1656	1482
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	213	982	1077	82	75	196
RTOR Reduction (vph)	0	0	0	44	0	48
Lane Group Flow (vph)	213	982	1077	38	75	148
Heavy Vehicles (%)	9%	9%	9%	9%	9%	9%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	8	Free!	6		7!	4
Permitted Phases				6		4
Actuated Green, G (s)	17.1	75.5	35.2	35.2	8.2	29.3
Effective Green, g (s)	17.1	75.5	35.2	35.2	8.2	29.3
Actuated g/C Ratio	0.23	1.00	0.47	0.47	0.11	0.39
Clearance Time (s)	3.5		7.3	7.3	4.2	3.7
Vehicle Extension (s)	3.0		4.0	4.0	3.5	3.0
Lane Grp Cap (vph)	375	3312	1544	690	179	575
v/s Ratio Prot	c0.13	0.30	c0.33		0.05	0.10
v/s Ratio Perm				0.03		
v/c Ratio	0.57	0.30	0.70	0.06	0.42	0.26
Uniform Delay, d1	25.9	0.0	15.9	11.0	31.4	15.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.0	0.2	1.5	0.0	1.9	0.2
Delay (s)	27.9	0.2	17.4	11.1	33.3	15.9
Level of Service	C	A	B	B	C	B
Approach Delay (s)		5.2	17.0		20.7	
Approach LOS		A	B		C	

Intersection Summary				
HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	75.5	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	60.7%	ICU Level of Service	B	
Analysis Period (min)	15			

! Phase conflict between lane groups.
c Critical Lane Group

HCM 6th Edition methodology cannot be performed with phasing conflicts.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	179	811	220	49	740	115	213	231	179	258	294
v/c Ratio	0.45	0.67	0.33	0.16	0.73	0.22	0.49	0.30	0.45	0.67	0.54
Control Delay	46.3	31.3	5.1	46.5	35.3	6.6	45.6	30.8	46.3	45.5	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.3	31.3	5.1	46.5	35.3	6.6	45.6	30.8	46.3	45.5	9.6
Queue Length 50th (ft)	51	219	0	13	203	0	60	54	51	140	8
Queue Length 95th (ft)	108	371	54	39	345	42	125	111	108	281	89
Internal Link Dist (ft)		1323			2509			853		451	
Turn Bay Length (ft)	225		485	125		390	160		140		
Base Capacity (vph)	647	2579	1189	647	2579	1164	718	1478	718	799	831
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.31	0.19	0.08	0.29	0.10	0.30	0.16	0.25	0.32	0.35

Intersection Summary

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Existing PM
2: Golden Hill Road & SR 46 E — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	174	787	213	48	718	112	207	179	45	174	250	285
Future Volume (vph)	174	787	213	48	718	112	207	179	45	174	250	285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3273	3374	1489	3273	3374	1489	3273	3264		3273	1776	1509
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3273	3374	1489	3273	3374	1489	3273	3264		3273	1776	1509
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	179	811	220	49	740	115	213	185	46	179	258	294
RTOR Reduction (vph)	0	0	141	0	0	79	0	13	0	0	0	217
Lane Group Flow (vph)	179	811	79	49	740	36	213	218	0	179	258	77
Confl. Peds. (#/hr)			1			1			2			
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	11.6	34.1	34.1	7.4	29.9	29.9	12.7	21.8		11.6	20.7	20.7
Effective Green, g (s)	11.6	34.1	34.1	7.4	29.9	29.9	12.7	21.8		11.6	20.7	20.7
Actuated g/C Ratio	0.12	0.36	0.36	0.08	0.31	0.31	0.13	0.23		0.12	0.22	0.22
Clearance Time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	397	1204	531	253	1056	466	435	745		397	384	327
v/s Ratio Prot	0.05	c0.24		0.01	c0.22		c0.07	0.07		0.05	c0.15	
v/s Ratio Perm			0.05			0.02						0.05
v/c Ratio	0.45	0.67	0.15	0.19	0.70	0.08	0.49	0.29		0.45	0.67	0.24
Uniform Delay, d1	39.0	26.0	20.8	41.3	28.9	23.1	38.4	30.5		39.0	34.3	30.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.8	1.5	0.1	0.1	2.1	0.1	0.9	0.2		0.8	4.6	0.4
Delay (s)	39.8	27.5	21.0	41.4	31.0	23.2	39.3	30.7		39.8	38.9	31.2
Level of Service	D	C	C	D	C	C	D	C		D	D	C
Approach Delay (s)		28.1			30.6			34.8			36.0	
Approach LOS		C			C			C			D	

Intersection Summary				
HCM 2000 Control Delay	31.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	95.5	Sum of lost time (s)	20.6	
Intersection Capacity Utilization	61.3%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Olsen-Chandler SP — Existing PM
2: Golden Hill Road & SR 46 E — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	174	787	213	48	718	112	207	179	45	174	250	285
Future Volume (veh/h)	174	787	213	48	718	112	207	179	45	174	250	285
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	179	811	220	49	740	115	213	185	46	179	258	294
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	271	1099	490	112	1082	482	313	685	166	273	431	365
Arrive On Green	0.08	0.32	0.32	0.03	0.32	0.32	0.09	0.25	0.25	0.08	0.24	0.24
Sat Flow, veh/h	3319	3413	1521	3319	3413	1521	3319	2722	660	3319	1796	1522
Grp Volume(v), veh/h	179	811	220	49	740	115	213	114	117	179	258	294
Grp Sat Flow(s),veh/h/ln	1659	1706	1521	1659	1706	1521	1659	1706	1676	1659	1796	1522
Q Serve(g_s), s	4.0	16.3	5.7	1.1	14.6	4.3	4.8	4.1	4.3	4.0	9.8	14.0
Cycle Q Clear(g_c), s	4.0	16.3	5.7	1.1	14.6	4.3	4.8	4.1	4.3	4.0	9.8	14.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.39	1.00		1.00
Lane Grp Cap(c), veh/h	271	1099	490	112	1082	482	313	429	422	273	431	365
V/C Ratio(X)	0.66	0.74	0.45	0.44	0.68	0.24	0.68	0.27	0.28	0.66	0.60	0.81
Avail Cap(c_a), veh/h	776	3102	1382	776	3102	1382	862	909	892	862	956	810
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.3	23.2	8.6	36.5	22.9	19.4	33.8	23.1	23.2	34.3	26.0	27.6
Incr Delay (d2), s/veh	2.7	1.0	0.6	1.0	0.8	0.3	2.6	0.3	0.4	2.7	1.3	4.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	5.7	2.8	0.4	5.1	1.4	1.9	1.6	1.6	1.6	4.1	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.1	24.2	9.2	37.5	23.7	19.7	36.4	23.4	23.5	36.9	27.3	31.8
LnGrp LOS	D	C	A	D	C	B	D	C	C	D	C	C
Approach Vol, veh/h		1210			904			444			731	
Approach Delay, s/veh		23.4			23.9			29.7			31.5	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.9	32.1	11.3	23.8	10.3	31.7	10.3	24.7
Change Period (Y+Rc), s	7.3	* 7.3	4.0	5.3	4.0	7.3	4.0	5.3
Max Green Setting (Gmax), s	18.0	* 70	20.0	41.0	18.0	70.0	20.0	41.0
Max Q Clear Time (g_c+I1), s	3.1	18.3	6.8	16.0	6.0	16.6	6.0	6.3
Green Ext Time (p_c), s	0.0	6.5	0.5	2.4	0.4	5.4	0.4	1.3

Intersection Summary	
HCM 6th Ctrl Delay	26.2
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	935	62	282	884	0	9	0	294	0	0	0
Future Volume (Veh/h)	0	935	62	282	884	0	9	0	294	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	964	64	291	911	0	9	0	303	0	0	0
Pedestrians											1	
Lane Width (ft)											12.0	
Walking Speed (ft/s)											3.5	
Percent Blockage											0	
Right turn flare (veh)									1			1
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	912			1028			2034	2490	514	1976	2522	456
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	912			1028			2034	2490	514	1976	2522	456
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			55			55	100	38	100	100	100
cM capacity (veh/h)	712			642			20	15	493	9	14	537

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	643	385	291	607	304	312	0
Volume Left	0	0	0	291	0	0	9	0
Volume Right	0	0	64	0	0	0	303	0
cSH	1700	1700	1700	642	1700	1700	401	1700
Volume to Capacity	0.00	0.38	0.23	0.45	0.36	0.18	0.78	0.00
Queue Length 95th (ft)	0	0	0	59	0	0	165	0
Control Delay (s)	0.0	0.0	0.0	15.2	0.0	0.0	39.2	0.0
Lane LOS				C			E	A
Approach Delay (s)	0.0			3.7			39.2	0.0
Approach LOS							E	A

Intersection Summary					
Average Delay	6.5				
Intersection Capacity Utilization	56.8%	ICU Level of Service		B	
Analysis Period (min)	15				

Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	935	62	282	884	0	9	0	294	0	0	0
Future Vol, veh/h	0	935	62	282	884	0	9	0	294	0	0	0
Conflicting Peds, #/hr	1	0	0	0	0	1	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	340	-	-	195	-	-	-	-	25	-	-	25
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	0	964	64	291	911	0	9	0	303	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	912	0	0	1028	0	0	2034	2490	514	1976	2522	457
Stage 1	-	-	-	-	-	-	996	996	-	1494	1494	-
Stage 2	-	-	-	-	-	-	1038	1494	-	482	1028	-
Critical Hdwy	4.24	-	-	4.24	-	-	7.64	6.64	7.04	7.64	6.64	7.04
Critical Hdwy Stg 1	-	-	-	-	-	-	6.64	5.64	-	6.64	5.64	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.64	5.64	-	6.64	5.64	-
Follow-up Hdwy	2.27	-	-	2.27	-	-	3.57	4.07	3.37	3.57	4.07	3.37
Pot Cap-1 Maneuver	712	-	-	642	-	-	31	27	493	35	26	537
Stage 1	-	-	-	-	-	-	253	310	-	123	176	-
Stage 2	-	-	-	-	-	-	238	176	-	521	299	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	711	-	-	642	-	-	20	15	493	9	14	536
Mov Cap-2 Maneuver	-	-	-	-	-	-	20	15	-	9	14	-
Stage 1	-	-	-	-	-	-	253	310	-	123	96	-
Stage 2	-	-	-	-	-	-	130	96	-	201	299	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3.7	31.3	0
HCM LOS			D	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	20	493	711	-	-	642	-	-	-	-
HCM Lane V/C Ratio	0.464	0.615	-	-	-	0.453	-	-	-	-
HCM Control Delay (s)	292.7	23.3	0	-	-	15.2	-	-	0	0
HCM Lane LOS	F	C	A	-	-	C	-	-	A	A
HCM 95th %tile Q(veh)	1.3	4.1	0	-	-	2.4	-	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	216	845	829	12	10	326
Future Volume (Veh/h)	216	845	829	12	10	326
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	230	899	882	13	11	347
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	895				1792	441
vC1, stage 1 conf vol					882	
vC2, stage 2 conf vol					910	
vCu, unblocked vol	895				1792	441
tC, single (s)	4.3				7.0	7.1
tC, 2 stage (s)					6.0	
tF (s)	2.3				3.6	3.4
p0 queue free %	67				94	36
cM capacity (veh/h)	706				188	543

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	230	450	450	441	441	13	358
Volume Left	230	0	0	0	0	0	11
Volume Right	0	0	0	0	0	13	347
cSH	706	1700	1700	1700	1700	1700	560
Volume to Capacity	0.33	0.26	0.26	0.26	0.26	0.01	0.64
Queue Length 95th (ft)	35	0	0	0	0	0	113
Control Delay (s)	12.5	0.0	0.0	0.0	0.0	0.0	22.7
Lane LOS	B						C
Approach Delay (s)	2.6			0.0			22.7
Approach LOS							C

Intersection Summary				
Average Delay		4.6		
Intersection Capacity Utilization		49.8%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection	
Int Delay, s/veh	4.6

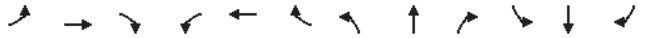
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	216	845	829	12	10	326
Future Vol, veh/h	216	845	829	12	10	326
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	580	-	-	165	0	25
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	230	899	882	13	11	347

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	895	0	-	0	1792	441
Stage 1	-	-	-	-	882	-
Stage 2	-	-	-	-	910	-
Critical Hdwy	4.3	-	-	-	7	7.1
Critical Hdwy Stg 1	-	-	-	-	6	-
Critical Hdwy Stg 2	-	-	-	-	6	-
Follow-up Hdwy	2.3	-	-	-	3.6	3.4
Pot Cap-1 Maneuver	706	-	-	-	66	543
Stage 1	-	-	-	-	346	-
Stage 2	-	-	-	-	334	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	706	-	-	-	44	543
Mov Cap-2 Maneuver	-	-	-	-	184	-
Stage 1	-	-	-	-	233	-
Stage 2	-	-	-	-	334	-

Approach	EB	WB	SB
HCM Control Delay, s	2.6	0	22.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	706	-	-	-	184	543
HCM Lane V/C Ratio	0.325	-	-	-	0.058	0.639
HCM Control Delay (s)	12.5	-	-	-	25.8	22.6
HCM Lane LOS	B	-	-	-	D	C
HCM 95th %tile Q(veh)	1.4	-	-	-	0.2	4.5

Reso A - Exhibit C2 (EIR Technical Appendix)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	890	10	1	835	0	17	0	4	0	0	1
Future Volume (Veh/h)	0	890	10	1	835	0	17	0	4	0	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	918	10	1	861	0	18	0	4	0	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									1			
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	861			928			1352	1781	459	1324	1791	430
vC1, stage 1 conf vol							918	918		863	863	
vC2, stage 2 conf vol							434	863		461	928	
vCu, unblocked vol	861			928			1352	1781	459	1324	1791	430
tC, single (s)	4.3			4.3			7.7	6.7	7.1	7.7	6.7	7.1
tC, 2 stage (s)							6.7	5.7		6.7	5.7	
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			100			93	100	99	100	100	100
cM capacity (veh/h)	716			674			250	243	523	264	240	546

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	459	459	10	1	574	287	22	1
Volume Left	0	0	0	0	1	0	0	18	0
Volume Right	0	0	0	10	0	0	0	4	1
cSH	1700	1700	1700	1700	674	1700	1700	305	546
Volume to Capacity	0.00	0.27	0.27	0.01	0.00	0.34	0.17	0.07	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	0	6	0
Control Delay (s)	0.0	0.0	0.0	0.0	10.4	0.0	0.0	19.0	11.6
Lane LOS					B			C	B
Approach Delay (s)	0.0				0.0			19.0	11.6
Approach LOS								C	B

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		41.3%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	890	10	1	835	0	17	0	4	0	0	1
Future Vol, veh/h	0	890	10	1	835	0	17	0	4	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	275	305	-	-	-	-	25	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	12	12	12	12	12	12	12	12	12	12	12	12
Mvmt Flow	0	918	10	1	861	0	18	0	4	0	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	861	0	0	928	0	0	1351	1781	459	1322	1791	431
Stage 1	-	-	-	-	-	-	918	918	-	863	863	-
Stage 2	-	-	-	-	-	-	433	863	-	459	928	-
Critical Hdwy	4.34	-	-	4.34	-	-	7.74	6.74	7.14	7.74	6.74	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	6.74	5.74	-	6.74	5.74	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.74	5.74	-	6.74	5.74	-
Follow-up Hdwy	2.32	-	-	2.32	-	-	3.62	4.12	3.42	3.62	4.12	3.42
Pot Cap-1 Maneuver	716	-	-	674	-	-	100	73	523	105	72	546
Stage 1	-	-	-	-	-	-	273	327	-	296	347	-
Stage 2	-	-	-	-	-	-	545	347	-	526	323	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	716	-	-	674	-	-	100	73	523	104	72	546
Mov Cap-2 Maneuver	-	-	-	-	-	-	243	236	-	258	234	-
Stage 1	-	-	-	-	-	-	273	327	-	296	347	-
Stage 2	-	-	-	-	-	-	543	347	-	522	323	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	19.3	11.6
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	243	523	716	-	-	674	-	-	546
HCM Lane V/C Ratio	0.072	0.008	-	-	-	0.002	-	-	0.002
HCM Control Delay (s)	21	11.9	0	-	-	10.3	-	-	11.6
HCM Lane LOS	C	B	A	-	-	B	-	-	B
HCM 95th %tile Q(veh)	0.2	0	0	-	-	0	-	-	0

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.
Channelized right turn lanes are not counted.

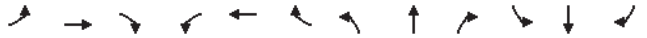
Intersection	
Intersection Delay, s/veh	50.5
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	63	199	61	255	185	97	49	209	243	29	340	90
Future Vol, veh/h	63	199	61	255	185	97	49	209	243	29	340	90
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	68	214	66	274	199	104	53	225	261	31	366	97
Number of Lanes	1	1	0	1	1	0	1	1	1	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	3	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	2	2	2
HCM Control Delay	55.8	62.5	37	47.5
HCM LOS	F	F	E	E

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	100%	0%	15%	0%
Vol Thru, %	0%	100%	0%	0%	77%	0%	66%	85%	65%
Vol Right, %	0%	0%	100%	0%	23%	0%	34%	0%	35%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	49	209	243	63	260	255	282	199	260
LT Vol	49	0	0	63	0	255	0	29	0
Through Vol	0	209	0	0	199	0	185	170	170
RT Vol	0	0	243	0	61	0	97	0	90
Lane Flow Rate	53	225	261	68	280	274	303	214	280
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.173	0.705	0.766	0.232	0.902	0.884	0.912	0.682	0.866
Departure Headway (Hd)	11.815	11.289	10.553	12.316	11.619	11.602	10.827	11.479	11.145
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	303	319	342	291	310	313	334	315	324
Service Time	9.598	9.072	8.336	10.111	9.414	9.39	8.614	9.266	8.933
HCM Lane V/C Ratio	0.175	0.705	0.763	0.234	0.903	0.875	0.907	0.679	0.864
HCM Control Delay	17.1	37.2	40.9	18.8	64.8	61.3	63.6	35.8	56.5
HCM Lane LOS	C	E	E	C	F	F	F	E	F
HCM 95th-tile Q	0.6	5	6.1	0.9	8.5	8.1	9	4.7	7.9

Reso A - Exhibit C2 (EIR Technical Appendix)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Volume (veh/h)	1	78	10	2	57	0	10	1	1	0	0	0
Future Volume (Veh/h)	1	78	10	2	57	0	10	1	1	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	1	92	12	2	67	0	12	1	1	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	67			104			171	171	98	172	177	67
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	67			104			171	171	98	172	177	67
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	100	100	100	100	100
cM capacity (veh/h)	1522			1475			787	717	953	783	712	991

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	105	69	14	0
Volume Left	1	2	12	0
Volume Right	12	0	1	0
cSH	1522	1475	791	1700
Volume to Capacity	0.00	0.00	0.02	0.00
Queue Length 95th (ft)	0	0	1	0
Control Delay (s)	0.1	0.2	9.6	0.0
Lane LOS	A	A	A	A
Approach Delay (s)	0.1	0.2	9.6	0.0
Approach LOS			A	A

Intersection Summary				
Average Delay			0.8	
Intersection Capacity Utilization			15.1%	ICU Level of Service
Analysis Period (min)			15	

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Vol, veh/h	1	78	10	2	57	0	10	1	1	0	0	0
Future Vol, veh/h	1	78	10	2	57	0	10	1	1	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	1	92	12	2	67	0	12	1	1	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	67	0	0	104	0	0	171	171	98	172	177	67
Stage 1	-	-	-	-	-	-	100	100	-	71	71	-
Stage 2	-	-	-	-	-	-	71	71	-	101	106	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	1522	-	-	1475	-	-	788	718	953	787	713	991
Stage 1	-	-	-	-	-	-	901	808	-	934	832	-
Stage 2	-	-	-	-	-	-	934	832	-	900	804	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1522	-	-	1475	-	-	786	717	953	784	712	991
Mov Cap-2 Maneuver	-	-	-	-	-	-	786	717	-	784	712	-
Stage 1	-	-	-	-	-	-	900	807	-	933	831	-
Stage 2	-	-	-	-	-	-	933	831	-	897	803	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.3	9.6	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	791	1522	-	-	1475	-	-	-
HCM Lane V/C Ratio	0.018	0.001	-	-	0.002	-	-	-
HCM Control Delay (s)	9.6	7.4	0	-	7.4	0	-	0
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	16	431	255	412	537	6	39	281	313	316	91
v/c Ratio	0.14	0.62	0.67	0.51	0.55	0.03	0.21	0.68	0.70	0.69	0.18
Control Delay	50.5	37.2	43.2	23.3	4.5	42.3	43.8	14.7	39.4	39.0	2.4
Queue Delay	0.0	0.0	0.0	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.5	37.2	43.3	23.7	4.7	42.3	43.8	14.7	39.4	39.0	2.4
Queue Length 50th (ft)	8	106	121	138	0	3	19	0	149	150	0
Queue Length 95th (ft)	36	207	266	342	70	17	60	81	328	329	13
Internal Link Dist (ft)		346		307			744			674	
Turn Bay Length (ft)	65		125			140		165	150		185
Base Capacity (vph)	118	1089	595	1080	1122	415	437	587	693	704	716
Starvation Cap Reductn	0	0	9	270	132	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.40	0.44	0.51	0.54	0.01	0.09	0.48	0.45	0.45	0.13

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	374	31	240	387	505	6	37	264	508	84	86
Future Volume (vph)	15	374	31	240	387	505	6	37	264	508	84	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (prot)	1787	3526		1787	1881	1558	1787	1881	1599	1698	1725	1561
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (perm)	1787	3526		1787	1881	1558	1787	1881	1599	1698	1725	1561
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	16	398	33	255	412	537	6	39	281	540	89	91
RTOR Reduction (vph)	0	5	0	0	0	312	0	0	253	0	0	68
Lane Group Flow (vph)	16	426	0	255	412	225	6	39	28	313	316	23
Confl. Peds. (#/hr)			4			2						2
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	1.7	20.2		18.0	36.5	36.5	8.6	8.6	8.6	22.5	22.5	22.5
Effective Green, g (s)	1.7	20.2		18.0	36.5	36.5	8.6	8.6	8.6	22.5	22.5	22.5
Actuated g/C Ratio	0.02	0.23		0.21	0.42	0.42	0.10	0.10	0.10	0.26	0.26	0.26
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	34	815		368	786	651	176	185	157	437	444	402
v/s Ratio Prot	0.01	0.12		c0.14	c0.22		0.00	c0.02		c0.18	0.18	
v/s Ratio Perm						0.14			0.02			0.02
v/c Ratio	0.47	0.52		0.69	0.52	0.34	0.03	0.21	0.18	0.72	0.71	0.06
Uniform Delay, d1	42.4	29.3		32.1	18.9	17.3	35.6	36.2	36.1	29.5	29.5	24.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.9	0.6		5.6	0.6	0.3	0.1	0.6	0.5	5.5	5.3	0.1
Delay (s)	52.3	29.9		37.7	19.6	17.6	35.7	36.8	36.6	35.0	34.8	24.5
Level of Service	D	C		D	B	B	D	D	D	D	C	C
Approach Delay (s)		30.7			22.5			36.6			33.6	
Approach LOS		C			C			D			C	

Intersection Summary				
HCM 2000 Control Delay	28.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	87.3	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	59.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	374	31	240	387	505	6	37	264	508	84	86
Future Volume (veh/h)	15	374	31	240	387	505	6	37	264	508	84	86
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	16	398	33	255	412	537	6	39	281	604	0	91
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	33	804	66	297	731	604	348	366	310	745	0	330
Arrive On Green	0.02	0.24	0.24	0.17	0.39	0.39	0.19	0.19	0.19	0.21	0.00	0.21
Sat Flow, veh/h	1795	3347	276	1795	1885	1559	1795	1885	1598	3591	0	1590
Grp Volume(v), veh/h	16	212	219	255	412	537	6	39	281	604	0	91
Grp Sat Flow(s),veh/h/ln	1795	1791	1833	1795	1885	1559	1795	1885	1598	1795	0	1590
Q Serve(g_s), s	0.8	9.5	9.6	12.9	16.0	30.0	0.3	1.6	16.1	15.0	0.0	4.5
Cycle Q Clear(g_c), s	0.8	9.5	9.6	12.9	16.0	30.0	0.3	1.6	16.1	15.0	0.0	4.5
Prop In Lane	1.00		0.15	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	33	430	440	297	731	604	348	366	310	745	0	330
V/C Ratio(X)	0.49	0.49	0.50	0.86	0.56	0.89	0.02	0.11	0.91	0.81	0.00	0.28
Avail Cap(c_a), veh/h	102	470	481	510	923	763	356	374	317	1250	0	554
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	45.4	30.6	30.6	37.9	22.4	26.7	30.4	31.0	36.8	35.2	0.0	31.1
Incr Delay (d2), s/veh	10.9	0.9	0.9	7.2	0.7	10.6	0.0	0.1	27.9	2.2	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	4.2	4.3	6.2	7.0	12.4	0.1	0.7	8.5	6.6	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.3	31.4	31.5	45.0	23.1	37.3	30.4	31.1	64.6	37.4	0.0	31.5
LnGrp LOS	E	C	C	D	C	D	C	C	E	D	A	C
Approach Vol, veh/h		447			1204			326			695	
Approach Delay, s/veh		32.3			34.1			60.0			36.7	
Approach LOS		C			C			E			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	19.9	26.9		23.9	6.2	40.7		22.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	26.5	24.5		32.5	5.3	45.7		18.5				
Max Q Clear Time (g_c+I1), s	14.9	11.6		17.0	2.8	32.0		18.1				
Green Ext Time (p_c), s	0.6	2.2		2.3	0.0	4.1		0.1				

Intersection Summary			
HCM 6th Ctrl Delay			37.6
HCM 6th LOS			D

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	89	1129	20	912	242	263	30	438	8	26
v/c Ratio	0.38	0.62	0.13	0.63	0.32	0.62	0.05	0.73	0.02	0.04
Control Delay	41.3	16.4	44.5	21.8	6.5	31.3	21.2	23.6	21.3	0.1
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.3	16.7	44.5	21.8	6.5	31.3	21.2	23.6	21.3	0.1
Queue Length 50th (ft)	38	150	9	173	13	103	10	112	3	0
Queue Length 95th (ft)	107	381	38	326	72	221	33	268	14	0
Internal Link Dist (ft)		307		269			836			575
Turn Bay Length (ft)	120		220		145	130		110	95	
Base Capacity (vph)	351	2454	154	2213	1042	805	1088	993	803	1017
Starvation Cap Reductn	0	570	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.60	0.13	0.41	0.23	0.33	0.03	0.44	0.01	0.03

Intersection Summary

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Existing PM
9: Paso Robles Street & 13th Street — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	1020	30	19	848	225	245	28	407	7	0	24
Future Volume (vph)	83	1020	30	19	848	225	245	28	407	7	0	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	3556		1787	3574	1564	1787	1881	1599	1787	1599	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.74	1.00	1.00	0.74	1.00	
Satd. Flow (perm)	1787	3556		1787	3574	1564	1393	1881	1599	1388	1599	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	89	1097	32	20	912	242	263	30	438	8	0	26
RTOR Reduction (vph)	0	2	0	0	0	112	0	0	112	0	18	0
Lane Group Flow (vph)	89	1127	0	20	912	130	263	30	326	8	8	0
Confl. Peds. (#/hr)			5									
Confl. Bikes (#/hr)			1			2						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		
Actuated Green, G (s)	7.3	37.4		1.7	31.8	31.8	22.4	22.4	22.4	22.4	22.4	
Effective Green, g (s)	7.3	37.4		1.7	31.8	31.8	22.4	22.4	22.4	22.4	22.4	
Actuated g/C Ratio	0.10	0.50		0.02	0.42	0.42	0.30	0.30	0.30	0.30	0.30	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	173	1773		40	1515	663	416	561	477	414	477	
v/s Ratio Prot	c0.05	c0.32		0.01	0.26			0.02			0.00	
v/s Ratio Perm						0.08	0.19		c0.20	0.01		
v/c Ratio	0.51	0.64		0.50	0.60	0.20	0.63	0.05	0.68	0.02	0.02	
Uniform Delay, d1	32.2	13.8		36.2	16.7	13.6	22.7	18.7	23.2	18.6	18.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.6	0.8		9.5	0.7	0.1	3.1	0.0	4.0	0.0	0.0	
Delay (s)	34.7	14.6		45.7	17.4	13.7	25.9	18.8	27.2	18.6	18.5	
Level of Service	C	B		D	B	B	C	B	C	B	B	
Approach Delay (s)		16.0			17.1			26.4			18.6	
Approach LOS		B			B			C			B	

Intersection Summary				
HCM 2000 Control Delay	18.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	69.8%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Olsen-Chandler SP — Existing PM
9: Paso Robles Street & 13th Street — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	1020	30	19	848	225	245	28	407	7	0	24
Future Volume (veh/h)	83	1020	30	19	848	225	245	28	407	7	0	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	89	1097	32	20	912	0	263	30	438	8	0	26
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	116	1536	45	42	1401		556	616	522	410	0	522
Arrive On Green	0.06	0.43	0.43	0.02	0.39	0.00	0.33	0.33	0.33	0.33	0.00	0.33
Sat Flow, veh/h	1795	3551	104	1795	3582	1598	1396	1885	1598	932	0	1598
Grp Volume(v), veh/h	89	553	576	20	912	0	263	30	438	8	0	26
Grp Sat Flow(s),veh/h/ln	1795	1791	1863	1795	1791	1598	1396	1885	1598	932	0	1598
Q Serve(g_s), s	3.0	15.8	15.8	0.7	12.9	0.0	9.9	0.7	15.8	0.4	0.0	0.7
Cycle Q Clear(g_c), s	3.0	15.8	15.8	0.7	12.9	0.0	10.6	0.7	15.8	1.0	0.0	0.7
Prop In Lane	1.00		0.06	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	116	775	806	42	1401		556	616	522	410	0	522
V/C Ratio(X)	0.77	0.71	0.71	0.47	0.65		0.47	0.05	0.84	0.02	0.00	0.05
Avail Cap(c_a), veh/h	361	1399	1455	159	2394		943	1139	965	669	0	965
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.6	14.5	14.5	29.9	15.4	0.0	17.9	14.3	19.4	14.7	0.0	14.3
Incr Delay (d2), s/veh	10.0	1.2	1.2	8.0	0.5	0.0	0.6	0.0	3.7	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	5.8	6.0	0.4	4.8	0.0	2.9	0.3	5.7	0.1	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.5	15.7	15.7	38.0	16.0	0.0	18.6	14.3	23.1	14.7	0.0	14.4
LnGrp LOS	D	B	B	D	B		B	B	C	B	A	B
Approach Vol, veh/h		1218			932	A		731			34	
Approach Delay, s/veh		17.4			16.4			21.1			14.4	
Approach LOS		B			B			C			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.0	31.4		24.8	8.5	28.8		24.8				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.5	48.5		37.5	12.5	41.5		37.5				
Max Q Clear Time (g_c+I1), s	2.7	17.8		3.0	5.0	14.9		17.8				
Green Ext Time (p_c), s	0.0	9.1		0.1	0.1	7.3		2.5				

Intersection Summary			
HCM 6th Ctrl Delay	18.0		
HCM 6th LOS	B		

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	379	1110	63	657	240	214	67	60	517
v/c Ratio	0.63	0.73	0.37	0.57	0.53	0.26	0.14	0.36	0.71
Control Delay	42.2	24.1	51.3	27.4	45.0	33.7	0.6	52.0	24.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.2	24.1	51.3	27.4	45.0	33.7	0.6	52.0	24.7
Queue Length 50th (ft)	104	259	34	153	66	55	0	33	71
Queue Length 95th (ft)	191	414	93	262	134	106	0	90	154
Internal Link Dist (ft)		353		673		608			523
Turn Bay Length (ft)	295		235		140		130	225	
Base Capacity (vph)	887	2193	223	1784	598	1204	629	206	1093
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.51	0.28	0.37	0.40	0.18	0.11	0.29	0.47

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	360	744	311	60	556	68	228	203	64	57	204	287
Future Volume (vph)	360	744	311	60	556	68	228	203	64	57	204	287
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.98		1.00	1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3467	3403		1787	3510		3467	3574	1599	1787	3236	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3467	3403		1787	3510		3467	3574	1599	1787	3236	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	379	783	327	63	585	72	240	214	67	60	215	302
RTOR Reduction (vph)	0	39	0	0	8	0	0	0	52	0	218	0
Lane Group Flow (vph)	379	1071	0	63	649	0	240	214	15	60	299	0
Confl. Peds. (#/hr)			1			1						1
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	15.7	39.4		6.8	30.5		11.8	20.7	20.7	6.5	15.4	
Effective Green, g (s)	15.7	39.4		6.8	30.5		11.8	20.7	20.7	6.5	15.4	
Actuated g/C Ratio	0.17	0.43		0.07	0.33		0.13	0.23	0.23	0.07	0.17	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	595	1466		132	1171		447	809	362	127	545	
v/s Ratio Prot	c0.11	c0.31		0.04	0.18		c0.07	0.06		0.03	c0.09	
v/s Ratio Perm									0.01			
v/c Ratio	0.64	0.73		0.48	0.55		0.54	0.26	0.04	0.47	0.55	
Uniform Delay, d1	35.2	21.6		40.6	24.9		37.2	29.1	27.6	40.8	34.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.2	1.9		2.7	0.6		1.2	0.2	0.0	2.8	1.1	
Delay (s)	37.4	23.5		43.3	25.5		38.5	29.3	27.7	43.6	36.0	
Level of Service	D	C		D	C		D	C	C	D	D	
Approach Delay (s)		27.0			27.0			33.3			36.7	
Approach LOS		C			C			C			D	

Intersection Summary				
HCM 2000 Control Delay	29.7	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	91.4	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	71.3%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	360	744	311	60	556	68	228	203	64	57	204	287
Future Volume (veh/h)	360	744	311	60	556	68	228	203	64	57	204	287
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	379	783	0	63	585	72	240	214	67	60	215	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	559	1378		102	900	111	381	608	271	99	413	
Arrive On Green	0.16	0.38	0.00	0.06	0.28	0.28	0.11	0.17	0.17	0.05	0.12	0.00
Sat Flow, veh/h	3483	3676	0	1795	3205	394	3483	3582	1598	1795	3676	0
Grp Volume(v), veh/h	379	783	0	63	326	331	240	214	67	60	215	0
Grp Sat Flow(s),veh/h/ln	1742	1791	0	1795	1791	1808	1742	1791	1598	1795	1791	0
Q Serve(g_s), s	5.5	9.3	0.0	1.8	8.6	8.7	3.6	2.8	2.0	1.8	3.0	0.0
Cycle Q Clear(g_c), s	5.5	9.3	0.0	1.8	8.6	8.7	3.6	2.8	2.0	1.8	3.0	0.0
Prop In Lane	1.00		0.00	1.00		0.22	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	559	1378		102	503	508	381	608	271	99	413	
V/C Ratio(X)	0.68	0.57		0.62	0.65	0.65	0.63	0.35	0.25	0.61	0.52	
Avail Cap(c_a), veh/h	1389	3555		350	1412	1425	937	1880	839	323	1562	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	21.3	13.1	0.0	24.9	17.0	17.1	23.0	19.8	19.4	24.9	22.4	0.0
Incr Delay (d2), s/veh	1.5	0.4	0.0	6.0	1.4	1.4	1.7	0.3	0.5	5.9	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	3.2	0.0	0.9	3.3	3.3	1.4	1.1	0.7	0.8	1.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.8	13.4	0.0	30.9	18.5	18.5	24.7	20.1	19.9	30.8	23.5	0.0
LnGrp LOS	C	B		C	B	B	C	C	B	C	C	
Approach Vol, veh/h		1162	A		720			521			275	A
Approach Delay, s/veh		16.5			19.5			22.2			25.1	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.6	25.2	10.4	10.7	13.1	19.6	7.5	13.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	53.5	14.5	23.5	21.5	42.5	9.7	28.3
Max Q Clear Time (g_c+I1), s	3.8	11.3	5.6	5.0	7.5	10.7	3.8	4.8
Green Ext Time (p_c), s	0.1	6.6	0.5	1.1	1.2	4.3	0.0	1.4

Intersection Summary	
HCM 6th Ctrl Delay	19.3
HCM 6th LOS	B

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	58	370	785	466	73
v/c Ratio	0.21	0.22	0.59	0.49	0.15
Control Delay	35.3	10.7	15.9	24.8	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	35.3	10.7	15.9	24.8	9.0
Queue Length 50th (ft)	16	24	74	63	0
Queue Length 95th (ft)	86	124	274	222	39
Internal Link Dist (ft)		1151	2310	505	
Turn Bay Length (ft)	125			120	
Base Capacity (vph)	381	3117	2520	1905	900
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.15	0.12	0.31	0.24	0.08

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	56	359	405	356	452	71
Future Volume (vph)	56	359	405	356	452	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.93		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1787	3574	3299		3467	1578
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1787	3574	3299		3467	1578
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	58	370	418	367	466	73
RTOR Reduction (vph)	0	0	130	0	0	54
Lane Group Flow (vph)	58	370	655	0	466	19
Confl. Peds. (#/hr)				4		1
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	NA		Perm	Perm
Protected Phases	5	2	6			
Permitted Phases					4	4
Actuated Green, G (s)	4.4	30.5	21.6		16.0	16.0
Effective Green, g (s)	4.4	30.5	21.6		16.0	16.0
Actuated g/C Ratio	0.07	0.49	0.34		0.26	0.26
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	125	1738	1136		884	402
v/s Ratio Prot	c0.03	0.10	c0.20			
v/s Ratio Perm					c0.13	0.01
v/c Ratio	0.46	0.21	0.58		0.53	0.05
Uniform Delay, d1	28.0	9.2	16.8		20.1	17.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.7	0.1	0.7		0.6	0.0
Delay (s)	30.7	9.3	17.5		20.7	17.6
Level of Service	C	A	B		C	B
Approach Delay (s)		12.2	17.5		20.3	
Approach LOS		B	B		C	

Intersection Summary			
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	62.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	51.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	196	267	253	83	290	246	164	428	157	575
v/c Ratio	0.64	0.53	0.42	0.40	0.46	0.51	0.58	0.52	0.55	0.69
Control Delay	41.8	30.1	6.1	39.5	30.5	8.4	40.0	27.4	38.1	28.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.8	30.1	6.1	39.5	30.5	8.4	40.0	27.4	38.1	28.7
Queue Length 50th (ft)	83	110	0	36	64	0	70	86	67	114
Queue Length 95th (ft)	#196	207	56	90	111	59	152	155	141	194
Internal Link Dist (ft)		1092			186			1440		2310
Turn Bay Length (ft)	150			170		140	230		245	
Base Capacity (vph)	372	648	707	269	1027	629	372	1071	423	1163
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.41	0.36	0.31	0.28	0.39	0.44	0.40	0.37	0.49

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	184	251	238	78	273	231	154	356	46	148	399	142
Future Volume (vph)	184	251	238	78	273	231	154	356	46	148	399	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1881	1573	1787	3574	1578	1787	3513		1787	3412	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	1881	1573	1787	3574	1578	1787	3513		1787	3412	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	196	267	253	83	290	246	164	379	49	157	424	151
RTOR Reduction (vph)	0	0	185	0	0	198	0	12	0	0	41	0
Lane Group Flow (vph)	196	267	68	83	290	48	164	416	0	157	534	0
Confl. Peds. (#/hr)			4			1						10
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	12.4	19.6	19.6	7.0	14.2	14.2	11.5	16.7		11.7	16.9	
Effective Green, g (s)	12.4	19.6	19.6	7.0	14.2	14.2	11.5	16.7		11.7	16.9	
Actuated g/C Ratio	0.17	0.27	0.27	0.10	0.19	0.19	0.16	0.23		0.16	0.23	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	303	505	422	171	695	306	281	803		286	789	
v/s Ratio Prot	c0.11	c0.14		0.05	0.08		c0.09	0.12		0.09	c0.16	
v/s Ratio Perm			0.04			0.03						
v/c Ratio	0.65	0.53	0.16	0.49	0.42	0.16	0.58	0.52		0.55	0.68	
Uniform Delay, d1	28.3	22.8	20.4	31.3	25.8	24.4	28.5	24.6		28.2	25.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.7	1.0	0.2	2.2	0.4	0.2	3.1	0.6		2.2	2.3	
Delay (s)	33.0	23.8	20.6	33.5	26.2	24.7	31.6	25.2		30.4	27.9	
Level of Service	C	C	C	C	C	C	C	C		C	C	
Approach Delay (s)		25.2			26.6			27.0			28.4	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	26.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	73.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	57.4%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
12: Creston Road & Niblick Road/Sherwood Road

Existing PM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	184	251	238	78	273	231	154	356	46	148	399	142
Future Volume (veh/h)	184	251	238	78	273	231	154	356	46	148	399	142
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	196	267	253	83	290	246	164	379	49	157	424	151
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	247	541	457	112	758	337	211	767	98	204	611	215
Arrive On Green	0.14	0.29	0.29	0.06	0.21	0.21	0.12	0.24	0.24	0.11	0.24	0.24
Sat Flow, veh/h	1795	1885	1591	1795	3582	1595	1795	3192	410	1795	2587	911
Grp Volume(v), veh/h	196	267	253	83	290	246	164	211	217	157	292	283
Grp Sat Flow(s),veh/h/ln	1795	1885	1591	1795	1791	1595	1795	1791	1811	1795	1791	1707
Q Serve(g_s), s	6.4	7.1	8.2	2.8	4.2	8.7	5.4	6.2	6.2	5.1	9.0	9.2
Cycle Q Clear(g_c), s	6.4	7.1	8.2	2.8	4.2	8.7	5.4	6.2	6.2	5.1	9.0	9.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.23	1.00		0.53
Lane Grp Cap(c), veh/h	247	541	457	112	758	337	211	430	435	204	423	403
V/C Ratio(X)	0.79	0.49	0.55	0.74	0.38	0.73	0.78	0.49	0.50	0.77	0.69	0.70
Avail Cap(c_a), veh/h	430	747	630	311	1183	527	430	621	628	489	680	648
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.3	17.9	18.3	27.9	20.5	22.3	26.0	19.8	19.9	26.1	21.1	21.2
Incr Delay (d2), s/veh	5.7	0.7	1.1	9.4	0.3	3.0	6.1	0.9	0.9	6.1	2.0	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	2.8	2.7	1.4	1.6	3.2	2.5	2.4	2.5	2.4	3.6	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.0	18.6	19.4	37.3	20.8	25.3	32.0	20.7	20.7	32.1	23.1	23.4
LnGrp LOS	C	B	B	D	C	C	C	C	C	C	C	C
Approach Vol, veh/h		716			619			592			732	
Approach Delay, s/veh		22.3			24.8			23.9			25.2	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.4	19.0	8.3	21.9	11.6	18.8	12.8	17.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.5	21.0	10.5	24.0	14.5	23.0	14.5	20.0
Max Q Clear Time (g_c+I1), s	7.1	8.2	4.8	10.2	7.4	11.2	8.4	10.7
Green Ext Time (p_c), s	0.3	1.9	0.1	2.0	0.2	2.7	0.3	1.8

Intersection Summary	
HCM 6th Ctrl Delay	24.0
HCM 6th LOS	C

Olsen-Chandler SP
13: Creston Road & Scott Street

Existing PM
HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	41	56	414	33	85	535
Future Volume (Veh/h)	41	56	414	33	85	535
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	44	60	445	35	91	575
Pedestrians	2					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1222	464			482	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1222	464			482	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	76	90			92	
cM capacity (veh/h)	182	599			1084	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	104	480	91	575
Volume Left	44	0	91	0
Volume Right	60	35	0	0
cSH	304	1700	1084	1700
Volume to Capacity	0.34	0.28	0.08	0.34
Queue Length 95th (ft)	37	0	7	0
Control Delay (s)	22.8	0.0	8.6	0.0
Lane LOS	C		A	
Approach Delay (s)	22.8	0.0	1.2	
Approach LOS	C			

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	44.2%	ICU Level of Service	A
Analysis Period (min)	15		

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	2.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	41	56	414	33	85	535
Future Vol, veh/h	41	56	414	33	85	535
Conflicting Peds, #/hr	0	0	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	44	60	445	35	91	575

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1222	465	0	0	482	0
Stage 1	465	-	-	-	-	-
Stage 2	757	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.11	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209	-
Pot Cap-1 Maneuver	199	599	-	-	1086	-
Stage 1	634	-	-	-	-	-
Stage 2	465	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	182	598	-	-	1084	-
Mov Cap-2 Maneuver	182	-	-	-	-	-
Stage 1	633	-	-	-	-	-
Stage 2	426	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	22.9	0	1.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	304	1084	-
HCM Lane V/C Ratio	-	-	0.343	0.084	-
HCM Control Delay (s)	-	-	22.9	8.6	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	1.5	0.3	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	4	7	4	1	38	16	228	10	48	271	126
Future Volume (Veh/h)	100	4	7	4	1	38	16	228	10	48	271	126
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Hourly flow rate (vph)	101	4	7	4	1	38	16	230	10	48	274	127
Pedestrians		5									4	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		3.5									3.5	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	680	647	279	646	769	239	406			240		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	680	647	279	646	769	239	406			240		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	69	99	99	99	100	95	99			96		
cM capacity (veh/h)	331	370	759	364	315	799	1153			1333		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	112	43	16	240	48	274	127
Volume Left	101	4	16	0	48	0	0
Volume Right	7	38	0	10	0	0	127
cSH	345	697	1153	1700	1333	1700	1700
Volume to Capacity	0.33	0.06	0.01	0.14	0.04	0.16	0.07
Queue Length 95th (ft)	34	5	1	0	3	0	0
Control Delay (s)	20.4	10.5	8.2	0.0	7.8	0.0	0.0
Lane LOS	C	B	A		A		
Approach Delay (s)	20.4	10.5	0.5		0.8		
Approach LOS	C	B					

Intersection Summary				
Average Delay	3.8			
Intersection Capacity Utilization	40.4%	ICU Level of Service		A
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	100	4	7	4	1	38	16	228	10	48	271	126
Future Vol, veh/h	100	4	7	4	1	38	16	228	10	48	271	126
Conflicting Peds, #/hr	4	0	0	0	0	4	5	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	30	-	-	70	-	60
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	99	99	99	99	99	99	99	99	99	99	99	99
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	101	4	7	4	1	38	16	230	10	48	274	127

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	666	647	279	706	769	239	406	0	0	240	0	0
Stage 1	375	375	-	267	267	-	-	-	-	-	-	-
Stage 2	291	272	-	439	502	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	374	391	762	352	333	802	1158	-	-	1333	-	-
Stage 1	648	619	-	741	690	-	-	-	-	-	-	-
Stage 2	719	686	-	599	544	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	339	370	758	333	315	799	1152	-	-	1333	-	-
Mov Cap-2 Maneuver	339	370	-	333	315	-	-	-	-	-	-	-
Stage 1	636	594	-	731	680	-	-	-	-	-	-	-
Stage 2	671	676	-	568	522	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.9	10.6	0.5	0.8
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1152	-	-	352	685	1333	-	-
HCM Lane V/C Ratio	0.014	-	-	0.319	0.063	0.036	-	-
HCM Control Delay (s)	8.2	-	-	19.9	10.6	7.8	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.3	0.2	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	8	2	3	77	3	58	7	190	123	103	165	12
Future Volume (vph)	8	2	3	77	3	58	7	190	123	103	165	12
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	9	2	3	83	3	62	8	204	132	111	177	13

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	14	148	212	132	200	102
Volume Left (vph)	9	83	8	0	111	0
Volume Right (vph)	3	62	0	132	0	13
Hadj (s)	0.02	-0.12	0.04	-0.68	0.30	-0.07
Departure Headway (s)	5.6	5.2	5.3	4.6	5.6	5.2
Degree Utilization, x	0.02	0.21	0.31	0.17	0.31	0.15
Capacity (veh/h)	565	631	655	752	619	661
Control Delay (s)	8.7	9.6	9.5	7.3	9.9	7.9
Approach Delay (s)	8.7	9.6	8.7		9.2	
Approach LOS	A	A	A		A	

Intersection Summary					
Delay	9.1				
Level of Service	A				
Intersection Capacity Utilization	38.6%	ICU Level of Service		A	
Analysis Period (min)	15				

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	9.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Vol, veh/h	8	2	3	77	3	58	0	7	190	123	103	165
Future Vol, veh/h	8	2	3	77	3	58	0	7	190	123	103	165
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	1	1	1	1	1	1	2	1	1	1	1	1
Mvmt Flow	9	2	3	83	3	62	0	8	204	132	111	177
Number of Lanes	0	1	0	0	1	0	0	0	1	1	0	2

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	8.8	9.7	9.6	10.1
HCM LOS	A	A	A	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	4%	0%	62%	56%	56%	0%
Vol Thru, %	96%	0%	15%	2%	44%	87%
Vol Right, %	0%	100%	23%	42%	0%	13%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	197	123	13	138	186	95
LT Vol	7	0	8	77	103	0
Through Vol	190	0	2	3	83	83
RT Vol	0	123	3	58	0	12
Lane Flow Rate	212	132	14	148	199	102
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.31	0.167	0.022	0.215	0.307	0.146
Departure Headway (Hd)	5.272	4.549	5.593	5.227	5.549	5.18
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	678	783	633	683	644	688
Service Time	3.033	2.309	3.686	3.292	3.313	2.944
HCM Lane V/C Ratio	0.313	0.169	0.022	0.217	0.309	0.148
HCM Control Delay	10.4	8.2	8.8	9.7	10.8	8.8
HCM Lane LOS	B	A	A	A	B	A
HCM 95th-tile Q	1.3	0.6	0.1	0.8	1.3	0.5

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBR
Lane Configurations	
Traffic Vol, veh/h	12
Future Vol, veh/h	12
Peak Hour Factor	0.93
Heavy Vehicles, %	1
Mvmt Flow	13
Number of Lanes	0

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	179	120	66	144	110	123
Future Volume (Veh/h)	179	120	66	144	110	123
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	185	124	68	148	113	127
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	323	113	240			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	323	113	240			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	70	87	95			
cM capacity (veh/h)	615	922	1331			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	309	68	74	74	113	127
Volume Left	185	68	0	0	0	0
Volume Right	124	0	0	0	0	127
cSH	1028	1331	1700	1700	1700	1700
Volume to Capacity	0.30	0.05	0.04	0.04	0.07	0.07
Queue Length 95th (ft)	32	4	0	0	0	0
Control Delay (s)	11.8	7.8	0.0	0.0	0.0	0.0
Lane LOS	B	A				
Approach Delay (s)	11.8	2.5			0.0	
Approach LOS	B					

Intersection Summary				
Average Delay		5.5		
Intersection Capacity Utilization		26.9%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	179	120	66	144	110	123
Future Vol, veh/h	179	120	66	144	110	123
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	145	105	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	185	124	68	148	113	127

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	323	113	240	0	-	0
Stage 1	113	-	-	-	-	-
Stage 2	210	-	-	-	-	-
Critical Hdwy	6.615	6.215	4.115	-	-	-
Critical Hdwy Stg 1	5.415	-	-	-	-	-
Critical Hdwy Stg 2	5.815	-	-	-	-	-
Follow-up Hdwy	3.5095	3.3095	2.2095	-	-	-
Pot Cap-1 Maneuver	661	942	1332	-	-	-
Stage 1	914	-	-	-	-	-
Stage 2	808	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	627	942	1332	-	-	-
Mov Cap-2 Maneuver	627	-	-	-	-	-
Stage 1	867	-	-	-	-	-
Stage 2	808	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.6	2.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1332	-	627	942	-	-
HCM Lane V/C Ratio	0.051	-	0.294	0.131	-	-
HCM Control Delay (s)	7.8	-	13.1	9.4	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	1.2	0.5	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	0	67	0	112	14	0	0	0	0	283	34
Future Volume (Veh/h)	27	0	67	0	112	14	0	0	0	0	283	34
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	32	0	80	0	133	17	0	0	0	0	337	40
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	432	357	357	437	377	0	377			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	432	357	357	437	377	0	377			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	88	100	76	98	100			100		
cM capacity (veh/h)	430	571	689	470	556	1088	1187			1630		

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	112	150	377
Volume Left	32	0	0
Volume Right	80	17	40
cSH	588	627	1700
Volume to Capacity	0.19	0.24	0.22
Queue Length 95th (ft)	17	23	0
Control Delay (s)	12.6	12.9	0.0
Lane LOS	B	B	
Approach Delay (s)	12.6	12.9	0.0
Approach LOS	B	B	

Intersection Summary					
Average Delay	5.2				
Intersection Capacity Utilization	35.9%	ICU Level of Service		A	
Analysis Period (min)	15				

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	0	67	0	112	14	0	0	0	0	283	34
Future Vol, veh/h	27	0	67	0	112	14	0	0	0	0	283	34
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	32	0	80	0	133	17	0	0	0	0	337	40

Major/Minor	Minor2			Minor1						Major2		
Conflicting Flow All	432	357	357	397	377	0				-	-	0
Stage 1	357	357	-	0	0	-				-	-	-
Stage 2	75	0	-	397	377	-				-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21				-	-	-
Critical Hdwy Stg 1	6.11	5.51	-	-	-	-				-	-	-
Critical Hdwy Stg 2	-	-	-	6.11	5.51	-				-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309				-	-	-
Pot Cap-1 Maneuver	536	571	689	565	556	-				0	-	-
Stage 1	663	630	-	-	-	-				0	-	-
Stage 2	-	-	-	631	618	-				0	-	-
Platoon blocked, %											-	-
Mov Cap-1 Maneuver	-	571	689	499	556	-				-	-	-
Mov Cap-2 Maneuver	-	571	-	499	556	-				-	-	-
Stage 1	663	630	-	-	-	-				-	-	-
Stage 2	-	-	-	558	618	-				-	-	-

Approach	EB	WB	SB
HCM Control Delay, s			0
HCM LOS	-	-	

Minor Lane/Major Mvmt	EBLn1	WBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	-	556	-	-	-
HCM Lane V/C Ratio	-	0.24	-	-	-
HCM Control Delay (s)	-	13.5	-	-	-
HCM Lane LOS	-	B	-	-	-
HCM 95th %tile Q(veh)	-	0.9	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	47	362	582	171	396	96	354	929	518	300
v/c Ratio	0.17	0.66	0.57	0.31	0.39	0.52	0.65	0.69	0.70	0.32
Control Delay	49.1	50.4	38.2	35.7	2.6	64.6	54.0	13.7	49.1	34.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.1	50.4	38.2	35.7	2.6	64.6	54.0	13.7	49.1	34.2
Queue Length 50th (ft)	31	123	184	96	0	68	131	123	184	87
Queue Length 95th (ft)	78	211	307	195	46	148	219	213	291	150
Internal Link Dist (ft)		521		1372			611			680
Turn Bay Length (ft)	115		515		115	165		290	305	
Base Capacity (vph)	399	787	1321	717	1138	265	923	1585	1121	1515
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.46	0.44	0.24	0.35	0.36	0.38	0.59	0.46	0.20

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	258	93	565	166	384	93	343	901	502	236	55
Future Volume (vph)	46	258	93	565	166	384	93	343	901	502	236	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.95	0.88	0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	3419		3467	1881	1585	1787	3574	2814	3467	3472	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	3419		3467	1881	1585	1787	3574	2814	3467	3472	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	47	266	96	582	171	396	96	354	929	518	243	57
RTOR Reduction (vph)	0	25	0	0	0	194	0	0	85	0	15	0
Lane Group Flow (vph)	47	337	0	582	171	202	96	354	844	518	285	0
Confl. Peds. (#/hr)						2						
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	17.5	17.5		33.6	33.6	57.8	11.8	17.6	51.2	24.2	30.0	
Effective Green, g (s)	17.5	17.5		33.6	33.6	57.8	11.8	17.6	51.2	24.2	30.0	
Actuated g/C Ratio	0.15	0.15		0.30	0.30	0.51	0.10	0.16	0.45	0.21	0.26	
Clearance Time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	275	527		1027	557	807	185	554	1270	739	918	
v/s Ratio Prot	0.03	c0.10		0.17	0.09	0.05	0.05	0.10	c0.20	c0.15	0.08	
v/s Ratio Perm						0.07			0.10			
v/c Ratio	0.17	0.64		0.57	0.31	0.25	0.52	0.64	0.66	0.70	0.31	
Uniform Delay, d1	41.6	45.0		33.7	30.9	15.6	48.1	44.9	24.4	41.3	33.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	2.7		0.7	0.3	0.2	2.4	2.4	1.3	3.0	0.2	
Delay (s)	41.9	47.7		34.5	31.2	15.8	50.6	47.3	25.7	44.3	33.6	
Level of Service	D	D		C	C	B	D	D	C	D	C	
Approach Delay (s)		47.0			27.5			33.0			40.4	
Approach LOS		D			C			C			D	

Intersection Summary					
HCM 2000 Control Delay	34.5	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.67				
Actuated Cycle Length (s)	113.4	Sum of lost time (s)		20.5	
Intersection Capacity Utilization	68.2%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
18: US 101 Ramps/Spring Street & 1st Street/Niblick Road

Existing PM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	258	93	565	166	384	93	343	901	502	236	55
Future Volume (veh/h)	46	258	93	565	166	384	93	343	901	502	236	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	47	266	96	582	171	396	96	354	929	518	243	57
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	244	352	124	863	467	679	122	909	1411	619	1022	235
Arrive On Green	0.14	0.14	0.14	0.25	0.25	0.25	0.07	0.25	0.25	0.18	0.35	0.35
Sat Flow, veh/h	1795	2587	909	3483	1885	1594	1795	3582	2812	3483	2891	665
Grp Volume(v), veh/h	47	182	180	582	171	396	96	354	929	518	149	151
Grp Sat Flow(s),veh/h/ln	1795	1791	1705	1742	1885	1594	1795	1791	1406	1742	1791	1765
Q Serve(g_s), s	2.6	10.9	11.3	16.8	8.3	21.1	5.8	9.1	27.3	16.0	6.5	6.7
Cycle Q Clear(g_c), s	2.6	10.9	11.3	16.8	8.3	21.1	5.8	9.1	27.3	16.0	6.5	6.7
Prop In Lane	1.00		0.53	1.00		1.00	1.00		1.00	1.00		0.38
Lane Grp Cap(c), veh/h	244	244	232	863	467	679	122	909	1411	619	633	624
V/C Ratio(X)	0.19	0.75	0.78	0.67	0.37	0.58	0.79	0.39	0.66	0.84	0.23	0.24
Avail Cap(c_a), veh/h	394	393	374	1304	706	881	262	909	1411	1107	763	752
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.6	46.1	46.4	37.7	34.6	24.4	51.0	34.3	20.6	44.1	25.3	25.4
Incr Delay (d2), s/veh	0.4	4.5	5.5	0.9	0.5	0.8	10.6	0.3	1.1	3.1	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	5.2	5.2	7.1	3.8	7.7	2.9	3.9	12.9	7.1	2.8	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.0	50.7	51.9	38.7	35.0	25.2	61.6	34.6	21.7	47.2	25.5	25.6
LnGrp LOS	D	D	D	D	D	C	E	C	C	D	C	C
Approach Vol, veh/h		409			1149			1379			818	
Approach Delay, s/veh		50.3			33.5			27.8			39.3	
Approach LOS		D			C			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	24.4	34.0		19.7	13.4	45.1		32.9				
Change Period (Y+Rc), s	* 4.7	5.8		4.6	5.8	* 5.8		5.4				
Max Green Setting (Gmax), s	* 35	28.2		24.4	16.2	* 47		41.6				
Max Q Clear Time (g_c+I1), s	18.0	29.3		13.3	7.8	8.7		23.1				
Green Ext Time (p_c), s	1.8	0.0		1.8	0.1	1.9		4.4				

Intersection Summary			
HCM 6th Ctrl Delay		34.5	
HCM 6th LOS		C	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Olsen-Chandler SP
19: S. River Road & Niblick Road

Existing PM
Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	252	774	485	101	720	342	294	145	487
v/c Ratio	0.55	0.61	0.55	0.49	0.68	0.62	0.38	0.57	0.68
Control Delay	45.7	29.5	5.2	51.8	31.8	44.2	32.3	49.9	38.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.7	29.5	5.2	51.8	31.8	44.2	32.3	49.9	38.4
Queue Length 50th (ft)	72	202	0	56	185	97	72	80	130
Queue Length 95th (ft)	139	332	76	132	304	177	136	172	222
Internal Link Dist (ft)		1510			1609		962		896
Turn Bay Length (ft)	140			80		150		110	
Base Capacity (vph)	608	1639	996	293	1566	765	1096	394	1091
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.47	0.49	0.34	0.46	0.45	0.27	0.37	0.45

Intersection Summary

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
19: S. River Road & Niblick Road

Existing PM
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	242	743	466	97	578	113	328	228	54	139	346	122
Future Volume (vph)	242	743	466	97	578	113	328	228	54	139	346	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3467	3574	1599	1787	3478		3467	3472		1787	3421	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3467	3574	1599	1787	3478		3467	3472		1787	3421	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	252	774	485	101	602	118	342	238	56	145	360	127
RTOR Reduction (vph)	0	0	314	0	14	0	0	17	0	0	30	0
Lane Group Flow (vph)	252	774	171	101	706	0	342	277	0	145	457	0
Confl. Peds. (#/hr)						2						3
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	12.3	32.9	32.9	8.8	29.4		14.8	20.1		13.3	18.6	
Effective Green, g (s)	12.3	32.9	32.9	8.8	29.4		14.8	20.1		13.3	18.6	
Actuated g/C Ratio	0.13	0.35	0.35	0.09	0.32		0.16	0.22		0.14	0.20	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	458	1262	565	168	1098		551	749		255	683	
v/s Ratio Prot	c0.07	c0.22		0.06	0.20		c0.10	0.08		0.08	c0.13	
v/s Ratio Perm			0.11									
v/c Ratio	0.55	0.61	0.30	0.60	0.64		0.62	0.37		0.57	0.67	
Uniform Delay, d1	37.8	24.8	21.8	40.5	27.3		36.5	31.1		37.2	34.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.4	0.9	0.3	5.9	1.3		2.2	0.3		2.9	2.5	
Delay (s)	39.2	25.7	22.1	46.4	28.6		38.7	31.4		40.1	36.9	
Level of Service	D	C	C	D	C		D	C		D	D	
Approach Delay (s)		26.8			30.8			35.3			37.6	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	31.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	93.1	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	65.4%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Olsen-Chandler SP
19: S. River Road & Niblick Road

Existing PM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	242	743	466	97	578	113	328	228	54	139	346	122
Future Volume (veh/h)	242	743	466	97	578	113	328	228	54	139	346	122
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	252	774	485	101	602	118	342	238	56	145	360	127
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	369	1167	521	132	877	171	474	673	155	188	525	182
Arrive On Green	0.11	0.33	0.33	0.07	0.29	0.29	0.14	0.23	0.23	0.10	0.20	0.20
Sat Flow, veh/h	3483	3582	1598	1795	2986	584	3483	2889	667	1795	2604	905
Grp Volume(v), veh/h	252	774	485	101	361	359	342	146	148	145	246	241
Grp Sat Flow(s),veh/h/ln	1742	1791	1598	1795	1791	1779	1742	1791	1765	1795	1791	1718
Q Serve(g_s), s	4.8	12.7	12.1	3.8	12.2	12.3	6.4	4.7	4.8	5.4	8.7	8.9
Cycle Q Clear(g_c), s	4.8	12.7	12.1	3.8	12.2	12.3	6.4	4.7	4.8	5.4	8.7	8.9
Prop In Lane	1.00		1.00	1.00		0.33	1.00		0.38	1.00		0.53
Lane Grp Cap(c), veh/h	369	1167	521	132	526	522	474	417	411	188	361	346
V/C Ratio(X)	0.68	0.66	0.93	0.76	0.69	0.69	0.72	0.35	0.36	0.77	0.68	0.70
Avail Cap(c_a), veh/h	788	2118	945	380	1033	1026	992	719	709	511	719	690
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.5	19.8	8.1	31.1	21.4	21.4	28.3	21.9	22.0	29.9	25.3	25.4
Incr Delay (d2), s/veh	2.2	0.7	8.7	8.8	1.6	1.6	2.1	0.5	0.5	6.6	2.3	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	4.8	4.3	1.9	4.8	4.8	2.6	1.8	1.9	2.5	3.6	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.8	20.5	16.8	39.9	23.0	23.0	30.4	22.4	22.5	36.4	27.6	27.9
LnGrp LOS	C	C	B	D	C	C	C	C	C	D	C	C
Approach Vol, veh/h		1511			821			636			632	
Approach Delay, s/veh		21.2			25.1			26.8			29.7	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.5	26.8	13.8	18.3	11.7	24.6	11.7	20.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	14.5	40.5	19.5	27.5	15.5	39.5	19.5	27.5
Max Q Clear Time (g_c+I1), s	5.8	14.7	8.4	10.9	6.8	14.3	7.4	6.8
Green Ext Time (p_c), s	0.1	7.6	0.9	2.5	0.5	4.4	0.3	1.5

Intersection Summary	
HCM 6th Ctrl Delay	24.6
HCM 6th LOS	C

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	242	196	18	263	247	11
v/c Ratio	0.36	0.29	0.04	0.21	0.46	0.02
Control Delay	11.3	3.3	9.5	9.3	13.2	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.3	3.3	9.5	9.3	13.2	6.0
Queue Length 50th (ft)	26	0	2	13	26	0
Queue Length 95th (ft)	107	32	15	53	115	8
Internal Link Dist (ft)	1629			570	669	
Turn Bay Length (ft)			75			50
Base Capacity (vph)	1636	1380	993	3109	1464	1315
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.14	0.02	0.08	0.17	0.01

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	215	174	16	234	220	10
Future Volume (vph)	215	174	16	234	220	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1827	1520	1734	3471	1733	1553
Flt Permitted	1.00	1.00	0.61	1.00	0.95	1.00
Satd. Flow (perm)	1827	1520	1111	3471	1733	1553
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	242	196	18	263	247	11
RTOR Reduction (vph)	0	122	0	0	0	7
Lane Group Flow (vph)	242	74	18	263	247	4
Confl. Peds. (#/hr)		2	2		3	
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type	NA	Perm	Perm	NA	Perm	Prot
Protected Phases	2			6		8
Permitted Phases		2	6		8	
Actuated Green, G (s)	13.7	13.7	13.7	13.7	11.7	11.7
Effective Green, g (s)	13.7	13.7	13.7	13.7	11.7	11.7
Actuated g/C Ratio	0.38	0.38	0.38	0.38	0.32	0.32
Clearance Time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	691	575	420	1313	560	501
v/s Ratio Prot	c0.13			0.08		0.00
v/s Ratio Perm		0.05	0.02		c0.14	
v/c Ratio	0.35	0.13	0.04	0.20	0.44	0.01
Uniform Delay, d1	8.1	7.4	7.1	7.6	9.7	8.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.0	0.0	0.0	0.2	0.0
Delay (s)	8.2	7.4	7.1	7.6	9.9	8.3
Level of Service	A	A	A	A	A	A
Approach Delay (s)	7.8			7.6	9.8	
Approach LOS	A			A	A	

Intersection Summary				
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.39		
Actuated Cycle Length (s)	36.2	Sum of lost time (s)	10.8
Intersection Capacity Utilization	34.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
20: Commerce Way & Sherwood Road

Existing PM
HCM 6th Signalized Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations							
Traffic Volume (veh/h)	215	174	16	234	220	10	
Future Volume (veh/h)	215	174	16	234	220	10	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach	No			No	No		
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841	
Adj Flow Rate, veh/h	242	196	18	263	247	11	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	
Percent Heavy Veh, %	4	4	4	4	4	4	
Cap, veh/h	591	499	483	1122	458	407	
Arrive On Green	0.32	0.32	0.32	0.32	0.26	0.26	
Sat Flow, veh/h	1841	1555	934	3589	1753	1560	
Grp Volume(v), veh/h	242	196	18	263	247	11	
Grp Sat Flow(s),veh/h/ln	1841	1555	934	1749	1753	1560	
Q Serve(g_s), s	2.7	2.5	0.4	1.4	3.1	0.1	
Cycle Q Clear(g_c), s	2.7	2.5	3.1	1.4	3.1	0.1	
Prop In Lane		1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	591	499	483	1122	458	407	
V/C Ratio(X)	0.41	0.39	0.04	0.23	0.54	0.03	
Avail Cap(c_a), veh/h	2465	2083	1434	4684	2009	1787	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	
Uniform Delay (d), s/veh	6.9	6.8	8.1	6.4	8.2	7.1	
Incr Delay (d2), s/veh	0.2	0.2	0.0	0.0	0.4	0.0	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	0.5	0.4	0.0	0.2	0.6	0.0	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	7.0	7.0	8.1	6.5	8.6	7.1	
LnGrp LOS	A	A	A	A	A	A	
Approach Vol, veh/h	438			281	258		
Approach Delay, s/veh	7.0			6.6	8.5		
Approach LOS	A			A	A		

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	13.7				13.7	12.1
Change Period (Y+Rc), s	5.4				5.4	5.4
Max Green Setting (Gmax), s	34.6				34.6	29.6
Max Q Clear Time (g_c+I1), s	4.7				5.1	5.1
Green Ext Time (p_c), s	1.1				1.1	0.3

Intersection Summary	
HCM 6th Ctrl Delay	7.3
HCM 6th LOS	A

Olsen-Chandler SP
23: Airport Road & Scott Street

Existing PM
HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	15	0	17	0	3	8	9	68	2	11	96	8
Future Volume (vph)	15	0	17	0	3	8	9	68	2	11	96	8
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	18	0	20	0	4	10	11	82	2	13	116	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	38	14	95	139
Volume Left (vph)	18	0	11	13
Volume Right (vph)	20	10	2	10
Hadj (s)	-0.20	-0.41	0.03	-0.01
Departure Headway (s)	4.2	4.0	4.2	4.1
Degree Utilization, x	0.04	0.02	0.11	0.16
Capacity (veh/h)	805	836	837	861
Control Delay (s)	7.4	7.1	7.7	7.9
Approach Delay (s)	7.4	7.1	7.7	7.9
Approach LOS	A	A	A	A

Intersection Summary					
Delay	7.7				
Level of Service	A				
Intersection Capacity Utilization	23.8%	ICU Level of Service		A	
Analysis Period (min)	15				

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	0	17	0	3	8	9	68	2	11	96	8
Future Vol, veh/h	15	0	17	0	3	8	9	68	2	11	96	8
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	18	0	20	0	4	10	11	82	2	13	116	10
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.4	7.1	7.7	7.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	11%	47%	0%	10%
Vol Thru, %	86%	0%	27%	83%
Vol Right, %	3%	53%	73%	7%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	79	32	11	115
LT Vol	9	15	0	11
Through Vol	68	0	3	96
RT Vol	2	17	8	8
Lane Flow Rate	95	39	13	139
Geometry Grp	1	1	1	1
Degree of Util (X)	0.109	0.045	0.015	0.156
Departure Headway (Hd)	4.119	4.212	4.029	4.057
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	863	855	894	878
Service Time	2.176	2.213	2.03	2.105
HCM Lane V/C Ratio	0.11	0.046	0.015	0.158
HCM Control Delay	7.7	7.4	7.1	7.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.4	0.1	0	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	6	0	0	5	2	0	0	0	0	0	31
Future Volume (Veh/h)	67	6	0	0	5	2	0	0	0	0	0	31
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Hourly flow rate (vph)	92	8	0	0	7	3	0	0	0	0	0	42
Pedestrians								6				
Lane Width (ft)								12.0				
Walking Speed (ft/s)								3.5				
Percent Blockage								1				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	10			14			248	208	14	200	206	8
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	10			14			248	208	14	200	206	8
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			100	100	100	100	100	96
cM capacity (veh/h)	1616			1602			643	648	1063	724	649	1076

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	100	10	0	0	42
Volume Left	92	0	0	0	0
Volume Right	0	3	0	0	42
cSH	1616	1602	1700	1700	1076
Volume to Capacity	0.06	0.00	0.00	0.00	0.04
Queue Length 95th (ft)	5	0	0	0	3
Control Delay (s)	6.8	0.0	0.0	0.0	8.5
Lane LOS	A		A	A	A
Approach Delay (s)	6.8	0.0	0.0	8.5	
Approach LOS			A	A	

Intersection Summary				
Average Delay	6.8			
Intersection Capacity Utilization	21.2%	ICU Level of Service		A
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	6.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	67	6	0	0	5	2	0	0	0	0	0	31
Future Vol, veh/h	67	6	0	0	5	2	0	0	0	0	0	31
Conflicting Peds, #/hr	0	0	6	6	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	73	73	73	73	73	73	73	73	73	73	73	73
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	92	8	0	0	7	3	0	0	0	0	0	42

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	10	0	0	14	0	0	228	208	14	201	207	9
Stage 1	-	-	-	-	-	-	198	198	-	9	9	-
Stage 2	-	-	-	-	-	-	30	10	-	192	198	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	1616	-	-	1611	-	-	729	691	1069	760	692	1076
Stage 1	-	-	-	-	-	-	806	739	-	1015	890	-
Stage 2	-	-	-	-	-	-	989	889	-	812	739	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1616	-	-	1602	-	-	666	647	1063	727	648	1076
Mov Cap-2 Maneuver	-	-	-	-	-	-	666	647	-	727	648	-
Stage 1	-	-	-	-	-	-	756	692	-	957	890	-
Stage 2	-	-	-	-	-	-	950	889	-	766	692	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	6.8	0	0	8.5
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	-	1616	-	-	1602	-	-	-	1076
HCM Lane V/C Ratio	-	0.057	-	-	-	-	-	-	0.039
HCM Control Delay (s)	0	7.4	0	-	0	-	-	0	8.5
HCM Lane LOS	A	A	A	-	A	-	-	A	A
HCM 95th %tile Q(veh)	-	0.2	-	-	0	-	-	-	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	6	50	47	5	3	6
Future Volume (Veh/h)	6	50	47	5	3	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	8	67	63	7	4	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	70				150	66
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	70				150	66
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	99
cM capacity (veh/h)	1518				833	992

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	75	70	12
Volume Left	8	0	4
Volume Right	0	7	8
cSH	1518	1700	933
Volume to Capacity	0.01	0.04	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.8	0.0	8.9
Lane LOS	A		A
Approach Delay (s)	0.8	0.0	8.9
Approach LOS			A

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	17.7%	ICU Level of Service		A
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	50	47	5	3	6
Future Vol, veh/h	6	50	47	5	3	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	8	67	63	7	4	8

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	70	0	-	0	150	67
Stage 1	-	-	-	-	67	-
Stage 2	-	-	-	-	83	-
Critical Hdwy	4.14	-	-	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	2.236	-	-	-	3.536	3.336
Pot Cap-1 Maneuver	1518	-	-	-	837	991
Stage 1	-	-	-	-	951	-
Stage 2	-	-	-	-	935	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1518	-	-	-	833	991
Mov Cap-2 Maneuver	-	-	-	-	833	-
Stage 1	-	-	-	-	946	-
Stage 2	-	-	-	-	935	-

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1518	-	-	-	932
HCM Lane V/C Ratio	0.005	-	-	-	0.013
HCM Control Delay (s)	7.4	0	-	-	8.9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Existing Plus 1293-Unit Project

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	265	1177	1151	118	133	238
v/c Ratio	0.67	0.37	0.80	0.17	0.55	0.36
Control Delay	45.6	0.3	29.5	4.0	51.9	16.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.6	0.3	29.5	4.0	51.9	16.0
Queue Length 50th (ft)	149	0	324	0	79	67
Queue Length 95th (ft)	258	0	395	22	145	129
Internal Link Dist (ft)		942	856		514	
Turn Bay Length (ft)	345			330	450	
Base Capacity (vph)	508	3223	2841	1285	508	991
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.37	0.41	0.09	0.26	0.24

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	209	930	909	93	105	188
Future Volume (vph)	209	930	909	93	105	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0	7.3	7.3	4.2	3.7
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1612	3223	3223	1442	1612	1442
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1612	3223	3223	1442	1612	1442
Peak-hour factor, PHF	0.79	0.79	0.79	0.79	0.79	0.79
Adj. Flow (vph)	265	1177	1151	118	133	238
RTOR Reduction (vph)	0	0	0	65	0	36
Lane Group Flow (vph)	265	1177	1151	53	133	202
Heavy Vehicles (%)	12%	12%	12%	12%	12%	12%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	8	Free!	6		7!	4
Permitted Phases				6		4
Actuated Green, G (s)	24.8	98.9	44.2	44.2	14.9	43.7
Effective Green, g (s)	24.8	98.9	44.2	44.2	14.9	43.7
Actuated g/C Ratio	0.25	1.00	0.45	0.45	0.15	0.44
Clearance Time (s)	3.5		7.3	7.3	4.2	3.7
Vehicle Extension (s)	3.0		4.0	4.0	3.5	3.0
Lane Grp Cap (vph)	404	3223	1440	644	242	637
v/s Ratio Prot	c0.16	0.37	c0.36		c0.08	0.14
v/s Ratio Perm				0.04		
v/c Ratio	0.66	0.37	0.80	0.08	0.55	0.32
Uniform Delay, d1	33.2	0.0	23.5	15.7	38.9	17.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.8	0.3	3.4	0.1	2.8	0.3
Delay (s)	37.0	0.3	26.9	15.8	41.7	18.2
Level of Service	D	A	C	B	D	B
Approach Delay (s)		7.1	25.9		26.6	
Approach LOS		A	C		C	

Intersection Summary				
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	98.9	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	56.3%	ICU Level of Service	B	
Analysis Period (min)	15			

! Phase conflict between lane groups.
c Critical Lane Group

HCM 6th Edition methodology cannot be performed with phasing conflicts.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	234	771	313	39	841	180	310	313	98	180	163
v/c Ratio	0.56	0.60	0.41	0.11	0.79	0.30	0.61	0.40	0.35	0.62	0.43
Control Delay	50.2	31.1	5.1	44.6	38.3	5.5	48.4	35.6	52.7	52.7	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.2	31.1	5.1	44.6	38.3	5.5	48.4	35.6	52.7	52.7	10.4
Queue Length 50th (ft)	75	237	0	11	262	0	98	89	31	111	0
Queue Length 95th (ft)	129	330	43	29	359	38	164	145	64	199	46
Internal Link Dist (ft)		1323			2509			853		451	
Turn Bay Length (ft)	225		485	125		390	160		140		
Base Capacity (vph)	570	2286	1115	579	2286	1076	633	1327	633	705	695
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.34	0.28	0.07	0.37	0.17	0.49	0.24	0.15	0.26	0.23

Intersection Summary

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
2: Golden Hill Road & SR 46 E

Existing Plus 1293 Unit Project AM
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	194	640	260	32	698	149	257	243	17	81	149	135
Future Volume (vph)	194	640	260	32	698	149	257	243	17	81	149	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3155	3252	1455	3155	3252	1455	3155	3218		3155	1712	1455
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3155	3252	1455	3155	3252	1455	3155	3218		3155	1712	1455
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	234	771	313	39	841	180	310	293	20	98	180	163
RTOR Reduction (vph)	0	0	192	0	0	118	0	3	0	0	0	136
Lane Group Flow (vph)	234	771	121	39	841	62	310	310	0	98	180	27
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	13.8	40.5	40.5	9.3	36.0	36.0	16.7	25.0		9.2	17.5	17.5
Effective Green, g (s)	13.8	40.5	40.5	9.3	36.0	36.0	16.7	25.0		9.2	17.5	17.5
Actuated g/C Ratio	0.13	0.39	0.39	0.09	0.34	0.34	0.16	0.24		0.09	0.17	0.17
Clearance Time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	416	1259	563	280	1119	500	503	769		277	286	243
v/s Ratio Prot	0.07	c0.24		0.01	c0.26		c0.10	0.10		0.03	c0.11	
v/s Ratio Perm			0.08			0.04						0.02
v/c Ratio	0.56	0.61	0.22	0.14	0.75	0.12	0.62	0.40		0.35	0.63	0.11
Uniform Delay, d1	42.6	25.7	21.4	44.0	30.3	23.5	41.0	33.5		44.9	40.5	37.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.7	0.9	0.2	0.1	2.9	0.1	2.2	0.3		0.8	4.3	0.2
Delay (s)	44.3	26.6	21.6	44.0	33.2	23.6	43.2	33.9		45.7	44.8	37.2
Level of Service	D	C	C	D	C	C	D	C		D	D	D
Approach Delay (s)		28.6			32.0			38.5			42.2	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	33.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	104.6	Sum of lost time (s)	20.6	
Intersection Capacity Utilization	57.2%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Olsen-Chandler SP
2: Golden Hill Road & SR 46 E

Existing Plus 1293 Unit Project AM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	194	640	260	32	698	149	257	243	17	81	149	135
Future Volume (veh/h)	194	640	260	32	698	149	257	243	17	81	149	135
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1737	1737	1737	1737	1737	1737	1737	1737	1737	1737	1737	1737
Adj Flow Rate, veh/h	234	771	313	39	841	180	310	293	20	98	180	163
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	332	1062	474	251	1124	501	417	723	49	166	265	224
Arrive On Green	0.10	0.32	0.32	0.08	0.34	0.34	0.13	0.23	0.23	0.05	0.15	0.15
Sat Flow, veh/h	3209	3300	1472	3209	3300	1472	3209	3133	213	3209	1737	1472
Grp Volume(v), veh/h	234	771	313	39	841	180	310	154	159	98	180	163
Grp Sat Flow(s),veh/h/ln	1605	1650	1472	1605	1650	1472	1605	1650	1695	1605	1737	1472
Q Serve(g_s), s	5.3	15.6	8.1	0.9	17.0	6.9	7.0	5.9	6.0	2.2	7.4	7.9
Cycle Q Clear(g_c), s	5.3	15.6	8.1	0.9	17.0	6.9	7.0	5.9	6.0	2.2	7.4	7.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.13	1.00		1.00
Lane Grp Cap(c), veh/h	332	1062	474	251	1124	501	417	381	391	166	265	224
V/C Ratio(X)	0.71	0.73	0.66	0.16	0.75	0.36	0.74	0.40	0.41	0.59	0.68	0.73
Avail Cap(c_a), veh/h	767	3069	1369	767	3069	1369	853	899	923	853	946	802
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.6	22.6	7.6	32.4	22.0	18.6	31.5	24.6	24.6	34.9	30.2	30.4
Incr Delay (d2), s/veh	2.8	1.0	1.6	0.1	1.0	0.4	2.6	0.7	0.7	3.3	3.1	4.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	5.2	4.0	0.3	5.7	2.2	2.7	2.2	2.3	0.9	3.1	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.4	23.6	9.2	32.5	23.0	19.1	34.2	25.2	25.3	38.2	33.2	34.9
LnGrp LOS	D	C	A	C	C	B	C	C	C	D	C	C
Approach Vol, veh/h		1318			1060			623			441	
Approach Delay, s/veh		22.2			22.7			29.7			34.9	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.2	31.5	13.8	16.8	11.8	32.9	7.9	22.7
Change Period (Y+Rc), s	7.3	* 7.3	4.0	5.3	4.0	7.3	4.0	5.3
Max Green Setting (Gmax), s	18.0	* 70	20.0	41.0	18.0	70.0	20.0	41.0
Max Q Clear Time (g_c+I1), s	2.9	17.6	9.0	9.9	7.3	19.0	4.2	8.0
Green Ext Time (p_c), s	0.0	6.7	0.8	1.5	0.5	6.7	0.2	1.8

Intersection Summary	
HCM 6th Ctrl Delay	25.3
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	705	27	255	891	0	5	0	235	0	0	0
Future Volume (Veh/h)	1	705	27	255	891	0	5	0	235	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	1	860	33	311	1087	0	6	0	287	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									1			1
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1087			893			2044	2588	446	2141	2604	544
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1087			893			2044	2588	446	2141	2604	544
tC, single (s)	4.3			4.3			7.7	6.7	7.1	7.7	6.7	7.1
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			56			69	100	46	100	100	100
cM capacity (veh/h)	587			701			19	12	535	7	12	461

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	1	573	320	311	725	362	293	0
Volume Left	1	0	0	311	0	0	6	0
Volume Right	0	0	33	0	0	0	287	0
cSH	587	1700	1700	701	1700	1700	547	1700
Volume to Capacity	0.00	0.34	0.19	0.44	0.43	0.21	0.54	0.00
Queue Length 95th (ft)	0	0	0	57	0	0	79	0
Control Delay (s)	11.1	0.0	0.0	14.2	0.0	0.0	24.2	0.0
Lane LOS	B			B			C	A
Approach Delay (s)	0.0			3.2			24.2	0.0
Approach LOS							C	A

Intersection Summary					
Average Delay	4.5				
Intersection Capacity Utilization	47.8%	ICU Level of Service		A	
Analysis Period (min)	15				

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	705	27	255	891	0	5	0	235	0	0	0
Future Vol, veh/h	1	705	27	255	891	0	5	0	235	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	340	-	-	195	-	-	-	-	25	-	-	25
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	11	11	11	11	11	11	11	11	11	11	11	11
Mvmt Flow	1	860	33	311	1087	0	6	0	287	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1087	0	0	893	0	0	2045	2588	447	2141	2604	544
Stage 1	-	-	-	-	-	-	879	879	-	1709	1709	-
Stage 2	-	-	-	-	-	-	1166	1709	-	432	895	-
Critical Hdwy	4.32	-	-	4.32	-	-	7.72	6.72	7.12	7.72	6.72	7.12
Critical Hdwy Stg 1	-	-	-	-	-	-	6.72	5.72	-	6.72	5.72	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.72	5.72	-	6.72	5.72	-
Follow-up Hdwy	2.31	-	-	2.31	-	-	3.61	4.11	3.41	3.61	4.11	3.41
Pot Cap-1 Maneuver	587	-	-	701	-	-	29	22	535	25	21	461
Stage 1	-	-	-	-	-	-	291	343	-	86	132	-
Stage 2	-	-	-	-	-	-	192	132	-	549	337	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	587	-	-	701	-	-	19	12	535	8	12	461
Mov Cap-2 Maneuver	-	-	-	-	-	-	19	12	-	8	12	-
Stage 1	-	-	-	-	-	-	290	342	-	86	73	-
Stage 2	-	-	-	-	-	-	107	73	-	254	336	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3.2	24.4	0
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	19	535	587	-	-	701	-	-	-	-
HCM Lane V/C Ratio	0.321	0.536	0.002	-	-	0.444	-	-	-	-
HCM Control Delay (s)	266.9	19.2	11.1	-	-	14.2	-	-	0	0
HCM Lane LOS	F	C	B	-	-	B	-	-	A	A
HCM 95th %tile Q(veh)	0.9	3.1	0	-	-	2.3	-	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	336	598	941	17	5	172
Future Volume (Veh/h)	336	598	941	17	5	172
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	400	712	1120	20	6	205
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1140				2276	560
vC1, stage 1 conf vol					1120	
vC2, stage 2 conf vol					1156	
vCu, unblocked vol	1140				2276	560
tC, single (s)	4.3				7.0	7.1
tC, 2 stage (s)					6.0	
tF (s)	2.3				3.6	3.4
p0 queue free %	29				91	55
cM capacity (veh/h)	565				67	452

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	400	356	356	560	560	20	211
Volume Left	400	0	0	0	0	0	6
Volume Right	0	0	0	0	0	20	205
cSH	565	1700	1700	1700	1700	1700	465
Volume to Capacity	0.71	0.21	0.21	0.33	0.33	0.01	0.45
Queue Length 95th (ft)	143	0	0	0	0	0	58
Control Delay (s)	25.4	0.0	0.0	0.0	0.0	0.0	20.7
Lane LOS	D						C
Approach Delay (s)	9.1			0.0			20.7
Approach LOS							C

Intersection Summary			
Average Delay		5.9	
Intersection Capacity Utilization		58.0%	ICU Level of Service B
Analysis Period (min)		15	

Intersection	
Int Delay, s/veh	5.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	336	598	941	17	5	172
Future Vol, veh/h	336	598	941	17	5	172
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	580	-	-	165	0	25
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	400	712	1120	20	6	205

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1140	0	-	0	2276	560
Stage 1	-	-	-	-	1120	-
Stage 2	-	-	-	-	1156	-
Critical Hdwy	4.3	-	-	-	7	7.1
Critical Hdwy Stg 1	-	-	-	-	6	-
Critical Hdwy Stg 2	-	-	-	-	6	-
Follow-up Hdwy	2.3	-	-	-	3.6	3.4
Pot Cap-1 Maneuver	565	-	-	-	30	452
Stage 1	-	-	-	-	257	-
Stage 2	-	-	-	-	246	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	565	-	-	-	9	452
Mov Cap-2 Maneuver	-	-	-	-	68	-
Stage 1	-	-	-	-	75	-
Stage 2	-	-	-	-	246	-

Approach	EB	WB	SB
HCM Control Delay, s	9.1	0	20.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	565	-	-	-	68	452
HCM Lane V/C Ratio	0.708	-	-	-	0.088	0.453
HCM Control Delay (s)	25.3	-	-	-	63	19.4
HCM Lane LOS	D	-	-	-	F	C
HCM 95th %tile Q(veh)	5.7	-	-	-	0.3	2.3

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	552	18	2	1010	0	8	0	1	0	0	0
Future Volume (Veh/h)	0	552	18	2	1010	0	8	0	1	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	0	634	21	2	1161	0	9	0	1	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									1			
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1161			655			1218	1799	317	1482	1820	580
vC1, stage 1 conf vol							634	634		1165	1165	
vC2, stage 2 conf vol							584	1165		318	655	
vCu, unblocked vol	1161			655			1218	1799	317	1482	1820	580
tC, single (s)	4.4			4.4			7.8	6.8	7.2	7.8	6.8	7.2
tC, 2 stage (s)							6.8	5.8		6.8	5.8	
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			100			97	100	100	100	100	100
cM capacity (veh/h)	539			858			315	217	647	181	215	431

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	317	317	21	2	774	387	10	0
Volume Left	0	0	0	0	2	0	0	9	0
Volume Right	0	0	0	21	0	0	0	1	0
cSH	1700	1700	1700	1700	858	1700	1700	350	1700
Volume to Capacity	0.00	0.19	0.19	0.01	0.00	0.46	0.23	0.03	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	0	2	0
Control Delay (s)	0.0	0.0	0.0	0.0	9.2	0.0	0.0	16.1	0.0
Lane LOS					A			C	A
Approach Delay (s)	0.0				0.0			16.1	0.0
Approach LOS								C	A

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	37.9%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	552	18	2	1010	0	8	0	1	0	0	0
Future Vol, veh/h	0	552	18	2	1010	0	8	0	1	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	275	305	-	-	-	-	25	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	13	13	13	13	13	13	13	13	13	13	13	13
Mvmt Flow	0	634	21	2	1161	0	9	0	1	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1161	0	0	655	0	0	1219	1799	317	1482	1820	581
Stage 1	-	-	-	-	-	-	634	634	-	1165	1165	-
Stage 2	-	-	-	-	-	-	585	1165	-	317	655	-
Critical Hdwy	4.36	-	-	4.36	-	-	7.76	6.76	7.16	7.76	6.76	7.16
Critical Hdwy Stg 1	-	-	-	-	-	-	6.76	5.76	-	6.76	5.76	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.76	5.76	-	6.76	5.76	-
Follow-up Hdwy	2.33	-	-	2.33	-	-	3.63	4.13	3.43	3.63	4.13	3.43
Pot Cap-1 Maneuver	539	-	-	858	-	-	124	70	647	78	68	430
Stage 1	-	-	-	-	-	-	408	445	-	189	245	-
Stage 2	-	-	-	-	-	-	438	245	-	639	435	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	539	-	-	858	-	-	124	70	647	78	68	430
Mov Cap-2 Maneuver	-	-	-	-	-	-	306	211	-	176	210	-
Stage 1	-	-	-	-	-	-	408	445	-	189	245	-
Stage 2	-	-	-	-	-	-	437	245	-	638	435	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	16.4	0
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	306	647	539	-	-	858	-	-	-
HCM Lane V/C Ratio	0.03	0.002	-	-	-	0.003	-	-	-
HCM Control Delay (s)	17.1	10.6	0	-	-	9.2	-	-	0
HCM Lane LOS	C	B	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0	0	-	-	0	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.
Channelized right turn lanes are not counted.

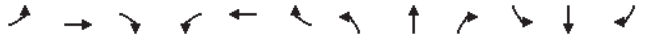
Intersection	
Intersection Delay, s/veh	81.5
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	87	113	92	253	96	66	40	361	202	39	285	50
Future Vol, veh/h	87	113	92	253	96	66	40	361	202	39	285	50
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	107	140	114	312	119	81	49	446	249	48	352	62
Number of Lanes	1	1	0	1	1	0	1	1	1	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	3	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	2	2	2
HCM Control Delay	40.5	65	138.3	40.3
HCM LOS	E	F	F	E

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	100%	0%	21%	0%
Vol Thru, %	0%	100%	0%	0%	55%	0%	59%	79%	74%
Vol Right, %	0%	0%	100%	0%	45%	0%	41%	0%	26%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	40	361	202	87	205	253	162	182	193
LT Vol	40	0	0	87	0	253	0	39	0
Through Vol	0	361	0	0	113	0	96	143	143
RT Vol	0	0	202	0	92	0	66	0	50
Lane Flow Rate	49	446	249	107	253	312	200	224	238
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.158	1.359	0.709	0.359	0.79	0.995	0.594	0.708	0.731
Departure Headway (Hd)	11.5	10.975	10.24	12.854	11.998	12.227	11.403	12.122	11.815
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	311	330	352	281	304	300	318	300	309
Service Time	9.294	8.769	8.034	10.554	9.698	9.927	9.103	9.822	9.515
HCM Lane V/C Ratio	0.158	1.352	0.707	0.381	0.832	1.04	0.629	0.747	0.77
HCM Control Delay	16.5	209.8	34.6	22.6	48.1	87.8	29.5	39.6	40.9
HCM Lane LOS	C	F	D	C	E	F	D	E	E
HCM 95th-tile Q	0.6	22.1	5.2	1.6	6.3	10.4	3.6	5	5.4

Reso A - Exhibit C2 (EIR Technical Appendix)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	13	5	3	67	0	13	1	2	0	0	2
Future Volume (Veh/h)	1	13	5	3	67	0	13	1	2	0	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Hourly flow rate (vph)	1	19	7	4	96	0	19	1	3	0	0	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	96			26			132	128	22	132	132	96
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	96			26			132	128	22	132	132	96
tC, single (s)	4.2			4.2			7.2	6.6	6.3	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			100			98	100	100	100	100	100
cM capacity (veh/h)	1461			1550			822	749	1037	821	745	944

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	27	100	23	3
Volume Left	1	4	19	0
Volume Right	7	0	3	3
cSH	1461	1550	841	944
Volume to Capacity	0.00	0.00	0.03	0.00
Queue Length 95th (ft)	0	0	2	0
Control Delay (s)	0.3	0.3	9.4	8.8
Lane LOS	A	A	A	A
Approach Delay (s)	0.3	0.3	9.4	8.8
Approach LOS			A	A

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	18.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	13	5	3	67	0	13	1	2	0	0	2
Future Vol, veh/h	1	13	5	3	67	0	13	1	2	0	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	70	70	70	70	70	70	70	70	70	70	70	70
Heavy Vehicles, %	8	8	8	8	8	8	8	8	8	8	8	8
Mvmt Flow	1	19	7	4	96	0	19	1	3	0	0	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	96	0	0	26	0	0	131	129	23	131	132	96
Stage 1	-	-	-	-	-	-	25	25	-	104	104	-
Stage 2	-	-	-	-	-	-	106	104	-	27	28	-
Critical Hdwy	4.18	-	-	4.18	-	-	7.18	6.58	6.28	7.18	6.58	6.28
Critical Hdwy Stg 1	-	-	-	-	-	-	6.18	5.58	-	6.18	5.58	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.18	5.58	-	6.18	5.58	-
Follow-up Hdwy	2.272	-	-	2.272	-	-	3.572	4.072	3.372	3.572	4.072	3.372
Pot Cap-1 Maneuver	1461	-	-	1550	-	-	828	751	1037	828	748	944
Stage 1	-	-	-	-	-	-	978	863	-	887	798	-
Stage 2	-	-	-	-	-	-	885	798	-	975	860	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1461	-	-	1550	-	-	823	748	1037	822	745	944
Mov Cap-2 Maneuver	-	-	-	-	-	-	823	748	-	822	745	-
Stage 1	-	-	-	-	-	-	977	862	-	886	796	-
Stage 2	-	-	-	-	-	-	880	796	-	970	859	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.3	9.4	8.8
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	839	1461	-	-	1550	-	-	944
HCM Lane V/C Ratio	0.027	0.001	-	-	0.003	-	-	0.003
HCM Control Delay (s)	9.4	7.5	0	-	7.3	0	-	8.8
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1	344	373	432	682	7	22	151	300	302	35
v/c Ratio	0.01	0.58	0.77	0.48	0.61	0.05	0.14	0.56	0.72	0.71	0.07
Control Delay	49.0	39.3	42.5	19.1	4.2	44.5	45.4	16.4	42.8	42.1	0.3
Queue Delay	0.0	0.0	0.2	0.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.0	39.3	42.7	19.6	4.5	44.5	45.4	16.4	42.8	42.1	0.3
Queue Length 50th (ft)	1	91	186	147	0	4	12	0	156	157	0
Queue Length 95th (ft)	6	153	333	299	44	18	37	51	295	295	0
Internal Link Dist (ft)		346		307			744			674	
Turn Bay Length (ft)	65		125			140		165	150		185
Base Capacity (vph)	104	951	680	1118	1219	376	396	450	566	577	605
Starvation Cap Reductn	0	0	35	323	159	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.36	0.58	0.54	0.64	0.02	0.06	0.34	0.53	0.52	0.06

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	264	28	317	367	580	6	19	128	425	87	30
Future Volume (vph)	1	264	28	317	367	580	6	19	128	425	87	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (prot)	1752	3442		1752	1845	1568	1752	1845	1544	1665	1696	1521
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (perm)	1752	3442		1752	1845	1568	1752	1845	1544	1665	1696	1521
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	1	311	33	373	432	682	7	22	151	500	102	35
RTOR Reduction (vph)	0	6	0	0	0	363	0	0	138	0	0	27
Lane Group Flow (vph)	1	338	0	373	432	319	7	22	13	300	302	9
Confl. Peds. (#/hr)			8						1			5
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	0.8	18.9		24.4	42.5	42.5	7.6	7.6	7.6	22.1	22.1	22.1
Effective Green, g (s)	0.8	18.9		24.4	42.5	42.5	7.6	7.6	7.6	22.1	22.1	22.1
Actuated g/C Ratio	0.01	0.21		0.27	0.47	0.47	0.08	0.08	0.08	0.24	0.24	0.24
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	15	714		469	861	732	146	154	128	404	411	369
v/s Ratio Prot	0.00	0.10		c0.21	c0.23		0.00	c0.01		c0.18	0.18	
v/s Ratio Perm						0.20			0.01			0.01
v/c Ratio	0.07	0.47		0.80	0.50	0.44	0.05	0.14	0.10	0.74	0.73	0.02
Uniform Delay, d1	44.7	31.7		31.0	16.9	16.2	38.4	38.7	38.5	31.8	31.7	26.2
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	0.5		9.0	0.5	0.4	0.1	0.4	0.3	7.2	6.7	0.0
Delay (s)	46.6	32.2		40.0	17.3	16.6	38.5	39.1	38.9	39.0	38.4	26.3
Level of Service	D	C		D	B	B	D	D	D	D	D	C
Approach Delay (s)		32.2			22.7			38.9			38.0	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	28.7	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	91.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	60.2%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
8: Riverside Ave & 13th Street

Existing Plus 1293 Unit Project AM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	264	28	317	367	580	6	19	128	425	87	30
Future Volume (veh/h)	1	264	28	317	367	580	6	19	128	425	87	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	1	311	33	373	432	682	7	22	151	573	0	35
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	2	773	81	419	884	749	210	220	186	711	0	313
Arrive On Green	0.00	0.24	0.24	0.24	0.48	0.48	0.12	0.12	0.12	0.20	0.00	0.20
Sat Flow, veh/h	1767	3213	338	1767	1856	1572	1767	1856	1569	3534	0	1553
Grp Volume(v), veh/h	1	169	175	373	432	682	7	22	151	573	0	35
Grp Sat Flow(s),veh/h/ln	1767	1763	1788	1767	1856	1572	1767	1856	1569	1767	0	1553
Q Serve(g_s), s	0.1	7.2	7.3	18.2	14.1	35.7	0.3	0.9	8.4	13.8	0.0	1.6
Cycle Q Clear(g_c), s	0.1	7.2	7.3	18.2	14.1	35.7	0.3	0.9	8.4	13.8	0.0	1.6
Prop In Lane	1.00		0.19	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	2	424	430	419	884	749	210	220	186	711	0	313
V/C Ratio(X)	0.41	0.40	0.41	0.89	0.49	0.91	0.03	0.10	0.81	0.81	0.00	0.11
Avail Cap(c_a), veh/h	99	456	462	645	1053	892	358	375	317	1132	0	497
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	44.4	28.4	28.4	32.8	15.9	21.5	34.7	35.0	38.2	33.9	0.0	29.0
Incr Delay (d2), s/veh	85.2	0.6	0.6	9.8	0.4	11.9	0.1	0.2	8.2	2.3	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	3.1	3.2	8.7	5.8	14.6	0.1	0.4	3.5	5.9	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	129.6	29.0	29.0	42.6	16.3	33.4	34.8	35.2	46.5	36.2	0.0	29.2
LnGrp LOS	F	C	C	D	B	C	C	D	D	D	A	C
Approach Vol, veh/h		345			1487			180			608	
Approach Delay, s/veh		29.3			30.7			44.6			35.8	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	25.6	25.9		22.4	4.6	46.9		15.1				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	32.5	23.0		28.5	5.0	50.5		18.0				
Max Q Clear Time (g_c+I1), s	20.2	9.3		15.8	2.1	37.7		10.4				
Green Ext Time (p_c), s	1.0	1.7		1.9	0.0	4.7		0.3				

Intersection Summary												
HCM 6th Ctrl Delay			32.7									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

Olsen-Chandler SP
9: Paso Robles Street & 13th Street

Existing Plus 1293 Unit Project AM
Queues

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	76	932	56	1300	411	251	14	273	6	9
v/c Ratio	0.41	0.52	0.33	0.73	0.45	0.71	0.03	0.46	0.02	0.02
Control Delay	49.2	16.1	48.4	21.0	7.3	44.1	27.4	7.7	27.2	0.0
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.2	16.4	48.4	21.0	7.3	44.1	27.4	7.7	27.2	0.0
Queue Length 50th (ft)	45	180	33	304	44	143	7	8	3	0
Queue Length 95th (ft)	85	236	67	375	91	200	19	45	12	0
Internal Link Dist (ft)		307		269			836			575
Turn Bay Length (ft)	120		220		145	130		110	95	
Base Capacity (vph)	240	2200	217	2192	1056	556	740	782	553	746
Starvation Cap Reductn	0	656	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.60	0.26	0.59	0.39	0.45	0.02	0.35	0.01	0.01

Intersection Summary

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
9: Paso Robles Street & 13th Street

Existing Plus 1293 Unit Project AM
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	699	46	45	1040	329	201	11	218	5	0	7
Future Volume (vph)	61	699	46	45	1040	329	201	11	218	5	0	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1752	3465		1752	3505	1530	1752	1845	1568	1752	1568	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.75	1.00	1.00	0.75	1.00	
Satd. Flow (perm)	1752	3465		1752	3505	1530	1387	1845	1568	1380	1568	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	76	874	58	56	1300	411	251	14	272	6	0	9
RTOR Reduction (vph)	0	4	0	0	0	132	0	0	191	0	7	0
Lane Group Flow (vph)	76	928	0	56	1300	279	251	14	82	6	2	0
Confl. Peds. (#/hr)			6			1						
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		
Actuated Green, G (s)	6.8	44.2		6.1	43.5	43.5	21.7	21.7	21.7	21.7	21.7	
Effective Green, g (s)	6.8	44.2		6.1	43.5	43.5	21.7	21.7	21.7	21.7	21.7	
Actuated g/C Ratio	0.08	0.52		0.07	0.51	0.51	0.25	0.25	0.25	0.25	0.25	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	139	1791		124	1783	778	352	468	397	350	397	
v/s Ratio Prot	c0.04	0.27		0.03	c0.37			0.01			0.00	
v/s Ratio Perm						0.18	c0.18		0.05	0.00		
v/c Ratio	0.55	0.52		0.45	0.73	0.36	0.71	0.03	0.21	0.02	0.01	
Uniform Delay, d1	37.9	13.6		38.1	16.4	12.6	29.1	24.0	25.1	23.9	23.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.3	0.3		2.6	1.5	0.3	6.7	0.0	0.3	0.0	0.0	
Delay (s)	42.2	13.9		40.7	17.9	12.9	35.8	24.0	25.4	23.9	23.8	
Level of Service	D	B		D	B	B	D	C	C	C	C	
Approach Delay (s)		16.0			17.5			30.2			23.9	
Approach LOS		B			B			C			C	

Intersection Summary				
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	85.5	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	62.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Olsen-Chandler SP
9: Paso Robles Street & 13th Street

Existing Plus 1293 Unit Project AM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	699	46	45	1040	329	201	11	218	5	0	7
Future Volume (veh/h)	61	699	46	45	1040	329	201	11	218	5	0	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	76	874	58	56	1300	0	251	14	272	6	0	9
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	101	1722	114	86	1780		426	427	362	354	0	362
Arrive On Green	0.06	0.51	0.51	0.05	0.50	0.00	0.23	0.23	0.23	0.23	0.00	0.23
Sat Flow, veh/h	1767	3354	223	1767	3526	1572	1395	1856	1572	1085	0	1572
Grp Volume(v), veh/h	76	459	473	56	1300	0	251	14	272	6	0	9
Grp Sat Flow(s),veh/h/ln	1767	1763	1814	1767	1763	1572	1395	1856	1572	1085	0	1572
Q Serve(g_s), s	2.8	11.2	11.2	2.0	18.8	0.0	11.1	0.4	10.5	0.3	0.0	0.3
Cycle Q Clear(g_c), s	2.8	11.2	11.2	2.0	18.8	0.0	11.3	0.4	10.5	0.7	0.0	0.3
Prop In Lane	1.00		0.12	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	101	905	931	86	1780		426	427	362	354	0	362
V/C Ratio(X)	0.75	0.51	0.51	0.65	0.73		0.59	0.03	0.75	0.02	0.00	0.02
Avail Cap(c_a), veh/h	285	1389	1430	258	2725		762	875	742	616	0	742
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.2	10.4	10.4	30.4	12.6	0.0	23.8	19.4	23.3	19.7	0.0	19.4
Incr Delay (d2), s/veh	10.5	0.4	0.4	7.9	0.6	0.0	1.3	0.0	3.2	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	3.8	3.9	1.0	6.4	0.0	3.5	0.2	3.9	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.7	10.9	10.8	38.3	13.2	0.0	25.1	19.5	26.5	19.7	0.0	19.4
LnGrp LOS	D	B	B	D	B		C	B	C	B	A	B
Approach Vol, veh/h		1008			1356	A		537			15	
Approach Delay, s/veh		13.1			14.3			25.6			19.5	
Approach LOS		B			B			C			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.7	37.9		19.5	8.2	37.4		19.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	9.5	51.3		30.7	10.5	50.3		30.7				
Max Q Clear Time (g_c+I1), s	4.0	13.2		2.7	4.8	20.8		13.3				
Green Ext Time (p_c), s	0.0	7.3		0.0	0.1	12.0		1.6				

Intersection Summary	
HCM 6th Ctrl Delay	16.0
HCM 6th LOS	B

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	224	924	70	1018	448	211	56	150	637
v/c Ratio	0.61	0.66	0.47	0.83	0.76	0.25	0.13	0.64	0.91dr
Control Delay	55.6	27.8	61.7	38.8	53.1	35.8	2.4	58.9	38.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.6	27.8	61.7	38.8	53.1	35.8	2.4	58.9	38.6
Queue Length 50th (ft)	82	271	50	352	163	66	0	107	170
Queue Length 95th (ft)	113	300	89	379	201	93	2	156	202
Internal Link Dist (ft)		353		673		608			523
Turn Bay Length (ft)	295		235		140		130	225	
Base Capacity (vph)	415	1524	179	1472	682	953	496	317	930
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.61	0.39	0.69	0.66	0.22	0.11	0.47	0.68

Intersection Summary

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	179	482	257	56	720	94	358	169	45	120	173	337
Future Volume (vph)	179	482	257	56	720	94	358	169	45	120	173	337
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.98		1.00	1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	3337		1770	3473		3433	3539	1583	1770	3188	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	3337		1770	3473		3433	3539	1583	1770	3188	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	224	602	321	70	900	118	448	211	56	150	216	421
RTOR Reduction (vph)	0	57	0	0	8	0	0	0	43	0	152	0
Lane Group Flow (vph)	224	867	0	70	1010	0	448	211	13	150	485	0
Confl. Peds. (#/hr)			3									
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	11.4	42.5		7.3	38.4		18.2	25.1	25.1	14.1	21.0	
Effective Green, g (s)	11.4	42.5		7.3	38.4		18.2	25.1	25.1	14.1	21.0	
Actuated g/C Ratio	0.11	0.40		0.07	0.36		0.17	0.23	0.23	0.13	0.20	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	365	1325		120	1246		583	830	371	233	625	
v/s Ratio Prot	c0.07	c0.26		0.04	c0.29		c0.13	c0.06		0.08	c0.15	
v/s Ratio Perm									0.01			
v/c Ratio	0.61	0.65		0.58	0.81		0.77	0.25	0.04	0.64	0.91dr	
Uniform Delay, d1	45.7	26.3		48.4	31.0		42.4	33.3	31.6	44.1	40.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.0	1.2		7.0	4.1		6.0	0.2	0.0	6.0	6.0	
Delay (s)	48.7	27.4		55.4	35.1		48.4	33.5	31.6	50.0	46.8	
Level of Service	D	C		E	D		D	C	C	D	D	
Approach Delay (s)		31.6			36.4			42.7			47.4	
Approach LOS		C			D			D			D	

Intersection Summary				
HCM 2000 Control Delay	38.5	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	107.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	68.9%	ICU Level of Service	C	
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	179	482	257	56	720	94	358	169	45	120	173	337
Future Volume (veh/h)	179	482	257	56	720	94	358	169	45	120	173	337
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	224	602	0	70	900	118	448	211	56	150	216	0
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	329	1492		94	1191	156	583	579	258	192	363	
Arrive On Green	0.10	0.42	0.00	0.05	0.38	0.38	0.17	0.16	0.16	0.11	0.10	0.00
Sat Flow, veh/h	3456	3647	0	1781	3153	413	3456	3554	1585	1781	3647	0
Grp Volume(v), veh/h	224	602	0	70	507	511	448	211	56	150	216	0
Grp Sat Flow(s),veh/h/ln	1728	1777	0	1781	1777	1790	1728	1777	1585	1781	1777	0
Q Serve(g_s), s	4.4	8.3	0.0	2.7	17.5	17.5	8.7	3.7	2.2	5.8	4.1	0.0
Cycle Q Clear(g_c), s	4.4	8.3	0.0	2.7	17.5	17.5	8.7	3.7	2.2	5.8	4.1	0.0
Prop In Lane	1.00		0.00	1.00		0.23	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	329	1492		94	671	676	583	579	258	192	363	
V/C Ratio(X)	0.68	0.40		0.74	0.76	0.76	0.77	0.36	0.22	0.78	0.60	
Avail Cap(c_a), veh/h	615	2302		266	1101	1109	1009	1392	621	469	1290	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.7	14.2	0.0	32.8	19.0	19.0	27.9	26.2	25.5	30.5	30.1	0.0
Incr Delay (d2), s/veh	2.5	0.2	0.0	10.8	1.8	1.8	2.2	0.4	0.4	6.7	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	3.1	0.0	1.4	6.8	6.8	3.5	1.5	0.8	2.6	1.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.2	14.4	0.0	43.6	20.8	20.8	30.0	26.5	25.9	37.2	31.7	0.0
LnGrp LOS	C	B		D	C	C	C	C	C	D	C	
Approach Vol, veh/h		826	A		1088			715			366	A
Approach Delay, s/veh		19.5			22.3			28.7			34.0	
Approach LOS		B			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.2	34.0	16.4	11.7	11.2	31.0	12.1	15.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	45.5	20.5	25.5	12.5	43.5	18.5	27.5
Max Q Clear Time (g_c+I1), s	4.7	10.3	10.7	6.1	6.4	19.5	7.8	5.7
Green Ext Time (p_c), s	0.1	4.6	1.2	1.1	0.4	7.0	0.3	1.3

Intersection Summary	
HCM 6th Ctrl Delay	24.5
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	75	431	1131	520	105
v/c Ratio	0.36	0.21	0.74	0.64	0.23
Control Delay	44.6	10.0	20.8	34.6	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	44.6	10.0	20.8	34.6	9.0
Queue Length 50th (ft)	33	37	174	113	0
Queue Length 95th (ft)	103	134	#458	251	43
Internal Link Dist (ft)		1151	2310	505	
Turn Bay Length (ft)	125			120	
Base Capacity (vph)	273	2619	2022	1187	615
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.27	0.16	0.56	0.44	0.17

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	65	375	527	457	452	91
Future Volume (vph)	65	375	527	457	452	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.93		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1752	3505	3238		3400	1568
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1752	3505	3238		3400	1568
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	75	431	606	525	520	105
RTOR Reduction (vph)	0	0	115	0	0	81
Lane Group Flow (vph)	75	431	1016	0	520	24
Confl. Peds. (#/hr)				3		
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	NA		Perm	Perm
Protected Phases	5	2	6			
Permitted Phases					4	4
Actuated Green, G (s)	6.9	45.2	33.8		18.3	18.3
Effective Green, g (s)	6.9	45.2	33.8		18.3	18.3
Actuated g/C Ratio	0.09	0.56	0.42		0.23	0.23
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	150	1970	1361		773	356
v/s Ratio Prot	c0.04	0.12	c0.31			
v/s Ratio Perm					c0.15	0.02
v/c Ratio	0.50	0.22	0.75		0.67	0.07
Uniform Delay, d1	35.1	8.8	19.7		28.3	24.4
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.6	0.1	2.3		2.3	0.1
Delay (s)	37.7	8.8	22.0		30.6	24.4
Level of Service	D	A	C		C	C
Approach Delay (s)		13.1	22.0		29.6	
Approach LOS		B	C		C	

Intersection Summary			
HCM 2000 Control Delay	22.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	80.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	57.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	129	266	133	51	552	412	260	556	231	654
v/c Ratio	0.52	0.46	0.23	0.33	0.67	0.61	0.74	0.67	0.71	0.70
Control Delay	42.5	26.4	5.9	44.3	33.3	7.7	47.0	32.3	46.7	20.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.5	26.4	5.9	44.3	33.3	7.7	47.0	32.3	46.7	20.4
Queue Length 50th (ft)	64	116	0	26	139	0	131	140	116	92
Queue Length 95th (ft)	124	199	40	65	210	78	#268	200	#238	155
Internal Link Dist (ft)		1092			186			1440		2310
Turn Bay Length (ft)	150			170		140	230		245	
Base Capacity (vph)	325	697	660	166	965	719	398	1101	373	1167
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.38	0.20	0.31	0.57	0.57	0.65	0.50	0.62	0.56

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	239	120	46	497	371	234	464	36	208	282	307
Future Volume (vph)	116	239	120	46	497	371	234	464	36	208	282	307
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1845	1532	1752	3505	1533	1752	3463		1752	3186	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1845	1532	1752	3505	1533	1752	3463		1752	3186	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	129	266	133	51	552	412	260	516	40	231	313	341
RTOR Reduction (vph)	0	0	92	0	0	312	0	6	0	0	227	0
Lane Group Flow (vph)	129	266	41	51	552	100	260	550	0	231	427	0
Confl. Peds. (#/hr)			9			9			4			12
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	8.7	24.1	24.1	3.6	19.0	19.0	15.4	18.3		14.2	17.1	
Effective Green, g (s)	8.7	24.1	24.1	3.6	19.0	19.0	15.4	18.3		14.2	17.1	
Actuated g/C Ratio	0.11	0.31	0.31	0.05	0.24	0.24	0.20	0.23		0.18	0.22	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	194	568	472	80	851	372	345	810		318	696	
v/s Ratio Prot	c0.07	0.14		0.03	c0.16		c0.15	c0.16		0.13	0.13	
v/s Ratio Perm			0.03			0.07						
v/c Ratio	0.66	0.47	0.09	0.64	0.65	0.27	0.75	0.68		0.73	0.61	
Uniform Delay, d1	33.4	21.9	19.2	36.7	26.6	24.0	29.6	27.3		30.2	27.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.3	0.6	0.1	15.5	1.7	0.4	9.0	2.3		8.0	1.6	
Delay (s)	41.7	22.5	19.3	52.1	28.3	24.4	38.6	29.5		38.2	29.2	
Level of Service	D	C	B	D	C	C	D	C		D	C	
Approach Delay (s)		26.4			27.9			32.4			31.5	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	29.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	78.2	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	67.2%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
12: Creston Road & Niblick Road/Sherwood Road

Existing Plus 1293 Unit Project AM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	116	239	120	46	497	371	234	464	36	208	282	307
Future Volume (veh/h)	116	239	120	46	497	371	234	464	36	208	282	307
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	129	266	133	51	552	412	260	516	40	231	313	341
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	164	565	474	75	897	396	302	894	69	273	446	392
Arrive On Green	0.09	0.30	0.30	0.04	0.25	0.25	0.17	0.27	0.27	0.15	0.25	0.25
Sat Flow, veh/h	1767	1856	1559	1767	3526	1556	1767	3315	256	1767	1763	1550
Grp Volume(v), veh/h	129	266	133	51	552	412	260	274	282	231	313	341
Grp Sat Flow(s),veh/h/ln	1767	1856	1559	1767	1763	1556	1767	1763	1808	1767	1763	1550
Q Serve(g_s), s	5.6	9.2	5.1	2.2	10.9	20.0	11.2	10.6	10.6	10.0	12.7	16.6
Cycle Q Clear(g_c), s	5.6	9.2	5.1	2.2	10.9	20.0	11.2	10.6	10.6	10.0	12.7	16.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.14	1.00		1.00
Lane Grp Cap(c), veh/h	164	565	474	75	897	396	302	475	487	273	446	392
V/C Ratio(X)	0.79	0.47	0.28	0.68	0.62	1.04	0.86	0.58	0.58	0.85	0.70	0.87
Avail Cap(c_a), veh/h	303	628	527	155	897	396	371	516	529	348	493	434
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.9	22.2	20.8	37.1	25.9	29.3	31.7	24.8	24.8	32.3	26.7	28.1
Incr Delay (d2), s/veh	8.1	0.6	0.3	10.0	1.3	56.3	15.7	1.4	1.4	14.3	3.9	16.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	3.8	1.8	1.1	4.4	13.1	5.9	4.3	4.5	5.2	5.5	7.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.0	22.8	21.1	47.1	27.2	85.6	47.3	26.2	26.2	46.6	30.6	44.1
LnGrp LOS	D	C	C	D	C	F	D	C	C	D	C	D
Approach Vol, veh/h		528			1015			816			885	
Approach Delay, s/veh		27.3			51.9			32.9			40.0	
Approach LOS		C			D			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.6	25.7	7.9	28.4	17.9	24.4	11.8	24.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.5	23.0	6.9	26.6	16.5	22.0	13.5	20.0
Max Q Clear Time (g_c+I1), s	12.0	12.6	4.2	11.2	13.2	18.6	7.6	22.0
Green Ext Time (p_c), s	0.2	2.4	0.0	1.6	0.2	1.3	0.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	39.9
HCM 6th LOS	D

Olsen-Chandler SP
13: Creston Road & Scott Street

Existing Plus 1293 Unit Project AM
HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	42	60	533	43	55	426
Future Volume (Veh/h)	42	60	533	43	55	426
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	50	71	635	51	65	507
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1298	660			686	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1298	660			686	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	70	85			93	
cM capacity (veh/h)	166	463			908	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	121	686	65	507
Volume Left	50	0	65	0
Volume Right	71	51	0	0
cSH	266	1700	908	1700
Volume to Capacity	0.46	0.40	0.07	0.30
Queue Length 95th (ft)	56	0	6	0
Control Delay (s)	29.4	0.0	9.3	0.0
Lane LOS	D		A	
Approach Delay (s)	29.4	0.0	1.1	
Approach LOS	D			

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	3.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	42	60	533	43	55	426
Future Vol, veh/h	42	60	533	43	55	426
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	50	71	635	51	65	507

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1298	661	0	0	686	0
Stage 1	661	-	-	-	-	-
Stage 2	637	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	178	462	-	-	908	-
Stage 1	514	-	-	-	-	-
Stage 2	527	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	165	462	-	-	908	-
Mov Cap-2 Maneuver	165	-	-	-	-	-
Stage 1	514	-	-	-	-	-
Stage 2	489	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	29.6	0	1.1
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	265	908	-
HCM Lane V/C Ratio	-	-	0.458	0.072	-
HCM Control Delay (s)	-	-	29.6	9.3	-
HCM Lane LOS	-	-	D	A	-
HCM 95th %tile Q(veh)	-	-	2.3	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	6	37	7	15	95	27	326	3	33	305	83
Future Volume (Veh/h)	94	6	37	7	15	95	27	326	3	33	305	83
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	112	7	44	8	18	113	32	388	4	39	363	99
Pedestrians		6			2						1	
Lane Width (ft)		12.0			12.0						12.0	
Walking Speed (ft/s)		3.5			3.5						3.5	
Percent Blockage		1			0						0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1022	905	369	944	1002	393	468			394		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1022	905	369	944	1002	393	468			394		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	29	97	93	96	92	83	97			97		
cM capacity (veh/h)	157	257	673	209	226	654	1087			1162		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	163	139	32	392	39	363	99
Volume Left	112	8	32	0	39	0	0
Volume Right	44	113	0	4	0	0	99
cSH	202	478	1087	1700	1162	1700	1700
Volume to Capacity	0.81	0.29	0.03	0.23	0.03	0.21	0.06
Queue Length 95th (ft)	144	30	2	0	3	0	0
Control Delay (s)	70.8	15.6	8.4	0.0	8.2	0.0	0.0
Lane LOS	F	C	A		A		
Approach Delay (s)	70.8	15.6	0.6		0.6		
Approach LOS	F	C					

Intersection Summary				
Average Delay	11.7			
Intersection Capacity Utilization	45.1%	ICU Level of Service		A
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	10

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	94	6	37	7	15	95	27	326	3	33	305	83
Future Vol, veh/h	94	6	37	7	15	95	27	326	3	33	305	83
Conflicting Peds, #/hr	1	0	0	0	0	1	6	0	2	2	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	30	-	-	70	-	60
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	112	7	44	8	18	113	32	388	4	39	363	99

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	968	905	369	972	1002	393	468	0	0	394	0	0
Stage 1	447	447	-	456	456	-	-	-	-	-	-	-
Stage 2	521	458	-	516	546	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	233	276	677	232	242	656	1094	-	-	1165	-	-
Stage 1	591	573	-	584	568	-	-	-	-	-	-	-
Stage 2	539	567	-	542	518	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	171	257	673	202	225	654	1088	-	-	1163	-	-
Mov Cap-2 Maneuver	171	257	-	202	225	-	-	-	-	-	-	-
Stage 1	570	550	-	566	550	-	-	-	-	-	-	-
Stage 2	418	549	-	483	497	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	58.5	15.7	0.6	0.6
HCM LOS	F	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1088	-	-	218	474	1163	-	-
HCM Lane V/C Ratio	0.03	-	-	0.748	0.294	0.034	-	-
HCM Control Delay (s)	8.4	-	-	58.5	15.7	8.2	-	-
HCM Lane LOS	A	-	-	F	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	5.1	1.2	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	20	9	5	200	5	171	4	165	94	174	161	10
Future Volume (vph)	20	9	5	200	5	171	4	165	94	174	161	10
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	24	11	6	235	6	201	5	194	111	205	189	12

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	41	442	199	111	300	107
Volume Left (vph)	24	235	5	0	205	0
Volume Right (vph)	6	201	0	111	0	12
Hadj (s)	0.06	-0.13	0.05	-0.67	0.38	-0.04
Departure Headway (s)	7.0	5.8	6.9	6.1	7.0	6.6
Degree Utilization, x	0.08	0.71	0.38	0.19	0.58	0.19
Capacity (veh/h)	422	442	488	548	495	523
Control Delay (s)	10.7	22.0	12.8	9.4	18.1	9.9
Approach Delay (s)	10.7	22.0	11.6		15.9	
Approach LOS	B	C	B		C	

Intersection Summary				
Delay	16.9			
Level of Service	C			
Intersection Capacity Utilization	56.1%	ICU Level of Service	B	
Analysis Period (min)	15			

Intersection	
Intersection Delay, s/veh	17.5
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Vol, veh/h	20	9	5	200	5	171	0	4	165	94	174	161
Future Vol, veh/h	20	9	5	200	5	171	0	4	165	94	174	161
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.92	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	24	11	6	235	6	201	0	5	194	111	205	189
Number of Lanes	0	1	0	0	1	0	0	0	1	1	0	2

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	10.8	22.3	12.4	16.7
HCM LOS	B	C	B	C

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	2%	0%	59%	53%	68%	0%
Vol Thru, %	98%	0%	26%	1%	32%	89%
Vol Right, %	0%	100%	15%	45%	0%	11%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	169	94	34	376	255	91
LT Vol	4	0	20	200	174	0
Through Vol	165	0	9	5	81	81
RT Vol	0	94	5	171	0	10
Lane Flow Rate	199	111	40	442	299	106
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.374	0.186	0.079	0.715	0.575	0.192
Departure Headway (Hd)	6.78	6.051	7.154	5.815	6.919	6.491
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	527	587	504	619	518	548
Service Time	4.579	3.849	5.154	3.892	4.709	4.28
HCM Lane V/C Ratio	0.378	0.189	0.079	0.714	0.577	0.193
HCM Control Delay	13.6	10.2	10.8	22.3	18.8	10.8
HCM Lane LOS	B	B	B	C	C	B
HCM 95th-tile Q	1.7	0.7	0.3	5.9	3.6	0.7

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBR
Lane Configurations	
Traffic Vol, veh/h	10
Future Vol, veh/h	10
Peak Hour Factor	0.85
Heavy Vehicles, %	2
Mvmt Flow	12
Number of Lanes	0

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	133	81	123	129	88	277
Future Volume (Veh/h)	133	81	123	129	88	277
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	155	94	143	150	102	322
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	463	102	424			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	463	102	424			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	66	90	87			
cM capacity (veh/h)	458	930	1125			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	249	143	75	75	102	322
Volume Left	155	143	0	0	0	0
Volume Right	94	0	0	0	0	322
cSH	736	1125	1700	1700	1700	1700
Volume to Capacity	0.34	0.13	0.04	0.04	0.06	0.19
Queue Length 95th (ft)	37	11	0	0	0	0
Control Delay (s)	14.0	8.7	0.0	0.0	0.0	0.0
Lane LOS	B	A				
Approach Delay (s)	14.0	4.2			0.0	
Approach LOS	B					

Intersection Summary			
Average Delay		4.9	
Intersection Capacity Utilization		30.6%	ICU Level of Service A
Analysis Period (min)		15	

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	133	81	123	129	88	277
Future Vol, veh/h	133	81	123	129	88	277
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	145	105	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	155	94	143	150	102	322

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	463	102	424	0	-	0
Stage 1	102	-	-	-	-	-
Stage 2	361	-	-	-	-	-
Critical Hdwy	6.645	6.245	4.145	-	-	-
Critical Hdwy Stg 1	5.445	-	-	-	-	-
Critical Hdwy Stg 2	5.845	-	-	-	-	-
Follow-up Hdwy	3.5285	3.3285	2.2285	-	-	-
Pot Cap-1 Maneuver	540	950	1127	-	-	-
Stage 1	919	-	-	-	-	-
Stage 2	674	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	471	950	1127	-	-	-
Mov Cap-2 Maneuver	471	-	-	-	-	-
Stage 1	802	-	-	-	-	-
Stage 2	674	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.6	4.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1127	-	471	950	-	-
HCM Lane V/C Ratio	0.127	-	0.328	0.099	-	-
HCM Control Delay (s)	8.7	-	16.3	9.2	-	-
HCM Lane LOS	A	-	C	A	-	-
HCM 95th %tile Q(veh)	0.4	-	1.4	0.3	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	0	24	1	87	9	0	0	0	0	324	15
Future Volume (Veh/h)	27	0	24	1	87	9	0	0	0	0	324	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	30	0	26	1	96	10	0	0	0	0	356	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	417	364	364	390	372	0	372			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	417	364	364	390	372	0	372			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	100	96	100	83	99	100			100		
cM capacity (veh/h)	470	564	681	547	558	1085	1186			1623		

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	56	107	372
Volume Left	30	1	0
Volume Right	26	10	16
cSH	549	616	1700
Volume to Capacity	0.10	0.17	0.22
Queue Length 95th (ft)	8	16	0
Control Delay (s)	12.3	12.4	0.0
Lane LOS	B	B	
Approach Delay (s)	12.3	12.4	0.0
Approach LOS	B	B	

Intersection Summary					
Average Delay	3.8				
Intersection Capacity Utilization	34.3%	ICU Level of Service		A	
Analysis Period (min)	15				

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	0	24	1	87	9	0	0	0	0	324	15
Future Vol, veh/h	27	0	24	1	87	9	0	0	0	0	324	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	30	0	26	1	96	10	0	0	0	0	356	16

Major/Minor	Minor2			Minor1						Major2		
Conflicting Flow All	417	364	364	377	372	0				-	-	0
Stage 1	364	364	-	0	0	-				-	-	-
Stage 2	53	0	-	377	372	-				-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22				-	-	-
Critical Hdwy Stg 1	6.12	5.52	-	-	-	-				-	-	-
Critical Hdwy Stg 2	-	-	-	6.12	5.52	-				-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318				-	-	-
Pot Cap-1 Maneuver	546	564	681	580	558	-				0	-	-
Stage 1	655	624	-	-	-	-				0	-	-
Stage 2	-	-	-	644	619	-				0	-	-
Platoon blocked, %											-	-
Mov Cap-1 Maneuver	-	564	681	557	558	-				-	-	-
Mov Cap-2 Maneuver	-	564	-	557	558	-				-	-	-
Stage 1	655	624	-	-	-	-				-	-	-
Stage 2	-	-	-	619	619	-				-	-	-

Approach	EB	WB	SB
HCM Control Delay, s			0
HCM LOS	-	-	

Minor Lane/Major Mvmt	EBLn1	WBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	-	558	-	-	-
HCM Lane V/C Ratio	-	0.173	-	-	-
HCM Control Delay (s)	-	12.8	-	-	-
HCM Lane LOS	-	B	-	-	-
HCM 95th %tile Q(veh)	-	0.6	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	21	348	1194	256	508	77	308	565	335	280
v/c Ratio	0.10	0.72	0.80	0.32	0.46	0.54	0.66	0.34	0.67	0.36
Control Delay	55.8	51.7	37.7	26.7	3.1	76.4	62.1	5.4	60.6	44.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.8	51.7	37.7	26.7	3.1	76.4	62.1	5.4	60.6	44.2
Queue Length 50th (ft)	17	120	441	139	15	66	137	40	145	109
Queue Length 95th (ft)	43	171	568	223	47	122	186	59	196	147
Internal Link Dist (ft)		521		1372			611			680
Turn Bay Length (ft)	115		515		115	165		290	305	
Base Capacity (vph)	289	614	1697	921	1163	173	658	1824	669	984
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.57	0.70	0.28	0.44	0.45	0.47	0.31	0.50	0.28

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	177	115	1003	215	427	65	259	475	281	197	38
Future Volume (vph)	18	177	115	1003	215	427	65	259	475	281	197	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.95	0.88	0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3330		3433	1863	1568	1770	3539	2787	3433	3441	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3330		3433	1863	1568	1770	3539	2787	3433	3441	
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	21	211	137	1194	256	508	77	308	565	335	235	45
RTOR Reduction (vph)	0	73	0	0	0	195	0	0	80	0	11	0
Lane Group Flow (vph)	21	275	0	1194	256	313	77	308	485	335	269	0
Confl. Peds. (#/hr)												1
Confl. Bikes (#/hr)						2						
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	15.8	15.8		55.5	55.5	74.3	8.4	18.5	74.0	18.8	28.9	
Effective Green, g (s)	15.8	15.8		55.5	55.5	74.3	8.4	18.5	74.0	18.8	28.9	
Actuated g/C Ratio	0.12	0.12		0.43	0.43	0.58	0.07	0.14	0.57	0.15	0.22	
Clearance Time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	216	407		1475	800	902	115	507	1597	499	770	
v/s Ratio Prot	0.01	c0.08		c0.35	0.14	0.05	0.04	c0.09	0.13	c0.10	0.08	
v/s Ratio Perm						0.15			0.04			
v/c Ratio	0.10	0.68		0.81	0.32	0.35	0.67	0.61	0.30	0.67	0.35	
Uniform Delay, d1	50.3	54.2		32.2	24.3	14.5	59.0	51.9	14.2	52.2	42.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	4.4		3.4	0.2	0.2	13.8	2.1	0.1	3.5	0.3	
Delay (s)	50.5	58.6		35.6	24.6	14.8	72.8	54.0	14.3	55.8	42.5	
Level of Service	D	E		D	C	B	E	D	B	E	D	
Approach Delay (s)		58.1			28.7			31.9			49.7	
Approach LOS		E			C			C			D	

Intersection Summary				
HCM 2000 Control Delay	35.6	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	129.1	Sum of lost time (s)	20.5	
Intersection Capacity Utilization	69.5%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Existing Plus 1293 Unit Project AM
18: US 101 Ramps/Spring Street & 1st Street/Niblick Road — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	177	115	1003	215	427	65	259	475	281	197	38
Future Volume (veh/h)	18	177	115	1003	215	427	65	259	475	281	197	38
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	21	211	137	1194	256	508	77	308	565	335	235	45
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	233	275	171	1429	774	838	99	544	1581	416	621	117
Arrive On Green	0.13	0.13	0.13	0.41	0.41	0.41	0.06	0.15	0.15	0.12	0.21	0.21
Sat Flow, veh/h	1781	2105	1307	3456	1870	1564	1781	3554	2790	3456	2983	562
Grp Volume(v), veh/h	21	177	171	1194	256	508	77	308	565	335	138	142
Grp Sat Flow(s),veh/h/ln	1781	1777	1635	1728	1870	1564	1781	1777	1395	1728	1777	1768
Q Serve(g_s), s	1.2	10.8	11.4	34.8	10.5	25.2	4.8	9.0	12.4	10.6	7.5	7.8
Cycle Q Clear(g_c), s	1.2	10.8	11.4	34.8	10.5	25.2	4.8	9.0	12.4	10.6	7.5	7.8
Prop In Lane	1.00		0.80	1.00		1.00	1.00		1.00	1.00		0.32
Lane Grp Cap(c), veh/h	233	232	213	1429	774	838	99	544	1581	416	370	368
V/C Ratio(X)	0.09	0.76	0.80	0.84	0.33	0.61	0.78	0.57	0.36	0.81	0.37	0.38
Avail Cap(c_a), veh/h	323	322	297	1893	1025	1048	193	733	1729	747	558	555
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.0	47.2	47.5	29.5	22.4	18.1	52.4	44.2	13.2	48.2	38.2	38.3
Incr Delay (d2), s/veh	0.2	6.8	10.4	2.6	0.2	0.7	12.4	0.9	0.1	3.7	0.6	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	5.2	5.3	14.2	4.5	8.6	2.4	3.9	7.8	4.8	3.3	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.2	54.0	57.9	32.1	22.6	18.8	64.8	45.1	13.4	51.9	38.8	39.0
LnGrp LOS	D	D	E	C	C	B	E	D	B	D	D	D
Approach Vol, veh/h		369			1958			950			615	
Approach Delay, s/veh		55.2			27.4			27.8			46.0	
Approach LOS		E			C			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	18.2	23.0		19.3	12.0	29.2		51.9				
Change Period (Y+Rc), s	* 4.7	5.8		4.6	5.8	* 5.8		5.4				
Max Green Setting (Gmax), s	* 24	23.2		20.4	12.2	* 35		61.6				
Max Q Clear Time (g_c+I1), s	12.6	14.4		13.4	6.8	9.8		36.8				
Green Ext Time (p_c), s	0.9	2.8		1.2	0.1	1.6		9.7				

Intersection Summary			
HCM 6th Ctrl Delay		33.1	
HCM 6th LOS		C	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Olsen-Chandler SP — Existing Plus 1293 Unit Project AM
19: S. River Road & Niblick Road — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	115	663	244	131	1368	609	367	308	431
v/c Ratio	0.56	0.53	0.34	0.68	0.98	0.84	0.65	0.84	0.73
Control Delay	62.6	31.1	5.0	65.4	51.0	53.1	47.3	62.6	43.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.6	31.1	5.0	65.4	51.0	53.1	47.3	62.6	43.0
Queue Length 50th (ft)	41	200	0	89	490	211	126	205	126
Queue Length 95th (ft)	73	273	51	#159	#687	285	170	#344	173
Internal Link Dist (ft)		1510			1609		962		896
Turn Bay Length (ft)	140			80		150		110	
Base Capacity (vph)	205	1262	721	219	1403	773	835	409	895
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.53	0.34	0.60	0.98	0.79	0.44	0.75	0.48

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
19: S. River Road & Niblick Road

Existing Plus 1293 Unit Project AM
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	577	212	114	923	267	530	273	46	268	241	134
Future Volume (vph)	100	577	212	114	923	267	530	273	46	268	241	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3539	1583	1770	3401		3433	3453		1770	3350	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	3539	1583	1770	3401		3433	3453		1770	3350	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	115	663	244	131	1061	307	609	314	53	308	277	154
RTOR Reduction (vph)	0	0	157	0	21	0	0	12	0	0	69	0
Lane Group Flow (vph)	115	663	87	131	1347	0	609	355	0	308	362	0
Confl. Peds. (#/hr)						10			5			
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	6.5	39.0	39.0	12.0	44.5		23.1	17.5		22.7	17.1	
Effective Green, g (s)	6.5	39.0	39.0	12.0	44.5		23.1	17.5		22.7	17.1	
Actuated g/C Ratio	0.06	0.36	0.36	0.11	0.41		0.21	0.16		0.21	0.16	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	204	1263	565	194	1385		726	553		367	524	
v/s Ratio Prot	0.03	0.19		c0.07	c0.40		c0.18	0.10		c0.17	0.11	
v/s Ratio Perm			0.06									
v/c Ratio	0.56	0.52	0.15	0.68	0.97		0.84	0.64		0.84	0.69	
Uniform Delay, d1	50.0	27.8	23.9	46.7	31.8		41.3	42.9		41.5	43.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.5	0.4	0.1	8.9	17.9		8.4	2.6		15.4	3.9	
Delay (s)	53.5	28.2	24.0	55.7	49.7		49.7	45.5		56.9	47.5	
Level of Service	D	C	C	E	D		D	D		E	D	
Approach Delay (s)		30.0			50.2			48.1			51.4	
Approach LOS		C			D			D			D	

Intersection Summary					
HCM 2000 Control Delay	45.1	HCM 2000 Level of Service		D	
HCM 2000 Volume to Capacity ratio	0.93				
Actuated Cycle Length (s)	109.2	Sum of lost time (s)		18.0	
Intersection Capacity Utilization	79.5%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

Olsen-Chandler SP
19: S. River Road & Niblick Road

Existing Plus 1293 Unit Project AM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	577	212	114	923	267	530	273	46	268	241	134
Future Volume (veh/h)	100	577	212	114	923	267	530	273	46	268	241	134
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	115	663	244	131	1061	307	609	314	53	308	277	154
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	173	1329	593	161	1126	323	688	528	88	342	370	200
Arrive On Green	0.05	0.37	0.37	0.09	0.41	0.41	0.20	0.17	0.17	0.19	0.17	0.17
Sat Flow, veh/h	3456	3554	1585	1781	2720	780	3456	3043	508	1781	2228	1203
Grp Volume(v), veh/h	115	663	244	131	690	678	609	182	185	308	219	212
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1781	1777	1723	1728	1777	1774	1781	1777	1654
Q Serve(g_s), s	3.5	15.2	6.6	7.6	39.3	40.2	18.1	10.0	10.2	17.8	12.4	12.9
Cycle Q Clear(g_c), s	3.5	15.2	6.6	7.6	39.3	40.2	18.1	10.0	10.2	17.8	12.4	12.9
Prop In Lane	1.00		1.00	1.00		0.45	1.00		0.29	1.00		0.73
Lane Grp Cap(c), veh/h	173	1329	593	161	736	714	688	308	308	342	295	275
V/C Ratio(X)	0.66	0.50	0.41	0.82	0.94	0.95	0.88	0.59	0.60	0.90	0.74	0.77
Avail Cap(c_a), veh/h	213	1329	593	228	745	722	788	437	436	425	456	424
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.3	25.4	7.3	47.2	29.7	29.9	41.1	40.2	40.3	41.7	41.9	42.1
Incr Delay (d2), s/veh	5.6	0.3	0.5	14.2	19.3	22.0	10.7	1.8	1.9	19.0	3.7	4.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	6.2	4.0	3.9	19.6	19.9	8.5	4.4	4.5	9.4	5.6	5.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.9	25.7	7.7	61.4	49.0	51.9	51.8	42.0	42.2	60.7	45.6	46.7
LnGrp LOS	D	C	A	E	D	D	D	D	D	E	D	D
Approach Vol, veh/h		1022			1499			976			739	
Approach Delay, s/veh		24.7			51.4			48.2			52.2	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	44.0	25.5	22.1	9.8	48.3	24.8	22.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	13.5	37.3	24.1	27.1	6.5	44.3	25.2	26.0
Max Q Clear Time (g_c+I1), s	9.6	17.2	20.1	14.9	5.5	42.2	19.8	12.2
Green Ext Time (p_c), s	0.1	5.0	0.9	1.9	0.0	1.6	0.4	1.6

Intersection Summary		
HCM 6th Ctrl Delay	44.3	
HCM 6th LOS	D	

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	321	146	13	733	203	7
v/c Ratio	0.41	0.20	0.03	0.49	0.41	0.02
Control Delay	11.1	3.1	9.0	10.5	13.8	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.1	3.1	9.0	10.5	13.8	6.8
Queue Length 50th (ft)	36	0	1	44	26	0
Queue Length 95th (ft)	145	28	12	152	95	7
Internal Link Dist (ft)	1629			570	669	
Turn Bay Length (ft)			75			50
Base Capacity (vph)	1606	1349	906	3052	1378	1236
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.11	0.01	0.24	0.15	0.01

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	292	133	12	667	185	6
Future Volume (vph)	292	133	12	667	185	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1845	1532	1749	3505	1752	1568
Flt Permitted	1.00	1.00	0.57	1.00	0.95	1.00
Satd. Flow (perm)	1845	1532	1042	3505	1752	1568
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	321	146	13	733	203	7
RTOR Reduction (vph)	0	82	0	0	0	5
Lane Group Flow (vph)	321	64	13	733	203	2
Confl. Peds. (#/hr)		4	4		1	
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Turn Type	NA	Perm	Perm	NA	Perm	Prot
Protected Phases	2			6		8
Permitted Phases		2	6		8	
Actuated Green, G (s)	17.5	17.5	17.5	17.5	11.6	11.6
Effective Green, g (s)	17.5	17.5	17.5	17.5	11.6	11.6
Actuated g/C Ratio	0.44	0.44	0.44	0.44	0.29	0.29
Clearance Time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	809	671	457	1537	509	455
v/s Ratio Prot	0.17			c0.21		0.00
v/s Ratio Perm		0.04	0.01		c0.12	
v/c Ratio	0.40	0.10	0.03	0.48	0.40	0.00
Uniform Delay, d1	7.6	6.6	6.4	8.0	11.4	10.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.0	0.0	0.1	0.2	0.0
Delay (s)	7.7	6.6	6.4	8.0	11.5	10.1
Level of Service	A	A	A	A	B	B
Approach Delay (s)	7.4			8.0	11.5	
Approach LOS	A			A	B	

Intersection Summary				
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	39.9	Sum of lost time (s)	10.8
Intersection Capacity Utilization	37.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	292	133	12	667	185	6
Future Volume (veh/h)	292	133	12	667	185	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	321	146	13	733	203	7
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	675	569	479	1283	416	370
Arrive On Green	0.36	0.36	0.36	0.36	0.24	0.24
Sat Flow, veh/h	1856	1564	916	3618	1767	1572
Grp Volume(v), veh/h	321	146	13	733	203	7
Grp Sat Flow(s),veh/h/ln	1856	1564	916	1763	1767	1572
Q Serve(g_s), s	3.6	1.8	0.3	4.5	2.7	0.1
Cycle Q Clear(g_c), s	3.6	1.8	3.9	4.5	2.7	0.1
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	675	569	479	1283	416	370
V/C Ratio(X)	0.48	0.26	0.03	0.57	0.49	0.02
Avail Cap(c_a), veh/h	2383	2008	1322	4528	1942	1728
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	6.6	6.0	8.1	6.9	8.9	7.9
Incr Delay (d2), s/veh	0.2	0.1	0.0	0.1	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.2	0.0	0.7	0.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	6.8	6.1	8.1	7.0	9.2	7.9
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h	467			746	210	
Approach Delay, s/veh	6.6			7.1	9.2	
Approach LOS	A			A	A	

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	15.2				15.2	11.7
Change Period (Y+Rc), s	5.4				5.4	5.4
Max Green Setting (Gmax), s	34.6				34.6	29.6
Max Q Clear Time (g_c+I1), s	5.6				6.5	4.7
Green Ext Time (p_c), s	1.3				3.3	0.3

Intersection Summary			
HCM 6th Ctrl Delay		7.2	
HCM 6th LOS		A	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	228	70	5	629	0	49	0	5	0	0	0
Future Volume (Veh/h)	0	228	70	5	629	0	49	0	5	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	248	76	5	684	0	53	0	5	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									4			
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		650										
pX, platoon unblocked				0.91			0.91	0.91	0.91	0.91	0.91	
vC, conflicting volume	684			324			638	980	286	982	1018	342
vC1, stage 1 conf vol							286	286		694	694	
vC2, stage 2 conf vol							352	694		288	324	
vCu, unblocked vol	684			210			555	930	168	932	971	342
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			91	100	99	100	100	100
cM capacity (veh/h)	905			1238			563	407	771	371	401	654

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	324	347	342	58	0
Volume Left	0	5	0	53	0
Volume Right	76	0	0	5	0
cSH	905	1238	1700	617	1700
Volume to Capacity	0.00	0.00	0.20	0.09	0.00
Queue Length 95th (ft)	0	0	0	8	0
Control Delay (s)	0.0	0.2	0.0	11.8	0.0
Lane LOS		A		B	A
Approach Delay (s)	0.0	0.1		11.8	0.0
Approach LOS				B	A

Intersection Summary					
Average Delay		0.7			
Intersection Capacity Utilization		30.9%	ICU Level of Service		A
Analysis Period (min)		15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	228	70	5	629	0	49	0	5	0	0	0
Future Vol, veh/h	0	228	70	5	629	0	49	0	5	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	248	76	5	684	0	53	0	5	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	684	0	0	324	0	0	638	980	286	983	1018	342
Stage 1	-	-	-	-	-	-	286	286	-	694	694	-
Stage 2	-	-	-	-	-	-	352	694	-	289	324	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.23	7.33	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.519	4.019	3.319
Pot Cap-1 Maneuver	907	-	-	1234	-	-	375	249	752	215	237	655
Stage 1	-	-	-	-	-	-	721	674	-	400	443	-
Stage 2	-	-	-	-	-	-	639	443	-	718	649	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	907	-	-	1234	-	-	373	247	752	212	235	655
Mov Cap-2 Maneuver	-	-	-	-	-	-	542	395	-	363	390	-
Stage 1	-	-	-	-	-	-	721	674	-	400	440	-
Stage 2	-	-	-	-	-	-	635	440	-	713	649	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	12.2	0
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	542	752	907	-	-	1234	-	-	-
HCM Lane V/C Ratio	0.098	0.007	-	-	-	0.004	-	-	-
HCM Control Delay (s)	12.4	9.8	0	-	-	7.9	0	-	0
HCM Lane LOS	B	A	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0.3	0	0	-	-	0	-	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Traffic Volume (veh/h)	24	113	67	13	262	2	198	9	14	7	9	72
Future Volume (veh/h)	24	113	67	13	262	2	198	9	14	7	9	72
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	123	73	14	285	2	215	10	15	8	10	78
Approach Volume (veh/h)		222			301			240			96	
Crossing Volume (veh/h)		32			251			157			514	
High Capacity (veh/h)		1351			1137			1225			923	
High v/c (veh/h)		0.16			0.26			0.20			0.10	
Low Capacity (veh/h)		1130			937			1016			745	
Low v/c (veh/h)		0.20			0.32			0.24			0.13	

Intersection Summary				
Maximum v/c High	0.26			
Maximum v/c Low	0.32			
Intersection Capacity Utilization	45.0%	ICU Level of Service		A

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	5.3
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	222	301	240	96
Demand Flow Rate, veh/h	226	307	244	98
Vehicles Circulating, veh/h	32	256	160	524
Vehicles Exiting, veh/h	590	148	98	39
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.2	6.3	5.0	5.8
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	226	307	244	98
Cap Entry Lane, veh/h	1336	1063	1172	809
Entry HV Adj Factor	0.980	0.981	0.983	0.978
Flow Entry, veh/h	222	301	240	96
Cap Entry, veh/h	1309	1043	1152	790
V/C Ratio	0.169	0.289	0.208	0.121
Control Delay, s/veh	4.2	6.3	5.0	5.8
LOS	A	A	A	A
95th %tile Queue, veh	1	1	1	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	16	8	9	1	24	13	10	100	1	9	63	23
Future Volume (vph)	16	8	9	1	24	13	10	100	1	9	63	23
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	19	10	11	1	29	16	12	120	1	11	76	28

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	40	46	133	115
Volume Left (vph)	19	1	12	11
Volume Right (vph)	11	16	1	28
Hadj (s)	0.07	-0.07	0.15	0.01
Departure Headway (s)	4.6	4.4	4.4	4.3
Degree Utilization, x	0.05	0.06	0.16	0.14
Capacity (veh/h)	730	754	797	823
Control Delay (s)	7.8	7.7	8.2	7.9
Approach Delay (s)	7.8	7.7	8.2	7.9
Approach LOS	A	A	A	A

Intersection Summary				
Delay	8.0			
Level of Service	A			
Intersection Capacity Utilization	22.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	8	9	1	24	13	10	100	1	9	63	23
Future Vol, veh/h	16	8	9	1	24	13	10	100	1	9	63	23
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	8	8	8	8	8	8	8	8	8	8	8	8
Mvmt Flow	19	10	11	1	29	16	12	120	1	11	76	28
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.8	7.7	8.2	7.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	9%	48%	3%	9%
Vol Thru, %	90%	24%	63%	66%
Vol Right, %	1%	27%	34%	24%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	111	33	38	95
LT Vol	10	16	1	9
Through Vol	100	8	24	63
RT Vol	1	9	13	23
Lane Flow Rate	134	40	46	114
Geometry Grp	1	1	1	1
Degree of Util (X)	0.159	0.051	0.056	0.132
Departure Headway (Hd)	4.285	4.579	4.44	4.161
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	825	786	811	847
Service Time	2.373	2.58	2.441	2.258
HCM Lane V/C Ratio	0.162	0.051	0.057	0.135
HCM Control Delay	8.2	7.8	7.7	7.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.6	0.2	0.2	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	49	0	0	123	2	0	4	0	0	13	79
Future Volume (Veh/h)	24	49	0	0	123	2	0	4	0	0	13	79
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	34	69	0	0	173	3	0	6	0	0	18	111
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	176			69			432	313	69	314	312	174
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	176			69			432	313	69	314	312	174
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			100	99	100	100	97	87
cM capacity (veh/h)	1388			1519			443	584	988	618	585	864

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	103	176	6	0	129
Volume Left	34	0	0	0	0
Volume Right	0	3	0	0	111
cSH	1388	1519	584	1700	810
Volume to Capacity	0.02	0.00	0.01	0.00	0.16
Queue Length 95th (ft)	2	0	1	0	14
Control Delay (s)	2.7	0.0	11.2	0.0	10.3
Lane LOS	A		B	A	B
Approach Delay (s)	2.7	0.0	11.2	10.3	
Approach LOS			B	B	

Intersection Summary				
Average Delay	4.0			
Intersection Capacity Utilization	26.1%	ICU Level of Service		A
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	24	49	0	0	123	2	0	4	0	0	13	79
Future Vol, veh/h	24	49	0	0	123	2	0	4	0	0	13	79
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	71	71	71	71	71	71	71	71	71
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	34	69	0	0	173	3	0	6	0	0	18	111

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	176	0	0	69	0	0	376	313	69	315	312	175
Stage 1	-	-	-	-	-	-	137	137	-	175	175	-
Stage 2	-	-	-	-	-	-	239	176	-	140	137	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	1388	-	-	1519	-	-	578	599	988	634	600	863
Stage 1	-	-	-	-	-	-	861	779	-	822	750	-
Stage 2	-	-	-	-	-	-	760	750	-	858	779	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1388	-	-	1519	-	-	482	584	988	618	585	863
Mov Cap-2 Maneuver	-	-	-	-	-	-	482	584	-	618	585	-
Stage 1	-	-	-	-	-	-	839	760	-	801	750	-
Stage 2	-	-	-	-	-	-	646	750	-	830	760	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.5	0	11.2	10.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	584	1388	-	-	1519	-	-	-	809
HCM Lane V/C Ratio	0.01	0.024	-	-	-	-	-	-	0.16
HCM Control Delay (s)	11.2	7.7	0	-	0	-	-	0	10.3
HCM Lane LOS	B	A	A	-	A	-	-	A	B
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	-	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Right Turn Channelized						
Traffic Volume (veh/h)	2	129	107	7	84	48
Future Volume (veh/h)	2	129	107	7	84	48
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	140	116	8	91	52
Approach Volume (veh/h)	142		124			143
Crossing Volume (veh/h)	116		91			2
High Capacity (veh/h)	1265		1290			1382
High v/c (veh/h)	0.11		0.10			0.10
Low Capacity (veh/h)	1052		1075			1159
Low v/c (veh/h)	0.13		0.12			0.12

Intersection Summary				
Maximum v/c High		0.11		
Maximum v/c Low		0.13		
Intersection Capacity Utilization		28.6%	ICU Level of Service	A

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	3.8
Intersection LOS	A

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	142	124	143
Demand Flow Rate, veh/h	145	126	146
Vehicles Circulating, veh/h	118	93	2
Vehicles Exiting, veh/h	101	55	261
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	4.0	3.8	3.5
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	145	126	146
Cap Entry Lane, veh/h	1223	1255	1377
Entry HV Adj Factor	0.979	0.982	0.979
Flow Entry, veh/h	142	124	143
Cap Entry, veh/h	1198	1232	1348
V/C Ratio	0.119	0.100	0.106
Control Delay, s/veh	4.0	3.8	3.5
LOS	A	A	A
95th %tile Queue, veh	0	0	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	45	70	5	1	6
Future Volume (Veh/h)	3	45	70	5	1	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63
Hourly flow rate (vph)	5	71	111	8	2	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	119				196	115
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	119				196	115
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1463				788	935

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	76	119	12
Volume Left	5	0	2
Volume Right	0	8	10
cSH	1463	1700	907
Volume to Capacity	0.00	0.07	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.5	0.0	9.0
Lane LOS	A		A
Approach Delay (s)	0.5	0.0	9.0
Approach LOS			A

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	14.8%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	45	70	5	1	6
Future Vol, veh/h	3	45	70	5	1	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	63	63	63	63	63	63
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	5	71	111	8	2	10

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	119	0	-	0	196	115
Stage 1	-	-	-	-	115	-
Stage 2	-	-	-	-	81	-
Critical Hdwy	4.13	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.227	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	1463	-	-	-	790	935
Stage 1	-	-	-	-	907	-
Stage 2	-	-	-	-	940	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1463	-	-	-	787	935
Mov Cap-2 Maneuver	-	-	-	-	787	-
Stage 1	-	-	-	-	903	-
Stage 2	-	-	-	-	940	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1463	-	-	-	911
HCM Lane V/C Ratio	0.003	-	-	-	0.012
HCM Control Delay (s)	7.5	0	-	-	9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	213	1004	1090	91	89	196
v/c Ratio	0.57	0.30	0.70	0.12	0.36	0.32
Control Delay	37.2	0.2	20.9	4.0	40.0	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.2	0.2	20.9	4.0	40.0	12.6
Queue Length 50th (ft)	94	0	218	0	40	37
Queue Length 95th (ft)	204	0	382	27	105	101
Internal Link Dist (ft)		1017	748		574	
Turn Bay Length (ft)	345			330	450	
Base Capacity (vph)	698	3312	3206	1437	698	1219
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.30	0.34	0.06	0.13	0.16

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	211	994	1079	90	88	194
Future Volume (vph)	211	994	1079	90	88	194
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0	7.3	7.3	4.2	3.7
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1656	3312	3312	1482	1656	1482
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1656	3312	3312	1482	1656	1482
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	213	1004	1090	91	89	196
RTOR Reduction (vph)	0	0	0	48	0	46
Lane Group Flow (vph)	213	1004	1090	43	89	150
Heavy Vehicles (%)	9%	9%	9%	9%	9%	9%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	8	Free!	6		7!	4
Permitted Phases				6		4
Actuated Green, G (s)	17.4	77.7	36.4	36.4	8.9	30.3
Effective Green, g (s)	17.4	77.7	36.4	36.4	8.9	30.3
Actuated g/C Ratio	0.22	1.00	0.47	0.47	0.11	0.39
Clearance Time (s)	3.5		7.3	7.3	4.2	3.7
Vehicle Extension (s)	3.0		4.0	4.0	3.5	3.0
Lane Grp Cap (vph)	370	3312	1551	694	189	577
v/s Ratio Prot	c0.13	0.30	c0.33		c0.05	0.10
v/s Ratio Perm				0.03		
v/c Ratio	0.58	0.30	0.70	0.06	0.47	0.26
Uniform Delay, d1	26.9	0.0	16.4	11.3	32.2	16.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.2	0.2	1.6	0.1	2.2	0.2
Delay (s)	29.0	0.2	17.9	11.4	34.4	16.3
Level of Service	C	A	B	B	C	B
Approach Delay (s)		5.3	17.4		22.0	
Approach LOS		A	B		C	

Intersection Summary				
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	77.7	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	61.1%	ICU Level of Service	B	
Analysis Period (min)	15			

! Phase conflict between lane groups.
c Critical Lane Group

HCM 6th Edition methodology cannot be performed with phasing conflicts.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	179	811	258	49	740	115	237	249	179	289	294
v/c Ratio	0.46	0.68	0.37	0.17	0.73	0.22	0.53	0.30	0.46	0.71	0.53
Control Delay	49.1	33.1	5.2	49.7	37.5	6.8	47.8	31.0	49.1	47.6	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.1	33.1	5.2	49.7	37.5	6.8	47.8	31.0	49.1	47.6	9.7
Queue Length 50th (ft)	54	232	0	14	215	0	71	62	54	166	11
Queue Length 95th (ft)	113	390	59	41	366	44	142	121	114	323	94
Internal Link Dist (ft)		1323			2509			853		451	
Turn Bay Length (ft)	225		485	125		390	160		140		
Base Capacity (vph)	616	2470	1158	616	2470	1120	684	1411	684	761	802
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.33	0.22	0.08	0.30	0.10	0.35	0.18	0.26	0.38	0.37

Intersection Summary

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	174	787	250	48	718	112	230	197	45	174	280	285
Future Volume (vph)	174	787	250	48	718	112	230	197	45	174	280	285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3273	3374	1489	3273	3374	1489	3273	3272		3273	1776	1509
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3273	3374	1489	3273	3374	1489	3273	3272		3273	1776	1509
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	179	811	258	49	740	115	237	203	46	179	289	294
RTOR Reduction (vph)	0	0	167	0	0	79	0	11	0	0	0	209
Lane Group Flow (vph)	179	811	91	49	740	36	237	238	0	179	289	85
Confl. Peds. (#/hr)			1			1			2			
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	11.8	35.5	35.5	7.4	31.1	31.1	13.7	25.0		11.8	23.1	23.1
Effective Green, g (s)	11.8	35.5	35.5	7.4	31.1	31.1	13.7	25.0		11.8	23.1	23.1
Actuated g/C Ratio	0.12	0.35	0.35	0.07	0.31	0.31	0.14	0.25		0.12	0.23	0.23
Clearance Time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	385	1194	527	241	1046	461	447	815		385	409	347
v/s Ratio Prot	0.05	c0.24		0.01	c0.22		c0.07	0.07		0.05	c0.16	
v/s Ratio Perm			0.06			0.02						0.06
v/c Ratio	0.46	0.68	0.17	0.20	0.71	0.08	0.53	0.29		0.46	0.71	0.24
Uniform Delay, d1	41.3	27.6	22.3	43.7	30.6	24.5	40.3	30.5		41.3	35.5	31.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.9	1.6	0.2	0.2	2.2	0.1	1.2	0.2		0.9	5.5	0.4
Delay (s)	42.2	29.1	22.5	43.8	32.8	24.5	41.5	30.7		42.2	41.0	31.8
Level of Service	D	C	C	D	C	C	D	C		D	D	C
Approach Delay (s)		29.6			32.3			36.0			37.7	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	33.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	100.3	Sum of lost time (s)	20.6	
Intersection Capacity Utilization	63.6%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	174	787	250	48	718	112	230	197	45	174	280	285
Future Volume (veh/h)	174	787	250	48	718	112	230	197	45	174	280	285
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	179	811	258	49	740	115	237	203	46	179	289	294
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	269	1098	489	111	1078	480	337	723	160	271	432	366
Arrive On Green	0.08	0.32	0.32	0.03	0.32	0.32	0.10	0.26	0.26	0.08	0.24	0.24
Sat Flow, veh/h	3319	3413	1521	3319	3413	1521	3319	2775	615	3319	1796	1522
Grp Volume(v), veh/h	179	811	258	49	740	115	237	123	126	179	289	294
Grp Sat Flow(s),veh/h/ln	1659	1706	1521	1659	1706	1521	1659	1706	1684	1659	1796	1522
Q Serve(g_s), s	4.1	16.7	7.0	1.1	15.0	4.4	5.5	4.5	4.7	4.1	11.5	14.4
Cycle Q Clear(g_c), s	4.1	16.7	7.0	1.1	15.0	4.4	5.5	4.5	4.7	4.1	11.5	14.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.37	1.00		1.00
Lane Grp Cap(c), veh/h	269	1098	489	111	1078	480	337	444	438	271	432	366
V/C Ratio(X)	0.67	0.74	0.53	0.44	0.69	0.24	0.70	0.28	0.29	0.66	0.67	0.80
Avail Cap(c_a), veh/h	757	3026	1348	757	3026	1348	841	886	874	841	933	791
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.2	23.8	8.9	37.4	23.6	20.0	34.3	23.3	23.3	35.2	27.1	28.2
Incr Delay (d2), s/veh	2.8	1.0	0.9	1.0	0.8	0.3	2.7	0.3	0.4	2.7	1.8	4.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	5.9	3.4	0.4	5.3	1.5	2.2	1.7	1.8	1.7	4.8	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.1	24.8	9.8	38.5	24.4	20.2	37.0	23.6	23.7	37.9	28.9	32.3
LnGrp LOS	D	C	A	D	C	C	D	C	C	D	C	C
Approach Vol, veh/h		1248			904			486			762	
Approach Delay, s/veh		23.6			24.6			30.2			32.4	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.9	32.7	12.0	24.3	10.4	32.2	10.5	25.9
Change Period (Y+Rc), s	7.3	* 7.3	4.0	5.3	4.0	7.3	4.0	5.3
Max Green Setting (Gmax), s	18.0	* 70	20.0	41.0	18.0	70.0	20.0	41.0
Max Q Clear Time (g_c+I1), s	3.1	18.7	7.5	16.4	6.1	17.0	6.1	6.7
Green Ext Time (p_c), s	0.0	6.7	0.6	2.6	0.4	5.4	0.4	1.4

Intersection Summary	
HCM 6th Ctrl Delay	26.8
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	935	62	296	884	0	9	0	303	0	0	0
Future Volume (Veh/h)	0	935	62	296	884	0	9	0	303	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	964	64	305	911	0	9	0	312	0	0	0
Pedestrians											1	
Lane Width (ft)											12.0	
Walking Speed (ft/s)											3.5	
Percent Blockage											0	
Right turn flare (veh)									1			1
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	912			1028			2062	2518	514	2004	2550	456
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	912			1028			2062	2518	514	2004	2550	456
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			53			52	100	37	100	100	100
cM capacity (veh/h)	712			642			19	13	493	8	13	537

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	643	385	305	607	304	321	0
Volume Left	0	0	0	305	0	0	9	0
Volume Right	0	0	64	0	0	0	312	0
cSH	1700	1700	1700	642	1700	1700	397	1700
Volume to Capacity	0.00	0.38	0.23	0.47	0.36	0.18	0.81	0.00
Queue Length 95th (ft)	0	0	0	64	0	0	180	0
Control Delay (s)	0.0	0.0	0.0	15.6	0.0	0.0	42.7	0.0
Lane LOS				C			E	A
Approach Delay (s)	0.0			3.9			42.7	0.0
Approach LOS							E	A

Intersection Summary					
Average Delay		7.2			
Intersection Capacity Utilization	57.6%	ICU Level of Service		B	
Analysis Period (min)	15				

Intersection	
Int Delay, s/veh	5.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	935	62	296	884	0	9	0	303	0	0	0
Future Vol, veh/h	0	935	62	296	884	0	9	0	303	0	0	0
Conflicting Peds, #/hr	1	0	0	0	0	1	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	340	-	-	195	-	-	-	-	25	-	-	25
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	0	964	64	305	911	0	9	0	312	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	912	0	0	1028	0	0	2062	2518	514	2004	2550	457
Stage 1	-	-	-	-	-	-	996	996	-	1522	1522	-
Stage 2	-	-	-	-	-	-	1066	1522	-	482	1028	-
Critical Hdwy	4.24	-	-	4.24	-	-	7.64	6.64	7.04	7.64	6.64	7.04
Critical Hdwy Stg 1	-	-	-	-	-	-	6.64	5.64	-	6.64	5.64	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.64	5.64	-	6.64	5.64	-
Follow-up Hdwy	2.27	-	-	2.27	-	-	3.57	4.07	3.37	3.57	4.07	3.37
Pot Cap-1 Maneuver	712	-	-	642	-	-	30	26	493	33	24	537
Stage 1	-	-	-	-	-	-	253	310	-	118	171	-
Stage 2	-	-	-	-	-	-	229	171	-	521	299	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	711	-	-	642	-	-	19	14	493	8	13	536
Mov Cap-2 Maneuver	-	-	-	-	-	-	19	14	-	8	13	-
Stage 1	-	-	-	-	-	-	253	310	-	118	90	-
Stage 2	-	-	-	-	-	-	120	90	-	191	299	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3.9	32.5	0
HCM LOS			D	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	19	493	711	-	-	642	-	-	-	-
HCM Lane V/C Ratio	0.488	0.634	-	-	-	0.475	-	-	-	-
HCM Control Delay (s)	$ 313.6	24.1	0	-	-	15.6	-	-	0	0
HCM Lane LOS	F	C	A	-	-	C	-	-	A	A
HCM 95th %tile Q(veh)	1.4	4.3	0	-	-	2.6	-	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	220	849	836	12	10	333
Future Volume (Veh/h)	220	849	836	12	10	333
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	234	903	889	13	11	354
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	902				1808	444
vC1, stage 1 conf vol					889	
vC2, stage 2 conf vol					920	
vCu, unblocked vol	902				1808	444
tC, single (s)	4.3				7.0	7.1
tC, 2 stage (s)					6.0	
tF (s)	2.3				3.6	3.4
p0 queue free %	67				94	34
cM capacity (veh/h)	701				184	540

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	234	452	452	444	444	13	365
Volume Left	234	0	0	0	0	0	11
Volume Right	0	0	0	0	0	13	354
cSH	701	1700	1700	1700	1700	1700	556
Volume to Capacity	0.33	0.27	0.27	0.26	0.26	0.01	0.66
Queue Length 95th (ft)	37	0	0	0	0	0	119
Control Delay (s)	12.7	0.0	0.0	0.0	0.0	0.0	23.6
Lane LOS	B						C
Approach Delay (s)	2.6			0.0			23.6
Approach LOS							C

Intersection Summary			
Average Delay		4.8	
Intersection Capacity Utilization		50.4%	ICU Level of Service A
Analysis Period (min)		15	

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	220	849	836	12	10	333
Future Vol, veh/h	220	849	836	12	10	333
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	580	-	-	165	0	25
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	234	903	889	13	11	354

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	902	0	-	0	1809	445
Stage 1	-	-	-	-	889	-
Stage 2	-	-	-	-	920	-
Critical Hdwy	4.3	-	-	-	7	7.1
Critical Hdwy Stg 1	-	-	-	-	6	-
Critical Hdwy Stg 2	-	-	-	-	6	-
Follow-up Hdwy	2.3	-	-	-	3.6	3.4
Pot Cap-1 Maneuver	701	-	-	-	64	539
Stage 1	-	-	-	-	343	-
Stage 2	-	-	-	-	330	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	701	-	-	-	43	539
Mov Cap-2 Maneuver	-	-	-	-	181	-
Stage 1	-	-	-	-	228	-
Stage 2	-	-	-	-	330	-

Approach	EB	WB	SB
HCM Control Delay, s	2.6	0	23.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	701	-	-	-	181	539
HCM Lane V/C Ratio	0.334	-	-	-	0.059	0.657
HCM Control Delay (s)	12.7	-	-	-	26.1	23.6
HCM Lane LOS	B	-	-	-	D	C
HCM 95th %tile Q(veh)	1.5	-	-	-	0.2	4.8

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	894	10	1	842	0	17	0	4	0	0	1
Future Volume (Veh/h)	0	894	10	1	842	0	17	0	4	0	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	922	10	1	868	0	18	0	4	0	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									1			
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	868			932			1359	1792	461	1333	1802	434
vC1, stage 1 conf vol							922	922		870	870	
vC2, stage 2 conf vol							437	870		463	932	
vCu, unblocked vol	868			932			1359	1792	461	1333	1802	434
tC, single (s)	4.3			4.3			7.7	6.7	7.1	7.7	6.7	7.1
tC, 2 stage (s)							6.7	5.7		6.7	5.7	
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			100			93	100	99	100	100	100
cM capacity (veh/h)	712			671			248	241	521	262	239	543

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	461	461	10	1	579	289	22	1
Volume Left	0	0	0	0	1	0	0	18	0
Volume Right	0	0	0	10	0	0	0	4	1
cSH	1700	1700	1700	1700	671	1700	1700	303	543
Volume to Capacity	0.00	0.27	0.27	0.01	0.00	0.34	0.17	0.07	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	0	6	0
Control Delay (s)	0.0	0.0	0.0	0.0	10.4	0.0	0.0	19.1	11.6
Lane LOS					B			C	B
Approach Delay (s)	0.0				0.0			19.1	11.6
Approach LOS								C	B

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		41.4%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	894	10	1	842	0	17	0	4	0	0	1
Future Vol, veh/h	0	894	10	1	842	0	17	0	4	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	275	305	-	-	-	-	25	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	12	12	12	12	12	12	12	12	12	12	12	12
Mvmt Flow	0	922	10	1	868	0	18	0	4	0	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	868	0	0	932	0	0	1358	1792	461	1331	1802	434
Stage 1	-	-	-	-	-	-	922	922	-	870	870	-
Stage 2	-	-	-	-	-	-	436	870	-	461	932	-
Critical Hdwy	4.34	-	-	4.34	-	-	7.74	6.74	7.14	7.74	6.74	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	6.74	5.74	-	6.74	5.74	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.74	5.74	-	6.74	5.74	-
Follow-up Hdwy	2.32	-	-	2.32	-	-	3.62	4.12	3.42	3.62	4.12	3.42
Pot Cap-1 Maneuver	712	-	-	671	-	-	98	72	521	103	71	543
Stage 1	-	-	-	-	-	-	272	325	-	293	345	-
Stage 2	-	-	-	-	-	-	543	345	-	524	322	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	712	-	-	671	-	-	98	72	521	102	71	543
Mov Cap-2 Maneuver	-	-	-	-	-	-	242	234	-	255	233	-
Stage 1	-	-	-	-	-	-	272	325	-	293	345	-
Stage 2	-	-	-	-	-	-	541	345	-	520	322	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	19.3	11.6
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	242	521	712	-	-	671	-	-	543
HCM Lane V/C Ratio	0.072	0.008	-	-	-	0.002	-	-	0.002
HCM Control Delay (s)	21	12	0	-	-	10.4	-	-	11.6
HCM Lane LOS	C	B	A	-	-	B	-	-	B
HCM 95th %tile Q(veh)	0.2	0	0	-	-	0	-	-	0

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.
Channelized right turn lanes are not counted.

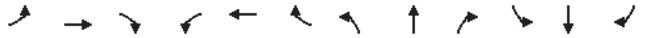
Intersection	
Intersection Delay, s/veh	72.5
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	63	199	61	278	185	97	49	258	257	29	421	90
Future Vol, veh/h	63	199	61	278	185	97	49	258	257	29	421	90
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	68	214	66	299	199	104	53	277	276	31	453	97
Number of Lanes	1	1	0	1	1	0	1	1	1	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	3	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	2	2	2
HCM Control Delay	68.2	82.8	54.6	83
HCM LOS	F	F	F	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	100%	0%	12%	0%
Vol Thru, %	0%	100%	0%	0%	77%	0%	66%	88%	70%
Vol Right, %	0%	0%	100%	0%	23%	0%	34%	0%	30%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	49	258	257	63	260	278	282	240	301
LT Vol	49	0	0	63	0	278	0	29	0
Through Vol	0	258	0	0	199	0	185	211	211
RT Vol	0	0	257	0	61	0	97	0	90
Lane Flow Rate	53	277	276	68	280	299	303	258	323
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.178	0.894	0.837	0.244	0.954	1.004	0.95	0.86	1.054
Departure Headway (Hd)	12.49	11.962	11.224	13.436	12.737	12.46	11.682	12.025	11.738
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	289	305	326	269	288	293	312	301	310
Service Time	10.19	9.662	8.924	11.136	10.437	10.16	9.382	9.796	9.509
HCM Lane V/C Ratio	0.183	0.908	0.847	0.253	0.972	1.02	0.971	0.857	1.042
HCM Control Delay	17.9	64.2	51.9	20.4	79.8	91.1	74.7	58.6	102.5
HCM Lane LOS	C	F	F	C	F	F	F	F	F
HCM 95th-tile Q	0.6	8.2	7.3	0.9	9.3	10.5	9.6	7.5	12.1

Reso A - Exhibit C2 (EIR Technical Appendix)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	78	10	2	57	0	10	1	1	0	0	0
Future Volume (Veh/h)	1	78	10	2	57	0	10	1	1	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	1	92	12	2	67	0	12	1	1	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	67			104			171	171	98	172	177	67
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	67			104			171	171	98	172	177	67
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	100	100	100	100	100
cM capacity (veh/h)	1522			1475			787	717	953	783	712	991

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	105	69	14	0
Volume Left	1	2	12	0
Volume Right	12	0	1	0
cSH	1522	1475	791	1700
Volume to Capacity	0.00	0.00	0.02	0.00
Queue Length 95th (ft)	0	0	1	0
Control Delay (s)	0.1	0.2	9.6	0.0
Lane LOS	A	A	A	A
Approach Delay (s)	0.1	0.2	9.6	0.0
Approach LOS			A	A

Intersection Summary				
Average Delay			0.8	
Intersection Capacity Utilization			15.1%	ICU Level of Service
Analysis Period (min)			15	

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	78	10	2	57	0	10	1	1	0	0	0
Future Vol, veh/h	1	78	10	2	57	0	10	1	1	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	1	92	12	2	67	0	12	1	1	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	67	0	0	104	0	0	171	171	98	172	177	67
Stage 1	-	-	-	-	-	-	100	100	-	71	71	-
Stage 2	-	-	-	-	-	-	71	71	-	101	106	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	1522	-	-	1475	-	-	788	718	953	787	713	991
Stage 1	-	-	-	-	-	-	901	808	-	934	832	-
Stage 2	-	-	-	-	-	-	934	832	-	900	804	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1522	-	-	1475	-	-	786	717	953	784	712	991
Mov Cap-2 Maneuver	-	-	-	-	-	-	786	717	-	784	712	-
Stage 1	-	-	-	-	-	-	900	807	-	933	831	-
Stage 2	-	-	-	-	-	-	933	831	-	897	803	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.3	9.6	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	791	1522	-	-	1475	-	-	-
HCM Lane V/C Ratio	0.018	0.001	-	-	0.002	-	-	-
HCM Control Delay (s)	9.6	7.4	0	-	7.4	0	-	0
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	16	470	255	436	561	6	39	281	330	338	91
v/c Ratio	0.14	0.65	0.68	0.54	0.57	0.03	0.21	0.69	0.72	0.73	0.17
Control Delay	51.8	38.4	44.9	24.2	4.5	43.3	45.0	15.0	40.9	41.0	2.4
Queue Delay	0.0	0.0	0.0	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.8	38.4	44.9	24.8	4.8	43.3	45.0	15.0	40.9	41.0	2.4
Queue Length 50th (ft)	9	122	129	156	0	3	20	0	169	173	0
Queue Length 95th (ft)	36	227	266	366	72	17	60	81	348	355	13
Internal Link Dist (ft)		346		307			744			674	
Turn Bay Length (ft)	65		125			140		165	150		185
Base Capacity (vph)	114	1052	574	1042	1112	401	421	576	669	679	696
Starvation Cap Reductn	0	0	9	288	146	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.45	0.45	0.58	0.58	0.01	0.09	0.49	0.49	0.50	0.13

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	411	31	240	410	527	6	37	264	544	84	86
Future Volume (vph)	15	411	31	240	410	527	6	37	264	544	84	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1787	3530		1787	1881	1558	1787	1881	1599	1698	1724	1561
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00
Satd. Flow (perm)	1787	3530		1787	1881	1558	1787	1881	1599	1698	1724	1561
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	16	437	33	255	436	561	6	39	281	579	89	91
RTOR Reduction (vph)	0	5	0	0	0	324	0	0	254	0	0	67
Lane Group Flow (vph)	16	465	0	255	436	237	6	39	27	330	338	24
Confl. Peds. (#/hr)			4			2						2
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	1.7	21.3		18.3	37.9	37.9	8.6	8.6	8.6	23.7	23.7	23.7
Effective Green, g (s)	1.7	21.3		18.3	37.9	37.9	8.6	8.6	8.6	23.7	23.7	23.7
Actuated g/C Ratio	0.02	0.24		0.20	0.42	0.42	0.10	0.10	0.10	0.26	0.26	0.26
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	33	836		363	792	656	170	179	152	447	454	411
v/s Ratio Prot	0.01	0.13		c0.14	c0.23		0.00	c0.02		0.19	c0.20	
v/s Ratio Perm						0.15			0.02			0.02
v/c Ratio	0.48	0.56		0.70	0.55	0.36	0.04	0.22	0.18	0.74	0.74	0.06
Uniform Delay, d1	43.7	30.2		33.3	19.6	17.7	36.9	37.5	37.4	30.3	30.3	24.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.8	0.8		6.0	0.8	0.3	0.1	0.6	0.6	6.3	6.5	0.1
Delay (s)	54.5	31.0		39.3	20.4	18.1	37.0	38.2	38.0	36.5	36.8	24.8
Level of Service	D	C		D	C	B	D	D	D	D	D	C
Approach Delay (s)		31.7			23.2			38.0			35.3	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	29.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	89.9	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	61.6%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	411	31	240	410	527	6	37	264	544	84	86
Future Volume (veh/h)	15	411	31	240	410	527	6	37	264	544	84	86
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	16	437	33	255	436	561	6	39	281	643	0	91
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	32	847	64	294	749	619	336	353	299	774	0	343
Arrive On Green	0.02	0.25	0.25	0.16	0.40	0.40	0.19	0.19	0.19	0.22	0.00	0.22
Sat Flow, veh/h	1795	3374	254	1795	1885	1559	1795	1885	1598	3591	0	1590
Grp Volume(v), veh/h	16	231	239	255	436	561	6	39	281	643	0	91
Grp Sat Flow(s),veh/h/ln	1795	1791	1837	1795	1885	1559	1795	1885	1598	1795	0	1590
Q Serve(g_s), s	0.9	11.0	11.1	13.7	17.9	33.5	0.3	1.7	17.1	16.9	0.0	4.7
Cycle Q Clear(g_c), s	0.9	11.0	11.1	13.7	17.9	33.5	0.3	1.7	17.1	16.9	0.0	4.7
Prop In Lane	1.00		0.14	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	32	450	461	294	749	619	336	353	299	774	0	343
V/C Ratio(X)	0.50	0.51	0.52	0.87	0.58	0.91	0.02	0.11	0.94	0.83	0.00	0.27
Avail Cap(c_a), veh/h	96	450	461	481	872	721	336	353	299	1181	0	523
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	48.1	31.8	31.9	40.3	23.4	28.1	32.8	33.3	39.6	37.0	0.0	32.3
Incr Delay (d2), s/veh	11.3	1.0	1.0	9.0	0.7	13.8	0.0	0.1	36.3	3.1	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	4.9	5.0	6.7	7.9	14.3	0.1	0.8	9.6	7.6	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.4	32.8	32.9	49.3	24.1	41.9	32.8	33.5	75.9	40.2	0.0	32.7
LnGrp LOS	E	C	C	D	C	D	C	C	E	D	A	C
Approach Vol, veh/h		486			1252			326			734	
Approach Delay, s/veh		33.7			37.2			70.0			39.2	
Approach LOS		C			D			E			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	20.7	29.3		25.8	6.3	43.8		23.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	26.5	24.5		32.5	5.3	45.7		18.5				
Max Q Clear Time (g_c+I1), s	15.7	13.1		18.9	2.9	35.5		19.1				
Green Ext Time (p_c), s	0.5	2.2		2.4	0.0	3.8		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			40.9									
HCM 6th LOS			D									

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	89	1208	20	959	252	263	30	438	8	26
v/c Ratio	0.38	0.65	0.14	0.64	0.33	0.62	0.05	0.74	0.02	0.04
Control Delay	42.6	17.2	45.6	22.2	6.9	32.2	21.7	25.2	21.7	0.1
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.6	17.6	45.6	22.2	6.9	32.2	21.7	25.2	21.7	0.1
Queue Length 50th (ft)	40	173	9	191	17	109	10	124	3	0
Queue Length 95th (ft)	107	420	38	347	80	221	33	274	14	0
Internal Link Dist (ft)		307		269			836			575
Turn Bay Length (ft)	120		220		145	130		110	95	
Base Capacity (vph)	337	2402	148	2168	1024	789	1066	971	786	997
Starvation Cap Reductn	0	584	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.66	0.14	0.44	0.25	0.33	0.03	0.45	0.01	0.03

Intersection Summary

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
9: Paso Robles Street & 13th Street

Existing Plus 1293 Unit Project PM
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	1094	30	19	892	234	245	28	407	7	0	24
Future Volume (vph)	83	1094	30	19	892	234	245	28	407	7	0	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	3557		1787	3574	1564	1787	1881	1599	1787	1599	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.74	1.00	1.00	0.74	1.00	
Satd. Flow (perm)	1787	3557		1787	3574	1564	1393	1881	1599	1388	1599	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	89	1176	32	20	959	252	263	30	438	8	0	26
RTOR Reduction (vph)	0	1	0	0	0	109	0	0	106	0	18	0
Lane Group Flow (vph)	89	1207	0	20	959	143	263	30	332	8	8	0
Confl. Peds. (#/hr)			5									
Confl. Bikes (#/hr)			1			2						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		
Actuated Green, G (s)	7.4	39.3		1.7	33.6	33.6	22.9	22.9	22.9	22.9	22.9	
Effective Green, g (s)	7.4	39.3		1.7	33.6	33.6	22.9	22.9	22.9	22.9	22.9	
Actuated g/C Ratio	0.10	0.51		0.02	0.43	0.43	0.30	0.30	0.30	0.30	0.30	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	170	1806		39	1551	678	412	556	473	410	473	
v/s Ratio Prot	c0.05	c0.34		0.01	0.27			0.02			0.00	
v/s Ratio Perm						0.09	0.19		c0.21	0.01		
v/c Ratio	0.52	0.67		0.51	0.62	0.21	0.64	0.05	0.70	0.02	0.02	
Uniform Delay, d1	33.3	14.2		37.4	16.9	13.6	23.7	19.5	24.2	19.3	19.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.9	0.9		10.9	0.7	0.2	3.2	0.0	4.7	0.0	0.0	
Delay (s)	36.2	15.1		48.4	17.7	13.8	26.9	19.5	28.9	19.3	19.3	
Level of Service	D	B		D	B	B	C	B	C	B	B	
Approach Delay (s)		16.6			17.4			27.8			19.3	
Approach LOS		B			B			C			B	

Intersection Summary				
HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	77.4	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	71.8%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Olsen-Chandler SP
9: Paso Robles Street & 13th Street

Existing Plus 1293 Unit Project PM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	1094	30	19	892	234	245	28	407	7	0	24
Future Volume (veh/h)	83	1094	30	19	892	234	245	28	407	7	0	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	89	1176	32	20	959	0	263	30	438	8	0	26
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	116	1601	44	42	1462		544	609	516	400	0	516
Arrive On Green	0.06	0.45	0.45	0.02	0.41	0.00	0.32	0.32	0.32	0.32	0.00	0.32
Sat Flow, veh/h	1795	3559	97	1795	3582	1598	1396	1885	1598	932	0	1598
Grp Volume(v), veh/h	89	592	616	20	959	0	263	30	438	8	0	26
Grp Sat Flow(s),veh/h/ln	1795	1791	1865	1795	1791	1598	1396	1885	1598	932	0	1598
Q Serve(g_s), s	3.2	18.0	18.0	0.7	14.3	0.0	10.6	0.7	16.9	0.4	0.0	0.7
Cycle Q Clear(g_c), s	3.2	18.0	18.0	0.7	14.3	0.0	11.3	0.7	16.9	1.1	0.0	0.7
Prop In Lane	1.00		0.05	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	116	806	839	42	1462		544	609	516	400	0	516
V/C Ratio(X)	0.77	0.73	0.73	0.48	0.66		0.48	0.05	0.85	0.02	0.00	0.05
Avail Cap(c_a), veh/h	339	1312	1366	149	2246		884	1068	905	627	0	905
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.5	15.0	15.0	31.9	15.8	0.0	19.3	15.4	20.9	15.8	0.0	15.4
Incr Delay (d2), s/veh	10.0	1.3	1.3	8.3	0.5	0.0	0.7	0.0	4.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	6.7	7.0	0.4	5.3	0.0	3.2	0.3	6.2	0.1	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.4	16.3	16.2	40.2	16.3	0.0	20.0	15.4	24.9	15.8	0.0	15.5
LnGrp LOS	D	B	B	D	B		B	B	C	B	A	B
Approach Vol, veh/h		1297			979	A		731			34	
Approach Delay, s/veh		17.9			16.8			22.7			15.5	
Approach LOS		B			B			C			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.0	34.3		25.9	8.8	31.5		25.9				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.5	48.5		37.5	12.5	41.5		37.5				
Max Q Clear Time (g_c+I1), s	2.7	20.0		3.1	5.2	16.3		18.9				
Green Ext Time (p_c), s	0.0	9.8		0.1	0.1	7.6		2.5				

Intersection Summary			
HCM 6th Ctrl Delay	18.7		
HCM 6th LOS	B		

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	379	1188	63	694	264	214	67	67	517
v/c Ratio	0.64	0.75	0.38	0.58	0.58	0.26	0.14	0.41	0.72
Control Delay	44.1	24.9	53.5	27.6	47.4	35.0	0.6	55.1	25.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.1	24.9	53.5	27.6	47.4	35.0	0.6	55.1	25.9
Queue Length 50th (ft)	112	297	37	171	78	60	0	39	77
Queue Length 95th (ft)	191	456	93	279	145	106	0	98	154
Internal Link Dist (ft)		353		673		608			523
Turn Bay Length (ft)	295		235		140		130	225	
Base Capacity (vph)	848	2098	213	1706	572	1151	607	197	1057
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.57	0.30	0.41	0.46	0.19	0.11	0.34	0.49

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	360	781	348	60	587	72	251	203	64	64	204	287
Future Volume (vph)	360	781	348	60	587	72	251	203	64	64	204	287
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.98		1.00	1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3467	3395		1787	3510		3467	3574	1599	1787	3236	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3467	3395		1787	3510		3467	3574	1599	1787	3236	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	379	822	366	63	618	76	264	214	67	67	215	302
RTOR Reduction (vph)	0	43	0	0	8	0	0	0	52	0	219	0
Lane Group Flow (vph)	379	1145	0	63	686	0	264	214	15	67	298	0
Confl. Peds. (#/hr)			1			1						1
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	16.1	42.4		6.8	33.1		12.4	21.4	21.4	6.7	15.7	
Effective Green, g (s)	16.1	42.4		6.8	33.1		12.4	21.4	21.4	6.7	15.7	
Actuated g/C Ratio	0.17	0.44		0.07	0.35		0.13	0.22	0.22	0.07	0.16	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	585	1510		127	1219		451	802	359	125	533	
v/s Ratio Prot	c0.11	c0.34		0.04	0.20		c0.08	0.06		0.04	c0.09	
v/s Ratio Perm									0.01			
v/c Ratio	0.65	0.76		0.50	0.56		0.59	0.27	0.04	0.54	0.56	
Uniform Delay, d1	37.0	22.2		42.6	25.2		39.0	30.5	28.9	42.8	36.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.5	2.2		3.0	0.6		1.9	0.2	0.0	4.4	1.3	
Delay (s)	39.4	24.4		45.6	25.8		41.0	30.7	29.0	47.2	37.9	
Level of Service	D	C		D	C		D	C	C	D	D	
Approach Delay (s)		28.0			27.5			35.4			39.0	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	30.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	95.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	360	781	348	60	587	72	251	203	64	64	204	287
Future Volume (veh/h)	360	781	348	60	587	72	251	203	64	64	204	287
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	379	822	0	63	618	76	264	214	67	67	215	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	552	1408		100	930	114	405	615	274	104	406	
Arrive On Green	0.16	0.39	0.00	0.06	0.29	0.29	0.12	0.17	0.17	0.06	0.11	0.00
Sat Flow, veh/h	3483	3676	0	1795	3205	393	3483	3582	1598	1795	3676	0
Grp Volume(v), veh/h	379	822	0	63	345	349	264	214	67	67	215	0
Grp Sat Flow(s),veh/h/ln	1742	1791	0	1795	1791	1808	1742	1791	1598	1795	1791	0
Q Serve(g_s), s	5.7	10.1	0.0	1.9	9.5	9.5	4.1	2.9	2.0	2.0	3.2	0.0
Cycle Q Clear(g_c), s	5.7	10.1	0.0	1.9	9.5	9.5	4.1	2.9	2.0	2.0	3.2	0.0
Prop In Lane	1.00		0.00	1.00		0.22	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	552	1408		100	520	525	405	615	274	104	406	
V/C Ratio(X)	0.69	0.58		0.63	0.66	0.67	0.65	0.35	0.24	0.65	0.53	
Avail Cap(c_a), veh/h	1338	3425		337	1360	1373	903	1812	808	311	1504	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.2	13.4	0.0	25.8	17.5	17.5	23.6	20.4	20.0	25.8	23.4	0.0
Incr Delay (d2), s/veh	1.5	0.4	0.0	6.3	1.5	1.5	1.8	0.3	0.5	6.6	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	3.6	0.0	0.9	3.6	3.6	1.6	1.1	0.7	1.0	1.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.8	13.8	0.0	32.2	18.9	18.9	25.4	20.8	20.5	32.3	24.5	0.0
LnGrp LOS	C	B		C	B	B	C	C	C	C	C	
Approach Vol, veh/h		1201	A		757			545			282	A
Approach Delay, s/veh		16.9			20.0			23.0			26.3	
Approach LOS		B			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.6	26.5	11.0	10.8	13.4	20.7	7.7	14.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	53.5	14.5	23.5	21.5	42.5	9.7	28.3
Max Q Clear Time (g_c+I1), s	3.9	12.1	6.1	5.2	7.7	11.5	4.0	4.9
Green Ext Time (p_c), s	0.1	7.0	0.6	1.1	1.1	4.6	0.0	1.4

Intersection Summary	
HCM 6th Ctrl Delay	19.9
HCM 6th LOS	B

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	58	447	911	580	73
v/c Ratio	0.24	0.25	0.65	0.58	0.14
Control Delay	38.9	11.4	17.7	27.5	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	38.9	11.4	17.7	27.5	9.1
Queue Length 50th (ft)	20	37	110	96	0
Queue Length 95th (ft)	88	150	337	286	40
Internal Link Dist (ft)		1151	2310	505	
Turn Bay Length (ft)	125			120	
Base Capacity (vph)	329	2923	2340	1645	786
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.18	0.15	0.39	0.35	0.09

Intersection Summary

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	56	434	460	424	563	71
Future Volume (vph)	56	434	460	424	563	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.93		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1787	3574	3292		3467	1578
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1787	3574	3292		3467	1578
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	58	447	474	437	580	73
RTOR Reduction (vph)	0	0	132	0	0	53
Lane Group Flow (vph)	58	447	779	0	580	20
Confl. Peds. (#/hr)				4		1
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	NA		Perm	Perm
Protected Phases	5	2	6			
Permitted Phases					4	4
Actuated Green, G (s)	4.5	34.5	25.5		18.8	18.8
Effective Green, g (s)	4.5	34.5	25.5		18.8	18.8
Actuated g/C Ratio	0.06	0.49	0.37		0.27	0.27
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	115	1769	1204		935	425
v/s Ratio Prot	c0.03	0.13	c0.24			
v/s Ratio Perm					c0.17	0.01
v/c Ratio	0.50	0.25	0.65		0.62	0.05
Uniform Delay, d1	31.5	10.2	18.4		22.3	18.8
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.5	0.1	1.2		1.3	0.0
Delay (s)	35.0	10.2	19.6		23.6	18.9
Level of Service	C	B	B		C	B
Approach Delay (s)		13.1	19.6		23.1	
Approach LOS		B	B		C	

Intersection Summary			
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	69.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	58.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Existing Plus 1293 Unit Project PM
12: Creston Road & Niblick Road/Sherwood Road — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	196	552	291	97	455	367	187	469	340	606
v/c Ratio	0.71	0.99	0.43	0.50	0.59	0.58	0.69	0.65	0.94	0.67
Control Delay	49.7	69.6	5.7	46.1	33.0	7.6	48.4	33.8	70.4	30.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.7	69.6	5.7	46.1	33.0	7.6	48.4	33.8	70.4	30.7
Queue Length 50th (ft)	101	~334	0	50	116	0	96	117	187	148
Queue Length 95th (ft)	#196	#556	59	101	171	71	#182	168	#377	208
Internal Link Dist (ft)		1092			186			1440		2310
Turn Bay Length (ft)	150			170		140	230		245	
Base Capacity (vph)	319	557	670	231	882	666	319	920	363	1005
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.99	0.43	0.42	0.52	0.55	0.59	0.51	0.94	0.60

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Olsen-Chandler SP — Existing Plus 1293 Unit Project PM
12: Creston Road & Niblick Road/Sherwood Road — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	184	519	274	91	428	345	176	373	68	320	428	142
Future Volume (vph)	184	519	274	91	428	345	176	373	68	320	428	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1881	1572	1787	3574	1578	1787	3492		1787	3419	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	1881	1572	1787	3574	1578	1787	3492		1787	3419	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	196	552	291	97	455	367	187	397	72	340	455	151
RTOR Reduction (vph)	0	0	206	0	0	283	0	17	0	0	36	0
Lane Group Flow (vph)	196	552	85	97	455	84	187	452	0	340	570	0
Confl. Peds. (#/hr)			4			1						10
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	12.8	24.4	24.4	7.4	19.0	19.0	12.6	16.6		16.8	20.8	
Effective Green, g (s)	12.8	24.4	24.4	7.4	19.0	19.0	12.6	16.6		16.8	20.8	
Actuated g/C Ratio	0.15	0.29	0.29	0.09	0.23	0.23	0.15	0.20		0.20	0.25	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	274	551	461	158	816	360	270	696		360	854	
v/s Ratio Prot	c0.11	c0.29		0.05	0.13		0.10	0.13		c0.19	c0.17	
v/s Ratio Perm			0.05			0.05						
v/c Ratio	0.72	1.00	0.19	0.61	0.56	0.23	0.69	0.65		0.94	0.67	
Uniform Delay, d1	33.5	29.4	22.0	36.5	28.4	26.2	33.5	30.6		32.7	28.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.6	38.8	0.2	6.9	0.8	0.3	7.5	2.1		33.1	2.0	
Delay (s)	42.0	68.2	22.2	43.4	29.2	26.5	40.9	32.7		65.8	30.1	
Level of Service	D	E	C	D	C	C	D	C		E	C	
Approach Delay (s)		50.4			29.6			35.1			42.9	
Approach LOS		D			C			D			D	

Intersection Summary

HCM 2000 Control Delay	40.2	HCM 2000 Level of Service		D	
HCM 2000 Volume to Capacity ratio	0.90				
Actuated Cycle Length (s)	83.2	Sum of lost time (s)		18.0	
Intersection Capacity Utilization	77.6%	ICU Level of Service		D	
Analysis Period (min)	15				

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
12: Creston Road & Niblick Road/Sherwood Road

Existing Plus 1293 Unit Project PM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	184	519	274	91	428	345	176	373	68	320	428	142
Future Volume (veh/h)	184	519	274	91	428	345	176	373	68	320	428	142
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	196	552	291	97	455	367	187	397	72	340	455	151
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	237	591	499	125	899	401	228	546	98	375	691	227
Arrive On Green	0.13	0.31	0.31	0.07	0.25	0.25	0.13	0.18	0.18	0.21	0.26	0.26
Sat Flow, veh/h	1795	1885	1591	1795	3582	1596	1795	3032	545	1795	2639	868
Grp Volume(v), veh/h	196	552	291	97	455	367	187	233	236	340	307	299
Grp Sat Flow(s),veh/h/ln	1795	1885	1591	1795	1791	1596	1795	1791	1787	1795	1791	1717
Q Serve(g_s), s	8.4	22.5	12.1	4.2	8.6	17.7	8.0	9.7	9.9	14.6	12.1	12.3
Cycle Q Clear(g_c), s	8.4	22.5	12.1	4.2	8.6	17.7	8.0	9.7	9.9	14.6	12.1	12.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.31	1.00		0.51
Lane Grp Cap(c), veh/h	237	591	499	125	899	401	228	323	322	375	469	450
V/C Ratio(X)	0.83	0.93	0.58	0.77	0.51	0.92	0.82	0.72	0.73	0.91	0.66	0.66
Avail Cap(c_a), veh/h	329	591	499	239	907	404	329	476	475	375	521	500
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.4	26.3	22.8	36.1	25.4	28.8	33.6	30.5	30.6	30.5	26.0	26.1
Incr Delay (d2), s/veh	11.4	22.2	1.7	9.7	0.4	25.2	10.2	3.1	3.2	25.0	2.6	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	12.8	4.4	2.1	3.5	9.0	4.0	4.3	4.3	8.6	5.2	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.8	48.5	24.5	45.8	25.8	54.0	43.8	33.6	33.8	55.5	28.6	28.9
LnGrp LOS	D	D	C	D	C	D	D	C	C	E	C	C
Approach Vol, veh/h		1039			919			656			946	
Approach Delay, s/veh		41.1			39.2			36.6			38.4	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.0	18.7	10.0	29.3	14.5	25.2	14.9	24.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.5	21.0	10.5	24.0	14.5	23.0	14.5	20.0
Max Q Clear Time (g_c+I1), s	16.6	11.9	6.2	24.5	10.0	14.3	10.4	19.7
Green Ext Time (p_c), s	0.0	1.8	0.1	0.0	0.2	2.4	0.2	0.2

Intersection Summary	
HCM 6th Ctrl Delay	39.0
HCM 6th LOS	D

Olsen-Chandler SP
13: Creston Road & Scott Street

Existing Plus 1293 Unit Project PM
HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	46	65	466	41	99	598
Future Volume (Veh/h)	46	65	466	41	99	598
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	49	70	501	44	106	643
Pedestrians	2					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1380	525			547	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1380	525			547	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	66	87			90	
cM capacity (veh/h)	143	553			1025	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	119	545	106	643
Volume Left	49	0	106	0
Volume Right	70	44	0	0
cSH	254	1700	1025	1700
Volume to Capacity	0.47	0.32	0.10	0.38
Queue Length 95th (ft)	58	0	9	0
Control Delay (s)	31.1	0.0	8.9	0.0
Lane LOS	D		A	
Approach Delay (s)	31.1	0.0	1.3	
Approach LOS	D			

Intersection Summary				
Average Delay	3.3			
Intersection Capacity Utilization	49.1%	ICU Level of Service		A
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	3.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	46	65	466	41	99	598
Future Vol, veh/h	46	65	466	41	99	598
Conflicting Peds, #/hr	0	0	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	49	70	501	44	106	643

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1380	525	0	0	547	0
Stage 1	525	-	-	-	-	-
Stage 2	855	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.11	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209	-
Pot Cap-1 Maneuver	160	554	-	-	1027	-
Stage 1	595	-	-	-	-	-
Stage 2	418	-	-	-	-	-
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	143	553		-	1025	-
Mov Cap-2 Maneuver	143	-		-	-	-
Stage 1	594	-		-	-	-
Stage 2	375	-		-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	31.3	0	1.3
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	253	1025	-
HCM Lane V/C Ratio	-	-	0.472	0.104	-
HCM Control Delay (s)	-	-	31.3	8.9	-
HCM Lane LOS	-	-	D	A	-
HCM 95th %tile Q(veh)	-	-	2.3	0.3	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	4	8	4	1	38	17	262	10	48	328	131
Future Volume (Veh/h)	108	4	8	4	1	38	17	262	10	48	328	131
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Hourly flow rate (vph)	109	4	8	4	1	38	17	265	10	48	331	132
Pedestrians		5									4	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		3.5									3.5	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	774	741	336	741	868	274	468			275		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	774	741	336	741	868	274	468			275		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	62	99	99	99	100	95	98			96		
cM capacity (veh/h)	285	326	705	312	275	764	1094			1294		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	121	43	17	275	48	331	132
Volume Left	109	4	17	0	48	0	0
Volume Right	8	38	0	10	0	0	132
cSH	298	650	1094	1700	1294	1700	1700
Volume to Capacity	0.41	0.07	0.02	0.16	0.04	0.19	0.08
Queue Length 95th (ft)	47	5	1	0	3	0	0
Control Delay (s)	25.1	10.9	8.3	0.0	7.9	0.0	0.0
Lane LOS	D	B	A		A		
Approach Delay (s)	25.1	10.9	0.5		0.7		
Approach LOS	D	B					

Intersection Summary					
Average Delay	4.2				
Intersection Capacity Utilization	43.9%	ICU Level of Service		A	
Analysis Period (min)	15				

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	108	4	8	4	1	38	17	262	10	48	328	131
Future Vol, veh/h	108	4	8	4	1	38	17	262	10	48	328	131
Conflicting Peds, #/hr	4	0	0	0	0	4	5	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	30	-	-	70	-	60
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	99	99	99	99	99	99	99	99	99	99	99	99
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	109	4	8	4	1	38	17	265	10	48	331	132

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	760	741	336	803	868	274	468	0	0	275	0	0
Stage 1	432	432	-	304	304	-	-	-	-	-	-	-
Stage 2	328	309	-	499	564	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	324	345	708	303	292	767	1099	-	-	1294	-	-
Stage 1	604	584	-	708	665	-	-	-	-	-	-	-
Stage 2	687	661	-	555	510	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	292	325	705	285	275	764	1094	-	-	1294	-	-
Mov Cap-2 Maneuver	292	325	-	285	275	-	-	-	-	-	-	-
Stage 1	592	559	-	697	654	-	-	-	-	-	-	-
Stage 2	639	650	-	524	489	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	24.4	11.1	0.5	0.7
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1094	-	-	305	638	1294	-	-
HCM Lane V/C Ratio	0.016	-	-	0.397	0.068	0.037	-	-
HCM Control Delay (s)	8.3	-	-	24.4	11.1	7.9	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.8	0.2	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	8	2	3	121	3	93	7	190	196	161	165	12
Future Volume (vph)	8	2	3	121	3	93	7	190	196	161	165	12
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	9	2	3	130	3	100	8	204	211	173	177	13

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	14	233	212	211	262	102
Volume Left (vph)	9	130	8	0	173	0
Volume Right (vph)	3	100	0	211	0	13
Hadj (s)	0.02	-0.13	0.04	-0.68	0.35	-0.07
Departure Headway (s)	6.3	5.6	5.8	5.0	6.1	5.7
Degree Utilization, x	0.02	0.36	0.34	0.30	0.44	0.16
Capacity (veh/h)	495	598	602	685	569	606
Control Delay (s)	9.4	11.7	10.5	8.9	12.7	8.6
Approach Delay (s)	9.4	11.7	9.7		11.5	
Approach LOS	A	B	A		B	

Intersection Summary				
Delay	10.8			
Level of Service	B			
Intersection Capacity Utilization	45.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	11.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Vol, veh/h	8	2	3	121	3	93	0	7	190	196	161	165
Future Vol, veh/h	8	2	3	121	3	93	0	7	190	196	161	165
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	1	1	1	1	1	1	2	1	1	1	1	1
Mvmt Flow	9	2	3	130	3	100	0	8	204	211	173	177
Number of Lanes	0	1	0	0	1	0	0	0	1	1	0	2

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	9.5	11.9	10.7	12.5
HCM LOS	A	B	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	4%	0%	62%	56%	66%	0%
Vol Thru, %	96%	0%	15%	1%	34%	87%
Vol Right, %	0%	100%	23%	43%	0%	13%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	197	196	13	217	244	95
LT Vol	7	0	8	121	161	0
Through Vol	190	0	2	3	83	83
RT Vol	0	196	3	93	0	12
Lane Flow Rate	212	211	14	233	262	102
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.34	0.295	0.024	0.366	0.444	0.16
Departure Headway (Hd)	5.77	5.043	6.302	5.643	6.11	5.685
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	625	712	567	637	589	631
Service Time	3.499	2.771	4.352	3.674	3.841	3.416
HCM Lane V/C Ratio	0.339	0.296	0.025	0.366	0.445	0.162
HCM Control Delay	11.5	9.9	9.5	11.9	13.7	9.5
HCM Lane LOS	B	A	A	B	B	A
HCM 95th-tile Q	1.5	1.2	0.1	1.7	2.3	0.6

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBR
Lane Configurations	
Traffic Vol, veh/h	12
Future Vol, veh/h	12
Peak Hour Factor	0.93
Heavy Vehicles, %	1
Mvmt Flow	13
Number of Lanes	0

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	252	120	66	144	110	167
Future Volume (Veh/h)	252	120	66	144	110	167
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	260	124	68	148	113	172
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	323	113	285			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	323	113	285			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	58	87	95			
cM capacity (veh/h)	614	922	1281			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	384	68	74	74	113	172
Volume Left	260	68	0	0	0	0
Volume Right	124	0	0	0	0	172
cSH	907	1281	1700	1700	1700	1700
Volume to Capacity	0.42	0.05	0.04	0.04	0.07	0.10
Queue Length 95th (ft)	53	4	0	0	0	0
Control Delay (s)	13.3	8.0	0.0	0.0	0.0	0.0
Lane LOS	B	A				
Approach Delay (s)	13.3	2.5			0.0	
Approach LOS	B					

Intersection Summary			
Average Delay		6.4	
Intersection Capacity Utilization		31.0%	ICU Level of Service A
Analysis Period (min)		15	

Intersection	
Int Delay, s/veh	6.3

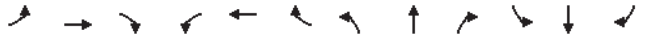
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	252	120	66	144	110	167
Future Vol, veh/h	252	120	66	144	110	167
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	145	105	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	260	124	68	148	113	172

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	323	113	285	0	-	0
Stage 1	113	-	-	-	-	-
Stage 2	210	-	-	-	-	-
Critical Hdwy	6.615	6.215	4.115	-	-	-
Critical Hdwy Stg 1	5.415	-	-	-	-	-
Critical Hdwy Stg 2	5.815	-	-	-	-	-
Follow-up Hdwy	3.5095	3.3095	2.2095	-	-	-
Pot Cap-1 Maneuver	661	942	1282	-	-	-
Stage 1	914	-	-	-	-	-
Stage 2	808	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	626	942	1282	-	-	-
Mov Cap-2 Maneuver	626	-	-	-	-	-
Stage 1	866	-	-	-	-	-
Stage 2	808	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.1	2.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1282	-	626	942	-	-
HCM Lane V/C Ratio	0.053	-	0.415	0.131	-	-
HCM Control Delay (s)	8	-	14.8	9.4	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	2	0.5	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	0	67	0	126	14	0	0	0	0	283	34
Future Volume (Veh/h)	27	0	67	0	126	14	0	0	0	0	283	34
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	32	0	80	0	150	17	0	0	0	0	337	40
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	440	357	357	437	377	0	377			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	440	357	357	437	377	0	377			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	100	88	100	73	98	100			100		
cM capacity (veh/h)	412	571	689	470	556	1088	1187			1630		

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	112	167	377
Volume Left	32	0	0
Volume Right	80	17	40
cSH	578	602	1700
Volume to Capacity	0.19	0.28	0.22
Queue Length 95th (ft)	18	28	0
Control Delay (s)	12.7	13.3	0.0
Lane LOS	B	B	
Approach Delay (s)	12.7	13.3	0.0
Approach LOS	B	B	

Intersection Summary					
Average Delay		5.5			
Intersection Capacity Utilization		39.2%	ICU Level of Service	A	
Analysis Period (min)		15			

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	0	67	0	126	14	0	0	0	0	283	34
Future Vol, veh/h	27	0	67	0	126	14	0	0	0	0	283	34
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	32	0	80	0	150	17	0	0	0	0	337	40

Major/Minor	Minor2			Minor1						Major2		
Conflicting Flow All	441	357	357	397	377	0				-	-	0
Stage 1	357	357	-	0	0	-				-	-	-
Stage 2	84	0	-	397	377	-				-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21				-	-	-
Critical Hdwy Stg 1	6.11	5.51	-	-	-	-				-	-	-
Critical Hdwy Stg 2	-	-	-	6.11	5.51	-				-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309				-	-	-
Pot Cap-1 Maneuver	528	571	689	565	556	-				0	-	-
Stage 1	663	630	-	-	-	-				0	-	-
Stage 2	-	-	-	631	618	-				0	-	-
Platoon blocked, %											-	-
Mov Cap-1 Maneuver	-	571	689	499	556	-				-	-	-
Mov Cap-2 Maneuver	-	571	-	499	556	-				-	-	-
Stage 1	663	630	-	-	-	-				-	-	-
Stage 2	-	-	-	558	618	-				-	-	-

Approach	EB	WB	SB
HCM Control Delay, s			0
HCM LOS	-	-	

Minor Lane/Major Mvmt	EBLn1	WBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	-	556	-	-	-
HCM Lane V/C Ratio	-	0.27	-	-	-
HCM Control Delay (s)	-	13.9	-	-	-
HCM Lane LOS	-	B	-	-	-
HCM 95th %tile Q(veh)	-	1.1	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	47	392	670	189	414	96	354	1072	563	300
v/c Ratio	0.17	0.71	0.63	0.33	0.40	0.55	0.67	0.79	0.75	0.32
Control Delay	50.8	55.1	41.2	37.2	2.9	69.0	58.2	20.0	53.0	35.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.8	55.1	41.2	37.2	2.9	69.0	58.2	20.0	53.0	35.6
Queue Length 50th (ft)	34	152	237	116	6	77	147	184	226	98
Queue Length 95th (ft)	79	234	362	217	55	149	221	290	318	150
Internal Link Dist (ft)		521		1372			611			680
Turn Bay Length (ft)	115		515		115	165		290	305	
Base Capacity (vph)	368	726	1217	660	1122	244	850	1472	1033	1398
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.54	0.55	0.29	0.37	0.39	0.42	0.73	0.55	0.21

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	287	93	650	183	402	93	343	1040	546	236	55
Future Volume (vph)	46	287	93	650	183	402	93	343	1040	546	236	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.95	0.88	0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	3430		3467	1881	1585	1787	3574	2814	3467	3472	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	3430		3467	1881	1585	1787	3574	2814	3467	3472	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	47	296	96	670	189	414	96	354	1072	563	243	57
RTOR Reduction (vph)	0	21	0	0	0	188	0	0	65	0	15	0
Lane Group Flow (vph)	47	371	0	670	189	226	96	354	1007	563	285	0
Confl. Peds. (#/hr)						2						
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	19.1	19.1		37.5	37.5	64.0	12.0	18.1	55.6	26.5	32.6	
Effective Green, g (s)	19.1	19.1		37.5	37.5	64.0	12.0	18.1	55.6	26.5	32.6	
Actuated g/C Ratio	0.16	0.16		0.31	0.31	0.53	0.10	0.15	0.46	0.22	0.27	
Clearance Time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	280	538		1068	579	833	176	531	1285	754	930	
v/s Ratio Prot	0.03	c0.11		0.19	0.10	0.06	0.05	0.10	c0.24	c0.16	0.08	
v/s Ratio Perm						0.08			0.12			
v/c Ratio	0.17	0.69		0.63	0.33	0.27	0.55	0.67	0.78	0.75	0.31	
Uniform Delay, d1	44.4	48.5		36.1	32.4	16.0	52.3	48.9	28.0	44.5	35.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	3.7		1.2	0.3	0.2	3.4	3.2	3.2	4.1	0.2	
Delay (s)	44.7	52.2		37.3	32.7	16.1	55.7	52.1	31.2	48.5	35.7	
Level of Service	D	D		D	C	B	E	D	C	D	D	
Approach Delay (s)		51.4			29.7			37.6			44.1	
Approach LOS		D			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	38.0	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	121.7	Sum of lost time (s)	20.5	
Intersection Capacity Utilization	75.1%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Existing Plus 1293 Unit Project PM
18: US 101 Ramps/Spring Street & 1st Street/Niblick Road — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	287	93	650	183	402	93	343	1040	546	236	55
Future Volume (veh/h)	46	287	93	650	183	402	93	343	1040	546	236	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	47	296	96	670	189	414	96	354	1072	563	243	57
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	255	378	120	884	478	707	121	860	1389	659	1019	235
Arrive On Green	0.14	0.14	0.14	0.25	0.25	0.25	0.07	0.24	0.24	0.19	0.35	0.35
Sat Flow, veh/h	1795	2663	845	3483	1885	1594	1795	3582	2812	3483	2891	665
Grp Volume(v), veh/h	47	197	195	670	189	414	96	354	1072	563	149	151
Grp Sat Flow(s),veh/h/ln	1795	1791	1718	1742	1885	1594	1795	1791	1406	1742	1791	1765
Q Serve(g_s), s	2.7	12.4	12.9	20.9	9.8	22.9	6.2	9.8	28.2	18.3	6.9	7.1
Cycle Q Clear(g_c), s	2.7	12.4	12.9	20.9	9.8	22.9	6.2	9.8	28.2	18.3	6.9	7.1
Prop In Lane	1.00		0.49	1.00		1.00	1.00		1.00	1.00		0.38
Lane Grp Cap(c), veh/h	255	255	244	884	478	707	121	860	1389	659	632	623
V/C Ratio(X)	0.18	0.77	0.80	0.76	0.40	0.59	0.79	0.41	0.77	0.85	0.24	0.24
Avail Cap(c_a), veh/h	373	372	357	1234	668	867	248	860	1389	1047	722	711
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.4	48.5	48.7	40.5	36.3	24.6	53.9	37.6	22.2	46.0	26.8	26.9
Incr Delay (d2), s/veh	0.3	6.0	7.8	1.8	0.5	0.8	10.9	0.3	2.7	4.1	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	6.0	6.1	8.9	4.5	8.4	3.1	4.2	16.1	8.3	3.0	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.7	54.5	56.5	42.3	36.9	25.4	64.8	37.9	24.9	50.1	27.0	27.1
LnGrp LOS	D	D	E	D	D	C	E	D	C	D	C	C
Approach Vol, veh/h		439			1273			1522			863	
Approach Delay, s/veh		54.4			36.0			30.5			42.1	
Approach LOS		D			D			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	26.9	34.0		21.3	13.7	47.2		35.2				
Change Period (Y+Rc), s	* 4.7	5.8		4.6	5.8	* 5.8		5.4				
Max Green Setting (Gmax), s	* 35	28.2		24.4	16.2	* 47		41.6				
Max Q Clear Time (g_c+I1), s	20.3	30.2		14.9	8.2	9.1		24.9				
Green Ext Time (p_c), s	1.9	0.0		1.8	0.1	1.9		4.8				

Intersection Summary												
HCM 6th Ctrl Delay			37.2									
HCM 6th LOS			D									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Olsen-Chandler SP — Existing Plus 1293 Unit Project PM
19: S. River Road & Niblick Road — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	252	973	523	119	864	365	333	198	502
v/c Ratio	0.58	0.77	0.59	0.58	0.72	0.67	0.47	0.71	0.72
Control Delay	50.7	35.7	6.3	58.6	33.6	49.4	35.8	58.4	43.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.7	35.7	6.3	58.6	33.6	49.4	35.8	58.4	43.1
Queue Length 50th (ft)	86	299	10	79	253	124	97	131	162
Queue Length 95th (ft)	139	443	101	151	382	189	147	#233	231
Internal Link Dist (ft)		1510			1609		962		896
Turn Bay Length (ft)	140			80		150		110	
Base Capacity (vph)	543	1463	949	261	1402	683	982	352	977
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.67	0.55	0.46	0.62	0.53	0.34	0.56	0.51

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	242	934	502	114	685	144	350	237	83	190	360	122
Future Volume (vph)	242	934	502	114	685	144	350	237	83	190	360	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.96		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3467	3574	1599	1787	3472		3467	3436		1787	3425	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3467	3574	1599	1787	3472		3467	3436		1787	3425	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	252	973	523	119	714	150	365	247	86	198	375	127
RTOR Reduction (vph)	0	0	323	0	14	0	0	30	0	0	29	0
Lane Group Flow (vph)	252	973	200	119	850	0	365	303	0	198	473	0
Confl. Peds. (#/hr)						2						3
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	12.7	35.9	35.9	11.7	34.9		16.0	20.1		15.9	20.0	
Effective Green, g (s)	12.7	35.9	35.9	11.7	34.9		16.0	20.1		15.9	20.0	
Actuated g/C Ratio	0.12	0.35	0.35	0.12	0.34		0.16	0.20		0.16	0.20	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	433	1262	565	205	1192		545	679		279	674	
v/s Ratio Prot	c0.07	c0.27		0.07	0.24		c0.11	c0.09		0.11	c0.14	
v/s Ratio Perm			0.13									
v/c Ratio	0.58	0.77	0.35	0.58	0.71		0.67	0.45		0.71	0.70	
Uniform Delay, d1	41.9	29.2	24.3	42.6	29.0		40.3	35.8		40.7	38.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.0	3.0	0.4	4.1	2.0		3.1	0.5		8.0	3.3	
Delay (s)	43.9	32.2	24.7	46.8	31.0		43.4	36.3		48.7	41.3	
Level of Service	D	C	C	D	C		D	D		D	D	
Approach Delay (s)		31.6			32.9			40.0			43.4	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	35.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	101.6	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	71.9%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	242	934	502	114	685	144	350	237	83	190	360	122
Future Volume (veh/h)	242	934	502	114	685	144	350	237	83	190	360	122
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	252	973	523	119	714	150	365	247	86	198	375	127
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	349	1307	583	153	1030	216	474	516	175	241	512	171
Arrive On Green	0.10	0.37	0.37	0.08	0.35	0.35	0.14	0.20	0.20	0.13	0.19	0.19
Sat Flow, veh/h	3483	3582	1598	1795	2945	618	3483	2625	891	1795	2633	880
Grp Volume(v), veh/h	252	973	523	119	434	430	365	167	166	198	253	249
Grp Sat Flow(s),veh/h/ln	1742	1791	1598	1795	1791	1773	1742	1791	1725	1795	1791	1722
Q Serve(g_s), s	5.8	19.4	15.5	5.3	17.1	17.1	8.3	6.8	7.0	8.8	10.9	11.2
Cycle Q Clear(g_c), s	5.8	19.4	15.5	5.3	17.1	17.1	8.3	6.8	7.0	8.8	10.9	11.2
Prop In Lane	1.00		1.00	1.00		0.35	1.00		0.52	1.00		0.51
Lane Grp Cap(c), veh/h	349	1307	583	153	626	620	474	352	339	241	348	335
V/C Ratio(X)	0.72	0.74	0.90	0.78	0.69	0.69	0.77	0.47	0.49	0.82	0.73	0.74
Avail Cap(c_a), veh/h	658	1767	788	317	862	853	827	600	578	427	600	577
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.8	22.7	9.2	36.8	22.9	22.9	34.2	29.2	29.3	34.6	31.0	31.1
Incr Delay (d2), s/veh	2.8	1.2	10.4	8.3	1.4	1.4	2.7	1.0	1.1	6.8	2.9	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	7.7	6.0	2.6	6.8	6.8	3.5	2.8	2.9	4.1	4.7	4.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.6	23.9	19.6	45.1	24.3	24.4	36.9	30.2	30.4	41.4	33.9	34.4
LnGrp LOS	D	C	B	D	C	C	D	C	C	D	C	C
Approach Vol, veh/h		1748			983			698			700	
Approach Delay, s/veh		24.7			26.9			33.8			36.2	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.5	34.5	15.7	20.5	12.7	33.2	15.5	20.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	14.5	40.5	19.5	27.5	15.5	39.5	19.5	27.5
Max Q Clear Time (g_c+I1), s	7.3	21.4	10.3	13.2	7.8	19.1	10.8	9.0
Green Ext Time (p_c), s	0.1	8.5	0.9	2.4	0.5	5.2	0.3	1.7

Intersection Summary	
HCM 6th Ctrl Delay	28.7
HCM 6th LOS	C

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	787	196	22	593	247	19
v/c Ratio	0.78	0.21	0.11	0.31	0.58	0.05
Control Delay	18.8	2.3	9.8	8.2	24.3	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.8	2.3	9.8	8.2	24.3	8.4
Queue Length 50th (ft)	165	0	3	45	73	0
Queue Length 95th (ft)	#526	30	18	116	134	12
Internal Link Dist (ft)	1629			570	669	
Turn Bay Length (ft)			75			50
Base Capacity (vph)	1152	1030	237	2189	934	846
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.19	0.09	0.27	0.26	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	700	174	20	528	220	17
Future Volume (vph)	700	174	20	528	220	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1827	1519	1735	3471	1732	1553
Flt Permitted	1.00	1.00	0.21	1.00	0.95	1.00
Satd. Flow (perm)	1827	1519	376	3471	1732	1553
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	787	196	22	593	247	19
RTOR Reduction (vph)	0	86	0	0	0	14
Lane Group Flow (vph)	787	110	22	593	247	5
Confl. Peds. (#/hr)		2	2		3	
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type	NA	Perm	Perm	NA	Perm	Prot
Protected Phases	2			6		8
Permitted Phases		2	6		8	
Actuated Green, G (s)	31.3	31.3	31.3	31.3	13.9	13.9
Effective Green, g (s)	31.3	31.3	31.3	31.3	13.9	13.9
Actuated g/C Ratio	0.56	0.56	0.56	0.56	0.25	0.25
Clearance Time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	1021	849	210	1940	429	385
v/s Ratio Prot	c0.43			0.17		0.00
v/s Ratio Perm		0.07	0.06		c0.14	
v/c Ratio	0.77	0.13	0.10	0.31	0.58	0.01
Uniform Delay, d1	9.6	5.9	5.8	6.6	18.5	15.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.3	0.0	0.1	0.0	1.2	0.0
Delay (s)	12.9	5.9	5.9	6.6	19.6	15.9
Level of Service	B	A	A	A	B	B
Approach Delay (s)	11.5			6.6	19.4	
Approach LOS	B			A	B	

Intersection Summary				
HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	56.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	58.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	700	174	20	528	220	17
Future Volume (veh/h)	700	174	20	528	220	17
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	787	196	22	593	247	19
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	949	802	277	1802	348	310
Arrive On Green	0.52	0.52	0.52	0.52	0.20	0.20
Sat Flow, veh/h	1841	1557	563	3589	1753	1560
Grp Volume(v), veh/h	787	196	22	593	247	19
Grp Sat Flow(s),veh/h/ln	1841	1557	563	1749	1753	1560
Q Serve(g_s), s	13.7	2.6	1.3	3.7	5.0	0.4
Cycle Q Clear(g_c), s	13.7	2.6	15.0	3.7	5.0	0.4
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	949	802	277	1802	348	310
V/C Ratio(X)	0.83	0.24	0.08	0.33	0.71	0.06
Avail Cap(c_a), veh/h	1686	1426	503	3203	1374	1222
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.8	5.1	14.1	5.3	14.1	12.3
Incr Delay (d2), s/veh	0.7	0.1	0.0	0.0	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.4	0.1	0.6	1.6	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.5	5.1	14.1	5.4	15.1	12.3
LnGrp LOS	A	A	B	A	B	B
Approach Vol, veh/h	983			615	266	
Approach Delay, s/veh	7.8			5.7	14.9	
Approach LOS	A			A	B	

Timer - Assigned Phs	2	6	8
Phs Duration (G+Y+Rc), s	24.9	24.9	12.9
Change Period (Y+Rc), s	5.4	5.4	5.4
Max Green Setting (Gmax), s	34.6	34.6	29.6
Max Q Clear Time (g_c+I1), s	15.7	17.0	7.0
Green Ext Time (p_c), s	3.6	2.5	0.3

Intersection Summary	
HCM 6th Ctrl Delay	8.1
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	657	60	11	444	0	105	0	11	0	0	0
Future Volume (Veh/h)	0	657	60	11	444	0	105	0	11	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	714	65	12	483	0	114	0	12	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									4			
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		650										
pX, platoon unblocked				0.63			0.63	0.63	0.63	0.63	0.63	
vC, conflicting volume	483			779			1012	1254	746	1260	1286	242
vC1, stage 1 conf vol							746	746		507	507	
vC2, stage 2 conf vol							266	507		752	779	
vCu, unblocked vol	483			357			726	1109	305	1119	1161	242
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			71	100	97	100	100	100
cM capacity (veh/h)	1076			756			390	342	436	320	323	759

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	779	254	242	126	0
Volume Left	0	12	0	114	0
Volume Right	65	0	0	12	0
cSH	1076	756	1700	431	1700
Volume to Capacity	0.00	0.02	0.14	0.29	0.00
Queue Length 95th (ft)	0	1	0	30	0
Control Delay (s)	0.0	0.6	0.0	17.6	0.0
Lane LOS		A		C	A
Approach Delay (s)	0.0	0.3		17.6	0.0
Approach LOS				C	A

Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	50.7%	ICU Level of Service		A
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↰	↱		↕	
Traffic Vol, veh/h	0	657	60	11	444	0	105	0	11	0	0	0
Future Vol, veh/h	0	657	60	11	444	0	105	0	11	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	714	65	12	483	0	114	0	12	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	483	0	0	779	0	0	1013	1254	747	1260	1286	242
Stage 1	-	-	-	-	-	-	747	747	-	507	507	-
Stage 2	-	-	-	-	-	-	266	507	-	753	779	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.23	7.33	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.519	4.019	3.319
Pot Cap-1 Maneuver	1078	-	-	836	-	-	205	171	412	137	164	759
Stage 1	-	-	-	-	-	-	404	419	-	517	538	-
Stage 2	-	-	-	-	-	-	717	538	-	401	405	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1078	-	-	836	-	-	202	168	412	131	161	759
Mov Cap-2 Maneuver	-	-	-	-	-	-	364	344	-	311	330	-
Stage 1	-	-	-	-	-	-	404	419	-	517	527	-
Stage 2	-	-	-	-	-	-	703	527	-	389	405	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.3	18.8	0
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	364	412	1078	-	-	836	-	-	-
HCM Lane V/C Ratio	0.314	0.029	-	-	-	0.014	-	-	-
HCM Control Delay (s)	19.3	14	0	-	-	9.4	0.1	-	0
HCM Lane LOS	C	B	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	1.3	0.1	0	-	-	0	-	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Traffic Volume (veh/h)	79	292	188	20	175	8	121	11	18	5	11	47
Future Volume (veh/h)	79	292	188	20	175	8	121	11	18	5	11	47
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	86	317	204	22	190	9	132	12	20	5	12	51
Approach Volume (veh/h)		607			221			164			68	
Crossing Volume (veh/h)		39			230			408			344	
High Capacity (veh/h)		1343			1156			1004			1057	
High v/c (veh/h)		0.45			0.19			0.16			0.06	
Low Capacity (veh/h)		1123			954			818			865	
Low v/c (veh/h)		0.54			0.23			0.20			0.08	

Intersection Summary					
Maximum v/c High		0.45			
Maximum v/c Low		0.54			
Intersection Capacity Utilization		67.0%	ICU Level of Service		C

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	6.6
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	607	221	164	68
Demand Flow Rate, veh/h	619	225	167	69
Vehicles Circulating, veh/h	39	235	416	351
Vehicles Exiting, veh/h	381	348	242	109
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	7.5	5.3	5.9	4.5
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	619	225	167	69
Cap Entry Lane, veh/h	1326	1086	903	965
Entry HV Adj Factor	0.980	0.983	0.981	0.982
Flow Entry, veh/h	607	221	164	68
Cap Entry, veh/h	1300	1067	885	947
V/C Ratio	0.467	0.207	0.185	0.072
Control Delay, s/veh	7.5	5.3	5.9	4.5
LOS	A	A	A	A
95th %tile Queue, veh	3	1	1	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	22	25	17	1	18	19	9	90	3	22	109	12
Future Volume (vph)	22	25	17	1	18	19	9	90	3	22	109	12
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	27	30	20	1	22	23	11	108	4	27	131	14

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	77	46	123	172
Volume Left (vph)	27	1	11	27
Volume Right (vph)	20	23	4	14
Hadj (s)	-0.07	-0.28	0.02	0.00
Departure Headway (s)	4.6	4.4	4.4	4.3
Degree Utilization, x	0.10	0.06	0.15	0.21
Capacity (veh/h)	731	754	785	796
Control Delay (s)	8.0	7.6	8.2	8.4
Approach Delay (s)	8.0	7.6	8.2	8.4
Approach LOS	A	A	A	A

Intersection Summary				
Delay	8.2			
Level of Service	A			
Intersection Capacity Utilization	29.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	22	25	17	1	18	19	9	90	3	22	109	12
Future Vol, veh/h	22	25	17	1	18	19	9	90	3	22	109	12
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	27	30	20	1	22	23	11	108	4	27	131	14
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8	7.7	8.2	8.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	9%	34%	3%	15%
Vol Thru, %	88%	39%	47%	76%
Vol Right, %	3%	27%	50%	8%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	102	64	38	143
LT Vol	9	22	1	22
Through Vol	90	25	18	109
RT Vol	3	17	19	12
Lane Flow Rate	123	77	46	172
Geometry Grp	1	1	1	1
Degree of Util (X)	0.15	0.097	0.056	0.206
Departure Headway (Hd)	4.383	4.539	4.375	4.314
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	820	791	820	834
Service Time	2.4	2.559	2.395	2.329
HCM Lane V/C Ratio	0.15	0.097	0.056	0.206
HCM Control Delay	8.2	8	7.7	8.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.5	0.3	0.2	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↰	↱	
Traffic Volume (veh/h)	67	138	0	1	85	2	0	14	1	0	9	31
Future Volume (Veh/h)	67	138	0	1	85	2	0	14	1	0	9	31
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Hourly flow rate (vph)	92	189	0	1	116	3	0	19	1	0	12	42
Pedestrians								6				
Lane Width (ft)								12.0				
Walking Speed (ft/s)								3.5				
Percent Blockage								1				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	119			195			546	500	195	503	498	118
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	119			195			546	500	195	503	498	118
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			100	96	100	100	97	96
cM capacity (veh/h)	1475			1376			396	442	844	440	443	937

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	281	120	20	0	54
Volume Left	92	1	0	0	0
Volume Right	0	3	1	0	42
cSH	1475	1376	452	1700	751
Volume to Capacity	0.06	0.00	0.04	0.00	0.07
Queue Length 95th (ft)	5	0	3	0	6
Control Delay (s)	2.8	0.1	13.3	0.0	10.2
Lane LOS	A	A	B	A	B
Approach Delay (s)	2.8	0.1	13.3	10.2	
Approach LOS			B	B	

Intersection Summary					
Average Delay	3.4				
Intersection Capacity Utilization	27.6%	ICU Level of Service		A	
Analysis Period (min)	15				

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↰	↕	
Traffic Vol, veh/h	67	138	0	1	85	2	0	14	1	0	9	31
Future Vol, veh/h	67	138	0	1	85	2	0	14	1	0	9	31
Conflicting Peds, #/hr	0	0	6	6	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	73	73	73	73	73	73	73	73	73	73	73	73
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	92	189	0	1	116	3	0	19	1	0	12	42

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	119	0	0	195	0	0	526	500	195	503	499	118
Stage 1	-	-	-	-	-	-	379	379	-	120	120	-
Stage 2	-	-	-	-	-	-	147	121	-	383	379	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	1475	-	-	1384	-	-	464	474	849	481	475	937
Stage 1	-	-	-	-	-	-	645	616	-	887	798	-
Stage 2	-	-	-	-	-	-	858	798	-	642	616	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1475	-	-	1376	-	-	408	438	844	439	438	937
Mov Cap-2 Maneuver	-	-	-	-	-	-	408	438	-	439	438	-
Stage 1	-	-	-	-	-	-	597	569	-	825	797	-
Stage 2	-	-	-	-	-	-	806	797	-	576	569	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.5	0.1	13.3	10.2
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	453	1475	-	-	1376	-	-	-	746
HCM Lane V/C Ratio	0.045	0.062	-	-	0.001	-	-	-	0.073
HCM Control Delay (s)	13.3	7.6	0	-	7.6	0	-	0	10.2
HCM Lane LOS	B	A	A	-	A	A	-	A	B
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0	-	-	-	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Right Turn Channelized						
Traffic Volume (veh/h)	8	98	89	5	140	134
Future Volume (veh/h)	8	98	89	5	140	134
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	107	97	5	152	146
Approach Volume (veh/h)	116		102			298
Crossing Volume (veh/h)	97		152			9
High Capacity (veh/h)	1284		1230			1375
High v/c (veh/h)	0.09		0.08			0.22
Low Capacity (veh/h)	1069		1020			1152
Low v/c (veh/h)	0.11		0.10			0.26

Intersection Summary			
Maximum v/c High	0.22		
Maximum v/c Low	0.26		
Intersection Capacity Utilization	34.6%	ICU Level of Service	A

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	4.2
Intersection LOS	A

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	116	102	298
Demand Flow Rate, veh/h	118	104	304
Vehicles Circulating, veh/h	99	155	9
Vehicles Exiting, veh/h	160	158	208
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.7	3.9	4.6
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	118	104	304
Cap Entry Lane, veh/h	1247	1178	1367
Entry HV Adj Factor	0.983	0.981	0.981
Flow Entry, veh/h	116	102	298
Cap Entry, veh/h	1226	1156	1341
V/C Ratio	0.095	0.088	0.222
Control Delay, s/veh	3.7	3.9	4.6
LOS	A	A	A
95th %tile Queue, veh	0	0	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	6	69	78	5	3	6
Future Volume (Veh/h)	6	69	78	5	3	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	8	92	104	7	4	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	111				216	108
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	111				216	108
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	99
cM capacity (veh/h)	1466				764	941

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	100	111	12
Volume Left	8	0	4
Volume Right	0	7	8
cSH	1466	1700	874
Volume to Capacity	0.01	0.07	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.6	0.0	9.2
Lane LOS	A		A
Approach Delay (s)	0.6	0.0	9.2
Approach LOS			A

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	18.6%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	69	78	5	3	6
Future Vol, veh/h	6	69	78	5	3	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	8	92	104	7	4	8

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	111	0	-	0	216	108
Stage 1	-	-	-	-	108	-
Stage 2	-	-	-	-	108	-
Critical Hdwy	4.14	-	-	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	2.236	-	-	-	3.536	3.336
Pot Cap-1 Maneuver	1466	-	-	-	768	940
Stage 1	-	-	-	-	911	-
Stage 2	-	-	-	-	911	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1466	-	-	-	763	940
Mov Cap-2 Maneuver	-	-	-	-	763	-
Stage 1	-	-	-	-	906	-
Stage 2	-	-	-	-	911	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1466	-	-	-	873
HCM Lane V/C Ratio	0.005	-	-	-	0.014
HCM Control Delay (s)	7.5	0	-	-	9.2
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Existing Plus 1293-Unit Project (Phase 1)

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Existing Plus 1293 Unit Project PM (Phase 1)
12: Creston Road & Niblick Road/Sherwood Road — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	196	468	280	93	409	333	180	456	286	597
v/c Ratio	0.70	0.83	0.42	0.47	0.53	0.55	0.66	0.64	0.82	0.69
Control Delay	48.3	43.9	5.7	44.9	31.6	7.5	46.8	33.3	54.2	30.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.3	43.9	5.7	44.9	31.6	7.5	46.8	33.3	54.2	30.9
Queue Length 50th (ft)	99	240	0	47	101	0	91	114	149	143
Queue Length 95th (ft)	#196	#446	59	98	154	68	#166	164	#301	204
Internal Link Dist (ft)		1092			186			1440		2310
Turn Bay Length (ft)	150			170		140	230		245	
Base Capacity (vph)	329	574	674	238	910	649	329	949	375	1035
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.82	0.42	0.39	0.45	0.51	0.55	0.48	0.76	0.58

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Olsen-Chandler SP — Existing Plus 1293 Unit Project PM (Phase 1)
12: Creston Road & Niblick Road/Sherwood Road — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	184	440	263	87	384	313	169	368	61	269	419	142
Future Volume (vph)	184	440	263	87	384	313	169	368	61	269	419	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1881	1572	1787	3574	1578	1787	3498		1787	3417	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	1881	1572	1787	3574	1578	1787	3498		1787	3417	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	196	468	280	93	409	333	180	391	65	286	446	151
RTOR Reduction (vph)	0	0	197	0	0	257	0	15	0	0	38	0
Lane Group Flow (vph)	196	468	83	93	409	77	180	441	0	286	559	0
Confl. Peds. (#/hr)			4			1						10
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	12.8	24.2	24.2	7.3	18.7	18.7	12.3	16.2		15.7	19.6	
Effective Green, g (s)	12.8	24.2	24.2	7.3	18.7	18.7	12.3	16.2		15.7	19.6	
Actuated g/C Ratio	0.16	0.30	0.30	0.09	0.23	0.23	0.15	0.20		0.19	0.24	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	281	559	467	160	821	362	270	696		344	822	
v/s Ratio Prot	c0.11	c0.25		0.05	0.11		0.10	0.13		c0.16	c0.16	
v/s Ratio Perm			0.05			0.05						
v/c Ratio	0.70	0.84	0.18	0.58	0.50	0.21	0.67	0.63		0.83	0.68	
Uniform Delay, d1	32.5	26.8	21.2	35.6	27.3	25.4	32.6	29.9		31.6	28.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.3	10.5	0.2	5.3	0.5	0.3	6.1	1.9		15.6	2.3	
Delay (s)	39.8	37.3	21.4	40.9	27.7	25.7	38.7	31.8		47.2	30.4	
Level of Service	D	D	C	D	C	C	D	C		D	C	
Approach Delay (s)		33.1			28.4			33.7			35.8	
Approach LOS		C			C			C			D	

Intersection Summary				
HCM 2000 Control Delay	32.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	81.4	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	70.0%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Olsen-Chandler SP — Existing Plus 1293 Unit Project PM (Phase 1)

12: Creston Road & Niblick Road/Sherwood Road — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	184	440	263	87	384	313	169	368	61	269	419	142
Future Volume (veh/h)	184	440	263	87	384	313	169	368	61	269	419	142
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	196	468	280	93	409	333	180	391	65	286	446	151
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	241	592	500	121	885	394	224	563	93	333	639	214
Arrive On Green	0.13	0.31	0.31	0.07	0.25	0.25	0.12	0.18	0.18	0.19	0.24	0.24
Sat Flow, veh/h	1795	1885	1592	1795	3582	1596	1795	3077	507	1795	2624	880
Grp Volume(v), veh/h	196	468	280	93	409	333	180	226	230	286	303	294
Grp Sat Flow(s),veh/h/ln	1795	1885	1592	1795	1791	1596	1795	1791	1794	1795	1791	1714
Q Serve(g_s), s	7.6	16.3	10.5	3.7	7.0	14.3	7.0	8.5	8.6	11.1	11.1	11.3
Cycle Q Clear(g_c), s	7.6	16.3	10.5	3.7	7.0	14.3	7.0	8.5	8.6	11.1	11.1	11.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.28	1.00		0.51
Lane Grp Cap(c), veh/h	241	592	500	121	885	394	224	328	328	333	436	417
V/C Ratio(X)	0.81	0.79	0.56	0.77	0.46	0.85	0.80	0.69	0.70	0.86	0.69	0.70
Avail Cap(c_a), veh/h	362	630	531	262	997	444	362	523	524	412	573	548
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.2	22.5	20.5	33.0	23.0	25.8	30.6	27.5	27.5	28.4	24.7	24.8
Incr Delay (d2), s/veh	8.3	6.4	1.2	9.8	0.4	12.8	6.6	2.6	2.7	14.0	2.4	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	7.5	3.7	1.8	2.7	6.3	3.3	3.7	3.7	5.8	4.7	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.5	28.9	21.7	42.8	23.4	38.5	37.2	30.1	30.2	42.4	27.2	27.6
LnGrp LOS	D	C	C	D	C	D	D	C	C	D	C	C
Approach Vol, veh/h		944			835			636			883	
Approach Delay, s/veh		28.8			31.6			32.1			32.2	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.8	17.6	9.3	27.1	13.5	22.0	14.1	22.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.5	21.0	10.5	24.0	14.5	23.0	14.5	20.0
Max Q Clear Time (g_c+I1), s	13.1	10.6	5.7	18.3	9.0	13.3	9.6	16.3
Green Ext Time (p_c), s	0.3	1.9	0.1	1.9	0.2	2.5	0.2	1.4

Intersection Summary	
HCM 6th Ctrl Delay	31.1
HCM 6th LOS	C

Existing Plus 1293-Unit and School Project

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	265	1184	1156	122	138	238
v/c Ratio	0.67	0.37	0.81	0.17	0.56	0.36
Control Delay	46.3	0.3	29.8	3.9	52.5	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.3	0.3	29.8	3.9	52.5	16.2
Queue Length 50th (ft)	151	0	330	0	83	68
Queue Length 95th (ft)	261	0	400	22	152	132
Internal Link Dist (ft)		942	856		514	
Turn Bay Length (ft)	345			330	450	
Base Capacity (vph)	503	3223	2824	1278	503	981
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.37	0.41	0.10	0.27	0.24

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	209	935	913	96	109	188
Future Volume (vph)	209	935	913	96	109	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0	7.3	7.3	4.2	3.7
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1612	3223	3223	1442	1612	1442
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1612	3223	3223	1442	1612	1442
Peak-hour factor, PHF	0.79	0.79	0.79	0.79	0.79	0.79
Adj. Flow (vph)	265	1184	1156	122	138	238
RTOR Reduction (vph)	0	0	0	67	0	36
Lane Group Flow (vph)	265	1184	1156	55	138	202
Heavy Vehicles (%)	12%	12%	12%	12%	12%	12%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	8	Free!	6		7!	4
Permitted Phases				6		4
Actuated Green, G (s)	24.9	99.9	44.7	44.7	15.3	44.2
Effective Green, g (s)	24.9	99.9	44.7	44.7	15.3	44.2
Actuated g/C Ratio	0.25	1.00	0.45	0.45	0.15	0.44
Clearance Time (s)	3.5		7.3	7.3	4.2	3.7
Vehicle Extension (s)	3.0		4.0	4.0	3.5	3.0
Lane Grp Cap (vph)	401	3223	1442	645	246	638
v/s Ratio Prot	c0.16	0.37	c0.36		c0.09	0.14
v/s Ratio Perm				0.04		
v/c Ratio	0.66	0.37	0.80	0.08	0.56	0.32
Uniform Delay, d1	33.7	0.0	23.8	15.9	39.2	18.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.1	0.3	3.5	0.1	3.2	0.3
Delay (s)	37.8	0.3	27.3	15.9	42.4	18.4
Level of Service	D	A	C	B	D	B
Approach Delay (s)		7.2	26.2		27.2	
Approach LOS		A	C		C	

Intersection Summary				
HCM 2000 Control Delay	17.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	99.9	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	56.4%	ICU Level of Service	B	
Analysis Period (min)	15			

! Phase conflict between lane groups.
c Critical Lane Group

HCM 6th Edition methodology cannot be performed with phasing conflicts.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	234	771	324	39	841	180	318	320	98	188	163
v/c Ratio	0.56	0.61	0.42	0.11	0.79	0.30	0.62	0.40	0.35	0.64	0.42
Control Delay	51.0	31.6	5.1	45.2	38.9	5.6	49.1	35.5	53.4	53.3	10.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.0	31.6	5.1	45.2	38.9	5.6	49.1	35.5	53.4	53.3	10.2
Queue Length 50th (ft)	76	242	0	11	266	0	102	92	32	118	0
Queue Length 95th (ft)	130	333	43	29	362	38	170	149	65	207	46
Internal Link Dist (ft)		1323			2509			853		451	
Turn Bay Length (ft)	225		485	125		390	160		140		
Base Capacity (vph)	562	2256	1108	571	2256	1064	625	1310	625	695	688
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.34	0.29	0.07	0.37	0.17	0.51	0.24	0.16	0.27	0.24

Intersection Summary

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
2: Golden Hill Road & SR 46 E

Existing Plus 1293 Unit Project and School AM
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	194	640	269	32	698	149	264	249	17	81	156	135
Future Volume (vph)	194	640	269	32	698	149	264	249	17	81	156	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3155	3252	1455	3155	3252	1455	3155	3219		3155	1712	1455
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3155	3252	1455	3155	3252	1455	3155	3219		3155	1712	1455
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	234	771	324	39	841	180	318	300	20	98	188	163
RTOR Reduction (vph)	0	0	199	0	0	118	0	3	0	0	0	135
Lane Group Flow (vph)	234	771	125	39	841	62	318	317	0	98	188	28
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	13.8	40.8	40.8	9.3	36.3	36.3	17.1	25.9		9.2	18.0	18.0
Effective Green, g (s)	13.8	40.8	40.8	9.3	36.3	36.3	17.1	25.9		9.2	18.0	18.0
Actuated g/C Ratio	0.13	0.39	0.39	0.09	0.34	0.34	0.16	0.24		0.09	0.17	0.17
Clearance Time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	411	1254	561	277	1115	499	509	788		274	291	247
v/s Ratio Prot	0.07	c0.24		0.01	c0.26		c0.10	0.10		0.03	c0.11	
v/s Ratio Perm			0.09			0.04						0.02
v/c Ratio	0.57	0.61	0.22	0.14	0.75	0.12	0.62	0.40		0.36	0.65	0.11
Uniform Delay, d1	43.2	26.2	21.8	44.6	30.8	23.8	41.4	33.5		45.5	40.9	37.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.8	0.9	0.2	0.1	2.9	0.1	2.4	0.3		0.8	4.9	0.2
Delay (s)	45.0	27.1	22.0	44.6	33.7	24.0	43.7	33.8		46.3	45.8	37.3
Level of Service	D	C	C	D	C	C	D	C		D	D	D
Approach Delay (s)		29.0			32.5			38.8			42.8	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	33.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	105.8	Sum of lost time (s)	20.6	
Intersection Capacity Utilization	57.7%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Olsen-Chandler SP
2: Golden Hill Road & SR 46 E

Existing Plus 1293 Unit Project and School AM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	194	640	269	32	698	149	264	249	17	81	156	135
Future Volume (veh/h)	194	640	269	32	698	149	264	249	17	81	156	135
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1737	1737	1737	1737	1737	1737	1737	1737	1737	1737	1737	1737
Adj Flow Rate, veh/h	234	771	324	39	841	180	318	300	20	98	188	163
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	331	1062	474	250	1122	500	425	733	49	166	265	225
Arrive On Green	0.10	0.32	0.32	0.08	0.34	0.34	0.13	0.23	0.23	0.05	0.15	0.15
Sat Flow, veh/h	3209	3300	1472	3209	3300	1472	3209	3138	208	3209	1737	1472
Grp Volume(v), veh/h	234	771	324	39	841	180	318	157	163	98	188	163
Grp Sat Flow(s),veh/h/ln	1605	1650	1472	1605	1650	1472	1605	1650	1696	1605	1737	1472
Q Serve(g_s), s	5.3	15.7	8.5	0.9	17.1	7.0	7.2	6.1	6.2	2.3	7.8	8.0
Cycle Q Clear(g_c), s	5.3	15.7	8.5	0.9	17.1	7.0	7.2	6.1	6.2	2.3	7.8	8.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.12	1.00		1.00
Lane Grp Cap(c), veh/h	331	1062	474	250	1122	500	425	385	396	166	265	225
V/C Ratio(X)	0.71	0.73	0.68	0.16	0.75	0.36	0.75	0.41	0.41	0.59	0.71	0.73
Avail Cap(c_a), veh/h	762	3048	1360	762	3048	1360	847	893	918	847	940	796
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.9	22.7	7.6	32.6	22.2	18.8	31.7	24.6	24.6	35.2	30.5	30.6
Incr Delay (d2), s/veh	2.8	1.0	1.8	0.1	1.0	0.4	2.7	0.7	0.7	3.3	3.5	4.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	5.3	4.2	0.3	5.8	2.2	2.8	2.3	2.4	0.9	3.3	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.7	23.7	9.4	32.7	23.2	19.2	34.3	25.3	25.3	38.5	34.0	35.0
LnGrp LOS	D	C	A	C	C	B	C	C	C	D	C	D
Approach Vol, veh/h		1329			1060			638			449	
Approach Delay, s/veh		22.3			22.9			29.8			35.3	
Approach LOS		C			C			C			D	

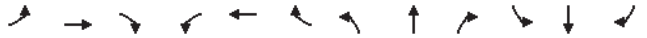
Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.2	31.7	14.0	16.9	11.8	33.1	7.9	23.0
Change Period (Y+Rc), s	7.3	* 7.3	4.0	5.3	4.0	7.3	4.0	5.3
Max Green Setting (Gmax), s	18.0	* 70	20.0	41.0	18.0	70.0	20.0	41.0
Max Q Clear Time (g_c+I1), s	2.9	17.7	9.2	10.0	7.3	19.1	4.3	8.2
Green Ext Time (p_c), s	0.0	6.7	0.8	1.6	0.5	6.7	0.2	1.8

Intersection Summary	
HCM 6th Ctrl Delay	25.5
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Reso A - Exhibit C2 (EIR Technical Appendix)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	705	27	259	891	0	5	0	238	0	0	0
Future Volume (Veh/h)	1	705	27	259	891	0	5	0	238	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	1	860	33	316	1087	0	6	0	290	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									1			1
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1087			893			2054	2598	446	2151	2614	544
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1087			893			2054	2598	446	2151	2614	544
tC, single (s)	4.3			4.3			7.7	6.7	7.1	7.7	6.7	7.1
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			55			68	100	46	100	100	100
cM capacity (veh/h)	587			701			19	12	535	7	11	461

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	1	573	320	316	725	362	296	0
Volume Left	1	0	0	316	0	0	6	0
Volume Right	0	0	33	0	0	0	290	0
cSH	587	1700	1700	701	1700	1700	546	1700
Volume to Capacity	0.00	0.34	0.19	0.45	0.43	0.21	0.54	0.00
Queue Length 95th (ft)	0	0	0	59	0	0	80	0
Control Delay (s)	11.1	0.0	0.0	14.3	0.0	0.0	24.5	0.0
Lane LOS	B			B			C	A
Approach Delay (s)	0.0			3.2			24.5	0.0
Approach LOS							C	A

Intersection Summary					
Average Delay	4.5				
Intersection Capacity Utilization	48.0%	ICU Level of Service		A	
Analysis Period (min)	15				

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	705	27	259	891	0	5	0	238	0	0	0
Future Vol, veh/h	1	705	27	259	891	0	5	0	238	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	340	-	-	195	-	-	-	-	25	-	-	25
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	11	11	11	11	11	11	11	11	11	11	11	11
Mvmt Flow	1	860	33	316	1087	0	6	0	290	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1087	0	0	893	0	0	2055	2598	447	2151	2614	544
Stage 1	-	-	-	-	-	-	879	879	-	1719	1719	-
Stage 2	-	-	-	-	-	-	1176	1719	-	432	895	-
Critical Hdwy	4.32	-	-	4.32	-	-	7.72	6.72	7.12	7.72	6.72	7.12
Critical Hdwy Stg 1	-	-	-	-	-	-	6.72	5.72	-	6.72	5.72	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.72	5.72	-	6.72	5.72	-
Follow-up Hdwy	2.31	-	-	2.31	-	-	3.61	4.11	3.41	3.61	4.11	3.41
Pot Cap-1 Maneuver	587	-	-	701	-	-	29	21	535	24	21	461
Stage 1	-	-	-	-	-	-	291	343	-	85	130	-
Stage 2	-	-	-	-	-	-	189	130	-	549	337	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	587	-	-	701	-	-	19	12	535	7	12	461
Mov Cap-2 Maneuver	-	-	-	-	-	-	19	12	-	7	12	-
Stage 1	-	-	-	-	-	-	290	342	-	85	71	-
Stage 2	-	-	-	-	-	-	104	71	-	251	336	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3.2	24.5	0
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	19	535	587	-	-	701	-	-	-	-
HCM Lane V/C Ratio	0.321	0.543	0.002	-	-	0.451	-	-	-	-
HCM Control Delay (s)	266.9	19.4	11.1	-	-	14.3	-	-	0	0
HCM Lane LOS	F	C	B	-	-	B	-	-	A	A
HCM 95th %tile Q(veh)	0.9	3.2	0	-	-	2.3	-	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	337	599	943	17	5	174
Future Volume (Veh/h)	337	599	943	17	5	174
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	401	713	1123	20	6	207
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1143				2282	562
vC1, stage 1 conf vol					1123	
vC2, stage 2 conf vol					1158	
vCu, unblocked vol	1143				2282	562
tC, single (s)	4.3				7.0	7.1
tC, 2 stage (s)					6.0	
tF (s)	2.3				3.6	3.4
p0 queue free %	29				91	54
cM capacity (veh/h)	563				66	451

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	401	356	356	562	562	20	213
Volume Left	401	0	0	0	0	0	6
Volume Right	0	0	0	0	0	20	207
cSH	563	1700	1700	1700	1700	1700	464
Volume to Capacity	0.71	0.21	0.21	0.33	0.33	0.01	0.46
Queue Length 95th (ft)	144	0	0	0	0	0	59
Control Delay (s)	25.6	0.0	0.0	0.0	0.0	0.0	20.9
Lane LOS	D						C
Approach Delay (s)	9.2			0.0			20.9
Approach LOS							C

Intersection Summary			
Average Delay		6.0	
Intersection Capacity Utilization		58.1%	ICU Level of Service B
Analysis Period (min)		15	

Intersection	
Int Delay, s/veh	5.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	337	599	943	17	5	174
Future Vol, veh/h	337	599	943	17	5	174
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	580	-	-	165	0	25
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	401	713	1123	20	6	207

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1143	0	-	0	2282	562
Stage 1	-	-	-	-	1123	-
Stage 2	-	-	-	-	1159	-
Critical Hdwy	4.3	-	-	-	7	7.1
Critical Hdwy Stg 1	-	-	-	-	6	-
Critical Hdwy Stg 2	-	-	-	-	6	-
Follow-up Hdwy	2.3	-	-	-	3.6	3.4
Pot Cap-1 Maneuver	563	-	-	-	30	450
Stage 1	-	-	-	-	256	-
Stage 2	-	-	-	-	245	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	563	-	-	-	9	450
Mov Cap-2 Maneuver	-	-	-	-	67	-
Stage 1	-	-	-	-	74	-
Stage 2	-	-	-	-	245	-

Approach	EB	WB	SB
HCM Control Delay, s	9.2	0	20.8
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	563	-	-	-	67	450
HCM Lane V/C Ratio	0.713	-	-	-	0.089	0.46
HCM Control Delay (s)	25.7	-	-	-	63.9	19.6
HCM Lane LOS	D	-	-	-	F	C
HCM 95th %tile Q(veh)	5.8	-	-	-	0.3	2.4

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	553	18	2	1012	0	8	0	1	0	0	0
Future Volume (Veh/h)	0	553	18	2	1012	0	8	0	1	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	0	636	21	2	1163	0	9	0	1	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									1			
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1163			657			1222	1803	318	1486	1824	582
vC1, stage 1 conf vol							636	636		1167	1167	
vC2, stage 2 conf vol							586	1167		318	657	
vCu, unblocked vol	1163			657			1222	1803	318	1486	1824	582
tC, single (s)	4.4			4.4			7.8	6.8	7.2	7.8	6.8	7.2
tC, 2 stage (s)							6.8	5.8		6.8	5.8	
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			100			97	100	100	100	100	100
cM capacity (veh/h)	538			856			314	216	646	180	215	430

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	318	318	21	2	775	388	10	0
Volume Left	0	0	0	0	2	0	0	9	0
Volume Right	0	0	0	21	0	0	0	1	0
cSH	1700	1700	1700	1700	856	1700	1700	349	1700
Volume to Capacity	0.00	0.19	0.19	0.01	0.00	0.46	0.23	0.03	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	0	2	0
Control Delay (s)	0.0	0.0	0.0	0.0	9.2	0.0	0.0	16.2	0.0
Lane LOS					A			C	A
Approach Delay (s)	0.0				0.0			16.2	0.0
Approach LOS								C	A

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	38.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	553	18	2	1012	0	8	0	1	0	0	0
Future Vol, veh/h	0	553	18	2	1012	0	8	0	1	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	275	305	-	-	-	-	25	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	13	13	13	13	13	13	13	13	13	13	13	13
Mvmt Flow	0	636	21	2	1163	0	9	0	1	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1163	0	0	657	0	0	1222	1803	318	1485	1824	582
Stage 1	-	-	-	-	-	-	636	636	-	1167	1167	-
Stage 2	-	-	-	-	-	-	586	1167	-	318	657	-
Critical Hdwy	4.36	-	-	4.36	-	-	7.76	6.76	7.16	7.76	6.76	7.16
Critical Hdwy Stg 1	-	-	-	-	-	-	6.76	5.76	-	6.76	5.76	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.76	5.76	-	6.76	5.76	-
Follow-up Hdwy	2.33	-	-	2.33	-	-	3.63	4.13	3.43	3.63	4.13	3.43
Pot Cap-1 Maneuver	538	-	-	856	-	-	124	70	646	78	68	430
Stage 1	-	-	-	-	-	-	407	444	-	189	244	-
Stage 2	-	-	-	-	-	-	437	244	-	638	434	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	538	-	-	856	-	-	124	70	646	78	68	430
Mov Cap-2 Maneuver	-	-	-	-	-	-	305	210	-	176	209	-
Stage 1	-	-	-	-	-	-	407	444	-	189	244	-
Stage 2	-	-	-	-	-	-	436	244	-	637	434	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	16.5	0
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	305	646	538	-	-	856	-	-	-
HCM Lane V/C Ratio	0.03	0.002	-	-	-	0.003	-	-	-
HCM Control Delay (s)	17.2	10.6	0	-	-	9.2	-	-	0
HCM Lane LOS	C	B	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0	0	-	-	0	-	-	-

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.
Channelized right turn lanes are not counted.

Intersection	
Intersection Delay, s/veh	90.7
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	87	113	92	258	96	66	40	378	206	39	305	50
Future Vol, veh/h	87	113	92	258	96	66	40	378	206	39	305	50
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	107	140	114	319	119	81	49	467	254	48	377	62
Number of Lanes	1	1	0	1	1	0	1	1	1	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	3	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	2	2	2
HCM Control Delay	42.3	71.8	155.1	44.8
HCM LOS	E	F	F	E

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	100%	0%	20%	0%
Vol Thru, %	0%	100%	0%	0%	55%	0%	59%	80%	75%
Vol Right, %	0%	0%	100%	0%	45%	0%	41%	0%	25%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	40	378	206	87	205	258	162	192	203
LT Vol	40	0	0	87	0	258	0	39	0
Through Vol	0	378	0	0	113	0	96	153	153
RT Vol	0	0	206	0	92	0	66	0	50
Lane Flow Rate	49	467	254	107	253	319	200	236	250
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.157	1.418	0.721	0.364	0.802	1.029	0.603	0.747	0.771
Departure Headway (Hd)	11.769	11.243	10.507	13.112	12.254	12.429	11.605	12.279	11.987
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	307	327	346	276	299	293	314	298	305
Service Time	9.469	8.943	8.207	10.812	9.954	10.129	9.305	9.979	9.687
HCM Lane V/C Ratio	0.16	1.428	0.734	0.388	0.846	1.089	0.637	0.792	0.82
HCM Control Delay	16.6	234.6	36.2	23.1	50.4	97.8	30.5	43.9	45.7
HCM Lane LOS	C	F	E	C	F	F	D	E	E
HCM 95th-tile Q	0.5	23.9	5.4	1.6	6.4	11.1	3.7	5.5	6

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	13	5	3	67	0	13	1	2	0	0	2
Future Volume (Veh/h)	1	13	5	3	67	0	13	1	2	0	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Hourly flow rate (vph)	1	19	7	4	96	0	19	1	3	0	0	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	96			26			132	128	22	132	132	96
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	96			26			132	128	22	132	132	96
tC, single (s)	4.2			4.2			7.2	6.6	6.3	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			100			98	100	100	100	100	100
cM capacity (veh/h)	1461			1550			822	749	1037	821	745	944

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	27	100	23	3
Volume Left	1	4	19	0
Volume Right	7	0	3	3
cSH	1461	1550	841	944
Volume to Capacity	0.00	0.00	0.03	0.00
Queue Length 95th (ft)	0	0	2	0
Control Delay (s)	0.3	0.3	9.4	8.8
Lane LOS	A	A	A	A
Approach Delay (s)	0.3	0.3	9.4	8.8
Approach LOS			A	A

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	18.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	13	5	3	67	0	13	1	2	0	0	2
Future Vol, veh/h	1	13	5	3	67	0	13	1	2	0	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	70	70	70	70	70	70	70	70	70	70	70	70
Heavy Vehicles, %	8	8	8	8	8	8	8	8	8	8	8	8
Mvmt Flow	1	19	7	4	96	0	19	1	3	0	0	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	96	0	0	26	0	0	131	129	23	131	132	96
Stage 1	-	-	-	-	-	-	25	25	-	104	104	-
Stage 2	-	-	-	-	-	-	106	104	-	27	28	-
Critical Hdwy	4.18	-	-	4.18	-	-	7.18	6.58	6.28	7.18	6.58	6.28
Critical Hdwy Stg 1	-	-	-	-	-	-	6.18	5.58	-	6.18	5.58	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.18	5.58	-	6.18	5.58	-
Follow-up Hdwy	2.272	-	-	2.272	-	-	3.572	4.072	3.372	3.572	4.072	3.372
Pot Cap-1 Maneuver	1461	-	-	1550	-	-	828	751	1037	828	748	944
Stage 1	-	-	-	-	-	-	978	863	-	887	798	-
Stage 2	-	-	-	-	-	-	885	798	-	975	860	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1461	-	-	1550	-	-	823	748	1037	822	745	944
Mov Cap-2 Maneuver	-	-	-	-	-	-	823	748	-	822	745	-
Stage 1	-	-	-	-	-	-	977	862	-	886	796	-
Stage 2	-	-	-	-	-	-	880	796	-	970	859	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.3	9.4	8.8
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	839	1461	-	-	1550	-	-	944
HCM Lane V/C Ratio	0.027	0.001	-	-	0.003	-	-	0.003
HCM Control Delay (s)	9.4	7.5	0	-	7.3	0	-	8.8
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1	354	373	440	691	7	22	151	307	306	35
v/c Ratio	0.01	0.60	0.77	0.49	0.62	0.05	0.14	0.56	0.73	0.71	0.07
Control Delay	50.0	39.8	42.8	19.3	4.2	44.7	45.7	16.5	43.5	42.4	0.3
Queue Delay	0.0	0.0	0.2	0.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.0	39.8	43.0	19.9	4.6	44.7	45.7	16.5	43.5	42.4	0.3
Queue Length 50th (ft)	1	96	190	153	0	4	12	0	164	162	0
Queue Length 95th (ft)	6	157	333	307	45	18	37	51	302	300	0
Internal Link Dist (ft)		346		307			744			674	
Turn Bay Length (ft)	65		125			140		165	150		185
Base Capacity (vph)	103	940	672	1107	1217	372	392	447	560	570	600
Starvation Cap Reductn	0	0	39	326	161	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.38	0.59	0.56	0.65	0.02	0.06	0.34	0.55	0.54	0.06

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	273	28	317	374	587	6	19	128	434	87	30
Future Volume (vph)	1	273	28	317	374	587	6	19	128	434	87	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (prot)	1752	3444		1752	1845	1568	1752	1845	1544	1665	1696	1521
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (perm)	1752	3444		1752	1845	1568	1752	1845	1544	1665	1696	1521
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	1	321	33	373	440	691	7	22	151	511	102	35
RTOR Reduction (vph)	0	6	0	0	0	368	0	0	139	0	0	26
Lane Group Flow (vph)	1	348	0	373	440	323	7	22	12	307	306	9
Confl. Peds. (#/hr)			8						1			5
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	0.8	19.2		24.6	43.0	43.0	7.6	7.6	7.6	22.5	22.5	22.5
Effective Green, g (s)	0.8	19.2		24.6	43.0	43.0	7.6	7.6	7.6	22.5	22.5	22.5
Actuated g/C Ratio	0.01	0.21		0.27	0.47	0.47	0.08	0.08	0.08	0.24	0.24	0.24
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	15	719		468	863	733	144	152	127	407	415	372
v/s Ratio Prot	0.00	0.10		c0.21	c0.24		0.00	c0.01		c0.18	0.18	
v/s Ratio Perm						0.21			0.01			0.01
v/c Ratio	0.07	0.48		0.80	0.51	0.44	0.05	0.14	0.10	0.75	0.74	0.02
Uniform Delay, d1	45.2	32.0		31.3	17.1	16.4	38.8	39.1	39.0	32.1	32.0	26.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	0.5		9.1	0.5	0.4	0.1	0.4	0.3	7.7	6.7	0.0
Delay (s)	47.1	32.5		40.5	17.6	16.8	39.0	39.6	39.3	39.9	38.7	26.4
Level of Service	D	C		D	B	B	D	D	D	D	D	C
Approach Delay (s)		32.5			22.9			39.3			38.6	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	29.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	91.9	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	60.6%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
8: Riverside Ave & 13th Street

Existing Plus 1293 Unit Project and School AM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	273	28	317	374	587	6	19	128	434	87	30
Future Volume (veh/h)	1	273	28	317	374	587	6	19	128	434	87	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	1	321	33	373	440	691	7	22	151	584	0	35
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	2	788	80	418	890	754	209	219	185	718	0	315
Arrive On Green	0.00	0.24	0.24	0.24	0.48	0.48	0.12	0.12	0.12	0.20	0.00	0.20
Sat Flow, veh/h	1767	3224	329	1767	1856	1572	1767	1856	1568	3534	0	1553
Grp Volume(v), veh/h	1	174	180	373	440	691	7	22	151	584	0	35
Grp Sat Flow(s),veh/h/ln	1767	1763	1790	1767	1856	1572	1767	1856	1568	1767	0	1553
Q Serve(g_s), s	0.1	7.5	7.7	18.6	14.7	37.1	0.3	1.0	8.5	14.4	0.0	1.7
Cycle Q Clear(g_c), s	0.1	7.5	7.7	18.6	14.7	37.1	0.3	1.0	8.5	14.4	0.0	1.7
Prop In Lane	1.00		0.18	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	2	431	437	418	890	754	209	219	185	718	0	315
V/C Ratio(X)	0.41	0.40	0.41	0.89	0.49	0.92	0.03	0.10	0.81	0.81	0.00	0.11
Avail Cap(c_a), veh/h	97	446	453	631	1030	873	350	367	310	1107	0	487
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	45.4	28.8	28.9	33.6	16.2	22.0	35.5	35.8	39.1	34.6	0.0	29.6
Incr Delay (d2), s/veh	85.2	0.6	0.6	10.5	0.4	13.1	0.1	0.2	8.4	2.7	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	3.3	3.4	9.0	6.0	15.4	0.1	0.4	3.6	6.2	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	130.6	29.4	29.5	44.1	16.6	35.1	35.6	36.0	47.5	37.3	0.0	29.7
LnGrp LOS	F	C	C	D	B	D	D	D	D	D	A	C
Approach Vol, veh/h		355			1504			180			619	
Approach Delay, s/veh		29.8			31.9			45.6			36.9	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	26.0	26.7		23.0	4.6	48.1		15.3				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	32.5	23.0		28.5	5.0	50.5		18.0				
Max Q Clear Time (g_c+I1), s	20.6	9.7		16.4	2.1	39.1		10.5				
Green Ext Time (p_c), s	0.9	1.8		1.9	0.0	4.5		0.3				

Intersection Summary												
HCM 6th Ctrl Delay			33.7									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

Olsen-Chandler SP
9: Paso Robles Street & 13th Street

Existing Plus 1293 Unit Project and School AM
Queues

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	76	954	56	1319	415	251	14	273	6	9
v/c Ratio	0.41	0.53	0.33	0.74	0.46	0.71	0.03	0.47	0.02	0.02
Control Delay	49.3	16.3	48.5	21.3	7.4	44.3	27.4	8.1	27.2	0.0
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.3	16.7	48.5	21.3	7.4	44.3	27.4	8.1	27.2	0.0
Queue Length 50th (ft)	45	186	33	311	46	143	7	10	3	0
Queue Length 95th (ft)	85	243	67	384	94	200	19	48	12	0
Internal Link Dist (ft)		307		269			836			575
Turn Bay Length (ft)	120		220		145	130		110	95	
Base Capacity (vph)	239	2196	216	2188	1054	554	737	777	551	743
Starvation Cap Reductn	0	650	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.62	0.26	0.60	0.39	0.45	0.02	0.35	0.01	0.01

Intersection Summary

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Existing Plus 1293 Unit Project and School AM
9: Paso Robles Street & 13th Street — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	61	717	46	45	1055	332	201	11	218	5	0	7
Future Volume (vph)	61	717	46	45	1055	332	201	11	218	5	0	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1752	3466		1752	3505	1530	1752	1845	1568	1752	1568	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.75	1.00	1.00	0.75	1.00	
Satd. Flow (perm)	1752	3466		1752	3505	1530	1387	1845	1568	1380	1568	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	76	896	58	56	1319	415	251	14	272	6	0	9
RTOR Reduction (vph)	0	4	0	0	0	131	0	0	187	0	7	0
Lane Group Flow (vph)	76	950	0	56	1319	284	251	14	86	6	2	0
Confl. Peds. (#/hr)			6			1						
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		
Actuated Green, G (s)	6.8	44.4		6.1	43.7	43.7	21.7	21.7	21.7	21.7	21.7	
Effective Green, g (s)	6.8	44.4		6.1	43.7	43.7	21.7	21.7	21.7	21.7	21.7	
Actuated g/C Ratio	0.08	0.52		0.07	0.51	0.51	0.25	0.25	0.25	0.25	0.25	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	139	1795		124	1787	780	351	467	397	349	397	
v/s Ratio Prot	c0.04	0.27		0.03	c0.38			0.01			0.00	
v/s Ratio Perm						0.19	c0.18		0.05	0.00		
v/c Ratio	0.55	0.53		0.45	0.74	0.36	0.72	0.03	0.22	0.02	0.01	
Uniform Delay, d1	38.0	13.7		38.2	16.5	12.6	29.2	24.1	25.3	24.0	23.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.3	0.3		2.6	1.6	0.3	6.8	0.0	0.3	0.0	0.0	
Delay (s)	42.3	14.0		40.8	18.1	12.9	36.0	24.1	25.6	24.0	23.9	
Level of Service	D	B		D	B	B	D	C	C	C	C	
Approach Delay (s)		16.1			17.6			30.4			24.0	
Approach LOS		B			B			C			C	

Intersection Summary				
HCM 2000 Control Delay	19.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	85.7	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	62.4%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Olsen-Chandler SP — Existing Plus 1293 Unit Project and School AM
9: Paso Robles Street & 13th Street — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	717	46	45	1055	332	201	11	218	5	0	7
Future Volume (veh/h)	61	717	46	45	1055	332	201	11	218	5	0	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	76	896	58	56	1319	0	251	14	272	6	0	9
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	101	1738	112	86	1794		423	426	361	352	0	361
Arrive On Green	0.06	0.52	0.52	0.05	0.51	0.00	0.23	0.23	0.23	0.23	0.00	0.23
Sat Flow, veh/h	1767	3360	218	1767	3526	1572	1395	1856	1572	1085	0	1572
Grp Volume(v), veh/h	76	470	484	56	1319	0	251	14	272	6	0	9
Grp Sat Flow(s),veh/h/ln	1767	1763	1815	1767	1763	1572	1395	1856	1572	1085	0	1572
Q Serve(g_s), s	2.8	11.6	11.6	2.1	19.4	0.0	11.2	0.4	10.6	0.3	0.0	0.3
Cycle Q Clear(g_c), s	2.8	11.6	11.6	2.1	19.4	0.0	11.5	0.4	10.6	0.7	0.0	0.3
Prop In Lane	1.00		0.12	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	101	912	939	86	1794		423	426	361	352	0	361
V/C Ratio(X)	0.75	0.52	0.52	0.65	0.74		0.59	0.03	0.75	0.02	0.00	0.02
Avail Cap(c_a), veh/h	281	1371	1412	255	2689		752	864	732	608	0	732
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.6	10.5	10.5	30.8	12.7	0.0	24.1	19.7	23.7	20.0	0.0	19.7
Incr Delay (d2), s/veh	10.8	0.5	0.4	8.0	0.6	0.0	1.3	0.0	3.2	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	3.9	4.1	1.0	6.6	0.0	3.6	0.2	3.9	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.5	10.9	10.9	38.9	13.3	0.0	25.5	19.8	26.9	20.0	0.0	19.7
LnGrp LOS	D	B	B	D	B		C	B	C	C	A	B
Approach Vol, veh/h		1030			1375	A		537			15	
Approach Delay, s/veh		13.2			14.4			26.0			19.8	
Approach LOS		B			B			C			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.7	38.6		19.6	8.3	38.1		19.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	9.5	51.3		30.7	10.5	50.3		30.7				
Max Q Clear Time (g_c+I1), s	4.1	13.6		2.7	4.8	21.4		13.5				
Green Ext Time (p_c), s	0.0	7.5		0.0	0.1	12.2		1.6				

Intersection Summary				
HCM 6th Ctrl Delay	16.1			
HCM 6th LOS	B			

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	224	947	70	1033	456	211	56	153	637
v/c Ratio	0.61	0.68	0.47	0.84	0.77	0.25	0.13	0.65	0.91dr
Control Delay	56.0	28.2	62.0	39.4	53.8	36.0	2.4	59.6	39.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.0	28.2	62.0	39.4	53.8	36.0	2.4	59.6	39.1
Queue Length 50th (ft)	83	282	51	362	168	66	0	110	173
Queue Length 95th (ft)	113	308	89	386	204	93	2	159	203
Internal Link Dist (ft)		353		673		608			523
Turn Bay Length (ft)	295		235		140		130	225	
Base Capacity (vph)	412	1513	178	1461	677	945	492	314	923
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.63	0.39	0.71	0.67	0.22	0.11	0.49	0.69

Intersection Summary

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	179	491	266	56	731	95	365	169	45	122	173	337
Future Volume (vph)	179	491	266	56	731	95	365	169	45	122	173	337
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.98		1.00	1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	3334		1770	3473		3433	3539	1583	1770	3188	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	3334		1770	3473		3433	3539	1583	1770	3188	
Peak-hour factor, PHF	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Adj. Flow (vph)	224	614	332	70	914	119	456	211	56	152	216	421
RTOR Reduction (vph)	0	59	0	0	8	0	0	0	43	0	150	0
Lane Group Flow (vph)	224	888	0	70	1025	0	456	211	13	153	487	0
Confl. Peds. (#/hr)			3									
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	11.4	42.8		7.3	38.7		18.4	25.2	25.2	14.3	21.1	
Effective Green, g (s)	11.4	42.8		7.3	38.7		18.4	25.2	25.2	14.3	21.1	
Actuated g/C Ratio	0.11	0.40		0.07	0.36		0.17	0.23	0.23	0.13	0.20	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	363	1326		120	1249		587	828	370	235	625	
v/s Ratio Prot	c0.07	c0.27		0.04	c0.30		c0.13	c0.06		0.09	c0.15	
v/s Ratio Perm									0.01			
v/c Ratio	0.62	0.67		0.58	0.82		0.78	0.25	0.04	0.65	0.91dr	
Uniform Delay, d1	46.0	26.6		48.7	31.3		42.6	33.6	31.8	44.3	41.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.1	1.3		7.0	4.4		6.4	0.2	0.0	6.3	6.1	
Delay (s)	49.1	27.9		55.7	35.7		49.0	33.7	31.9	50.6	47.1	
Level of Service	D	C		E	D		D	C	C	D	D	
Approach Delay (s)		32.0			37.0			43.2			47.8	
Approach LOS		C			D			D			D	

Intersection Summary				
HCM 2000 Control Delay	38.9	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	107.6	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	69.4%	ICU Level of Service	C	
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Existing Plus 1293 Unit Project and School AM
10: River Road/Union Road & Creston Road — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	179	491	266	56	731	95	365	169	45	122	173	337
Future Volume (veh/h)	179	491	266	56	731	95	365	169	45	122	173	337
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	224	614	0	70	914	119	456	211	56	152	216	0
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	328	1503		94	1201	156	589	579	258	194	360	
Arrive On Green	0.09	0.42	0.00	0.05	0.38	0.38	0.17	0.16	0.16	0.11	0.10	0.00
Sat Flow, veh/h	3456	3647	0	1781	3156	411	3456	3554	1585	1781	3647	0
Grp Volume(v), veh/h	224	614	0	70	515	518	456	211	56	152	216	0
Grp Sat Flow(s),veh/h/ln	1728	1777	0	1781	1777	1790	1728	1777	1585	1781	1777	0
Q Serve(g_s), s	4.5	8.6	0.0	2.8	18.0	18.0	9.0	3.8	2.2	5.9	4.1	0.0
Cycle Q Clear(g_c), s	4.5	8.6	0.0	2.8	18.0	18.0	9.0	3.8	2.2	5.9	4.1	0.0
Prop In Lane	1.00		0.00	1.00		0.23	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	328	1503		94	676	681	589	579	258	194	360	
V/C Ratio(X)	0.68	0.41		0.75	0.76	0.76	0.77	0.36	0.22	0.78	0.60	
Avail Cap(c_a), veh/h	606	2269		262	1085	1093	994	1371	612	462	1272	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	31.2	14.3	0.0	33.3	19.2	19.2	28.2	26.5	25.9	30.9	30.6	0.0
Incr Delay (d2), s/veh	2.5	0.2	0.0	11.2	1.8	1.8	2.2	0.4	0.4	6.7	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	3.2	0.0	1.4	7.0	7.0	3.6	1.5	0.8	2.7	1.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.7	14.5	0.0	44.4	21.0	21.0	30.4	26.9	26.3	37.6	32.2	0.0
LnGrp LOS	C	B		D	C	C	C	C	C	D	C	
Approach Vol, veh/h		838	A		1103			723			368	A
Approach Delay, s/veh		19.7			22.5			29.1			34.5	
Approach LOS		B			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.2	34.6	16.7	11.7	11.3	31.6	12.3	16.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	45.5	20.5	25.5	12.5	43.5	18.5	27.5
Max Q Clear Time (g_c+I1), s	4.8	10.6	11.0	6.1	6.5	20.0	7.9	5.8
Green Ext Time (p_c), s	0.1	4.7	1.2	1.1	0.4	7.1	0.3	1.3

Intersection Summary	
HCM 6th Ctrl Delay	24.7
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Olsen-Chandler SP — Existing Plus 1293 Unit Project and School AM
11: Creston Road & Golden Hill Road — Queues

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	75	452	1178	551	105
v/c Ratio	0.38	0.22	0.74	0.68	0.23
Control Delay	46.6	10.1	21.3	36.3	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	46.6	10.1	21.3	36.3	9.0
Queue Length 50th (ft)	35	41	193	129	0
Queue Length 95th (ft)	103	141	#515	267	43
Internal Link Dist (ft)		1151	2310	505	
Turn Bay Length (ft)	125			120	
Base Capacity (vph)	255	2525	1924	1107	581
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.29	0.18	0.61	0.50	0.18

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	65	393	545	480	479	91
Future Volume (vph)	65	393	545	480	479	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.93		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1752	3505	3235		3400	1568
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1752	3505	3235		3400	1568
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	75	452	626	552	551	105
RTOR Reduction (vph)	0	0	114	0	0	81
Lane Group Flow (vph)	75	452	1064	0	551	24
Confl. Peds. (#/hr)				3		
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	NA		Perm	Perm
Protected Phases	5	2	6			
Permitted Phases					4	4
Actuated Green, G (s)	6.9	47.9	36.5		19.2	19.2
Effective Green, g (s)	6.9	47.9	36.5		19.2	19.2
Actuated g/C Ratio	0.08	0.57	0.43		0.23	0.23
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	143	1993	1402		775	357
v/s Ratio Prot	c0.04	0.13	c0.33			
v/s Ratio Perm					c0.16	0.02
v/c Ratio	0.52	0.23	0.76		0.71	0.07
Uniform Delay, d1	37.1	9.0	20.1		29.9	25.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.4	0.1	2.4		3.1	0.1
Delay (s)	40.5	9.0	22.5		33.0	25.6
Level of Service	D	A	C		C	C
Approach Delay (s)		13.5	22.5		31.8	
Approach LOS		B	C		C	

Intersection Summary			
HCM 2000 Control Delay	23.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	84.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	59.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	129	338	143	56	610	454	268	568	277	662
v/c Ratio	0.54	0.58	0.25	0.38	0.73	0.64	0.77	0.70	0.81	0.69
Control Delay	43.5	29.3	5.7	46.3	35.5	7.8	49.6	33.4	53.9	20.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.5	29.3	5.7	46.3	35.5	7.8	49.6	33.4	53.9	20.9
Queue Length 50th (ft)	65	155	0	29	157	0	136	143	144	97
Queue Length 95th (ft)	124	256	41	70	#235	82	#279	204	#304	162
Internal Link Dist (ft)		1092			186			1440		2310
Turn Bay Length (ft)	150			170		140	230		245	
Base Capacity (vph)	309	674	649	158	916	735	378	1046	354	1117
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.50	0.22	0.35	0.67	0.62	0.71	0.54	0.78	0.59

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	304	129	50	549	409	241	470	41	249	289	307
Future Volume (vph)	116	304	129	50	549	409	241	470	41	249	289	307
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.92	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1845	1531	1752	3505	1532	1752	3458		1752	3189	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1845	1531	1752	3505	1532	1752	3458		1752	3189	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	129	338	143	56	610	454	268	522	46	277	321	341
RTOR Reduction (vph)	0	0	99	0	0	342	0	8	0	0	218	0
Lane Group Flow (vph)	129	338	44	56	610	112	268	560	0	277	444	0
Confl. Peds. (#/hr)			9			9			4			12
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	8.8	25.0	25.0	3.7	19.9	19.9	15.7	18.6		15.6	18.5	
Effective Green, g (s)	8.8	25.0	25.0	3.7	19.9	19.9	15.7	18.6		15.6	18.5	
Actuated g/C Ratio	0.11	0.31	0.31	0.05	0.25	0.25	0.19	0.23		0.19	0.23	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	190	570	473	80	862	376	340	795		337	729	
v/s Ratio Prot	c0.07	0.18		0.03	c0.17		0.15	c0.16		c0.16	0.14	
v/s Ratio Perm			0.03			0.07						
v/c Ratio	0.68	0.59	0.09	0.70	0.71	0.30	0.79	0.70		0.82	0.61	
Uniform Delay, d1	34.7	23.6	19.9	38.1	27.8	24.8	31.0	28.6		31.3	28.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.3	1.7	0.1	23.4	2.7	0.4	11.5	2.9		14.8	1.5	
Delay (s)	44.0	25.3	20.0	61.5	30.5	25.3	42.5	31.5		46.1	29.4	
Level of Service	D	C	B	E	C	C	D	C		D	C	
Approach Delay (s)		28.0			29.9			35.0			34.3	
Approach LOS		C			C			D			C	

Intersection Summary				
HCM 2000 Control Delay	32.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	80.9	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	68.8%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Existing Plus 1293 Unit Project and School AM
12: Creston Road & Niblick Road/Sherwood Road — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	116	304	129	50	549	409	241	470	41	249	289	307
Future Volume (veh/h)	116	304	129	50	549	409	241	470	41	249	289	307
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	129	338	143	56	610	454	268	522	46	277	321	341
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	164	558	468	79	890	393	309	814	72	316	445	391
Arrive On Green	0.09	0.30	0.30	0.04	0.25	0.25	0.18	0.25	0.25	0.18	0.25	0.25
Sat Flow, veh/h	1767	1856	1558	1767	3526	1556	1767	3277	288	1767	1763	1550
Grp Volume(v), veh/h	129	338	143	56	610	454	268	280	288	277	321	341
Grp Sat Flow(s),veh/h/ln	1767	1856	1558	1767	1763	1556	1767	1763	1802	1767	1763	1550
Q Serve(g_s), s	5.7	12.3	5.6	2.5	12.4	20.0	11.7	11.2	11.3	12.1	13.2	16.7
Cycle Q Clear(g_c), s	5.7	12.3	5.6	2.5	12.4	20.0	11.7	11.2	11.3	12.1	13.2	16.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.16	1.00		1.00
Lane Grp Cap(c), veh/h	164	558	468	79	890	393	309	438	448	316	445	391
V/C Ratio(X)	0.79	0.61	0.31	0.71	0.69	1.16	0.87	0.64	0.64	0.88	0.72	0.87
Avail Cap(c_a), veh/h	301	623	523	154	890	393	368	512	523	346	490	431
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.2	23.7	21.3	37.3	26.8	29.6	31.8	26.6	26.6	31.7	27.1	28.4
Incr Delay (d2), s/veh	8.1	1.4	0.4	11.0	2.2	95.1	16.9	2.1	2.1	20.2	4.6	16.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	5.2	1.9	1.3	5.1	17.3	6.2	4.7	4.9	6.7	5.8	7.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.3	25.1	21.7	48.4	28.9	124.7	48.7	28.7	28.7	51.9	31.7	44.7
LnGrp LOS	D	C	C	D	C	F	D	C	C	D	C	D
Approach Vol, veh/h		610			1120			836			939	
Approach Delay, s/veh		28.1			68.7			35.1			42.4	
Approach LOS		C			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	18.7	24.2	8.0	28.3	18.4	24.5	11.8	24.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.5	23.0	6.9	26.6	16.5	22.0	13.5	20.0
Max Q Clear Time (g_c+I1), s	14.1	13.3	4.5	14.3	13.7	18.7	7.7	22.0
Green Ext Time (p_c), s	0.1	2.3	0.0	1.9	0.2	1.3	0.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	46.6
HCM 6th LOS	D

Olsen-Chandler SP — Existing Plus 1293 Unit Project and School AM
13: Creston Road & Scott Street — HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	43	63	550	45	59	443
Future Volume (Veh/h)	43	63	550	45	59	443
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	51	75	655	54	70	527
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1349	682			709	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1349	682			709	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	67	83			92	
cM capacity (veh/h)	153	450			890	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	126	709	70	527
Volume Left	51	0	70	0
Volume Right	75	54	0	0
cSH	252	1700	890	1700
Volume to Capacity	0.50	0.42	0.08	0.31
Queue Length 95th (ft)	64	0	6	0
Control Delay (s)	32.8	0.0	9.4	0.0
Lane LOS	D		A	
Approach Delay (s)	32.8	0.0	1.1	
Approach LOS	D			

Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	51.3%	ICU Level of Service	A
Analysis Period (min)	15		

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	3.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	43	63	550	45	59	443
Future Vol, veh/h	43	63	550	45	59	443
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	51	75	655	54	70	527

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1349	682	0	0	709	0
Stage 1	682	-	-	-	-	-
Stage 2	667	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	166	450	-	-	890	-
Stage 1	502	-	-	-	-	-
Stage 2	510	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	153	450	-	-	890	-
Mov Cap-2 Maneuver	153	-	-	-	-	-
Stage 1	502	-	-	-	-	-
Stage 2	470	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	32.8	0	1.1
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	252	890	-
HCM Lane V/C Ratio	-	-	0.501	0.079	-
HCM Control Delay (s)	-	-	32.8	9.4	-
HCM Lane LOS	-	-	D	A	-
HCM 95th %tile Q(veh)	-	-	2.6	0.3	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	6	37	7	15	95	27	339	3	33	319	84
Future Volume (Veh/h)	96	6	37	7	15	95	27	339	3	33	319	84
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	114	7	44	8	18	113	32	404	4	39	380	100
Pedestrians		6			2						1	
Lane Width (ft)		12.0			12.0						12.0	
Walking Speed (ft/s)		3.5			3.5						3.5	
Percent Blockage		1			0						0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1055	938	386	978	1036	409	486			410		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1055	938	386	978	1036	409	486			410		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	23	97	93	96	92	82	97			97		
cM capacity (veh/h)	148	246	658	198	215	641	1071			1147		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	165	139	32	408	39	380	100
Volume Left	114	8	32	0	39	0	0
Volume Right	44	113	0	4	0	0	100
cSH	190	463	1071	1700	1147	1700	1700
Volume to Capacity	0.87	0.30	0.03	0.24	0.03	0.22	0.06
Queue Length 95th (ft)	161	31	2	0	3	0	0
Control Delay (s)	85.1	16.1	8.5	0.0	8.3	0.0	0.0
Lane LOS	F	C	A		A		
Approach Delay (s)	85.1	16.1	0.6		0.6		
Approach LOS	F	C					

Intersection Summary				
Average Delay	13.4			
Intersection Capacity Utilization	45.9%	ICU Level of Service		A
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	11.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	96	6	37	7	15	95	27	339	3	33	319	84
Future Vol, veh/h	96	6	37	7	15	95	27	339	3	33	319	84
Conflicting Peds, #/hr	1	0	0	0	0	1	6	0	2	2	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	30	-	-	70	-	60
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	114	7	44	8	18	113	32	404	4	39	380	100

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1001	938	386	1006	1036	409	486	0	0	410	0	0
Stage 1	464	464	-	472	472	-	-	-	-	-	-	-
Stage 2	537	474	-	534	564	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	222	264	662	220	232	642	1077	-	-	1149	-	-
Stage 1	578	564	-	573	559	-	-	-	-	-	-	-
Stage 2	528	558	-	530	508	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	162	246	658	191	216	640	1071	-	-	1147	-	-
Mov Cap-2 Maneuver	162	246	-	191	216	-	-	-	-	-	-	-
Stage 1	558	541	-	555	541	-	-	-	-	-	-	-
Stage 2	407	540	-	471	488	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	69.2	16.2	0.6	0.6
HCM LOS	F	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1071	-	-	206	460	1147	-	-
HCM Lane V/C Ratio	0.03	-	-	0.803	0.303	0.034	-	-
HCM Control Delay (s)	8.5	-	-	69.2	16.2	8.2	-	-
HCM Lane LOS	A	-	-	F	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	5.7	1.3	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	20	9	5	215	5	184	4	165	112	188	161	10
Future Volume (vph)	20	9	5	215	5	184	4	165	112	188	161	10
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	24	11	6	253	6	216	5	194	132	221	189	12

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	41	475	199	132	316	107
Volume Left (vph)	24	253	5	0	221	0
Volume Right (vph)	6	216	0	132	0	12
Hadj (s)	0.06	-0.13	0.05	-0.67	0.38	-0.04
Departure Headway (s)	7.3	5.9	7.1	6.4	7.2	6.8
Degree Utilization, x	0.08	0.78	0.39	0.23	0.63	0.20
Capacity (veh/h)	430	589	472	529	482	508
Control Delay (s)	11.0	27.1	13.4	10.1	20.6	10.3
Approach Delay (s)	11.0	27.1	12.1		18.0	
Approach LOS	B	D	B		C	

Intersection Summary				
Delay	19.6			
Level of Service	C			
Intersection Capacity Utilization	58.5%	ICU Level of Service	B	
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	20.9
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Vol, veh/h	20	9	5	215	5	184	0	4	165	112	188	161
Future Vol, veh/h	20	9	5	215	5	184	0	4	165	112	188	161
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.92	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	24	11	6	253	6	216	0	5	194	132	221	189
Number of Lanes	0	1	0	0	1	0	0	0	1	1	0	2

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	11.2	28.8	13.1	19.1
HCM LOS	B	D	B	C

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	2%	0%	59%	53%	70%	0%
Vol Thru, %	98%	0%	26%	1%	30%	89%
Vol Right, %	0%	100%	15%	46%	0%	11%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	169	112	34	404	269	91
LT Vol	4	0	20	215	188	0
Through Vol	165	0	9	5	81	81
RT Vol	0	112	5	184	0	10
Lane Flow Rate	199	132	40	475	316	106
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.392	0.233	0.083	0.799	0.634	0.201
Departure Headway (Hd)	7.097	6.366	7.452	6.053	7.225	6.787
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	507	563	480	604	499	528
Service Time	4.85	4.119	5.516	4.053	4.975	4.536
HCM Lane V/C Ratio	0.393	0.234	0.083	0.786	0.633	0.201
HCM Control Delay	14.4	11.1	11.2	28.8	21.7	11.2
HCM Lane LOS	B	B	B	D	C	B
HCM 95th-tile Q	1.8	0.9	0.3	7.8	4.4	0.7

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBR
Lane Configurations	
Traffic Vol, veh/h	10
Future Vol, veh/h	10
Peak Hour Factor	0.85
Heavy Vehicles, %	2
Mvmt Flow	12
Number of Lanes	0

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	151	81	123	129	88	292
Future Volume (Veh/h)	151	81	123	129	88	292
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	176	94	143	150	102	340
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	463	102	442			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	463	102	442			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	62	90	87			
cM capacity (veh/h)	457	930	1107			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	270	143	75	75	102	340
Volume Left	176	143	0	0	0	0
Volume Right	94	0	0	0	0	340
cSH	701	1107	1700	1700	1700	1700
Volume to Capacity	0.38	0.13	0.04	0.04	0.06	0.20
Queue Length 95th (ft)	45	11	0	0	0	0
Control Delay (s)	14.8	8.7	0.0	0.0	0.0	0.0
Lane LOS	B	A				
Approach Delay (s)	14.8	4.3			0.0	
Approach LOS	B					

Intersection Summary			
Average Delay		5.2	
Intersection Capacity Utilization		31.6%	ICU Level of Service A
Analysis Period (min)		15	

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	151	81	123	129	88	292
Future Vol, veh/h	151	81	123	129	88	292
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	145	105	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	176	94	143	150	102	340

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	463	102	442	0	-	0
Stage 1	102	-	-	-	-	-
Stage 2	361	-	-	-	-	-
Critical Hdwy	6.645	6.245	4.145	-	-	-
Critical Hdwy Stg 1	5.445	-	-	-	-	-
Critical Hdwy Stg 2	5.845	-	-	-	-	-
Follow-up Hdwy	3.5285	3.3285	2.2285	-	-	-
Pot Cap-1 Maneuver	540	950	1110	-	-	-
Stage 1	919	-	-	-	-	-
Stage 2	674	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	470	950	1110	-	-	-
Mov Cap-2 Maneuver	470	-	-	-	-	-
Stage 1	800	-	-	-	-	-
Stage 2	674	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.4	4.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1110	-	470	950	-	-
HCM Lane V/C Ratio	0.129	-	0.374	0.099	-	-
HCM Control Delay (s)	8.7	-	17.2	9.2	-	-
HCM Lane LOS	A	-	C	A	-	-
HCM 95th %tile Q(veh)	0.4	-	1.7	0.3	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	0	24	1	91	9	0	0	0	0	324	15
Future Volume (Veh/h)	27	0	24	1	91	9	0	0	0	0	324	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	30	0	26	1	100	10	0	0	0	0	356	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	419	364	364	390	372	0	372			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	419	364	364	390	372	0	372			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	100	96	100	82	99	100			100		
cM capacity (veh/h)	465	564	681	547	558	1085	1186			1623		

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	56	111	372
Volume Left	30	1	0
Volume Right	26	10	16
cSH	545	613	1700
Volume to Capacity	0.10	0.18	0.22
Queue Length 95th (ft)	9	16	0
Control Delay (s)	12.4	12.5	0.0
Lane LOS	B	B	
Approach Delay (s)	12.4	12.5	0.0
Approach LOS	B	B	

Intersection Summary					
Average Delay	3.9				
Intersection Capacity Utilization	34.3%	ICU Level of Service		A	
Analysis Period (min)	15				

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	0	24	1	91	9	0	0	0	0	324	15
Future Vol, veh/h	27	0	24	1	91	9	0	0	0	0	324	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	30	0	26	1	100	10	0	0	0	0	356	16

Major/Minor	Minor2			Minor1						Major2		
Conflicting Flow All	419	364	364	377	372	0				-	-	0
Stage 1	364	364	-	0	0	-				-	-	-
Stage 2	55	0	-	377	372	-				-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22				-	-	-
Critical Hdwy Stg 1	6.12	5.52	-	-	-	-				-	-	-
Critical Hdwy Stg 2	-	-	-	6.12	5.52	-				-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318				-	-	-
Pot Cap-1 Maneuver	544	564	681	580	558	-				0	-	-
Stage 1	655	624	-	-	-	-				0	-	-
Stage 2	-	-	-	644	619	-				0	-	-
Platoon blocked, %											-	-
Mov Cap-1 Maneuver	-	564	681	557	558	-				-	-	-
Mov Cap-2 Maneuver	-	564	-	557	558	-				-	-	-
Stage 1	655	624	-	-	-	-				-	-	-
Stage 2	-	-	-	619	619	-				-	-	-

Approach	EB	WB	SB
HCM Control Delay, s			0
HCM LOS	-	-	

Minor Lane/Major Mvmt	EBLn1	WBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	-	558	-	-	-
HCM Lane V/C Ratio	-	0.181	-	-	-
HCM Control Delay (s)	-	12.9	-	-	-
HCM Lane LOS	-	B	-	-	-
HCM 95th %tile Q(veh)	-	0.7	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	21	356	1230	263	515	77	308	606	348	280
v/c Ratio	0.09	0.73	0.82	0.32	0.46	0.56	0.67	0.36	0.69	0.36
Control Delay	55.9	54.4	39.0	27.1	3.2	78.3	63.7	6.1	62.4	44.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.9	54.4	39.0	27.1	3.2	78.3	63.7	6.1	62.4	44.9
Queue Length 50th (ft)	17	127	471	146	17	66	139	48	153	110
Queue Length 95th (ft)	43	179	592	229	50	122	186	69	204	147
Internal Link Dist (ft)		521		1372			611			680
Turn Bay Length (ft)	115		515		115	165		290	305	
Base Capacity (vph)	280	593	1645	893	1161	168	639	1774	649	955
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.60	0.75	0.29	0.44	0.46	0.48	0.34	0.54	0.29

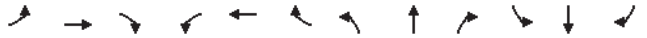
Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	184	115	1033	221	433	65	259	509	292	197	38
Future Volume (vph)	18	184	115	1033	221	433	65	259	509	292	197	38
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.95	0.88	0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3335		3433	1863	1568	1770	3539	2787	3433	3441	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3335		3433	1863	1568	1770	3539	2787	3433	3441	
Peak-hour factor, PHF	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Adj. Flow (vph)	21	219	137	1230	263	515	77	308	606	348	235	45
RTOR Reduction (vph)	0	67	0	0	0	193	0	0	73	0	11	0
Lane Group Flow (vph)	21	289	0	1230	263	322	77	308	533	348	269	0
Confl. Peds. (#/hr)												1
Confl. Bikes (#/hr)						2						
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	16.5	16.5		57.5	57.5	76.8	8.5	18.6	76.1	19.3	29.4	
Effective Green, g (s)	16.5	16.5		57.5	57.5	76.8	8.5	18.6	76.1	19.3	29.4	
Actuated g/C Ratio	0.12	0.12		0.43	0.43	0.58	0.06	0.14	0.57	0.15	0.22	
Clearance Time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	220	415		1490	809	909	113	497	1601	500	764	
v/s Ratio Prot	0.01	c0.09		c0.36	0.14	0.05	0.04	c0.09	0.14	c0.10	0.08	
v/s Ratio Perm						0.15			0.05			
v/c Ratio	0.10	0.70		0.83	0.33	0.35	0.68	0.62	0.33	0.70	0.35	
Uniform Delay, d1	51.3	55.6		33.0	24.7	14.7	60.6	53.6	14.8	53.8	43.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	5.1		3.9	0.2	0.2	15.6	2.3	0.1	4.2	0.3	
Delay (s)	51.5	60.6		36.9	24.9	14.9	76.2	55.9	14.9	58.0	43.7	
Level of Service	D	E		D	C	B	E	E	B	E	D	
Approach Delay (s)		60.1			29.7			32.4			51.6	
Approach LOS		E			C			C			D	

Intersection Summary				
HCM 2000 Control Delay	36.7	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	132.4	Sum of lost time (s)	20.5	
Intersection Capacity Utilization	70.8%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	184	115	1033	221	433	65	259	509	292	197	38
Future Volume (veh/h)	18	184	115	1033	221	433	65	259	509	292	197	38
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	21	219	137	1230	263	515	77	308	606	348	235	45
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	232	279	167	1444	781	848	98	557	1603	424	641	121
Arrive On Green	0.13	0.13	0.13	0.42	0.42	0.42	0.06	0.16	0.16	0.12	0.22	0.22
Sat Flow, veh/h	1781	2136	1281	3456	1870	1564	1781	3554	2790	3456	2983	562
Grp Volume(v), veh/h	21	181	175	1230	263	515	77	308	606	348	138	142
Grp Sat Flow(s),veh/h/ln	1781	1777	1640	1728	1870	1564	1781	1777	1395	1728	1777	1768
Q Serve(g_s), s	1.2	11.7	12.4	38.3	11.3	26.8	5.1	9.5	14.1	11.7	7.9	8.1
Cycle Q Clear(g_c), s	1.2	11.7	12.4	38.3	11.3	26.8	5.1	9.5	14.1	11.7	7.9	8.1
Prop In Lane	1.00		0.78	1.00		1.00	1.00		1.00	1.00		0.32
Lane Grp Cap(c), veh/h	232	232	214	1444	781	848	98	557	1603	424	382	380
V/C Ratio(X)	0.09	0.78	0.82	0.85	0.34	0.61	0.78	0.55	0.38	0.82	0.36	0.37
Avail Cap(c_a), veh/h	305	305	281	1788	968	1004	183	693	1709	705	527	524
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.5	50.1	50.4	31.3	23.5	18.7	55.5	46.3	13.8	50.9	39.8	39.9
Incr Delay (d2), s/veh	0.2	9.1	13.5	3.5	0.3	0.8	12.6	0.9	0.1	4.0	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	5.8	5.9	15.9	4.9	9.3	2.6	4.2	9.0	5.3	3.5	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.7	59.2	63.8	34.8	23.7	19.5	68.1	47.2	13.9	54.9	40.3	40.5
LnGrp LOS	D	E	E	C	C	B	E	D	B	D	D	D
Approach Vol, veh/h		377			2008			991			628	
Approach Delay, s/veh		60.6			29.4			28.5			48.4	
Approach LOS		E			C			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	19.3	24.5		20.1	12.4	31.4		55.1				
Change Period (Y+Rc), s	* 4.7	5.8		4.6	5.8	* 5.8		5.4				
Max Green Setting (Gmax), s	* 24	23.2		20.4	12.2	* 35		61.6				
Max Q Clear Time (g_c+I1), s	13.7	16.1		14.4	7.1	10.1		40.3				
Green Ext Time (p_c), s	0.9	2.6		1.1	0.1	1.6		9.4				

Intersection Summary			
HCM 6th Ctrl Delay		35.1	
HCM 6th LOS		D	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	115	717	254	138	1423	617	378	323	436
v/c Ratio	0.56	0.57	0.35	0.70	1.02	0.85	0.68	0.86	0.73
Control Delay	63.0	32.3	5.0	67.3	61.4	53.7	48.2	64.4	43.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.0	32.3	5.0	67.3	61.4	53.7	48.2	64.4	43.5
Queue Length 50th (ft)	41	221	0	95	~564	215	130	219	128
Queue Length 95th (ft)	73	298	51	#177	#733	289	173	#371	176
Internal Link Dist (ft)		1510			1609		962		896
Turn Bay Length (ft)	140			80		150		110	
Base Capacity (vph)	204	1250	723	218	1398	770	831	408	891
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.57	0.35	0.63	1.02	0.80	0.45	0.79	0.49

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
19: S. River Road & Niblick Road

Existing Plus 1293 Unit Project and School AM
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	624	221	120	960	278	537	276	53	281	245	134
Future Volume (vph)	100	624	221	120	960	278	537	276	53	281	245	134
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3539	1583	1770	3401		3433	3443		1770	3352	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	3539	1583	1770	3401		3433	3443		1770	3352	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	115	717	254	138	1103	320	617	317	61	323	282	154
RTOR Reduction (vph)	0	0	164	0	21	0	0	14	0	0	67	0
Lane Group Flow (vph)	115	717	90	138	1402	0	617	364	0	323	369	0
Confl. Peds. (#/hr)						10			5			
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	6.5	38.7	38.7	12.2	44.4		23.3	17.3		23.3	17.3	
Effective Green, g (s)	6.5	38.7	38.7	12.2	44.4		23.3	17.3		23.3	17.3	
Actuated g/C Ratio	0.06	0.35	0.35	0.11	0.41		0.21	0.16		0.21	0.16	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	203	1250	559	197	1379		730	543		376	529	
v/s Ratio Prot	0.03	0.20		c0.08	c0.41		c0.18	0.11		c0.18	0.11	
v/s Ratio Perm			0.06									
v/c Ratio	0.57	0.57	0.16	0.70	1.02		0.85	0.67		0.86	0.70	
Uniform Delay, d1	50.1	28.7	24.3	46.9	32.5		41.4	43.4		41.5	43.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.6	0.6	0.1	10.7	28.5		8.9	3.1		17.4	4.0	
Delay (s)	53.7	29.3	24.4	57.6	61.1		50.3	46.5		58.9	47.6	
Level of Service	D	C	C	E	E		D	D		E	D	
Approach Delay (s)		30.8			60.8			48.8			52.4	
Approach LOS		C			E			D			D	

Intersection Summary					
HCM 2000 Control Delay	49.2	HCM 2000 Level of Service	D		
HCM 2000 Volume to Capacity ratio	0.96				
Actuated Cycle Length (s)	109.5	Sum of lost time (s)	18.0		
Intersection Capacity Utilization	81.4%	ICU Level of Service	D		
Analysis Period (min)	15				
c Critical Lane Group					

Olsen-Chandler SP
19: S. River Road & Niblick Road

Existing Plus 1293 Unit Project and School AM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	624	221	120	960	278	537	276	53	281	245	134
Future Volume (veh/h)	100	624	221	120	960	278	537	276	53	281	245	134
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	115	717	254	138	1103	320	617	317	61	323	282	154
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	173	1315	587	168	1126	323	693	499	95	356	374	199
Arrive On Green	0.05	0.37	0.37	0.09	0.41	0.41	0.20	0.17	0.17	0.20	0.17	0.17
Sat Flow, veh/h	3456	3554	1585	1781	2720	780	3456	2974	565	1781	2242	1191
Grp Volume(v), veh/h	115	717	254	138	716	707	617	188	190	323	222	214
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1781	1777	1723	1728	1777	1763	1781	1777	1656
Q Serve(g_s), s	3.5	17.0	7.0	8.1	42.3	43.6	18.6	10.5	10.8	19.0	12.7	13.2
Cycle Q Clear(g_c), s	3.5	17.0	7.0	8.1	42.3	43.6	18.6	10.5	10.8	19.0	12.7	13.2
Prop In Lane	1.00		1.00	1.00		0.45	1.00		0.32	1.00		0.72
Lane Grp Cap(c), veh/h	173	1315	587	168	736	714	693	298	296	356	297	277
V/C Ratio(X)	0.67	0.55	0.43	0.82	0.97	0.99	0.89	0.63	0.64	0.91	0.75	0.77
Avail Cap(c_a), veh/h	210	1315	587	225	736	714	779	432	428	420	450	420
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.9	26.6	7.6	47.6	30.7	31.1	41.6	41.4	41.5	41.8	42.4	42.6
Incr Delay (d2), s/veh	5.8	0.5	0.5	16.4	26.6	31.1	11.5	2.2	2.3	21.2	3.8	5.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	7.0	4.3	4.3	22.3	23.0	8.8	4.7	4.7	10.2	5.7	5.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.7	27.1	8.1	64.0	57.4	62.2	53.1	43.6	43.8	63.0	46.2	47.6
LnGrp LOS	E	C	A	E	E	E	D	D	D	E	D	D
Approach Vol, veh/h		1086			1561			995			759	
Approach Delay, s/veh		25.7			60.1			49.5			53.7	
Approach LOS		C			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.6	44.1	26.0	22.4	9.8	48.8	25.9	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	13.5	37.3	24.1	27.1	6.5	44.3	25.2	26.0
Max Q Clear Time (g_c+I1), s	10.1	19.0	20.6	15.2	5.5	45.6	21.0	12.8
Green Ext Time (p_c), s	0.1	5.3	0.9	1.9	0.0	0.0	0.4	1.7

Intersection Summary	
HCM 6th Ctrl Delay	48.1
HCM 6th LOS	D

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	448	146	14	842	203	9
v/c Ratio	0.54	0.19	0.04	0.54	0.42	0.02
Control Delay	12.7	3.0	9.1	10.9	14.6	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.7	3.0	9.1	10.9	14.6	6.9
Queue Length 50th (ft)	56	0	1	54	28	0
Queue Length 95th (ft)	214	28	13	180	95	8
Internal Link Dist (ft)	1629			570	669	
Turn Bay Length (ft)			75			50
Base Capacity (vph)	1573	1324	702	2988	1311	1176
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.11	0.02	0.28	0.15	0.01

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	408	133	13	766	185	8
Future Volume (vph)	408	133	13	766	185	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1845	1532	1750	3505	1752	1568
Flt Permitted	1.00	1.00	0.45	1.00	0.95	1.00
Satd. Flow (perm)	1845	1532	825	3505	1752	1568
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	448	146	14	842	203	9
RTOR Reduction (vph)	0	80	0	0	0	6
Lane Group Flow (vph)	448	66	14	842	203	3
Confl. Peds. (#/hr)		4	4		1	
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Turn Type	NA	Perm	Perm	NA	Perm	Prot
Protected Phases	2			6		8
Permitted Phases		2	6		8	
Actuated Green, G (s)	18.9	18.9	18.9	18.9	11.8	11.8
Effective Green, g (s)	18.9	18.9	18.9	18.9	11.8	11.8
Actuated g/C Ratio	0.46	0.46	0.46	0.46	0.28	0.28
Clearance Time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	840	697	375	1596	498	445
v/s Ratio Prot	c0.24			0.24		0.00
v/s Ratio Perm		0.04	0.02		c0.12	
v/c Ratio	0.53	0.10	0.04	0.53	0.41	0.01
Uniform Delay, d1	8.1	6.4	6.3	8.1	12.0	10.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.0	0.0	0.1	0.2	0.0
Delay (s)	8.5	6.5	6.3	8.2	12.2	10.6
Level of Service	A	A	A	A	B	B
Approach Delay (s)	8.0			8.2	12.2	
Approach LOS	A			A	B	

Intersection Summary				
HCM 2000 Control Delay	8.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	41.5	Sum of lost time (s)	10.8
Intersection Capacity Utilization	41.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Existing Plus 1293 Unit Project and School AM
20: Commerce Way & Sherwood Road — HCM 6th Signalized Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	408	133	13	766	185	8
Future Volume (veh/h)	408	133	13	766	185	8
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	448	146	14	842	203	9
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	752	634	423	1429	397	354
Arrive On Green	0.41	0.41	0.41	0.41	0.22	0.22
Sat Flow, veh/h	1856	1565	815	3618	1767	1572
Grp Volume(v), veh/h	448	146	14	842	203	9
Grp Sat Flow(s),veh/h/ln	1856	1565	815	1763	1767	1572
Q Serve(g_s), s	5.5	1.8	0.4	5.4	2.9	0.1
Cycle Q Clear(g_c), s	5.5	1.8	5.9	5.4	2.9	0.1
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	752	634	423	1429	397	354
V/C Ratio(X)	0.60	0.23	0.03	0.59	0.51	0.03
Avail Cap(c_a), veh/h	2199	1854	1058	4178	1791	1594
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	6.8	5.7	9.1	6.8	9.9	8.8
Incr Delay (d2), s/veh	0.3	0.1	0.0	0.1	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.3	0.0	0.8	0.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	7.1	5.8	9.1	6.9	10.3	8.8
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h	594			856	212	
Approach Delay, s/veh	6.8			7.0	10.2	
Approach LOS	A			A	B	

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	17.2				17.2	12.0
Change Period (Y+Rc), s	5.4				5.4	5.4
Max Green Setting (Gmax), s	34.6				34.6	29.6
Max Q Clear Time (g_c+I1), s	7.5				7.9	4.9
Green Ext Time (p_c), s	1.9				3.9	0.3

Intersection Summary			
HCM 6th Ctrl Delay		7.3	
HCM 6th LOS		A	

Olsen-Chandler SP — Existing Plus 1293 Unit Project and School AM
21: Fontana Road & Sherwood Road — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	333	83	5	720	0	60	0	5	0	0	0
Future Volume (Veh/h)	0	333	83	5	720	0	60	0	5	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	362	90	5	783	0	65	0	5	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									4			
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		650										
pX, platoon unblocked				0.83			0.83	0.83	0.83	0.83	0.83	
vC, conflicting volume	783			452			808	1200	407	1202	1245	392
vC1, stage 1 conf vol							407	407		793	793	
vC2, stage 2 conf vol							402	793		410	452	
vCu, unblocked vol	783			236			666	1138	182	1141	1193	392
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			87	100	99	100	100	100
cM capacity (veh/h)	831			1101			499	354	688	315	347	607

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	452	396	392	70	0
Volume Left	0	5	0	65	0
Volume Right	90	0	0	5	0
cSH	831	1101	1700	537	1700
Volume to Capacity	0.00	0.00	0.23	0.13	0.00
Queue Length 95th (ft)	0	0	0	11	0
Control Delay (s)	0.0	0.2	0.0	13.1	0.0
Lane LOS		A		B	A
Approach Delay (s)	0.0	0.1		13.1	0.0
Approach LOS				B	A

Intersection Summary					
Average Delay		0.7			
Intersection Capacity Utilization		33.4%	ICU Level of Service		A
Analysis Period (min)		15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	333	83	5	720	0	60	0	5	0	0	0
Future Vol, veh/h	0	333	83	5	720	0	60	0	5	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	362	90	5	783	0	65	0	5	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	783	0	0	452	0	0	809	1200	407	1203	1245	392
Stage 1	-	-	-	-	-	-	407	407	-	793	793	-
Stage 2	-	-	-	-	-	-	402	793	-	410	452	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.23	7.33	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.519	4.019	3.319
Pot Cap-1 Maneuver	833	-	-	1107	-	-	285	184	643	150	173	608
Stage 1	-	-	-	-	-	-	620	596	-	349	399	-
Stage 2	-	-	-	-	-	-	597	399	-	618	570	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	833	-	-	1107	-	-	283	183	643	148	172	608
Mov Cap-2 Maneuver	-	-	-	-	-	-	472	346	-	309	339	-
Stage 1	-	-	-	-	-	-	620	596	-	349	396	-
Stage 2	-	-	-	-	-	-	592	396	-	613	570	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	13.6	0
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	472	643	833	-	-	1107	-	-	-
HCM Lane V/C Ratio	0.138	0.008	-	-	-	0.005	-	-	-
HCM Control Delay (s)	13.8	10.6	0	-	-	8.3	0	-	0
HCM Lane LOS	B	B	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0.5	0	0	-	-	0	-	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Traffic Volume (veh/h)	44	163	76	15	305	4	206	12	15	8	12	89
Future Volume (veh/h)	44	163	76	15	305	4	206	12	15	8	12	89
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	48	177	83	16	332	4	224	13	16	9	13	97
Approach Volume (veh/h)		308			352			253			119	
Crossing Volume (veh/h)		38			285			234			572	
High Capacity (veh/h)		1344			1107			1153			881	
High v/c (veh/h)		0.23			0.32			0.22			0.14	
Low Capacity (veh/h)		1124			910			951			708	
Low v/c (veh/h)		0.27			0.39			0.27			0.17	

Intersection Summary				
Maximum v/c High		0.32		
Maximum v/c Low		0.39		
Intersection Capacity Utilization		57.2%	ICU Level of Service	B

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	6.0
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	308	352	253	119
Demand Flow Rate, veh/h	315	359	257	121
Vehicles Circulating, veh/h	38	290	239	583
Vehicles Exiting, veh/h	666	206	114	66
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.8	7.2	5.6	6.5
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	315	359	257	121
Cap Entry Lane, veh/h	1327	1027	1081	761
Entry HV Adj Factor	0.979	0.981	0.983	0.981
Flow Entry, veh/h	308	352	253	119
Cap Entry, veh/h	1300	1008	1063	747
V/C Ratio	0.237	0.350	0.238	0.159
Control Delay, s/veh	4.8	7.2	5.6	6.5
LOS	A	A	A	A
95th %tile Queue, veh	1	2	1	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	18	13	9	1	28	16	10	105	1	12	67	24
Future Volume (vph)	18	13	9	1	28	16	10	105	1	12	67	24
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	22	16	11	1	34	19	12	127	1	14	81	29

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	49	54	140	124
Volume Left (vph)	22	1	12	14
Volume Right (vph)	11	19	1	29
Hadj (s)	0.09	-0.07	0.15	0.02
Departure Headway (s)	4.7	4.5	4.4	4.3
Degree Utilization, x	0.06	0.07	0.17	0.15
Capacity (veh/h)	717	743	785	797
Control Delay (s)	8.0	7.8	8.4	8.1
Approach Delay (s)	8.0	7.8	8.4	8.1
Approach LOS	A	A	A	A

Intersection Summary				
Delay	8.1			
Level of Service	A			
Intersection Capacity Utilization	23.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	18	13	9	1	28	16	10	105	1	12	67	24
Future Vol, veh/h	18	13	9	1	28	16	10	105	1	12	67	24
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	8	8	8	8	8	8	8	8	8	8	8	8
Mvmt Flow	22	16	11	1	34	19	12	127	1	14	81	29
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8	7.8	8.4	8.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	9%	45%	2%	12%
Vol Thru, %	91%	32%	62%	65%
Vol Right, %	1%	23%	36%	23%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	116	40	45	103
LT Vol	10	18	1	12
Through Vol	105	13	28	67
RT Vol	1	9	16	24
Lane Flow Rate	140	48	54	124
Geometry Grp	1	1	1	1
Degree of Util (X)	0.172	0.062	0.068	0.149
Departure Headway (Hd)	4.434	4.653	4.483	4.312
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	813	772	801	834
Service Time	2.434	2.671	2.5	2.325
HCM Lane V/C Ratio	0.172	0.062	0.067	0.149
HCM Control Delay	8.4	8	7.8	8.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.6	0.2	0.2	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	81	0	0	150	2	0	8	0	0	16	79
Future Volume (Veh/h)	24	81	0	0	150	2	0	8	0	0	16	79
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71
Hourly flow rate (vph)	34	114	0	0	211	3	0	11	0	0	23	111
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	214			114			517	396	114	400	394	212
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	214			114			517	396	114	400	394	212
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			100	98	100	100	96	87
cM capacity (veh/h)	1344			1463			382	524	933	537	525	823

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	148	214	11	0	134
Volume Left	34	0	0	0	0
Volume Right	0	3	0	0	111
cSH	1344	1463	524	1700	750
Volume to Capacity	0.03	0.00	0.02	0.00	0.18
Queue Length 95th (ft)	2	0	2	0	16
Control Delay (s)	1.9	0.0	12.0	0.0	10.8
Lane LOS	A		B	A	B
Approach Delay (s)	1.9	0.0	12.0	10.8	
Approach LOS			B	B	

Intersection Summary				
Average Delay	3.7			
Intersection Capacity Utilization	29.3%	ICU Level of Service		A
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↰	↕	
Traffic Vol, veh/h	24	81	0	0	150	2	0	8	0	0	16	79
Future Vol, veh/h	24	81	0	0	150	2	0	8	0	0	16	79
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	71	71	71	71	71	71	71	71	71	71	71	71
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	34	114	0	0	211	3	0	11	0	0	23	111

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	214	0	0	114	0	0	462	396	114	401	395	213
Stage 1	-	-	-	-	-	-	182	182	-	213	213	-
Stage 2	-	-	-	-	-	-	280	214	-	188	182	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	1344	-	-	1463	-	-	507	538	933	556	539	822
Stage 1	-	-	-	-	-	-	815	745	-	785	722	-
Stage 2	-	-	-	-	-	-	722	722	-	809	745	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1344	-	-	1463	-	-	415	523	933	535	524	822
Mov Cap-2 Maneuver	-	-	-	-	-	-	415	523	-	535	524	-
Stage 1	-	-	-	-	-	-	793	725	-	764	722	-
Stage 2	-	-	-	-	-	-	605	722	-	775	725	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.8	0	12	10.8
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	523	1344	-	-	1463	-	-	-	750
HCM Lane V/C Ratio	0.022	0.025	-	-	-	-	-	-	0.178
HCM Control Delay (s)	12	7.7	0	-	0	-	-	0	10.8
HCM Lane LOS	B	A	A	-	A	-	-	A	B
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	-	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Right Turn Channelized						
Traffic Volume (veh/h)	4	143	132	8	99	76
Future Volume (veh/h)	4	143	132	8	99	76
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	155	143	9	108	83
Approach Volume (veh/h)	159		152			191
Crossing Volume (veh/h)	143		108			4
High Capacity (veh/h)	1238		1273			1380
High v/c (veh/h)	0.13		0.12			0.14
Low Capacity (veh/h)	1028		1059			1157
Low v/c (veh/h)	0.15		0.14			0.17

Intersection Summary			
Maximum v/c High	0.14		
Maximum v/c Low	0.17		
Intersection Capacity Utilization	36.0%	ICU Level of Service	A

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	4.0
Intersection LOS	A

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	159	152	191
Demand Flow Rate, veh/h	162	155	195
Vehicles Circulating, veh/h	146	110	4
Vehicles Exiting, veh/h	119	89	304
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	4.3	4.0	3.8
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	162	155	195
Cap Entry Lane, veh/h	1189	1233	1374
Entry HV Adj Factor	0.981	0.982	0.981
Flow Entry, veh/h	159	152	191
Cap Entry, veh/h	1167	1211	1348
V/C Ratio	0.136	0.126	0.142
Control Delay, s/veh	4.3	4.0	3.8
LOS	A	A	A
95th %tile Queue, veh	0	0	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	51	77	5	1	6
Future Volume (Veh/h)	3	51	77	5	1	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.63	0.63	0.63	0.63	0.63	0.63
Hourly flow rate (vph)	5	81	122	8	2	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	130				217	126
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	130				217	126
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1449				766	922

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	86	130	12
Volume Left	5	0	2
Volume Right	0	8	10
cSH	1449	1700	892
Volume to Capacity	0.00	0.08	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.5	0.0	9.1
Lane LOS	A		A
Approach Delay (s)	0.5	0.0	9.1
Approach LOS			A

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	15.1%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	51	77	5	1	6
Future Vol, veh/h	3	51	77	5	1	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	63	63	63	63	63	63
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	5	81	122	8	2	10

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	130	0	-	0	217	126
Stage 1	-	-	-	-	126	-
Stage 2	-	-	-	-	91	-
Critical Hdwy	4.13	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.227	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	1449	-	-	-	769	922
Stage 1	-	-	-	-	897	-
Stage 2	-	-	-	-	930	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1449	-	-	-	766	922
Mov Cap-2 Maneuver	-	-	-	-	766	-
Stage 1	-	-	-	-	893	-
Stage 2	-	-	-	-	930	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1449	-	-	-	896
HCM Lane V/C Ratio	0.003	-	-	-	0.012
HCM Control Delay (s)	7.5	0	-	-	9.1
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	213	1005	1091	92	90	196
v/c Ratio	0.57	0.30	0.70	0.12	0.36	0.32
Control Delay	37.3	0.2	20.9	3.9	40.1	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.3	0.2	20.9	3.9	40.1	12.6
Queue Length 50th (ft)	94	0	218	0	41	37
Queue Length 95th (ft)	204	0	384	27	106	101
Internal Link Dist (ft)		1017	748		574	
Turn Bay Length (ft)	345			330	450	
Base Capacity (vph)	697	3312	3202	1436	697	1217
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.30	0.34	0.06	0.13	0.16

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	211	995	1080	91	89	194
Future Volume (vph)	211	995	1080	91	89	194
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0	7.3	7.3	4.2	3.7
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1656	3312	3312	1482	1656	1482
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1656	3312	3312	1482	1656	1482
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	213	1005	1091	92	90	196
RTOR Reduction (vph)	0	0	0	49	0	46
Lane Group Flow (vph)	213	1005	1091	43	90	150
Heavy Vehicles (%)	9%	9%	9%	9%	9%	9%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	8	Free!	6		7!	4
Permitted Phases				6		4
Actuated Green, G (s)	17.4	77.8	36.5	36.5	8.9	30.3
Effective Green, g (s)	17.4	77.8	36.5	36.5	8.9	30.3
Actuated g/C Ratio	0.22	1.00	0.47	0.47	0.11	0.39
Clearance Time (s)	3.5		7.3	7.3	4.2	3.7
Vehicle Extension (s)	3.0		4.0	4.0	3.5	3.0
Lane Grp Cap (vph)	370	3312	1553	695	189	577
v/s Ratio Prot	c0.13	0.30	c0.33		c0.05	0.10
v/s Ratio Perm				0.03		
v/c Ratio	0.58	0.30	0.70	0.06	0.48	0.26
Uniform Delay, d1	26.9	0.0	16.4	11.3	32.3	16.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.2	0.2	1.6	0.1	2.2	0.2
Delay (s)	29.1	0.2	17.9	11.3	34.5	16.4
Level of Service	C	A	B	B	C	B
Approach Delay (s)		5.3	17.4		22.1	
Approach LOS		A	B		C	

Intersection Summary				
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	77.8	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	61.1%	ICU Level of Service	B	
Analysis Period (min)	15			

! Phase conflict between lane groups.
c Critical Lane Group

HCM 6th Edition methodology cannot be performed with phasing conflicts.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	179	811	260	49	740	115	239	251	179	290	294
v/c Ratio	0.46	0.68	0.37	0.17	0.73	0.22	0.53	0.30	0.46	0.71	0.53
Control Delay	49.2	33.2	5.2	49.8	37.6	6.8	48.0	30.9	49.3	47.7	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.2	33.2	5.2	49.8	37.6	6.8	48.0	30.9	49.3	47.7	9.7
Queue Length 50th (ft)	54	234	0	14	216	0	72	62	54	167	11
Queue Length 95th (ft)	114	391	59	41	366	44	143	121	114	325	93
Internal Link Dist (ft)		1323			2509			853		451	
Turn Bay Length (ft)	225		485	125		390	160		140		
Base Capacity (vph)	614	2465	1157	614	2465	1118	683	1409	683	760	801
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.33	0.22	0.08	0.30	0.10	0.35	0.18	0.26	0.38	0.37

Intersection Summary

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Existing Plus 1293 Unit Project and School PM
2: Golden Hill Road & SR 46 E — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	174	787	252	48	718	112	232	199	45	174	281	285
Future Volume (vph)	174	787	252	48	718	112	232	199	45	174	281	285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3273	3374	1489	3273	3374	1489	3273	3273		3273	1776	1509
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3273	3374	1489	3273	3374	1489	3273	3273		3273	1776	1509
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	179	811	260	49	740	115	239	205	46	179	290	294
RTOR Reduction (vph)	0	0	168	0	0	79	0	11	0	0	0	209
Lane Group Flow (vph)	179	811	92	49	740	36	239	240	0	179	290	85
Confl. Peds. (#/hr)			1			1			2			
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	11.8	35.5	35.5	7.4	31.1	31.1	13.8	25.2		11.8	23.2	23.2
Effective Green, g (s)	11.8	35.5	35.5	7.4	31.1	31.1	13.8	25.2		11.8	23.2	23.2
Actuated g/C Ratio	0.12	0.35	0.35	0.07	0.31	0.31	0.14	0.25		0.12	0.23	0.23
Clearance Time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	384	1191	525	240	1044	460	449	820		384	409	348
v/s Ratio Prot	0.05	c0.24		0.01	c0.22		c0.07	0.07		0.05	c0.16	
v/s Ratio Perm			0.06			0.02						0.06
v/c Ratio	0.47	0.68	0.17	0.20	0.71	0.08	0.53	0.29		0.47	0.71	0.24
Uniform Delay, d1	41.4	27.7	22.4	43.8	30.7	24.5	40.3	30.4		41.4	35.5	31.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.9	1.6	0.2	0.2	2.2	0.1	1.2	0.2		0.9	5.6	0.4
Delay (s)	42.3	29.3	22.6	43.9	32.9	24.6	41.6	30.6		42.3	41.1	31.9
Level of Service	D	C	C	D	C	C	D	C		D	D	C
Approach Delay (s)		29.8			32.5			36.0			37.8	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	33.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	100.5	Sum of lost time (s)	20.6	
Intersection Capacity Utilization	63.7%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Olsen-Chandler SP — Existing Plus 1293 Unit Project and School PM
2: Golden Hill Road & SR 46 E — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	174	787	252	48	718	112	232	199	45	174	281	285
Future Volume (veh/h)	174	787	252	48	718	112	232	199	45	174	281	285
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	179	811	260	49	740	115	239	205	46	179	290	294
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	269	1098	489	111	1078	480	339	726	159	271	432	366
Arrive On Green	0.08	0.32	0.32	0.03	0.32	0.32	0.10	0.26	0.26	0.08	0.24	0.24
Sat Flow, veh/h	3319	3413	1521	3319	3413	1521	3319	2780	611	3319	1796	1522
Grp Volume(v), veh/h	179	811	260	49	740	115	239	124	127	179	290	294
Grp Sat Flow(s),veh/h/ln	1659	1706	1521	1659	1706	1521	1659	1706	1685	1659	1796	1522
Q Serve(g_s), s	4.1	16.7	7.1	1.1	15.0	4.4	5.5	4.6	4.8	4.1	11.6	14.4
Cycle Q Clear(g_c), s	4.1	16.7	7.1	1.1	15.0	4.4	5.5	4.6	4.8	4.1	11.6	14.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.36	1.00		1.00
Lane Grp Cap(c), veh/h	269	1098	489	111	1078	480	339	445	440	271	432	366
V/C Ratio(X)	0.67	0.74	0.53	0.44	0.69	0.24	0.70	0.28	0.29	0.66	0.67	0.80
Avail Cap(c_a), veh/h	755	3021	1346	755	3021	1346	839	885	873	839	931	789
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.3	23.9	9.0	37.5	23.6	20.0	34.3	23.3	23.4	35.2	27.2	28.3
Incr Delay (d2), s/veh	2.8	1.0	0.9	1.0	0.8	0.3	2.7	0.3	0.4	2.7	1.8	4.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	5.9	3.5	0.4	5.3	1.5	2.2	1.8	1.8	1.7	4.8	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.1	24.9	9.8	38.5	24.4	20.3	37.0	23.6	23.7	38.0	29.0	32.4
LnGrp LOS	D	C	A	D	C	C	D	C	C	D	C	C
Approach Vol, veh/h		1250			904			490			763	
Approach Delay, s/veh		23.6			24.7			30.2			32.4	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.9	32.7	12.1	24.3	10.4	32.3	10.5	25.9
Change Period (Y+Rc), s	7.3	* 7.3	4.0	5.3	4.0	7.3	4.0	5.3
Max Green Setting (Gmax), s	18.0	* 70	20.0	41.0	18.0	70.0	20.0	41.0
Max Q Clear Time (g_c+I1), s	3.1	18.7	7.5	16.4	6.1	17.0	6.1	6.8
Green Ext Time (p_c), s	0.0	6.7	0.6	2.6	0.4	5.4	0.4	1.4

Intersection Summary	
HCM 6th Ctrl Delay	26.8
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	935	62	297	884	0	9	0	304	0	0	0
Future Volume (Veh/h)	0	935	62	297	884	0	9	0	304	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	964	64	306	911	0	9	0	313	0	0	0
Pedestrians											1	
Lane Width (ft)											12.0	
Walking Speed (ft/s)											3.5	
Percent Blockage											0	
Right turn flare (veh)									1			1
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	912			1028			2064	2520	514	2006	2552	456
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	912			1028			2064	2520	514	2006	2552	456
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			52			52	100	36	100	100	100
cM capacity (veh/h)	712			642			19	13	493	7	13	537

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	643	385	306	607	304	322	0
Volume Left	0	0	0	306	0	0	9	0
Volume Right	0	0	64	0	0	0	313	0
cSH	1700	1700	1700	642	1700	1700	397	1700
Volume to Capacity	0.00	0.38	0.23	0.48	0.36	0.18	0.81	0.00
Queue Length 95th (ft)	0	0	0	64	0	0	181	0
Control Delay (s)	0.0	0.0	0.0	15.6	0.0	0.0	43.1	0.0
Lane LOS				C			E	A
Approach Delay (s)	0.0			3.9			43.1	0.0
Approach LOS							E	A

Intersection Summary					
Average Delay		7.3			
Intersection Capacity Utilization	57.6%	ICU Level of Service		B	
Analysis Period (min)	15				

Intersection	
Int Delay, s/veh	5.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	935	62	297	884	0	9	0	304	0	0	0
Future Vol, veh/h	0	935	62	297	884	0	9	0	304	0	0	0
Conflicting Peds, #/hr	1	0	0	0	0	1	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	340	-	-	195	-	-	-	-	25	-	-	25
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	0	964	64	306	911	0	9	0	313	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	912	0	0	1028	0	0	2064	2520	514	2006	2552	457
Stage 1	-	-	-	-	-	-	996	996	-	1524	1524	-
Stage 2	-	-	-	-	-	-	1068	1524	-	482	1028	-
Critical Hdwy	4.24	-	-	4.24	-	-	7.64	6.64	7.04	7.64	6.64	7.04
Critical Hdwy Stg 1	-	-	-	-	-	-	6.64	5.64	-	6.64	5.64	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.64	5.64	-	6.64	5.64	-
Follow-up Hdwy	2.27	-	-	2.27	-	-	3.57	4.07	3.37	3.57	4.07	3.37
Pot Cap-1 Maneuver	712	-	-	642	-	-	30	26	493	33	24	537
Stage 1	-	-	-	-	-	-	253	310	-	118	170	-
Stage 2	-	-	-	-	-	-	228	170	-	521	299	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	711	-	-	642	-	-	19	14	493	8	13	536
Mov Cap-2 Maneuver	-	-	-	-	-	-	19	14	-	8	13	-
Stage 1	-	-	-	-	-	-	253	310	-	118	89	-
Stage 2	-	-	-	-	-	-	119	89	-	190	299	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3.9	32.5	0
HCM LOS			D	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	19	493	711	-	-	642	-	-	-	-
HCM Lane V/C Ratio	0.488	0.636	-	-	-	0.477	-	-	-	-
HCM Control Delay (s)	$ 313.6	24.2	0	-	-	15.6	-	-	0	0
HCM Lane LOS	F	C	A	-	-	C	-	-	A	A
HCM 95th %tile Q(veh)	1.4	4.4	0	-	-	2.6	-	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	221	850	837	12	10	334
Future Volume (Veh/h)	221	850	837	12	10	334
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	235	904	890	13	11	355
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	903				1812	445
vC1, stage 1 conf vol					890	
vC2, stage 2 conf vol					922	
vCu, unblocked vol	903				1812	445
tC, single (s)	4.3				7.0	7.1
tC, 2 stage (s)					6.0	
tF (s)	2.3				3.6	3.4
p0 queue free %	66				94	34
cM capacity (veh/h)	701				183	539

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	235	452	452	445	445	13	366
Volume Left	235	0	0	0	0	0	11
Volume Right	0	0	0	0	0	13	355
cSH	701	1700	1700	1700	1700	1700	556
Volume to Capacity	0.34	0.27	0.27	0.26	0.26	0.01	0.66
Queue Length 95th (ft)	37	0	0	0	0	0	120
Control Delay (s)	12.7	0.0	0.0	0.0	0.0	0.0	23.7
Lane LOS	B						C
Approach Delay (s)	2.6			0.0			23.7
Approach LOS							C

Intersection Summary				
Average Delay		4.8		
Intersection Capacity Utilization		50.5%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	221	850	837	12	10	334
Future Vol, veh/h	221	850	837	12	10	334
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	580	-	-	165	0	25
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	235	904	890	13	11	355

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	903	0	-	0	1812	445
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	922	-
Critical Hdwy	4.3	-	-	-	7	7.1
Critical Hdwy Stg 1	-	-	-	-	6	-
Critical Hdwy Stg 2	-	-	-	-	6	-
Follow-up Hdwy	2.3	-	-	-	3.6	3.4
Pot Cap-1 Maneuver	701	-	-	-	64	539
Stage 1	-	-	-	-	343	-
Stage 2	-	-	-	-	329	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	701	-	-	-	43	539
Mov Cap-2 Maneuver	-	-	-	-	181	-
Stage 1	-	-	-	-	228	-
Stage 2	-	-	-	-	329	-

Approach	EB	WB	SB
HCM Control Delay, s	2.6	0	23.8
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	701	-	-	-	181	539
HCM Lane V/C Ratio	0.335	-	-	-	0.059	0.659
HCM Control Delay (s)	12.7	-	-	-	26.1	23.7
HCM Lane LOS	B	-	-	-	D	C
HCM 95th %tile Q(veh)	1.5	-	-	-	0.2	4.8

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	895	10	1	843	0	17	0	4	0	0	1
Future Volume (Veh/h)	0	895	10	1	843	0	17	0	4	0	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	923	10	1	869	0	18	0	4	0	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									1			
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	869			933			1360	1794	462	1334	1804	434
vC1, stage 1 conf vol							923	923		871	871	
vC2, stage 2 conf vol							438	871		464	933	
vCu, unblocked vol	869			933			1360	1794	462	1334	1804	434
tC, single (s)	4.3			4.3			7.7	6.7	7.1	7.7	6.7	7.1
tC, 2 stage (s)							6.7	5.7		6.7	5.7	
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			100			93	100	99	100	100	100
cM capacity (veh/h)	711			670			248	241	521	262	239	543

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	462	462	10	1	579	290	22	1
Volume Left	0	0	0	0	1	0	0	18	0
Volume Right	0	0	0	10	0	0	0	4	1
cSH	1700	1700	1700	1700	670	1700	1700	303	543
Volume to Capacity	0.00	0.27	0.27	0.01	0.00	0.34	0.17	0.07	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	0	6	0
Control Delay (s)	0.0	0.0	0.0	0.0	10.4	0.0	0.0	19.1	11.6
Lane LOS					B			C	B
Approach Delay (s)	0.0				0.0			19.1	11.6
Approach LOS								C	B

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		41.4%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	895	10	1	843	0	17	0	4	0	0	1
Future Vol, veh/h	0	895	10	1	843	0	17	0	4	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	275	305	-	-	-	-	25	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	12	12	12	12	12	12	12	12	12	12	12	12
Mvmt Flow	0	923	10	1	869	0	18	0	4	0	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	869	0	0	933	0	0	1360	1794	462	1333	1804	435
Stage 1	-	-	-	-	-	-	923	923	-	871	871	-
Stage 2	-	-	-	-	-	-	437	871	-	462	933	-
Critical Hdwy	4.34	-	-	4.34	-	-	7.74	6.74	7.14	7.74	6.74	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	6.74	5.74	-	6.74	5.74	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.74	5.74	-	6.74	5.74	-
Follow-up Hdwy	2.32	-	-	2.32	-	-	3.62	4.12	3.42	3.62	4.12	3.42
Pot Cap-1 Maneuver	711	-	-	670	-	-	98	72	520	103	71	542
Stage 1	-	-	-	-	-	-	271	325	-	292	344	-
Stage 2	-	-	-	-	-	-	542	344	-	524	321	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	711	-	-	670	-	-	98	72	520	102	71	542
Mov Cap-2 Maneuver	-	-	-	-	-	-	241	234	-	255	232	-
Stage 1	-	-	-	-	-	-	271	325	-	292	344	-
Stage 2	-	-	-	-	-	-	540	344	-	520	321	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	19.4	11.7
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	241	520	711	-	-	670	-	-	542
HCM Lane V/C Ratio	0.073	0.008	-	-	-	0.002	-	-	0.002
HCM Control Delay (s)	21.1	12	0	-	-	10.4	-	-	11.7
HCM Lane LOS	C	B	A	-	-	B	-	-	B
HCM 95th %tile Q(veh)	0.2	0	0	-	-	0	-	-	0

Intersection has too many lanes per leg.

HCM All-Way analysis is limited to two lanes per leg.
Channelized right turn lanes are not counted.

Intersection	
Intersection Delay, s/veh	72.5
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	63	199	61	279	185	97	49	263	258	29	425	90
Future Vol, veh/h	63	199	61	279	185	97	49	263	258	29	425	90
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	68	214	66	300	199	104	53	283	277	31	457	97
Number of Lanes	1	1	0	1	1	0	1	1	1	0	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	3	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	2	2	2
HCM Control Delay	69.5	83.9	56.6	79.3
HCM LOS	F	F	F	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	100%	0%	12%	0%
Vol Thru, %	0%	100%	0%	0%	77%	0%	66%	88%	70%
Vol Right, %	0%	0%	100%	0%	23%	0%	34%	0%	30%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	49	263	258	63	260	279	282	242	303
LT Vol	49	0	0	63	0	279	0	29	0
Through Vol	0	263	0	0	199	0	185	213	213
RT Vol	0	0	258	0	61	0	97	0	90
Lane Flow Rate	53	283	277	68	280	300	303	260	325
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.176	0.914	0.84	0.245	0.961	1.008	0.954	0.842	1.038
Departure Headway (Hd)	12.485	11.957	11.219	13.434	12.735	12.465	11.686	12.137	11.852
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	289	305	325	269	288	294	312	301	309
Service Time	10.185	9.657	8.919	11.134	10.435	10.165	9.386	9.837	9.552
HCM Lane V/C Ratio	0.183	0.928	0.852	0.253	0.972	1.02	0.971	0.864	1.052
HCM Control Delay	17.8	68.1	52.3	20.4	81.4	92.2	75.6	55.9	98
HCM Lane LOS	C	F	F	C	F	F	F	F	F
HCM 95th-tile Q	0.6	8.7	7.3	0.9	9.4	10.6	9.6	7.2	11.6

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	78	10	2	57	0	10	1	1	0	0	0
Future Volume (Veh/h)	1	78	10	2	57	0	10	1	1	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	1	92	12	2	67	0	12	1	1	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	67			104			171	171	98	172	177	67
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	67			104			171	171	98	172	177	67
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	100	100	100	100	100
cM capacity (veh/h)	1522			1475			787	717	953	783	712	991

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	105	69	14	0
Volume Left	1	2	12	0
Volume Right	12	0	1	0
cSH	1522	1475	791	1700
Volume to Capacity	0.00	0.00	0.02	0.00
Queue Length 95th (ft)	0	0	1	0
Control Delay (s)	0.1	0.2	9.6	0.0
Lane LOS	A	A	A	A
Approach Delay (s)	0.1	0.2	9.6	0.0
Approach LOS			A	A

Intersection Summary				
Average Delay			0.8	
Intersection Capacity Utilization			15.1%	ICU Level of Service
Analysis Period (min)			15	

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	78	10	2	57	0	10	1	1	0	0	0
Future Vol, veh/h	1	78	10	2	57	0	10	1	1	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	1	92	12	2	67	0	12	1	1	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	67	0	0	104	0	0	171	171	98	172	177	67
Stage 1	-	-	-	-	-	-	100	100	-	71	71	-
Stage 2	-	-	-	-	-	-	71	71	-	101	106	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	1522	-	-	1475	-	-	788	718	953	787	713	991
Stage 1	-	-	-	-	-	-	901	808	-	934	832	-
Stage 2	-	-	-	-	-	-	934	832	-	900	804	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1522	-	-	1475	-	-	786	717	953	784	712	991
Mov Cap-2 Maneuver	-	-	-	-	-	-	786	717	-	784	712	-
Stage 1	-	-	-	-	-	-	900	807	-	933	831	-
Stage 2	-	-	-	-	-	-	933	831	-	897	803	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.3	9.6	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	791	1522	-	-	1475	-	-	-
HCM Lane V/C Ratio	0.018	0.001	-	-	0.002	-	-	-
HCM Control Delay (s)	9.6	7.4	0	-	7.4	0	-	0
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	16	472	255	438	563	6	39	281	331	339	91
v/c Ratio	0.14	0.65	0.68	0.54	0.57	0.03	0.21	0.69	0.72	0.73	0.17
Control Delay	51.9	38.5	45.0	24.3	4.6	43.3	45.1	15.0	40.9	41.1	2.4
Queue Delay	0.0	0.0	0.0	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.9	38.5	45.0	25.0	4.8	43.3	45.1	15.0	40.9	41.1	2.4
Queue Length 50th (ft)	9	123	130	158	0	3	20	0	169	174	0
Queue Length 95th (ft)	36	228	266	369	72	17	60	81	349	356	13
Internal Link Dist (ft)		346		307			744			674	
Turn Bay Length (ft)	65		125			140		165	150		185
Base Capacity (vph)	114	1051	573	1040	1112	400	421	576	668	677	695
Starvation Cap Reductn	0	0	9	288	146	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.45	0.45	0.58	0.58	0.01	0.09	0.49	0.50	0.50	0.13

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	413	31	240	412	529	6	37	264	546	84	86
Future Volume (vph)	15	413	31	240	412	529	6	37	264	546	84	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1787	3530		1787	1881	1558	1787	1881	1599	1698	1724	1561
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00
Satd. Flow (perm)	1787	3530		1787	1881	1558	1787	1881	1599	1698	1724	1561
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	16	439	33	255	438	563	6	39	281	581	89	91
RTOR Reduction (vph)	0	5	0	0	0	326	0	0	254	0	0	67
Lane Group Flow (vph)	16	467	0	255	438	237	6	39	27	331	339	24
Confl. Peds. (#/hr)			4			2						2
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	1.7	21.3		18.3	37.9	37.9	8.6	8.6	8.6	23.8	23.8	23.8
Effective Green, g (s)	1.7	21.3		18.3	37.9	37.9	8.6	8.6	8.6	23.8	23.8	23.8
Actuated g/C Ratio	0.02	0.24		0.20	0.42	0.42	0.10	0.10	0.10	0.26	0.26	0.26
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	33	835		363	792	656	170	179	152	449	455	412
v/s Ratio Prot	0.01	0.13		c0.14	c0.23		0.00	c0.02		0.19	c0.20	
v/s Ratio Perm						0.15			0.02			0.02
v/c Ratio	0.48	0.56		0.70	0.55	0.36	0.04	0.22	0.18	0.74	0.75	0.06
Uniform Delay, d1	43.7	30.2		33.3	19.7	17.8	36.9	37.6	37.4	30.2	30.3	24.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.8	0.8		6.0	0.8	0.3	0.1	0.6	0.6	6.2	6.5	0.1
Delay (s)	54.5	31.0		39.4	20.5	18.1	37.0	38.2	38.0	36.5	36.8	24.8
Level of Service	D	C		D	C	B	D	D	D	D	D	C
Approach Delay (s)		31.8			23.3			38.0			35.2	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	29.7	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	61.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	413	31	240	412	529	6	37	264	546	84	86
Future Volume (veh/h)	15	413	31	240	412	529	6	37	264	546	84	86
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	16	439	33	255	438	563	6	39	281	645	0	91
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	32	851	64	294	750	620	335	352	298	775	0	343
Arrive On Green	0.02	0.25	0.25	0.16	0.40	0.40	0.19	0.19	0.19	0.22	0.00	0.22
Sat Flow, veh/h	1795	3375	253	1795	1885	1559	1795	1885	1598	3591	0	1590
Grp Volume(v), veh/h	16	232	240	255	438	563	6	39	281	645	0	91
Grp Sat Flow(s),veh/h/ln	1795	1791	1837	1795	1885	1559	1795	1885	1598	1795	0	1590
Q Serve(g_s), s	0.9	11.0	11.1	13.7	18.1	33.7	0.3	1.7	17.2	17.0	0.0	4.7
Cycle Q Clear(g_c), s	0.9	11.0	11.1	13.7	18.1	33.7	0.3	1.7	17.2	17.0	0.0	4.7
Prop In Lane	1.00		0.14	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	32	451	463	294	750	620	335	352	298	775	0	343
V/C Ratio(X)	0.50	0.51	0.52	0.87	0.58	0.91	0.02	0.11	0.94	0.83	0.00	0.27
Avail Cap(c_a), veh/h	96	451	463	480	869	718	335	352	298	1177	0	521
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	48.2	31.9	31.9	40.4	23.4	28.1	32.9	33.5	39.8	37.2	0.0	32.3
Incr Delay (d2), s/veh	11.3	1.0	1.0	9.1	0.7	14.1	0.0	0.1	37.1	3.2	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	4.9	5.1	6.7	8.0	14.5	0.1	0.8	9.6	7.6	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.5	32.9	32.9	49.5	24.2	42.2	32.9	33.6	76.9	40.4	0.0	32.7
LnGrp LOS	E	C	C	D	C	D	C	C	E	D	A	C
Approach Vol, veh/h		488			1256			326			736	
Approach Delay, s/veh		33.8			37.4			70.9			39.4	
Approach LOS		C			D			E			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	20.8	29.5		25.9	6.3	44.0		23.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	26.5	24.5		32.5	5.3	45.7		18.5				
Max Q Clear Time (g_c+I1), s	15.7	13.1		19.0	2.9	35.7		19.2				
Green Ext Time (p_c), s	0.5	2.2		2.4	0.0	3.7		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			41.2									
HCM 6th LOS			D									

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	89	1213	20	965	253	263	30	438	8	26
v/c Ratio	0.39	0.65	0.14	0.64	0.33	0.62	0.05	0.74	0.02	0.04
Control Delay	42.7	17.2	45.7	22.3	7.0	32.2	21.8	25.2	21.7	0.1
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.7	17.6	45.7	22.3	7.0	32.2	21.8	25.2	21.7	0.1
Queue Length 50th (ft)	40	175	9	193	18	109	10	124	3	0
Queue Length 95th (ft)	107	421	38	351	80	221	33	274	14	0
Internal Link Dist (ft)		307		269			836			575
Turn Bay Length (ft)	120		220		145	130		110	95	
Base Capacity (vph)	336	2399	148	2165	1023	787	1064	970	785	995
Starvation Cap Reductn	0	585	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.67	0.14	0.45	0.25	0.33	0.03	0.45	0.01	0.03

Intersection Summary

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Existing Plus 1293 Unit Project and School PM
9: Paso Robles Street & 13th Street — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	1098	30	19	897	235	245	28	407	7	0	24
Future Volume (vph)	83	1098	30	19	897	235	245	28	407	7	0	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	3557		1787	3574	1564	1787	1881	1599	1787	1599	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.74	1.00	1.00	0.74	1.00	
Satd. Flow (perm)	1787	3557		1787	3574	1564	1393	1881	1599	1388	1599	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	89	1181	32	20	965	253	263	30	438	8	0	26
RTOR Reduction (vph)	0	1	0	0	0	109	0	0	106	0	18	0
Lane Group Flow (vph)	89	1212	0	20	965	144	263	30	332	8	8	0
Confl. Peds. (#/hr)			5									
Confl. Bikes (#/hr)			1			2						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		
Actuated Green, G (s)	7.4	39.4		1.7	33.7	33.7	22.9	22.9	22.9	22.9	22.9	
Effective Green, g (s)	7.4	39.4		1.7	33.7	33.7	22.9	22.9	22.9	22.9	22.9	
Actuated g/C Ratio	0.10	0.51		0.02	0.43	0.43	0.30	0.30	0.30	0.30	0.30	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	170	1808		39	1554	680	411	555	472	410	472	
v/s Ratio Prot	c0.05	c0.34		0.01	0.27			0.02			0.00	
v/s Ratio Perm						0.09	0.19		c0.21	0.01		
v/c Ratio	0.52	0.67		0.51	0.62	0.21	0.64	0.05	0.70	0.02	0.02	
Uniform Delay, d1	33.4	14.2		37.5	17.0	13.6	23.7	19.5	24.3	19.3	19.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.9	1.0		10.9	0.8	0.2	3.3	0.0	4.7	0.0	0.0	
Delay (s)	36.3	15.2		48.4	17.7	13.8	27.0	19.6	29.0	19.4	19.3	
Level of Service	D	B		D	B	B	C	B	C	B	B	
Approach Delay (s)		16.6			17.4			27.9			19.3	
Approach LOS		B			B			C			B	

Intersection Summary				
HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	77.5	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	71.9%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Olsen-Chandler SP — Existing Plus 1293 Unit Project and School PM
9: Paso Robles Street & 13th Street — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	1098	30	19	897	235	245	28	407	7	0	24
Future Volume (veh/h)	83	1098	30	19	897	235	245	28	407	7	0	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	89	1181	32	20	965	0	263	30	438	8	0	26
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	116	1605	43	42	1466		543	609	516	399	0	516
Arrive On Green	0.06	0.45	0.45	0.02	0.41	0.00	0.32	0.32	0.32	0.32	0.00	0.32
Sat Flow, veh/h	1795	3559	96	1795	3582	1598	1396	1885	1598	932	0	1598
Grp Volume(v), veh/h	89	594	619	20	965	0	263	30	438	8	0	26
Grp Sat Flow(s),veh/h/ln	1795	1791	1865	1795	1791	1598	1396	1885	1598	932	0	1598
Q Serve(g_s), s	3.2	18.1	18.1	0.7	14.5	0.0	10.6	0.7	17.0	0.4	0.0	0.7
Cycle Q Clear(g_c), s	3.2	18.1	18.1	0.7	14.5	0.0	11.4	0.7	17.0	1.1	0.0	0.7
Prop In Lane	1.00		0.05	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	116	807	841	42	1466		543	609	516	399	0	516
V/C Ratio(X)	0.77	0.74	0.74	0.48	0.66		0.48	0.05	0.85	0.02	0.00	0.05
Avail Cap(c_a), veh/h	338	1307	1361	149	2237		880	1064	901	624	0	901
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.6	15.0	15.0	32.1	15.9	0.0	19.4	15.5	21.0	15.9	0.0	15.5
Incr Delay (d2), s/veh	10.0	1.3	1.3	8.3	0.5	0.0	0.7	0.0	4.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	6.7	7.0	0.4	5.4	0.0	3.2	0.3	6.2	0.1	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.5	16.3	16.3	40.4	16.4	0.0	20.1	15.5	25.0	15.9	0.0	15.5
LnGrp LOS	D	B	B	D	B		C	B	C	B	A	B
Approach Vol, veh/h		1302			985	A		731			34	
Approach Delay, s/veh		18.0			16.9			22.8			15.6	
Approach LOS		B			B			C			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.0	34.5		26.0	8.8	31.7		26.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.5	48.5		37.5	12.5	41.5		37.5				
Max Q Clear Time (g_c+I1), s	2.7	20.1		3.1	5.2	16.5		19.0				
Green Ext Time (p_c), s	0.0	9.8		0.1	0.1	7.7		2.5				

Intersection Summary			
HCM 6th Ctrl Delay	18.7		
HCM 6th LOS	B		

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	379	1192	63	698	266	214	67	68	517
v/c Ratio	0.64	0.75	0.38	0.58	0.58	0.26	0.14	0.42	0.72
Control Delay	44.2	25.0	53.7	27.7	47.6	35.1	0.6	55.3	25.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.2	25.0	53.7	27.7	47.6	35.1	0.6	55.3	25.9
Queue Length 50th (ft)	113	300	37	173	79	60	0	40	77
Queue Length 95th (ft)	191	459	93	281	147	106	0	100	154
Internal Link Dist (ft)		353		673		608			523
Turn Bay Length (ft)	295		235		140		130	225	
Base Capacity (vph)	846	2092	213	1699	571	1148	605	196	1055
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.57	0.30	0.41	0.47	0.19	0.11	0.35	0.49

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	360	783	350	60	590	73	253	203	64	65	204	287
Future Volume (vph)	360	783	350	60	590	73	253	203	64	65	204	287
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.98		1.00	1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3467	3395		1787	3510		3467	3574	1599	1787	3236	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3467	3395		1787	3510		3467	3574	1599	1787	3236	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	379	824	368	63	621	77	266	214	67	68	215	302
RTOR Reduction (vph)	0	43	0	0	8	0	0	0	52	0	219	0
Lane Group Flow (vph)	379	1149	0	63	690	0	266	214	15	68	298	0
Confl. Peds. (#/hr)			1			1						1
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	16.0	42.5		6.8	33.3		12.4	21.5	21.5	6.7	15.8	
Effective Green, g (s)	16.0	42.5		6.8	33.3		12.4	21.5	21.5	6.7	15.8	
Actuated g/C Ratio	0.17	0.45		0.07	0.35		0.13	0.23	0.23	0.07	0.17	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	580	1510		127	1223		450	804	359	125	535	
v/s Ratio Prot	c0.11	c0.34		0.04	0.20		c0.08	0.06		0.04	c0.09	
v/s Ratio Perm									0.01			
v/c Ratio	0.65	0.76		0.50	0.56		0.59	0.27	0.04	0.54	0.56	
Uniform Delay, d1	37.2	22.2		42.7	25.2		39.2	30.5	28.9	42.9	36.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.6	2.3		3.0	0.6		2.1	0.2	0.0	4.8	1.3	
Delay (s)	39.8	24.6		45.7	25.8		41.2	30.7	29.0	47.7	37.9	
Level of Service	D	C		D	C		D	C	C	D	D	
Approach Delay (s)		28.2			27.5			35.6			39.0	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	31.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	95.5	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	74.3%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	360	783	350	60	590	73	253	203	64	65	204	287
Future Volume (veh/h)	360	783	350	60	590	73	253	203	64	65	204	287
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	379	824	0	63	621	77	266	214	67	68	215	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	552	1411		100	933	115	406	615	274	105	405	
Arrive On Green	0.16	0.39	0.00	0.06	0.29	0.29	0.12	0.17	0.17	0.06	0.11	0.00
Sat Flow, veh/h	3483	3676	0	1795	3202	396	3483	3582	1598	1795	3676	0
Grp Volume(v), veh/h	379	824	0	63	347	351	266	214	67	68	215	0
Grp Sat Flow(s),veh/h/ln	1742	1791	0	1795	1791	1807	1742	1791	1598	1795	1791	0
Q Serve(g_s), s	5.8	10.2	0.0	1.9	9.6	9.6	4.1	3.0	2.0	2.1	3.2	0.0
Cycle Q Clear(g_c), s	5.8	10.2	0.0	1.9	9.6	9.6	4.1	3.0	2.0	2.1	3.2	0.0
Prop In Lane	1.00		0.00	1.00		0.22	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	552	1411		100	522	527	406	615	274	105	405	
V/C Ratio(X)	0.69	0.58		0.63	0.66	0.67	0.65	0.35	0.24	0.65	0.53	
Avail Cap(c_a), veh/h	1333	3412		336	1355	1368	899	1805	805	310	1499	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	22.3	13.4	0.0	26.0	17.5	17.5	23.7	20.5	20.1	25.9	23.5	0.0
Incr Delay (d2), s/veh	1.5	0.4	0.0	6.4	1.5	1.5	1.8	0.3	0.5	6.7	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	3.6	0.0	0.9	3.6	3.7	1.6	1.1	0.7	1.0	1.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.9	13.8	0.0	32.3	19.0	19.0	25.5	20.8	20.6	32.5	24.6	0.0
LnGrp LOS	C	B		C	B	B	C	C	C	C	C	
Approach Vol, veh/h		1203	A		761			547			283	A
Approach Delay, s/veh		17.0			20.1			23.1			26.5	
Approach LOS		B			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.6	26.6	11.1	10.9	13.4	20.9	7.8	14.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	53.5	14.5	23.5	21.5	42.5	9.7	28.3
Max Q Clear Time (g_c+I1), s	3.9	12.2	6.1	5.2	7.8	11.6	4.1	5.0
Green Ext Time (p_c), s	0.1	7.0	0.6	1.1	1.1	4.6	0.0	1.4

Intersection Summary	
HCM 6th Ctrl Delay	20.0
HCM 6th LOS	B

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	58	452	922	587	73
v/c Ratio	0.24	0.26	0.66	0.58	0.14
Control Delay	39.4	11.6	18.1	27.5	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	39.4	11.6	18.1	27.5	9.0
Queue Length 50th (ft)	20	38	113	99	0
Queue Length 95th (ft)	88	152	343	290	40
Internal Link Dist (ft)		1151	2310	505	
Turn Bay Length (ft)	125			120	
Base Capacity (vph)	325	2902	2320	1625	778
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.18	0.16	0.40	0.36	0.09

Intersection Summary

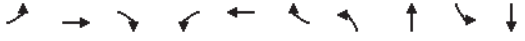
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	56	438	465	430	569	71
Future Volume (vph)	56	438	465	430	569	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.93		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1787	3574	3291		3467	1578
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1787	3574	3291		3467	1578
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	58	452	479	443	587	73
RTOR Reduction (vph)	0	0	133	0	0	53
Lane Group Flow (vph)	58	452	789	0	587	20
Confl. Peds. (#/hr)				4		1
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	NA		Perm	Perm
Protected Phases	5	2	6			
Permitted Phases					4	4
Actuated Green, G (s)	4.5	34.7	25.7		19.3	19.3
Effective Green, g (s)	4.5	34.7	25.7		19.3	19.3
Actuated g/C Ratio	0.06	0.49	0.36		0.27	0.27
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	114	1759	1199		949	431
v/s Ratio Prot	c0.03	0.13	c0.24			
v/s Ratio Perm					c0.17	0.01
v/c Ratio	0.51	0.26	0.66		0.62	0.05
Uniform Delay, d1	31.9	10.4	18.7		22.4	18.8
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.5	0.1	1.3		1.2	0.0
Delay (s)	35.5	10.5	20.0		23.6	18.9
Level of Service	D	B	C		C	B
Approach Delay (s)		13.3	20.0		23.1	
Approach LOS		B	C		C	

Intersection Summary			
HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	70.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Existing Plus 1293 Unit Project and School PM
12: Creston Road & Niblick Road/Sherwood Road — Queues



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	196	568	294	98	471	379	189	472	350	607
v/c Ratio	0.71	1.02	0.44	0.50	0.61	0.59	0.69	0.65	0.96	0.68
Control Delay	49.6	76.9	5.7	46.2	33.5	7.7	48.7	33.8	76.3	30.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.6	76.9	5.7	46.2	33.5	7.7	48.7	33.8	76.3	30.8
Queue Length 50th (ft)	101	~354	0	51	121	0	97	118	~207	149
Queue Length 95th (ft)	#196	#578	60	103	177	73	#185	169	#391	208
Internal Link Dist (ft)		1092			186			1440		2310
Turn Bay Length (ft)	150			170		140	230		245	
Base Capacity (vph)	319	556	671	231	881	674	319	920	363	1004
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.61	1.02	0.44	0.42	0.53	0.56	0.59	0.51	0.96	0.60

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Olsen-Chandler SP — Existing Plus 1293 Unit Project and School PM
12: Creston Road & Niblick Road/Sherwood Road — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	184	534	276	92	443	356	178	375	69	329	429	142
Future Volume (vph)	184	534	276	92	443	356	178	375	69	329	429	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1881	1572	1787	3574	1578	1787	3491		1787	3420	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	1881	1572	1787	3574	1578	1787	3491		1787	3420	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	196	568	294	98	471	379	189	399	73	350	456	151
RTOR Reduction (vph)	0	0	208	0	0	292	0	18	0	0	36	0
Lane Group Flow (vph)	196	568	86	98	471	87	189	454	0	350	571	0
Confl. Peds. (#/hr)			4			1						10
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	12.8	24.4	24.4	7.5	19.1	19.1	12.6	16.7		16.8	20.9	
Effective Green, g (s)	12.8	24.4	24.4	7.5	19.1	19.1	12.6	16.7		16.8	20.9	
Actuated g/C Ratio	0.15	0.29	0.29	0.09	0.23	0.23	0.15	0.20		0.20	0.25	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	274	550	459	160	818	361	269	699		359	857	
v/s Ratio Prot	c0.11	c0.30		0.05	0.13		0.11	0.13		c0.20	c0.17	
v/s Ratio Perm			0.05			0.06						
v/c Ratio	0.72	1.03	0.19	0.61	0.58	0.24	0.70	0.65		0.97	0.67	
Uniform Delay, d1	33.6	29.5	22.1	36.6	28.6	26.2	33.6	30.7		33.1	28.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.6	47.1	0.2	6.8	1.0	0.3	8.1	2.2		40.5	2.0	
Delay (s)	42.1	76.6	22.3	43.3	29.5	26.6	41.7	32.8		73.6	30.1	
Level of Service	D	E	C	D	C	C	D	C		E	C	
Approach Delay (s)		55.1			29.8			35.4			46.0	
Approach LOS		E			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	42.5	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	83.4	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	79.0%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Existing Plus 1293 Unit Project and School PM
12: Creston Road & Niblick Road/Sherwood Road — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	184	534	276	92	443	356	178	375	69	329	429	142
Future Volume (veh/h)	184	534	276	92	443	356	178	375	69	329	429	142
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	196	568	294	98	471	379	189	399	73	350	456	151
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	237	592	499	127	903	402	230	547	99	374	688	226
Arrive On Green	0.13	0.31	0.31	0.07	0.25	0.25	0.13	0.18	0.18	0.21	0.26	0.26
Sat Flow, veh/h	1795	1885	1592	1795	3582	1596	1795	3028	549	1795	2641	867
Grp Volume(v), veh/h	196	568	294	98	471	379	189	235	237	350	308	299
Grp Sat Flow(s),veh/h/ln	1795	1885	1592	1795	1791	1596	1795	1791	1786	1795	1791	1717
Q Serve(g_s), s	8.4	23.5	12.3	4.3	9.0	18.5	8.1	9.8	10.0	15.2	12.2	12.4
Cycle Q Clear(g_c), s	8.4	23.5	12.3	4.3	9.0	18.5	8.1	9.8	10.0	15.2	12.2	12.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.31	1.00		0.50
Lane Grp Cap(c), veh/h	237	592	499	127	903	402	230	324	323	374	467	447
V/C Ratio(X)	0.83	0.96	0.59	0.77	0.52	0.94	0.82	0.73	0.74	0.94	0.66	0.67
Avail Cap(c_a), veh/h	328	592	499	238	903	402	328	474	473	374	519	498
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.5	26.7	22.9	36.2	25.5	29.1	33.7	30.6	30.7	30.9	26.2	26.3
Incr Delay (d2), s/veh	11.6	27.3	1.8	9.6	0.5	30.4	10.6	3.1	3.3	30.9	2.7	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	14.1	4.5	2.1	3.6	9.9	4.1	4.3	4.4	9.4	5.2	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.1	54.0	24.7	45.8	26.1	59.5	44.3	33.7	34.0	61.8	28.8	29.2
LnGrp LOS	D	D	C	D	C	E	D	C	C	E	C	C
Approach Vol, veh/h		1058			948			661			957	
Approach Delay, s/veh		44.2			41.5			36.9			41.0	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.0	18.8	10.1	29.4	14.7	25.2	15.0	24.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.5	21.0	10.5	24.0	14.5	23.0	14.5	20.0
Max Q Clear Time (g_c+I1), s	17.2	12.0	6.3	25.5	10.1	14.4	10.4	20.5
Green Ext Time (p_c), s	0.0	1.8	0.1	0.0	0.2	2.4	0.2	0.0

Intersection Summary			
HCM 6th Ctrl Delay			41.3
HCM 6th LOS			D

Olsen-Chandler SP — Existing Plus 1293 Unit Project and School PM
13: Creston Road & Scott Street — HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	47	66	470	42	100	602
Future Volume (Veh/h)	47	66	470	42	100	602
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	51	71	505	45	108	647
Pedestrians	2					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1392	530			552	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1392	530			552	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	64	87			89	
cM capacity (veh/h)	140	550			1021	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	122	550	108	647
Volume Left	51	0	108	0
Volume Right	71	45	0	0
cSH	248	1700	1021	1700
Volume to Capacity	0.49	0.32	0.11	0.38
Queue Length 95th (ft)	63	0	9	0
Control Delay (s)	32.9	0.0	8.9	0.0
Lane LOS	D		A	
Approach Delay (s)	32.9	0.0	1.3	
Approach LOS	D			

Intersection Summary				
Average Delay		3.5		
Intersection Capacity Utilization		49.5%	ICU Level of Service	A
Analysis Period (min)		15		

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	3.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	47	66	470	42	100	602
Future Vol, veh/h	47	66	470	42	100	602
Conflicting Peds, #/hr	0	0	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	51	71	505	45	108	647

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1393	530	0	0	552	0
Stage 1	530	-	-	-	-	-
Stage 2	863	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.11	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209	-
Pot Cap-1 Maneuver	157	551	-	-	1023	-
Stage 1	592	-	-	-	-	-
Stage 2	415	-	-	-	-	-
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	140	550	-	-	1021	-
Mov Cap-2 Maneuver	140	-	-	-	-	-
Stage 1	591	-	-	-	-	-
Stage 2	371	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	32.7	0	1.3
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	248	1021	-
HCM Lane V/C Ratio	-	-	0.49	0.105	-
HCM Control Delay (s)	-	-	32.7	8.9	-
HCM Lane LOS	-	-	D	A	-
HCM 95th %tile Q(veh)	-	-	2.5	0.4	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	109	4	8	4	1	38	17	266	10	48	332	132
Future Volume (Veh/h)	109	4	8	4	1	38	17	266	10	48	332	132
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Hourly flow rate (vph)	110	4	8	4	1	38	17	269	10	48	335	133
Pedestrians		5									4	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		3.5									3.5	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	782	749	340	749	877	278	473			279		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	782	749	340	749	877	278	473			279		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	61	99	99	99	100	95	98			96		
cM capacity (veh/h)	281	322	701	309	272	760	1089			1289		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	122	43	17	279	48	335	133
Volume Left	110	4	17	0	48	0	0
Volume Right	8	38	0	10	0	0	133
cSH	294	645	1089	1700	1289	1700	1700
Volume to Capacity	0.41	0.07	0.02	0.16	0.04	0.20	0.08
Queue Length 95th (ft)	49	5	1	0	3	0	0
Control Delay (s)	25.6	11.0	8.4	0.0	7.9	0.0	0.0
Lane LOS	D	B	A		A		
Approach Delay (s)	25.6	11.0	0.5		0.7		
Approach LOS	D	B					

Intersection Summary				
Average Delay	4.2			
Intersection Capacity Utilization	44.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	109	4	8	4	1	38	17	266	10	48	332	132
Future Vol, veh/h	109	4	8	4	1	38	17	266	10	48	332	132
Conflicting Peds, #/hr	4	0	0	0	0	4	5	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	30	-	-	70	-	60
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	99	99	99	99	99	99	99	99	99	99	99	99
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	110	4	8	4	1	38	17	269	10	48	335	133

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	768	749	340	812	877	278	473	0	0	279	0	0
Stage 1	436	436	-	308	308	-	-	-	-	-	-	-
Stage 2	332	313	-	504	569	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	320	342	705	299	288	763	1094	-	-	1289	-	-
Stage 1	601	582	-	704	662	-	-	-	-	-	-	-
Stage 2	684	659	-	552	507	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	288	323	702	281	272	760	1089	-	-	1289	-	-
Mov Cap-2 Maneuver	288	323	-	281	272	-	-	-	-	-	-	-
Stage 1	589	558	-	693	651	-	-	-	-	-	-	-
Stage 2	636	648	-	522	486	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	24.9	11.1	0.5	0.7
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1089	-	-	301	633	1289	-	-
HCM Lane V/C Ratio	0.016	-	-	0.406	0.069	0.038	-	-
HCM Control Delay (s)	8.4	-	-	24.9	11.1	7.9	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.9	0.2	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	8	2	3	126	3	97	7	190	200	165	165	12
Future Volume (vph)	8	2	3	126	3	97	7	190	200	165	165	12
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	9	2	3	135	3	104	8	204	215	177	177	13

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	14	242	212	215	266	102
Volume Left (vph)	9	135	8	0	177	0
Volume Right (vph)	3	104	0	215	0	13
Hadj (s)	0.02	-0.13	0.04	-0.68	0.35	-0.07
Departure Headway (s)	6.3	5.6	5.8	5.1	6.2	5.7
Degree Utilization, x	0.02	0.38	0.34	0.30	0.45	0.16
Capacity (veh/h)	490	596	597	679	563	601
Control Delay (s)	9.5	12.0	10.6	9.1	13.0	8.6
Approach Delay (s)	9.5	12.0	9.8		11.8	
Approach LOS	A	B	A		B	

Intersection Summary				
Delay	11.0			
Level of Service	B			
Intersection Capacity Utilization	45.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	11.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Vol, veh/h	8	2	3	126	3	97	0	7	190	200	165	165
Future Vol, veh/h	8	2	3	126	3	97	0	7	190	200	165	165
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	1	1	1	1	1	1	2	1	1	1	1	1
Mvmt Flow	9	2	3	135	3	104	0	8	204	215	177	177
Number of Lanes	0	1	0	0	1	0	0	0	1	1	0	2

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	9.6	12.2	10.8	12.8
HCM LOS	A	B	B	B

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	4%	0%	62%	56%	67%	0%
Vol Thru, %	96%	0%	15%	1%	33%	87%
Vol Right, %	0%	100%	23%	43%	0%	13%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	197	200	13	226	248	95
LT Vol	7	0	8	126	165	0
Through Vol	190	0	2	3	83	83
RT Vol	0	200	3	97	0	12
Lane Flow Rate	212	215	14	243	266	102
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.342	0.304	0.025	0.383	0.455	0.162
Departure Headway (Hd)	5.816	5.089	6.358	5.668	6.158	5.73
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	619	705	562	634	585	626
Service Time	3.551	2.823	4.414	3.704	3.894	3.466
HCM Lane V/C Ratio	0.342	0.305	0.025	0.383	0.455	0.163
HCM Control Delay	11.6	10	9.6	12.2	14	9.6
HCM Lane LOS	B	A	A	B	B	A
HCM 95th-tile Q	1.5	1.3	0.1	1.8	2.4	0.6

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBR
Lane Configurations	
Traffic Vol, veh/h	12
Future Vol, veh/h	12
Peak Hour Factor	0.93
Heavy Vehicles, %	1
Mvmt Flow	13
Number of Lanes	0

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	256	120	66	144	110	172
Future Volume (Veh/h)	256	120	66	144	110	172
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	264	124	68	148	113	177
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	323	113	290			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	323	113	290			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	57	87	95			
cM capacity (veh/h)	614	922	1276			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	388	68	74	74	113	177
Volume Left	264	68	0	0	0	0
Volume Right	124	0	0	0	0	177
cSH	902	1276	1700	1700	1700	1700
Volume to Capacity	0.43	0.05	0.04	0.04	0.07	0.10
Queue Length 95th (ft)	55	4	0	0	0	0
Control Delay (s)	13.4	8.0	0.0	0.0	0.0	0.0
Lane LOS	B	A				
Approach Delay (s)	13.4	2.5			0.0	
Approach LOS	B					

Intersection Summary			
Average Delay		6.4	
Intersection Capacity Utilization		31.2%	ICU Level of Service A
Analysis Period (min)		15	

Intersection	
Int Delay, s/veh	6.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	256	120	66	144	110	172
Future Vol, veh/h	256	120	66	144	110	172
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	145	105	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	264	124	68	148	113	177

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	323	113	290	0	-	0
Stage 1	113	-	-	-	-	-
Stage 2	210	-	-	-	-	-
Critical Hdwy	6.615	6.215	4.115	-	-	-
Critical Hdwy Stg 1	5.415	-	-	-	-	-
Critical Hdwy Stg 2	5.815	-	-	-	-	-
Follow-up Hdwy	3.5095	3.3095	2.2095	-	-	-
Pot Cap-1 Maneuver	661	942	1277	-	-	-
Stage 1	914	-	-	-	-	-
Stage 2	808	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	626	942	1277	-	-	-
Mov Cap-2 Maneuver	626	-	-	-	-	-
Stage 1	866	-	-	-	-	-
Stage 2	808	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.1	2.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1277	-	626	942	-	-
HCM Lane V/C Ratio	0.053	-	0.422	0.131	-	-
HCM Control Delay (s)	8	-	14.9	9.4	-	-
HCM Lane LOS	A	-	B	A	-	-
HCM 95th %tile Q(veh)	0.2	-	2.1	0.5	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	0	67	0	127	14	0	0	0	0	283	34
Future Volume (Veh/h)	27	0	67	0	127	14	0	0	0	0	283	34
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	32	0	80	0	151	17	0	0	0	0	337	40
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	441	357	357	437	377	0	377			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	441	357	357	437	377	0	377			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	100	88	100	73	98	100			100		
cM capacity (veh/h)	411	571	689	470	556	1088	1187			1630		

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	112	168	377
Volume Left	32	0	0
Volume Right	80	17	40
cSH	578	602	1700
Volume to Capacity	0.19	0.28	0.22
Queue Length 95th (ft)	18	28	0
Control Delay (s)	12.7	13.3	0.0
Lane LOS	B	B	
Approach Delay (s)	12.7	13.3	0.0
Approach LOS	B	B	

Intersection Summary					
Average Delay		5.6			
Intersection Capacity Utilization	39.3%	ICU Level of Service		A	
Analysis Period (min)		15			

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	0	67	0	127	14	0	0	0	0	283	34
Future Vol, veh/h	27	0	67	0	127	14	0	0	0	0	283	34
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	32	0	80	0	151	17	0	0	0	0	337	40

Major/Minor	Minor2			Minor1						Major2		
Conflicting Flow All	441	357	357	397	377	0				-	-	0
Stage 1	357	357	-	0	0	-				-	-	-
Stage 2	84	0	-	397	377	-				-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21				-	-	-
Critical Hdwy Stg 1	6.11	5.51	-	-	-	-				-	-	-
Critical Hdwy Stg 2	-	-	-	6.11	5.51	-				-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309				-	-	-
Pot Cap-1 Maneuver	528	571	689	565	556	-				0	-	-
Stage 1	663	630	-	-	-	-				0	-	-
Stage 2	-	-	-	631	618	-				0	-	-
Platoon blocked, %											-	-
Mov Cap-1 Maneuver	-	571	689	499	556	-				-	-	-
Mov Cap-2 Maneuver	-	571	-	499	556	-				-	-	-
Stage 1	663	630	-	-	-	-				-	-	-
Stage 2	-	-	-	558	618	-				-	-	-

Approach	EB	WB	SB
HCM Control Delay, s			0
HCM LOS	-	-	

Minor Lane/Major Mvmt	EBLn1	WBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	-	556	-	-	-
HCM Lane V/C Ratio	-	0.272	-	-	-
HCM Control Delay (s)	-	13.9	-	-	-
HCM Lane LOS	-	B	-	-	-
HCM 95th %tile Q(veh)	-	1.1	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	47	393	678	191	416	96	354	1080	565	300
v/c Ratio	0.17	0.71	0.63	0.33	0.41	0.55	0.67	0.80	0.75	0.32
Control Delay	50.8	55.3	41.4	37.2	3.0	69.4	58.5	20.4	53.2	35.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.8	55.3	41.4	37.2	3.0	69.4	58.5	20.4	53.2	35.7
Queue Length 50th (ft)	34	153	240	118	6	77	148	187	227	98
Queue Length 95th (ft)	79	234	368	220	56	149	221	294	319	150
Internal Link Dist (ft)		521		1372			611			680
Turn Bay Length (ft)	115		515		115	165		290	305	
Base Capacity (vph)	366	722	1209	656	1122	242	845	1464	1026	1389
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.54	0.56	0.29	0.37	0.40	0.42	0.74	0.55	0.22

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	288	93	658	185	404	93	343	1048	548	236	55
Future Volume (vph)	46	288	93	658	185	404	93	343	1048	548	236	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.95	0.88	0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	3431		3467	1881	1585	1787	3574	2814	3467	3472	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	3431		3467	1881	1585	1787	3574	2814	3467	3472	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	47	297	96	678	191	416	96	354	1080	565	243	57
RTOR Reduction (vph)	0	21	0	0	0	187	0	0	64	0	15	0
Lane Group Flow (vph)	47	372	0	678	191	229	96	354	1016	565	285	0
Confl. Peds. (#/hr)						2						
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	19.1	19.1		37.9	37.9	64.5	12.0	18.1	56.0	26.6	32.7	
Effective Green, g (s)	19.1	19.1		37.9	37.9	64.5	12.0	18.1	56.0	26.6	32.7	
Actuated g/C Ratio	0.16	0.16		0.31	0.31	0.53	0.10	0.15	0.46	0.22	0.27	
Clearance Time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	279	536		1075	583	836	175	529	1289	754	929	
v/s Ratio Prot	0.03	c0.11		0.20	0.10	0.06	0.05	0.10	c0.24	c0.16	0.08	
v/s Ratio Perm						0.08			0.12			
v/c Ratio	0.17	0.69		0.63	0.33	0.27	0.55	0.67	0.79	0.75	0.31	
Uniform Delay, d1	44.7	48.8		36.1	32.4	15.9	52.5	49.2	28.1	44.7	35.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	3.9		1.2	0.3	0.2	3.5	3.2	3.3	4.1	0.2	
Delay (s)	45.0	52.7		37.4	32.7	16.1	56.0	52.4	31.3	48.8	35.9	
Level of Service	D	D		D	C	B	E	D	C	D	D	
Approach Delay (s)		51.8			29.8			37.8			44.3	
Approach LOS		D			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	38.2	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	122.2	Sum of lost time (s)	20.5	
Intersection Capacity Utilization	75.5%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Existing Plus 1293 Unit Project and School PM
18: US 101 Ramps/Spring Street & 1st Street/Niblick Road — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	288	93	658	185	404	93	343	1048	548	236	55
Future Volume (veh/h)	46	288	93	658	185	404	93	343	1048	548	236	55
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	47	297	96	678	191	416	96	354	1080	565	243	57
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	255	379	120	887	480	709	121	857	1389	661	1018	234
Arrive On Green	0.14	0.14	0.14	0.25	0.25	0.25	0.07	0.24	0.24	0.19	0.35	0.35
Sat Flow, veh/h	1795	2666	843	3483	1885	1594	1795	3582	2812	3483	2891	665
Grp Volume(v), veh/h	47	197	196	678	191	416	96	354	1080	565	149	151
Grp Sat Flow(s),veh/h/ln	1795	1791	1718	1742	1885	1594	1795	1791	1406	1742	1791	1765
Q Serve(g_s), s	2.7	12.5	13.0	21.2	9.9	23.1	6.2	9.8	28.2	18.5	6.9	7.1
Cycle Q Clear(g_c), s	2.7	12.5	13.0	21.2	9.9	23.1	6.2	9.8	28.2	18.5	6.9	7.1
Prop In Lane	1.00		0.49	1.00		1.00	1.00		1.00	1.00		0.38
Lane Grp Cap(c), veh/h	255	255	244	887	480	709	121	857	1389	661	631	622
V/C Ratio(X)	0.18	0.78	0.80	0.76	0.40	0.59	0.79	0.41	0.78	0.85	0.24	0.24
Avail Cap(c_a), veh/h	372	371	356	1230	666	866	247	857	1389	1044	719	709
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.5	48.7	48.9	40.6	36.4	24.6	54.1	37.8	22.2	46.2	27.0	27.0
Incr Delay (d2), s/veh	0.3	6.1	8.0	1.9	0.5	0.8	10.9	0.3	2.9	4.2	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	6.1	6.1	9.1	4.5	8.5	3.1	4.2	16.3	8.4	3.0	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.9	54.8	56.9	42.6	37.0	25.4	65.0	38.1	25.1	50.4	27.1	27.2
LnGrp LOS	D	D	E	D	D	C	E	D	C	D	C	C
Approach Vol, veh/h		440			1285			1530			865	
Approach Delay, s/veh		54.7			36.2			30.6			42.3	
Approach LOS		D			D			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	27.1	34.0		21.4	13.8	47.3		35.4				
Change Period (Y+Rc), s	* 4.7	5.8		4.6	5.8	* 5.8		5.4				
Max Green Setting (Gmax), s	* 35	28.2		24.4	16.2	* 47		41.6				
Max Q Clear Time (g_c+I1), s	20.5	30.2		15.0	8.2	9.1		25.1				
Green Ext Time (p_c), s	1.9	0.0		1.8	0.1	1.9		4.9				

Intersection Summary			
HCM 6th Ctrl Delay		37.4	
HCM 6th LOS		D	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Olsen-Chandler SP — Existing Plus 1293 Unit Project and School PM
19: S. River Road & Niblick Road — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	252	984	525	121	878	367	336	201	503
v/c Ratio	0.59	0.78	0.59	0.59	0.73	0.68	0.48	0.72	0.72
Control Delay	50.8	36.1	6.5	58.9	34.0	49.6	36.1	58.8	43.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.8	36.1	6.5	58.9	34.0	49.6	36.1	58.8	43.3
Queue Length 50th (ft)	86	305	12	81	258	125	98	133	163
Queue Length 95th (ft)	139	450	105	154	390	191	149	#243	231
Internal Link Dist (ft)		1510			1609		962		896
Turn Bay Length (ft)	140			80		150		110	
Base Capacity (vph)	540	1456	946	260	1398	680	977	350	973
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.68	0.55	0.47	0.63	0.54	0.34	0.57	0.52

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
19: S. River Road & Niblick Road

Existing Plus 1293 Unit Project and School PM
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	242	945	504	116	696	147	352	238	84	193	361	122
Future Volume (vph)	242	945	504	116	696	147	352	238	84	193	361	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.96		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3467	3574	1599	1787	3472		3467	3434		1787	3426	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3467	3574	1599	1787	3472		3467	3434		1787	3426	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	252	984	525	121	725	153	367	248	88	201	376	127
RTOR Reduction (vph)	0	0	321	0	14	0	0	31	0	0	29	0
Lane Group Flow (vph)	252	984	204	121	864	0	367	305	0	201	474	0
Confl. Peds. (#/hr)						2						3
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	12.7	36.1	36.1	11.8	35.2		16.0	20.0		16.1	20.1	
Effective Green, g (s)	12.7	36.1	36.1	11.8	35.2		16.0	20.0		16.1	20.1	
Actuated g/C Ratio	0.12	0.35	0.35	0.12	0.35		0.16	0.20		0.16	0.20	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	431	1264	565	206	1198		543	673		282	675	
v/s Ratio Prot	c0.07	c0.28		0.07	0.25		c0.11	c0.09		0.11	c0.14	
v/s Ratio Perm			0.13									
v/c Ratio	0.58	0.78	0.36	0.59	0.72		0.68	0.45		0.71	0.70	
Uniform Delay, d1	42.2	29.4	24.4	42.8	29.1		40.6	36.2		40.8	38.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.0	3.1	0.4	4.2	2.2		3.3	0.5		8.2	3.3	
Delay (s)	44.2	32.5	24.8	47.0	31.3		43.9	36.7		49.0	41.5	
Level of Service	D	C	C	D	C		D	D		D	D	
Approach Delay (s)		31.9			33.2			40.4			43.6	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	35.6	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	102.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	72.4%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Olsen-Chandler SP
19: S. River Road & Niblick Road

Existing Plus 1293 Unit Project and School PM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	242	945	504	116	696	147	352	238	84	193	361	122
Future Volume (veh/h)	242	945	504	116	696	147	352	238	84	193	361	122
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	252	984	525	121	725	153	367	248	88	201	376	127
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	348	1313	586	155	1038	219	475	509	176	244	512	170
Arrive On Green	0.10	0.37	0.37	0.09	0.35	0.35	0.14	0.19	0.19	0.14	0.19	0.19
Sat Flow, veh/h	3483	3582	1598	1795	2942	621	3483	2611	903	1795	2635	878
Grp Volume(v), veh/h	252	984	525	121	441	437	367	168	168	201	254	249
Grp Sat Flow(s),veh/h/ln	1742	1791	1598	1795	1791	1772	1742	1791	1723	1795	1791	1722
Q Serve(g_s), s	5.8	19.9	15.8	5.5	17.6	17.6	8.4	6.9	7.2	9.0	11.0	11.3
Cycle Q Clear(g_c), s	5.8	19.9	15.8	5.5	17.6	17.6	8.4	6.9	7.2	9.0	11.0	11.3
Prop In Lane	1.00		1.00	1.00		0.35	1.00		0.52	1.00		0.51
Lane Grp Cap(c), veh/h	348	1313	586	155	632	625	475	349	336	244	348	334
V/C Ratio(X)	0.72	0.75	0.90	0.78	0.70	0.70	0.77	0.48	0.50	0.82	0.73	0.74
Avail Cap(c_a), veh/h	650	1747	779	314	852	843	818	593	571	422	593	570
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.3	23.0	9.3	37.2	23.1	23.1	34.6	29.7	29.8	34.9	31.4	31.5
Incr Delay (d2), s/veh	2.9	1.3	10.6	8.3	1.6	1.6	2.7	1.0	1.2	6.9	3.0	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	7.9	6.1	2.7	7.1	7.0	3.6	2.9	2.9	4.2	4.8	4.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.1	24.2	20.0	45.5	24.7	24.7	37.3	30.7	31.0	41.8	34.4	34.8
LnGrp LOS	D	C	B	D	C	C	D	C	C	D	C	C
Approach Vol, veh/h		1761			999			703			704	
Approach Delay, s/veh		25.1			27.2			34.2			36.7	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.7	34.9	15.8	20.6	12.8	33.8	15.8	20.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	14.5	40.5	19.5	27.5	15.5	39.5	19.5	27.5
Max Q Clear Time (g_c+I1), s	7.5	21.9	10.4	13.3	7.8	19.6	11.0	9.2
Green Ext Time (p_c), s	0.1	8.5	0.9	2.4	0.5	5.3	0.3	1.7

Intersection Summary	
HCM 6th Ctrl Delay	29.1
HCM 6th LOS	C

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	816	196	24	626	247	20
v/c Ratio	0.78	0.21	0.12	0.31	0.60	0.05
Control Delay	18.9	2.3	10.0	8.1	25.8	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.9	2.3	10.0	8.1	25.8	8.3
Queue Length 50th (ft)	177	0	3	48	79	0
Queue Length 95th (ft)	#556	30	20	123	134	13
Internal Link Dist (ft)	1629			570	669	
Turn Bay Length (ft)			75			50
Base Capacity (vph)	1097	990	215	2085	889	807
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.74	0.20	0.11	0.30	0.28	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	726	174	21	557	220	18
Future Volume (vph)	726	174	21	557	220	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1827	1519	1735	3471	1732	1553
Flt Permitted	1.00	1.00	0.20	1.00	0.95	1.00
Satd. Flow (perm)	1827	1519	359	3471	1732	1553
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	816	196	24	626	247	20
RTOR Reduction (vph)	0	83	0	0	0	14
Lane Group Flow (vph)	816	113	24	626	247	6
Confl. Peds. (#/hr)		2	2		3	
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type	NA	Perm	Perm	NA	Perm	Prot
Protected Phases	2			6		8
Permitted Phases		2	6		8	
Actuated Green, G (s)	33.6	33.6	33.6	33.6	14.0	14.0
Effective Green, g (s)	33.6	33.6	33.6	33.6	14.0	14.0
Actuated g/C Ratio	0.58	0.58	0.58	0.58	0.24	0.24
Clearance Time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	1051	873	206	1997	415	372
v/s Ratio Prot	c0.45			0.18		0.00
v/s Ratio Perm		0.07	0.07		c0.14	
v/c Ratio	0.78	0.13	0.12	0.31	0.60	0.01
Uniform Delay, d1	9.5	5.7	5.6	6.4	19.7	16.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.3	0.0	0.1	0.0	1.5	0.0
Delay (s)	12.9	5.7	5.7	6.5	21.2	16.9
Level of Service	B	A	A	A	C	B
Approach Delay (s)	11.5			6.4	20.9	
Approach LOS	B			A	C	

Intersection Summary				
HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	58.4	Sum of lost time (s)	10.8	
Intersection Capacity Utilization	59.4%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Existing Plus 1293 Unit Project and School PM
20: Commerce Way & Sherwood Road — HCM 6th Signalized Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	726	174	21	557	220	18
Future Volume (veh/h)	726	174	21	557	220	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	816	196	24	626	247	20
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	976	826	270	1855	339	302
Arrive On Green	0.53	0.53	0.53	0.53	0.19	0.19
Sat Flow, veh/h	1841	1557	548	3589	1753	1560
Grp Volume(v), veh/h	816	196	24	626	247	20
Grp Sat Flow(s),veh/h/ln	1841	1557	548	1749	1753	1560
Q Serve(g_s), s	14.6	2.6	1.5	4.0	5.2	0.4
Cycle Q Clear(g_c), s	14.6	2.6	16.1	4.0	5.2	0.4
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	976	826	270	1855	339	302
V/C Ratio(X)	0.84	0.24	0.09	0.34	0.73	0.07
Avail Cap(c_a), veh/h	1629	1378	464	3095	1327	1181
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.7	4.9	14.5	5.2	14.8	12.9
Incr Delay (d2), s/veh	0.8	0.1	0.1	0.0	1.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.4	0.1	0.7	1.7	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.5	5.0	14.6	5.3	15.9	12.9
LnGrp LOS	A	A	B	A	B	B
Approach Vol, veh/h	1012			650	267	
Approach Delay, s/veh	7.8			5.6	15.7	
Approach LOS	A			A	B	

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	26.1				26.1	13.0
Change Period (Y+Rc), s	5.4				5.4	5.4
Max Green Setting (Gmax), s	34.6				34.6	29.6
Max Q Clear Time (g_c+I1), s	16.6				18.1	7.2
Green Ext Time (p_c), s	3.7				2.6	0.3

Intersection Summary			
HCM 6th Ctrl Delay		8.2	
HCM 6th LOS		A	

Olsen-Chandler SP — Existing Plus 1293 Unit Project and School PM
21: Fontana Road & Sherwood Road — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	681	63	11	470	0	108	0	11	0	0	0
Future Volume (Veh/h)	0	681	63	11	470	0	108	0	11	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	740	68	12	511	0	117	0	12	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									4			
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		650										
pX, platoon unblocked				0.62			0.62	0.62	0.62	0.62	0.62	
vC, conflicting volume	511			808			1054	1309	774	1315	1343	256
vC1, stage 1 conf vol							774	774		535	535	
vC2, stage 2 conf vol							280	535		780	808	
vCu, unblocked vol	511			379			777	1191	324	1200	1246	256
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			68	100	97	100	100	100
cM capacity (veh/h)	1050			726			371	326	415	302	307	744

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	808	268	256	129	0
Volume Left	0	12	0	117	0
Volume Right	68	0	0	12	0
cSH	1050	726	1700	409	1700
Volume to Capacity	0.00	0.02	0.15	0.32	0.00
Queue Length 95th (ft)	0	1	0	33	0
Control Delay (s)	0.0	0.6	0.0	18.6	0.0
Lane LOS		A		C	A
Approach Delay (s)	0.0	0.3		18.6	0.0
Approach LOS				C	A

Intersection Summary					
Average Delay		1.8			
Intersection Capacity Utilization		52.3%	ICU Level of Service		A
Analysis Period (min)		15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	681	63	11	470	0	108	0	11	0	0	0
Future Vol, veh/h	0	681	63	11	470	0	108	0	11	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	740	68	12	511	0	117	0	12	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	511	0	0	808	0	0	1054	1309	774	1315	1343	256
Stage 1	-	-	-	-	-	-	774	774	-	535	535	-
Stage 2	-	-	-	-	-	-	280	535	-	780	808	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.23	7.33	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.519	4.019	3.319
Pot Cap-1 Maneuver	1052	-	-	815	-	-	192	159	398	125	151	744
Stage 1	-	-	-	-	-	-	390	407	-	498	523	-
Stage 2	-	-	-	-	-	-	704	523	-	387	393	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1052	-	-	815	-	-	189	156	398	119	148	744
Mov Cap-2 Maneuver	-	-	-	-	-	-	350	333	-	298	317	-
Stage 1	-	-	-	-	-	-	390	407	-	498	512	-
Stage 2	-	-	-	-	-	-	689	512	-	375	393	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.3	19.8	0
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	350	398	1052	-	-	815	-	-	-
HCM Lane V/C Ratio	0.335	0.03	-	-	-	0.015	-	-	-
HCM Control Delay (s)	20.4	14.3	0	-	-	9.5	0.1	-	0
HCM Lane LOS	C	B	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	1.4	0.1	0	-	-	0	-	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Traffic Volume (veh/h)	83	303	190	21	187	9	124	12	19	6	12	52
Future Volume (veh/h)	83	303	190	21	187	9	124	12	19	6	12	52
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	90	329	207	23	203	10	135	13	21	7	13	57
Approach Volume (veh/h)		626			236			169			77	
Crossing Volume (veh/h)		43			238			426			361	
High Capacity (veh/h)		1339			1149			990			1043	
High v/c (veh/h)		0.47			0.21			0.17			0.07	
Low Capacity (veh/h)		1120			948			805			852	
Low v/c (veh/h)		0.56			0.25			0.21			0.09	

Intersection Summary				
Maximum v/c High	0.47			
Maximum v/c Low	0.56			
Intersection Capacity Utilization	69.0%	ICU Level of Service		C

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	6.8
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	626	236	169	77
Demand Flow Rate, veh/h	639	240	172	78
Vehicles Circulating, veh/h	43	243	435	368
Vehicles Exiting, veh/h	403	364	247	115
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	7.8	5.5	6.1	4.6
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	639	240	172	78
Cap Entry Lane, veh/h	1321	1077	885	948
Entry HV Adj Factor	0.980	0.983	0.981	0.984
Flow Entry, veh/h	626	236	169	77
Cap Entry, veh/h	1295	1059	869	933
V/C Ratio	0.484	0.223	0.194	0.082
Control Delay, s/veh	7.8	5.5	6.1	4.6
LOS	A	A	A	A
95th %tile Queue, veh	3	1	1	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	23	26	17	1	19	20	9	91	3	23	110	13
Future Volume (vph)	23	26	17	1	19	20	9	91	3	23	110	13
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	28	31	20	1	23	24	11	110	4	28	133	16

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	79	48	125	177
Volume Left (vph)	28	1	11	28
Volume Right (vph)	20	24	4	16
Hadj (s)	-0.06	-0.28	0.02	-0.01
Departure Headway (s)	4.6	4.4	4.4	4.3
Degree Utilization, x	0.10	0.06	0.15	0.21
Capacity (veh/h)	726	749	781	794
Control Delay (s)	8.1	7.7	8.2	8.5
Approach Delay (s)	8.1	7.7	8.2	8.5
Approach LOS	A	A	A	A

Intersection Summary			
Delay	8.2		
Level of Service	A		
Intersection Capacity Utilization	30.1%	ICU Level of Service	A
Analysis Period (min)	15		

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	23	26	17	1	19	20	9	91	3	23	110	13
Future Vol, veh/h	23	26	17	1	19	20	9	91	3	23	110	13
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	28	31	20	1	23	24	11	110	4	28	133	16
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.1	7.7	8.2	8.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	9%	35%	3%	16%
Vol Thru, %	88%	39%	47%	75%
Vol Right, %	3%	26%	50%	9%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	103	66	40	146
LT Vol	9	23	1	23
Through Vol	91	26	19	110
RT Vol	3	17	20	13
Lane Flow Rate	124	80	48	176
Geometry Grp	1	1	1	1
Degree of Util (X)	0.152	0.101	0.059	0.211
Departure Headway (Hd)	4.4	4.56	4.39	4.324
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	817	787	817	832
Service Time	2.418	2.581	2.412	2.343
HCM Lane V/C Ratio	0.152	0.102	0.059	0.212
HCM Control Delay	8.2	8.1	7.7	8.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.5	0.3	0.2	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	145	0	1	93	2	0	15	1	0	10	31
Future Volume (Veh/h)	67	145	0	1	93	2	0	15	1	0	10	31
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Hourly flow rate (vph)	92	199	0	1	127	3	0	21	1	0	14	42
Pedestrians								6				
Lane Width (ft)								12.0				
Walking Speed (ft/s)								3.5				
Percent Blockage								1				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	130			205			568	521	205	525	520	128
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	130			205			568	521	205	525	520	128
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			100	95	100	100	97	95
cM capacity (veh/h)	1462			1365			381	430	833	423	430	924

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	291	131	22	0	56
Volume Left	92	1	0	0	0
Volume Right	0	3	1	0	42
cSH	1462	1365	439	1700	718
Volume to Capacity	0.06	0.00	0.05	0.00	0.08
Queue Length 95th (ft)	5	0	4	0	6
Control Delay (s)	2.8	0.1	13.6	0.0	10.4
Lane LOS	A	A	B	A	B
Approach Delay (s)	2.8	0.1	13.6	10.4	
Approach LOS			B	B	

Intersection Summary				
Average Delay	3.4			
Intersection Capacity Utilization	28.0%	ICU Level of Service		A
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↰	↕	
Traffic Vol, veh/h	67	145	0	1	93	2	0	15	1	0	10	31
Future Vol, veh/h	67	145	0	1	93	2	0	15	1	0	10	31
Conflicting Peds, #/hr	0	0	6	6	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	73	73	73	73	73	73	73	73	73	73	73	73
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	92	199	0	1	127	3	0	21	1	0	14	42

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	130	0	0	205	0	0	548	521	205	525	520	129
Stage 1	-	-	-	-	-	-	389	389	-	131	131	-
Stage 2	-	-	-	-	-	-	159	132	-	394	389	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	1462	-	-	1372	-	-	449	461	838	465	462	924
Stage 1	-	-	-	-	-	-	637	610	-	875	790	-
Stage 2	-	-	-	-	-	-	846	789	-	633	610	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1462	-	-	1364	-	-	393	426	833	423	426	924
Mov Cap-2 Maneuver	-	-	-	-	-	-	393	426	-	423	426	-
Stage 1	-	-	-	-	-	-	589	563	-	813	789	-
Stage 2	-	-	-	-	-	-	792	788	-	566	563	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.4	0.1	13.6	10.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	439	1462	-	-	1364	-	-	-	719
HCM Lane V/C Ratio	0.05	0.063	-	-	0.001	-	-	-	0.078
HCM Control Delay (s)	13.6	7.6	0	-	7.6	0	-	0	10.4
HCM Lane LOS	B	A	A	-	A	A	-	A	B
HCM 95th %tile Q(veh)	0.2	0.2	-	-	0	-	-	-	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Right Turn Channelized						
Traffic Volume (veh/h)	9	102	96	6	144	140
Future Volume (veh/h)	9	102	96	6	144	140
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	111	104	7	157	152
Approach Volume (veh/h)	121		111			309
Crossing Volume (veh/h)	104		157			10
High Capacity (veh/h)	1277		1225			1374
High v/c (veh/h)	0.09		0.09			0.22
Low Capacity (veh/h)	1063		1016			1151
Low v/c (veh/h)	0.11		0.11			0.27

Intersection Summary				
Maximum v/c High		0.22		
Maximum v/c Low		0.27		
Intersection Capacity Utilization		35.5%	ICU Level of Service	A

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	4.3
Intersection LOS	A

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	121	111	309
Demand Flow Rate, veh/h	123	113	315
Vehicles Circulating, veh/h	106	160	10
Vehicles Exiting, veh/h	167	165	219
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.8	3.9	4.6
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	123	113	315
Cap Entry Lane, veh/h	1238	1172	1366
Entry HV Adj Factor	0.984	0.982	0.981
Flow Entry, veh/h	121	111	309
Cap Entry, veh/h	1218	1151	1340
V/C Ratio	0.099	0.096	0.231
Control Delay, s/veh	3.8	3.9	4.6
LOS	A	A	A
95th %tile Queue, veh	0	0	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	6	71	79	5	3	6
Future Volume (Veh/h)	6	71	79	5	3	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	8	95	105	7	4	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	112				220	108
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	112				220	108
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	99
cM capacity (veh/h)	1465				760	940

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	103	112	12
Volume Left	8	0	4
Volume Right	0	7	8
cSH	1465	1700	871
Volume to Capacity	0.01	0.07	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.6	0.0	9.2
Lane LOS	A		A
Approach Delay (s)	0.6	0.0	9.2
Approach LOS			A

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	18.7%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	71	79	5	3	6
Future Vol, veh/h	6	71	79	5	3	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	8	95	105	7	4	8

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	112	0	-	0	220	109
Stage 1	-	-	-	-	109	-
Stage 2	-	-	-	-	111	-
Critical Hdwy	4.14	-	-	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	2.236	-	-	-	3.536	3.336
Pot Cap-1 Maneuver	1465	-	-	-	764	939
Stage 1	-	-	-	-	911	-
Stage 2	-	-	-	-	909	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1465	-	-	-	759	939
Mov Cap-2 Maneuver	-	-	-	-	759	-
Stage 1	-	-	-	-	906	-
Stage 2	-	-	-	-	909	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1465	-	-	-	870
HCM Lane V/C Ratio	0.005	-	-	-	0.014
HCM Control Delay (s)	7.5	0	-	-	9.2
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Existing Plus 1293-Unit and School Project (Mitigated)

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	705	27	259	891	0	5	0	238	0	0	0
Future Vol, veh/h	1	705	27	259	891	0	5	0	238	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	340	-	-	195	-	-	-	-	-	-	-	25
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	11	11	11	11	11	11	11	11	11	11	11	11
Mvmt Flow	1	860	33	316	1087	0	6	0	290	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1087	0	0	893	0	0	2055	-	447	2151	2614	544
Stage 1	-	-	-	-	-	-	879	-	-	1719	1719	-
Stage 2	-	-	-	-	-	-	1176	-	-	432	895	-
Critical Hdwy	4.32	-	-	4.32	-	-	7.72	-	7.12	7.72	6.72	7.12
Critical Hdwy Stg 1	-	-	-	-	-	-	6.72	-	-	6.72	5.72	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.72	-	-	6.72	5.72	-
Follow-up Hdwy	2.31	-	-	2.31	-	-	3.61	-	3.41	3.61	4.11	3.41
Pot Cap-1 Maneuver	587	-	-	701	-	-	29	0	535	24	21	461
Stage 1	-	-	-	-	-	-	291	0	-	85	130	-
Stage 2	-	-	-	-	-	-	189	0	-	549	337	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	587	-	-	701	-	-	19	-	535	7	12	461
Mov Cap-2 Maneuver	-	-	-	-	-	-	19	-	-	7	12	-
Stage 1	-	-	-	-	-	-	290	-	-	85	71	-
Stage 2	-	-	-	-	-	-	104	-	-	251	336	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3.2	19.4	0
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	535	587	-	-	701	-	-	-	-
HCM Lane V/C Ratio	0.543	0.002	-	-	0.451	-	-	-	-
HCM Control Delay (s)	19.4	11.1	-	-	14.3	-	-	0	0
HCM Lane LOS	C	B	-	-	B	-	-	A	A
HCM 95th %tile Q(veh)	3.2	0	-	-	2.3	-	-	-	-

Intersection	
Intersection Delay, s/veh	18.5
Intersection LOS	C

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	361	519	770	487
Demand Flow Rate, veh/h	371	535	793	501
Vehicles Circulating, veh/h	766	641	303	502
Vehicles Exiting, veh/h	237	455	834	674
Ped Vol Crossing Leg, #/h	0	0	3	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	16.8	22.4	19.4	14.1
Approach LOS	C	C	C	B

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	371	535	793	501
Cap Entry Lane, veh/h	632	718	1013	827
Entry HV Adj Factor	0.973	0.971	0.971	0.971
Flow Entry, veh/h	361	519	770	487
Cap Entry, veh/h	614	697	983	803
V/C Ratio	0.587	0.745	0.783	0.606
Control Delay, s/veh	16.8	22.4	19.4	14.1
LOS	C	C	C	B
95th %tile Queue, veh	4	7	8	4

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1	354	373	440	691	7	22	151	307	306	35
v/c Ratio	0.01	0.36	0.86	0.43	0.47	0.07	0.20	0.29	0.71	0.70	0.07
Control Delay	41.0	29.6	54.1	23.6	1.1	42.7	45.8	7.4	41.0	40.0	0.2
Queue Delay	0.0	0.0	0.2	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.0	29.6	54.4	24.3	1.2	42.7	45.8	7.4	41.0	40.0	0.2
Queue Length 50th (ft)	1	100	236	232	0	4	12	11	160	157	0
Queue Length 95th (ft)	5	122	#323	263	0	17	35	44	#262	253	0
Internal Link Dist (ft)		346		307			744			674	
Turn Bay Length (ft)	65		125			140		165	150		185
Base Capacity (vph)	100	1086	468	1028	1467	105	111	559	450	459	541
Starvation Cap Reductn	0	0	4	295	165	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.33	0.80	0.60	0.53	0.07	0.20	0.27	0.68	0.67	0.06

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	273	28	317	374	587	6	19	128	434	87	30
Future Volume (veh/h)	1	273	28	317	374	587	6	19	128	434	87	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	1	321	33	373	440	691	7	22	151	584	0	35
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	2	1047	107	404	1024	1177	96	101	444	696	0	306
Arrive On Green	0.00	0.32	0.32	0.38	0.92	0.92	0.05	0.05	0.05	0.20	0.00	0.20
Sat Flow, veh/h	1767	3225	329	1767	1856	1572	1767	1856	1564	3534	0	1553
Grp Volume(v), veh/h	1	174	180	373	440	691	7	22	151	584	0	35
Grp Sat Flow(s),veh/h/ln	1767	1763	1791	1767	1856	1572	1767	1856	1564	1767	0	1553
Q Serve(g_s), s	0.1	6.8	6.9	18.5	2.8	6.7	0.3	1.0	5.0	14.6	0.0	1.7
Cycle Q Clear(g_c), s	0.1	6.8	6.9	18.5	2.8	6.7	0.3	1.0	5.0	14.6	0.0	1.7
Prop In Lane	1.00		0.18	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	2	572	582	404	1024	1177	96	101	444	696	0	306
V/C Ratio(X)	0.41	0.30	0.31	0.92	0.43	0.59	0.07	0.22	0.34	0.84	0.00	0.11
Avail Cap(c_a), veh/h	96	572	582	471	1024	1177	96	101	444	849	0	373
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.66	0.66	0.66	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	45.9	23.3	23.3	27.7	1.7	0.7	41.3	41.6	26.2	35.6	0.0	30.4
Incr Delay (d2), s/veh	85.3	1.4	1.4	16.3	0.2	0.5	0.3	1.1	0.5	6.4	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	3.0	3.1	8.1	0.7	1.3	0.2	0.5	2.6	6.7	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	131.2	24.6	24.7	44.0	1.9	1.2	41.6	42.7	26.6	41.9	0.0	30.5
LnGrp LOS	F	C	C	D	A	A	D	D	C	D	A	C
Approach Vol, veh/h		355			1504			180			619	
Approach Delay, s/veh		25.0			12.0			29.2			41.3	
Approach LOS		C			B			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	25.5	34.4		22.6	4.6	55.3		9.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	24.5	22.4		22.1	5.0	41.9		5.0				
Max Q Clear Time (g_c+I1), s	20.5	8.9		16.6	2.1	8.7		7.0				
Green Ext Time (p_c), s	0.5	1.8		1.2	0.0	6.6		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	21.7
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	76	954	56	1319	415	251	14	273	6	9
v/c Ratio	0.50	0.51	0.25	0.67	0.42	0.80	0.03	0.50	0.02	0.02
Control Delay	57.5	21.0	37.4	18.1	5.0	52.6	25.6	8.7	25.4	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.0
Total Delay	57.5	21.1	37.4	18.1	5.0	54.8	25.6	8.7	25.4	0.0
Queue Length 50th (ft)	47	208	26	304	29	135	6	12	3	0
Queue Length 95th (ft)	m77	222	58	326	59	186	18	50	11	0
Internal Link Dist (ft)		307		269			836			575
Turn Bay Length (ft)	120		220		145	130		110	95	
Base Capacity (vph)	164	2069	237	1973	998	369	491	598	367	573
Starvation Cap Reductn	0	112	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	42	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.49	0.24	0.67	0.42	0.77	0.03	0.46	0.02	0.02

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	717	46	45	1055	332	201	11	218	5	0	7
Future Volume (veh/h)	61	717	46	45	1055	332	201	11	218	5	0	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	76	896	58	56	1319	0	251	14	272	6	0	9
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	97	1047	68	584	2070		367	392	332	301	0	332
Arrive On Green	0.11	0.62	0.62	0.33	0.59	0.00	0.21	0.21	0.21	0.21	0.00	0.21
Sat Flow, veh/h	1767	3359	217	1767	3526	1572	1395	1856	1572	1085	0	1572
Grp Volume(v), veh/h	76	470	484	56	1319	0	251	14	272	6	0	9
Grp Sat Flow(s),veh/h/ln	1767	1763	1814	1767	1763	1572	1395	1856	1572	1085	0	1572
Q Serve(g_s), s	3.9	19.8	19.8	2.0	22.7	0.0	16.0	0.6	15.2	0.4	0.0	0.4
Cycle Q Clear(g_c), s	3.9	19.8	19.8	2.0	22.7	0.0	16.4	0.6	15.2	1.0	0.0	0.4
Prop In Lane	1.00		0.12	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	97	549	565	584	2070		367	392	332	301	0	332
V/C Ratio(X)	0.78	0.86	0.86	0.10	0.64		0.68	0.04	0.82	0.02	0.00	0.03
Avail Cap(c_a), veh/h	163	897	923	584	2070		443	494	419	361	0	419
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.87	0.87	0.87	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	40.4	15.7	15.7	21.3	12.5	0.0	35.3	28.8	34.6	29.2	0.0	28.8
Incr Delay (d2), s/veh	11.4	14.0	13.6	0.1	1.5	0.0	3.3	0.0	9.8	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	6.6	6.7	0.8	8.5	0.0	5.6	0.2	6.5	0.1	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.8	29.6	29.3	21.4	14.0	0.0	38.6	28.9	44.4	29.2	0.0	28.8
LnGrp LOS	D	C	C	C	B		D	C	D	C	A	C
Approach Vol, veh/h		1030			1375	A		537			15	
Approach Delay, s/veh		31.1			14.3			41.3			29.0	
Approach LOS		C			B			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	34.9	33.2		23.9	9.5	58.5		23.9				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	7.2	46.8		24.5	8.5	45.5		24.5				
Max Q Clear Time (g_c+I1), s	4.0	21.8		3.0	5.9	24.7		18.4				
Green Ext Time (p_c), s	0.0	6.8		0.0	0.0	10.3		1.0				

Intersection Summary

HCM 6th Ctrl Delay	25.2
HCM 6th LOS	C

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	129	338	143	56	610	454	268	568	277	321	341
v/c Ratio	0.68	0.51	0.22	0.37	0.64	0.63	0.78	0.67	0.58	0.49	0.75
Control Delay	56.8	25.9	5.3	44.8	28.9	8.2	49.4	31.4	38.6	31.9	24.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.8	25.9	5.3	44.8	28.9	8.2	49.4	31.4	38.6	31.9	24.1
Queue Length 50th (ft)	63	144	0	27	138	14	125	133	67	76	60
Queue Length 95th (ft)	#166	248	40	69	208	96	#279	201	117	122	164
Internal Link Dist (ft)		1092			186			1440		2310	
Turn Bay Length (ft)	150			170		140	230		245		25
Base Capacity (vph)	195	702	670	165	1241	813	379	1091	562	919	553
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.48	0.21	0.34	0.49	0.56	0.71	0.52	0.49	0.35	0.62

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	116	304	129	50	549	409	241	470	41	249	289	307
Future Volume (veh/h)	116	304	129	50	549	409	241	470	41	249	289	307
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	129	338	143	56	610	454	268	522	46	277	321	341
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	160	658	553	75	1080	478	304	963	85	360	800	351
Arrive On Green	0.09	0.35	0.35	0.04	0.31	0.31	0.17	0.29	0.29	0.10	0.23	0.23
Sat Flow, veh/h	1767	1856	1561	1767	3526	1559	1767	3277	288	3428	3526	1548
Grp Volume(v), veh/h	129	338	143	56	610	454	268	280	288	277	321	341
Grp Sat Flow(s),veh/h/ln	1767	1856	1561	1767	1763	1559	1767	1763	1802	1714	1763	1548
Q Serve(g_s), s	6.3	12.7	5.7	2.8	12.8	25.1	13.0	11.8	11.8	6.9	6.8	19.2
Cycle Q Clear(g_c), s	6.3	12.7	5.7	2.8	12.8	25.1	13.0	11.8	11.8	6.9	6.8	19.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.16	1.00		1.00
Lane Grp Cap(c), veh/h	160	658	553	75	1080	478	304	518	530	360	800	351
V/C Ratio(X)	0.81	0.51	0.26	0.75	0.56	0.95	0.88	0.54	0.54	0.77	0.40	0.97
Avail Cap(c_a), veh/h	170	658	553	144	1080	478	331	518	530	490	800	351
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.3	22.4	20.2	41.7	25.6	29.9	35.6	26.1	26.1	38.4	29.0	33.8
Incr Delay (d2), s/veh	23.1	0.7	0.2	13.8	0.7	29.0	22.0	1.1	1.1	5.1	0.3	40.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	5.3	2.0	1.4	5.1	12.6	7.3	4.9	5.0	3.1	2.8	10.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.4	23.1	20.5	55.5	26.3	58.9	57.6	27.3	27.3	43.5	29.3	73.9
LnGrp LOS	E	C	C	E	C	E	E	C	C	D	C	E
Approach Vol, veh/h		610			1120			836			939	
Approach Delay, s/veh		30.8			41.0			37.0			49.7	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.8	30.4	8.2	35.7	19.6	24.5	12.5	31.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	12.6	23.9	7.2	28.3	16.5	20.0	8.5	27.0
Max Q Clear Time (g_c+I1), s	8.9	13.8	4.8	14.7	15.0	21.2	8.3	27.1
Green Ext Time (p_c), s	0.3	2.4	0.0	2.0	0.1	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	40.6
HCM 6th LOS	D

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	115	717	254	138	1103	320	617	378	323	436
v/c Ratio	0.57	0.70	0.26	0.99	1.01	0.48	0.72	0.58	0.78	0.67
Control Delay	53.8	33.6	1.7	116.4	62.1	8.1	34.7	33.9	45.5	31.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.8	33.6	1.7	116.4	62.1	8.1	34.7	33.9	45.5	31.6
Queue Length 50th (ft)	30	176	2	74	~308	14	154	92	159	88
Queue Length 95th (ft)	#76	#304	22	#222	#575	84	221	140	279	148
Internal Link Dist (ft)		1510			1609			962		896
Turn Bay Length (ft)	140			80			150		110	
Base Capacity (vph)	203	1020	1070	140	1091	672	1135	1117	566	1139
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.70	0.24	0.99	1.01	0.48	0.54	0.34	0.57	0.38

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	624	221	120	960	278	537	276	53	281	245	134
Future Volume (veh/h)	100	624	221	120	960	278	537	276	53	281	245	134
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	115	717	254	138	1103	320	617	317	61	323	282	154
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	197	1051	813	148	1142	505	751	566	107	372	407	216
Arrive On Green	0.06	0.30	0.30	0.08	0.32	0.32	0.22	0.19	0.19	0.21	0.18	0.18
Sat Flow, veh/h	3456	3554	1585	1781	3554	1570	3456	2975	565	1781	2242	1191
Grp Volume(v), veh/h	115	717	254	138	1103	320	617	188	190	323	222	214
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1781	1777	1570	1728	1777	1763	1781	1777	1656
Q Serve(g_s), s	2.6	14.4	2.1	6.2	24.7	14.0	13.8	7.7	7.9	14.2	9.4	9.8
Cycle Q Clear(g_c), s	2.6	14.4	2.1	6.2	24.7	14.0	13.8	7.7	7.9	14.2	9.4	9.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.32	1.00		0.72
Lane Grp Cap(c), veh/h	197	1051	813	148	1142	505	751	338	335	372	323	301
V/C Ratio(X)	0.58	0.68	0.31	0.94	0.97	0.63	0.82	0.56	0.57	0.87	0.69	0.71
Avail Cap(c_a), veh/h	214	1068	820	148	1142	505	1154	593	589	595	593	553
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.2	25.1	3.6	36.9	27.0	23.4	30.2	29.7	29.7	30.9	30.9	31.1
Incr Delay (d2), s/veh	3.4	1.8	0.2	54.9	18.9	2.6	2.9	1.4	1.5	8.0	2.6	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	5.9	0.6	4.8	12.5	5.1	5.7	3.3	3.3	6.5	4.0	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.6	26.9	3.9	91.8	45.9	26.0	33.1	31.1	31.3	38.9	33.5	34.2
LnGrp LOS	D	C	A	F	D	C	C	C	C	D	C	C
Approach Vol, veh/h		1086			1561			995			759	
Approach Delay, s/veh		23.0			45.9			32.3			36.0	
Approach LOS		C			D			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.2	28.4	22.1	19.2	9.1	30.5	21.4	19.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.7	24.3	27.0	27.0	5.0	26.0	27.0	27.0
Max Q Clear Time (g_c+I1), s	8.2	16.4	15.8	11.8	4.6	26.7	16.2	9.9
Green Ext Time (p_c), s	0.0	3.4	1.8	2.1	0.0	0.0	0.7	1.9

Intersection Summary	
HCM 6th Ctrl Delay	35.5
HCM 6th LOS	D

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	935	62	297	884	0	9	0	304	0	0	0
Future Vol, veh/h	0	935	62	297	884	0	9	0	304	0	0	0
Conflicting Peds, #/hr	1	0	0	0	0	1	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	340	-	-	195	-	-	-	-	-	-	-	25
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	0	964	64	306	911	0	9	0	313	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	912	0	0	1028	0	0	2064	-	514	2006	2552	457
Stage 1	-	-	-	-	-	-	996	-	-	1524	1524	-
Stage 2	-	-	-	-	-	-	1068	-	-	482	1028	-
Critical Hdwy	4.24	-	-	4.24	-	-	7.64	-	7.04	7.64	6.64	7.04
Critical Hdwy Stg 1	-	-	-	-	-	-	6.64	-	-	6.64	5.64	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.64	-	-	6.64	5.64	-
Follow-up Hdwy	2.27	-	-	2.27	-	-	3.57	-	3.37	3.57	4.07	3.37
Pot Cap-1 Maneuver	712	-	-	642	-	-	30	0	493	33	24	537
Stage 1	-	-	-	-	-	-	253	0	-	118	170	-
Stage 2	-	-	-	-	-	-	228	0	-	521	299	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	711	-	-	642	-	-	19	-	493	8	13	536
Mov Cap-2 Maneuver	-	-	-	-	-	-	19	-	-	8	13	-
Stage 1	-	-	-	-	-	-	253	-	-	118	89	-
Stage 2	-	-	-	-	-	-	119	-	-	190	299	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3.9	24.2	0
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	493	711	-	-	642	-	-	-	-
HCM Lane V/C Ratio	0.636	-	-	-	0.477	-	-	-	-
HCM Control Delay (s)	24.2	0	-	-	15.6	-	-	0	0
HCM Lane LOS	C	A	-	-	C	-	-	A	A
HCM 95th %tile Q(veh)	4.4	0	-	-	2.6	-	-	-	-

Intersection	
Intersection Delay, s/veh	16.3
Intersection LOS	C

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	348	603	613	585
Demand Flow Rate, veh/h	352	609	620	591
Vehicles Circulating, veh/h	796	409	316	558
Vehicles Exiting, veh/h	353	527	832	460
Ped Vol Crossing Leg, #/h	1	1	1	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	16.5	15.1	12.5	21.4
Approach LOS	C	C	B	C

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	352	609	620	591
Cap Entry Lane, veh/h	613	909	1000	781
Entry HV Adj Factor	0.988	0.990	0.989	0.991
Flow Entry, veh/h	348	603	613	585
Cap Entry, veh/h	605	900	989	774
V/C Ratio	0.575	0.670	0.620	0.757
Control Delay, s/veh	16.5	15.1	12.5	21.4
LOS	C	C	B	C
95th %tile Queue, veh	4	5	4	7

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	16	472	255	438	563	6	39	281	331	339	91
v/c Ratio	0.14	0.43	0.73	0.44	0.41	0.05	0.31	0.58	0.76	0.77	0.16
Control Delay	38.3	24.9	45.2	15.6	1.3	36.3	42.8	13.4	39.4	39.8	0.6
Queue Delay	0.0	0.0	0.0	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.3	24.9	45.2	16.1	1.4	36.3	42.8	13.4	39.4	39.8	0.6
Queue Length 50th (ft)	8	111	115	137	0	3	19	26	156	160	0
Queue Length 95th (ft)	27	146	#257	271	25	15	49	82	#263	#278	0
Internal Link Dist (ft)		346		307			744			674	
Turn Bay Length (ft)	65		125			140		165	150		185
Base Capacity (vph)	115	1185	349	1005	1376	118	125	481	466	473	577
Starvation Cap Reductn	0	0	0	234	105	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.40	0.73	0.57	0.44	0.05	0.31	0.58	0.71	0.72	0.16

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	413	31	240	412	529	6	37	264	546	84	86
Future Volume (veh/h)	15	413	31	240	412	529	6	37	264	546	84	86
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	16	439	33	255	438	563	6	39	281	645	0	91
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	34	613	46	563	898	1091	112	118	600	782	0	346
Arrive On Green	0.02	0.18	0.18	0.31	0.48	0.48	0.06	0.06	0.06	0.22	0.00	0.22
Sat Flow, veh/h	1795	3375	253	1795	1885	1560	1795	1885	1598	3591	0	1590
Grp Volume(v), veh/h	16	232	240	255	438	563	6	39	281	645	0	91
Grp Sat Flow(s),veh/h/ln	1795	1791	1836	1795	1885	1560	1795	1885	1598	1795	0	1590
Q Serve(g_s), s	0.7	9.8	9.8	9.1	12.7	13.8	0.3	1.6	0.0	13.7	0.0	3.8
Cycle Q Clear(g_c), s	0.7	9.8	9.8	9.1	12.7	13.8	0.3	1.6	0.0	13.7	0.0	3.8
Prop In Lane	1.00		0.14	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	34	325	333	563	898	1091	112	118	600	782	0	346
V/C Ratio(X)	0.48	0.71	0.72	0.45	0.49	0.52	0.05	0.33	0.47	0.83	0.00	0.26
Avail Cap(c_a), veh/h	112	504	516	563	898	1091	112	118	600	987	0	437
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.77	0.77	0.77	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	38.9	30.8	30.8	22.0	14.3	5.9	35.3	35.9	18.9	29.8	0.0	26.0
Incr Delay (d2), s/veh	10.1	12.6	12.6	0.4	0.3	0.3	0.2	1.6	0.6	4.7	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	5.3	5.4	3.7	5.1	7.8	0.1	0.8	3.8	6.1	0.0	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.0	43.4	43.4	22.4	14.6	6.2	35.5	37.5	19.5	34.5	0.0	26.4
LnGrp LOS	D	D	D	C	B	A	D	D	B	C	A	C
Approach Vol, veh/h		488			1256			326			736	
Approach Delay, s/veh		43.6			12.4			21.9			33.5	
Approach LOS		D			B			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	29.6	19.0		21.9	6.0	42.6		9.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	25.5	22.5		22.0	5.0	30.0		5.0				
Max Q Clear Time (g_c+I1), s	11.1	11.8		15.7	2.7	15.8		3.6				
Green Ext Time (p_c), s	0.1	2.2		1.6	0.0	4.5		0.2				

Intersection Summary	
HCM 6th Ctrl Delay	24.5
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.
User approved changes to right turn type.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	89	1213	20	965	253	263	30	438	8	26
v/c Ratio	0.48	0.57	0.14	0.56	0.29	0.75	0.06	0.80	0.02	0.04
Control Delay	39.1	11.6	33.2	16.3	3.0	38.3	18.8	25.2	18.1	0.1
Queue Delay	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.1	12.1	33.2	16.3	3.0	38.3	18.8	25.2	18.1	0.1
Queue Length 50th (ft)	37	154	8	172	0	100	9	92	3	0
Queue Length 95th (ft)	79	297	28	233	39	#180	27	#207	12	0
Internal Link Dist (ft)		307		269			836			575
Turn Bay Length (ft)	120		220		145	130		110	95	
Base Capacity (vph)	193	2116	138	1728	887	404	546	603	403	671
Starvation Cap Reductn	0	450	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.73	0.14	0.56	0.29	0.65	0.05	0.73	0.02	0.04

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	1098	30	19	897	235	245	28	407	7	0	24
Future Volume (veh/h)	83	1098	30	19	897	235	245	28	407	7	0	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	89	1181	32	20	965	0	263	30	438	8	0	26
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	115	1418	38	208	1613		495	552	468	365	0	468
Arrive On Green	0.06	0.40	0.40	0.12	0.45	0.00	0.29	0.29	0.29	0.29	0.00	0.29
Sat Flow, veh/h	1795	3559	96	1795	3582	1598	1396	1885	1598	932	0	1598
Grp Volume(v), veh/h	89	594	619	20	965	0	263	30	438	8	0	26
Grp Sat Flow(s),veh/h/ln	1795	1791	1865	1795	1791	1598	1396	1885	1598	932	0	1598
Q Serve(g_s), s	3.4	20.9	20.9	0.7	14.2	0.0	11.7	0.8	18.7	0.4	0.0	0.8
Cycle Q Clear(g_c), s	3.4	20.9	20.9	0.7	14.2	0.0	12.5	0.8	18.7	1.2	0.0	0.8
Prop In Lane	1.00		0.05	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	115	713	743	208	1613		495	552	468	365	0	468
V/C Ratio(X)	0.77	0.83	0.83	0.10	0.60		0.53	0.05	0.94	0.02	0.00	0.06
Avail Cap(c_a), veh/h	192	806	839	208	1613		495	552	468	365	0	468
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.80	0.80	0.80	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.3	19.0	19.0	27.7	14.5	0.0	22.3	17.8	24.1	18.2	0.0	17.8
Incr Delay (d2), s/veh	8.5	9.0	8.7	0.2	1.6	0.0	1.1	0.0	26.4	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	9.6	10.0	0.3	5.5	0.0	3.7	0.3	9.8	0.1	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.8	27.9	27.7	27.9	16.1	0.0	23.4	17.8	50.5	18.3	0.0	17.8
LnGrp LOS	D	C	C	C	B		C	B	D	B	A	B
Approach Vol, veh/h		1302			985	A		731			34	
Approach Delay, s/veh		28.7			16.4			39.4			17.9	
Approach LOS		C			B			D			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.6	32.4		25.0	9.0	36.0		25.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.0	31.5		20.5	7.5	29.0		20.5				
Max Q Clear Time (g_c+I1), s	2.7	22.9		3.2	5.4	16.2		20.7				
Green Ext Time (p_c), s	0.0	5.0		0.1	0.0	5.5		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	27.2
HCM 6th LOS	C

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	196	568	294	98	471	379	189	472	350	456	151
v/c Ratio	0.75	0.82	0.38	0.59	0.48	0.53	0.73	0.64	0.73	0.64	0.33
Control Delay	54.7	36.3	4.3	55.3	26.3	5.9	53.3	32.8	45.8	35.1	5.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.7	36.3	4.3	55.3	26.3	5.9	53.3	32.8	45.8	35.1	5.0
Queue Length 50th (ft)	105	278	0	53	107	0	101	119	96	122	0
Queue Length 95th (ft)	#220	#479	52	#126	158	63	#209	169	#165	172	32
Internal Link Dist (ft)		1092			186			1440		2310	
Turn Bay Length (ft)	150			170		140	230		245		25
Base Capacity (vph)	285	766	814	173	1233	792	285	953	509	913	533
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.74	0.36	0.57	0.38	0.48	0.66	0.50	0.69	0.50	0.28

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	184	534	276	92	443	356	178	375	69	329	429	142
Future Volume (veh/h)	184	534	276	92	443	356	178	375	69	329	429	142
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	196	568	294	98	471	379	189	399	73	350	456	151
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	240	675	570	126	1056	470	232	570	103	453	676	297
Arrive On Green	0.13	0.36	0.36	0.07	0.29	0.29	0.13	0.19	0.19	0.13	0.19	0.19
Sat Flow, veh/h	1795	1885	1592	1795	3582	1596	1795	3028	549	3483	3582	1572
Grp Volume(v), veh/h	196	568	294	98	471	379	189	235	237	350	456	151
Grp Sat Flow(s),veh/h/ln	1795	1885	1592	1795	1791	1596	1795	1791	1786	1742	1791	1572
Q Serve(g_s), s	7.5	19.7	10.3	3.8	7.6	15.6	7.3	8.7	8.8	6.9	8.4	6.1
Cycle Q Clear(g_c), s	7.5	19.7	10.3	3.8	7.6	15.6	7.3	8.7	8.8	6.9	8.4	6.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.31	1.00		1.00
Lane Grp Cap(c), veh/h	240	675	570	126	1056	470	232	337	336	453	676	297
V/C Ratio(X)	0.82	0.84	0.52	0.78	0.45	0.81	0.81	0.70	0.71	0.77	0.67	0.51
Avail Cap(c_a), veh/h	316	847	715	192	1362	607	316	530	528	564	1009	443
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.9	21.0	18.0	32.5	20.3	23.2	30.1	26.9	27.0	29.9	26.8	25.8
Incr Delay (d2), s/veh	11.9	6.3	0.7	10.4	0.3	6.1	11.0	2.6	2.7	5.2	1.2	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	8.8	3.5	1.9	2.9	6.0	3.7	3.7	3.8	3.1	3.5	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.8	27.3	18.7	42.8	20.6	29.3	41.1	29.5	29.7	35.1	28.0	27.2
LnGrp LOS	D	C	B	D	C	C	D	C	C	D	C	C
Approach Vol, veh/h		1058			948			661			957	
Approach Delay, s/veh		27.6			26.4			32.9			30.4	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.7	17.9	9.5	29.9	13.7	17.9	14.0	25.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.5	21.0	7.6	31.9	12.5	20.0	12.5	27.0
Max Q Clear Time (g_c+I1), s	9.7	10.8	5.8	21.7	9.3	10.4	9.5	17.6
Green Ext Time (p_c), s	0.3	1.9	0.0	3.3	0.1	2.4	0.1	3.0

Intersection Summary	
HCM 6th Ctrl Delay	29.0
HCM 6th LOS	C

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	252	984	525	121	725	153	367	336	201	503
v/c Ratio	0.94	0.87	0.59	0.88	0.64	0.25	0.56	0.44	0.61	0.68
Control Delay	85.2	39.9	9.0	94.8	30.3	6.1	35.1	27.5	40.9	34.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.2	39.9	9.0	94.8	30.3	6.1	35.1	27.5	40.9	34.0
Queue Length 50th (ft)	68	248	65	63	166	0	90	68	98	117
Queue Length 95th (ft)	#181	#509	175	#205	305	49	150	125	180	191
Internal Link Dist (ft)		1510			1609			962		896
Turn Bay Length (ft)	140			80			150		110	
Base Capacity (vph)	267	1125	1043	137	1125	601	1042	1132	573	1196
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.94	0.87	0.50	0.88	0.64	0.25	0.35	0.30	0.35	0.42

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	242	945	504	116	696	147	352	238	84	193	361	122
Future Volume (veh/h)	242	945	504	116	696	147	352	238	84	193	361	122
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	252	984	525	121	725	153	367	248	88	201	376	127
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	303	1181	755	153	1175	523	497	529	183	254	531	177
Arrive On Green	0.09	0.33	0.33	0.09	0.33	0.33	0.14	0.20	0.20	0.14	0.20	0.20
Sat Flow, veh/h	3483	3582	1598	1795	3582	1595	3483	2611	903	1795	2635	878
Grp Volume(v), veh/h	252	984	525	121	725	153	367	168	168	201	254	249
Grp Sat Flow(s),veh/h/ln	1742	1791	1598	1795	1791	1595	1742	1791	1723	1795	1791	1722
Q Serve(g_s), s	5.3	19.0	5.3	4.9	12.7	5.3	7.5	6.2	6.4	8.1	9.9	10.1
Cycle Q Clear(g_c), s	5.3	19.0	5.3	4.9	12.7	5.3	7.5	6.2	6.4	8.1	9.9	10.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.52	1.00		0.51
Lane Grp Cap(c), veh/h	303	1181	755	153	1175	523	497	363	349	254	361	347
V/C Ratio(X)	0.83	0.83	0.70	0.79	0.62	0.29	0.74	0.46	0.48	0.79	0.70	0.72
Avail Cap(c_a), veh/h	303	1270	794	156	1270	565	1179	647	622	649	688	661
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.6	23.2	5.0	33.5	21.2	18.7	30.7	26.2	26.3	31.0	27.8	27.9
Incr Delay (d2), s/veh	17.6	4.6	2.5	23.0	0.8	0.3	2.2	0.9	1.0	5.5	2.5	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	7.9	2.1	3.0	5.0	1.8	3.1	2.5	2.6	3.7	4.2	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.2	27.8	7.5	56.5	22.0	19.0	32.9	27.1	27.3	36.5	30.3	30.7
LnGrp LOS	D	C	A	E	C	B	C	C	C	D	C	C
Approach Vol, veh/h		1761			999			703			704	
Approach Delay, s/veh		25.1			25.7			30.2			32.2	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.9	29.1	15.2	19.6	11.0	29.0	15.1	19.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	26.5	25.3	28.7	6.5	26.5	27.0	27.0
Max Q Clear Time (g_c+I1), s	6.9	21.0	9.5	12.1	7.3	14.7	10.1	8.4
Green Ext Time (p_c), s	0.0	3.7	1.1	2.6	0.0	4.0	0.5	1.7

Intersection Summary

HCM 6th Ctrl Delay	27.3
HCM 6th LOS	C

Near Term

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	252	1214	1254	120	155	263
v/c Ratio	0.70	0.38	0.83	0.16	0.61	0.41
Control Delay	53.4	0.3	30.9	3.7	56.8	21.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.4	0.3	30.9	3.7	56.8	21.2
Queue Length 50th (ft)	159	0	383	0	101	98
Queue Length 95th (ft)	#340	0	582	33	209	216
Internal Link Dist (ft)		942	856		514	
Turn Bay Length (ft)	345			330	450	
Base Capacity (vph)	470	3223	2680	1219	470	917
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.38	0.47	0.10	0.33	0.29

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	232	1117	1154	110	143	242
Future Volume (vph)	232	1117	1154	110	143	242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0	7.3	7.3	4.2	3.7
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1612	3223	3223	1442	1612	1442
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1612	3223	3223	1442	1612	1442
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	252	1214	1254	120	155	263
RTOR Reduction (vph)	0	0	0	63	0	29
Lane Group Flow (vph)	252	1214	1254	57	155	234
Heavy Vehicles (%)	12%	12%	12%	12%	12%	12%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	8	Free!	6		7!	4
Permitted Phases				6		4
Actuated Green, G (s)	24.4	107.6	51.0	51.0	17.2	45.6
Effective Green, g (s)	24.4	107.6	51.0	51.0	17.2	45.6
Actuated g/C Ratio	0.23	1.00	0.47	0.47	0.16	0.42
Clearance Time (s)	3.5		7.3	7.3	4.2	3.7
Vehicle Extension (s)	3.0		4.0	4.0	3.5	3.0
Lane Grp Cap (vph)	365	3223	1527	683	257	611
v/s Ratio Prot	c0.16	0.38	c0.39		c0.10	0.16
v/s Ratio Perm				0.04		
v/c Ratio	0.69	0.38	0.82	0.08	0.60	0.38
Uniform Delay, d1	38.1	0.0	24.4	15.5	42.0	21.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.5	0.3	3.9	0.1	4.2	0.4
Delay (s)	43.7	0.3	28.2	15.6	46.2	21.7
Level of Service	D	A	C	B	D	C
Approach Delay (s)		7.8	27.1		30.8	
Approach LOS		A	C		C	

Intersection Summary				
HCM 2000 Control Delay	18.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	107.6	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	65.6%	ICU Level of Service	C	
Analysis Period (min)	15			

! Phase conflict between lane groups.
c Critical Lane Group

HCM 6th Edition methodology cannot be performed with phasing conflicts.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	227	850	292	39	959	186	264	298	93	173	151
v/c Ratio	0.56	0.62	0.37	0.11	0.81	0.29	0.59	0.42	0.35	0.62	0.41
Control Delay	53.0	30.9	4.7	46.4	37.9	5.0	52.2	39.1	55.8	55.0	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.0	30.9	4.7	46.4	37.9	5.0	52.2	39.1	55.8	55.0	10.9
Queue Length 50th (ft)	76	272	0	11	307	0	89	92	31	112	0
Queue Length 95th (ft)	146	423	61	34	477	49	165	163	71	223	62
Internal Link Dist (ft)		1323			2509			853		451	
Turn Bay Length (ft)	225		485	125		390	160		140		
Base Capacity (vph)	551	2210	1082	573	2210	1048	612	1283	612	681	670
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.38	0.27	0.07	0.43	0.18	0.43	0.23	0.15	0.25	0.23

Intersection Summary

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
2: Golden Hill Road & SR 46 E

Near Term AM
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	209	782	269	36	882	171	243	256	18	86	159	139
Future Volume (vph)	209	782	269	36	882	171	243	256	18	86	159	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3155	3252	1455	3155	3252	1455	3155	3217		3155	1712	1455
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3155	3252	1455	3155	3252	1455	3155	3217		3155	1712	1455
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	227	850	292	39	959	186	264	278	20	93	173	151
RTOR Reduction (vph)	0	0	171	0	0	116	0	3	0	0	0	126
Lane Group Flow (vph)	227	850	121	39	959	70	264	295	0	93	173	25
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	14.0	45.1	45.1	10.1	41.2	41.2	15.3	23.8		9.2	17.7	17.7
Effective Green, g (s)	14.0	45.1	45.1	10.1	41.2	41.2	15.3	23.8		9.2	17.7	17.7
Actuated g/C Ratio	0.13	0.41	0.41	0.09	0.38	0.38	0.14	0.22		0.08	0.16	0.16
Clearance Time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	405	1348	603	292	1231	550	443	703		266	278	236
v/s Ratio Prot	0.07	c0.26		0.01	c0.29		c0.08	0.09		0.03	c0.10	
v/s Ratio Perm			0.08			0.05						0.02
v/c Ratio	0.56	0.63	0.20	0.13	0.78	0.13	0.60	0.42		0.35	0.62	0.10
Uniform Delay, d1	44.5	25.2	20.3	45.3	29.8	22.1	43.9	36.6		47.0	42.4	38.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.8	1.0	0.2	0.1	3.2	0.1	2.2	0.4		0.8	4.3	0.2
Delay (s)	46.3	26.2	20.5	45.4	33.0	22.2	46.0	37.0		47.8	46.7	39.0
Level of Service	D	C	C	D	C	C	D	D		D	D	D
Approach Delay (s)		28.3			31.7			41.2			44.2	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	33.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	108.8	Sum of lost time (s)	20.6	
Intersection Capacity Utilization	62.8%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Olsen-Chandler SP
2: Golden Hill Road & SR 46 E

Near Term AM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	209	782	269	36	882	171	243	256	18	86	159	139
Future Volume (veh/h)	209	782	269	36	882	171	243	256	18	86	159	139
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1737	1737	1737	1737	1737	1737	1737	1737	1737	1737	1737	1737
Adj Flow Rate, veh/h	227	850	292	39	959	186	264	278	20	93	173	151
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	321	1143	510	295	1256	560	364	644	46	157	247	209
Arrive On Green	0.10	0.35	0.35	0.09	0.38	0.38	0.11	0.21	0.21	0.05	0.14	0.14
Sat Flow, veh/h	3209	3300	1472	3209	3300	1472	3209	3120	223	3209	1737	1472
Grp Volume(v), veh/h	227	850	292	39	959	186	264	146	152	93	173	151
Grp Sat Flow(s),veh/h/ln	1605	1650	1472	1605	1650	1472	1605	1650	1693	1605	1737	1472
Q Serve(g_s), s	5.3	17.7	7.6	0.9	19.8	7.0	6.2	6.0	6.1	2.2	7.4	7.7
Cycle Q Clear(g_c), s	5.3	17.7	7.6	0.9	19.8	7.0	6.2	6.0	6.1	2.2	7.4	7.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.13	1.00		1.00
Lane Grp Cap(c), veh/h	321	1143	510	295	1256	560	364	341	350	157	247	209
V/C Ratio(X)	0.71	0.74	0.57	0.13	0.76	0.33	0.73	0.43	0.43	0.59	0.70	0.72
Avail Cap(c_a), veh/h	740	2959	1320	740	2959	1320	822	867	889	822	912	773
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.0	22.5	7.6	32.6	21.1	17.1	33.4	27.0	27.0	36.3	31.9	32.0
Incr Delay (d2), s/veh	2.9	1.0	1.0	0.1	1.0	0.3	2.8	0.9	0.9	3.5	3.6	4.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	6.0	3.7	0.3	6.5	2.2	2.4	2.3	2.4	0.9	3.2	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.9	23.4	8.6	32.7	22.1	17.5	36.2	27.8	27.8	39.8	35.5	36.7
LnGrp LOS	D	C	A	C	C	B	D	C	C	D	D	D
Approach Vol, veh/h		1369			1184			562			417	
Approach Delay, s/veh		22.5			21.7			31.8			36.9	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.5	34.3	12.9	16.4	11.8	37.0	7.8	21.4
Change Period (Y+Rc), s	7.3	* 7.3	4.0	5.3	4.0	7.3	4.0	5.3
Max Green Setting (Gmax), s	18.0	* 70	20.0	41.0	18.0	70.0	20.0	41.0
Max Q Clear Time (g_c+I1), s	2.9	19.7	8.2	9.7	7.3	21.8	4.2	8.1
Green Ext Time (p_c), s	0.0	7.3	0.7	1.4	0.5	7.9	0.2	1.7

Intersection Summary	
HCM 6th Ctrl Delay	25.4
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	839	46	276	1080	0	9	0	247	0	0	0
Future Volume (Veh/h)	1	839	46	276	1080	0	9	0	247	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	912	50	300	1174	0	10	0	268	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									1			1
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1174			962			2126	2713	481	2232	2738	587
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1174			962			2126	2713	481	2232	2738	587
tC, single (s)	4.3			4.3			7.7	6.7	7.1	7.7	6.7	7.1
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			54			38	100	47	100	100	100
cM capacity (veh/h)	542			658			16	10	508	6	9	431

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	1	608	354	300	783	391	278	0
Volume Left	1	0	0	300	0	0	10	0
Volume Right	0	0	50	0	0	0	268	0
cSH	542	1700	1700	658	1700	1700	347	1700
Volume to Capacity	0.00	0.36	0.21	0.46	0.46	0.23	0.80	0.00
Queue Length 95th (ft)	0	0	0	60	0	0	169	0
Control Delay (s)	11.7	0.0	0.0	15.0	0.0	0.0	46.4	0.0
Lane LOS	B			B			E	A
Approach Delay (s)	0.0			3.0			46.4	0.0
Approach LOS							E	A

Intersection Summary					
Average Delay		6.4			
Intersection Capacity Utilization	53.3%	ICU Level of Service		A	
Analysis Period (min)	15				

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	839	46	276	1080	0	9	0	247	0	0	0
Future Vol, veh/h	1	839	46	276	1080	0	9	0	247	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	340	-	-	195	-	-	-	-	25	-	-	25
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	11	11	11	11	11	11	11	11	11	11	11	11
Mvmt Flow	1	912	50	300	1174	0	10	0	268	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1174	0	0	962	0	0	2126	2713	481	2232	2738	587
Stage 1	-	-	-	-	-	-	939	939	-	1774	1774	-
Stage 2	-	-	-	-	-	-	1187	1774	-	458	964	-
Critical Hdwy	4.32	-	-	4.32	-	-	7.72	6.72	7.12	7.72	6.72	7.12
Critical Hdwy Stg 1	-	-	-	-	-	-	6.72	5.72	-	6.72	5.72	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.72	5.72	-	6.72	5.72	-
Follow-up Hdwy	2.31	-	-	2.31	-	-	3.61	4.11	3.41	3.61	4.11	3.41
Pot Cap-1 Maneuver	542	-	-	658	-	-	25	18	508	21	17	431
Stage 1	-	-	-	-	-	-	267	321	-	78	122	-
Stage 2	-	-	-	-	-	-	186	122	-	529	312	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	542	-	-	658	-	-	16	10	508	6	9	431
Mov Cap-2 Maneuver	-	-	-	-	-	-	16	10	-	6	9	-
Stage 1	-	-	-	-	-	-	266	320	-	78	66	-
Stage 2	-	-	-	-	-	-	101	66	-	249	311	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3	33.4	0
HCM LOS			D	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	16	508	542	-	-	658	-	-	-	-
HCM Lane V/C Ratio	0.611	0.529	0.002	-	-	0.456	-	-	-	-
HCM Control Delay (s)	$ 406.3	19.8	11.7	-	-	15	-	-	0	0
HCM Lane LOS	F	C	B	-	-	B	-	-	A	A
HCM 95th %tile Q(veh)	1.6	3.1	0	-	-	2.4	-	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	357	729	1173	19	5	182
Future Volume (Veh/h)	357	729	1173	19	5	182
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	388	792	1275	21	5	198
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1296				2447	638
vC1, stage 1 conf vol					1275	
vC2, stage 2 conf vol					1172	
vCu, unblocked vol	1296				2447	638
tC, single (s)	4.3				7.0	7.1
tC, 2 stage (s)					6.0	
tF (s)	2.3				3.6	3.4
p0 queue free %	21				89	51
cM capacity (veh/h)	489				47	401

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	388	396	396	638	638	21	203
Volume Left	388	0	0	0	0	0	5
Volume Right	0	0	0	0	0	21	198
cSH	489	1700	1700	1700	1700	1700	411
Volume to Capacity	0.79	0.23	0.23	0.38	0.38	0.01	0.49
Queue Length 95th (ft)	182	0	0	0	0	0	66
Control Delay (s)	35.0	0.0	0.0	0.0	0.0	0.0	24.1
Lane LOS	D						C
Approach Delay (s)	11.5			0.0			24.1
Approach LOS							C

Intersection Summary			
Average Delay		6.9	
Intersection Capacity Utilization		65.5%	ICU Level of Service C
Analysis Period (min)		15	

Intersection	
Int Delay, s/veh	6.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	357	729	1173	19	5	182
Future Vol, veh/h	357	729	1173	19	5	182
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	580	-	-	165	0	25
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	388	792	1275	21	5	198

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1296	0	-	0	2447	638
Stage 1	-	-	-	-	1275	-
Stage 2	-	-	-	-	1172	-
Critical Hdwy	4.3	-	-	-	7	7.1
Critical Hdwy Stg 1	-	-	-	-	6	-
Critical Hdwy Stg 2	-	-	-	-	6	-
Follow-up Hdwy	2.3	-	-	-	3.6	3.4
Pot Cap-1 Maneuver	489	-	-	-	23	401
Stage 1	-	-	-	-	211	-
Stage 2	-	-	-	-	241	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	489	-	-	-	~ 5	401
Mov Cap-2 Maneuver	-	-	-	-	41	-
Stage 1	-	-	-	-	44	-
Stage 2	-	-	-	-	241	-

Approach	EB	WB	SB
HCM Control Delay, s	11.5	0	24.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	489	-	-	-	41	401
HCM Lane V/C Ratio	0.794	-	-	-	0.133	0.493
HCM Control Delay (s)	35.1	-	-	-	105.8	22.4
HCM Lane LOS	E	-	-	-	F	C
HCM 95th %tile Q(veh)	7.3	-	-	-	0.4	2.6

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	715	19	2	1184	0	8	0	1	0	0	0
Future Volume (Veh/h)	0	715	19	2	1184	0	8	0	1	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	777	21	2	1287	0	9	0	1	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									1			
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1287			798			1424	2068	388	1680	2089	644
vC1, stage 1 conf vol							777	777		1291	1291	
vC2, stage 2 conf vol							648	1291		389	798	
vCu, unblocked vol	1287			798			1424	2068	388	1680	2089	644
tC, single (s)	4.4			4.4			7.8	6.8	7.2	7.8	6.8	7.2
tC, 2 stage (s)							6.8	5.8		6.8	5.8	
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			100			97	100	100	100	100	100
cM capacity (veh/h)	479			753			263	184	580	150	182	390

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	388	388	21	2	858	429	10	0
Volume Left	0	0	0	0	2	0	0	9	0
Volume Right	0	0	0	21	0	0	0	1	0
cSH	1700	1700	1700	1700	753	1700	1700	292	1700
Volume to Capacity	0.00	0.23	0.23	0.01	0.00	0.50	0.25	0.03	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	0	3	0
Control Delay (s)	0.0	0.0	0.0	0.0	9.8	0.0	0.0	18.4	0.0
Lane LOS					A			C	A
Approach Delay (s)	0.0				0.0			18.4	0.0
Approach LOS								C	A

Intersection Summary				
Average Delay		0.1		
Intersection Capacity Utilization		42.7%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	715	19	2	1184	0	8	0	1	0	0	0
Future Vol, veh/h	0	715	19	2	1184	0	8	0	1	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	275	305	-	-	-	-	25	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	13	13	13	13	13	13	13	13	13	13	13	13
Mvmt Flow	0	777	21	2	1287	0	9	0	1	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1287	0	0	798	0	0	1425	2068	389	1680	2089	644
Stage 1	-	-	-	-	-	-	777	777	-	1291	1291	-
Stage 2	-	-	-	-	-	-	648	1291	-	389	798	-
Critical Hdwy	4.36	-	-	4.36	-	-	7.76	6.76	7.16	7.76	6.76	7.16
Critical Hdwy Stg 1	-	-	-	-	-	-	6.76	5.76	-	6.76	5.76	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.76	5.76	-	6.76	5.76	-
Follow-up Hdwy	2.33	-	-	2.33	-	-	3.63	4.13	3.43	3.63	4.13	3.43
Pot Cap-1 Maneuver	479	-	-	753	-	-	87	47	579	55	45	390
Stage 1	-	-	-	-	-	-	333	380	-	157	212	-
Stage 2	-	-	-	-	-	-	400	212	-	578	371	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	479	-	-	753	-	-	87	47	579	55	45	390
Mov Cap-2 Maneuver	-	-	-	-	-	-	256	179	-	146	177	-
Stage 1	-	-	-	-	-	-	333	380	-	157	211	-
Stage 2	-	-	-	-	-	-	399	211	-	577	371	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	18.7	0
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	256	579	479	-	-	753	-	-	-
HCM Lane V/C Ratio	0.034	0.002	-	-	-	0.003	-	-	-
HCM Control Delay (s)	19.6	11.2	0	-	-	9.8	-	-	0
HCM Lane LOS	C	B	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0	0	-	-	0	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Traffic Volume (veh/h)	91	120	94	266	103	71	42	343	208	42	292	53
Future Volume (veh/h)	91	120	94	266	103	71	42	343	208	42	292	53
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	99	130	102	289	112	77	46	373	226	46	317	58
Approach Volume (veh/h)		331			478			645			421	
Crossing Volume (veh/h)		652			518			275			447	
High Capacity (veh/h)		826			920			1116			974	
High v/c (veh/h)		0.40			0.52			0.58			0.43	
Low Capacity (veh/h)		660			743			918			790	
Low v/c (veh/h)		0.50			0.64			0.70			0.53	

Intersection Summary					
Maximum v/c High		0.58			
Maximum v/c Low		0.70			
Intersection Capacity Utilization		91.4%	ICU Level of Service		F

Intersection	
Intersection Delay, s/veh	13.0
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	331	478	645	421
Demand Flow Rate, veh/h	341	492	664	434
Vehicles Circulating, veh/h	672	533	283	460
Vehicles Exiting, veh/h	222	414	730	565
Ped Vol Crossing Leg, #/h	0	0	3	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	12.8	14.8	13.0	11.1
Approach LOS	B	B	B	B

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	341	492	664	434
Cap Entry Lane, veh/h	695	801	1034	863
Entry HV Adj Factor	0.971	0.971	0.971	0.971
Flow Entry, veh/h	331	478	645	421
Cap Entry, veh/h	675	778	1004	838
V/C Ratio	0.490	0.614	0.642	0.503
Control Delay, s/veh	12.8	14.8	13.0	11.1
LOS	B	B	B	B
95th %tile Queue, veh	3	4	5	3

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	1	15	5	3	70	0	15	1	2	0	0	0
Future Volume (Veh/h)	1	15	5	3	70	0	15	1	2	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	16	5	3	76	0	16	1	2	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	76			21			102	102	18	105	105	76
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	76			21			102	102	18	105	105	76
tC, single (s)	4.2			4.2			7.2	6.6	6.3	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			100			98	100	100	100	100	100
cM capacity (veh/h)	1486			1557			862	774	1043	857	772	969

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	22	79	19	0
Volume Left	1	3	16	0
Volume Right	5	0	2	0
cSH	1486	1557	873	1700
Volume to Capacity	0.00	0.00	0.02	0.00
Queue Length 95th (ft)	0	0	2	0
Control Delay (s)	0.3	0.3	9.2	0.0
Lane LOS	A	A	A	A
Approach Delay (s)	0.3	0.3	9.2	0.0
Approach LOS			A	A

Intersection Summary				
Average Delay			1.7	
Intersection Capacity Utilization			14.7%	ICU Level of Service
Analysis Period (min)			15	

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	15	5	3	70	0	15	1	2	0	0	0
Future Vol, veh/h	1	15	5	3	70	0	15	1	2	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	8	8	8	8	8	8	8	8	8	8	8	8
Mvmt Flow	1	16	5	3	76	0	16	1	2	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	76	0	0	21	0	0	103	103	19	104	105	76
Stage 1	-	-	-	-	-	-	21	21	-	82	82	-
Stage 2	-	-	-	-	-	-	82	82	-	22	23	-
Critical Hdwy	4.18	-	-	4.18	-	-	7.18	6.58	6.28	7.18	6.58	6.28
Critical Hdwy Stg 1	-	-	-	-	-	-	6.18	5.58	-	6.18	5.58	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.18	5.58	-	6.18	5.58	-
Follow-up Hdwy	2.272	-	-	2.272	-	-	3.572	4.072	3.372	3.572	4.072	3.372
Pot Cap-1 Maneuver	1486	-	-	1557	-	-	863	776	1042	862	774	969
Stage 1	-	-	-	-	-	-	982	866	-	912	815	-
Stage 2	-	-	-	-	-	-	912	815	-	981	864	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1486	-	-	1557	-	-	861	774	1042	858	772	969
Mov Cap-2 Maneuver	-	-	-	-	-	-	861	774	-	858	772	-
Stage 1	-	-	-	-	-	-	981	865	-	911	813	-
Stage 2	-	-	-	-	-	-	910	813	-	977	863	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.3	9.2	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	872	1486	-	-	1557	-	-	-
HCM Lane V/C Ratio	0.022	0.001	-	-	0.002	-	-	-
HCM Control Delay (s)	9.2	7.4	0	-	7.3	0	-	0
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1	347	345	425	637	7	21	139	283	283	35
v/c Ratio	0.01	0.57	0.74	0.48	0.59	0.05	0.13	0.53	0.70	0.68	0.07
Control Delay	48.0	37.3	40.8	18.6	4.0	43.5	44.1	16.1	41.1	40.2	0.3
Queue Delay	0.0	0.0	0.1	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	37.3	40.9	19.0	4.2	43.5	44.1	16.1	41.1	40.2	0.3
Queue Length 50th (ft)	1	85	161	135	0	3	10	0	137	136	0
Queue Length 95th (ft)	6	165	328	316	65	19	40	59	296	295	0
Internal Link Dist (ft)		346		307			744			674	
Turn Bay Length (ft)	65		125			140		165	150		185
Base Capacity (vph)	110	1002	717	1173	1229	397	418	457	597	608	631
Starvation Cap Reductn	0	0	29	303	151	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.35	0.50	0.49	0.59	0.02	0.05	0.30	0.47	0.47	0.06

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	290	29	317	391	586	6	19	128	433	87	32
Future Volume (vph)	1	290	29	317	391	586	6	19	128	433	87	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (prot)	1752	3445		1752	1845	1568	1752	1845	1544	1665	1696	1521
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (perm)	1752	3445		1752	1845	1568	1752	1845	1544	1665	1696	1521
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	315	32	345	425	637	7	21	139	471	95	35
RTOR Reduction (vph)	0	6	0	0	0	342	0	0	127	0	0	27
Lane Group Flow (vph)	1	341	0	345	425	295	7	21	12	283	283	8
Confl. Peds. (#/hr)			8						1			5
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	0.7	18.7		22.3	40.3	40.3	7.5	7.5	7.5	20.5	20.5	20.5
Effective Green, g (s)	0.7	18.7		22.3	40.3	40.3	7.5	7.5	7.5	20.5	20.5	20.5
Actuated g/C Ratio	0.01	0.21		0.26	0.46	0.46	0.09	0.09	0.09	0.24	0.24	0.24
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	14	740		449	854	726	151	159	133	392	399	358
v/s Ratio Prot	0.00	0.10		c0.20	c0.23		0.00	c0.01		c0.17	0.17	
v/s Ratio Perm						0.19			0.01			0.01
v/c Ratio	0.07	0.46		0.77	0.50	0.41	0.05	0.13	0.09	0.72	0.71	0.02
Uniform Delay, d1	42.8	29.8		30.0	16.3	15.4	36.5	36.7	36.6	30.6	30.5	25.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.2	0.5		7.7	0.5	0.4	0.1	0.4	0.3	6.4	5.7	0.0
Delay (s)	45.0	30.2		37.7	16.7	15.8	36.6	37.1	36.9	37.1	36.2	25.6
Level of Service	D	C		D	B	B	D	D	D	D	D	C
Approach Delay (s)		30.3			21.5			36.9			36.0	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	27.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	87.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	61.0%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
8: Riverside Ave & 13th Street

Near Term AM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	290	29	317	391	586	6	19	128	433	87	32
Future Volume (veh/h)	1	290	29	317	391	586	6	19	128	433	87	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	1	315	32	345	425	637	7	21	139	539	0	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	2	763	77	398	854	724	199	209	177	700	0	307
Arrive On Green	0.00	0.24	0.24	0.23	0.46	0.46	0.11	0.11	0.11	0.20	0.00	0.20
Sat Flow, veh/h	1767	3228	325	1767	1856	1572	1767	1856	1568	3534	0	1553
Grp Volume(v), veh/h	1	171	176	345	425	637	7	21	139	539	0	35
Grp Sat Flow(s),veh/h/ln	1767	1763	1790	1767	1856	1572	1767	1856	1568	1767	0	1553
Q Serve(g_s), s	0.0	6.5	6.6	14.9	12.7	29.1	0.3	0.8	6.8	11.4	0.0	1.5
Cycle Q Clear(g_c), s	0.0	6.5	6.6	14.9	12.7	29.1	0.3	0.8	6.8	11.4	0.0	1.5
Prop In Lane	1.00		0.18	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	2	417	423	398	854	724	199	209	177	700	0	307
V/C Ratio(X)	0.41	0.41	0.42	0.87	0.50	0.88	0.04	0.10	0.79	0.77	0.00	0.11
Avail Cap(c_a), veh/h	112	513	521	726	1185	1004	402	422	357	1274	0	560
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	39.5	25.5	25.6	29.5	14.9	19.4	31.2	31.5	34.1	30.0	0.0	26.0
Incr Delay (d2), s/veh	84.9	0.6	0.7	5.8	0.5	6.9	0.1	0.2	7.5	1.8	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	2.7	2.8	6.7	5.0	11.0	0.1	0.4	2.9	4.8	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	124.4	26.2	26.2	35.3	15.4	26.3	31.3	31.7	41.6	31.8	0.0	26.2
LnGrp LOS	F	C	C	D	B	C	C	C	D	C	A	C
Approach Vol, veh/h		348			1407			167			574	
Approach Delay, s/veh		26.5			25.2			39.9			31.5	
Approach LOS		C			C			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	22.3	23.2		20.2	4.6	40.9		13.4				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	32.5	23.0		28.5	5.0	50.5		18.0				
Max Q Clear Time (g_c+I1), s	16.9	8.6		13.4	2.0	31.1		8.8				
Green Ext Time (p_c), s	0.9	1.8		1.9	0.0	5.3		0.3				

Intersection Summary												
HCM 6th Ctrl Delay			27.8									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

Olsen-Chandler SP
9: Paso Robles Street & 13th Street

Near Term AM
Queues

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	68	856	49	1166	360	234	12	249	5	8
v/c Ratio	0.35	0.46	0.27	0.67	0.41	0.67	0.03	0.43	0.01	0.01
Control Delay	45.4	14.1	45.1	19.1	6.0	40.6	26.8	6.5	26.8	0.0
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.4	14.2	45.1	19.1	6.0	40.6	26.8	6.5	26.8	0.0
Queue Length 50th (ft)	34	145	25	232	27	113	5	0	2	0
Queue Length 95th (ft)	88	251	69	389	97	216	20	57	12	0
Internal Link Dist (ft)		307		269			836			575
Turn Bay Length (ft)	120		220		145	130		110	95	
Base Capacity (vph)	265	2332	239	2322	1101	613	816	832	611	809
Starvation Cap Reductn	0	564	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.48	0.21	0.50	0.33	0.38	0.01	0.30	0.01	0.01

Intersection Summary

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
9: Paso Robles Street & 13th Street

Near Term AM
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	740	48	45	1073	331	215	11	229	5	0	7
Future Volume (vph)	63	740	48	45	1073	331	215	11	229	5	0	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1752	3466		1752	3505	1530	1752	1845	1568	1752	1568	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.75	1.00	1.00	0.75	1.00	
Satd. Flow (perm)	1752	3466		1752	3505	1530	1388	1845	1568	1383	1568	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	68	804	52	49	1166	360	234	12	249	5	0	8
RTOR Reduction (vph)	0	4	0	0	0	131	0	0	187	0	6	0
Lane Group Flow (vph)	68	852	0	49	1166	229	234	12	62	5	2	0
Confl. Peds. (#/hr)			6			1						
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		
Actuated Green, G (s)	6.6	42.3		4.4	40.1	40.1	20.0	20.0	20.0	20.0	20.0	
Effective Green, g (s)	6.6	42.3		4.4	40.1	40.1	20.0	20.0	20.0	20.0	20.0	
Actuated g/C Ratio	0.08	0.53		0.05	0.50	0.50	0.25	0.25	0.25	0.25	0.25	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	144	1828		96	1752	765	346	460	391	344	391	
v/s Ratio Prot	c0.04	0.25		0.03	c0.33			0.01			0.00	
v/s Ratio Perm						0.15	c0.17		0.04	0.00		
v/c Ratio	0.47	0.47		0.51	0.67	0.30	0.68	0.03	0.16	0.01	0.01	
Uniform Delay, d1	35.1	11.9		36.9	15.0	11.8	27.2	22.7	23.5	22.7	22.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.4	0.2		4.5	1.0	0.2	5.2	0.0	0.2	0.0	0.0	
Delay (s)	37.6	12.1		41.4	16.0	12.0	32.3	22.8	23.7	22.7	22.6	
Level of Service	D	B		D	B	B	C	C	C	C	C	
Approach Delay (s)		13.9			15.9			27.8			22.7	
Approach LOS		B			B			C			C	

Intersection Summary				
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	80.2	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	63.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Olsen-Chandler SP
9: Paso Robles Street & 13th Street

Near Term AM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	740	48	45	1073	331	215	11	229	5	0	7
Future Volume (veh/h)	63	740	48	45	1073	331	215	11	229	5	0	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	68	804	52	49	1166	0	234	12	249	5	0	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	102	1655	107	84	1699		432	414	351	368	0	351
Arrive On Green	0.06	0.49	0.49	0.05	0.48	0.00	0.22	0.22	0.22	0.22	0.00	0.22
Sat Flow, veh/h	1767	3360	217	1767	3526	1572	1396	1856	1572	1110	0	1572
Grp Volume(v), veh/h	68	422	434	49	1166	0	234	12	249	5	0	8
Grp Sat Flow(s),veh/h/ln	1767	1763	1815	1767	1763	1572	1396	1856	1572	1110	0	1572
Q Serve(g_s), s	2.1	9.1	9.1	1.5	14.6	0.0	9.0	0.3	8.3	0.2	0.0	0.2
Cycle Q Clear(g_c), s	2.1	9.1	9.1	1.5	14.6	0.0	9.2	0.3	8.3	0.5	0.0	0.2
Prop In Lane	1.00		0.12	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	102	868	894	84	1699		432	414	351	368	0	351
V/C Ratio(X)	0.67	0.49	0.49	0.59	0.69		0.54	0.03	0.71	0.01	0.00	0.02
Avail Cap(c_a), veh/h	326	1588	1635	295	3114		873	1000	848	719	0	848
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.3	9.6	9.6	26.6	11.4	0.0	20.9	17.3	20.4	17.5	0.0	17.3
Incr Delay (d2), s/veh	7.2	0.4	0.4	6.4	0.5	0.0	1.1	0.0	2.7	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	3.0	3.0	0.8	4.7	0.0	2.7	0.1	3.0	0.0	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.5	10.1	10.1	32.9	11.9	0.0	21.9	17.3	23.1	17.5	0.0	17.3
LnGrp LOS	C	B	B	C	B		C	B	C	B	A	B
Approach Vol, veh/h		924			1215	A		495			13	
Approach Delay, s/veh		11.8			12.8			22.4			17.4	
Approach LOS		B			B			C			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.2	32.6		17.2	7.8	32.0		17.2				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	9.5	51.3		30.7	10.5	50.3		30.7				
Max Q Clear Time (g_c+I1), s	3.5	11.1		2.5	4.1	16.6		11.2				
Green Ext Time (p_c), s	0.0	6.5		0.0	0.1	10.9		1.5				

Intersection Summary			
HCM 6th Ctrl Delay	14.2		
HCM 6th LOS	B		

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	214	844	61	883	395	193	49	133	598
v/c Ratio	0.55	0.63	0.39	0.77	0.68	0.24	0.11	0.56	0.77
Control Delay	49.7	25.3	54.7	34.3	46.2	33.5	1.0	52.5	32.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.7	25.3	54.7	34.3	46.2	33.5	1.0	52.5	32.2
Queue Length 50th (ft)	66	205	37	256	121	52	0	80	124
Queue Length 95th (ft)	124	315	91	375	203	98	4	161	216
Internal Link Dist (ft)		353		673		608			523
Turn Bay Length (ft)	295		235		140		130	225	
Base Capacity (vph)	464	1693	201	1642	761	1053	538	354	1030
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.50	0.30	0.54	0.52	0.18	0.09	0.38	0.58

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	197	500	277	56	722	90	363	178	45	122	187	363
Future Volume (vph)	197	500	277	56	722	90	363	178	45	122	187	363
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.98		1.00	1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	3332		1770	3475		3433	3539	1583	1770	3189	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	3332		1770	3475		3433	3539	1583	1770	3189	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	214	543	301	61	785	98	395	193	49	133	203	395
RTOR Reduction (vph)	0	63	0	0	9	0	0	0	38	0	168	0
Lane Group Flow (vph)	214	781	0	61	874	0	395	193	11	133	430	0
Confl. Peds. (#/hr)			3									
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	11.0	37.1		7.0	33.1		16.4	22.0	22.0	12.9	18.5	
Effective Green, g (s)	11.0	37.1		7.0	33.1		16.4	22.0	22.0	12.9	18.5	
Actuated g/C Ratio	0.11	0.38		0.07	0.34		0.17	0.23	0.23	0.13	0.19	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	389	1274		127	1185		580	802	359	235	608	
v/s Ratio Prot	c0.06	c0.23		0.03	c0.25		c0.12	c0.05		0.08	c0.14	
v/s Ratio Perm									0.01			
v/c Ratio	0.55	0.61		0.48	0.74		0.68	0.24	0.03	0.57	0.71	
Uniform Delay, d1	40.7	24.2		43.3	28.1		37.8	30.7	29.2	39.4	36.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.7	0.9		2.8	2.4		3.3	0.2	0.0	3.1	3.8	
Delay (s)	42.3	25.0		46.1	30.6		41.1	30.8	29.2	42.5	40.5	
Level of Service	D	C		D	C		D	C	C	D	D	
Approach Delay (s)		28.5			31.6			37.1			40.9	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	33.7	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	97.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	70.7%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
10: River Road/Union Road & Creston Road

Near Term AM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	197	500	277	56	722	90	363	178	45	122	187	363
Future Volume (veh/h)	197	500	277	56	722	90	363	178	45	122	187	363
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	214	543	0	61	785	98	395	193	49	133	203	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	331	1392		94	1106	138	549	584	261	174	368	
Arrive On Green	0.10	0.39	0.00	0.05	0.35	0.35	0.16	0.16	0.16	0.10	0.10	0.00
Sat Flow, veh/h	3456	3647	0	1781	3174	396	3456	3554	1585	1781	3647	0
Grp Volume(v), veh/h	214	543	0	61	439	444	395	193	49	133	203	0
Grp Sat Flow(s),veh/h/ln	1728	1777	0	1781	1777	1793	1728	1777	1585	1781	1777	0
Q Serve(g_s), s	3.7	6.7	0.0	2.1	13.1	13.1	6.7	2.9	1.6	4.5	3.3	0.0
Cycle Q Clear(g_c), s	3.7	6.7	0.0	2.1	13.1	13.1	6.7	2.9	1.6	4.5	3.3	0.0
Prop In Lane	1.00		0.00	1.00		0.22	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	331	1392		94	619	625	549	584	261	174	368	
V/C Ratio(X)	0.65	0.39		0.65	0.71	0.71	0.72	0.33	0.19	0.76	0.55	
Avail Cap(c_a), veh/h	704	2634		305	1259	1271	1154	1592	710	537	1476	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	26.7	13.4	0.0	28.5	17.3	17.3	24.5	22.7	22.1	27.0	26.2	0.0
Incr Delay (d2), s/veh	2.1	0.2	0.0	7.4	1.5	1.5	1.8	0.3	0.3	6.8	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	2.4	0.0	1.0	4.9	5.0	2.6	1.1	0.6	2.0	1.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.9	13.6	0.0	35.9	18.8	18.8	26.3	23.0	22.5	33.8	27.5	0.0
LnGrp LOS	C	B		D	B	B	C	C	C	C	C	
Approach Vol, veh/h		757	A		944			637			336	A
Approach Delay, s/veh		17.9			19.9			25.0			30.0	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.7	28.6	14.2	10.9	10.4	25.9	10.5	14.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	45.5	20.5	25.5	12.5	43.5	18.5	27.5
Max Q Clear Time (g_c+I1), s	4.1	8.7	8.7	5.3	5.7	15.1	6.5	4.9
Green Ext Time (p_c), s	0.0	4.1	1.1	1.0	0.4	6.1	0.2	1.2

Intersection Summary	
HCM 6th Ctrl Delay	21.8
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Olsen-Chandler SP
11: Creston Road & Golden Hill Road

Near Term AM
Queues

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	71	410	1024	510	101
v/c Ratio	0.31	0.21	0.72	0.60	0.22
Control Delay	41.2	10.1	20.2	31.3	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	41.2	10.1	20.2	31.3	8.9
Queue Length 50th (ft)	27	34	142	95	0
Queue Length 95th (ft)	103	133	407	256	47
Internal Link Dist (ft)		1151	2310	505	
Turn Bay Length (ft)	125			120	
Base Capacity (vph)	306	2805	2141	1332	676
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.23	0.15	0.48	0.38	0.15

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	65	377	508	434	469	93
Future Volume (vph)	65	377	508	434	469	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.93		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1752	3505	3240		3400	1568
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1752	3505	3240		3400	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	71	410	552	472	510	101
RTOR Reduction (vph)	0	0	121	0	0	77
Lane Group Flow (vph)	71	410	903	0	510	24
Confl. Peds. (#/hr)				3		
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	NA		Perm	Perm
Protected Phases	5	2	6			
Permitted Phases					4	4
Actuated Green, G (s)	6.8	39.9	28.6		17.7	17.7
Effective Green, g (s)	6.8	39.9	28.6		17.7	17.7
Actuated g/C Ratio	0.09	0.54	0.38		0.24	0.24
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	160	1882	1247		809	373
v/s Ratio Prot	c0.04	0.12	c0.28			
v/s Ratio Perm					c0.15	0.02
v/c Ratio	0.44	0.22	0.72		0.63	0.06
Uniform Delay, d1	32.0	9.0	19.5		25.4	21.9
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.0	0.1	2.1		1.6	0.1
Delay (s)	33.9	9.1	21.6		27.0	22.0
Level of Service	C	A	C		C	C
Approach Delay (s)		12.7	21.6		26.1	
Approach LOS		B	C		C	

Intersection Summary			
HCM 2000 Control Delay	20.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	74.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	56.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Near Term AM
12: Creston Road & Niblick Road/Sherwood Road — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	128	177	151	34	312	248	280	646	182	696
v/c Ratio	0.50	0.37	0.29	0.21	0.49	0.51	0.73	0.66	0.60	0.73
Control Delay	40.0	26.5	6.3	39.9	31.6	8.6	43.4	28.6	40.3	22.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.0	26.5	6.3	39.9	31.6	8.6	43.4	28.6	40.3	22.3
Queue Length 50th (ft)	58	73	0	15	72	0	127	141	81	101
Queue Length 95th (ft)	124	134	43	48	119	60	#297	236	165	185
Internal Link Dist (ft)		1092			186			1440		2310
Turn Bay Length (ft)	150			170		140	230		245	
Base Capacity (vph)	349	725	692	178	1035	626	427	1182	401	1212
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.24	0.22	0.19	0.30	0.40	0.66	0.55	0.45	0.57

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Olsen-Chandler SP — Near Term AM
12: Creston Road & Niblick Road/Sherwood Road — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	118	163	139	31	287	228	258	556	39	167	327	314
Future Volume (vph)	118	163	139	31	287	228	258	556	39	167	327	314
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1845	1533	1752	3505	1534	1752	3467		1752	3206	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1845	1533	1752	3505	1534	1752	3467		1752	3206	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	128	177	151	34	312	248	280	604	42	182	355	341
RTOR Reduction (vph)	0	0	112	0	0	200	0	6	0	0	195	0
Lane Group Flow (vph)	128	177	39	34	312	48	280	640	0	182	501	0
Confl. Peds. (#/hr)			9			9			4			12
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	8.4	19.0	19.0	3.6	14.2	14.2	16.0	20.5		12.6	17.1	
Effective Green, g (s)	8.4	19.0	19.0	3.6	14.2	14.2	16.0	20.5		12.6	17.1	
Actuated g/C Ratio	0.11	0.26	0.26	0.05	0.19	0.19	0.22	0.28		0.17	0.23	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	199	475	395	85	675	295	380	964		299	743	
v/s Ratio Prot	c0.07	0.10		0.02	c0.09		c0.16	c0.18		0.10	0.16	
v/s Ratio Perm			0.03			0.03						
v/c Ratio	0.64	0.37	0.10	0.40	0.46	0.16	0.74	0.66		0.61	0.67	
Uniform Delay, d1	31.2	22.5	20.8	34.0	26.4	24.8	26.9	23.6		28.3	25.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.9	0.5	0.1	3.1	0.5	0.3	7.3	1.7		3.5	2.4	
Delay (s)	38.2	23.0	20.9	37.1	26.9	25.1	34.2	25.3		31.8	28.2	
Level of Service	D	C	C	D	C	C	C	C		C	C	
Approach Delay (s)		26.6			26.7			28.0			28.9	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	27.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	73.7	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	65.8%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
12: Creston Road & Niblick Road/Sherwood Road

Near Term AM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	163	139	31	287	228	258	556	39	167	327	314
Future Volume (veh/h)	118	163	139	31	287	228	258	556	39	167	327	314
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	128	177	151	34	312	248	280	604	42	182	355	341
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	164	503	422	60	750	330	326	1065	74	226	462	406
Arrive On Green	0.09	0.27	0.27	0.03	0.21	0.21	0.18	0.32	0.32	0.13	0.26	0.26
Sat Flow, veh/h	1767	1856	1557	1767	3526	1553	1767	3343	232	1767	1763	1551
Grp Volume(v), veh/h	128	177	151	34	312	248	280	318	328	182	355	341
Grp Sat Flow(s),veh/h/ln	1767	1856	1557	1767	1763	1553	1767	1763	1813	1767	1763	1551
Q Serve(g_s), s	5.1	5.6	5.7	1.4	5.5	10.8	11.1	10.9	10.9	7.3	13.5	15.1
Cycle Q Clear(g_c), s	5.1	5.6	5.7	1.4	5.5	10.8	11.1	10.9	10.9	7.3	13.5	15.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.13	1.00		1.00
Lane Grp Cap(c), veh/h	164	503	422	60	750	330	326	561	577	226	462	406
V/C Ratio(X)	0.78	0.35	0.36	0.56	0.42	0.75	0.86	0.57	0.57	0.81	0.77	0.84
Avail Cap(c_a), veh/h	329	681	571	168	973	428	402	561	577	378	535	471
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.1	21.3	21.3	34.5	24.6	26.7	28.6	20.5	20.5	30.7	24.7	25.3
Incr Delay (d2), s/veh	7.8	0.4	0.5	8.0	0.4	5.3	14.4	1.3	1.3	6.7	5.8	11.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	2.3	2.0	0.7	2.2	4.2	5.7	4.3	4.5	3.4	6.0	6.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.0	21.7	21.8	42.4	25.0	32.1	43.1	21.9	21.9	37.4	30.5	36.7
LnGrp LOS	D	C	C	D	C	C	D	C	C	D	C	D
Approach Vol, veh/h		456			594			926			878	
Approach Delay, s/veh		26.9			29.0			28.3			34.3	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.8	27.6	7.0	24.2	17.9	23.5	11.2	19.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.5	23.0	6.9	26.6	16.5	22.0	13.5	20.0
Max Q Clear Time (g_c+I1), s	9.3	12.9	3.4	7.7	13.1	17.1	7.1	12.8
Green Ext Time (p_c), s	0.2	2.8	0.0	1.3	0.3	1.9	0.1	1.6

Intersection Summary	
HCM 6th Ctrl Delay	30.1
HCM 6th LOS	C

Olsen-Chandler SP
13: Creston Road & Scott Street

Near Term AM
HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	38	47	681	48	51	485
Future Volume (Veh/h)	38	47	681	48	51	485
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	41	51	740	52	55	527
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1403	766			792	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1403	766			792	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	71	87			93	
cM capacity (veh/h)	144	403			829	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	92	792	55	527
Volume Left	41	0	55	0
Volume Right	51	52	0	0
cSH	223	1700	829	1700
Volume to Capacity	0.41	0.47	0.07	0.31
Queue Length 95th (ft)	47	0	5	0
Control Delay (s)	31.9	0.0	9.7	0.0
Lane LOS	D		A	
Approach Delay (s)	31.9	0.0	0.9	
Approach LOS	D			

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	2.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	38	47	681	48	51	485
Future Vol, veh/h	38	47	681	48	51	485
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	41	51	740	52	55	527

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1403	766	0	0	792	0
Stage 1	766	-	-	-	-	-
Stage 2	637	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	154	403	-	-	829	-
Stage 1	459	-	-	-	-	-
Stage 2	527	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	144	403	-	-	829	-
Mov Cap-2 Maneuver	144	-	-	-	-	-
Stage 1	459	-	-	-	-	-
Stage 2	492	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	32.1	0	0.9
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	223	829	-
HCM Lane V/C Ratio	-	-	0.414	0.067	-
HCM Control Delay (s)	-	-	32.1	9.7	-
HCM Lane LOS	-	-	D	A	-
HCM 95th %tile Q(veh)	-	-	1.9	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	95	6	40	8	15	98	34	490	3	33	391	77
Future Volume (Veh/h)	95	6	40	8	15	98	34	490	3	33	391	77
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	103	7	43	9	16	107	37	533	3	36	425	84
Pedestrians		6			2						1	
Lane Width (ft)		12.0			12.0						12.0	
Walking Speed (ft/s)		3.5			3.5						3.5	
Percent Blockage		1			0						0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1226	1115	431	1154	1198	538	515			538		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1226	1115	431	1154	1198	538	515			538		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	5	96	93	94	91	80	96			96		
cM capacity (veh/h)	108	192	621	148	172	542	1045			1028		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	153	132	37	536	36	425	84
Volume Left	103	9	37	0	36	0	0
Volume Right	43	107	0	3	0	0	84
cSH	145	376	1045	1700	1028	1700	1700
Volume to Capacity	1.06	0.35	0.04	0.32	0.04	0.25	0.05
Queue Length 95th (ft)	202	39	3	0	3	0	0
Control Delay (s)	151.7	19.7	8.6	0.0	8.6	0.0	0.0
Lane LOS	F	C	A		A		
Approach Delay (s)	151.7	19.7	0.6		0.6		
Approach LOS	F	C					

Intersection Summary					
Average Delay	18.8				
Intersection Capacity Utilization	49.6%	ICU Level of Service		A	
Analysis Period (min)	15				

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	15.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	95	6	40	8	15	98	34	490	3	33	391	77
Future Vol, veh/h	95	6	40	8	15	98	34	490	3	33	391	77
Conflicting Peds, #/hr	1	0	0	0	0	1	6	0	2	2	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	30	-	-	70	-	60
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	103	7	43	9	16	107	37	533	3	36	425	84

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1174	1115	431	1175	1198	538	515	0	0	538	0	0
Stage 1	503	503	-	611	611	-	-	-	-	-	-	-
Stage 2	671	612	-	564	587	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	169	208	624	168	186	543	1051	-	-	1030	-	-
Stage 1	551	541	-	481	484	-	-	-	-	-	-	-
Stage 2	446	484	-	510	497	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	118	192	620	144	172	541	1045	-	-	1028	-	-
Mov Cap-2 Maneuver	118	192	-	144	172	-	-	-	-	-	-	-
Stage 1	528	519	-	463	466	-	-	-	-	-	-	-
Stage 2	333	466	-	452	477	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	123.1	19.8	0.6	0.6
HCM LOS	F	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1045	-	-	157	374	1028	-	-
HCM Lane V/C Ratio	0.035	-	-	0.976	0.352	0.035	-	-
HCM Control Delay (s)	8.6	-	-	123.1	19.8	8.6	-	-
HCM Lane LOS	A	-	-	F	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	7.4	1.5	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	20	9	7	210	5	264	9	243	109	230	199	10
Future Volume (vph)	20	9	7	210	5	264	9	243	109	230	199	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	10	8	228	5	287	10	264	118	250	216	11

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	40	520	274	118	358	119
Volume Left (vph)	22	228	10	0	250	0
Volume Right (vph)	8	287	0	118	0	11
Hadj (s)	0.02	-0.21	0.05	-0.67	0.38	-0.03
Departure Headway (s)	8.1	6.2	7.5	6.8	7.7	7.2
Degree Utilization, x	0.09	0.90	0.57	0.22	0.76	0.24
Capacity (veh/h)	405	565	453	500	450	480
Control Delay (s)	11.9	42.3	19.0	10.5	30.1	11.3
Approach Delay (s)	11.9	42.3	16.4		25.4	
Approach LOS	B	E	C		D	

Intersection Summary				
Delay	28.7			
Level of Service	D			
Intersection Capacity Utilization	69.6%	ICU Level of Service	C	
Analysis Period (min)	15			

Intersection	
Intersection Delay, s/veh	30.4
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Vol, veh/h	20	9	7	210	5	264	0	9	243	109	230	199
Future Vol, veh/h	20	9	7	210	5	264	0	9	243	109	230	199
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	10	8	228	5	287	0	10	264	118	250	216
Number of Lanes	0	1	0	0	1	0	0	0	1	1	0	2

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	12.1	45.1	17.4	26.6
HCM LOS	B	E	C	D

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	4%	0%	56%	44%	70%	0%
Vol Thru, %	96%	0%	25%	1%	30%	91%
Vol Right, %	0%	100%	19%	55%	0%	9%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	252	109	36	479	330	110
LT Vol	9	0	20	210	230	0
Through Vol	243	0	9	5	100	100
RT Vol	0	109	7	264	0	10
Lane Flow Rate	274	118	39	521	358	119
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.573	0.224	0.089	0.916	0.763	0.24
Departure Headway (Hd)	7.536	6.794	8.206	6.332	7.67	7.245
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	477	526	434	573	469	494
Service Time	5.305	4.563	6.306	4.378	5.435	5.009
HCM Lane V/C Ratio	0.574	0.224	0.09	0.909	0.763	0.241
HCM Control Delay	20	11.5	12.1	45.1	31.3	12.3
HCM Lane LOS	C	B	B	E	D	B
HCM 95th-tile Q	3.5	0.9	0.3	11.3	6.5	0.9

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBR
Lane Configurations	
Traffic Vol, veh/h	10
Future Vol, veh/h	10
Peak Hour Factor	0.92
Heavy Vehicles, %	2
Mvmt Flow	11
Number of Lanes	0

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	153	136	229	208	125	292
Future Volume (Veh/h)	153	136	229	208	125	292
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	166	148	249	226	136	317
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	747	136	453			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	747	136	453			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	38	83	77			
cM capacity (veh/h)	268	885	1097			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	314	249	113	113	136	317
Volume Left	166	249	0	0	0	0
Volume Right	148	0	0	0	0	317
cSH	507	1097	1700	1700	1700	1700
Volume to Capacity	0.62	0.23	0.07	0.07	0.08	0.19
Queue Length 95th (ft)	104	22	0	0	0	0
Control Delay (s)	24.8	9.2	0.0	0.0	0.0	0.0
Lane LOS	C	A				
Approach Delay (s)	24.8	4.8			0.0	
Approach LOS	C					

Intersection Summary			
Average Delay		8.1	
Intersection Capacity Utilization		37.7%	ICU Level of Service A
Analysis Period (min)		15	

Intersection	
Int Delay, s/veh	7.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	153	136	229	208	125	292
Future Vol, veh/h	153	136	229	208	125	292
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	145	105	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	166	148	249	226	136	317

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	747	136	453	0	-	0
Stage 1	136	-	-	-	-	-
Stage 2	611	-	-	-	-	-
Critical Hdwy	6.645	6.245	4.145	-	-	-
Critical Hdwy Stg 1	5.445	-	-	-	-	-
Critical Hdwy Stg 2	5.845	-	-	-	-	-
Follow-up Hdwy	3.5285	3.3285	2.2285	-	-	-
Pot Cap-1 Maneuver	362	909	1100	-	-	-
Stage 1	887	-	-	-	-	-
Stage 2	503	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	280	909	1100	-	-	-
Mov Cap-2 Maneuver	280	-	-	-	-	-
Stage 1	687	-	-	-	-	-
Stage 2	503	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	23.1	4.8	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1100	-	280	909	-	-
HCM Lane V/C Ratio	0.226	-	0.594	0.163	-	-
HCM Control Delay (s)	9.2	-	35	9.7	-	-
HCM Lane LOS	A	-	E	A	-	-
HCM 95th %tile Q(veh)	0.9	-	3.5	0.6	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	0	55	1	109	9	0	0	0	0	324	15
Future Volume (Veh/h)	27	0	55	1	109	9	0	0	0	0	324	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	0	60	1	118	10	0	0	0	0	352	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	424	360	360	420	368	0	368			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	424	360	360	420	368	0	368			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	100	91	100	79	99	100			100		
cM capacity (veh/h)	449	567	684	496	561	1085	1191			1623		

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	89	129	368
Volume Left	29	1	0
Volume Right	60	10	16
cSH	584	608	1700
Volume to Capacity	0.15	0.21	0.22
Queue Length 95th (ft)	13	20	0
Control Delay (s)	12.3	12.8	0.0
Lane LOS	B	B	
Approach Delay (s)	12.3	12.8	0.0
Approach LOS	B	B	

Intersection Summary					
Average Delay		4.7			
Intersection Capacity Utilization		36.2%	ICU Level of Service	A	
Analysis Period (min)		15			

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	0	55	1	109	9	0	0	0	0	324	15
Future Vol, veh/h	27	0	55	1	109	9	0	0	0	0	324	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	29	0	60	1	118	10	0	0	0	0	352	16

Major/Minor	Minor2			Minor1						Major2		
Conflicting Flow All	424	360	360	390	368	0				-	-	0
Stage 1	360	360	-	0	0	-				-	-	-
Stage 2	64	0	-	390	368	-				-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22				-	-	-
Critical Hdwy Stg 1	6.12	5.52	-	-	-	-				-	-	-
Critical Hdwy Stg 2	-	-	-	6.12	5.52	-				-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318				-	-	-
Pot Cap-1 Maneuver	540	567	684	569	561	-				0	-	-
Stage 1	658	626	-	-	-	-				0	-	-
Stage 2	-	-	-	634	621	-				0	-	-
Platoon blocked, %											-	-
Mov Cap-1 Maneuver	-	567	684	519	561	-				-	-	-
Mov Cap-2 Maneuver	-	567	-	519	561	-				-	-	-
Stage 1	658	626	-	-	-	-				-	-	-
Stage 2	-	-	-	579	621	-				-	-	-

Approach	EB	WB	SB
HCM Control Delay, s			0
HCM LOS	-	-	

Minor Lane/Major Mvmt	EBLn1	WBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	-	561	-	-	-
HCM Lane V/C Ratio	-	0.213	-	-	-
HCM Control Delay (s)	-	13.1	-	-	-
HCM Lane LOS	-	B	-	-	-
HCM 95th %tile Q(veh)	-	0.8	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	20	318	1049	275	458	91	293	538	323	276
v/c Ratio	0.09	0.67	0.73	0.35	0.42	0.57	0.62	0.33	0.64	0.41
Control Delay	54.5	46.6	33.5	26.5	2.2	72.9	58.1	4.7	56.7	43.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.5	46.6	33.5	26.5	2.2	72.9	58.1	4.7	56.7	43.5
Queue Length 50th (ft)	14	95	346	144	0	70	118	31	126	97
Queue Length 95th (ft)	44	168	522	258	42	#158	192	57	203	155
Internal Link Dist (ft)		521		1372			611			680
Turn Bay Length (ft)	115		515		115	165		290	305	
Base Capacity (vph)	314	661	1844	1001	1166	188	716	1899	727	1066
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.48	0.57	0.27	0.39	0.48	0.41	0.28	0.44	0.26

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	178	115	965	253	421	84	270	495	297	205	49
Future Volume (vph)	18	178	115	965	253	421	84	270	495	297	205	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.95	0.88	0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3331		3433	1863	1568	1770	3539	2787	3433	3422	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3331		3433	1863	1568	1770	3539	2787	3433	3422	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	193	125	1049	275	458	91	293	538	323	223	53
RTOR Reduction (vph)	0	73	0	0	0	196	0	0	98	0	15	0
Lane Group Flow (vph)	20	245	0	1049	275	262	91	293	440	323	261	0
Confl. Peds. (#/hr)												1
Confl. Bikes (#/hr)						2						
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	14.5	14.5		50.2	50.2	67.9	10.8	16.0	66.2	17.7	22.9	
Effective Green, g (s)	14.5	14.5		50.2	50.2	67.9	10.8	16.0	66.2	17.7	22.9	
Actuated g/C Ratio	0.12	0.12		0.42	0.42	0.57	0.09	0.13	0.56	0.15	0.19	
Clearance Time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	215	406		1449	786	895	160	476	1551	511	659	
v/s Ratio Prot	0.01	c0.07		c0.31	0.15	0.04	0.05	c0.08	0.12	c0.09	0.08	
v/s Ratio Perm						0.12			0.04			
v/c Ratio	0.09	0.60		0.72	0.35	0.29	0.57	0.62	0.28	0.63	0.40	
Uniform Delay, d1	46.4	49.5		28.6	23.3	13.1	51.8	48.5	13.9	47.5	42.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	2.5		1.8	0.3	0.2	4.6	2.4	0.1	2.6	0.4	
Delay (s)	46.5	52.0		30.4	23.6	13.3	56.4	50.9	14.0	50.1	42.4	
Level of Service	D	D		C	C	B	E	D	B	D	D	
Approach Delay (s)		51.7			25.0			29.9			46.5	
Approach LOS		D			C			C			D	

Intersection Summary

HCM 2000 Control Delay	32.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	118.9	Sum of lost time (s)	20.5
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Near Term AM
18: US 101 Ramps/Spring Street & 1st Street/Niblick Road — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	178	115	965	253	421	84	270	495	297	205	49
Future Volume (veh/h)	18	178	115	965	253	421	84	270	495	297	205	49
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	20	193	125	1049	275	458	91	293	538	323	223	53
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	226	268	165	1325	717	791	117	568	1516	417	583	136
Arrive On Green	0.13	0.13	0.13	0.38	0.38	0.38	0.07	0.16	0.16	0.12	0.20	0.20
Sat Flow, veh/h	1781	2111	1302	3456	1870	1564	1781	3554	2790	3456	2860	666
Grp Volume(v), veh/h	20	161	157	1049	275	458	91	293	538	323	137	139
Grp Sat Flow(s),veh/h/ln	1781	1777	1636	1728	1870	1564	1781	1777	1395	1728	1777	1749
Q Serve(g_s), s	1.0	8.5	9.1	26.3	10.4	20.1	4.9	7.4	10.7	8.9	6.5	6.8
Cycle Q Clear(g_c), s	1.0	8.5	9.1	26.3	10.4	20.1	4.9	7.4	10.7	8.9	6.5	6.8
Prop In Lane	1.00		0.80	1.00		1.00	1.00		1.00	1.00		0.38
Lane Grp Cap(c), veh/h	226	225	208	1325	717	791	117	568	1516	417	362	356
V/C Ratio(X)	0.09	0.71	0.76	0.79	0.38	0.58	0.78	0.52	0.35	0.77	0.38	0.39
Avail Cap(c_a), veh/h	371	370	341	2172	1175	1174	222	841	1730	857	640	630
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.8	41.1	41.3	26.7	21.8	17.0	45.1	37.7	12.7	41.8	33.7	33.8
Incr Delay (d2), s/veh	0.2	4.2	5.5	1.1	0.3	0.7	10.7	0.7	0.1	3.1	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	4.0	4.0	10.3	4.4	6.7	2.4	3.1	6.4	3.9	2.9	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.0	45.2	46.9	27.8	22.2	17.7	55.8	38.4	12.8	44.9	34.3	34.5
LnGrp LOS	D	D	D	C	C	B	E	D	B	D	C	C
Approach Vol, veh/h		338			1782			922			599	
Approach Delay, s/veh		45.6			24.4			25.2			40.1	
Approach LOS		D			C			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	16.5	21.5		17.0	12.2	25.8		43.0				
Change Period (Y+Rc), s	* 4.7	5.8		4.6	5.8	* 5.8		5.4				
Max Green Setting (Gmax), s	* 24	23.2		20.4	12.2	* 35		61.6				
Max Q Clear Time (g_c+I1), s	10.9	12.7		11.1	6.9	8.8		28.3				
Green Ext Time (p_c), s	0.9	3.0		1.3	0.1	1.6		9.2				

Intersection Summary												
HCM 6th Ctrl Delay			29.1									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Olsen-Chandler SP — Near Term AM
19: S. River Road & Niblick Road — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	111	590	276	96	1153	657	372	287	445
v/c Ratio	0.53	0.45	0.36	0.54	0.87	0.86	0.57	0.81	0.72
Control Delay	60.8	29.0	4.9	59.2	38.5	53.9	43.7	59.5	42.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.8	29.0	4.9	59.2	38.5	53.9	43.7	59.5	42.3
Queue Length 50th (ft)	40	167	0	66	370	233	127	193	132
Queue Length 95th (ft)	74	251	60	126	#527	#359	180	#329	188
Internal Link Dist (ft)		1510			1609		962		896
Turn Bay Length (ft)	140			80		150		110	
Base Capacity (vph)	210	1309	759	225	1443	785	860	421	916
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.45	0.36	0.43	0.80	0.84	0.43	0.68	0.49

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
19: S. River Road & Niblick Road

Near Term AM
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	543	254	88	824	236	604	305	37	264	265	144
Future Volume (vph)	102	543	254	88	824	236	604	305	37	264	265	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3539	1583	1770	3402		3433	3475		1770	3352	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	3539	1583	1770	3402		3433	3475		1770	3352	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	111	590	276	96	896	257	657	332	40	287	288	157
RTOR Reduction (vph)	0	0	175	0	21	0	0	8	0	0	66	0
Lane Group Flow (vph)	111	590	101	96	1132	0	657	364	0	287	379	0
Confl. Peds. (#/hr)						10			5			
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	6.6	39.5	39.5	9.1	42.0		23.7	19.7		21.5	17.5	
Effective Green, g (s)	6.6	39.5	39.5	9.1	42.0		23.7	19.7		21.5	17.5	
Actuated g/C Ratio	0.06	0.37	0.37	0.08	0.39		0.22	0.18		0.20	0.16	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	210	1296	580	149	1325		754	635		353	544	
v/s Ratio Prot	0.03	0.17		c0.05	c0.33		c0.19	0.10		c0.16	0.11	
v/s Ratio Perm			0.06									
v/c Ratio	0.53	0.46	0.17	0.64	0.85		0.87	0.57		0.81	0.70	
Uniform Delay, d1	49.1	26.0	23.1	47.8	30.1		40.6	40.2		41.2	42.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.4	0.3	0.1	9.2	5.6		10.8	1.3		13.3	3.9	
Delay (s)	51.5	26.2	23.3	57.0	35.7		51.4	41.5		54.6	46.5	
Level of Service	D	C	C	E	D		D	D		D	D	
Approach Delay (s)		28.3			37.3			47.8			49.7	
Approach LOS		C			D			D			D	

Intersection Summary					
HCM 2000 Control Delay	40.1	HCM 2000 Level of Service		D	
HCM 2000 Volume to Capacity ratio	0.87				
Actuated Cycle Length (s)	107.8	Sum of lost time (s)		18.0	
Intersection Capacity Utilization	78.9%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

Olsen-Chandler SP
19: S. River Road & Niblick Road

Near Term AM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	102	543	254	88	824	236	604	305	37	264	265	144
Future Volume (veh/h)	102	543	254	88	824	236	604	305	37	264	265	144
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	111	590	276	96	896	257	657	332	40	287	288	157
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	171	1288	575	123	1039	297	741	656	78	325	388	206
Arrive On Green	0.05	0.36	0.36	0.07	0.38	0.38	0.21	0.21	0.21	0.18	0.17	0.17
Sat Flow, veh/h	3456	3554	1585	1781	2721	779	3456	3194	382	1781	2243	1190
Grp Volume(v), veh/h	111	590	276	96	585	568	657	184	188	287	227	218
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1781	1777	1723	1728	1777	1798	1781	1777	1656
Q Serve(g_s), s	3.1	12.6	7.0	5.3	30.1	30.3	18.3	9.1	9.3	15.6	12.0	12.5
Cycle Q Clear(g_c), s	3.1	12.6	7.0	5.3	30.1	30.3	18.3	9.1	9.3	15.6	12.0	12.5
Prop In Lane	1.00		1.00	1.00		0.45	1.00		0.21	1.00		0.72
Lane Grp Cap(c), veh/h	171	1288	575	123	678	658	741	365	369	325	308	287
V/C Ratio(X)	0.65	0.46	0.48	0.78	0.86	0.86	0.89	0.50	0.51	0.88	0.74	0.76
Avail Cap(c_a), veh/h	226	1333	595	242	792	768	838	465	470	451	484	451
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.4	24.2	6.7	45.6	28.3	28.4	37.9	35.0	35.1	39.6	39.0	39.2
Incr Delay (d2), s/veh	4.1	0.3	0.6	10.3	8.6	9.0	10.4	1.1	1.1	14.3	3.4	4.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	5.1	4.4	2.6	13.6	13.3	8.5	3.9	4.0	7.9	5.4	5.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.5	24.5	7.3	55.9	36.9	37.3	48.3	36.1	36.2	53.9	42.4	43.3
LnGrp LOS	D	C	A	E	D	D	D	D	D	D	D	D
Approach Vol, veh/h		977			1249			1029			732	
Approach Delay, s/veh		22.6			38.6			43.9			47.2	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.3	40.6	25.8	21.7	9.4	42.5	22.6	24.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	13.5	37.3	24.1	27.1	6.5	44.3	25.2	26.0
Max Q Clear Time (g_c+I1), s	7.3	14.6	20.3	14.5	5.1	32.3	17.6	11.3
Green Ext Time (p_c), s	0.1	4.8	1.0	2.0	0.0	5.7	0.5	1.7

Intersection Summary		
HCM 6th Ctrl Delay	37.6	
HCM 6th LOS	D	

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	200	166	5	312	212	4
v/c Ratio	0.28	0.24	0.01	0.23	0.41	0.01
Control Delay	10.4	3.2	9.2	9.1	12.6	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.4	3.2	9.2	9.1	12.6	7.0
Queue Length 50th (ft)	20	0	1	15	21	0
Queue Length 95th (ft)	90	30	7	63	100	5
Internal Link Dist (ft)	1629			570	669	
Turn Bay Length (ft)			75			50
Base Capacity (vph)	1606	1352	1011	3052	1456	1304
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.12	0.00	0.10	0.15	0.00

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	184	153	5	287	195	4
Future Volume (vph)	184	153	5	287	195	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1845	1533	1749	3505	1752	1568
Flt Permitted	1.00	1.00	0.63	1.00	0.95	1.00
Satd. Flow (perm)	1845	1533	1164	3505	1752	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	200	166	5	312	212	4
RTOR Reduction (vph)	0	100	0	0	0	3
Lane Group Flow (vph)	200	66	5	312	212	1
Confl. Peds. (#/hr)		4	4		1	
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Turn Type	NA	Perm	Perm	NA	Perm	Prot
Protected Phases	2			6		8
Permitted Phases		2	6		8	
Actuated Green, G (s)	14.7	14.7	14.7	14.7	11.4	11.4
Effective Green, g (s)	14.7	14.7	14.7	14.7	11.4	11.4
Actuated g/C Ratio	0.40	0.40	0.40	0.40	0.31	0.31
Clearance Time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	735	610	463	1396	541	484
v/s Ratio Prot	c0.11			0.09		0.00
v/s Ratio Perm		0.04	0.00		c0.12	
v/c Ratio	0.27	0.11	0.01	0.22	0.39	0.00
Uniform Delay, d1	7.5	7.0	6.7	7.3	10.0	8.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.0	0.0	0.0	0.2	0.0
Delay (s)	7.6	7.0	6.7	7.4	10.2	8.8
Level of Service	A	A	A	A	B	A
Approach Delay (s)	7.3			7.4	10.2	
Approach LOS	A			A	B	

Intersection Summary				
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	36.9	Sum of lost time (s)	10.8
Intersection Capacity Utilization	31.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
20: Commerce Way & Sherwood Road

Near Term AM
HCM 6th Signalized Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR	
Lane Configurations							
Traffic Volume (veh/h)	184	153	5	287	195	4	
Future Volume (veh/h)	184	153	5	287	195	4	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach	No			No	No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	
Adj Flow Rate, veh/h	200	166	5	312	212	4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	3	3	3	3	3	3	
Cap, veh/h	620	522	536	1178	433	385	
Arrive On Green	0.33	0.33	0.33	0.33	0.24	0.24	
Sat Flow, veh/h	1856	1563	1005	3618	1767	1572	
Grp Volume(v), veh/h	200	166	5	312	212	4	
Grp Sat Flow(s),veh/h/ln	1856	1563	1005	1763	1767	1572	
Q Serve(g_s), s	2.1	2.0	0.1	1.7	2.6	0.0	
Cycle Q Clear(g_c), s	2.1	2.0	2.2	1.7	2.6	0.0	
Prop In Lane		1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	620	522	536	1178	433	385	
V/C Ratio(X)	0.32	0.32	0.01	0.26	0.49	0.01	
Avail Cap(c_a), veh/h	2502	2108	1555	4754	2039	1814	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	
Uniform Delay (d), s/veh	6.4	6.4	7.2	6.2	8.3	7.3	
Incr Delay (d2), s/veh	0.1	0.1	0.0	0.0	0.3	0.0	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	0.3	0.3	0.0	0.2	0.5	0.0	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	6.5	6.5	7.2	6.3	8.6	7.3	
LnGrp LOS	A	A	A	A	A	A	
Approach Vol, veh/h	366			317	216		
Approach Delay, s/veh	6.5			6.3	8.6		
Approach LOS	A			A	A		

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	14.0				14.0	11.7
Change Period (Y+Rc), s	5.4				5.4	5.4
Max Green Setting (Gmax), s	34.6				34.6	29.6
Max Q Clear Time (g_c+I1), s	4.1				4.2	4.6
Green Ext Time (p_c), s	0.9				1.3	0.3

Intersection Summary		
HCM 6th Ctrl Delay		6.9
HCM 6th LOS		A

Olsen-Chandler SP
23: Airport Road & Scott Street

Near Term AM
HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	15	0	24	1	3	4	40	161	0	0	79	18
Future Volume (vph)	15	0	24	1	3	4	40	161	0	0	79	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	0	26	1	3	4	43	175	0	0	86	20

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	42	8	218	106
Volume Left (vph)	16	1	43	0
Volume Right (vph)	26	4	0	20
Hadj (s)	-0.16	-0.14	0.18	0.02
Departure Headway (s)	4.5	4.5	4.3	4.3
Degree Utilization, x	0.05	0.01	0.26	0.13
Capacity (veh/h)	739	725	818	825
Control Delay (s)	7.7	7.6	8.8	7.9
Approach Delay (s)	7.7	7.6	8.8	7.9
Approach LOS	A	A	A	A

Intersection Summary				
Delay		8.4		
Level of Service		A		
Intersection Capacity Utilization		29.4%	ICU Level of Service	A
Analysis Period (min)		15		

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Vol, veh/h	15	0	24	1	3	4	40	161	0	0	79	18
Future Vol, veh/h	15	0	24	1	3	4	40	161	0	0	79	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	8	8	8	8	8	8	8	8	8	8	8	8
Mvmt Flow	16	0	26	1	3	4	43	175	0	0	86	20
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.7	7.6	8.8	7.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	20%	38%	12%	0%
Vol Thru, %	80%	0%	38%	81%
Vol Right, %	0%	62%	50%	19%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	201	39	8	97
LT Vol	40	15	1	0
Through Vol	161	0	3	79
RT Vol	0	24	4	18
Lane Flow Rate	218	42	9	105
Geometry Grp	1	1	1	1
Degree of Util (X)	0.258	0.053	0.011	0.122
Departure Headway (Hd)	4.246	4.477	4.536	4.18
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	839	805	793	845
Service Time	2.306	2.477	2.538	2.272
HCM Lane V/C Ratio	0.26	0.052	0.011	0.124
HCM Control Delay	8.8	7.7	7.6	7.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1	0.2	0	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Volume (veh/h)	45	10	20	0	9	18	40	61	0	7	30	92
Future Volume (Veh/h)	45	10	20	0	9	18	40	61	0	7	30	92
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	49	11	22	0	10	20	43	66	0	8	33	100
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	30			33			256	150	22	173	151	20
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	30			33			256	150	22	173	151	20
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			93	91	100	99	95	90
cM capacity (veh/h)	1570			1566			590	715	1049	713	714	1052

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	82	30	109	8	133
Volume Left	49	0	43	8	0
Volume Right	22	20	0	0	100
cSH	1570	1566	660	713	941
Volume to Capacity	0.03	0.00	0.17	0.01	0.14
Queue Length 95th (ft)	2	0	15	1	12
Control Delay (s)	4.5	0.0	11.5	10.1	9.5
Lane LOS	A		B	B	A
Approach Delay (s)	4.5	0.0	11.5	9.5	
Approach LOS			B	A	

Intersection Summary				
Average Delay	8.2			
Intersection Capacity Utilization	33.6%	ICU Level of Service		A
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	8.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	45	10	20	0	9	18	40	61	0	7	30	92
Future Vol, veh/h	45	10	20	0	9	18	40	61	0	7	30	92
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	49	11	22	0	10	20	43	66	0	8	33	100

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	30	0	0	33	0	0	207	150	22	173	151	20
Stage 1	-	-	-	-	-	-	120	120	-	20	20	-
Stage 2	-	-	-	-	-	-	87	30	-	153	131	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	1570	-	-	1566	-	-	746	738	1049	786	737	1052
Stage 1	-	-	-	-	-	-	880	793	-	994	875	-
Stage 2	-	-	-	-	-	-	916	866	-	845	784	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1570	-	-	1566	-	-	636	714	1049	713	713	1052
Mov Cap-2 Maneuver	-	-	-	-	-	-	636	714	-	713	713	-
Stage 1	-	-	-	-	-	-	852	768	-	962	875	-
Stage 2	-	-	-	-	-	-	798	866	-	747	759	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	4.4	0	11.3	9.4
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	681	1570	-	-	1566	-	-	713	942
HCM Lane V/C Ratio	0.161	0.031	-	-	-	-	-	0.011	0.141
HCM Control Delay (s)	11.3	7.4	0	-	0	-	-	10.1	9.4
HCM Lane LOS	B	A	A	-	A	-	-	B	A
HCM 95th %tile Q(veh)	0.6	0.1	-	-	0	-	-	0	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	38	70	5	1	6
Future Volume (Veh/h)	3	38	70	5	1	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	41	76	5	1	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	81				126	78
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	81				126	78
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1510				865	979

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	44	81	8
Volume Left	3	0	1
Volume Right	0	5	7
cSH	1510	1700	963
Volume to Capacity	0.00	0.05	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.5	0.0	8.8
Lane LOS	A		A
Approach Delay (s)	0.5	0.0	8.8
Approach LOS			A

Intersection Summary				
Average Delay		0.7		
Intersection Capacity Utilization		14.5%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	38	70	5	1	6
Future Vol, veh/h	3	38	70	5	1	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	3	41	76	5	1	7

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	81	0	-	0	126	79
Stage 1	-	-	-	-	79	-
Stage 2	-	-	-	-	47	-
Critical Hdwy	4.13	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.227	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	1510	-	-	-	866	979
Stage 1	-	-	-	-	942	-
Stage 2	-	-	-	-	973	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1510	-	-	-	864	979
Mov Cap-2 Maneuver	-	-	-	-	864	-
Stage 1	-	-	-	-	940	-
Stage 2	-	-	-	-	973	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	8.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1510	-	-	-	961
HCM Lane V/C Ratio	0.002	-	-	-	0.008
HCM Control Delay (s)	7.4	0	-	-	8.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	257	1269	1286	109	111	231
v/c Ratio	0.67	0.38	0.82	0.14	0.50	0.36
Control Delay	47.5	0.3	28.1	3.7	52.7	19.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.5	0.3	28.1	3.7	52.7	19.5
Queue Length 50th (ft)	148	0	355	0	67	78
Queue Length 95th (ft)	300	0	548	30	149	175
Internal Link Dist (ft)		1017	748		574	
Turn Bay Length (ft)	345			330	450	
Base Capacity (vph)	518	3312	2895	1309	518	1006
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.38	0.44	0.08	0.21	0.23

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	254	1256	1273	108	110	229
Future Volume (vph)	254	1256	1273	108	110	229
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0	7.3	7.3	4.2	3.7
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1656	3312	3312	1482	1656	1482
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1656	3312	3312	1482	1656	1482
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	257	1269	1286	109	111	231
RTOR Reduction (vph)	0	0	0	57	0	27
Lane Group Flow (vph)	257	1269	1286	52	111	204
Heavy Vehicles (%)	9%	9%	9%	9%	9%	9%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	8	Free!	6		7!	4
Permitted Phases				6		4
Actuated Green, G (s)	23.5	99.9	47.8	47.8	13.6	41.1
Effective Green, g (s)	23.5	99.9	47.8	47.8	13.6	41.1
Actuated g/C Ratio	0.24	1.00	0.48	0.48	0.14	0.41
Clearance Time (s)	3.5		7.3	7.3	4.2	3.7
Vehicle Extension (s)	3.0		4.0	4.0	3.5	3.0
Lane Grp Cap (vph)	389	3312	1584	709	225	609
v/s Ratio Prot	c0.16	0.38	c0.39		0.07	0.14
v/s Ratio Perm				0.04		
v/c Ratio	0.66	0.38	0.81	0.07	0.49	0.33
Uniform Delay, d1	34.6	0.0	22.2	14.1	40.0	20.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.2	0.3	3.5	0.1	2.0	0.3
Delay (s)	38.8	0.3	25.7	14.1	42.0	20.4
Level of Service	D	A	C	B	D	C
Approach Delay (s)		6.8	24.8		27.4	
Approach LOS		A	C		C	

Intersection Summary				
HCM 2000 Control Delay	16.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	99.9	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	68.8%	ICU Level of Service	C	
Analysis Period (min)	15			

! Phase conflict between lane groups.
c Critical Lane Group

HCM 6th Edition methodology cannot be performed with phasing conflicts.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	196	971	241	52	887	127	225	264	193	305	312
v/c Ratio	0.52	0.75	0.34	0.19	0.79	0.22	0.55	0.33	0.51	0.74	0.58
Control Delay	55.9	36.3	4.9	55.8	40.9	6.2	55.0	35.6	55.9	53.7	14.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.9	36.3	4.9	55.8	40.9	6.2	55.0	35.6	55.9	53.7	14.3
Queue Length 50th (ft)	67	318	0	17	293	0	77	75	66	199	35
Queue Length 95th (ft)	138	527	58	47	486	46	154	144	136	381	146
Internal Link Dist (ft)		1323			2509			853		451	
Turn Bay Length (ft)	225		485	125		390	160		140		
Base Capacity (vph)	554	2220	1052	554	2220	1022	615	1273	615	684	735
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.44	0.23	0.09	0.40	0.12	0.37	0.21	0.31	0.45	0.42

Intersection Summary

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Near Term PM
2: Golden Hill Road & SR 46 E — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	190	942	234	50	860	123	218	210	47	187	296	303
Future Volume (vph)	190	942	234	50	860	123	218	210	47	187	296	303
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3273	3374	1476	3273	3374	1489	3273	3274		3273	1776	1509
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3273	3374	1476	3273	3374	1489	3273	3274		3273	1776	1509
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	196	971	241	52	887	127	225	216	48	193	305	312
RTOR Reduction (vph)	0	0	148	0	0	83	0	11	0	0	0	192
Lane Group Flow (vph)	196	971	93	52	887	44	225	253	0	193	305	120
Confl. Peds. (#/hr)			1			1			2			
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	13.0	43.2	43.2	8.2	38.4	38.4	14.1	27.2		12.9	26.0	26.0
Effective Green, g (s)	13.0	43.2	43.2	8.2	38.4	38.4	14.1	27.2		12.9	26.0	26.0
Actuated g/C Ratio	0.12	0.39	0.39	0.07	0.34	0.34	0.13	0.24		0.12	0.23	0.23
Clearance Time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	379	1300	568	239	1155	510	411	794		376	411	349
v/s Ratio Prot	0.06	c0.29		0.02	c0.26		c0.07	0.08		0.06	c0.17	
v/s Ratio Perm			0.06			0.03						0.08
v/c Ratio	0.52	0.75	0.16	0.22	0.77	0.09	0.55	0.32		0.51	0.74	0.34
Uniform Delay, d1	46.6	29.7	22.6	48.9	32.9	25.0	46.0	34.8		46.6	39.9	35.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.2	2.4	0.1	0.2	3.1	0.1	1.5	0.2		1.2	7.1	0.6
Delay (s)	47.8	32.1	22.7	49.1	36.0	25.0	47.5	35.1		47.8	47.0	36.5
Level of Service	D	C	C	D	D	C	D	D		D	D	D
Approach Delay (s)		32.7			35.3			40.8			43.2	
Approach LOS		C			D			D			D	

Intersection Summary				
HCM 2000 Control Delay	36.7	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	112.1	Sum of lost time (s)	20.6	
Intersection Capacity Utilization	68.3%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Olsen-Chandler SP — Near Term PM
2: Golden Hill Road & SR 46 E — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	190	942	234	50	860	123	218	210	47	187	296	303
Future Volume (veh/h)	190	942	234	50	860	123	218	210	47	187	296	303
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	196	971	241	52	887	127	225	216	48	193	305	312
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	277	1246	555	107	1195	532	311	716	156	276	443	375
Arrive On Green	0.08	0.37	0.37	0.03	0.35	0.35	0.09	0.26	0.26	0.08	0.25	0.25
Sat Flow, veh/h	3319	3413	1520	3319	3413	1521	3319	2785	607	3319	1796	1522
Grp Volume(v), veh/h	196	971	241	52	887	127	225	131	133	193	305	312
Grp Sat Flow(s),veh/h/ln	1659	1706	1520	1659	1706	1521	1659	1706	1685	1659	1796	1522
Q Serve(g_s), s	5.2	23.0	7.1	1.4	20.8	5.4	6.0	5.6	5.8	5.2	14.0	17.7
Cycle Q Clear(g_c), s	5.2	23.0	7.1	1.4	20.8	5.4	6.0	5.6	5.8	5.2	14.0	17.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.36	1.00		1.00
Lane Grp Cap(c), veh/h	277	1246	555	107	1195	532	311	438	433	276	443	375
V/C Ratio(X)	0.71	0.78	0.43	0.49	0.74	0.24	0.72	0.30	0.31	0.70	0.69	0.83
Avail Cap(c_a), veh/h	657	2626	1169	657	2626	1170	729	769	759	729	809	686
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.6	25.6	9.4	43.3	26.0	21.0	40.1	27.2	27.3	40.6	31.1	32.5
Incr Delay (d2), s/veh	3.3	1.1	0.5	1.3	0.9	0.2	3.2	0.4	0.4	3.2	1.9	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	8.4	3.5	0.6	7.6	1.8	2.5	2.2	2.3	2.2	6.0	6.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.9	26.7	9.9	44.6	26.9	21.2	43.3	27.6	27.7	43.8	33.0	37.3
LnGrp LOS	D	C	A	D	C	C	D	C	C	D	C	D
Approach Vol, veh/h		1408			1066			489			810	
Approach Delay, s/veh		26.2			27.1			34.8			37.3	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.2	40.5	12.5	27.7	11.6	39.1	11.6	28.7
Change Period (Y+Rc), s	7.3	* 7.3	4.0	5.3	4.0	7.3	4.0	5.3
Max Green Setting (Gmax), s	18.0	* 70	20.0	41.0	18.0	70.0	20.0	41.0
Max Q Clear Time (g_c+I1), s	3.4	25.0	8.0	19.7	7.2	22.8	7.2	7.8
Green Ext Time (p_c), s	0.0	8.2	0.6	2.7	0.4	6.8	0.5	1.5

Intersection Summary	
HCM 6th Ctrl Delay	30.0
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1074	102	309	1015	0	18	0	380	0	0	0
Future Volume (Veh/h)	0	1074	102	309	1015	0	18	0	380	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	1107	105	319	1046	0	19	0	392	0	0	0
Pedestrians											1	
Lane Width (ft)											12.0	
Walking Speed (ft/s)											3.5	
Percent Blockage											0	
Right turn flare (veh)									1			1
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1047			1212			2320	2844	606	2238	2897	524
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1047			1212			2320	2844	606	2238	2897	524
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			41			0	100	8	100	100	100
cM capacity (veh/h)	631			544			10	6	428	1	6	485

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	738	474	319	697	349	411	0
Volume Left	0	0	0	319	0	0	19	0
Volume Right	0	0	105	0	0	0	392	0
cSH	1700	1700	1700	544	1700	1700	156	1700
Volume to Capacity	0.00	0.43	0.28	0.59	0.41	0.21	2.64	0.00
Queue Length 95th (ft)	0	0	0	94	0	0	904	0
Control Delay (s)	0.0	0.0	0.0	20.6	0.0	0.0	799.7	0.0
Lane LOS				C			F	A
Approach Delay (s)	0.0			4.8			799.7	0.0
Approach LOS							F	A

Intersection Summary					
Average Delay		112.2			
Intersection Capacity Utilization		63.4%	ICU Level of Service		B
Analysis Period (min)		15			

Intersection	
Int Delay, s/veh	16.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1074	102	309	1015	0	18	0	380	0	0	0
Future Vol, veh/h	0	1074	102	309	1015	0	18	0	380	0	0	0
Conflicting Peds, #/hr	1	0	0	0	0	1	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	340	-	-	195	-	-	-	-	25	-	-	25
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	0	1107	105	319	1046	0	19	0	392	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1047	0	0	1212	0	0	2321	2845	606	2239	2897	524
Stage 1	-	-	-	-	-	-	1160	1160	-	1685	1685	-
Stage 2	-	-	-	-	-	-	1161	1685	-	554	1212	-
Critical Hdwy	4.24	-	-	4.24	-	-	7.64	6.64	7.04	7.64	6.64	7.04
Critical Hdwy Stg 1	-	-	-	-	-	-	6.64	5.64	-	6.64	5.64	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.64	5.64	-	6.64	5.64	-
Follow-up Hdwy	2.27	-	-	2.27	-	-	3.57	4.07	3.37	3.57	4.07	3.37
Pot Cap-1 Maneuver	631	-	-	544	-	-	19	16	428	22	14	485
Stage 1	-	-	-	-	-	-	200	258	-	93	141	-
Stage 2	-	-	-	-	-	-	199	141	-	472	243	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	630	-	-	544	-	-	~ 10	7	428	1	6	485
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 10	7	-	1	6	-
Stage 1	-	-	-	-	-	-	200	258	-	93	58	-
Stage 2	-	-	-	-	-	-	82	58	-	40	243	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	4.8	105.2	0
HCM LOS			F	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	10	428	630	-	-	544	-	-	-	-
HCM Lane V/C Ratio	1.856	0.915	-	-	-	0.586	-	-	-	-
HCM Control Delay (s)	$ 1138.6	56.2	0	-	-	20.5	-	-	0	0
HCM Lane LOS	F	F	A	-	-	C	-	-	A	A
HCM 95th %tile Q(veh)	3.2	10.1	0	-	-	3.7	-	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	279	1175	970	13	11	355
Future Volume (Veh/h)	279	1175	970	13	11	355
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	297	1250	1032	14	12	378
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1046				2251	516
vC1, stage 1 conf vol					1032	
vC2, stage 2 conf vol					1219	
vCu, unblocked vol	1046				2251	516
tC, single (s)	4.3				7.0	7.1
tC, 2 stage (s)					6.0	
tF (s)	2.3				3.6	3.4
p0 queue free %	52				89	22
cM capacity (veh/h)	615				105	483

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	297	625	625	516	516	14	390
Volume Left	297	0	0	0	0	0	12
Volume Right	0	0	0	0	0	14	378
cSH	615	1700	1700	1700	1700	1700	499
Volume to Capacity	0.48	0.37	0.37	0.30	0.30	0.01	0.78
Queue Length 95th (ft)	66	0	0	0	0	0	177
Control Delay (s)	16.2	0.0	0.0	0.0	0.0	0.0	34.6
Lane LOS	C						D
Approach Delay (s)	3.1			0.0			34.6
Approach LOS							D

Intersection Summary				
Average Delay	6.1			
Intersection Capacity Utilization	55.6%	ICU Level of Service		B
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	6.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	279	1175	970	13	11	355
Future Vol, veh/h	279	1175	970	13	11	355
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	580	-	-	165	0	25
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	297	1250	1032	14	12	378

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1046	0	-	0	2251	516
Stage 1	-	-	-	-	1032	-
Stage 2	-	-	-	-	1219	-
Critical Hdwy	4.3	-	-	-	7	7.1
Critical Hdwy Stg 1	-	-	-	-	6	-
Critical Hdwy Stg 2	-	-	-	-	6	-
Follow-up Hdwy	2.3	-	-	-	3.6	3.4
Pot Cap-1 Maneuver	615	-	-	-	32	483
Stage 1	-	-	-	-	287	-
Stage 2	-	-	-	-	227	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	615	-	-	-	17	483
Mov Cap-2 Maneuver	-	-	-	-	116	-
Stage 1	-	-	-	-	148	-
Stage 2	-	-	-	-	227	-

Approach	EB	WB	SB
HCM Control Delay, s	3.1	0	34.5
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	615	-	-	-	116	483
HCM Lane V/C Ratio	0.483	-	-	-	0.101	0.782
HCM Control Delay (s)	16.2	-	-	-	39.5	34.3
HCM Lane LOS	C	-	-	-	E	D
HCM 95th %tile Q(veh)	2.6	-	-	-	0.3	7

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1175	11	1	967	0	17	0	4	0	0	1
Future Volume (Veh/h)	0	1175	11	1	967	0	17	0	4	0	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	1211	11	1	997	0	18	0	4	0	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									1			
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	997			1222			1712	2210	606	1606	2221	498
vC1, stage 1 conf vol							1211	1211		999	999	
vC2, stage 2 conf vol							502	999		608	1222	
vCu, unblocked vol	997			1222			1712	2210	606	1606	2221	498
tC, single (s)	4.3			4.3			7.7	6.7	7.1	7.7	6.7	7.1
tC, 2 stage (s)							6.7	5.7		6.7	5.7	
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			100			89	100	99	100	100	100
cM capacity (veh/h)	632			514			167	182	417	211	180	492

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	606	606	11	1	665	332	22	1
Volume Left	0	0	0	0	1	0	0	18	0
Volume Right	0	0	0	11	0	0	0	4	1
cSH	1700	1700	1700	1700	514	1700	1700	204	492
Volume to Capacity	0.00	0.36	0.36	0.01	0.00	0.39	0.20	0.11	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	0	9	0
Control Delay (s)	0.0	0.0	0.0	0.0	12.0	0.0	0.0	26.4	12.3
Lane LOS					B			D	B
Approach Delay (s)	0.0				0.0			26.4	12.3
Approach LOS								D	B

Intersection Summary				
Average Delay		0.3		
Intersection Capacity Utilization		49.1%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection	
Int Delay, s/veh	0.3

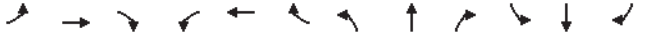
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1175	11	1	967	0	17	0	4	0	0	1
Future Vol, veh/h	0	1175	11	1	967	0	17	0	4	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	275	305	-	-	-	-	25	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	12	12	12	12	12	12	12	12	12	12	12	12
Mvmt Flow	0	1211	11	1	997	0	18	0	4	0	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	997	0	0	1222	0	0	1712	2210	606	1605	2221	499
Stage 1	-	-	-	-	-	-	1211	1211	-	999	999	-
Stage 2	-	-	-	-	-	-	501	999	-	606	1222	-
Critical Hdwy	4.34	-	-	4.34	-	-	7.74	6.74	7.14	7.74	6.74	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	6.74	5.74	-	6.74	5.74	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.74	5.74	-	6.74	5.74	-
Follow-up Hdwy	2.32	-	-	2.32	-	-	3.62	4.12	3.42	3.62	4.12	3.42
Pot Cap-1 Maneuver	632	-	-	514	-	-	53	38	416	64	38	491
Stage 1	-	-	-	-	-	-	178	234	-	243	298	-
Stage 2	-	-	-	-	-	-	496	298	-	427	231	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	632	-	-	514	-	-	53	38	416	63	38	491
Mov Cap-2 Maneuver	-	-	-	-	-	-	162	176	-	206	175	-
Stage 1	-	-	-	-	-	-	178	234	-	243	297	-
Stage 2	-	-	-	-	-	-	494	297	-	423	231	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	26.8	12.3
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	162	416	632	-	-	514	-	-	491
HCM Lane V/C Ratio	0.108	0.01	-	-	-	0.002	-	-	0.002
HCM Control Delay (s)	29.9	13.7	0	-	-	12	-	-	12.3
HCM Lane LOS	D	B	A	-	-	B	-	-	B
HCM 95th %tile Q(veh)	0.4	0	0	-	-	0	-	-	0

Reso A - Exhibit C2 (EIR Technical Appendix)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Traffic Volume (veh/h)	69	235	64	290	204	109	49	245	279	34	395	95
Future Volume (veh/h)	69	235	64	290	204	109	49	245	279	34	395	95
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	74	253	69	312	219	117	53	263	300	37	425	102
Approach Volume (veh/h)		396			648			616			564	
Crossing Volume (veh/h)		774			390			364			584	
High Capacity (veh/h)		749			1019			1040			873	
High v/c (veh/h)		0.53			0.64			0.59			0.65	
Low Capacity (veh/h)		592			831			850			701	
Low v/c (veh/h)		0.67			0.78			0.73			0.80	

Intersection Summary					
Maximum v/c High	0.65				
Maximum v/c Low	0.80				
Intersection Capacity Utilization	109.1%	ICU Level of Service		H	

Intersection	
Intersection Delay, s/veh	17.6
Intersection LOS	C

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	396	648	616	564
Demand Flow Rate, veh/h	401	654	623	569
Vehicles Circulating, veh/h	781	395	368	590
Vehicles Exiting, veh/h	378	596	814	459
Ped Vol Crossing Leg, #/h	1	1	1	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	19.1	16.5	14.2	21.7
Approach LOS	C	C	B	C

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	401	654	623	569
Cap Entry Lane, veh/h	622	922	948	756
Entry HV Adj Factor	0.989	0.991	0.989	0.991
Flow Entry, veh/h	396	648	616	564
Cap Entry, veh/h	615	913	938	749
V/C Ratio	0.645	0.709	0.657	0.753
Control Delay, s/veh	19.1	16.5	14.2	21.7
LOS	C	C	B	C
95th %tile Queue, veh	5	6	5	7

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Volume (veh/h)	1	80	10	2	60	0	10	1	1	0	0	0
Future Volume (Veh/h)	1	80	10	2	60	0	10	1	1	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	87	11	2	65	0	11	1	1	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	65			98			164	164	92	165	169	65
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	65			98			164	164	92	165	169	65
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	100	100	100	100	100
cM capacity (veh/h)	1524			1483			796	724	959	792	719	993

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	99	67	13	0
Volume Left	1	2	11	0
Volume Right	11	0	1	0
cSH	1524	1483	800	1700
Volume to Capacity	0.00	0.00	0.02	0.00
Queue Length 95th (ft)	0	0	1	0
Control Delay (s)	0.1	0.2	9.6	0.0
Lane LOS	A	A	A	A
Approach Delay (s)	0.1	0.2	9.6	0.0
Approach LOS			A	A

Intersection Summary					
Average Delay			0.8		
Intersection Capacity Utilization			15.2%	ICU Level of Service	A
Analysis Period (min)			15		

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Vol, veh/h	1	80	10	2	60	0	10	1	1	0	0	0
Future Vol, veh/h	1	80	10	2	60	0	10	1	1	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	1	87	11	2	65	0	11	1	1	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	65	0	0	98	0	0	164	164	93	165	169	65
Stage 1	-	-	-	-	-	-	95	95	-	69	69	-
Stage 2	-	-	-	-	-	-	69	69	-	96	100	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	1524	-	-	1483	-	-	796	725	959	795	720	993
Stage 1	-	-	-	-	-	-	907	812	-	936	834	-
Stage 2	-	-	-	-	-	-	936	834	-	906	808	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1524	-	-	1483	-	-	794	724	959	792	719	993
Mov Cap-2 Maneuver	-	-	-	-	-	-	794	724	-	792	719	-
Stage 1	-	-	-	-	-	-	906	811	-	935	833	-
Stage 2	-	-	-	-	-	-	935	833	-	903	807	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.2	9.6	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	799	1524	-	-	1483	-	-	-
HCM Lane V/C Ratio	0.016	0.001	-	-	0.001	-	-	-
HCM Control Delay (s)	9.6	7.4	0	-	7.4	0	-	0
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	21	481	255	437	627	6	47	281	335	341	110
v/c Ratio	0.19	0.66	0.69	0.54	0.61	0.03	0.25	0.68	0.73	0.73	0.21
Control Delay	53.0	39.0	45.7	24.6	4.8	43.3	45.7	14.7	41.7	41.6	4.2
Queue Delay	0.0	0.0	0.0	0.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.0	39.0	45.7	25.2	5.2	43.3	45.7	14.7	41.7	41.6	4.2
Queue Length 50th (ft)	11	128	132	161	0	3	25	0	175	178	0
Queue Length 95th (ft)	44	234	268	372	78	17	69	80	357	364	28
Internal Link Dist (ft)		346		307			744			674	
Turn Bay Length (ft)	65		125			140		165	150		185
Base Capacity (vph)	113	1041	567	1030	1136	396	417	573	661	671	689
Starvation Cap Reductn	0	0	9	291	138	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.46	0.46	0.59	0.63	0.02	0.11	0.49	0.51	0.51	0.16

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	421	31	240	411	589	6	44	264	552	84	103
Future Volume (vph)	20	421	31	240	411	589	6	44	264	552	84	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1787	3531		1787	1881	1558	1787	1881	1599	1698	1723	1561
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00
Satd. Flow (perm)	1787	3531		1787	1881	1558	1787	1881	1599	1698	1723	1561
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	21	448	33	255	437	627	6	47	281	587	89	110
RTOR Reduction (vph)	0	5	0	0	0	363	0	0	253	0	0	81
Lane Group Flow (vph)	21	476	0	255	437	264	6	47	28	335	341	29
Confl. Peds. (#/hr)			4			2						2
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	1.7	21.6		18.4	38.3	38.3	8.9	8.9	8.9	24.0	24.0	24.0
Effective Green, g (s)	1.7	21.6		18.4	38.3	38.3	8.9	8.9	8.9	24.0	24.0	24.0
Actuated g/C Ratio	0.02	0.24		0.20	0.42	0.42	0.10	0.10	0.10	0.26	0.26	0.26
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	33	839		361	792	656	174	184	156	448	454	412
v/s Ratio Prot	0.01	0.13		c0.14	c0.23		0.00	c0.02		0.20	c0.20	
v/s Ratio Perm						0.17			0.02			0.02
v/c Ratio	0.64	0.57		0.71	0.55	0.40	0.03	0.26	0.18	0.75	0.75	0.07
Uniform Delay, d1	44.3	30.5		33.7	19.8	18.3	37.1	37.9	37.6	30.7	30.7	25.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	33.9	0.9		6.2	0.8	0.4	0.1	0.7	0.5	6.7	6.9	0.1
Delay (s)	78.1	31.4		39.9	20.7	18.7	37.2	38.7	38.2	37.4	37.6	25.2
Level of Service	E	C		D	C	B	D	D	D	D	D	C
Approach Delay (s)		33.4			23.5			38.2			35.8	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	30.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	90.9	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	62.1%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
8: Riverside Ave & 13th Street

Near Term PM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	421	31	240	411	589	6	44	264	552	84	103
Future Volume (veh/h)	20	421	31	240	411	589	6	44	264	552	84	103
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	21	448	33	255	437	627	6	47	281	651	0	110
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	39	946	69	291	792	655	312	328	278	771	0	341
Arrive On Green	0.02	0.28	0.28	0.16	0.42	0.42	0.17	0.17	0.17	0.21	0.00	0.21
Sat Flow, veh/h	1795	3381	248	1795	1885	1559	1795	1885	1598	3591	0	1590
Grp Volume(v), veh/h	21	237	244	255	437	627	6	47	281	651	0	110
Grp Sat Flow(s),veh/h/ln	1795	1791	1838	1795	1885	1559	1795	1885	1598	1795	0	1590
Q Serve(g_s), s	1.2	11.7	11.7	14.7	18.6	41.5	0.3	2.2	18.5	18.5	0.0	6.2
Cycle Q Clear(g_c), s	1.2	11.7	11.7	14.7	18.6	41.5	0.3	2.2	18.5	18.5	0.0	6.2
Prop In Lane	1.00		0.14	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	39	501	514	291	792	655	312	328	278	771	0	341
V/C Ratio(X)	0.54	0.47	0.48	0.88	0.55	0.96	0.02	0.14	1.01	0.84	0.00	0.32
Avail Cap(c_a), veh/h	89	501	514	447	810	670	312	328	278	1097	0	486
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.5	31.8	31.8	43.5	23.3	29.9	36.4	37.2	43.9	40.1	0.0	35.2
Incr Delay (d2), s/veh	11.0	0.7	0.7	11.7	0.8	24.3	0.0	0.2	56.9	4.3	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	5.2	5.3	7.4	8.3	19.4	0.1	1.0	11.5	8.5	0.0	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.5	32.5	32.5	55.2	24.0	54.2	36.4	37.4	100.8	44.4	0.0	35.8
LnGrp LOS	E	C	C	E	C	D	D	D	F	D	A	D
Approach Vol, veh/h		502			1319			334			761	
Approach Delay, s/veh		33.7			44.4			90.7			43.1	
Approach LOS		C			D			F			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	21.8	34.3		27.3	6.8	49.2		23.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	26.5	24.5		32.5	5.3	45.7		18.5				
Max Q Clear Time (g_c+I1), s	16.7	13.7		20.5	3.2	43.5		20.5				
Green Ext Time (p_c), s	0.5	2.2		2.3	0.0	1.2		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			47.5									
HCM 6th LOS			D									

Notes

User approved volume balancing among the lanes for turning movement.

Olsen-Chandler SP
9: Paso Robles Street & 13th Street

Near Term PM
Queues

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	91	1239	20	1030	255	276	30	447	8	27
v/c Ratio	0.40	0.66	0.14	0.68	0.33	0.65	0.05	0.76	0.02	0.04
Control Delay	44.3	17.6	46.7	23.2	7.7	34.0	22.3	26.7	22.1	0.1
Queue Delay	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.3	18.2	46.7	23.2	7.7	34.0	22.3	26.7	22.1	0.1
Queue Length 50th (ft)	45	192	10	222	23	124	11	140	3	0
Queue Length 95th (ft)	109	435	38	382	88	233	33	285	14	0
Internal Link Dist (ft)		307		269			836			575
Turn Bay Length (ft)	120		220		145	130		110	95	
Base Capacity (vph)	324	2329	142	2102	994	758	1024	938	755	963
Starvation Cap Reductn	0	616	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.72	0.14	0.49	0.26	0.36	0.03	0.48	0.01	0.03

Intersection Summary

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
9: Paso Robles Street & 13th Street

Near Term PM
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	1122	31	19	958	237	257	28	416	7	0	25
Future Volume (vph)	85	1122	31	19	958	237	257	28	416	7	0	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	3557		1787	3574	1564	1787	1881	1599	1787	1599	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.74	1.00	1.00	0.74	1.00	
Satd. Flow (perm)	1787	3557		1787	3574	1564	1391	1881	1599	1388	1599	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	91	1206	33	20	1030	255	276	30	447	8	0	27
RTOR Reduction (vph)	0	1	0	0	0	101	0	0	105	0	19	0
Lane Group Flow (vph)	91	1238	0	20	1030	154	276	30	342	8	8	0
Confl. Peds. (#/hr)			5									
Confl. Bikes (#/hr)			1			2						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		
Actuated Green, G (s)	7.5	41.1		1.7	35.3	35.3	23.9	23.9	23.9	23.9	23.9	
Effective Green, g (s)	7.5	41.1		1.7	35.3	35.3	23.9	23.9	23.9	23.9	23.9	
Actuated g/C Ratio	0.09	0.51		0.02	0.44	0.44	0.30	0.30	0.30	0.30	0.30	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	167	1822		37	1573	688	414	560	476	413	476	
v/s Ratio Prot	c0.05	c0.35		0.01	0.29			0.02			0.01	
v/s Ratio Perm						0.10	0.20		c0.21	0.01		
v/c Ratio	0.54	0.68		0.54	0.65	0.22	0.67	0.05	0.72	0.02	0.02	
Uniform Delay, d1	34.7	14.6		38.9	17.7	13.9	24.7	20.1	25.2	19.9	19.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.6	1.0		15.1	1.0	0.2	4.0	0.0	5.2	0.0	0.0	
Delay (s)	38.3	15.6		54.0	18.6	14.1	28.7	20.1	30.3	19.9	19.9	
Level of Service	D	B		D	B	B	C	C	C	B	B	
Approach Delay (s)		17.2			18.3			29.3			19.9	
Approach LOS		B			B			C			B	

Intersection Summary				
HCM 2000 Control Delay	20.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	80.2	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	73.2%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Olsen-Chandler SP
9: Paso Robles Street & 13th Street

Near Term PM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	1122	31	19	958	237	257	28	416	7	0	25
Future Volume (veh/h)	85	1122	31	19	958	237	257	28	416	7	0	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	91	1206	33	20	1030	0	276	30	447	8	0	27
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	119	1616	44	41	1472		544	616	522	397	0	522
Arrive On Green	0.07	0.45	0.45	0.02	0.41	0.00	0.33	0.33	0.33	0.33	0.00	0.33
Sat Flow, veh/h	1795	3558	97	1795	3582	1598	1394	1885	1598	925	0	1598
Grp Volume(v), veh/h	91	607	632	20	1030	0	276	30	447	8	0	27
Grp Sat Flow(s),veh/h/ln	1795	1791	1865	1795	1791	1598	1394	1885	1598	925	0	1598
Q Serve(g_s), s	3.4	19.3	19.3	0.8	16.4	0.0	11.6	0.7	18.0	0.4	0.0	0.8
Cycle Q Clear(g_c), s	3.4	19.3	19.3	0.8	16.4	0.0	12.4	0.7	18.0	1.2	0.0	0.8
Prop In Lane	1.00		0.05	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	119	813	847	41	1472		544	616	522	397	0	522
V/C Ratio(X)	0.77	0.75	0.75	0.48	0.70		0.51	0.05	0.86	0.02	0.00	0.05
Avail Cap(c_a), veh/h	326	1261	1313	143	2158		848	1026	870	598	0	870
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.6	15.5	15.5	33.2	16.8	0.0	20.1	15.9	21.7	16.3	0.0	15.9
Incr Delay (d2), s/veh	9.8	1.4	1.3	8.4	0.6	0.0	0.7	0.0	4.6	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	7.3	7.6	0.4	6.2	0.0	3.5	0.3	6.7	0.1	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.4	16.9	16.9	41.7	17.4	0.0	20.9	15.9	26.2	16.3	0.0	15.9
LnGrp LOS	D	B	B	D	B		C	B	C	B	A	B
Approach Vol, veh/h		1330			1050	A		753			35	
Approach Delay, s/veh		18.6			17.9			23.8			16.0	
Approach LOS		B			B			C			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.1	35.8		27.0	9.1	32.8		27.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.5	48.5		37.5	12.5	41.5		37.5				
Max Q Clear Time (g_c+I1), s	2.8	21.3		3.2	5.4	18.4		20.0				
Green Ext Time (p_c), s	0.0	10.0		0.1	0.1	8.1		2.5				

Intersection Summary			
HCM 6th Ctrl Delay	19.6		
HCM 6th LOS	B		

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	415	1211	63	730	282	232	67	64	577
v/c Ratio	0.68	0.77	0.40	0.62	0.62	0.27	0.14	0.41	0.76
Control Delay	46.6	26.2	56.1	29.8	50.4	35.2	0.6	57.2	28.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.6	26.2	56.1	29.8	50.4	35.2	0.6	57.2	28.0
Queue Length 50th (ft)	132	332	40	201	90	67	0	40	98
Queue Length 95th (ft)	211	478	94	300	156	114	0	95	177
Internal Link Dist (ft)		353		673		608			523
Turn Bay Length (ft)	295		235		140		130	225	
Base Capacity (vph)	809	2003	203	1630	545	1098	585	188	1031
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.60	0.31	0.45	0.52	0.21	0.11	0.34	0.56

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	394	797	353	60	620	73	268	220	64	61	222	326
Future Volume (vph)	394	797	353	60	620	73	268	220	64	61	222	326
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.98		1.00	1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3467	3395		1787	3513		3467	3574	1599	1787	3230	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3467	3395		1787	3513		3467	3574	1599	1787	3230	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	415	839	372	63	653	77	282	232	67	64	234	343
RTOR Reduction (vph)	0	42	0	0	8	0	0	0	51	0	229	0
Lane Group Flow (vph)	415	1169	0	63	722	0	282	232	16	64	348	0
Confl. Peds. (#/hr)			1			1						1
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	17.1	44.3		6.9	34.1		12.8	23.5	23.5	6.7	17.4	
Effective Green, g (s)	17.1	44.3		6.9	34.1		12.8	23.5	23.5	6.7	17.4	
Actuated g/C Ratio	0.17	0.45		0.07	0.34		0.13	0.24	0.24	0.07	0.18	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	596	1513		124	1205		446	844	378	120	565	
v/s Ratio Prot	c0.12	c0.34		0.04	0.21		c0.08	0.06		0.04	c0.11	
v/s Ratio Perm									0.01			
v/c Ratio	0.70	0.77		0.51	0.60		0.63	0.27	0.04	0.53	0.62	
Uniform Delay, d1	38.7	23.3		44.6	27.0		41.1	31.0	29.3	44.8	37.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.5	2.5		3.3	0.8		2.9	0.2	0.0	4.5	2.0	
Delay (s)	42.2	25.8		47.9	27.8		44.0	31.2	29.3	49.3	39.9	
Level of Service	D	C		D	C		D	C	C	D	D	
Approach Delay (s)		30.0			29.4			37.2			40.8	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM 2000 Control Delay	32.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	99.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	76.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
10: River Road & Creston Road

Near Term PM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	394	797	353	60	620	73	268	220	64	61	222	326
Future Volume (veh/h)	394	797	353	60	620	73	268	220	64	61	222	326
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	415	839	0	63	653	77	282	232	67	64	234	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	581	1463		97	954	112	416	650	290	98	417	
Arrive On Green	0.17	0.41	0.00	0.05	0.30	0.30	0.12	0.18	0.18	0.05	0.12	0.00
Sat Flow, veh/h	3483	3676	0	1795	3222	379	3483	3582	1598	1795	3676	0
Grp Volume(v), veh/h	415	839	0	63	363	367	282	232	67	64	234	0
Grp Sat Flow(s),veh/h/ln	1742	1791	0	1795	1791	1811	1742	1791	1598	1795	1791	0
Q Serve(g_s), s	6.7	10.8	0.0	2.1	10.7	10.7	4.6	3.4	2.1	2.1	3.7	0.0
Cycle Q Clear(g_c), s	6.7	10.8	0.0	2.1	10.7	10.7	4.6	3.4	2.1	2.1	3.7	0.0
Prop In Lane	1.00		0.00	1.00		0.21	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	581	1463		97	530	536	416	650	290	98	417	
V/C Ratio(X)	0.71	0.57		0.65	0.68	0.69	0.68	0.36	0.23	0.65	0.56	
Avail Cap(c_a), veh/h	1253	3206		315	1273	1287	845	1696	756	291	1408	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	23.6	13.7	0.0	27.7	18.6	18.6	25.2	21.4	20.9	27.7	25.0	0.0
Incr Delay (d2), s/veh	1.7	0.4	0.0	7.0	1.6	1.6	1.9	0.3	0.4	7.1	1.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	3.9	0.0	1.0	4.1	4.2	1.8	1.3	0.7	1.0	1.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.2	14.0	0.0	34.7	20.1	20.1	27.1	21.7	21.3	34.8	26.1	0.0
LnGrp LOS	C	B		C	C	C	C	C	C	C	C	
Approach Vol, veh/h		1254	A		793			581			298	A
Approach Delay, s/veh		17.7			21.3			24.3			28.0	
Approach LOS		B			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.7	28.9	11.6	11.5	14.5	22.2	7.8	15.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	53.5	14.5	23.5	21.5	42.5	9.7	28.3
Max Q Clear Time (g_c+I1), s	4.1	12.8	6.6	5.7	8.7	12.7	4.1	5.4
Green Ext Time (p_c), s	0.0	7.2	0.6	1.1	1.2	4.8	0.0	1.5

Intersection Summary	
HCM 6th Ctrl Delay	21.0
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Olsen-Chandler SP
11: Creston Road & Golden Hill Road

Near Term PM
Queues

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	58	429	893	554	73
v/c Ratio	0.23	0.24	0.64	0.56	0.15
Control Delay	38.3	11.1	17.3	27.1	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	38.3	11.1	17.3	27.1	9.1
Queue Length 50th (ft)	19	34	103	89	0
Queue Length 95th (ft)	88	143	328	272	40
Internal Link Dist (ft)		1151	2310	505	
Turn Bay Length (ft)	125			120	
Base Capacity (vph)	342	2955	2378	1709	815
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.17	0.15	0.38	0.32	0.09

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	56	416	451	415	537	71
Future Volume (vph)	56	416	451	415	537	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.93		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1787	3574	3292		3467	1578
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1787	3574	3292		3467	1578
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	58	429	465	428	554	73
RTOR Reduction (vph)	0	0	131	0	0	54
Lane Group Flow (vph)	58	429	762	0	554	19
Confl. Peds. (#/hr)				4		1
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	NA		Perm	Perm
Protected Phases	5	2	6			
Permitted Phases					4	4
Actuated Green, G (s)	4.4	33.6	24.7		18.1	18.1
Effective Green, g (s)	4.4	33.6	24.7		18.1	18.1
Actuated g/C Ratio	0.06	0.49	0.36		0.27	0.27
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	115	1763	1194		921	419
v/s Ratio Prot	c0.03	0.12	c0.23			
v/s Ratio Perm					c0.16	0.01
v/c Ratio	0.50	0.24	0.64		0.60	0.05
Uniform Delay, d1	30.8	9.9	18.0		21.8	18.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.5	0.1	1.1		1.1	0.0
Delay (s)	34.2	10.0	19.1		23.0	18.6
Level of Service	C	B	B		C	B
Approach Delay (s)		12.9	19.1		22.5	
Approach LOS		B	B		C	

Intersection Summary			
HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	68.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	56.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	199	288	329	95	305	263	212	529	185	706
v/c Ratio	0.68	0.58	0.50	0.47	0.48	0.53	0.71	0.58	0.62	0.78
Control Delay	46.6	33.1	6.2	43.9	32.4	8.3	48.2	29.3	42.3	33.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.6	33.1	6.2	43.9	32.4	8.3	48.2	29.3	42.3	33.4
Queue Length 50th (ft)	99	140	0	48	77	0	106	120	92	168
Queue Length 95th (ft)	#200	225	63	100	116	61	#219	194	165	253
Internal Link Dist (ft)		1092			186			1440		2310
Turn Bay Length (ft)	150			170		140	230		245	
Base Capacity (vph)	340	593	720	246	939	608	340	1002	387	1065
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.49	0.46	0.39	0.32	0.43	0.62	0.53	0.48	0.66

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	187	271	309	89	287	247	199	444	54	174	518	146
Future Volume (vph)	187	271	309	89	287	247	199	444	54	174	518	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1881	1572	1787	3574	1578	1787	3516		1787	3438	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	1881	1572	1787	3574	1578	1787	3516		1787	3438	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	199	288	329	95	305	263	212	472	57	185	551	155
RTOR Reduction (vph)	0	0	243	0	0	212	0	10	0	0	28	0
Lane Group Flow (vph)	199	288	86	95	305	51	212	519	0	185	678	0
Confl. Peds. (#/hr)			4			1						10
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	12.8	20.7	20.7	7.3	15.2	15.2	13.0	20.1		13.0	20.1	
Effective Green, g (s)	12.8	20.7	20.7	7.3	15.2	15.2	13.0	20.1		13.0	20.1	
Actuated g/C Ratio	0.16	0.26	0.26	0.09	0.19	0.19	0.16	0.25		0.16	0.25	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	289	492	411	164	686	303	293	893		293	873	
v/s Ratio Prot	c0.11	c0.15		0.05	0.09		c0.12	0.15		0.10	c0.20	
v/s Ratio Perm			0.05			0.03						
v/c Ratio	0.69	0.59	0.21	0.58	0.44	0.17	0.72	0.58		0.63	0.78	
Uniform Delay, d1	31.3	25.5	22.8	34.4	28.2	26.7	31.3	25.8		30.8	27.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.7	1.8	0.3	4.9	0.5	0.3	8.5	1.0		4.4	4.4	
Delay (s)	37.9	27.2	23.1	39.3	28.7	26.9	39.9	26.8		35.2	31.8	
Level of Service	D	C	C	D	C	C	D	C		D	C	
Approach Delay (s)		28.2			29.5			30.5			32.5	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	30.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	79.1	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	64.6%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
12: Creston Road & Niblick Road/Sherwood Road

Near Term PM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	187	271	309	89	287	247	199	444	54	174	518	146
Future Volume (veh/h)	187	271	309	89	287	247	199	444	54	174	518	146
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	199	288	329	95	305	263	212	472	57	185	551	155
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	245	524	442	123	754	336	258	867	104	231	701	196
Arrive On Green	0.14	0.28	0.28	0.07	0.21	0.21	0.14	0.27	0.27	0.13	0.25	0.25
Sat Flow, veh/h	1795	1885	1591	1795	3582	1595	1795	3219	387	1795	2754	772
Grp Volume(v), veh/h	199	288	329	95	305	263	212	262	267	185	358	348
Grp Sat Flow(s),veh/h/ln	1795	1885	1591	1795	1791	1595	1795	1791	1816	1795	1791	1735
Q Serve(g_s), s	7.6	9.2	13.3	3.7	5.2	11.0	8.1	8.8	8.9	7.1	13.1	13.2
Cycle Q Clear(g_c), s	7.6	9.2	13.3	3.7	5.2	11.0	8.1	8.8	8.9	7.1	13.1	13.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.21	1.00		0.44
Lane Grp Cap(c), veh/h	245	524	442	123	754	336	258	482	489	231	455	441
V/C Ratio(X)	0.81	0.55	0.74	0.77	0.40	0.78	0.82	0.54	0.55	0.80	0.78	0.79
Avail Cap(c_a), veh/h	369	641	541	267	1014	452	369	533	540	419	583	565
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.6	21.7	23.2	32.3	24.1	26.3	29.3	22.1	22.1	29.9	24.5	24.6
Incr Delay (d2), s/veh	8.1	0.9	4.4	9.6	0.3	6.3	9.5	1.0	1.0	6.3	5.4	5.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	3.8	5.0	1.8	2.1	4.4	4.0	3.6	3.6	3.3	5.8	5.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.7	22.6	27.6	42.0	24.4	32.6	38.9	23.0	23.1	36.2	29.9	30.3
LnGrp LOS	D	C	C	D	C	C	D	C	C	D	C	C
Approach Vol, veh/h		816			663			741			891	
Approach Delay, s/veh		28.3			30.2			27.6			31.4	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.6	23.5	9.4	24.1	14.7	22.5	14.1	19.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.5	21.0	10.5	24.0	14.5	23.0	14.5	20.0
Max Q Clear Time (g_c+I1), s	9.1	10.9	5.7	15.3	10.1	15.2	9.6	13.0
Green Ext Time (p_c), s	0.3	2.2	0.1	1.9	0.2	2.6	0.2	1.6

Intersection Summary	
HCM 6th Ctrl Delay	29.4
HCM 6th LOS	C

Olsen-Chandler SP
13: Creston Road & Scott Street

Near Term PM
HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	48	56	564	38	85	741
Future Volume (Veh/h)	48	56	564	38	85	741
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	52	60	606	41	91	797
Pedestrians	2					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1608	628			649	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1608	628			649	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	50	88			90	
cM capacity (veh/h)	105	483			940	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	112	647	91	797
Volume Left	52	0	91	0
Volume Right	60	41	0	0
cSH	180	1700	940	1700
Volume to Capacity	0.62	0.38	0.10	0.47
Queue Length 95th (ft)	87	0	8	0
Control Delay (s)	53.1	0.0	9.2	0.0
Lane LOS	F		A	
Approach Delay (s)	53.1	0.0	0.9	
Approach LOS	F			

Intersection Summary			
Average Delay	4.1		
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	4.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	48	56	564	38	85	741
Future Vol, veh/h	48	56	564	38	85	741
Conflicting Peds, #/hr	0	0	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	52	60	606	41	91	797

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1608	629	0	0	649	0
Stage 1	629	-	-	-	-	-
Stage 2	979	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.11	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209	-
Pot Cap-1 Maneuver	116	484	-	-	942	-
Stage 1	533	-	-	-	-	-
Stage 2	366	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	105	483	-	-	940	-
Mov Cap-2 Maneuver	105	-	-	-	-	-
Stage 1	532	-	-	-	-	-
Stage 2	330	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	52.6	0	1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	181	940	-
HCM Lane V/C Ratio	-	-	0.618	0.097	-
HCM Control Delay (s)	-	-	52.6	9.2	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	3.5	0.3	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	104	4	13	4	1	38	21	391	10	48	499	128
Future Volume (Veh/h)	104	4	13	4	1	38	21	391	10	48	499	128
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Hourly flow rate (vph)	105	4	13	4	1	38	21	395	10	48	504	129
Pedestrians		5									4	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		3.5									3.5	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1084	1052	509	1057	1176	404	638			405		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1084	1052	509	1057	1176	404	638			405		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	39	98	98	98	99	94	98			96		
cM capacity (veh/h)	172	212	563	186	179	646	946			1159		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	122	43	21	405	48	504	129
Volume Left	105	4	21	0	48	0	0
Volume Right	13	38	0	10	0	0	129
cSH	187	501	946	1700	1159	1700	1700
Volume to Capacity	0.65	0.09	0.02	0.24	0.04	0.30	0.08
Queue Length 95th (ft)	96	7	2	0	3	0	0
Control Delay (s)	54.5	12.9	8.9	0.0	8.2	0.0	0.0
Lane LOS	F	B	A		A		
Approach Delay (s)	54.5	12.9	0.4		0.6		
Approach LOS	F	B					

Intersection Summary					
Average Delay	6.1				
Intersection Capacity Utilization	53.0%	ICU Level of Service		A	
Analysis Period (min)	15				

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	5.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	104	4	13	4	1	38	21	391	10	48	499	128
Future Vol, veh/h	104	4	13	4	1	38	21	391	10	48	499	128
Conflicting Peds, #/hr	4	0	0	0	0	4	5	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	30	-	-	70	-	60
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	99	99	99	99	99	99	99	99	99	99	99	99
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	105	4	13	4	1	38	21	395	10	48	504	129

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1071	1052	509	1115	1176	404	638	0	0	405	0	0
Stage 1	605	605	-	442	442	-	-	-	-	-	-	-
Stage 2	466	447	-	673	734	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	199	227	566	186	192	649	951	-	-	1159	-	-
Stage 1	486	489	-	596	578	-	-	-	-	-	-	-
Stage 2	579	575	-	446	427	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	176	212	563	170	179	647	946	-	-	1159	-	-
Mov Cap-2 Maneuver	176	212	-	170	179	-	-	-	-	-	-	-
Stage 1	473	467	-	583	565	-	-	-	-	-	-	-
Stage 2	530	562	-	414	407	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	52.3	13.1	0.4	0.6
HCM LOS	F	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	946	-	-	191	489	1159	-	-
HCM Lane V/C Ratio	0.022	-	-	0.64	0.089	0.042	-	-
HCM Control Delay (s)	8.9	-	-	52.3	13.1	8.2	-	-
HCM Lane LOS	A	-	-	F	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	3.7	0.3	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	8	2	9	135	3	165	11	248	209	258	246	12
Future Volume (vph)	8	2	9	135	3	165	11	248	209	258	246	12
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	9	2	10	145	3	177	12	267	225	277	265	13

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	21	325	279	225	410	146
Volume Left (vph)	9	145	12	0	277	0
Volume Right (vph)	10	177	0	225	0	13
Hadj (s)	-0.18	-0.22	0.04	-0.68	0.36	-0.05
Departure Headway (s)	7.3	6.2	6.6	5.9	6.8	6.4
Degree Utilization, x	0.04	0.56	0.51	0.37	0.78	0.26
Capacity (veh/h)	424	550	517	587	510	545
Control Delay (s)	10.6	16.8	15.2	11.1	28.3	10.4
Approach Delay (s)	10.6	16.8	13.4		23.6	
Approach LOS	B	C	B		C	

Intersection Summary				
Delay	18.2			
Level of Service	C			
Intersection Capacity Utilization	61.8%	ICU Level of Service	B	
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	18.8
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Vol, veh/h	8	2	9	135	3	165	0	11	248	209	258	246
Future Vol, veh/h	8	2	9	135	3	165	0	11	248	209	258	246
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	1	1	1	1	1	1	2	1	1	1	1	1
Mvmt Flow	9	2	10	145	3	177	0	12	267	225	277	265
Number of Lanes	0	1	0	0	1	0	0	0	1	1	0	2

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	10.8	17.2	14.3	24.2
HCM LOS	B	C	B	C

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	4%	0%	42%	45%	68%	0%
Vol Thru, %	96%	0%	11%	1%	32%	91%
Vol Right, %	0%	100%	47%	54%	0%	9%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	259	209	19	303	381	135
LT Vol	11	0	8	135	258	0
Through Vol	248	0	2	3	123	123
RT Vol	0	209	9	165	0	12
Lane Flow Rate	278	225	20	326	410	145
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.509	0.365	0.042	0.564	0.769	0.256
Departure Headway (Hd)	6.576	5.839	7.429	6.232	6.759	6.35
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	546	611	485	577	533	562
Service Time	4.363	3.626	5.429	4.312	4.542	4.133
HCM Lane V/C Ratio	0.509	0.368	0.041	0.565	0.769	0.258
HCM Control Delay	16.1	12	10.8	17.2	28.8	11.3
HCM Lane LOS	C	B	B	C	D	B
HCM 95th-tile Q	2.9	1.7	0.1	3.5	6.9	1

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBR
Lane Configurations	
Traffic Vol, veh/h	12
Future Vol, veh/h	12
Peak Hour Factor	0.93
Heavy Vehicles, %	1
Mvmt Flow	13
Number of Lanes	0

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	268	247	148	200	198	192
Future Volume (Veh/h)	268	247	148	200	198	192
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	276	255	153	206	204	198
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	613	204	402			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	613	204	402			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	25	68	87			
cM capacity (veh/h)	370	806	1160			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	531	153	103	103	204	198
Volume Left	276	153	0	0	0	0
Volume Right	255	0	0	0	0	198
cSH	712	1160	1700	1700	1700	1700
Volume to Capacity	0.75	0.13	0.06	0.06	0.12	0.12
Queue Length 95th (ft)	169	11	0	0	0	0
Control Delay (s)	25.4	8.6	0.0	0.0	0.0	0.0
Lane LOS	D	A				
Approach Delay (s)	25.4	3.7			0.0	
Approach LOS	D					

Intersection Summary			
Average Delay		11.5	
Intersection Capacity Utilization		43.5%	ICU Level of Service A
Analysis Period (min)		15	

Intersection	
Int Delay, s/veh	10.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	268	247	148	200	198	192
Future Vol, veh/h	268	247	148	200	198	192
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	145	105	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	276	255	153	206	204	198

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	613	204	402	0	-	0
Stage 1	204	-	-	-	-	-
Stage 2	409	-	-	-	-	-
Critical Hdwy	6.615	6.215	4.115	-	-	-
Critical Hdwy Stg 1	5.415	-	-	-	-	-
Critical Hdwy Stg 2	5.815	-	-	-	-	-
Follow-up Hdwy	3.5095	3.3095	2.2095	-	-	-
Pot Cap-1 Maneuver	442	839	1161	-	-	-
Stage 1	832	-	-	-	-	-
Stage 2	642	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	384	839	1161	-	-	-
Mov Cap-2 Maneuver	384	-	-	-	-	-
Stage 1	722	-	-	-	-	-
Stage 2	642	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	23.6	3.6	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1161	-	384	839	-	-
HCM Lane V/C Ratio	0.131	-	0.72	0.304	-	-
HCM Control Delay (s)	8.6	-	35	11.2	-	-
HCM Lane LOS	A	-	E	B	-	-
HCM 95th %tile Q(veh)	0.5	-	5.5	1.3	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	0	109	0	168	14	0	0	0	0	283	34
Future Volume (Veh/h)	27	0	109	0	168	14	0	0	0	0	283	34
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	0	118	0	183	15	0	0	0	0	308	37
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	426	326	326	444	345	0	345			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	426	326	326	444	345	0	345			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	84	100	68	99	100			100		
cM capacity (veh/h)	403	593	717	439	580	1088	1220			1630		

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	147	198	345
Volume Left	29	0	0
Volume Right	118	15	37
cSH	621	614	1700
Volume to Capacity	0.24	0.32	0.20
Queue Length 95th (ft)	23	35	0
Control Delay (s)	12.6	13.6	0.0
Lane LOS	B	B	
Approach Delay (s)	12.6	13.6	0.0
Approach LOS	B	B	

Intersection Summary					
Average Delay		6.6			
Intersection Capacity Utilization		44.0%	ICU Level of Service	A	
Analysis Period (min)		15			

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	0	109	0	168	14	0	0	0	0	283	34
Future Vol, veh/h	27	0	109	0	168	14	0	0	0	0	283	34
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	29	0	118	0	183	15	0	0	0	0	308	37

Major/Minor	Minor2			Minor1					Major2			
Conflicting Flow All	426	327	327	386	345	0			-	-	0	
Stage 1	327	327	-	0	0	-			-	-	-	
Stage 2	99	0	-	386	345	-			-	-	-	
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21			-	-	-	
Critical Hdwy Stg 1	6.11	5.51	-	-	-	-			-	-	-	
Critical Hdwy Stg 2	-	-	-	6.11	5.51	-			-	-	-	
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309			-	-	-	
Pot Cap-1 Maneuver	540	593	717	574	580	-			0	-	-	
Stage 1	688	650	-	-	-	-			0	-	-	
Stage 2	-	-	-	639	638	-			0	-	-	
Platoon blocked, %										-	-	
Mov Cap-1 Maneuver	-	593	717	479	580	-			-	-	-	
Mov Cap-2 Maneuver	-	593	-	479	580	-			-	-	-	
Stage 1	688	650	-	-	-	-			-	-	-	
Stage 2	-	-	-	533	638	-			-	-	-	

Approach	EB	WB	SB
HCM Control Delay, s			0
HCM LOS	-	-	

Minor Lane/Major Mvmt	EBLn1	WBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	-	580	-	-	-
HCM Lane V/C Ratio	-	0.315	-	-	-
HCM Control Delay (s)	-	14	-	-	-
HCM Lane LOS	-	B	-	-	-
HCM 95th %tile Q(veh)	-	1.3	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	52	413	673	190	422	99	368	1053	587	324
v/c Ratio	0.18	0.73	0.65	0.34	0.42	0.57	0.69	0.79	0.76	0.33
Control Delay	51.6	56.7	43.0	38.6	3.6	71.1	59.6	20.4	53.8	36.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.6	56.7	43.0	38.6	3.6	71.1	59.6	20.4	53.8	36.2
Queue Length 50th (ft)	39	166	252	124	15	82	160	196	244	110
Queue Length 95th (ft)	86	246	367	219	68	154	230	286	335	162
Internal Link Dist (ft)		521		1372			611			680
Turn Bay Length (ft)	115		515		115	165		290	305	
Base Capacity (vph)	358	709	1186	643	1098	238	829	1446	1006	1363
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.58	0.57	0.30	0.38	0.42	0.44	0.73	0.58	0.24

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	299	102	653	184	409	96	357	1021	569	256	58
Future Volume (vph)	50	299	102	653	184	409	96	357	1021	569	256	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.95	0.88	0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	3425		3467	1881	1585	1787	3574	2814	3467	3475	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	3425		3467	1881	1585	1787	3574	2814	3467	3475	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	52	308	105	673	190	422	99	368	1053	587	264	60
RTOR Reduction (vph)	0	23	0	0	0	180	0	0	58	0	14	0
Lane Group Flow (vph)	52	390	0	673	190	242	99	368	995	587	310	0
Confl. Peds. (#/hr)						2						
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	19.9	19.9		37.5	37.5	65.4	12.2	18.7	56.2	27.9	34.4	
Effective Green, g (s)	19.9	19.9		37.5	37.5	65.4	12.2	18.7	56.2	27.9	34.4	
Actuated g/C Ratio	0.16	0.16		0.30	0.30	0.53	0.10	0.15	0.45	0.22	0.28	
Clearance Time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	285	547		1044	566	832	175	536	1270	776	960	
v/s Ratio Prot	0.03	c0.11		0.19	0.10	0.07	0.06	0.10	c0.24	c0.17	0.09	
v/s Ratio Perm						0.09			0.12			
v/c Ratio	0.18	0.71		0.64	0.34	0.29	0.57	0.69	0.78	0.76	0.32	
Uniform Delay, d1	45.3	49.6		37.7	33.8	16.6	53.6	50.1	29.0	45.1	35.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	4.4		1.4	0.4	0.2	4.1	3.6	3.2	4.2	0.2	
Delay (s)	45.6	54.0		39.1	34.2	16.7	57.8	53.8	32.2	49.4	36.0	
Level of Service	D	D		D	C	B	E	D	C	D	D	
Approach Delay (s)		53.0			31.0			39.1			44.6	
Approach LOS		D			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	39.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	124.5	Sum of lost time (s)	20.5	
Intersection Capacity Utilization	75.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
18: US 101 Ramps/Spring Street & 1st Street/Niblick Road

Near Term PM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	299	102	653	184	409	96	357	1021	569	256	58
Future Volume (veh/h)	50	299	102	653	184	409	96	357	1021	569	256	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	52	308	105	673	190	422	99	368	1053	587	264	60
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	264	386	129	886	479	718	124	836	1371	681	1020	228
Arrive On Green	0.15	0.15	0.15	0.25	0.25	0.25	0.07	0.23	0.23	0.20	0.35	0.35
Sat Flow, veh/h	1795	2626	877	3483	1885	1594	1795	3582	2812	3483	2909	650
Grp Volume(v), veh/h	52	208	205	673	190	422	99	368	1053	587	161	163
Grp Sat Flow(s),veh/h/ln	1795	1791	1712	1742	1885	1594	1795	1791	1406	1742	1791	1768
Q Serve(g_s), s	3.1	13.5	14.0	21.6	10.1	23.9	6.6	10.6	28.2	19.7	7.7	8.0
Cycle Q Clear(g_c), s	3.1	13.5	14.0	21.6	10.1	23.9	6.6	10.6	28.2	19.7	7.7	8.0
Prop In Lane	1.00		0.51	1.00		1.00	1.00		1.00	1.00		0.37
Lane Grp Cap(c), veh/h	264	264	252	886	479	718	124	836	1371	681	628	620
V/C Ratio(X)	0.20	0.79	0.81	0.76	0.40	0.59	0.80	0.44	0.77	0.86	0.26	0.26
Avail Cap(c_a), veh/h	363	362	346	1199	649	861	241	836	1371	1018	701	692
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.2	49.7	49.9	41.6	37.4	24.9	55.4	39.6	23.1	47.0	28.0	28.1
Incr Delay (d2), s/veh	0.4	7.9	10.1	2.0	0.5	0.8	11.0	0.4	2.7	5.1	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	6.7	6.8	9.3	4.6	8.8	3.3	4.6	16.3	9.0	3.4	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.6	57.6	60.0	43.6	37.9	25.6	66.4	39.9	25.8	52.2	28.2	28.3
LnGrp LOS	D	E	E	D	D	C	E	D	C	D	C	C
Approach Vol, veh/h		465			1285			1520			911	
Approach Delay, s/veh		57.3			36.9			31.8			43.7	
Approach LOS		E			D			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	28.3	34.0		22.4	14.2	48.1		36.1				
Change Period (Y+Rc), s	* 4.7	5.8		4.6	5.8	* 5.8		5.4				
Max Green Setting (Gmax), s	* 35	28.2		24.4	16.2	* 47		41.6				
Max Q Clear Time (g_c+I1), s	21.7	30.2		16.0	8.6	10.0		25.9				
Green Ext Time (p_c), s	1.9	0.0		1.8	0.1	2.1		4.8				

Intersection Summary			
HCM 6th Ctrl Delay		38.8	
HCM 6th LOS		D	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Olsen-Chandler SP
19: S. River Road & Niblick Road

Near Term PM
Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	269	858	627	101	783	426	330	163	543
v/c Ratio	0.60	0.66	0.70	0.52	0.72	0.73	0.40	0.64	0.73
Control Delay	50.6	32.5	11.1	57.0	35.0	50.5	34.7	55.8	42.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.6	32.5	11.1	57.0	35.0	50.5	34.7	55.8	42.9
Queue Length 50th (ft)	92	268	59	67	241	145	95	108	175
Queue Length 95th (ft)	148	378	216	132	338	221	154	191	252
Internal Link Dist (ft)		1510			1609		962		896
Turn Bay Length (ft)	140			80		150		110	
Base Capacity (vph)	550	1483	960	265	1419	692	995	357	990
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.58	0.65	0.38	0.55	0.62	0.33	0.46	0.55

Intersection Summary

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
19: S. River Road & Niblick Road

Near Term PM
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	258	824	602	97	627	125	409	263	54	156	393	129
Future Volume (vph)	258	824	602	97	627	125	409	263	54	156	393	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3467	3574	1599	1787	3477		3467	3483		1787	3429	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3467	3574	1599	1787	3477		3467	3483		1787	3429	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	269	858	627	101	653	130	426	274	56	162	409	134
RTOR Reduction (vph)	0	0	325	0	14	0	0	14	0	0	27	0
Lane Group Flow (vph)	269	858	302	101	769	0	426	316	0	163	516	0
Confl. Peds. (#/hr)						2						3
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	13.1	36.7	36.7	9.1	32.7		17.1	23.6		14.6	21.1	
Effective Green, g (s)	13.1	36.7	36.7	9.1	32.7		17.1	23.6		14.6	21.1	
Actuated g/C Ratio	0.13	0.36	0.36	0.09	0.32		0.17	0.23		0.14	0.21	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	445	1285	575	159	1114		581	805		255	709	
v/s Ratio Prot	c0.08	c0.24		0.06	0.22		c0.12	0.09		0.09	c0.15	
v/s Ratio Perm			0.19									
v/c Ratio	0.60	0.67	0.53	0.64	0.69		0.73	0.39		0.64	0.73	
Uniform Delay, d1	42.0	27.5	25.8	44.8	30.2		40.3	33.1		41.2	37.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.3	1.3	0.9	8.0	1.9		4.8	0.3		5.2	3.7	
Delay (s)	44.3	28.8	26.7	52.9	32.1		45.1	33.5		46.4	41.5	
Level of Service	D	C	C	D	C		D	C		D	D	
Approach Delay (s)		30.4			34.5			40.0			42.6	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	35.2	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	102.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	71.2%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Olsen-Chandler SP
19: S. River Road & Niblick Road

Near Term PM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	258	824	602	97	627	125	409	263	54	156	393	129
Future Volume (veh/h)	258	824	602	97	627	125	409	263	54	156	393	129
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	269	858	627	101	653	130	426	274	56	162	409	134
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	369	1220	544	131	916	182	539	741	149	203	552	179
Arrive On Green	0.11	0.34	0.34	0.07	0.31	0.31	0.15	0.25	0.25	0.11	0.21	0.21
Sat Flow, veh/h	3483	3582	1598	1795	2976	592	3483	2970	598	1795	2656	861
Grp Volume(v), veh/h	269	858	627	101	393	390	426	164	166	162	274	269
Grp Sat Flow(s),veh/h/ln	1742	1791	1598	1795	1791	1777	1742	1791	1778	1795	1791	1726
Q Serve(g_s), s	6.0	16.7	16.3	4.4	15.6	15.7	9.5	6.1	6.2	7.1	11.5	11.8
Cycle Q Clear(g_c), s	6.0	16.7	16.3	4.4	15.6	15.7	9.5	6.1	6.2	7.1	11.5	11.8
Prop In Lane	1.00		1.00	1.00		0.33	1.00		0.34	1.00		0.50
Lane Grp Cap(c), veh/h	369	1220	544	131	551	547	539	447	443	203	372	359
V/C Ratio(X)	0.73	0.70	1.15	0.77	0.71	0.71	0.79	0.37	0.38	0.80	0.74	0.75
Avail Cap(c_a), veh/h	671	1803	804	324	879	873	844	612	608	435	612	590
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.8	23.0	9.4	36.6	24.7	24.7	32.7	24.9	25.0	34.8	29.8	29.9
Incr Delay (d2), s/veh	2.8	0.8	82.1	9.1	1.7	1.7	2.7	0.5	0.5	7.0	2.9	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	6.6	16.9	2.2	6.3	6.3	4.0	2.5	2.5	3.3	4.9	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.6	23.7	91.5	45.7	26.4	26.5	35.5	25.4	25.5	41.8	32.7	33.1
LnGrp LOS	D	C	F	D	C	C	D	C	C	D	C	C
Approach Vol, veh/h		1754			884			756			705	
Approach Delay, s/veh		50.1			28.6			31.1			34.9	
Approach LOS		D			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.4	31.9	17.0	21.2	13.0	29.3	13.6	24.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	14.5	40.5	19.5	27.5	15.5	39.5	19.5	27.5
Max Q Clear Time (g_c+I1), s	6.4	18.7	11.5	13.8	8.0	17.7	9.1	8.2
Green Ext Time (p_c), s	0.1	8.7	1.0	2.6	0.5	4.7	0.3	1.6

Intersection Summary	
HCM 6th Ctrl Delay	39.4
HCM 6th LOS	D

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	314	213	17	297	248	11
v/c Ratio	0.45	0.30	0.04	0.23	0.46	0.02
Control Delay	12.2	3.2	9.4	9.3	13.7	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.2	3.2	9.4	9.3	13.7	6.2
Queue Length 50th (ft)	36	0	2	16	29	0
Queue Length 95th (ft)	143	34	14	61	117	8
Internal Link Dist (ft)	1629			570	669	
Turn Bay Length (ft)			75			50
Base Capacity (vph)	1638	1383	932	3113	1440	1294
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.15	0.02	0.10	0.17	0.01

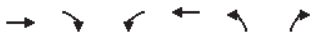
Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	289	196	16	273	228	10
Future Volume (vph)	289	196	16	273	228	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1827	1520	1734	3471	1733	1553
Flt Permitted	1.00	1.00	0.57	1.00	0.95	1.00
Satd. Flow (perm)	1827	1520	1040	3471	1733	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	314	213	17	297	248	11
RTOR Reduction (vph)	0	130	0	0	0	7
Lane Group Flow (vph)	314	83	17	297	248	4
Confl. Peds. (#/hr)		2	2		3	
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type	NA	Perm	Perm	NA	Perm	Prot
Protected Phases	2			6		8
Permitted Phases		2	6		8	
Actuated Green, G (s)	14.5	14.5	14.5	14.5	11.9	11.9
Effective Green, g (s)	14.5	14.5	14.5	14.5	11.9	11.9
Actuated g/C Ratio	0.39	0.39	0.39	0.39	0.32	0.32
Clearance Time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	712	592	405	1352	554	496
v/s Ratio Prot	c0.17			0.09		0.00
v/s Ratio Perm		0.05	0.02		c0.14	
v/c Ratio	0.44	0.14	0.04	0.22	0.45	0.01
Uniform Delay, d1	8.4	7.3	7.0	7.6	10.0	8.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.0	0.0	0.0	0.2	0.0
Delay (s)	8.5	7.4	7.1	7.6	10.3	8.6
Level of Service	A	A	A	A	B	A
Approach Delay (s)	8.1			7.6	10.2	
Approach LOS	A			A	B	

Intersection Summary				
HCM 2000 Control Delay	8.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	37.2	Sum of lost time (s)	10.8
Intersection Capacity Utilization	37.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	289	196	16	273	228	10
Future Volume (veh/h)	289	196	16	273	228	10
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	314	213	17	297	248	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	590	499	435	1122	458	408
Arrive On Green	0.32	0.32	0.32	0.32	0.26	0.26
Sat Flow, veh/h	1841	1555	861	3589	1753	1560
Grp Volume(v), veh/h	314	213	17	297	248	11
Grp Sat Flow(s),veh/h/ln	1841	1555	861	1749	1753	1560
Q Serve(g_s), s	3.6	2.8	0.4	1.6	3.1	0.1
Cycle Q Clear(g_c), s	3.6	2.8	4.0	1.6	3.1	0.1
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	590	499	435	1122	458	408
V/C Ratio(X)	0.53	0.43	0.04	0.26	0.54	0.03
Avail Cap(c_a), veh/h	2464	2082	1311	4682	2008	1787
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.2	6.9	8.8	6.5	8.2	7.1
Incr Delay (d2), s/veh	0.3	0.2	0.0	0.0	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.4	0.0	0.3	0.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	7.5	7.1	8.9	6.6	8.6	7.1
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h	527			314	259	
Approach Delay, s/veh	7.3			6.7	8.5	
Approach LOS	A			A	A	

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	13.7				13.7	12.2
Change Period (Y+Rc), s	5.4				5.4	5.4
Max Green Setting (Gmax), s	34.6				34.6	29.6
Max Q Clear Time (g_c+I1), s	5.6				6.0	5.1
Green Ext Time (p_c), s	1.4				1.2	0.3

Intersection Summary			
HCM 6th Ctrl Delay		7.4	
HCM 6th LOS		A	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	16	0	51	0	3	8	32	117	2	13	181	9
Future Volume (vph)	16	0	51	0	3	8	32	117	2	13	181	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	0	55	0	3	9	35	127	2	14	197	10

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	72	12	164	221
Volume Left (vph)	17	0	35	14
Volume Right (vph)	55	9	2	10
Hadj (s)	-0.39	-0.43	0.05	0.00
Departure Headway (s)	4.4	4.4	4.4	4.3
Degree Utilization, x	0.09	0.01	0.20	0.26
Capacity (veh/h)	750	733	795	813
Control Delay (s)	7.8	7.5	8.5	8.8
Approach Delay (s)	7.8	7.5	8.5	8.8
Approach LOS	A	A	A	A

Intersection Summary					
Delay		8.5			
Level of Service		A			
Intersection Capacity Utilization		34.9%	ICU Level of Service		A
Analysis Period (min)		15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	8.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	0	51	0	3	8	32	117	2	13	181	9
Future Vol, veh/h	16	0	51	0	3	8	32	117	2	13	181	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	17	0	55	0	3	9	35	127	2	14	197	10
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.8	7.5	8.5	8.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	21%	24%	0%	6%
Vol Thru, %	77%	0%	27%	89%
Vol Right, %	1%	76%	73%	4%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	151	67	11	203
LT Vol	32	16	0	13
Through Vol	117	0	3	181
RT Vol	2	51	8	9
Lane Flow Rate	164	73	12	221
Geometry Grp	1	1	1	1
Degree of Util (X)	0.2	0.088	0.015	0.256
Departure Headway (Hd)	4.378	4.37	4.417	4.28
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	824	823	813	845
Service Time	2.378	2.38	2.43	2.28
HCM Lane V/C Ratio	0.199	0.089	0.015	0.262
HCM Control Delay	8.5	7.8	7.5	8.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.7	0.3	0	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	82	12	46	0	9	14	31	46	0	17	69	64
Future Volume (Veh/h)	82	12	46	0	9	14	31	46	0	17	69	64
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	89	13	50	0	10	15	34	50	0	18	75	70
Pedestrians								6				
Lane Width (ft)								12.0				
Walking Speed (ft/s)								3.5				
Percent Blockage								1				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	25			69			347	247	44	258	264	18
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	25			69			347	247	44	258	264	18
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			93	92	100	97	88	93
cM capacity (veh/h)	1596			1530			489	617	1023	623	603	1064

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	152	25	84	18	145
Volume Left	89	0	34	18	0
Volume Right	50	15	0	0	70
cSH	1596	1530	558	623	763
Volume to Capacity	0.06	0.00	0.15	0.03	0.19
Queue Length 95th (ft)	4	0	13	2	17
Control Delay (s)	4.5	0.0	12.6	10.9	10.8
Lane LOS	A		B	B	B
Approach Delay (s)	4.5	0.0	12.6	10.8	
Approach LOS			B	B	

Intersection Summary				
Average Delay	8.3			
Intersection Capacity Utilization	36.5%	ICU Level of Service		A
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	8.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	82	12	46	0	9	14	31	46	0	17	69	64
Future Vol, veh/h	82	12	46	0	9	14	31	46	0	17	69	64
Conflicting Peds, #/hr	0	0	6	6	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	89	13	50	0	10	15	34	50	0	18	75	70

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	25	0	0	69	0	0	312	247	44	259	265	18
Stage 1	-	-	-	-	-	-	222	222	-	18	18	-
Stage 2	-	-	-	-	-	-	90	25	-	241	247	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	1596	-	-	1538	-	-	642	657	1029	696	642	1063
Stage 1	-	-	-	-	-	-	783	722	-	1004	882	-
Stage 2	-	-	-	-	-	-	920	876	-	765	704	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1596	-	-	1529	-	-	516	615	1023	624	601	1063
Mov Cap-2 Maneuver	-	-	-	-	-	-	516	615	-	624	601	-
Stage 1	-	-	-	-	-	-	734	676	-	946	882	-
Stage 2	-	-	-	-	-	-	787	876	-	667	659	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	4.3	0	12.4	10.8
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	571	1596	-	-	1529	-	-	624	760
HCM Lane V/C Ratio	0.147	0.056	-	-	-	-	-	0.03	0.19
HCM Control Delay (s)	12.4	7.4	0	-	0	-	-	10.9	10.8
HCM Lane LOS	B	A	A	-	A	-	-	B	B
HCM 95th %tile Q(veh)	0.5	0.2	-	-	0	-	-	0.1	0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	6	65	70	5	3	6
Future Volume (Veh/h)	6	65	70	5	3	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	71	76	5	3	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	81				164	78
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	81				164	78
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1504				819	977

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	78	81	10
Volume Left	7	0	3
Volume Right	0	5	7
cSH	1504	1700	923
Volume to Capacity	0.00	0.05	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.7	0.0	8.9
Lane LOS	A		A
Approach Delay (s)	0.7	0.0	8.9
Approach LOS			A

Intersection Summary				
Average Delay		0.9		
Intersection Capacity Utilization		18.4%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	65	70	5	3	6
Future Vol, veh/h	6	65	70	5	3	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	7	71	76	5	3	7

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	81	0	-	0	164	79
Stage 1	-	-	-	-	79	-
Stage 2	-	-	-	-	85	-
Critical Hdwy	4.14	-	-	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	2.236	-	-	-	3.536	3.336
Pot Cap-1 Maneuver	1504	-	-	-	822	976
Stage 1	-	-	-	-	939	-
Stage 2	-	-	-	-	933	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1504	-	-	-	818	976
Mov Cap-2 Maneuver	-	-	-	-	818	-
Stage 1	-	-	-	-	934	-
Stage 2	-	-	-	-	933	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1504	-	-	-	917
HCM Lane V/C Ratio	0.004	-	-	-	0.011
HCM Control Delay (s)	7.4	0	-	-	9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Reso A - Exhibit C2 (EIR Technical Appendix)

Near Term Plus 1293-Unit Project

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	252	1222	1276	134	160	263
v/c Ratio	0.71	0.38	0.83	0.18	0.62	0.42
Control Delay	55.4	0.3	31.3	3.6	58.3	22.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.4	0.3	31.3	3.6	58.3	22.2
Queue Length 50th (ft)	164	0	402	0	107	103
Queue Length 95th (ft)	#353	0	604	34	220	225
Internal Link Dist (ft)		942	856		514	
Turn Bay Length (ft)	345			330	450	
Base Capacity (vph)	460	3223	2631	1201	460	896
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.38	0.48	0.11	0.35	0.29

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	232	1124	1174	123	147	242
Future Volume (vph)	232	1124	1174	123	147	242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0	7.3	7.3	4.2	3.7
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1612	3223	3223	1442	1612	1442
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1612	3223	3223	1442	1612	1442
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	252	1222	1276	134	160	263
RTOR Reduction (vph)	0	0	0	70	0	27
Lane Group Flow (vph)	252	1222	1276	64	160	236
Heavy Vehicles (%)	12%	12%	12%	12%	12%	12%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	8	Free!	6		7!	4
Permitted Phases				6		4
Actuated Green, G (s)	24.6	110.3	52.9	52.9	17.8	46.4
Effective Green, g (s)	24.6	110.3	52.9	52.9	17.8	46.4
Actuated g/C Ratio	0.22	1.00	0.48	0.48	0.16	0.42
Clearance Time (s)	3.5		7.3	7.3	4.2	3.7
Vehicle Extension (s)	3.0		4.0	4.0	3.5	3.0
Lane Grp Cap (vph)	359	3223	1545	691	260	606
v/s Ratio Prot	c0.16	0.38	c0.40		c0.10	0.16
v/s Ratio Perm				0.04		
v/c Ratio	0.70	0.38	0.83	0.09	0.62	0.39
Uniform Delay, d1	39.5	0.0	24.7	15.6	43.1	22.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.1	0.3	3.9	0.1	4.5	0.4
Delay (s)	45.6	0.3	28.7	15.7	47.6	22.5
Level of Service	D	A	C	B	D	C
Approach Delay (s)		8.1	27.4		32.0	
Approach LOS		A	C		C	

Intersection Summary

HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	110.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

HCM 6th Edition methodology cannot be performed with phasing conflicts.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	227	850	304	39	959	186	300	327	93	183	151
v/c Ratio	0.57	0.63	0.39	0.11	0.82	0.29	0.63	0.43	0.35	0.64	0.41
Control Delay	54.9	32.1	4.8	47.8	39.5	5.0	53.5	39.1	57.3	56.7	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.9	32.1	4.8	47.8	39.5	5.0	53.5	39.1	57.3	56.7	10.8
Queue Length 50th (ft)	79	285	0	12	322	0	104	103	32	124	0
Queue Length 95th (ft)	148	428	63	34	484	49	189	179	72	236	61
Internal Link Dist (ft)		1323			2509			853		451	
Turn Bay Length (ft)	225		485	125		390	160		140		
Base Capacity (vph)	533	2139	1061	555	2139	1020	592	1243	592	659	653
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.40	0.29	0.07	0.45	0.18	0.51	0.26	0.16	0.28	0.23

Intersection Summary

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	209	782	280	36	882	171	276	282	18	86	168	139
Future Volume (vph)	209	782	280	36	882	171	276	282	18	86	168	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3155	3252	1455	3155	3252	1455	3155	3220		3155	1712	1455
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3155	3252	1455	3155	3252	1455	3155	3220		3155	1712	1455
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	227	850	304	39	959	186	300	307	20	93	183	151
RTOR Reduction (vph)	0	0	180	0	0	116	0	3	0	0	0	126
Lane Group Flow (vph)	227	850	124	39	959	70	300	324	0	93	183	25
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	14.0	45.9	45.9	10.2	42.1	42.1	16.8	26.1		9.3	18.6	18.6
Effective Green, g (s)	14.0	45.9	45.9	10.2	42.1	42.1	16.8	26.1		9.3	18.6	18.6
Actuated g/C Ratio	0.12	0.41	0.41	0.09	0.38	0.38	0.15	0.23		0.08	0.17	0.17
Clearance Time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	394	1331	595	287	1221	546	472	749		261	284	241
v/s Ratio Prot	0.07	c0.26		0.01	c0.29		c0.10	0.10		0.03	c0.11	
v/s Ratio Perm			0.09			0.05						0.02
v/c Ratio	0.58	0.64	0.21	0.14	0.79	0.13	0.64	0.43		0.36	0.64	0.10
Uniform Delay, d1	46.3	26.5	21.4	46.9	31.0	23.0	44.8	36.7		48.6	43.7	39.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.0	1.0	0.2	0.1	3.4	0.1	2.8	0.4		0.8	4.9	0.2
Delay (s)	48.3	27.5	21.6	47.0	34.4	23.1	47.6	37.1		49.4	48.6	39.9
Level of Service	D	C	C	D	C	C	D	D		D	D	D
Approach Delay (s)		29.6			33.0			42.1			45.7	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	34.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	112.1	Sum of lost time (s)	20.6	
Intersection Capacity Utilization	64.2%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	209	782	280	36	882	171	276	282	18	86	168	139
Future Volume (veh/h)	209	782	280	36	882	171	276	282	18	86	168	139
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1737	1737	1737	1737	1737	1737	1737	1737	1737	1737	1737	1737
Adj Flow Rate, veh/h	227	850	304	39	959	186	300	307	20	93	183	151
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	318	1135	506	294	1246	556	399	690	45	156	250	212
Arrive On Green	0.10	0.34	0.34	0.09	0.38	0.38	0.12	0.22	0.22	0.05	0.14	0.14
Sat Flow, veh/h	3209	3300	1472	3209	3300	1472	3209	3144	204	3209	1737	1472
Grp Volume(v), veh/h	227	850	304	39	959	186	300	160	167	93	183	151
Grp Sat Flow(s),veh/h/ln	1605	1650	1472	1605	1650	1472	1605	1650	1697	1605	1737	1472
Q Serve(g_s), s	5.5	18.4	8.2	0.9	20.6	7.3	7.3	6.8	6.9	2.3	8.1	7.9
Cycle Q Clear(g_c), s	5.5	18.4	8.2	0.9	20.6	7.3	7.3	6.8	6.9	2.3	8.1	7.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.12	1.00		1.00
Lane Grp Cap(c), veh/h	318	1135	506	294	1246	556	399	362	373	156	250	212
V/C Ratio(X)	0.71	0.75	0.60	0.13	0.77	0.33	0.75	0.44	0.45	0.59	0.73	0.71
Avail Cap(c_a), veh/h	715	2861	1276	715	2861	1276	795	838	862	795	882	747
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.3	23.4	7.8	33.7	22.1	17.9	34.2	27.2	27.3	37.6	33.1	33.0
Incr Delay (d2), s/veh	3.0	1.0	1.1	0.1	1.0	0.4	2.9	0.8	0.8	3.6	4.1	4.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	6.3	4.1	0.3	6.9	2.3	2.9	2.6	2.7	0.9	3.5	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.3	24.4	9.0	33.8	23.1	18.3	37.0	28.1	28.1	41.2	37.2	37.3
LnGrp LOS	D	C	A	C	C	B	D	C	C	D	D	D
Approach Vol, veh/h		1381			1184			627			427	
Approach Delay, s/veh		23.3			22.7			32.4			38.1	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.7	35.1	14.0	16.9	12.0	37.8	7.9	23.0
Change Period (Y+Rc), s	7.3	* 7.3	4.0	5.3	4.0	7.3	4.0	5.3
Max Green Setting (Gmax), s	18.0	* 70	20.0	41.0	18.0	70.0	20.0	41.0
Max Q Clear Time (g_c+I1), s	2.9	20.4	9.3	10.1	7.5	22.6	4.3	8.9
Green Ext Time (p_c), s	0.0	7.4	0.8	1.5	0.5	7.9	0.2	1.8

Intersection Summary	
HCM 6th Ctrl Delay	26.4
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	839	46	280	1080	0	9	0	260	0	0	0
Future Volume (Veh/h)	1	839	46	280	1080	0	9	0	260	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	912	50	304	1174	0	10	0	283	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									1			1
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1174			962			2134	2721	481	2240	2746	587
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1174			962			2134	2721	481	2240	2746	587
tC, single (s)	4.3			4.3			7.7	6.7	7.1	7.7	6.7	7.1
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			54			37	100	44	100	100	100
cM capacity (veh/h)	542			658			16	10	508	6	9	431

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	1	608	354	304	783	391	293	0
Volume Left	1	0	0	304	0	0	10	0
Volume Right	0	0	50	0	0	0	283	0
cSH	542	1700	1700	658	1700	1700	356	1700
Volume to Capacity	0.00	0.36	0.21	0.46	0.46	0.23	0.82	0.00
Queue Length 95th (ft)	0	0	0	61	0	0	182	0
Control Delay (s)	11.7	0.0	0.0	15.1	0.0	0.0	48.4	0.0
Lane LOS	B			C			E	A
Approach Delay (s)	0.0			3.1			48.4	0.0
Approach LOS							E	A

Intersection Summary				
Average Delay	6.9			
Intersection Capacity Utilization	53.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	839	46	280	1080	0	9	0	260	0	0	0
Future Vol, veh/h	1	839	46	280	1080	0	9	0	260	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	340	-	-	195	-	-	-	-	25	-	-	25
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	11	11	11	11	11	11	11	11	11	11	11	11
Mvmt Flow	1	912	50	304	1174	0	10	0	283	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1174	0	0	962	0	0	2134	2721	481	2240	2746	587
Stage 1	-	-	-	-	-	-	939	939	-	1782	1782	-
Stage 2	-	-	-	-	-	-	1195	1782	-	458	964	-
Critical Hdwy	4.32	-	-	4.32	-	-	7.72	6.72	7.12	7.72	6.72	7.12
Critical Hdwy Stg 1	-	-	-	-	-	-	6.72	5.72	-	6.72	5.72	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.72	5.72	-	6.72	5.72	-
Follow-up Hdwy	2.31	-	-	2.31	-	-	3.61	4.11	3.41	3.61	4.11	3.41
Pot Cap-1 Maneuver	542	-	-	658	-	-	25	18	508	21	17	431
Stage 1	-	-	-	-	-	-	267	321	-	77	121	-
Stage 2	-	-	-	-	-	-	184	121	-	529	312	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	542	-	-	658	-	-	16	10	508	6	9	431
Mov Cap-2 Maneuver	-	-	-	-	-	-	16	10	-	6	9	-
Stage 1	-	-	-	-	-	-	266	320	-	77	65	-
Stage 2	-	-	-	-	-	-	99	65	-	234	311	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3.1	33.5	0
HCM LOS			D	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	16	508	542	-	-	658	-	-	-	-
HCM Lane V/C Ratio	0.611	0.556	0.002	-	-	0.463	-	-	-	-
HCM Control Delay (s)	$ 406.3	20.6	11.7	-	-	15.1	-	-	0	0
HCM Lane LOS	F	C	B	-	-	C	-	-	A	A
HCM 95th %tile Q(veh)	1.6	3.4	0	-	-	2.4	-	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	364	736	1175	19	5	184
Future Volume (Veh/h)	364	736	1175	19	5	184
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	396	800	1277	21	5	200
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1298				2469	638
vC1, stage 1 conf vol					1277	
vC2, stage 2 conf vol					1192	
vCu, unblocked vol	1298				2469	638
tC, single (s)	4.3				7.0	7.1
tC, 2 stage (s)					6.0	
tF (s)	2.3				3.6	3.4
p0 queue free %	19				88	50
cM capacity (veh/h)	489				42	400

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	396	400	400	638	638	21	205
Volume Left	396	0	0	0	0	0	5
Volume Right	0	0	0	0	0	21	200
cSH	489	1700	1700	1700	1700	1700	410
Volume to Capacity	0.81	0.24	0.24	0.38	0.38	0.01	0.50
Queue Length 95th (ft)	193	0	0	0	0	0	68
Control Delay (s)	36.9	0.0	0.0	0.0	0.0	0.0	24.6
Lane LOS	E						C
Approach Delay (s)	12.2			0.0			24.6
Approach LOS							C

Intersection Summary			
Average Delay		7.3	
Intersection Capacity Utilization		66.0%	ICU Level of Service C
Analysis Period (min)		15	

Intersection	
Int Delay, s/veh	7.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	364	736	1175	19	5	184
Future Vol, veh/h	364	736	1175	19	5	184
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	580	-	-	165	0	25
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	396	800	1277	21	5	200

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1298	0	-	0	2469	639
Stage 1	-	-	-	-	1277	-
Stage 2	-	-	-	-	1192	-
Critical Hdwy	4.3	-	-	-	7	7.1
Critical Hdwy Stg 1	-	-	-	-	6	-
Critical Hdwy Stg 2	-	-	-	-	6	-
Follow-up Hdwy	2.3	-	-	-	3.6	3.4
Pot Cap-1 Maneuver	489	-	-	-	22	400
Stage 1	-	-	-	-	211	-
Stage 2	-	-	-	-	235	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	489	-	-	-	~ 4	400
Mov Cap-2 Maneuver	-	-	-	-	37	-
Stage 1	-	-	-	-	40	-
Stage 2	-	-	-	-	235	-

Approach	EB	WB	SB
HCM Control Delay, s	12.1	0	25.2
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	489	-	-	-	37	400
HCM Lane V/C Ratio	0.809	-	-	-	0.147	0.5
HCM Control Delay (s)	36.7	-	-	-	118.4	22.7
HCM Lane LOS	E	-	-	-	F	C
HCM 95th %tile Q(veh)	7.7	-	-	-	0.5	2.7

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	722	19	2	1186	0	8	0	1	0	0	0
Future Volume (Veh/h)	0	722	19	2	1186	0	8	0	1	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	785	21	2	1289	0	9	0	1	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									1			
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1289			806			1434	2078	392	1686	2099	644
vC1, stage 1 conf vol							785	785		1293	1293	
vC2, stage 2 conf vol							648	1293		393	806	
vCu, unblocked vol	1289			806			1434	2078	392	1686	2099	644
tC, single (s)	4.4			4.4			7.8	6.8	7.2	7.8	6.8	7.2
tC, 2 stage (s)							6.8	5.8		6.8	5.8	
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			100			97	100	100	100	100	100
cM capacity (veh/h)	478			747			261	183	576	149	181	390

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	392	392	21	2	859	430	10	0
Volume Left	0	0	0	0	2	0	0	9	0
Volume Right	0	0	0	21	0	0	0	1	0
cSH	1700	1700	1700	1700	747	1700	1700	290	1700
Volume to Capacity	0.00	0.23	0.23	0.01	0.00	0.51	0.25	0.03	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	0	3	0
Control Delay (s)	0.0	0.0	0.0	0.0	9.8	0.0	0.0	18.5	0.0
Lane LOS					A			C	A
Approach Delay (s)	0.0				0.0			18.5	0.0
Approach LOS								C	A

Intersection Summary				
Average Delay		0.1		
Intersection Capacity Utilization		42.8%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	722	19	2	1186	0	8	0	1	0	0	0
Future Vol, veh/h	0	722	19	2	1186	0	8	0	1	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	275	305	-	-	-	-	25	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	13	13	13	13	13	13	13	13	13	13	13	13
Mvmt Flow	0	785	21	2	1289	0	9	0	1	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1289	0	0	806	0	0	1434	2078	393	1686	2099	645
Stage 1	-	-	-	-	-	-	785	785	-	1293	1293	-
Stage 2	-	-	-	-	-	-	649	1293	-	393	806	-
Critical Hdwy	4.36	-	-	4.36	-	-	7.76	6.76	7.16	7.76	6.76	7.16
Critical Hdwy Stg 1	-	-	-	-	-	-	6.76	5.76	-	6.76	5.76	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.76	5.76	-	6.76	5.76	-
Follow-up Hdwy	2.33	-	-	2.33	-	-	3.63	4.13	3.43	3.63	4.13	3.43
Pot Cap-1 Maneuver	478	-	-	747	-	-	85	46	576	54	45	390
Stage 1	-	-	-	-	-	-	329	377	-	157	211	-
Stage 2	-	-	-	-	-	-	399	211	-	574	368	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	478	-	-	747	-	-	85	46	576	54	45	390
Mov Cap-2 Maneuver	-	-	-	-	-	-	253	177	-	146	176	-
Stage 1	-	-	-	-	-	-	329	377	-	157	210	-
Stage 2	-	-	-	-	-	-	398	210	-	573	368	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	18.8	0
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	253	576	478	-	-	747	-	-	-
HCM Lane V/C Ratio	0.034	0.002	-	-	-	0.003	-	-	-
HCM Control Delay (s)	19.7	11.3	0	-	-	9.8	-	-	0
HCM Lane LOS	C	B	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0	0	-	-	0	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Traffic Volume (veh/h)	91	120	94	273	103	71	42	416	228	42	317	53
Future Volume (veh/h)	91	120	94	273	103	71	42	416	228	42	317	53
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	99	130	102	297	112	77	46	452	248	46	345	58
Approach Volume (veh/h)		331			486			746			449	
Crossing Volume (veh/h)		688			597			275			455	
High Capacity (veh/h)		803			864			1116			968	
High v/c (veh/h)		0.41			0.56			0.67			0.46	
Low Capacity (veh/h)		639			693			918			785	
Low v/c (veh/h)		0.52			0.70			0.81			0.57	

Intersection Summary					
Maximum v/c High	0.67				
Maximum v/c Low	0.81				
Intersection Capacity Utilization	97.1%	ICU Level of Service		F	

Intersection	
Intersection Delay, s/veh	15.6
Intersection LOS	C

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	331	486	746	449
Demand Flow Rate, veh/h	341	500	768	462
Vehicles Circulating, veh/h	708	615	283	468
Vehicles Exiting, veh/h	222	436	766	647
Ped Vol Crossing Leg, #/h	0	0	3	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	13.7	18.4	16.9	12.0
Approach LOS	B	C	C	B

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	341	500	768	462
Cap Entry Lane, veh/h	670	737	1034	856
Entry HV Adj Factor	0.971	0.971	0.972	0.971
Flow Entry, veh/h	331	486	746	449
Cap Entry, veh/h	651	716	1004	831
V/C Ratio	0.509	0.678	0.743	0.540
Control Delay, s/veh	13.7	18.4	16.9	12.0
LOS	B	C	C	B
95th %tile Queue, veh	3	5	7	3

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	1	15	5	3	70	0	15	1	2	0	0	0
Future Volume (Veh/h)	1	15	5	3	70	0	15	1	2	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	16	5	3	76	0	16	1	2	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	76			21			102	102	18	105	105	76
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	76			21			102	102	18	105	105	76
tC, single (s)	4.2			4.2			7.2	6.6	6.3	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			100			98	100	100	100	100	100
cM capacity (veh/h)	1486			1557			862	774	1043	857	772	969

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	22	79	19	0
Volume Left	1	3	16	0
Volume Right	5	0	2	0
cSH	1486	1557	873	1700
Volume to Capacity	0.00	0.00	0.02	0.00
Queue Length 95th (ft)	0	0	2	0
Control Delay (s)	0.3	0.3	9.2	0.0
Lane LOS	A	A	A	A
Approach Delay (s)	0.3	0.3	9.2	0.0
Approach LOS			A	A

Intersection Summary				
Average Delay			1.7	
Intersection Capacity Utilization			14.7%	ICU Level of Service
Analysis Period (min)			15	

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	15	5	3	70	0	15	1	2	0	0	0
Future Vol, veh/h	1	15	5	3	70	0	15	1	2	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	8	8	8	8	8	8	8	8	8	8	8	8
Mvmt Flow	1	16	5	3	76	0	16	1	2	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	76	0	0	21	0	0	103	103	19	104	105	76
Stage 1	-	-	-	-	-	-	21	21	-	82	82	-
Stage 2	-	-	-	-	-	-	82	82	-	22	23	-
Critical Hdwy	4.18	-	-	4.18	-	-	7.18	6.58	6.28	7.18	6.58	6.28
Critical Hdwy Stg 1	-	-	-	-	-	-	6.18	5.58	-	6.18	5.58	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.18	5.58	-	6.18	5.58	-
Follow-up Hdwy	2.272	-	-	2.272	-	-	3.572	4.072	3.372	3.572	4.072	3.372
Pot Cap-1 Maneuver	1486	-	-	1557	-	-	863	776	1042	862	774	969
Stage 1	-	-	-	-	-	-	982	866	-	912	815	-
Stage 2	-	-	-	-	-	-	912	815	-	981	864	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1486	-	-	1557	-	-	861	774	1042	858	772	969
Mov Cap-2 Maneuver	-	-	-	-	-	-	861	774	-	858	772	-
Stage 1	-	-	-	-	-	-	981	865	-	911	813	-
Stage 2	-	-	-	-	-	-	910	813	-	977	863	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.3	9.2	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	872	1486	-	-	1557	-	-	-
HCM Lane V/C Ratio	0.022	0.001	-	-	0.002	-	-	-
HCM Control Delay (s)	9.2	7.4	0	-	7.3	0	-	0
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1	360	345	461	673	7	21	139	285	293	35
v/c Ratio	0.01	0.58	0.75	0.52	0.61	0.05	0.13	0.53	0.70	0.70	0.07
Control Delay	49.0	37.7	41.3	19.5	4.2	43.7	44.4	16.1	41.0	41.1	0.3
Queue Delay	0.0	0.0	0.1	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.0	37.7	41.4	19.9	4.4	43.7	44.4	16.1	41.0	41.1	0.3
Queue Length 50th (ft)	1	90	164	152	0	3	11	0	141	145	0
Queue Length 95th (ft)	6	171	328	350	68	19	40	59	300	307	0
Internal Link Dist (ft)		346		307			744			674	
Turn Bay Length (ft)	65		125			140		165	150		185
Base Capacity (vph)	109	992	708	1160	1235	392	413	454	590	601	626
Starvation Cap Reductn	0	0	29	298	147	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.36	0.51	0.53	0.62	0.02	0.05	0.31	0.48	0.49	0.06

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	302	29	317	424	619	6	19	128	444	87	32
Future Volume (vph)	1	302	29	317	424	619	6	19	128	444	87	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (prot)	1752	3447		1752	1845	1568	1752	1845	1544	1665	1695	1521
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (perm)	1752	3447		1752	1845	1568	1752	1845	1544	1665	1695	1521
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	328	32	345	461	673	7	21	139	483	95	35
RTOR Reduction (vph)	0	6	0	0	0	361	0	0	127	0	0	27
Lane Group Flow (vph)	1	354	0	345	461	312	7	21	12	285	293	8
Confl. Peds. (#/hr)			8						1			5
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	0.8	19.1		22.4	40.7	40.7	7.5	7.5	7.5	20.9	20.9	20.9
Effective Green, g (s)	0.8	19.1		22.4	40.7	40.7	7.5	7.5	7.5	20.9	20.9	20.9
Actuated g/C Ratio	0.01	0.22		0.25	0.46	0.46	0.09	0.09	0.09	0.24	0.24	0.24
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	15	749		446	854	726	149	157	131	395	403	361
v/s Ratio Prot	0.00	0.10		c0.20	c0.25		0.00	c0.01		0.17	c0.17	
v/s Ratio Perm						0.20			0.01			0.01
v/c Ratio	0.07	0.47		0.77	0.54	0.43	0.05	0.13	0.09	0.72	0.73	0.02
Uniform Delay, d1	43.2	30.0		30.4	16.9	15.8	36.9	37.2	37.1	30.8	30.9	25.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	0.5		8.1	0.7	0.4	0.1	0.4	0.3	6.4	6.4	0.0
Delay (s)	45.1	30.5		38.5	17.6	16.2	37.0	37.6	37.4	37.2	37.3	25.7
Level of Service	D	C		D	B	B	D	D	D	D	D	C
Approach Delay (s)		30.5			21.8			37.4			36.6	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	27.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	87.9	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	61.5%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
8: Riverside Ave & 13th Street

Near Term Plus 1293 Unit Project AM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	302	29	317	424	619	6	19	128	444	87	32
Future Volume (veh/h)	1	302	29	317	424	619	6	19	128	444	87	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	1	328	32	345	461	673	7	21	139	551	0	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	2	829	80	394	885	750	197	207	175	699	0	307
Arrive On Green	0.00	0.26	0.26	0.22	0.48	0.48	0.11	0.11	0.11	0.20	0.00	0.20
Sat Flow, veh/h	1767	3242	314	1767	1856	1572	1767	1856	1568	3534	0	1553
Grp Volume(v), veh/h	1	177	183	345	461	673	7	21	139	551	0	35
Grp Sat Flow(s),veh/h/ln	1767	1763	1793	1767	1856	1572	1767	1856	1568	1767	0	1553
Q Serve(g_s), s	0.0	7.1	7.2	16.0	14.7	33.2	0.3	0.9	7.3	12.6	0.0	1.6
Cycle Q Clear(g_c), s	0.0	7.1	7.2	16.0	14.7	33.2	0.3	0.9	7.3	12.6	0.0	1.6
Prop In Lane	1.00		0.18	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	2	451	458	394	885	750	197	207	175	699	0	307
V/C Ratio(X)	0.41	0.39	0.40	0.88	0.52	0.90	0.04	0.10	0.79	0.79	0.00	0.11
Avail Cap(c_a), veh/h	104	478	486	677	1105	937	375	394	333	1188	0	522
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.3	26.1	26.2	31.8	15.4	20.3	33.6	33.8	36.7	32.3	0.0	27.9
Incr Delay (d2), s/veh	85.1	0.6	0.6	6.7	0.5	9.7	0.1	0.2	7.9	2.0	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	3.0	3.1	7.3	5.9	13.1	0.1	0.4	3.1	5.4	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	127.4	26.7	26.7	38.5	15.9	29.9	33.7	34.1	44.6	34.4	0.0	28.1
LnGrp LOS	F	C	C	D	B	C	C	C	D	C	A	C
Approach Vol, veh/h		361			1479			167			586	
Approach Delay, s/veh		27.0			27.5			42.9			34.0	
Approach LOS		C			C			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	23.4	26.2		21.3	4.6	45.0		14.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	32.5	23.0		28.5	5.0	50.5		18.0				
Max Q Clear Time (g_c+I1), s	18.0	9.2		14.6	2.0	35.2		9.3				
Green Ext Time (p_c), s	0.9	1.8		1.9	0.0	5.3		0.3				

Intersection Summary												
HCM 6th Ctrl Delay			29.9									
HCM 6th LOS			C									

Notes

User approved volume balancing among the lanes for turning movement.

Olsen-Chandler SP
9: Paso Robles Street & 13th Street

Near Term Plus 1293 Unit Project AM
Queues

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	68	881	49	1239	374	234	12	249	5	8
v/c Ratio	0.36	0.47	0.28	0.70	0.42	0.68	0.03	0.43	0.01	0.01
Control Delay	46.5	14.1	46.0	19.7	6.5	41.8	27.2	6.5	27.0	0.0
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.5	14.3	46.0	19.7	6.5	41.8	27.2	6.5	27.0	0.0
Queue Length 50th (ft)	36	155	26	261	33	122	5	0	2	0
Queue Length 95th (ft)	88	260	69	425	109	216	20	57	12	0
Internal Link Dist (ft)		307		269			836			575
Turn Bay Length (ft)	120		220		145	130		110	95	
Base Capacity (vph)	254	2276	229	2267	1079	587	782	808	586	780
Starvation Cap Reductn	0	621	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.53	0.21	0.55	0.35	0.40	0.02	0.31	0.01	0.01

Intersection Summary

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	763	48	45	1140	344	215	11	229	5	0	7
Future Volume (vph)	63	763	48	45	1140	344	215	11	229	5	0	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1752	3467		1752	3505	1530	1752	1845	1568	1752	1568	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.75	1.00	1.00	0.75	1.00	
Satd. Flow (perm)	1752	3467		1752	3505	1530	1388	1845	1568	1383	1568	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	68	829	52	49	1239	374	234	12	249	5	0	8
RTOR Reduction (vph)	0	4	0	0	0	126	0	0	188	0	6	0
Lane Group Flow (vph)	68	877	0	49	1239	248	234	12	61	5	2	0
Confl. Peds. (#/hr)			6			1						
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		
Actuated Green, G (s)	6.6	44.4		4.5	42.3	42.3	20.3	20.3	20.3	20.3	20.3	
Effective Green, g (s)	6.6	44.4		4.5	42.3	42.3	20.3	20.3	20.3	20.3	20.3	
Actuated g/C Ratio	0.08	0.54		0.05	0.51	0.51	0.25	0.25	0.25	0.25	0.25	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	139	1861		95	1792	782	340	452	384	339	384	
v/s Ratio Prot	c0.04	0.25		0.03	c0.35			0.01			0.00	
v/s Ratio Perm						0.16	c0.17		0.04	0.00		
v/c Ratio	0.49	0.47		0.52	0.69	0.32	0.69	0.03	0.16	0.01	0.01	
Uniform Delay, d1	36.4	11.9		38.0	15.3	11.8	28.3	23.7	24.5	23.6	23.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.7	0.2		4.7	1.2	0.2	5.7	0.0	0.2	0.0	0.0	
Delay (s)	39.1	12.1		42.7	16.4	12.0	34.0	23.7	24.7	23.6	23.6	
Level of Service	D	B		D	B	B	C	C	C	C	C	
Approach Delay (s)		14.0			16.2			29.1			23.6	
Approach LOS		B			B			C			C	

Intersection Summary				
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	82.7	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	65.5%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	763	48	45	1140	344	215	11	229	5	0	7
Future Volume (veh/h)	63	763	48	45	1140	344	215	11	229	5	0	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	68	829	52	49	1239	0	234	12	249	5	0	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	100	1713	107	82	1758		422	409	346	359	0	346
Arrive On Green	0.06	0.51	0.51	0.05	0.50	0.00	0.22	0.22	0.22	0.22	0.00	0.22
Sat Flow, veh/h	1767	3368	211	1767	3526	1572	1396	1856	1572	1110	0	1572
Grp Volume(v), veh/h	68	434	447	49	1239	0	234	12	249	5	0	8
Grp Sat Flow(s),veh/h/ln	1767	1763	1816	1767	1763	1572	1396	1856	1572	1110	0	1572
Q Serve(g_s), s	2.3	9.6	9.6	1.6	16.3	0.0	9.5	0.3	8.8	0.2	0.0	0.2
Cycle Q Clear(g_c), s	2.3	9.6	9.6	1.6	16.3	0.0	9.7	0.3	8.8	0.5	0.0	0.2
Prop In Lane	1.00		0.12	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	100	897	924	82	1758		422	409	346	359	0	346
V/C Ratio(X)	0.68	0.48	0.48	0.60	0.70		0.55	0.03	0.72	0.01	0.00	0.02
Avail Cap(c_a), veh/h	309	1505	1550	279	2951		827	948	803	681	0	803
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.8	9.6	9.6	28.1	11.6	0.0	22.2	18.4	21.7	18.6	0.0	18.4
Incr Delay (d2), s/veh	7.9	0.4	0.4	6.7	0.5	0.0	1.1	0.0	2.8	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	3.2	3.3	0.8	5.4	0.0	2.9	0.1	3.2	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.7	10.0	10.0	34.8	12.2	0.0	23.3	18.4	24.5	18.6	0.0	18.4
LnGrp LOS	D	B	B	C	B		C	B	C	B	A	B
Approach Vol, veh/h		949			1288	A		495			13	
Approach Delay, s/veh		11.9			13.0			23.8			18.5	
Approach LOS		B			B			C			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.3	35.1		17.7	7.9	34.5		17.7				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	9.5	51.3		30.7	10.5	50.3		30.7				
Max Q Clear Time (g_c+I1), s	3.6	11.6		2.5	4.3	18.3		11.7				
Green Ext Time (p_c), s	0.0	6.8		0.0	0.1	11.6		1.5				

Intersection Summary				
HCM 6th Ctrl Delay	14.6			
HCM 6th LOS	B			

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	214	868	61	940	430	193	49	135	598
v/c Ratio	0.57	0.63	0.40	0.79	0.73	0.24	0.11	0.59	0.86dr
Control Delay	52.0	25.6	57.2	35.6	49.3	34.3	1.0	55.2	34.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.0	25.6	57.2	35.6	49.3	34.3	1.0	55.2	34.5
Queue Length 50th (ft)	71	224	39	293	141	54	0	87	136
Queue Length 95th (ft)	124	327	91	406	221	98	4	163	221
Internal Link Dist (ft)		353		673		608			523
Turn Bay Length (ft)	295		235		140		130	225	
Base Capacity (vph)	442	1616	191	1564	725	1009	519	337	983
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.54	0.32	0.60	0.59	0.19	0.09	0.40	0.61

Intersection Summary

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	197	511	288	56	768	97	396	178	45	124	187	363
Future Volume (vph)	197	511	288	56	768	97	396	178	45	124	187	363
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.98		1.00	1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	3329		1770	3475		3433	3539	1583	1770	3189	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	3329		1770	3475		3433	3539	1583	1770	3189	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	214	555	313	61	835	105	430	193	49	135	203	395
RTOR Reduction (vph)	0	64	0	0	8	0	0	0	38	0	160	0
Lane Group Flow (vph)	214	804	0	61	932	0	430	193	11	135	438	0
Confl. Peds. (#/hr)			3									
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	11.1	39.7		7.0	35.6		17.4	23.4	23.4	13.1	19.1	
Effective Green, g (s)	11.1	39.7		7.0	35.6		17.4	23.4	23.4	13.1	19.1	
Actuated g/C Ratio	0.11	0.39		0.07	0.35		0.17	0.23	0.23	0.13	0.19	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	376	1305		122	1222		590	818	366	229	601	
v/s Ratio Prot	c0.06	c0.24		0.03	c0.27		c0.13	c0.05		0.08	c0.14	
v/s Ratio Perm									0.01			
v/c Ratio	0.57	0.62		0.50	0.76		0.73	0.24	0.03	0.59	0.86dr	
Uniform Delay, d1	42.8	24.6		45.4	29.1		39.7	31.6	30.1	41.5	38.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.0	0.9		3.2	2.9		4.5	0.1	0.0	3.8	4.4	
Delay (s)	44.8	25.5		48.6	31.9		44.2	31.8	30.2	45.4	43.0	
Level of Service	D	C		D	C		D	C	C	D	D	
Approach Delay (s)		29.3			32.9			39.6			43.5	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	35.3	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	101.2	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	73.1%	ICU Level of Service	D	
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	197	511	288	56	768	97	396	178	45	124	187	363
Future Volume (veh/h)	197	511	288	56	768	97	396	178	45	124	187	363
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	214	555	0	61	835	105	430	193	49	135	203	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	326	1436		91	1145	144	577	601	268	176	358	
Arrive On Green	0.09	0.40	0.00	0.05	0.36	0.36	0.17	0.17	0.17	0.10	0.10	0.00
Sat Flow, veh/h	3456	3647	0	1781	3171	399	3456	3554	1585	1781	3647	0
Grp Volume(v), veh/h	214	555	0	61	468	472	430	193	49	135	203	0
Grp Sat Flow(s),veh/h/ln	1728	1777	0	1781	1777	1793	1728	1777	1585	1781	1777	0
Q Serve(g_s), s	3.9	7.2	0.0	2.2	14.8	14.9	7.7	3.1	1.7	4.8	3.5	0.0
Cycle Q Clear(g_c), s	3.9	7.2	0.0	2.2	14.8	14.9	7.7	3.1	1.7	4.8	3.5	0.0
Prop In Lane	1.00		0.00	1.00		0.22	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	326	1436		91	642	647	577	601	268	176	358	
V/C Ratio(X)	0.66	0.39		0.67	0.73	0.73	0.75	0.32	0.18	0.77	0.57	
Avail Cap(c_a), veh/h	664	2487		288	1189	1199	1089	1503	670	507	1394	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.4	13.7	0.0	30.3	18.0	18.0	25.8	23.7	23.2	28.6	27.9	0.0
Incr Delay (d2), s/veh	2.3	0.2	0.0	8.1	1.6	1.6	1.9	0.3	0.3	6.8	1.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	2.6	0.0	1.1	5.6	5.7	3.0	1.2	0.6	2.2	1.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.7	13.9	0.0	38.4	19.6	19.6	27.7	24.0	23.5	35.4	29.3	0.0
LnGrp LOS	C	B		D	B	B	C	C	C	D	C	
Approach Vol, veh/h		769	A		1001			672			338	A
Approach Delay, s/veh		18.5			20.8			26.4			31.7	
Approach LOS		B			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.8	30.8	15.4	11.1	10.6	28.0	10.9	15.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	45.5	20.5	25.5	12.5	43.5	18.5	27.5
Max Q Clear Time (g_c+I1), s	4.2	9.2	9.7	5.5	5.9	16.9	6.8	5.1
Green Ext Time (p_c), s	0.0	4.2	1.2	1.0	0.4	6.5	0.2	1.2

Intersection Summary	
HCM 6th Ctrl Delay	22.8
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	71	435	1218	547	101
v/c Ratio	0.38	0.21	0.74	0.71	0.23
Control Delay	47.5	9.8	20.8	38.1	9.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	47.5	9.8	20.8	38.1	9.2
Queue Length 50th (ft)	35	39	201	134	0
Queue Length 95th (ft)	103	141	#585	#290	47
Internal Link Dist (ft)		1151	2310	505	
Turn Bay Length (ft)	125			120	
Base Capacity (vph)	240	2479	1830	1046	552
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.30	0.18	0.67	0.52	0.18

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	65	400	588	533	503	93
Future Volume (vph)	65	400	588	533	503	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.93		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1752	3505	3231		3400	1568
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1752	3505	3231		3400	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	71	435	639	579	547	101
RTOR Reduction (vph)	0	0	113	0	0	79
Lane Group Flow (vph)	71	435	1105	0	547	22
Confl. Peds. (#/hr)				3		
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	NA		Perm	Perm
Protected Phases	5	2	6			
Permitted Phases					4	4
Actuated Green, G (s)	6.8	50.8	39.5		18.9	18.9
Effective Green, g (s)	6.8	50.8	39.5		18.9	18.9
Actuated g/C Ratio	0.08	0.58	0.45		0.22	0.22
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	137	2048	1468		739	341
v/s Ratio Prot	c0.04	0.12	c0.34			
v/s Ratio Perm					c0.16	0.01
v/c Ratio	0.52	0.21	0.75		0.74	0.06
Uniform Delay, d1	38.5	8.6	19.6		31.7	27.0
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.3	0.1	2.2		4.0	0.1
Delay (s)	41.8	8.6	21.9		35.7	27.1
Level of Service	D	A	C		D	C
Approach Delay (s)		13.3	21.9		34.4	
Approach LOS		B	C		C	

Intersection Summary			
HCM 2000 Control Delay	23.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	86.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	128	267	163	55	558	428	316	683	239	706
v/c Ratio	0.54	0.48	0.28	0.38	0.70	0.63	0.84	0.74	0.76	0.76
Control Delay	44.2	27.7	5.7	46.8	35.5	8.0	56.7	33.9	51.1	24.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.2	27.7	5.7	46.8	35.5	8.0	56.7	33.9	51.1	24.8
Queue Length 50th (ft)	68	124	0	30	150	0	176	181	128	122
Queue Length 95th (ft)	124	199	44	68	213	80	#347	252	#250	191
Internal Link Dist (ft)		1092			186			1440		2310
Turn Bay Length (ft)	150			170		140	230		245	
Base Capacity (vph)	305	659	651	156	906	712	374	1036	351	1089
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.41	0.25	0.35	0.62	0.60	0.84	0.66	0.68	0.65

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	118	246	150	51	513	394	291	582	46	220	336	314
Future Volume (vph)	118	246	150	51	513	394	291	582	46	220	336	314
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1845	1531	1752	3505	1532	1752	3462		1752	3208	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1845	1531	1752	3505	1532	1752	3462		1752	3208	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	128	267	163	55	558	428	316	633	50	239	365	341
RTOR Reduction (vph)	0	0	115	0	0	328	0	7	0	0	191	0
Lane Group Flow (vph)	128	267	48	55	558	100	316	676	0	239	515	0
Confl. Peds. (#/hr)			9			9			4			12
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	8.9	24.3	24.3	3.7	19.1	19.1	17.2	21.4		14.5	18.7	
Effective Green, g (s)	8.9	24.3	24.3	3.7	19.1	19.1	17.2	21.4		14.5	18.7	
Actuated g/C Ratio	0.11	0.30	0.30	0.05	0.23	0.23	0.21	0.26		0.18	0.23	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	190	547	454	79	817	357	367	904		310	732	
v/s Ratio Prot	c0.07	0.14		0.03	c0.16		c0.18	c0.20		0.14	0.16	
v/s Ratio Perm			0.03			0.07						
v/c Ratio	0.67	0.49	0.11	0.70	0.68	0.28	0.86	0.75		0.77	0.70	
Uniform Delay, d1	35.1	23.7	20.9	38.5	28.6	25.8	31.2	27.8		32.1	29.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.1	0.7	0.1	23.4	2.4	0.4	18.3	3.4		11.2	3.1	
Delay (s)	44.2	24.4	21.0	61.9	31.0	26.2	49.5	31.2		43.4	32.1	
Level of Service	D	C	C	E	C	C	D	C		D	C	
Approach Delay (s)		27.9			30.7			37.0			35.0	
Approach LOS		C			C			D			C	

Intersection Summary				
HCM 2000 Control Delay	33.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.77			
Actuated Cycle Length (s)	81.9	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	72.4%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
12: Creston Road & Niblick Road/Sherwood Road

Near Term Plus 1293 Unit Project AM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	246	150	51	513	394	291	582	46	220	336	314
Future Volume (veh/h)	118	246	150	51	513	394	291	582	46	220	336	314
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	128	267	163	55	558	428	316	633	50	239	365	341
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	162	539	453	77	854	377	351	961	76	278	439	386
Arrive On Green	0.09	0.29	0.29	0.04	0.24	0.24	0.20	0.29	0.29	0.16	0.25	0.25
Sat Flow, veh/h	1767	1856	1558	1767	3526	1555	1767	3309	261	1767	1763	1550
Grp Volume(v), veh/h	128	267	163	55	558	428	316	337	346	239	365	341
Grp Sat Flow(s),veh/h/ln	1767	1856	1558	1767	1763	1555	1767	1763	1807	1767	1763	1550
Q Serve(g_s), s	5.9	9.8	6.8	2.5	11.8	20.0	14.4	13.8	13.9	10.9	16.2	17.5
Cycle Q Clear(g_c), s	5.9	9.8	6.8	2.5	11.8	20.0	14.4	13.8	13.9	10.9	16.2	17.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.14	1.00		1.00
Lane Grp Cap(c), veh/h	162	539	453	77	854	377	351	512	525	278	439	386
V/C Ratio(X)	0.79	0.50	0.36	0.72	0.65	1.14	0.90	0.66	0.66	0.86	0.83	0.88
Avail Cap(c_a), veh/h	289	598	502	148	854	377	353	512	525	332	470	413
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.7	24.3	23.2	39.0	28.1	31.3	32.3	25.7	25.7	33.9	29.3	29.8
Incr Delay (d2), s/veh	8.3	0.7	0.5	11.8	1.8	88.7	24.8	3.1	3.0	17.3	11.4	18.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	4.1	2.4	1.3	4.9	16.3	8.3	5.9	6.1	5.8	7.9	8.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.0	25.0	23.7	50.7	29.9	120.0	57.1	28.8	28.7	51.2	40.7	48.6
LnGrp LOS	D	C	C	D	C	F	E	C	C	D	D	D
Approach Vol, veh/h		558			1041			999			945	
Approach Delay, s/veh		29.2			68.0			37.7			46.2	
Approach LOS		C			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.5	28.5	8.1	28.5	20.9	25.1	12.1	24.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.5	23.0	6.9	26.6	16.5	22.0	13.5	20.0
Max Q Clear Time (g_c+I1), s	12.9	15.9	4.5	11.8	16.4	19.5	7.9	22.0
Green Ext Time (p_c), s	0.2	2.3	0.0	1.7	0.0	1.1	0.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	47.5
HCM 6th LOS	D

Olsen-Chandler SP
13: Creston Road & Scott Street

Near Term Plus 1293 Unit Project AM
HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	45	60	733	50	55	520
Future Volume (Veh/h)	45	60	733	50	55	520
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	49	65	797	54	60	565
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1509	824			851	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1509	824			851	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	60	83			92	
cM capacity (veh/h)	123	373			788	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	114	851	60	565
Volume Left	49	0	60	0
Volume Right	65	54	0	0
cSH	199	1700	788	1700
Volume to Capacity	0.57	0.50	0.08	0.33
Queue Length 95th (ft)	78	0	6	0
Control Delay (s)	45.0	0.0	9.9	0.0
Lane LOS	E		A	
Approach Delay (s)	45.0	0.0	1.0	
Approach LOS	E			

Intersection Summary			
Average Delay	3.6		
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	3.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	45	60	733	50	55	520
Future Vol, veh/h	45	60	733	50	55	520
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	49	65	797	54	60	565

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1509	824	0	0	851	0
Stage 1	824	-	-	-	-	-
Stage 2	685	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	133	373	-	-	788	-
Stage 1	431	-	-	-	-	-
Stage 2	500	-	-	-	-	-
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	123	373	-	-	788	-
Mov Cap-2 Maneuver	123	-	-	-	-	-
Stage 1	431	-	-	-	-	-
Stage 2	462	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	44.9	0	1
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	199	788	-
HCM Lane V/C Ratio	-	-	0.574	0.076	-
HCM Control Delay (s)	-	-	44.9	9.9	-
HCM Lane LOS	-	-	E	A	-
HCM 95th %tile Q(veh)	-	-	3.1	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	97	6	40	8	15	98	34	542	3	33	409	84
Future Volume (Veh/h)	97	6	40	8	15	98	34	542	3	33	409	84
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	105	7	43	9	16	107	37	589	3	36	445	91
Pedestrians		6			2						1	
Lane Width (ft)		12.0			12.0						12.0	
Walking Speed (ft/s)		3.5			3.5						3.5	
Percent Blockage		1			0						0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1302	1191	451	1230	1280	594	542			594		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1302	1191	451	1230	1280	594	542			594		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	96	93	93	90	79	96			96		
cM capacity (veh/h)	93	173	605	130	153	504	1021			980		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	155	132	37	592	36	445	91
Volume Left	105	9	37	0	36	0	0
Volume Right	43	107	0	3	0	0	91
cSH	125	342	1021	1700	980	1700	1700
Volume to Capacity	1.24	0.39	0.04	0.35	0.04	0.26	0.05
Queue Length 95th (ft)	243	44	3	0	3	0	0
Control Delay (s)	224.6	22.0	8.7	0.0	8.8	0.0	0.0
Lane LOS	F	C	A		A		
Approach Delay (s)	224.6	22.0	0.5		0.6		
Approach LOS	F	C					

Intersection Summary				
Average Delay	25.8			
Intersection Capacity Utilization	50.2%	ICU Level of Service		A
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	21.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	97	6	40	8	15	98	34	542	3	33	409	84
Future Vol, veh/h	97	6	40	8	15	98	34	542	3	33	409	84
Conflicting Peds, #/hr	1	0	0	0	0	1	6	0	2	2	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	30	-	-	70	-	60
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	105	7	43	9	16	107	37	589	3	36	445	91

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1250	1191	451	1255	1281	594	542	0	0	594	0	0
Stage 1	523	523	-	667	667	-	-	-	-	-	-	-
Stage 2	727	668	-	588	614	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	150	187	608	148	166	505	1027	-	-	982	-	-
Stage 1	537	530	-	448	457	-	-	-	-	-	-	-
Stage 2	415	456	-	495	483	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 102	172	605	126	153	504	1021	-	-	980	-	-
Mov Cap-2 Maneuver	~ 102	172	-	126	153	-	-	-	-	-	-	-
Stage 1	514	507	-	431	440	-	-	-	-	-	-	-
Stage 2	303	439	-	437	462	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	184.7	22.1	0.5	0.6
HCM LOS	F	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1021	-	-	136	340	980	-	-
HCM Lane V/C Ratio	0.036	-	-	1.143	0.387	0.037	-	-
HCM Control Delay (s)	8.7	-	-	184.7	22.1	8.8	-	-
HCM Lane LOS	A	-	-	F	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	8.9	1.8	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	20	9	7	276	5	316	9	243	131	248	199	10
Future Volume (vph)	20	9	7	276	5	316	9	243	131	248	199	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	10	8	300	5	343	10	264	142	270	216	11

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	40	648	274	142	378	119
Volume Left (vph)	22	300	10	0	270	0
Volume Right (vph)	8	343	0	142	0	11
Hadj (s)	0.02	-0.19	0.05	-0.67	0.39	-0.03
Departure Headway (s)	8.3	6.4	7.6	6.9	7.8	7.3
Degree Utilization, x	0.09	1.15	0.58	0.27	0.82	0.24
Capacity (veh/h)	397	557	456	509	453	482
Control Delay (s)	12.1	109.4	19.5	11.3	35.6	11.5
Approach Delay (s)	12.1	109.4	16.7		29.9	
Approach LOS	B	F	C		D	

Intersection Summary				
Delay	58.2			
Level of Service	F			
Intersection Capacity Utilization	78.7%	ICU Level of Service	D	
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	61.9
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Vol, veh/h	20	9	7	276	5	316	0	9	243	131	248	199
Future Vol, veh/h	20	9	7	276	5	316	0	9	243	131	248	199
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	10	8	300	5	343	0	10	264	142	270	216
Number of Lanes	0	1	0	0	1	0	0	0	1	1	0	2

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	12.9	114.8	18.9	32.8
HCM LOS	B	F	C	D

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	4%	0%	56%	46%	71%	0%
Vol Thru, %	96%	0%	25%	1%	29%	91%
Vol Right, %	0%	100%	19%	53%	0%	9%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	252	131	36	597	348	110
LT Vol	9	0	20	276	248	0
Through Vol	243	0	9	5	100	100
RT Vol	0	131	7	316	0	10
Lane Flow Rate	274	142	39	649	378	119
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.583	0.275	0.091	1.162	0.817	0.243
Departure Headway (Hd)	8.259	7.511	9.006	6.448	8.365	7.928
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	441	481	400	565	434	456
Service Time	5.959	5.211	7.006	4.51	6.065	5.628
HCM Lane V/C Ratio	0.621	0.295	0.098	1.149	0.871	0.261
HCM Control Delay	21.9	13	12.9	114.8	39	13.2
HCM Lane LOS	C	B	B	F	E	B
HCM 95th-tile Q	3.6	1.1	0.3	22.1	7.6	0.9

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBR
Lane Configurations	
Traffic Vol, veh/h	10
Future Vol, veh/h	10
Peak Hour Factor	0.92
Heavy Vehicles, %	2
Mvmt Flow	11
Number of Lanes	0

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	175	136	229	208	125	358
Future Volume (Veh/h)	175	136	229	208	125	358
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	190	148	249	226	136	389
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	747	136	525			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	747	136	525			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	28	83	76			
cM capacity (veh/h)	263	885	1031			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	338	249	113	113	136	389
Volume Left	190	249	0	0	0	0
Volume Right	148	0	0	0	0	389
cSH	468	1031	1700	1700	1700	1700
Volume to Capacity	0.72	0.24	0.07	0.07	0.08	0.23
Queue Length 95th (ft)	144	24	0	0	0	0
Control Delay (s)	31.1	9.6	0.0	0.0	0.0	0.0
Lane LOS	D	A				
Approach Delay (s)	31.1	5.0			0.0	
Approach LOS	D					

Intersection Summary			
Average Delay		9.7	
Intersection Capacity Utilization		41.5%	ICU Level of Service A
Analysis Period (min)		15	

Intersection	
Int Delay, s/veh	8.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	175	136	229	208	125	358
Future Vol, veh/h	175	136	229	208	125	358
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	145	105	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	190	148	249	226	136	389

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	747	136	525	0	-	0
Stage 1	136	-	-	-	-	-
Stage 2	611	-	-	-	-	-
Critical Hdwy	6.645	6.245	4.145	-	-	-
Critical Hdwy Stg 1	5.445	-	-	-	-	-
Critical Hdwy Stg 2	5.845	-	-	-	-	-
Follow-up Hdwy	3.5285	3.3285	2.2285	-	-	-
Pot Cap-1 Maneuver	362	909	1034	-	-	-
Stage 1	887	-	-	-	-	-
Stage 2	503	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	275	909	1034	-	-	-
Mov Cap-2 Maneuver	275	-	-	-	-	-
Stage 1	673	-	-	-	-	-
Stage 2	503	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	28.4	5	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1034	-	275	909	-	-
HCM Lane V/C Ratio	0.241	-	0.692	0.163	-	-
HCM Control Delay (s)	9.6	-	43	9.7	-	-
HCM Lane LOS	A	-	E	A	-	-
HCM 95th %tile Q(veh)	0.9	-	4.7	0.6	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	0	55	1	113	9	0	0	0	0	324	15
Future Volume (Veh/h)	27	0	55	1	113	9	0	0	0	0	324	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	0	60	1	123	10	0	0	0	0	352	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	426	360	360	420	368	0	368			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	426	360	360	420	368	0	368			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	91	100	78	99	100			100		
cM capacity (veh/h)	443	567	684	496	561	1085	1191			1623		

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	89	134	368
Volume Left	29	1	0
Volume Right	60	10	16
cSH	581	606	1700
Volume to Capacity	0.15	0.22	0.22
Queue Length 95th (ft)	13	21	0
Control Delay (s)	12.3	12.9	0.0
Lane LOS	B	B	
Approach Delay (s)	12.3	12.9	0.0
Approach LOS	B	B	

Intersection Summary					
Average Delay		4.8			
Intersection Capacity Utilization		36.2%	ICU Level of Service	A	
Analysis Period (min)		15			

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	0	55	1	113	9	0	0	0	0	324	15
Future Vol, veh/h	27	0	55	1	113	9	0	0	0	0	324	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	29	0	60	1	123	10	0	0	0	0	352	16

Major/Minor	Minor2			Minor1						Major2		
Conflicting Flow All	427	360	360	390	368	0				-	-	0
Stage 1	360	360	-	0	0	-				-	-	-
Stage 2	67	0	-	390	368	-				-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22				-	-	-
Critical Hdwy Stg 1	6.12	5.52	-	-	-	-				-	-	-
Critical Hdwy Stg 2	-	-	-	6.12	5.52	-				-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318				-	-	-
Pot Cap-1 Maneuver	538	567	684	569	561	-				0	-	-
Stage 1	658	626	-	-	-	-				0	-	-
Stage 2	-	-	-	634	621	-				0	-	-
Platoon blocked, %											-	-
Mov Cap-1 Maneuver	-	567	684	519	561	-				-	-	-
Mov Cap-2 Maneuver	-	567	-	519	561	-				-	-	-
Stage 1	658	626	-	-	-	-				-	-	-
Stage 2	-	-	-	579	621	-				-	-	-

Approach	EB	WB	SB
HCM Control Delay, s			0
HCM LOS	-	-	

Minor Lane/Major Mvmt	EBLn1	WBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	-	561	-	-	-
HCM Lane V/C Ratio	-	0.221	-	-	-
HCM Control Delay (s)	-	13.2	-	-	-
HCM Lane LOS	-	B	-	-	-
HCM 95th %tile Q(veh)	-	0.8	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	20	328	1185	303	486	91	293	585	337	276
v/c Ratio	0.09	0.70	0.79	0.37	0.43	0.61	0.65	0.35	0.67	0.42
Control Delay	55.6	52.1	36.4	27.0	2.5	78.0	62.0	5.4	60.3	45.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.6	52.1	36.4	27.0	2.5	78.0	62.0	5.4	60.3	45.6
Queue Length 50th (ft)	16	114	427	166	5	77	130	41	144	106
Queue Length 95th (ft)	44	181	622	287	50	#158	192	69	212	155
Internal Link Dist (ft)		521		1372			611			680
Turn Bay Length (ft)	115		515		115	165		290	305	
Base Capacity (vph)	291	609	1706	926	1173	174	662	1824	673	987
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.54	0.69	0.33	0.41	0.52	0.44	0.32	0.50	0.28

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	187	115	1090	279	447	84	270	538	310	205	49
Future Volume (vph)	18	187	115	1090	279	447	84	270	538	310	205	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.95	0.88	0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3337		3433	1863	1568	1770	3539	2787	3433	3422	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3337		3433	1863	1568	1770	3539	2787	3433	3422	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	203	125	1185	303	486	91	293	585	337	223	53
RTOR Reduction (vph)	0	63	0	0	0	194	0	0	85	0	15	0
Lane Group Flow (vph)	20	265	0	1185	303	292	91	293	500	337	261	0
Confl. Peds. (#/hr)												1
Confl. Bikes (#/hr)						2						
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	15.4	15.4		55.8	55.8	74.5	10.9	16.4	72.2	18.7	24.2	
Effective Green, g (s)	15.4	15.4		55.8	55.8	74.5	10.9	16.4	72.2	18.7	24.2	
Actuated g/C Ratio	0.12	0.12		0.44	0.44	0.59	0.09	0.13	0.57	0.15	0.19	
Clearance Time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	214	405		1510	819	921	152	457	1586	506	653	
v/s Ratio Prot	0.01	c0.08		c0.35	0.16	0.05	0.05	c0.08	0.14	c0.10	0.08	
v/s Ratio Perm						0.14			0.04			
v/c Ratio	0.09	0.65		0.78	0.37	0.32	0.60	0.64	0.32	0.67	0.40	
Uniform Delay, d1	49.5	53.2		30.4	23.7	13.3	55.8	52.4	14.3	51.1	44.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	3.8		2.8	0.3	0.2	6.2	3.1	0.1	3.3	0.4	
Delay (s)	49.7	56.9		33.1	24.0	13.5	62.1	55.5	14.4	54.4	45.3	
Level of Service	D	E		C	C	B	E	E	B	D	D	
Approach Delay (s)		56.5			26.9			31.3			50.3	
Approach LOS		E			C			C			D	

Intersection Summary				
HCM 2000 Control Delay	34.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	126.8	Sum of lost time (s)	20.5	
Intersection Capacity Utilization	73.3%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	187	115	1090	279	447	84	270	538	310	205	49
Future Volume (veh/h)	18	187	115	1090	279	447	84	270	538	310	205	49
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	20	203	125	1185	303	486	91	293	585	337	223	53
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	222	269	158	1429	773	839	115	557	1591	419	582	135
Arrive On Green	0.12	0.12	0.12	0.41	0.41	0.41	0.06	0.16	0.16	0.12	0.20	0.20
Sat Flow, veh/h	1781	2152	1267	3456	1870	1564	1781	3554	2790	3456	2860	666
Grp Volume(v), veh/h	20	166	162	1185	303	486	91	293	585	337	137	139
Grp Sat Flow(s),veh/h/ln	1781	1777	1642	1728	1870	1564	1781	1777	1395	1728	1777	1749
Q Serve(g_s), s	1.1	10.1	10.7	34.2	12.7	23.4	5.6	8.5	12.7	10.6	7.4	7.7
Cycle Q Clear(g_c), s	1.1	10.1	10.7	34.2	12.7	23.4	5.6	8.5	12.7	10.6	7.4	7.7
Prop In Lane	1.00		0.77	1.00		1.00	1.00		1.00	1.00		0.38
Lane Grp Cap(c), veh/h	222	222	205	1429	773	839	115	557	1591	419	361	356
V/C Ratio(X)	0.09	0.75	0.79	0.83	0.39	0.58	0.79	0.53	0.37	0.80	0.38	0.39
Avail Cap(c_a), veh/h	326	325	300	1908	1033	1056	195	739	1733	753	562	553
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.2	47.1	47.4	29.2	22.9	17.5	51.4	43.2	13.0	47.7	38.4	38.5
Incr Delay (d2), s/veh	0.2	5.4	8.5	2.4	0.3	0.6	11.3	0.8	0.1	3.7	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	4.8	4.9	13.9	5.4	8.0	2.8	3.7	8.0	4.8	3.3	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.4	52.5	55.9	31.6	23.2	18.2	62.7	44.0	13.2	51.4	39.0	39.2
LnGrp LOS	D	D	E	C	C	B	E	D	B	D	D	D
Approach Vol, veh/h		348			1974			969			613	
Approach Delay, s/veh		53.6			27.0			27.1			45.9	
Approach LOS		D			C			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	18.2	23.3		18.5	13.0	28.5		51.5				
Change Period (Y+Rc), s	* 4.7	5.8		4.6	5.8	* 5.8		5.4				
Max Green Setting (Gmax), s	* 24	23.2		20.4	12.2	* 35		61.6				
Max Q Clear Time (g_c+I1), s	12.6	14.7		12.7	7.6	9.7		36.2				
Green Ext Time (p_c), s	0.9	2.8		1.2	0.1	1.6		10.0				

Intersection Summary			
HCM 6th Ctrl Delay		32.4	
HCM 6th LOS		C	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	111	654	288	124	1375	692	396	303	449
v/c Ratio	0.56	0.53	0.39	0.66	1.00	0.92	0.63	0.85	0.74
Control Delay	63.0	31.7	5.0	65.8	57.3	61.3	46.5	64.4	44.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.0	31.7	5.0	65.8	57.3	61.3	46.5	64.4	44.5
Queue Length 50th (ft)	40	197	0	85	499	250	138	204	135
Queue Length 95th (ft)	74	281	61	#157	#737	#392	191	#358	191
Internal Link Dist (ft)		1510			1609		962		896
Turn Bay Length (ft)	140			80		150		110	
Base Capacity (vph)	200	1243	743	214	1377	754	819	401	876
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.53	0.39	0.58	1.00	0.92	0.48	0.76	0.51

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
19: S. River Road & Niblick Road

Near Term Plus 1293 Unit Project AM
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	602	265	114	983	282	637	318	46	279	269	144
Future Volume (vph)	102	602	265	114	983	282	637	318	46	279	269	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3539	1583	1770	3402		3433	3464		1770	3354	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	3539	1583	1770	3402		3433	3464		1770	3354	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	111	654	288	124	1068	307	692	346	50	303	292	157
RTOR Reduction (vph)	0	0	187	0	21	0	0	10	0	0	65	0
Lane Group Flow (vph)	111	654	101	124	1354	0	692	386	0	303	384	0
Confl. Peds. (#/hr)						10			5			
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	6.5	39.1	39.1	11.8	44.4		24.5	19.8		22.6	17.9	
Effective Green, g (s)	6.5	39.1	39.1	11.8	44.4		24.5	19.8		22.6	17.9	
Actuated g/C Ratio	0.06	0.35	0.35	0.11	0.40		0.22	0.18		0.20	0.16	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	200	1243	556	187	1357		755	616		359	539	
v/s Ratio Prot	0.03	0.18		c0.07	c0.40		c0.20	0.11		c0.17	0.11	
v/s Ratio Perm			0.06									
v/c Ratio	0.56	0.53	0.18	0.66	1.00		0.92	0.63		0.84	0.71	
Uniform Delay, d1	51.0	28.7	25.0	47.8	33.4		42.4	42.3		42.7	44.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.3	0.4	0.2	8.5	23.7		15.8	2.0		16.4	4.4	
Delay (s)	54.3	29.1	25.2	56.4	57.1		58.2	44.3		59.0	48.7	
Level of Service	D	C	C	E	E		E	D		E	D	
Approach Delay (s)		30.7			57.0			53.1			52.9	
Approach LOS		C			E			D			D	

Intersection Summary					
HCM 2000 Control Delay	49.0	HCM 2000 Level of Service		D	
HCM 2000 Volume to Capacity ratio	0.96				
Actuated Cycle Length (s)	111.3	Sum of lost time (s)		18.0	
Intersection Capacity Utilization	85.8%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

Olsen-Chandler SP
19: S. River Road & Niblick Road

Near Term Plus 1293 Unit Project AM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	102	602	265	114	983	282	637	318	46	279	269	144
Future Volume (veh/h)	102	602	265	114	983	282	637	318	46	279	269	144
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	111	654	288	124	1068	307	692	346	50	303	292	157
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	167	1300	580	152	1097	313	747	614	88	335	381	200
Arrive On Green	0.05	0.37	0.37	0.09	0.40	0.40	0.22	0.20	0.20	0.19	0.17	0.17
Sat Flow, veh/h	3456	3554	1585	1781	2724	776	3456	3117	446	1781	2254	1181
Grp Volume(v), veh/h	111	654	288	124	693	682	692	196	200	303	229	220
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1781	1777	1724	1728	1777	1786	1781	1777	1658
Q Serve(g_s), s	3.5	15.7	8.2	7.5	42.0	43.0	21.6	10.9	11.1	18.3	13.5	14.0
Cycle Q Clear(g_c), s	3.5	15.7	8.2	7.5	42.0	43.0	21.6	10.9	11.1	18.3	13.5	14.0
Prop In Lane	1.00		1.00	1.00		0.45	1.00		0.25	1.00		0.71
Lane Grp Cap(c), veh/h	167	1300	580	152	716	694	747	350	352	335	300	280
V/C Ratio(X)	0.66	0.50	0.50	0.81	0.97	0.98	0.93	0.56	0.57	0.90	0.76	0.79
Avail Cap(c_a), veh/h	204	1300	580	219	716	694	757	420	422	408	438	409
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.5	27.1	7.6	49.4	32.2	32.4	42.3	39.9	39.9	43.7	43.6	43.8
Incr Delay (d2), s/veh	5.8	0.3	0.7	14.2	26.0	29.5	17.3	1.4	1.4	20.4	4.6	6.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	6.5	5.2	3.9	22.1	22.5	10.7	4.8	4.9	9.7	6.2	6.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.3	27.4	8.3	63.7	58.1	61.9	59.6	41.3	41.4	64.1	48.1	50.0
LnGrp LOS	E	C	A	E	E	E	E	D	D	E	D	D
Approach Vol, veh/h		1053			1499			1088			752	
Approach Delay, s/veh		25.3			60.3			52.9			55.1	
Approach LOS		C			E			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.9	44.7	28.3	23.1	9.8	48.8	25.2	26.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	13.5	37.3	24.1	27.1	6.5	44.3	25.2	26.0
Max Q Clear Time (g_c+I1), s	9.5	17.7	23.6	16.0	5.5	45.0	20.3	13.1
Green Ext Time (p_c), s	0.1	5.1	0.2	1.9	0.0	0.0	0.4	1.7

Intersection Summary	
HCM 6th Ctrl Delay	49.2
HCM 6th LOS	D

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	363	166	13	782	212	7
v/c Ratio	0.45	0.22	0.03	0.51	0.43	0.02
Control Delay	11.6	3.0	9.1	10.8	14.3	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.6	3.0	9.1	10.8	14.3	7.0
Queue Length 50th (ft)	43	0	1	50	29	0
Queue Length 95th (ft)	167	30	12	165	100	7
Internal Link Dist (ft)	1629			570	669	
Turn Bay Length (ft)			75			50
Base Capacity (vph)	1595	1343	852	3030	1348	1209
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.12	0.02	0.26	0.16	0.01

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	334	153	12	719	195	6
Future Volume (vph)	334	153	12	719	195	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1845	1532	1749	3505	1752	1568
Flt Permitted	1.00	1.00	0.54	1.00	0.95	1.00
Satd. Flow (perm)	1845	1532	987	3505	1752	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	363	166	13	782	212	7
RTOR Reduction (vph)	0	92	0	0	0	5
Lane Group Flow (vph)	363	74	13	782	212	2
Confl. Peds. (#/hr)		4	4		1	
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Turn Type	NA	Perm	Perm	NA	Perm	Prot
Protected Phases	2			6		8
Permitted Phases		2	6		8	
Actuated Green, G (s)	18.0	18.0	18.0	18.0	11.7	11.7
Effective Green, g (s)	18.0	18.0	18.0	18.0	11.7	11.7
Actuated g/C Ratio	0.44	0.44	0.44	0.44	0.29	0.29
Clearance Time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	820	680	438	1557	506	452
v/s Ratio Prot	0.20			c0.22		0.00
v/s Ratio Perm		0.05	0.01		c0.12	
v/c Ratio	0.44	0.11	0.03	0.50	0.42	0.00
Uniform Delay, d1	7.8	6.6	6.3	8.0	11.7	10.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.0	0.0	0.1	0.2	0.0
Delay (s)	7.9	6.6	6.3	8.1	11.9	10.3
Level of Service	A	A	A	A	B	B
Approach Delay (s)	7.5			8.1	11.8	
Approach LOS	A			A	B	

Intersection Summary				
HCM 2000 Control Delay	8.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	40.5	Sum of lost time (s)	10.8
Intersection Capacity Utilization	39.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
20: Commerce Way & Sherwood Road

Near Term Plus 1293 Unit Project AM
HCM 6th Signalized Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	334	153	12	719	195	6
Future Volume (veh/h)	334	153	12	719	195	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	363	166	13	782	212	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	701	591	454	1331	414	369
Arrive On Green	0.38	0.38	0.38	0.38	0.23	0.23
Sat Flow, veh/h	1856	1564	866	3618	1767	1572
Grp Volume(v), veh/h	363	166	13	782	212	7
Grp Sat Flow(s),veh/h/ln	1856	1564	866	1763	1767	1572
Q Serve(g_s), s	4.2	2.1	0.3	4.9	2.9	0.1
Cycle Q Clear(g_c), s	4.2	2.1	4.5	4.9	2.9	0.1
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	701	591	454	1331	414	369
V/C Ratio(X)	0.52	0.28	0.03	0.59	0.51	0.02
Avail Cap(c_a), veh/h	2306	1944	1203	4381	1879	1672
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	6.7	6.0	8.5	6.9	9.3	8.2
Incr Delay (d2), s/veh	0.2	0.1	0.0	0.2	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.3	0.0	0.8	0.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	6.9	6.1	8.5	7.1	9.6	8.2
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h	529			795	219	
Approach Delay, s/veh	6.7			7.1	9.6	
Approach LOS	A			A	A	

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	15.9				15.9	11.9
Change Period (Y+Rc), s	5.4				5.4	5.4
Max Green Setting (Gmax), s	34.6				34.6	29.6
Max Q Clear Time (g_c+I1), s	6.2				6.9	4.9
Green Ext Time (p_c), s	1.5				3.6	0.3

Intersection Summary	
HCM 6th Ctrl Delay	7.3
HCM 6th LOS	A

Olsen-Chandler SP
21: Fontana Road & Sherwood Road

Near Term Plus 1293 Unit Project AM
HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	262	78	5	680	0	50	0	5	0	0	0
Future Volume (Veh/h)	0	262	78	5	680	0	50	0	5	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	285	85	5	739	0	54	0	5	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									4			
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		650										
pX, platoon unblocked				0.88			0.88	0.88	0.88	0.88	0.88	
vC, conflicting volume	739			370			707	1076	328	1079	1119	370
vC1, stage 1 conf vol							328	328		749	749	
vC2, stage 2 conf vol							380	749		330	370	
vCu, unblocked vol	739			218			600	1020	170	1022	1068	370
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			90	100	99	100	100	100
cM capacity (veh/h)	863			1189			535	380	744	341	374	628

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	370	374	370	59	0
Volume Left	0	5	0	54	0
Volume Right	85	0	0	5	0
cSH	863	1189	1700	585	1700
Volume to Capacity	0.00	0.00	0.22	0.10	0.00
Queue Length 95th (ft)	0	0	0	8	0
Control Delay (s)	0.0	0.1	0.0	12.3	0.0
Lane LOS		A		B	A
Approach Delay (s)	0.0	0.1		12.3	0.0
Approach LOS				B	A

Intersection Summary					
Average Delay	0.7				
Intersection Capacity Utilization	32.3%	ICU Level of Service		A	
Analysis Period (min)	15				

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	262	78	5	680	0	50	0	5	0	0	0
Future Vol, veh/h	0	262	78	5	680	0	50	0	5	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	285	85	5	739	0	54	0	5	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	739	0	0	370	0	0	708	1077	328	1079	1119	370
Stage 1	-	-	-	-	-	-	328	328	-	749	749	-
Stage 2	-	-	-	-	-	-	380	749	-	330	370	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.23	7.33	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.519	4.019	3.319
Pot Cap-1 Maneuver	865	-	-	1187	-	-	335	218	713	184	206	628
Stage 1	-	-	-	-	-	-	684	646	-	371	418	-
Stage 2	-	-	-	-	-	-	615	418	-	682	619	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	865	-	-	1187	-	-	333	216	713	182	205	628
Mov Cap-2 Maneuver	-	-	-	-	-	-	511	370	-	335	364	-
Stage 1	-	-	-	-	-	-	684	646	-	371	415	-
Stage 2	-	-	-	-	-	-	611	415	-	677	619	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	12.6	0
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	511	713	865	-	-	1187	-	-	-
HCM Lane V/C Ratio	0.106	0.008	-	-	-	0.005	-	-	-
HCM Control Delay (s)	12.9	10.1	0	-	-	8	0	-	0
HCM Lane LOS	B	B	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0.4	0	0	-	-	0	-	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Traffic Volume (veh/h)	24	119	95	23	265	2	246	9	34	7	9	72
Future Volume (veh/h)	24	119	95	23	265	2	246	9	34	7	9	72
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	129	103	25	288	2	267	10	37	8	10	78
Approach Volume (veh/h)		258			315			314			96	
Crossing Volume (veh/h)		43			303			163			580	
High Capacity (veh/h)		1339			1092			1219			875	
High v/c (veh/h)		0.19			0.29			0.26			0.11	
Low Capacity (veh/h)		1120			896			1011			703	
Low v/c (veh/h)		0.23			0.35			0.31			0.14	

Intersection Summary				
Maximum v/c High	0.29			
Maximum v/c Low	0.35			
Intersection Capacity Utilization	48.6%	ICU Level of Service		A

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	5.8
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	258	315	314	96
Demand Flow Rate, veh/h	264	322	320	98
Vehicles Circulating, veh/h	43	309	167	591
Vehicles Exiting, veh/h	646	178	140	39
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.5	7.0	5.7	6.3
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	264	322	320	98
Cap Entry Lane, veh/h	1321	1007	1164	755
Entry HV Adj Factor	0.979	0.979	0.981	0.978
Flow Entry, veh/h	258	315	314	96
Cap Entry, veh/h	1293	986	1141	738
V/C Ratio	0.200	0.320	0.275	0.130
Control Delay, s/veh	4.5	7.0	5.7	6.3
LOS	A	A	A	A
95th %tile Queue, veh	1	1	1	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	17	8	24	1	24	13	40	168	1	9	99	25
Future Volume (vph)	17	8	24	1	24	13	40	168	1	9	99	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	9	26	1	26	14	43	183	1	10	108	27

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	53	41	227	145
Volume Left (vph)	18	1	43	10
Volume Right (vph)	26	14	1	27
Hadj (s)	-0.09	-0.06	0.17	0.04
Departure Headway (s)	4.7	4.8	4.5	4.4
Degree Utilization, x	0.07	0.05	0.28	0.18
Capacity (veh/h)	696	689	783	780
Control Delay (s)	8.1	8.0	9.2	8.4
Approach Delay (s)	8.1	8.0	9.2	8.4
Approach LOS	A	A	A	A

Intersection Summary				
Delay	8.7			
Level of Service	A			
Intersection Capacity Utilization	37.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	8.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	8	24	1	24	13	40	168	1	9	99	25
Future Vol, veh/h	17	8	24	1	24	13	40	168	1	9	99	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	8	8	8	8	8	8	8	8	8	8	8	8
Mvmt Flow	18	9	26	1	26	14	43	183	1	10	108	27
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.1	8	9.2	8.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	19%	35%	3%	7%
Vol Thru, %	80%	16%	63%	74%
Vol Right, %	0%	49%	34%	19%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	209	49	38	133
LT Vol	40	17	1	9
Through Vol	168	8	24	99
RT Vol	1	24	13	25
Lane Flow Rate	227	53	41	145
Geometry Grp	1	1	1	1
Degree of Util (X)	0.281	0.07	0.054	0.177
Departure Headway (Hd)	4.454	4.708	4.748	4.409
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	809	762	755	815
Service Time	2.47	2.732	2.774	2.427
HCM Lane V/C Ratio	0.281	0.07	0.054	0.178
HCM Control Delay	9.2	8.1	8	8.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1.2	0.2	0.2	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	51	20	0	128	18	40	65	0	7	43	92
Future Volume (Veh/h)	45	51	20	0	128	18	40	65	0	7	43	92
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	49	55	22	0	139	20	43	71	0	8	47	100
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	159			77			436	323	66	348	324	149
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	159			77			436	323	66	348	324	149
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			90	88	100	98	92	89
cM capacity (veh/h)	1408			1509			427	571	992	531	570	892

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	126	159	114	8	147
Volume Left	49	0	43	8	0
Volume Right	22	20	0	0	100
cSH	1408	1509	506	531	756
Volume to Capacity	0.03	0.00	0.23	0.02	0.19
Queue Length 95th (ft)	3	0	21	1	18
Control Delay (s)	3.1	0.0	14.2	11.9	10.9
Lane LOS	A		B	B	B
Approach Delay (s)	3.1	0.0	14.2	11.0	
Approach LOS			B	B	

Intersection Summary				
Average Delay	6.7			
Intersection Capacity Utilization	41.1%	ICU Level of Service		A
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	6.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↰	↕	
Traffic Vol, veh/h	45	51	20	0	128	18	40	65	0	7	43	92
Future Vol, veh/h	45	51	20	0	128	18	40	65	0	7	43	92
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	49	55	22	0	139	20	43	71	0	8	47	100

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	159	0	0	77	0	0	387	323	66	349	324	149
Stage 1	-	-	-	-	-	-	164	164	-	149	149	-
Stage 2	-	-	-	-	-	-	223	159	-	200	175	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	1408	-	-	1509	-	-	568	591	992	602	590	892
Stage 1	-	-	-	-	-	-	833	759	-	849	770	-
Stage 2	-	-	-	-	-	-	775	762	-	797	750	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1408	-	-	1509	-	-	460	570	992	530	569	892
Mov Cap-2 Maneuver	-	-	-	-	-	-	460	570	-	530	569	-
Stage 1	-	-	-	-	-	-	803	732	-	818	770	-
Stage 2	-	-	-	-	-	-	646	762	-	694	723	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3	0	13.8	10.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	522	1408	-	-	1509	-	-	530	755
HCM Lane V/C Ratio	0.219	0.035	-	-	-	-	-	0.014	0.194
HCM Control Delay (s)	13.8	7.6	0	-	0	-	-	11.9	10.9
HCM Lane LOS	B	A	A	-	A	-	-	B	B
HCM 95th %tile Q(veh)	0.8	0.1	-	-	0	-	-	0	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Right Turn Channelized						
Traffic Volume (veh/h)	2	142	107	7	110	48
Future Volume (veh/h)	2	142	107	7	110	48
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	154	116	8	120	52
Approach Volume (veh/h)	156		124			172
Crossing Volume (veh/h)	116		120			2
High Capacity (veh/h)	1265		1261			1382
High v/c (veh/h)	0.12		0.10			0.12
Low Capacity (veh/h)	1052		1049			1159
Low v/c (veh/h)	0.15		0.12			0.15

Intersection Summary				
Maximum v/c High	0.12			
Maximum v/c Low	0.15			
Intersection Capacity Utilization	30.8%	ICU Level of Service		A

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	3.9
Intersection LOS	A

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	156	124	172
Demand Flow Rate, veh/h	159	126	175
Vehicles Circulating, veh/h	118	122	2
Vehicles Exiting, veh/h	130	55	275
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	4.1	3.9	3.7
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	159	126	175
Cap Entry Lane, veh/h	1223	1218	1377
Entry HV Adj Factor	0.981	0.982	0.983
Flow Entry, veh/h	156	124	172
Cap Entry, veh/h	1200	1196	1353
V/C Ratio	0.130	0.103	0.127
Control Delay, s/veh	4.1	3.9	3.7
LOS	A	A	A
95th %tile Queue, veh	0	0	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	65	80	5	1	6
Future Volume (Veh/h)	3	65	80	5	1	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	71	87	5	1	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	92				166	90
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	92				166	90
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1496				820	966

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	74	92	8
Volume Left	3	0	1
Volume Right	0	5	7
cSH	1496	1700	945
Volume to Capacity	0.00	0.05	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.3	0.0	8.8
Lane LOS	A		A
Approach Delay (s)	0.3	0.0	8.8
Approach LOS			A

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	15.9%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	65	80	5	1	6
Future Vol, veh/h	3	65	80	5	1	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	3	71	87	5	1	7

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	92	0	-	0	167	90
Stage 1	-	-	-	-	90	-
Stage 2	-	-	-	-	77	-
Critical Hdwy	4.13	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.227	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	1496	-	-	-	821	965
Stage 1	-	-	-	-	931	-
Stage 2	-	-	-	-	943	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1496	-	-	-	819	965
Mov Cap-2 Maneuver	-	-	-	-	819	-
Stage 1	-	-	-	-	929	-
Stage 2	-	-	-	-	943	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1496	-	-	-	941
HCM Lane V/C Ratio	0.002	-	-	-	0.008
HCM Control Delay (s)	7.4	0	-	-	8.9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	257	1291	1299	118	125	231
v/c Ratio	0.68	0.39	0.82	0.15	0.53	0.36
Control Delay	49.6	0.3	29.0	3.6	54.2	20.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.6	0.3	29.0	3.6	54.2	20.1
Queue Length 50th (ft)	154	0	373	0	77	81
Queue Length 95th (ft)	312	0	570	32	168	181
Internal Link Dist (ft)		1017	748		574	
Turn Bay Length (ft)	345			330	450	
Base Capacity (vph)	505	3312	2848	1291	505	979
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.39	0.46	0.09	0.25	0.24

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	254	1278	1286	117	124	229
Future Volume (vph)	254	1278	1286	117	124	229
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0	7.3	7.3	4.2	3.7
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1656	3312	3312	1482	1656	1482
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1656	3312	3312	1482	1656	1482
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	257	1291	1299	118	125	231
RTOR Reduction (vph)	0	0	0	61	0	26
Lane Group Flow (vph)	257	1291	1299	57	125	205
Heavy Vehicles (%)	9%	9%	9%	9%	9%	9%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	8	Free!	6		7!	4
Permitted Phases				6		4
Actuated Green, G (s)	23.8	102.9	49.4	49.4	14.7	42.5
Effective Green, g (s)	23.8	102.9	49.4	49.4	14.7	42.5
Actuated g/C Ratio	0.23	1.00	0.48	0.48	0.14	0.41
Clearance Time (s)	3.5		7.3	7.3	4.2	3.7
Vehicle Extension (s)	3.0		4.0	4.0	3.5	3.0
Lane Grp Cap (vph)	383	3312	1590	711	236	612
v/s Ratio Prot	c0.16	0.39	c0.39		c0.08	0.14
v/s Ratio Perm				0.04		
v/c Ratio	0.67	0.39	0.82	0.08	0.53	0.34
Uniform Delay, d1	36.0	0.0	22.9	14.5	40.9	20.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.6	0.3	3.6	0.1	2.4	0.3
Delay (s)	40.6	0.3	26.4	14.5	43.3	20.9
Level of Service	D	A	C	B	D	C
Approach Delay (s)		7.0	25.4		28.8	
Approach LOS		A	C		C	

Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	102.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

HCM 6th Edition methodology cannot be performed with phasing conflicts.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	196	971	279	52	887	127	248	283	193	336	312
v/c Ratio	0.53	0.76	0.38	0.19	0.80	0.22	0.59	0.33	0.53	0.77	0.56
Control Delay	58.6	38.3	5.0	58.3	43.0	6.4	57.9	35.9	58.6	56.1	14.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.6	38.3	5.0	58.3	43.0	6.4	57.9	35.9	58.6	56.1	14.3
Queue Length 50th (ft)	72	341	0	19	314	0	91	85	71	234	39
Queue Length 95th (ft)	139	536	62	48	495	46	170	154	138	423	149
Internal Link Dist (ft)		1323			2509			853		451	
Turn Bay Length (ft)	225		485	125		390	160		140		
Base Capacity (vph)	527	2116	1028	527	2116	980	586	1222	586	652	710
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.46	0.27	0.10	0.42	0.13	0.42	0.23	0.33	0.52	0.44

Intersection Summary

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	190	942	271	50	860	123	241	228	47	187	326	303
Future Volume (vph)	190	942	271	50	860	123	241	228	47	187	326	303
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3273	3374	1475	3273	3374	1489	3273	3280		3273	1776	1509
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3273	3374	1475	3273	3374	1489	3273	3280		3273	1776	1509
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	196	971	279	52	887	127	248	235	48	193	336	312
RTOR Reduction (vph)	0	0	173	0	0	84	0	10	0	0	0	186
Lane Group Flow (vph)	196	971	106	52	887	43	248	273	0	193	336	126
Confl. Peds. (#/hr)			1			1			2			
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	13.2	44.6	44.6	8.2	39.6	39.6	15.0	30.6		13.1	28.7	28.7
Effective Green, g (s)	13.2	44.6	44.6	8.2	39.6	39.6	15.0	30.6		13.1	28.7	28.7
Actuated g/C Ratio	0.11	0.38	0.38	0.07	0.34	0.34	0.13	0.26		0.11	0.25	0.25
Clearance Time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	368	1285	561	229	1140	503	419	857		366	435	369
v/s Ratio Prot	0.06	c0.29		0.02	c0.26		c0.08	0.08		0.06	c0.19	
v/s Ratio Perm			0.07			0.03						0.08
v/c Ratio	0.53	0.76	0.19	0.23	0.78	0.09	0.59	0.32		0.53	0.77	0.34
Uniform Delay, d1	49.0	31.5	24.2	51.5	34.8	26.4	48.2	34.9		49.1	41.2	36.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.5	2.6	0.2	0.2	3.4	0.1	2.2	0.2		1.4	8.3	0.6
Delay (s)	50.5	34.1	24.4	51.6	38.2	26.5	50.4	35.1		50.5	49.4	37.0
Level of Service	D	C	C	D	D	C	D	D		D	D	D
Approach Delay (s)		34.4			37.5			42.2			45.1	
Approach LOS		C			D			D			D	

Intersection Summary				
HCM 2000 Control Delay	38.6	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	117.1	Sum of lost time (s)	20.6	
Intersection Capacity Utilization	70.6%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	190	942	271	50	860	123	241	228	47	187	326	303
Future Volume (veh/h)	190	942	271	50	860	123	241	228	47	187	326	303
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	196	971	279	52	887	127	248	235	48	193	336	312
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	275	1245	554	105	1191	531	333	750	150	274	444	376
Arrive On Green	0.08	0.36	0.36	0.03	0.35	0.35	0.10	0.26	0.26	0.08	0.25	0.25
Sat Flow, veh/h	3319	3413	1520	3319	3413	1521	3319	2831	568	3319	1796	1522
Grp Volume(v), veh/h	196	971	279	52	887	127	248	140	143	193	336	312
Grp Sat Flow(s),veh/h/ln	1659	1706	1520	1659	1706	1521	1659	1706	1692	1659	1796	1522
Q Serve(g_s), s	5.4	23.6	8.7	1.4	21.3	5.5	6.8	6.1	6.3	5.3	16.2	18.1
Cycle Q Clear(g_c), s	5.4	23.6	8.7	1.4	21.3	5.5	6.8	6.1	6.3	5.3	16.2	18.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.34	1.00		1.00
Lane Grp Cap(c), veh/h	275	1245	554	105	1191	531	333	452	448	274	444	376
V/C Ratio(X)	0.71	0.78	0.50	0.49	0.74	0.24	0.74	0.31	0.32	0.70	0.76	0.83
Avail Cap(c_a), veh/h	640	2561	1141	640	2561	1141	711	750	744	711	789	669
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.7	26.3	9.8	44.4	26.7	21.6	40.8	27.5	27.5	41.7	32.5	33.3
Incr Delay (d2), s/veh	3.4	1.1	0.7	1.3	0.9	0.2	3.3	0.4	0.4	3.3	2.7	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	8.6	4.2	0.6	7.9	1.9	2.8	2.4	2.5	2.2	7.0	6.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.1	27.4	10.5	45.8	27.7	21.8	44.1	27.9	27.9	45.0	35.2	38.0
LnGrp LOS	D	C	B	D	C	C	D	C	C	D	D	D
Approach Vol, veh/h		1446			1066			531			841	
Approach Delay, s/veh		26.5			27.9			35.5			38.5	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.3	41.3	13.4	28.3	11.7	39.8	11.7	30.0
Change Period (Y+Rc), s	7.3	* 7.3	4.0	5.3	4.0	7.3	4.0	5.3
Max Green Setting (Gmax), s	18.0	* 70	20.0	41.0	18.0	70.0	20.0	41.0
Max Q Clear Time (g_c+I1), s	3.4	25.6	8.8	20.1	7.4	23.3	7.3	8.3
Green Ext Time (p_c), s	0.0	8.5	0.6	2.9	0.4	6.8	0.5	1.6

Intersection Summary	
HCM 6th Ctrl Delay	30.7
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1074	102	323	1015	0	18	0	389	0	0	0
Future Volume (Veh/h)	0	1074	102	323	1015	0	18	0	389	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	1107	105	333	1046	0	19	0	401	0	0	0
Pedestrians											1	
Lane Width (ft)											12.0	
Walking Speed (ft/s)											3.5	
Percent Blockage											0	
Right turn flare (veh)									1			1
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1047			1212			2348	2872	606	2266	2925	524
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1047			1212			2348	2872	606	2266	2925	524
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			39			0	100	6	100	100	100
cM capacity (veh/h)	631			544			9	6	428	1	5	485

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	738	474	333	697	349	420	0
Volume Left	0	0	0	333	0	0	19	0
Volume Right	0	0	105	0	0	0	401	0
cSH	1700	1700	1700	544	1700	1700	147	1700
Volume to Capacity	0.00	0.43	0.28	0.61	0.41	0.21	2.86	0.00
Queue Length 95th (ft)	0	0	0	102	0	0	957	0
Control Delay (s)	0.0	0.0	0.0	21.5	0.0	0.0	904.0	0.0
Lane LOS				C			F	A
Approach Delay (s)	0.0			5.2			904.0	0.0
Approach LOS							F	A

Intersection Summary				
Average Delay	128.5			
Intersection Capacity Utilization	64.2%	ICU Level of Service	C	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	18.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1074	102	323	1015	0	18	0	389	0	0	0
Future Vol, veh/h	0	1074	102	323	1015	0	18	0	389	0	0	0
Conflicting Peds, #/hr	1	0	0	0	0	1	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	340	-	-	195	-	-	-	-	25	-	-	25
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	0	1107	105	333	1046	0	19	0	401	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1047	0	0	1212	0	0	2349	2873	606	2267	2925	524
Stage 1	-	-	-	-	-	-	1160	1160	-	1713	1713	-
Stage 2	-	-	-	-	-	-	1189	1713	-	554	1212	-
Critical Hdwy	4.24	-	-	4.24	-	-	7.64	6.64	7.04	7.64	6.64	7.04
Critical Hdwy Stg 1	-	-	-	-	-	-	6.64	5.64	-	6.64	5.64	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.64	5.64	-	6.64	5.64	-
Follow-up Hdwy	2.27	-	-	2.27	-	-	3.57	4.07	3.37	3.57	4.07	3.37
Pot Cap-1 Maneuver	631	-	-	544	-	-	~ 18	15	428	21	14	485
Stage 1	-	-	-	-	-	-	200	258	-	89	137	-
Stage 2	-	-	-	-	-	-	192	137	-	472	243	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	630	-	-	544	-	-	~ 9	6	428	1	5	485
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 9	6	-	1	5	-
Stage 1	-	-	-	-	-	-	200	258	-	89	53	-
Stage 2	-	-	-	-	-	-	74	53	-	30	243	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	5.2	115.2	0
HCM LOS			F	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	9	428	630	-	-	544	-	-	-	-
HCM Lane V/C Ratio	2.062	0.937	-	-	-	0.612	-	-	-	-
HCM Control Delay (s)	$ 1298.3	60.5	0	-	-	21.5	-	-	0	0
HCM Lane LOS	F	F	A	-	-	C	-	-	A	A
HCM 95th %tile Q(veh)	3.3	10.7	0	-	-	4.1	-	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	283	1179	977	13	11	362
Future Volume (Veh/h)	283	1179	977	13	11	362
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	301	1254	1039	14	12	385
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1053				2268	520
vC1, stage 1 conf vol					1039	
vC2, stage 2 conf vol					1229	
vCu, unblocked vol	1053				2268	520
tC, single (s)	4.3				7.0	7.1
tC, 2 stage (s)					6.0	
tF (s)	2.3				3.6	3.4
p0 queue free %	51				88	20
cM capacity (veh/h)	611				103	481

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	301	627	627	520	520	14	397
Volume Left	301	0	0	0	0	0	12
Volume Right	0	0	0	0	0	14	385
cSH	611	1700	1700	1700	1700	1700	496
Volume to Capacity	0.49	0.37	0.37	0.31	0.31	0.01	0.80
Queue Length 95th (ft)	68	0	0	0	0	0	187
Control Delay (s)	16.5	0.0	0.0	0.0	0.0	0.0	36.5
Lane LOS	C						E
Approach Delay (s)	3.2			0.0			36.5
Approach LOS							E

Intersection Summary			
Average Delay		6.5	
Intersection Capacity Utilization		56.1%	ICU Level of Service B
Analysis Period (min)		15	

Intersection	
Int Delay, s/veh	6.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	283	1179	977	13	11	362
Future Vol, veh/h	283	1179	977	13	11	362
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	580	-	-	165	0	25
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	301	1254	1039	14	12	385

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1053	0	-	0	2268	520
Stage 1	-	-	-	-	1039	-
Stage 2	-	-	-	-	1229	-
Critical Hdwy	4.3	-	-	-	7	7.1
Critical Hdwy Stg 1	-	-	-	-	6	-
Critical Hdwy Stg 2	-	-	-	-	6	-
Follow-up Hdwy	2.3	-	-	-	3.6	3.4
Pot Cap-1 Maneuver	611	-	-	-	31	481
Stage 1	-	-	-	-	285	-
Stage 2	-	-	-	-	224	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	611	-	-	-	16	481
Mov Cap-2 Maneuver	-	-	-	-	114	-
Stage 1	-	-	-	-	144	-
Stage 2	-	-	-	-	224	-

Approach	EB	WB	SB
HCM Control Delay, s	3.2	0	36.3
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	611	-	-	-	114	481
HCM Lane V/C Ratio	0.493	-	-	-	0.103	0.801
HCM Control Delay (s)	16.5	-	-	-	40.2	36.2
HCM Lane LOS	C	-	-	-	E	E
HCM 95th %tile Q(veh)	2.7	-	-	-	0.3	7.4

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1179	11	1	974	0	17	0	4	0	0	1
Future Volume (Veh/h)	0	1179	11	1	974	0	17	0	4	0	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	1215	11	1	1004	0	18	0	4	0	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									1			
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1004			1226			1720	2221	608	1616	2232	502
vC1, stage 1 conf vol							1215	1215		1006	1006	
vC2, stage 2 conf vol							505	1006		610	1226	
vCu, unblocked vol	1004			1226			1720	2221	608	1616	2232	502
tC, single (s)	4.3			4.3			7.7	6.7	7.1	7.7	6.7	7.1
tC, 2 stage (s)							6.7	5.7		6.7	5.7	
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			100			89	100	99	100	100	100
cM capacity (veh/h)	628			512			166	181	415	210	179	489

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	608	608	11	1	669	335	22	1
Volume Left	0	0	0	0	1	0	0	18	0
Volume Right	0	0	0	11	0	0	0	4	1
cSH	1700	1700	1700	1700	512	1700	1700	202	489
Volume to Capacity	0.00	0.36	0.36	0.01	0.00	0.39	0.20	0.11	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	0	9	0
Control Delay (s)	0.0	0.0	0.0	0.0	12.0	0.0	0.0	26.5	12.4
Lane LOS					B			D	B
Approach Delay (s)	0.0				0.0			26.5	12.4
Approach LOS								D	B

Intersection Summary				
Average Delay		0.3		
Intersection Capacity Utilization		49.3%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1179	11	1	974	0	17	0	4	0	0	1
Future Vol, veh/h	0	1179	11	1	974	0	17	0	4	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	275	305	-	-	-	-	25	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	12	12	12	12	12	12	12	12	12	12	12	12
Mvmt Flow	0	1215	11	1	1004	0	18	0	4	0	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1004	0	0	1226	0	0	1719	2221	608	1614	2232	502
Stage 1	-	-	-	-	-	-	1215	1215	-	1006	1006	-
Stage 2	-	-	-	-	-	-	504	1006	-	608	1226	-
Critical Hdwy	4.34	-	-	4.34	-	-	7.74	6.74	7.14	7.74	6.74	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	6.74	5.74	-	6.74	5.74	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.74	5.74	-	6.74	5.74	-
Follow-up Hdwy	2.32	-	-	2.32	-	-	3.62	4.12	3.42	3.62	4.12	3.42
Pot Cap-1 Maneuver	628	-	-	512	-	-	52	38	415	63	37	489
Stage 1	-	-	-	-	-	-	177	233	-	240	296	-
Stage 2	-	-	-	-	-	-	493	296	-	426	230	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	628	-	-	512	-	-	52	38	415	62	37	489
Mov Cap-2 Maneuver	-	-	-	-	-	-	161	175	-	204	173	-
Stage 1	-	-	-	-	-	-	177	233	-	240	295	-
Stage 2	-	-	-	-	-	-	491	295	-	422	230	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	27	12.4
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	161	415	628	-	-	512	-	-	489
HCM Lane V/C Ratio	0.109	0.01	-	-	-	0.002	-	-	0.002
HCM Control Delay (s)	30.1	13.8	0	-	-	12	-	-	12.4
HCM Lane LOS	D	B	A	-	-	B	-	-	B
HCM 95th %tile Q(veh)	0.4	0	0	-	-	0	-	-	0

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Traffic Volume (veh/h)	69	235	64	313	204	109	49	294	293	34	476	95
Future Volume (veh/h)	69	235	64	313	204	109	49	294	293	34	476	95
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	74	253	69	337	219	117	53	316	315	37	512	102
Approach Volume (veh/h)		396			673			684			651	
Crossing Volume (veh/h)		886			443			364			609	
High Capacity (veh/h)		683			977			1040			855	
High v/c (veh/h)		0.58			0.69			0.66			0.76	
Low Capacity (veh/h)		535			793			850			685	
Low v/c (veh/h)		0.74			0.85			0.81			0.95	

Intersection Summary					
Maximum v/c High	0.76				
Maximum v/c Low	0.95				
Intersection Capacity Utilization	115.1%	ICU Level of Service		H	

Intersection	
Intersection Delay, s/veh	24.6
Intersection LOS	C

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	396	673	684	651
Demand Flow Rate, veh/h	401	679	691	657
Vehicles Circulating, veh/h	894	448	368	615
Vehicles Exiting, veh/h	378	611	927	512
Ped Vol Crossing Leg, #/h	1	1	1	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	25.5	20.9	17.1	35.7
Approach LOS	D	C	C	E

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	401	679	691	657
Cap Entry Lane, veh/h	554	874	948	737
Entry HV Adj Factor	0.989	0.991	0.990	0.991
Flow Entry, veh/h	396	673	684	651
Cap Entry, veh/h	548	866	938	730
V/C Ratio	0.723	0.777	0.729	0.892
Control Delay, s/veh	25.5	20.9	17.1	35.7
LOS	D	C	C	E
95th %tile Queue, veh	6	8	7	11

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	80	10	2	60	0	10	1	1	0	0	0
Future Volume (Veh/h)	1	80	10	2	60	0	10	1	1	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	87	11	2	65	0	11	1	1	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	65			98			164	164	92	165	169	65
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	65			98			164	164	92	165	169	65
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	100	100	100	100	100
cM capacity (veh/h)	1524			1483			796	724	959	792	719	993

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	99	67	13	0
Volume Left	1	2	11	0
Volume Right	11	0	1	0
cSH	1524	1483	800	1700
Volume to Capacity	0.00	0.00	0.02	0.00
Queue Length 95th (ft)	0	0	1	0
Control Delay (s)	0.1	0.2	9.6	0.0
Lane LOS	A	A	A	A
Approach Delay (s)	0.1	0.2	9.6	0.0
Approach LOS			A	A

Intersection Summary				
Average Delay			0.8	
Intersection Capacity Utilization			15.2%	ICU Level of Service
Analysis Period (min)			15	

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	80	10	2	60	0	10	1	1	0	0	0
Future Vol, veh/h	1	80	10	2	60	0	10	1	1	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	1	87	11	2	65	0	11	1	1	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	65	0	0	98	0	0	164	164	93	165	169	65
Stage 1	-	-	-	-	-	-	95	95	-	69	69	-
Stage 2	-	-	-	-	-	-	69	69	-	96	100	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	1524	-	-	1483	-	-	796	725	959	795	720	993
Stage 1	-	-	-	-	-	-	907	812	-	936	834	-
Stage 2	-	-	-	-	-	-	936	834	-	906	808	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1524	-	-	1483	-	-	794	724	959	792	719	993
Mov Cap-2 Maneuver	-	-	-	-	-	-	794	724	-	792	719	-
Stage 1	-	-	-	-	-	-	906	811	-	935	833	-
Stage 2	-	-	-	-	-	-	935	833	-	903	807	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.2	9.6	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	799	1524	-	-	1483	-	-	-
HCM Lane V/C Ratio	0.016	0.001	-	-	0.001	-	-	-
HCM Control Delay (s)	9.6	7.4	0	-	7.4	0	-	0
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	21	520	255	462	650	6	47	281	357	358	110
v/c Ratio	0.19	0.69	0.70	0.57	0.62	0.03	0.26	0.69	0.76	0.75	0.21
Control Delay	54.0	40.3	47.3	25.5	4.9	44.0	46.9	15.0	43.8	43.1	4.2
Queue Delay	0.0	0.0	0.0	1.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.0	40.3	47.4	26.6	5.3	44.0	46.9	15.0	43.8	43.1	4.2
Queue Length 50th (ft)	12	147	141	183	0	3	27	0	197	197	0
Queue Length 95th (ft)	44	255	268	398	79	17	69	80	#405	#388	28
Internal Link Dist (ft)		346		307			744			674	
Turn Bay Length (ft)	65		125			140		165	150		185
Base Capacity (vph)	109	1001	546	990	1127	381	401	562	636	645	668
Starvation Cap Reductn	0	0	9	298	144	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.52	0.47	0.67	0.66	0.02	0.12	0.50	0.56	0.56	0.16

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	458	31	240	434	611	6	44	264	588	84	103
Future Volume (vph)	20	458	31	240	434	611	6	44	264	588	84	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1787	3534		1787	1881	1558	1787	1881	1599	1698	1722	1560
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00
Satd. Flow (perm)	1787	3534		1787	1881	1558	1787	1881	1599	1698	1722	1560
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	21	487	33	255	462	650	6	47	281	626	89	110
RTOR Reduction (vph)	0	4	0	0	0	374	0	0	254	0	0	80
Lane Group Flow (vph)	21	516	0	255	462	276	6	47	27	357	358	30
Confl. Peds. (#/hr)			4			2						2
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	1.7	22.8		18.7	39.8	39.8	8.9	8.9	8.9	25.4	25.4	25.4
Effective Green, g (s)	1.7	22.8		18.7	39.8	39.8	8.9	8.9	8.9	25.4	25.4	25.4
Actuated g/C Ratio	0.02	0.24		0.20	0.42	0.42	0.09	0.09	0.09	0.27	0.27	0.27
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	32	859		356	798	661	169	178	151	459	466	422
v/s Ratio Prot	0.01	0.15		c0.14	c0.25		0.00	c0.02		c0.21	0.21	
v/s Ratio Perm						0.18			0.02			0.02
v/c Ratio	0.66	0.60		0.72	0.58	0.42	0.04	0.26	0.18	0.78	0.77	0.07
Uniform Delay, d1	45.8	31.5		35.1	20.6	18.9	38.6	39.4	39.1	31.6	31.5	25.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	39.4	1.2		6.7	1.0	0.4	0.1	0.8	0.6	8.1	7.5	0.1
Delay (s)	85.1	32.7		41.8	21.6	19.3	38.6	40.2	39.6	39.7	38.9	25.5
Level of Service	F	C		D	C	B	D	D	D	D	D	C
Approach Delay (s)		34.7			24.3			39.7			37.5	
Approach LOS		C			C			D			D	

Intersection Summary

HCM 2000 Control Delay	31.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	93.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	64.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	458	31	240	434	611	6	44	264	588	84	103
Future Volume (veh/h)	20	458	31	240	434	611	6	44	264	588	84	103
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	21	487	33	255	462	650	6	47	281	690	0	110
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	39	950	64	290	790	654	305	320	271	805	0	357
Arrive On Green	0.02	0.28	0.28	0.16	0.42	0.42	0.17	0.17	0.17	0.22	0.00	0.22
Sat Flow, veh/h	1795	3403	230	1795	1885	1559	1795	1885	1598	3591	0	1590
Grp Volume(v), veh/h	21	256	264	255	462	650	6	47	281	690	0	110
Grp Sat Flow(s),veh/h/ln	1795	1791	1842	1795	1885	1559	1795	1885	1598	1795	0	1590
Q Serve(g_s), s	1.3	13.1	13.2	15.1	20.5	45.3	0.3	2.3	18.5	20.1	0.0	6.3
Cycle Q Clear(g_c), s	1.3	13.1	13.2	15.1	20.5	45.3	0.3	2.3	18.5	20.1	0.0	6.3
Prop In Lane	1.00		0.12	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	39	500	514	290	790	654	305	320	271	805	0	357
V/C Ratio(X)	0.54	0.51	0.51	0.88	0.58	0.99	0.02	0.15	1.04	0.86	0.00	0.31
Avail Cap(c_a), veh/h	87	500	514	437	790	654	305	320	271	1071	0	474
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.8	33.0	33.1	44.6	24.3	31.5	37.7	38.5	45.2	40.6	0.0	35.2
Incr Delay (d2), s/veh	11.3	0.9	0.9	12.7	1.1	33.7	0.0	0.2	64.4	5.5	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	5.8	6.0	7.7	9.2	22.5	0.1	1.1	12.0	9.3	0.0	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.0	33.9	33.9	57.3	25.5	65.2	37.7	38.7	109.6	46.1	0.0	35.7
LnGrp LOS	E	C	C	E	C	E	D	D	F	D	A	D
Approach Vol, veh/h		541			1367			334			800	
Approach Delay, s/veh		35.1			50.3			98.4			44.6	
Approach LOS		D			D			F			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	22.1	34.9		28.9	6.9	50.2		23.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	26.5	24.5		32.5	5.3	45.7		18.5				
Max Q Clear Time (g_c+I1), s	17.1	15.2		22.1	3.3	47.3		20.5				
Green Ext Time (p_c), s	0.5	2.2		2.3	0.0	0.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			51.4									
HCM 6th LOS			D									

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	91	1319	20	1077	265	276	30	447	8	27
v/c Ratio	0.42	0.70	0.15	0.69	0.34	0.66	0.05	0.77	0.02	0.04
Control Delay	45.4	18.5	47.4	23.7	8.2	34.7	22.6	28.0	22.4	0.1
Queue Delay	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.4	19.3	47.4	23.7	8.2	34.7	22.6	28.0	22.4	0.1
Queue Length 50th (ft)	47	217	10	241	27	130	12	152	3	0
Queue Length 95th (ft)	109	479	38	406	96	233	33	290	14	0
Internal Link Dist (ft)		307		269			836			575
Turn Bay Length (ft)	120		220		145	130		110	95	
Base Capacity (vph)	312	2309	137	2070	982	729	986	906	727	933
Starvation Cap Reductn	0	623	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.78	0.15	0.52	0.27	0.38	0.03	0.49	0.01	0.03

Intersection Summary

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
9: Paso Robles Street & 13th Street

Near Term Plus 1293 Unit Project PM
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	1196	31	19	1002	246	257	28	416	7	0	25
Future Volume (vph)	85	1196	31	19	1002	246	257	28	416	7	0	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	3558		1787	3574	1564	1787	1881	1599	1787	1599	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.74	1.00	1.00	0.74	1.00	
Satd. Flow (perm)	1787	3558		1787	3574	1564	1391	1881	1599	1388	1599	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	91	1286	33	20	1077	265	276	30	447	8	0	27
RTOR Reduction (vph)	0	1	0	0	0	99	0	0	101	0	19	0
Lane Group Flow (vph)	91	1318	0	20	1077	166	276	30	346	8	8	0
Confl. Peds. (#/hr)			5									
Confl. Bikes (#/hr)			1			2						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		
Actuated Green, G (s)	7.5	42.7		1.7	36.9	36.9	24.3	24.3	24.3	24.3	24.3	
Effective Green, g (s)	7.5	42.7		1.7	36.9	36.9	24.3	24.3	24.3	24.3	24.3	
Actuated g/C Ratio	0.09	0.52		0.02	0.45	0.45	0.30	0.30	0.30	0.30	0.30	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	163	1848		36	1604	702	411	556	472	410	472	
v/s Ratio Prot	c0.05	c0.37		0.01	0.30			0.02			0.00	
v/s Ratio Perm						0.11	0.20		c0.22	0.01		
v/c Ratio	0.56	0.71		0.56	0.67	0.24	0.67	0.05	0.73	0.02	0.02	
Uniform Delay, d1	35.8	15.1		39.9	17.9	14.0	25.4	20.7	26.0	20.5	20.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.1	1.3		17.3	1.1	0.2	4.3	0.0	5.8	0.0	0.0	
Delay (s)	39.9	16.4		57.1	19.0	14.1	29.7	20.8	31.9	20.5	20.5	
Level of Service	D	B		E	B	B	C	C	C	C	C	
Approach Delay (s)		17.9			18.6			30.6			20.5	
Approach LOS		B			B			C			C	

Intersection Summary				
HCM 2000 Control Delay	20.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	82.2	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	75.2%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Olsen-Chandler SP
9: Paso Robles Street & 13th Street

Near Term Plus 1293 Unit Project PM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	1196	31	19	1002	246	257	28	416	7	0	25
Future Volume (veh/h)	85	1196	31	19	1002	246	257	28	416	7	0	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	91	1286	33	20	1077	0	276	30	447	8	0	27
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	119	1673	43	41	1526		533	610	517	387	0	517
Arrive On Green	0.07	0.47	0.47	0.02	0.43	0.00	0.32	0.32	0.32	0.32	0.00	0.32
Sat Flow, veh/h	1795	3565	91	1795	3582	1598	1394	1885	1598	925	0	1598
Grp Volume(v), veh/h	91	646	673	20	1077	0	276	30	447	8	0	27
Grp Sat Flow(s),veh/h/ln	1795	1791	1866	1795	1791	1598	1394	1885	1598	925	0	1598
Q Serve(g_s), s	3.7	21.9	22.0	0.8	18.1	0.0	12.4	0.8	19.3	0.4	0.0	0.9
Cycle Q Clear(g_c), s	3.7	21.9	22.0	0.8	18.1	0.0	13.3	0.8	19.3	1.2	0.0	0.9
Prop In Lane	1.00		0.05	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	119	841	876	41	1526		533	610	517	387	0	517
V/C Ratio(X)	0.77	0.77	0.77	0.49	0.71		0.52	0.05	0.86	0.02	0.00	0.05
Avail Cap(c_a), veh/h	306	1185	1235	135	2029		796	965	818	561	0	818
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.7	16.1	16.1	35.4	17.3	0.0	21.6	17.0	23.3	17.5	0.0	17.1
Incr Delay (d2), s/veh	9.8	2.0	1.9	8.7	0.7	0.0	0.8	0.0	5.9	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	8.4	8.8	0.4	6.9	0.0	3.9	0.3	7.5	0.1	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.5	18.1	18.1	44.1	18.0	0.0	22.4	17.1	29.1	17.5	0.0	17.1
LnGrp LOS	D	B	B	D	B		C	B	C	B	A	B
Approach Vol, veh/h		1410			1097	A		753			35	
Approach Delay, s/veh		19.7			18.5			26.2			17.2	
Approach LOS		B			B			C			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.2	38.9		28.2	9.3	35.7		28.2				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.5	48.5		37.5	12.5	41.5		37.5				
Max Q Clear Time (g_c+I1), s	2.8	24.0		3.2	5.7	20.1		21.3				
Green Ext Time (p_c), s	0.0	10.4		0.1	0.1	8.2		2.5				

Intersection Summary	
HCM 6th Ctrl Delay	20.8
HCM 6th LOS	C

Notes
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	415	1289	63	766	306	232	67	72	577
v/c Ratio	0.69	0.80	0.41	0.63	0.67	0.27	0.14	0.46	0.77
Control Delay	47.9	27.7	57.4	30.3	52.7	36.0	0.6	60.0	28.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.9	27.7	57.4	30.3	52.7	36.0	0.6	60.0	28.9
Queue Length 50th (ft)	141	375	42	219	105	72	0	48	105
Queue Length 95th (ft)	211	526	94	318	169	114	0	104	177
Internal Link Dist (ft)		353		673		608			523
Turn Bay Length (ft)	295		235		140		130	225	
Base Capacity (vph)	785	1944	197	1581	529	1064	571	182	1008
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.66	0.32	0.48	0.58	0.22	0.12	0.40	0.57

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	394	834	390	60	651	77	291	220	64	68	222	326
Future Volume (vph)	394	834	390	60	651	77	291	220	64	68	222	326
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.98		1.00	1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3467	3389		1787	3512		3467	3574	1599	1787	3230	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3467	3389		1787	3512		3467	3574	1599	1787	3230	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	415	878	411	63	685	81	306	232	67	72	234	343
RTOR Reduction (vph)	0	45	0	0	8	0	0	0	51	0	230	0
Lane Group Flow (vph)	415	1244	0	63	758	0	306	232	16	72	347	0
Confl. Peds. (#/hr)			1			1						1
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	17.4	46.3		6.9	35.8		13.2	24.0	24.0	6.8	17.6	
Effective Green, g (s)	17.4	46.3		6.9	35.8		13.2	24.0	24.0	6.8	17.6	
Actuated g/C Ratio	0.17	0.45		0.07	0.35		0.13	0.24	0.24	0.07	0.17	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	591	1538		120	1232		448	840	376	119	557	
v/s Ratio Prot	c0.12	c0.37		0.04	0.22		c0.09	0.06		0.04	c0.11	
v/s Ratio Perm									0.01			
v/c Ratio	0.70	0.81		0.53	0.62		0.68	0.28	0.04	0.61	0.62	
Uniform Delay, d1	39.9	24.0		46.0	27.4		42.4	31.9	30.1	46.3	39.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.8	3.2		4.1	0.9		4.3	0.2	0.0	8.4	2.2	
Delay (s)	43.6	27.3		50.1	28.3		46.7	32.1	30.2	54.7	41.3	
Level of Service	D	C		D	C		D	C	C	D	D	
Approach Delay (s)		31.3			30.0			39.2			42.8	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	34.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	102.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	79.8%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	394	834	390	60	651	77	291	220	64	68	222	326
Future Volume (veh/h)	394	834	390	60	651	77	291	220	64	68	222	326
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	415	878	0	63	685	81	306	232	67	72	234	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	574	1491		96	981	116	438	656	292	103	411	
Arrive On Green	0.16	0.42	0.00	0.05	0.30	0.30	0.13	0.18	0.18	0.06	0.11	0.00
Sat Flow, veh/h	3483	3676	0	1795	3221	380	3483	3582	1598	1795	3676	0
Grp Volume(v), veh/h	415	878	0	63	381	385	306	232	67	72	234	0
Grp Sat Flow(s),veh/h/ln	1742	1791	0	1795	1791	1810	1742	1791	1598	1795	1791	0
Q Serve(g_s), s	7.0	11.8	0.0	2.1	11.6	11.7	5.2	3.5	2.2	2.4	3.8	0.0
Cycle Q Clear(g_c), s	7.0	11.8	0.0	2.1	11.6	11.7	5.2	3.5	2.2	2.4	3.8	0.0
Prop In Lane	1.00		0.00	1.00		0.21	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	574	1491		96	546	552	438	656	292	103	411	
V/C Ratio(X)	0.72	0.59		0.66	0.70	0.70	0.70	0.35	0.23	0.70	0.57	
Avail Cap(c_a), veh/h	1207	3089		304	1227	1240	814	1634	729	281	1357	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.6	14.0	0.0	28.8	19.0	19.1	26.0	22.1	21.6	28.7	26.0	0.0
Incr Delay (d2), s/veh	1.7	0.4	0.0	7.4	1.6	1.6	2.0	0.3	0.4	8.3	1.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	4.3	0.0	1.1	4.5	4.6	2.1	1.4	0.8	1.2	1.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.3	14.4	0.0	36.2	20.7	20.7	28.0	22.5	22.0	37.0	27.3	0.0
LnGrp LOS	C	B		D	C	C	C	C	C	D	C	
Approach Vol, veh/h		1293	A		829			605			306	A
Approach Delay, s/veh		18.2			21.9			25.2			29.6	
Approach LOS		B			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.8	30.3	12.3	11.6	14.7	23.4	8.1	15.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	53.5	14.5	23.5	21.5	42.5	9.7	28.3
Max Q Clear Time (g_c+I1), s	4.1	13.8	7.2	5.8	9.0	13.7	4.4	5.5
Green Ext Time (p_c), s	0.0	7.6	0.6	1.1	1.2	5.1	0.0	1.5

Intersection Summary	
HCM 6th Ctrl Delay	21.7
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	58	506	1020	668	73
v/c Ratio	0.29	0.28	0.74	0.64	0.14
Control Delay	43.1	12.3	21.8	30.4	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	43.1	12.3	21.8	30.4	8.9
Queue Length 50th (ft)	24	54	156	128	0
Queue Length 95th (ft)	88	170	401	#367	40
Internal Link Dist (ft)		1151	2310	505	
Turn Bay Length (ft)	125			120	
Base Capacity (vph)	271	2665	2056	1357	662
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.21	0.19	0.50	0.49	0.11

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	56	491	506	483	648	71
Future Volume (vph)	56	491	506	483	648	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.93		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1787	3574	3286		3467	1578
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1787	3574	3286		3467	1578
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	58	506	522	498	668	73
RTOR Reduction (vph)	0	0	136	0	0	52
Lane Group Flow (vph)	58	506	884	0	668	21
Confl. Peds. (#/hr)				4		1
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	NA		Perm	Perm
Protected Phases	5	2	6			
Permitted Phases					4	4
Actuated Green, G (s)	6.3	39.2	28.4		22.3	22.3
Effective Green, g (s)	6.3	39.2	28.4		22.3	22.3
Actuated g/C Ratio	0.08	0.50	0.36		0.28	0.28
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	143	1787	1190		986	448
v/s Ratio Prot	c0.03	0.14	c0.27			
v/s Ratio Perm					c0.19	0.01
v/c Ratio	0.41	0.28	0.74		0.68	0.05
Uniform Delay, d1	34.3	11.4	21.8		24.9	20.3
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.9	0.1	2.5		1.9	0.0
Delay (s)	36.1	11.5	24.4		26.7	20.4
Level of Service	D	B	C		C	C
Approach Delay (s)		14.0	24.4		26.1	
Approach LOS		B	C		C	

Intersection Summary			
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	78.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	199	573	367	109	470	384	235	571	368	737
v/c Ratio	0.73	1.06	0.51	0.56	0.62	0.60	0.81	0.72	1.05	0.81
Control Delay	52.0	88.4	5.9	49.0	34.7	7.8	58.8	35.8	97.4	37.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.0	88.4	5.9	49.0	34.7	7.8	58.8	35.8	97.4	37.0
Queue Length 50th (ft)	108	~385	0	59	126	0	131	151	~244	197
Queue Length 95th (ft)	#200	#585	65	112	177	73	#252	209	#415	#271
Internal Link Dist (ft)		1092			186			1440		2310
Turn Bay Length (ft)	150			170		140	230		245	
Base Capacity (vph)	309	541	714	224	855	669	309	893	352	973
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	1.06	0.51	0.49	0.55	0.57	0.76	0.64	1.05	0.76

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	187	539	345	102	442	361	221	461	76	346	547	146
Future Volume (vph)	187	539	345	102	442	361	221	461	76	346	547	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1881	1571	1787	3574	1578	1787	3498		1787	3443	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	1881	1571	1787	3574	1578	1787	3498		1787	3443	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	199	573	367	109	470	384	235	490	81	368	582	155
RTOR Reduction (vph)	0	0	262	0	0	298	0	15	0	0	27	0
Lane Group Flow (vph)	199	573	105	109	470	86	235	556	0	368	710	0
Confl. Peds. (#/hr)			4			1						10
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	13.0	24.4	24.4	7.7	19.1	19.1	13.7	18.8		16.7	21.8	
Effective Green, g (s)	13.0	24.4	24.4	7.7	19.1	19.1	13.7	18.8		16.7	21.8	
Actuated g/C Ratio	0.15	0.29	0.29	0.09	0.22	0.22	0.16	0.22		0.20	0.25	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	271	536	447	160	797	352	286	768		348	876	
v/s Ratio Prot	c0.11	c0.30		0.06	0.13		0.13	0.16		c0.21	c0.21	
v/s Ratio Perm			0.07			0.05						
v/c Ratio	0.73	1.07	0.23	0.68	0.59	0.24	0.82	0.72		1.06	0.81	
Uniform Delay, d1	34.7	30.6	23.4	37.8	29.7	27.3	34.8	31.0		34.4	30.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.9	58.6	0.3	11.3	1.1	0.4	17.0	3.4		64.2	5.7	
Delay (s)	44.5	89.2	23.7	49.1	30.9	27.7	51.8	34.4		98.7	35.7	
Level of Service	D	F	C	D	C	C	D	C		F	D	
Approach Delay (s)		60.3			31.7			39.5			56.7	
Approach LOS		E			C			D			E	

Intersection Summary				
HCM 2000 Control Delay	48.2	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.00			
Actuated Cycle Length (s)	85.6	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	83.4%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
12: Creston Road & Niblick Road/Sherwood Road

Near Term Plus 1293 Unit Project PM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	187	539	345	102	442	361	221	461	76	346	547	146
Future Volume (veh/h)	187	539	345	102	442	361	221	461	76	346	547	146
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	199	573	367	109	470	384	235	490	81	368	582	155
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	239	564	476	140	874	389	275	622	102	361	699	186
Arrive On Green	0.13	0.30	0.30	0.08	0.24	0.24	0.15	0.20	0.20	0.20	0.25	0.25
Sat Flow, veh/h	1795	1885	1591	1795	3582	1596	1795	3078	506	1795	2791	741
Grp Volume(v), veh/h	199	573	367	109	470	384	235	284	287	368	373	364
Grp Sat Flow(s),veh/h/ln	1795	1885	1591	1795	1791	1596	1795	1791	1794	1795	1791	1741
Q Serve(g_s), s	8.9	24.5	17.2	4.9	9.4	19.6	10.5	12.3	12.5	16.5	16.2	16.3
Cycle Q Clear(g_c), s	8.9	24.5	17.2	4.9	9.4	19.6	10.5	12.3	12.5	16.5	16.2	16.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.28	1.00		0.43
Lane Grp Cap(c), veh/h	239	564	476	140	874	389	275	362	363	361	449	436
V/C Ratio(X)	0.83	1.02	0.77	0.78	0.54	0.99	0.86	0.78	0.79	1.02	0.83	0.83
Avail Cap(c_a), veh/h	318	564	476	230	874	389	318	459	459	361	502	488
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.6	28.7	26.2	37.1	27.0	30.9	33.8	31.0	31.1	32.7	29.1	29.1
Incr Delay (d2), s/veh	13.2	41.8	7.6	9.1	0.7	41.9	18.1	6.8	7.2	52.1	10.4	10.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	16.7	7.0	2.4	3.8	11.5	5.8	5.8	5.9	12.0	7.9	7.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.9	70.6	33.7	46.2	27.6	72.8	51.9	37.8	38.2	84.9	39.4	40.1
LnGrp LOS	D	F	C	D	C	E	D	D	D	F	D	D
Approach Vol, veh/h		1139			963			806			1105	
Approach Delay, s/veh		54.7			47.7			42.1			54.8	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.0	21.1	10.9	29.0	17.0	25.0	15.4	24.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.5	21.0	10.5	24.0	14.5	23.0	14.5	20.0
Max Q Clear Time (g_c+I1), s	18.5	14.5	6.9	26.5	12.5	18.3	10.9	21.6
Green Ext Time (p_c), s	0.0	1.8	0.1	0.0	0.1	1.9	0.2	0.0

Intersection Summary	
HCM 6th Ctrl Delay	50.5
HCM 6th LOS	D

Olsen-Chandler SP
13: Creston Road & Scott Street

Near Term Plus 1293 Unit Project PM
HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	53	65	616	46	99	804
Future Volume (Veh/h)	53	65	616	46	99	804
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	57	70	662	49	106	865
Pedestrians	2					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1766	688			713	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1766	688			713	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	30	84			88	
cM capacity (veh/h)	82	447			890	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	127	711	106	865
Volume Left	57	0	106	0
Volume Right	70	49	0	0
cSH	148	1700	890	1700
Volume to Capacity	0.86	0.42	0.12	0.51
Queue Length 95th (ft)	142	0	10	0
Control Delay (s)	98.8	0.0	9.6	0.0
Lane LOS	F		A	
Approach Delay (s)	98.8	0.0	1.0	
Approach LOS	F			

Intersection Summary			
Average Delay	7.5		
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	7.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	53	65	616	46	99	804
Future Vol, veh/h	53	65	616	46	99	804
Conflicting Peds, #/hr	0	0	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	57	70	662	49	106	865

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1766	689	0	0	713	0
Stage 1	689	-	-	-	-	-
Stage 2	1077	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.11	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209	-
Pot Cap-1 Maneuver	93	447	-	-	892	-
Stage 1	500	-	-	-	-	-
Stage 2	328	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	82	446	-	-	890	-
Mov Cap-2 Maneuver	82	-	-	-	-	-
Stage 1	499	-	-	-	-	-
Stage 2	289	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	97.6	0	1.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	149	890	-
HCM Lane V/C Ratio	-	-	0.852	0.12	-
HCM Control Delay (s)	-	-	97.6	9.6	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	5.7	0.4	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	112	4	14	4	1	38	22	425	10	48	556	133
Future Volume (Veh/h)	112	4	14	4	1	38	22	425	10	48	556	133
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Hourly flow rate (vph)	113	4	14	4	1	38	22	429	10	48	562	134
Pedestrians		5									4	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		3.5									3.5	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1178	1146	567	1152	1275	438	701			439		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1178	1146	567	1152	1275	438	701			439		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	23	98	97	97	99	94	98			96		
cM capacity (veh/h)	147	186	522	159	156	618	896			1126		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	131	43	22	439	48	562	134
Volume Left	113	4	22	0	48	0	0
Volume Right	14	38	0	10	0	0	134
cSH	161	462	896	1700	1126	1700	1700
Volume to Capacity	0.81	0.09	0.02	0.26	0.04	0.33	0.08
Queue Length 95th (ft)	135	8	2	0	3	0	0
Control Delay (s)	85.4	13.6	9.1	0.0	8.3	0.0	0.0
Lane LOS	F	B	A		A		
Approach Delay (s)	85.4	13.6	0.4		0.5		
Approach LOS	F	B					

Intersection Summary				
Average Delay	9.0			
Intersection Capacity Utilization	56.5%	ICU Level of Service	B	
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	8.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	112	4	14	4	1	38	22	425	10	48	556	133
Future Vol, veh/h	112	4	14	4	1	38	22	425	10	48	556	133
Conflicting Peds, #/hr	4	0	0	0	0	4	5	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	30	-	-	70	-	60
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	99	99	99	99	99	99	99	99	99	99	99	99
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	113	4	14	4	1	38	22	429	10	48	562	134

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1165	1146	567	1212	1275	438	701	0	0	439	0	0
Stage 1	663	663	-	478	478	-	-	-	-	-	-	-
Stage 2	502	483	-	734	797	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	172	200	525	160	168	621	901	-	-	1126	-	-
Stage 1	452	460	-	570	557	-	-	-	-	-	-	-
Stage 2	553	554	-	413	400	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	151	186	523	145	156	619	897	-	-	1126	-	-
Mov Cap-2 Maneuver	151	186	-	145	156	-	-	-	-	-	-	-
Stage 1	439	438	-	556	543	-	-	-	-	-	-	-
Stage 2	503	540	-	381	381	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	80.5	13.8	0.4	0.5
HCM LOS	F	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	897	-	-	165	451	1126	-	-
HCM Lane V/C Ratio	0.025	-	-	0.796	0.096	0.043	-	-
HCM Control Delay (s)	9.1	-	-	80.5	13.8	8.3	-	-
HCM Lane LOS	A	-	-	F	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	5.2	0.3	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	8	2	9	179	3	200	11	248	282	316	246	12
Future Volume (vph)	8	2	9	179	3	200	11	248	282	316	246	12
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	9	2	10	192	3	215	12	267	303	340	265	13

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	21	410	279	303	473	146
Volume Left (vph)	9	192	12	0	340	0
Volume Right (vph)	10	215	0	303	0	13
Hadj (s)	-0.18	-0.20	0.04	-0.68	0.38	-0.05
Departure Headway (s)	8.3	6.6	7.3	6.6	7.5	7.0
Degree Utilization, x	0.05	0.75	0.57	0.55	0.98	0.28
Capacity (veh/h)	394	410	491	545	478	502
Control Delay (s)	11.7	27.0	18.2	16.2	62.3	11.6
Approach Delay (s)	11.7	27.0	17.1		50.4	
Approach LOS	B	D	C		F	

Intersection Summary				
Delay	32.1			
Level of Service	D			
Intersection Capacity Utilization	70.3%	ICU Level of Service	C	
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	33.5
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Vol, veh/h	8	2	9	179	3	200	0	11	248	282	316	246
Future Vol, veh/h	8	2	9	179	3	200	0	11	248	282	316	246
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	1	1	1	1	1	1	2	1	1	1	1	1
Mvmt Flow	9	2	10	192	3	215	0	12	267	303	340	265
Number of Lanes	0	1	0	0	1	0	0	0	1	1	0	2

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	11.9	28.5	18.3	51.8
HCM LOS	B	D	C	F

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	4%	0%	42%	47%	72%	0%
Vol Thru, %	96%	0%	11%	1%	28%	91%
Vol Right, %	0%	100%	47%	52%	0%	9%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	259	282	19	382	439	135
LT Vol	11	0	8	179	316	0
Through Vol	248	0	2	3	123	123
RT Vol	0	282	9	200	0	12
Lane Flow Rate	278	303	20	411	472	145
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.567	0.554	0.048	0.766	0.981	0.284
Departure Headway (Hd)	7.325	6.582	8.415	6.711	7.485	7.052
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	493	546	424	538	486	510
Service Time	5.077	4.334	6.497	4.748	5.234	4.8
HCM Lane V/C Ratio	0.564	0.555	0.047	0.764	0.971	0.284
HCM Control Delay	19.3	17.3	11.9	28.5	63.8	12.6
HCM Lane LOS	C	C	B	D	F	B
HCM 95th-tile Q	3.5	3.4	0.2	6.8	12.7	1.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBR
Lane Configurations	
Traffic Vol, veh/h	12
Future Vol, veh/h	12
Peak Hour Factor	0.93
Heavy Vehicles, %	1
Mvmt Flow	13
Number of Lanes	0

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	341	247	148	200	198	236
Future Volume (Veh/h)	341	247	148	200	198	236
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	352	255	153	206	204	243
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	613	204	447			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	613	204	447			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	4	68	86			
cM capacity (veh/h)	368	806	1117			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	607	153	103	103	204	243
Volume Left	352	153	0	0	0	0
Volume Right	255	0	0	0	0	243
cSH	595	1117	1700	1700	1700	1700
Volume to Capacity	1.02	0.14	0.06	0.06	0.12	0.14
Queue Length 95th (ft)	396	12	0	0	0	0
Control Delay (s)	68.3	8.7	0.0	0.0	0.0	0.0
Lane LOS	F	A				
Approach Delay (s)	68.3	3.7			0.0	
Approach LOS	F					

Intersection Summary			
Average Delay		30.3	
Intersection Capacity Utilization		47.5%	ICU Level of Service A
Analysis Period (min)		15	

Intersection	
Int Delay, s/veh	18.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	341	247	148	200	198	236
Future Vol, veh/h	341	247	148	200	198	236
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	145	105	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	352	255	153	206	204	243

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	613	204	447	0	-	0
Stage 1	204	-	-	-	-	-
Stage 2	409	-	-	-	-	-
Critical Hdwy	6.615	6.215	4.115	-	-	-
Critical Hdwy Stg 1	5.415	-	-	-	-	-
Critical Hdwy Stg 2	5.815	-	-	-	-	-
Follow-up Hdwy	3.5095	3.3095	2.2095	-	-	-
Pot Cap-1 Maneuver	442	839	1118	-	-	-
Stage 1	832	-	-	-	-	-
Stage 2	642	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	381	839	1118	-	-	-
Mov Cap-2 Maneuver	381	-	-	-	-	-
Stage 1	718	-	-	-	-	-
Stage 2	642	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	40.7	3.7	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1118	-	381	839	-	-
HCM Lane V/C Ratio	0.136	-	0.923	0.304	-	-
HCM Control Delay (s)	8.7	-	62.1	11.2	-	-
HCM Lane LOS	A	-	F	B	-	-
HCM 95th %tile Q(veh)	0.5	-	9.8	1.3	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	0	109	0	182	14	0	0	0	0	283	34
Future Volume (Veh/h)	27	0	109	0	182	14	0	0	0	0	283	34
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	0	118	0	198	15	0	0	0	0	308	37
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	433	326	326	444	345	0	345			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	433	326	326	444	345	0	345			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	84	100	66	99	100			100		
cM capacity (veh/h)	388	593	717	439	580	1088	1220			1630		

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	147	213	345
Volume Left	29	0	0
Volume Right	118	15	37
cSH	614	611	1700
Volume to Capacity	0.24	0.35	0.20
Queue Length 95th (ft)	23	39	0
Control Delay (s)	12.7	14.0	0.0
Lane LOS	B	B	
Approach Delay (s)	12.7	14.0	0.0
Approach LOS	B	B	

Intersection Summary					
Average Delay		6.9			
Intersection Capacity Utilization		44.8%	ICU Level of Service	A	
Analysis Period (min)		15			

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	0	109	0	182	14	0	0	0	0	283	34
Future Vol, veh/h	27	0	109	0	182	14	0	0	0	0	283	34
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	29	0	118	0	198	15	0	0	0	0	308	37

Major/Minor	Minor2			Minor1					Major2		
Conflicting Flow All	434	327	327	386	345	0			-	-	0
Stage 1	327	327	-	0	0	-			-	-	-
Stage 2	107	0	-	386	345	-			-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21			-	-	-
Critical Hdwy Stg 1	6.11	5.51	-	-	-	-			-	-	-
Critical Hdwy Stg 2	-	-	-	6.11	5.51	-			-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309			-	-	-
Pot Cap-1 Maneuver	534	593	717	574	580	-			0	-	-
Stage 1	688	650	-	-	-	-			0	-	-
Stage 2	-	-	-	639	638	-			0	-	-
Platoon blocked, %										-	-
Mov Cap-1 Maneuver	-	593	717	479	580	-			-	-	-
Mov Cap-2 Maneuver	-	593	-	479	580	-			-	-	-
Stage 1	688	650	-	-	-	-			-	-	-
Stage 2	-	-	-	533	638	-			-	-	-

Approach	EB	WB	SB
HCM Control Delay, s			0
HCM LOS	-	-	

Minor Lane/Major Mvmt	EBLn1	WBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	-	580	-	-	-
HCM Lane V/C Ratio	-	0.341	-	-	-
HCM Control Delay (s)	-	14.4	-	-	-
HCM Lane LOS	-	B	-	-	-
HCM 95th %tile Q(veh)	-	1.5	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	52	443	761	207	440	99	368	1196	632	324
v/c Ratio	0.18	0.78	0.71	0.35	0.43	0.59	0.71	0.89	0.81	0.33
Control Delay	52.5	61.9	46.0	39.7	3.9	74.3	62.9	30.0	57.6	37.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.5	61.9	46.0	39.7	3.9	74.3	62.9	30.0	57.6	37.0
Queue Length 50th (ft)	40	187	309	143	22	85	166	298	273	112
Queue Length 95th (ft)	86	267	424	238	81	154	230	398	363	162
Internal Link Dist (ft)		521		1372			611			680
Turn Bay Length (ft)	115		515		115	165		290	305	
Base Capacity (vph)	335	664	1110	602	1089	223	776	1364	942	1276
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.67	0.69	0.34	0.40	0.44	0.47	0.88	0.67	0.25

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	328	102	738	201	427	96	357	1160	613	256	58
Future Volume (vph)	50	328	102	738	201	427	96	357	1160	613	256	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.95	0.88	0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	3435		3467	1881	1585	1787	3574	2814	3467	3475	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	3435		3467	1881	1585	1787	3574	2814	3467	3475	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	52	338	105	761	207	440	99	368	1196	632	264	60
RTOR Reduction (vph)	0	20	0	0	0	175	0	0	48	0	14	0
Lane Group Flow (vph)	52	423	0	761	207	265	99	368	1148	632	310	0
Confl. Peds. (#/hr)						2						
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	20.9	20.9		41.0	41.0	70.8	12.4	19.1	60.1	29.8	36.5	
Effective Green, g (s)	20.9	20.9		41.0	41.0	70.8	12.4	19.1	60.1	29.8	36.5	
Actuated g/C Ratio	0.16	0.16		0.31	0.31	0.54	0.09	0.15	0.46	0.23	0.28	
Clearance Time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	284	546		1082	587	854	168	519	1288	786	966	
v/s Ratio Prot	0.03	c0.12		0.22	0.11	0.07	0.06	0.10	c0.28	c0.18	0.09	
v/s Ratio Perm						0.10			0.13			
v/c Ratio	0.18	0.77		0.70	0.35	0.31	0.59	0.71	0.89	0.80	0.32	
Uniform Delay, d1	47.8	52.9		39.8	34.9	16.7	57.0	53.5	32.6	48.0	37.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	6.8		2.1	0.4	0.2	5.2	4.4	8.1	6.0	0.2	
Delay (s)	48.1	59.7		41.9	35.3	16.9	62.2	57.9	40.7	54.0	37.8	
Level of Service	D	E		D	D	B	E	E	D	D	D	
Approach Delay (s)		58.5			33.1			45.8			48.5	
Approach LOS		E			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	43.8	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	131.3	Sum of lost time (s)	20.5	
Intersection Capacity Utilization	82.6%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Near Term Plus 1293 Unit Project PM
18: US 101 Ramps/Spring Street & 1st Street/Niblick Road — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	328	102	738	201	427	96	357	1160	613	256	58
Future Volume (veh/h)	50	328	102	738	201	427	96	357	1160	613	256	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	52	338	105	761	207	440	99	368	1196	632	264	60
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	273	410	125	908	492	745	123	789	1353	719	1017	227
Arrive On Green	0.15	0.15	0.15	0.26	0.26	0.26	0.07	0.22	0.22	0.21	0.35	0.35
Sat Flow, veh/h	1795	2692	822	3483	1885	1594	1795	3582	2812	3483	2909	650
Grp Volume(v), veh/h	52	223	220	761	207	440	99	368	1196	632	161	163
Grp Sat Flow(s),veh/h/ln	1795	1791	1723	1742	1885	1594	1795	1791	1406	1742	1791	1768
Q Serve(g_s), s	3.2	15.4	15.9	26.4	11.7	26.0	7.0	11.4	28.2	22.5	8.2	8.5
Cycle Q Clear(g_c), s	3.2	15.4	15.9	26.4	11.7	26.0	7.0	11.4	28.2	22.5	8.2	8.5
Prop In Lane	1.00		0.48	1.00		1.00	1.00		1.00	1.00		0.37
Lane Grp Cap(c), veh/h	273	273	262	908	492	745	123	789	1353	719	626	618
V/C Ratio(X)	0.19	0.82	0.84	0.84	0.42	0.59	0.80	0.47	0.88	0.88	0.26	0.26
Avail Cap(c_a), veh/h	342	342	328	1132	613	848	227	789	1353	961	662	654
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.3	52.5	52.7	44.7	39.3	25.1	58.7	43.3	24.5	49.2	29.7	29.8
Incr Delay (d2), s/veh	0.3	11.8	14.4	4.7	0.6	0.9	11.4	0.4	7.3	7.4	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	7.9	8.0	11.7	5.4	9.7	3.5	5.0	20.5	10.5	3.6	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.7	64.3	67.1	49.4	39.8	25.9	70.1	43.8	31.8	56.7	30.0	30.1
LnGrp LOS	D	E	E	D	D	C	E	D	C	E	C	C
Approach Vol, veh/h		495			1408			1663			956	
Approach Delay, s/veh		63.8			40.7			36.7			47.6	
Approach LOS		E			D			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	31.1	34.0		24.1	14.6	50.5		38.8				
Change Period (Y+Rc), s	* 4.7	5.8		4.6	5.8	* 5.8		5.4				
Max Green Setting (Gmax), s	* 35	28.2		24.4	16.2	* 47		41.6				
Max Q Clear Time (g_c+I1), s	24.5	30.2		17.9	9.0	10.5		28.4				
Green Ext Time (p_c), s	1.9	0.0		1.6	0.1	2.1		4.9				

Intersection Summary												
HCM 6th Ctrl Delay			43.2									
HCM 6th LOS			D									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Olsen-Chandler SP — Near Term Plus 1293 Unit Project PM
19: S. River Road & Niblick Road — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	269	1057	665	119	928	449	369	216	558
v/c Ratio	0.64	0.83	0.76	0.61	0.77	0.79	0.49	0.77	0.77
Control Delay	54.5	40.2	15.1	62.5	37.4	56.0	37.8	64.4	46.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.5	40.2	15.1	62.5	37.4	56.0	37.8	64.4	46.9
Queue Length 50th (ft)	98	373	110	85	312	164	116	152	193
Queue Length 95th (ft)	148	#500	291	151	418	#244	167	#271	261
Internal Link Dist (ft)		1510			1609		962		896
Turn Bay Length (ft)	140			80		150		110	
Base Capacity (vph)	501	1351	906	241	1294	631	908	325	905
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.78	0.73	0.49	0.72	0.71	0.41	0.66	0.62

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
19: S. River Road & Niblick Road

Near Term Plus 1293 Unit Project PM
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	258	1015	638	114	734	156	431	272	83	207	407	129
Future Volume (vph)	258	1015	638	114	734	156	431	272	83	207	407	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3467	3574	1599	1787	3471		3467	3449		1787	3433	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3467	3574	1599	1787	3471		3467	3449		1787	3433	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	269	1057	665	119	765	162	449	283	86	216	424	134
RTOR Reduction (vph)	0	0	313	0	14	0	0	24	0	0	26	0
Lane Group Flow (vph)	269	1057	352	119	914	0	449	345	0	216	532	0
Confl. Peds. (#/hr)						2						3
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	13.3	38.6	38.6	11.9	37.2		17.9	23.0		17.1	22.2	
Effective Green, g (s)	13.3	38.6	38.6	11.9	37.2		17.9	23.0		17.1	22.2	
Actuated g/C Ratio	0.12	0.36	0.36	0.11	0.34		0.16	0.21		0.16	0.20	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	424	1270	568	195	1188		571	730		281	701	
v/s Ratio Prot	c0.08	c0.30		0.07	0.26		c0.13	0.10		0.12	c0.15	
v/s Ratio Perm			0.22									
v/c Ratio	0.63	0.83	0.62	0.61	0.77		0.79	0.47		0.77	0.76	
Uniform Delay, d1	45.3	32.0	28.9	46.1	31.9		43.5	37.5		43.9	40.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.1	4.8	2.0	5.5	3.1		7.0	0.5		11.9	4.7	
Delay (s)	48.4	36.9	30.9	51.7	34.9		50.6	38.0		55.8	45.4	
Level of Service	D	D	C	D	C		D	D		E	D	
Approach Delay (s)		36.4			36.8			44.9			48.3	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM 2000 Control Delay	40.0	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	108.6	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	77.8%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Olsen-Chandler SP
19: S. River Road & Niblick Road

Near Term Plus 1293 Unit Project PM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	258	1015	638	114	734	156	431	272	83	207	407	129
Future Volume (veh/h)	258	1015	638	114	734	156	431	272	83	207	407	129
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	269	1057	665	119	765	162	449	283	86	216	424	134
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	353	1323	590	150	1035	219	540	586	175	254	541	169
Arrive On Green	0.10	0.37	0.37	0.08	0.35	0.35	0.16	0.22	0.22	0.14	0.20	0.20
Sat Flow, veh/h	3483	3582	1598	1795	2940	623	3483	2720	810	1795	2682	839
Grp Volume(v), veh/h	269	1057	665	119	466	461	449	184	185	216	282	276
Grp Sat Flow(s),veh/h/ln	1742	1791	1598	1795	1791	1772	1742	1791	1739	1795	1791	1730
Q Serve(g_s), s	7.1	25.0	21.1	6.2	21.6	21.6	11.8	8.5	8.8	11.1	14.1	14.4
Cycle Q Clear(g_c), s	7.1	25.0	21.1	6.2	21.6	21.6	11.8	8.5	8.8	11.1	14.1	14.4
Prop In Lane	1.00		1.00	1.00		0.35	1.00		0.47	1.00		0.49
Lane Grp Cap(c), veh/h	353	1323	590	150	630	624	540	386	375	254	361	349
V/C Ratio(X)	0.76	0.80	1.13	0.79	0.74	0.74	0.83	0.48	0.49	0.85	0.78	0.79
Avail Cap(c_a), veh/h	570	1532	683	275	747	739	717	520	505	370	520	502
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.5	26.7	10.9	42.6	26.9	26.9	38.8	32.5	32.6	39.7	35.8	35.9
Incr Delay (d2), s/veh	3.4	2.7	76.4	9.0	3.2	3.3	6.3	0.9	1.0	12.0	4.7	5.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	10.4	18.8	3.0	9.2	9.1	5.3	3.6	3.7	5.6	6.4	6.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.9	29.4	87.2	51.6	30.1	30.2	45.1	33.4	33.6	51.7	40.5	41.4
LnGrp LOS	D	C	F	D	C	C	D	C	C	D	D	D
Approach Vol, veh/h		1991			1046			818			774	
Approach Delay, s/veh		50.8			32.6			39.9			43.9	
Approach LOS		D			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.4	39.5	19.2	23.6	14.1	37.8	17.9	24.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	14.5	40.5	19.5	27.5	15.5	39.5	19.5	27.5
Max Q Clear Time (g_c+I1), s	8.2	27.0	13.8	16.4	9.1	23.6	13.1	10.8
Green Ext Time (p_c), s	0.1	8.0	0.8	2.4	0.5	5.1	0.3	1.8

Intersection Summary	
HCM 6th Ctrl Delay	43.6
HCM 6th LOS	D

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	841	213	22	616	248	18
v/c Ratio	0.78	0.22	0.11	0.30	0.62	0.05
Control Delay	19.1	2.2	9.9	7.9	26.9	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.1	2.2	9.9	7.9	26.9	8.5
Queue Length 50th (ft)	187	0	3	47	79	0
Queue Length 95th (ft)	#592	32	19	123	137	12
Internal Link Dist (ft)	1629			570	669	
Turn Bay Length (ft)			75			50
Base Capacity (vph)	1078	983	203	2048	851	772
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.22	0.11	0.30	0.29	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	774	196	20	567	228	17
Future Volume (vph)	774	196	20	567	228	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1827	1519	1735	3471	1732	1553
Flt Permitted	1.00	1.00	0.19	1.00	0.95	1.00
Satd. Flow (perm)	1827	1519	345	3471	1732	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	841	213	22	616	248	18
RTOR Reduction (vph)	0	88	0	0	0	13
Lane Group Flow (vph)	841	125	22	616	248	5
Confl. Peds. (#/hr)		2	2		3	
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type	NA	Perm	Perm	NA	Perm	Prot
Protected Phases	2			6		8
Permitted Phases		2	6		8	
Actuated Green, G (s)	35.7	35.7	35.7	35.7	14.1	14.1
Effective Green, g (s)	35.7	35.7	35.7	35.7	14.1	14.1
Actuated g/C Ratio	0.59	0.59	0.59	0.59	0.23	0.23
Clearance Time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	1076	894	203	2044	402	361
v/s Ratio Prot	c0.46			0.18		0.00
v/s Ratio Perm		0.08	0.06		c0.14	
v/c Ratio	0.78	0.14	0.11	0.30	0.62	0.01
Uniform Delay, d1	9.5	5.6	5.5	6.2	20.8	17.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.5	0.0	0.1	0.0	2.0	0.0
Delay (s)	13.0	5.6	5.6	6.3	22.8	17.9
Level of Service	B	A	A	A	C	B
Approach Delay (s)	11.5			6.2	22.5	
Approach LOS	B			A	C	

Intersection Summary				
HCM 2000 Control Delay	11.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	60.6	Sum of lost time (s)	10.8
Intersection Capacity Utilization	62.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
20: Commerce Way & Sherwood Road

Near Term Plus 1293 Unit Project PM
HCM 6th Signalized Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	774	196	20	567	228	17
Future Volume (veh/h)	774	196	20	567	228	17
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	841	213	22	616	248	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	992	839	260	1885	333	297
Arrive On Green	0.54	0.54	0.54	0.54	0.19	0.19
Sat Flow, veh/h	1841	1557	527	3589	1753	1560
Grp Volume(v), veh/h	841	213	22	616	248	18
Grp Sat Flow(s),veh/h/ln	1841	1557	527	1749	1753	1560
Q Serve(g_s), s	15.5	2.9	1.5	3.9	5.3	0.4
Cycle Q Clear(g_c), s	15.5	2.9	16.9	3.9	5.3	0.4
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	992	839	260	1885	333	297
V/C Ratio(X)	0.85	0.25	0.08	0.33	0.74	0.06
Avail Cap(c_a), veh/h	1597	1351	433	3035	1301	1158
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.8	4.9	15.0	5.1	15.2	13.2
Incr Delay (d2), s/veh	1.3	0.1	0.1	0.0	1.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.4	0.1	0.7	1.7	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.1	5.0	15.0	5.2	16.5	13.3
LnGrp LOS	A	A	B	A	B	B
Approach Vol, veh/h	1054			638	266	
Approach Delay, s/veh	8.2			5.5	16.3	
Approach LOS	A			A	B	

Timer - Assigned Phs	2	6	8
Phs Duration (G+Y+Rc), s	26.9	26.9	13.0
Change Period (Y+Rc), s	5.4	5.4	5.4
Max Green Setting (Gmax), s	34.6	34.6	29.6
Max Q Clear Time (g_c+I1), s	17.5	18.9	7.3
Green Ext Time (p_c), s	3.9	2.5	0.3

Intersection Summary	
HCM 6th Ctrl Delay	8.4
HCM 6th LOS	A

Olsen-Chandler SP
21: Fontana Road & Sherwood Road

Near Term Plus 1293 Unit Project PM
HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	730	61	11	481	0	107	0	11	0	0	0
Future Volume (Veh/h)	0	730	61	11	481	0	107	0	11	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	793	66	12	523	0	116	0	12	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									4			
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		650										
pX, platoon unblocked				0.59			0.59	0.59	0.59	0.59	0.59	
vC, conflicting volume	523			859			1112	1373	826	1379	1406	262
vC1, stage 1 conf vol							826	826		547	547	
vC2, stage 2 conf vol							286	547		832	859	
vCu, unblocked vol	523			418			844	1286	363	1296	1341	262
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			66	100	97	100	100	100
cM capacity (veh/h)	1040			674			340	304	376	279	285	737

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	859	274	262	128	0
Volume Left	0	12	0	116	0
Volume Right	66	0	0	12	0
cSH	1040	674	1700	375	1700
Volume to Capacity	0.00	0.02	0.15	0.34	0.00
Queue Length 95th (ft)	0	1	0	37	0
Control Delay (s)	0.0	0.7	0.0	20.4	0.0
Lane LOS		A		C	A
Approach Delay (s)	0.0	0.3		20.4	0.0
Approach LOS				C	A

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	54.7%	ICU Level of Service		A
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	730	61	11	481	0	107	0	11	0	0	0
Future Vol, veh/h	0	730	61	11	481	0	107	0	11	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	793	66	12	523	0	116	0	12	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	523	0	0	859	0	0	1112	1373	826	1379	1406	262
Stage 1	-	-	-	-	-	-	826	826	-	547	547	-
Stage 2	-	-	-	-	-	-	286	547	-	832	859	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.23	7.33	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.519	4.019	3.319
Pot Cap-1 Maneuver	1042	-	-	780	-	-	174	145	371	112	139	737
Stage 1	-	-	-	-	-	-	365	386	-	490	517	-
Stage 2	-	-	-	-	-	-	698	517	-	363	372	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1042	-	-	780	-	-	171	142	371	107	136	737
Mov Cap-2 Maneuver	-	-	-	-	-	-	329	317	-	281	302	-
Stage 1	-	-	-	-	-	-	365	386	-	490	506	-
Stage 2	-	-	-	-	-	-	683	506	-	351	372	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.3	21.2	0
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	329	371	1042	-	-	780	-	-	-
HCM Lane V/C Ratio	0.354	0.032	-	-	-	0.015	-	-	-
HCM Control Delay (s)	21.8	15	0	-	-	9.7	0.1	-	0
HCM Lane LOS	C	C	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	1.6	0.1	0	-	-	0	-	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Traffic Volume (veh/h)	79	300	253	43	177	8	156	11	33	5	11	47
Future Volume (veh/h)	79	300	253	43	177	8	156	11	33	5	11	47
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	86	326	275	47	192	9	170	12	36	5	12	51
Approach Volume (veh/h)		687			248			218			68	
Crossing Volume (veh/h)		64			268			417			409	
High Capacity (veh/h)		1317			1122			997			1004	
High v/c (veh/h)		0.52			0.22			0.22			0.07	
Low Capacity (veh/h)		1100			923			811			817	
Low v/c (veh/h)		0.62			0.27			0.27			0.08	

Intersection Summary				
Maximum v/c High		0.52		
Maximum v/c Low		0.62		
Intersection Capacity Utilization		67.4%	ICU Level of Service	C

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	687	248	218	68
Demand Flow Rate, veh/h	701	253	222	69
Vehicles Circulating, veh/h	65	273	426	417
Vehicles Exiting, veh/h	421	375	340	109
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	8.9	5.8	6.7	4.8
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	701	253	222	69
Cap Entry Lane, veh/h	1291	1045	894	902
Entry HV Adj Factor	0.981	0.981	0.981	0.982
Flow Entry, veh/h	687	248	218	68
Cap Entry, veh/h	1266	1025	877	886
V/C Ratio	0.543	0.242	0.248	0.077
Control Delay, s/veh	8.9	5.8	6.7	4.8
LOS	A	A	A	A
95th %tile Queue, veh	3	1	1	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	23	25	51	1	18	19	32	139	3	24	194	13
Future Volume (vph)	23	25	51	1	18	19	32	139	3	24	194	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	27	55	1	20	21	35	151	3	26	211	14

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	107	42	189	251
Volume Left (vph)	25	1	35	26
Volume Right (vph)	55	21	3	14
Hadj (s)	-0.24	-0.28	0.04	0.00
Departure Headway (s)	4.7	4.8	4.6	4.5
Degree Utilization, x	0.14	0.06	0.24	0.31
Capacity (veh/h)	689	668	747	765
Control Delay (s)	8.5	8.1	9.1	9.5
Approach Delay (s)	8.5	8.1	9.1	9.5
Approach LOS	A	A	A	A

Intersection Summary				
Delay	9.1			
Level of Service	A			
Intersection Capacity Utilization	34.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	9.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	23	25	51	1	18	19	32	139	3	24	194	13
Future Vol, veh/h	23	25	51	1	18	19	32	139	3	24	194	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	25	27	55	1	20	21	35	151	3	26	211	14
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.5	8.1	9.1	9.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	18%	23%	3%	10%
Vol Thru, %	80%	25%	47%	84%
Vol Right, %	2%	52%	50%	6%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	174	99	38	231
LT Vol	32	23	1	24
Through Vol	139	25	18	194
RT Vol	3	51	19	13
Lane Flow Rate	189	108	41	251
Geometry Grp	1	1	1	1
Degree of Util (X)	0.24	0.141	0.055	0.312
Departure Headway (Hd)	4.574	4.704	4.763	4.47
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	783	761	749	803
Service Time	2.611	2.745	2.811	2.505
HCM Lane V/C Ratio	0.241	0.142	0.055	0.313
HCM Control Delay	9.1	8.5	8.1	9.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.9	0.5	0.2	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	82	144	46	1	89	14	31	60	1	17	78	64
Future Volume (Veh/h)	82	144	46	1	89	14	31	60	1	17	78	64
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	89	157	50	1	97	15	34	65	1	18	85	70
Pedestrians								6				
Lane Width (ft)								12.0				
Walking Speed (ft/s)								3.5				
Percent Blockage								1				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	112			213			585	480	188	500	498	104
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	112			213			585	480	188	500	498	104
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			89	86	100	96	81	93
cM capacity (veh/h)	1484			1355			317	455	852	408	444	953

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	296	113	100	18	155
Volume Left	89	1	34	18	0
Volume Right	50	15	1	0	70
cSH	1484	1355	398	408	585
Volume to Capacity	0.06	0.00	0.25	0.04	0.26
Queue Length 95th (ft)	5	0	25	3	26
Control Delay (s)	2.6	0.1	17.1	14.2	13.4
Lane LOS	A	A	C	B	B
Approach Delay (s)	2.6	0.1	17.1	13.4	
Approach LOS			C	B	

Intersection Summary				
Average Delay	7.1			
Intersection Capacity Utilization	44.6%	ICU Level of Service		A
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	6.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↰	↕	
Traffic Vol, veh/h	82	144	46	1	89	14	31	60	1	17	78	64
Future Vol, veh/h	82	144	46	1	89	14	31	60	1	17	78	64
Conflicting Peds, #/hr	0	0	6	6	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	89	157	50	1	97	15	34	65	1	18	85	70

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	112	0	0	213	0	0	550	480	188	500	498	105
Stage 1	-	-	-	-	-	-	366	366	-	107	107	-
Stage 2	-	-	-	-	-	-	184	114	-	393	391	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	1484	-	-	1363	-	-	447	487	857	483	475	952
Stage 1	-	-	-	-	-	-	655	624	-	901	809	-
Stage 2	-	-	-	-	-	-	820	803	-	634	609	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1484	-	-	1355	-	-	333	450	852	407	439	952
Mov Cap-2 Maneuver	-	-	-	-	-	-	333	450	-	407	439	-
Stage 1	-	-	-	-	-	-	607	578	-	840	808	-
Stage 2	-	-	-	-	-	-	680	802	-	524	564	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.3	0.1	16.8	13.5
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	404	1484	-	-	1355	-	-	407	580
HCM Lane V/C Ratio	0.248	0.06	-	-	0.001	-	-	0.045	0.266
HCM Control Delay (s)	16.8	7.6	0	-	7.7	0	-	14.3	13.4
HCM Lane LOS	C	A	A	-	A	A	-	B	B
HCM 95th %tile Q(veh)	1	0.2	-	-	0	-	-	0.1	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Right Turn Channelized						
Traffic Volume (veh/h)	8	123	89	5	163	134
Future Volume (veh/h)	8	123	89	5	163	134
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	134	97	5	177	146
Approach Volume (veh/h)	143		102			323
Crossing Volume (veh/h)	97		177			9
High Capacity (veh/h)	1284		1206			1375
High v/c (veh/h)	0.11		0.08			0.23
Low Capacity (veh/h)	1069		999			1152
Low v/c (veh/h)	0.13		0.10			0.28

Intersection Summary			
Maximum v/c High	0.23		
Maximum v/c Low	0.28		
Intersection Capacity Utilization	37.5%	ICU Level of Service	A

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	4.4
Intersection LOS	A

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	143	102	323
Demand Flow Rate, veh/h	146	104	330
Vehicles Circulating, veh/h	99	181	9
Vehicles Exiting, veh/h	186	158	236
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.9	4.0	4.7
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	146	104	330
Cap Entry Lane, veh/h	1247	1147	1367
Entry HV Adj Factor	0.979	0.981	0.979
Flow Entry, veh/h	143	102	323
Cap Entry, veh/h	1222	1126	1339
V/C Ratio	0.117	0.091	0.241
Control Delay, s/veh	3.9	4.0	4.7
LOS	A	A	A
95th %tile Queue, veh	0	0	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	6	84	101	5	3	6
Future Volume (Veh/h)	6	84	101	5	3	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	91	110	5	3	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	115				218	112
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	115				218	112
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1462				763	935

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	98	115	10
Volume Left	7	0	3
Volume Right	0	5	7
cSH	1462	1700	876
Volume to Capacity	0.00	0.07	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.6	0.0	9.2
Lane LOS	A		A
Approach Delay (s)	0.6	0.0	9.2
Approach LOS			A

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	19.4%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	84	101	5	3	6
Future Vol, veh/h	6	84	101	5	3	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	7	91	110	5	3	7

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	115	0	-	0	218	113
Stage 1	-	-	-	-	113	-
Stage 2	-	-	-	-	105	-
Critical Hdwy	4.14	-	-	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	2.236	-	-	-	3.536	3.336
Pot Cap-1 Maneuver	1462	-	-	-	766	934
Stage 1	-	-	-	-	907	-
Stage 2	-	-	-	-	914	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1462	-	-	-	762	934
Mov Cap-2 Maneuver	-	-	-	-	762	-
Stage 1	-	-	-	-	902	-
Stage 2	-	-	-	-	914	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1462	-	-	-	869
HCM Lane V/C Ratio	0.004	-	-	-	0.011
HCM Control Delay (s)	7.5	0	-	-	9.2
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Reso A - Exhibit C2 (EIR Technical Appendix)

Near Term Plus 1293-Unit Project (Phase 1)

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Near Term Plus 1293 Unit Project AM (Phase 1)
12: Creston Road & Niblick Road/Sherwood Road — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	128	240	160	48	480	372	304	672	222	703
v/c Ratio	0.53	0.44	0.29	0.32	0.63	0.60	0.80	0.72	0.71	0.75
Control Delay	43.1	27.1	5.8	44.5	33.7	8.0	51.5	32.7	47.1	24.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.1	27.1	5.8	44.5	33.7	8.0	51.5	32.7	47.1	24.3
Queue Length 50th (ft)	66	109	0	25	124	0	162	173	114	117
Queue Length 95th (ft)	124	179	44	62	182	73	#330	247	#225	189
Internal Link Dist (ft)		1092			186			1440		2310
Turn Bay Length (ft)	150			170		140	230		245	
Base Capacity (vph)	319	673	659	163	946	684	390	1080	366	1128
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.36	0.24	0.29	0.51	0.54	0.78	0.62	0.61	0.62

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Olsen-Chandler SP — Near Term Plus 1293 Unit Project AM (Phase 1)
12: Creston Road & Niblick Road/Sherwood Road — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	118	221	147	44	442	342	280	574	44	204	333	314
Future Volume (vph)	118	221	147	44	442	342	280	574	44	204	333	314
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1845	1532	1752	3505	1533	1752	3463		1752	3208	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1845	1532	1752	3505	1533	1752	3463		1752	3208	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	128	240	160	48	480	372	304	624	48	222	362	341
RTOR Reduction (vph)	0	0	114	0	0	289	0	6	0	0	194	0
Lane Group Flow (vph)	128	240	46	48	480	83	304	666	0	222	509	0
Confl. Peds. (#/hr)			9			9			4			12
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	8.7	22.9	22.9	3.6	17.8	17.8	16.9	20.9		14.0	18.0	
Effective Green, g (s)	8.7	22.9	22.9	3.6	17.8	17.8	16.9	20.9		14.0	18.0	
Actuated g/C Ratio	0.11	0.29	0.29	0.05	0.22	0.22	0.21	0.26		0.18	0.23	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	191	532	441	79	785	343	372	911		308	727	
v/s Ratio Prot	c0.07	0.13		0.03	c0.14		c0.17	c0.19		0.13	0.16	
v/s Ratio Perm			0.03			0.05						
v/c Ratio	0.67	0.45	0.10	0.61	0.61	0.24	0.82	0.73		0.72	0.70	
Uniform Delay, d1	34.0	23.1	20.7	37.2	27.7	25.3	29.8	26.7		30.9	28.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	8.9	0.6	0.1	12.5	1.4	0.4	13.0	3.1		8.1	3.1	
Delay (s)	42.9	23.7	20.8	49.7	29.1	25.6	42.8	29.7		38.9	31.3	
Level of Service	D	C	C	D	C	C	D	C		D	C	
Approach Delay (s)		27.5			28.8			33.8			33.1	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	31.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	79.4	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	70.3%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	221	147	44	442	342	280	574	44	204	333	314
Future Volume (veh/h)	118	221	147	44	442	342	280	574	44	204	333	314
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	128	240	160	48	480	372	304	624	48	222	362	341
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	162	549	461	72	863	381	341	978	75	262	441	388
Arrive On Green	0.09	0.30	0.30	0.04	0.24	0.24	0.19	0.29	0.29	0.15	0.25	0.25
Sat Flow, veh/h	1767	1856	1558	1767	3526	1555	1767	3316	255	1767	1763	1550
Grp Volume(v), veh/h	128	240	160	48	480	372	304	331	341	222	362	341
Grp Sat Flow(s),veh/h/ln	1767	1856	1558	1767	1763	1555	1767	1763	1808	1767	1763	1550
Q Serve(g_s), s	5.8	8.5	6.6	2.2	9.7	19.4	13.7	13.3	13.4	10.0	15.8	17.3
Cycle Q Clear(g_c), s	5.8	8.5	6.6	2.2	9.7	19.4	13.7	13.3	13.4	10.0	15.8	17.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.14	1.00		1.00
Lane Grp Cap(c), veh/h	162	549	461	72	863	381	341	520	533	262	441	388
V/C Ratio(X)	0.79	0.44	0.35	0.67	0.56	0.98	0.89	0.64	0.64	0.85	0.82	0.88
Avail Cap(c_a), veh/h	292	604	507	149	863	381	357	520	533	335	475	417
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.3	23.3	22.6	38.7	27.0	30.6	32.1	25.0	25.0	33.9	28.9	29.4
Incr Delay (d2), s/veh	8.3	0.5	0.4	10.2	0.8	40.0	22.7	2.6	2.6	14.7	10.4	18.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	3.6	2.3	1.1	3.9	11.0	7.7	5.6	5.8	5.2	7.6	8.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.6	23.8	23.0	48.9	27.8	70.6	54.8	27.6	27.6	48.6	39.3	47.5
LnGrp LOS	D	C	C	D	C	E	D	C	C	D	D	D
Approach Vol, veh/h		528			900			976			925	
Approach Delay, s/veh		28.6			46.6			36.1			44.6	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.6	28.6	7.8	28.7	20.3	24.9	12.0	24.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.5	23.0	6.9	26.6	16.5	22.0	13.5	20.0
Max Q Clear Time (g_c+I1), s	12.0	15.4	4.2	10.5	15.7	19.3	7.8	21.4
Green Ext Time (p_c), s	0.2	2.4	0.0	1.6	0.1	1.2	0.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	40.1
HCM 6th LOS	D

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	42	56	717	50	54	509
Future Volume (Veh/h)	42	56	717	50	54	509
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	46	61	779	54	59	553
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1477	806			833	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1477	806			833	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	64	84			93	
cM capacity (veh/h)	129	382			800	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	107	833	59	553
Volume Left	46	0	59	0
Volume Right	61	54	0	0
cSH	207	1700	800	1700
Volume to Capacity	0.52	0.49	0.07	0.33
Queue Length 95th (ft)	66	0	6	0
Control Delay (s)	39.7	0.0	9.9	0.0
Lane LOS	E		A	
Approach Delay (s)	39.7	0.0	1.0	
Approach LOS	E			

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	57.3%	ICU Level of Service	B
Analysis Period (min)	15		

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	42	56	717	50	54	509
Future Vol, veh/h	42	56	717	50	54	509
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	46	61	779	54	59	553

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1477	806	0	0	833	0
Stage 1	806	-	-	-	-	-
Stage 2	671	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	139	382	-	-	800	-
Stage 1	439	-	-	-	-	-
Stage 2	508	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	129	382	-	-	800	-
Mov Cap-2 Maneuver	129	-	-	-	-	-
Stage 1	439	-	-	-	-	-
Stage 2	470	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	39.2	0	0.9
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 208	800	-
HCM Lane V/C Ratio	-	- 0.512	0.073	-
HCM Control Delay (s)	-	- 39.2	9.9	-
HCM Lane LOS	-	- E	A	-
HCM 95th %tile Q(veh)	-	- 2.6	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	20	9	7	255	5	300	9	243	124	242	199	10
Future Volume (vph)	20	9	7	255	5	300	9	243	124	242	199	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	10	8	277	5	326	10	264	135	263	216	11

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	40	608	274	135	371	119
Volume Left (vph)	22	277	10	0	263	0
Volume Right (vph)	8	326	0	135	0	11
Hadj (s)	0.02	-0.20	0.05	-0.67	0.39	-0.03
Departure Headway (s)	8.3	6.4	7.6	6.9	7.8	7.3
Degree Utilization, x	0.09	1.07	0.58	0.26	0.80	0.24
Capacity (veh/h)	401	559	457	510	453	483
Control Delay (s)	12.1	83.6	19.5	11.1	33.9	11.5
Approach Delay (s)	12.1	83.6	16.7		28.4	
Approach LOS	B	F	C		D	

Intersection Summary				
Delay	46.6			
Level of Service	E			
Intersection Capacity Utilization	75.8%	ICU Level of Service	D	
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	48.6
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Vol, veh/h	20	9	7	255	5	300	0	9	243	124	242	199
Future Vol, veh/h	20	9	7	255	5	300	0	9	243	124	242	199
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	10	8	277	5	326	0	10	264	135	263	216
Number of Lanes	0	1	0	0	1	0	0	0	1	1	0	2

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	12.7	85.7	18.4	30.5
HCM LOS	B	F	C	D

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	4%	0%	56%	46%	71%	0%
Vol Thru, %	96%	0%	25%	1%	29%	91%
Vol Right, %	0%	100%	19%	54%	0%	9%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	252	124	36	560	342	110
LT Vol	9	0	20	255	242	0
Through Vol	243	0	9	5	100	100
RT Vol	0	124	7	300	0	10
Lane Flow Rate	274	135	39	609	371	119
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.58	0.259	0.092	1.078	0.799	0.242
Departure Headway (Hd)	8.038	7.293	8.766	6.373	8.155	7.722
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	452	496	411	566	445	468
Service Time	5.738	4.993	6.766	4.472	5.855	5.422
HCM Lane V/C Ratio	0.606	0.272	0.095	1.076	0.834	0.254
HCM Control Delay	21.3	12.5	12.7	85.7	36.2	12.9
HCM Lane LOS	C	B	B	F	E	B
HCM 95th-tile Q	3.6	1	0.3	18	7.2	0.9

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBR
Lane Configurations	
Traffic Vol, veh/h	10
Future Vol, veh/h	10
Peak Hour Factor	0.92
Heavy Vehicles, %	2
Mvmt Flow	11
Number of Lanes	0

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	168	136	229	208	125	337
Future Volume (Veh/h)	168	136	229	208	125	337
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	183	148	249	226	136	366
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	747	136	502			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	747	136	502			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	31	83	76			
cM capacity (veh/h)	264	885	1052			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	331	249	113	113	136	366
Volume Left	183	249	0	0	0	0
Volume Right	148	0	0	0	0	366
cSH	478	1052	1700	1700	1700	1700
Volume to Capacity	0.69	0.24	0.07	0.07	0.08	0.22
Queue Length 95th (ft)	131	23	0	0	0	0
Control Delay (s)	29.0	9.5	0.0	0.0	0.0	0.0
Lane LOS	D	A				
Approach Delay (s)	29.0	5.0			0.0	
Approach LOS	D					

Intersection Summary				
Average Delay		9.1		
Intersection Capacity Utilization		40.2%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection	
Int Delay, s/veh	8.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	168	136	229	208	125	337
Future Vol, veh/h	168	136	229	208	125	337
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	145	105	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	183	148	249	226	136	366

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	747	136	502	0	-	0
Stage 1	136	-	-	-	-	-
Stage 2	611	-	-	-	-	-
Critical Hdwy	6.645	6.245	4.145	-	-	-
Critical Hdwy Stg 1	5.445	-	-	-	-	-
Critical Hdwy Stg 2	5.845	-	-	-	-	-
Follow-up Hdwy	3.5285	3.3285	2.2285	-	-	-
Pot Cap-1 Maneuver	362	909	1054	-	-	-
Stage 1	887	-	-	-	-	-
Stage 2	503	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	277	909	1054	-	-	-
Mov Cap-2 Maneuver	277	-	-	-	-	-
Stage 1	678	-	-	-	-	-
Stage 2	503	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	26.4	5	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1054	-	277	909	-	-
HCM Lane V/C Ratio	0.236	-	0.659	0.163	-	-
HCM Control Delay (s)	9.5	-	40	9.7	-	-
HCM Lane LOS	A	-	E	A	-	-
HCM 95th %tile Q(veh)	0.9	-	4.3	0.6	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Near Term Plus 1293 Unit Project PM (Phase 1)
12: Creston Road & Niblick Road/Sherwood Road — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	199	489	355	104	423	350	228	558	314	727
v/c Ratio	0.73	0.91	0.50	0.54	0.56	0.58	0.79	0.71	0.89	0.80
Control Delay	51.7	54.0	5.9	48.1	33.5	7.7	56.6	35.4	63.7	36.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.7	54.0	5.9	48.1	33.5	7.7	56.6	35.4	63.7	36.2
Queue Length 50th (ft)	108	275	0	56	112	0	126	147	179	194
Queue Length 95th (ft)	#200	#474	65	108	159	70	#243	204	#340	#262
Internal Link Dist (ft)		1092			186			1440		2310
Turn Bay Length (ft)	150			170		140	230		245	
Base Capacity (vph)	311	543	706	225	861	645	311	898	355	979
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.90	0.50	0.46	0.49	0.54	0.73	0.62	0.88	0.74

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Olsen-Chandler SP — Near Term Plus 1293 Unit Project PM (Phase 1)
12: Creston Road & Niblick Road/Sherwood Road — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	187	460	334	98	398	329	214	456	69	295	538	146
Future Volume (vph)	187	460	334	98	398	329	214	456	69	295	538	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1881	1571	1787	3574	1578	1787	3504		1787	3441	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	1881	1571	1787	3574	1578	1787	3504		1787	3441	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	199	489	355	104	423	350	228	485	73	314	572	155
RTOR Reduction (vph)	0	0	254	0	0	272	0	13	0	0	28	0
Lane Group Flow (vph)	199	489	101	104	423	78	228	545	0	314	699	0
Confl. Peds. (#/hr)			4			1						10
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	13.0	24.3	24.3	7.6	18.9	18.9	13.6	18.6		16.7	21.7	
Effective Green, g (s)	13.0	24.3	24.3	7.6	18.9	18.9	13.6	18.6		16.7	21.7	
Actuated g/C Ratio	0.15	0.29	0.29	0.09	0.22	0.22	0.16	0.22		0.20	0.25	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	272	536	448	159	792	350	285	764		350	876	
v/s Ratio Prot	c0.11	c0.26		0.06	0.12		0.13	0.16		c0.18	c0.20	
v/s Ratio Perm			0.06			0.05						
v/c Ratio	0.73	0.91	0.23	0.65	0.53	0.22	0.80	0.71		0.90	0.80	
Uniform Delay, d1	34.4	29.4	23.3	37.5	29.3	27.1	34.5	30.8		33.4	29.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.7	19.9	0.3	9.3	0.7	0.3	14.8	3.2		24.3	5.1	
Delay (s)	44.2	49.3	23.5	46.8	30.0	27.5	49.2	34.0		57.7	34.8	
Level of Service	D	D	C	D	C	C	D	C		E	C	
Approach Delay (s)		39.5			31.0			38.4			41.7	
Approach LOS		D			C			D			D	

Intersection Summary

HCM 2000 Control Delay	37.9	HCM 2000 Level of Service	D		
HCM 2000 Volume to Capacity ratio	0.90				
Actuated Cycle Length (s)	85.2	Sum of lost time (s)	18.0		
Intersection Capacity Utilization	76.2%	ICU Level of Service	D		
Analysis Period (min)	15				

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Near Term Plus 1293 Unit Project PM (Phase 1)
12: Creston Road & Niblick Road/Sherwood Road — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	187	460	334	98	398	329	214	456	69	295	538	146
Future Volume (veh/h)	187	460	334	98	398	329	214	456	69	295	538	146
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	199	489	355	104	423	350	228	485	73	314	572	155
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	240	571	482	134	873	389	269	628	94	353	688	186
Arrive On Green	0.13	0.30	0.30	0.07	0.24	0.24	0.15	0.20	0.20	0.20	0.25	0.25
Sat Flow, veh/h	1795	1885	1591	1795	3582	1596	1795	3124	468	1795	2779	751
Grp Volume(v), veh/h	199	489	355	104	423	350	228	277	281	314	368	359
Grp Sat Flow(s),veh/h/ln	1795	1885	1591	1795	1791	1596	1795	1791	1801	1795	1791	1739
Q Serve(g_s), s	8.6	19.5	16.0	4.5	8.1	17.0	9.9	11.7	11.8	13.6	15.5	15.6
Cycle Q Clear(g_c), s	8.6	19.5	16.0	4.5	8.1	17.0	9.9	11.7	11.8	13.6	15.5	15.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.26	1.00		0.43
Lane Grp Cap(c), veh/h	240	571	482	134	873	389	269	360	362	353	443	430
V/C Ratio(X)	0.83	0.86	0.74	0.78	0.48	0.90	0.85	0.77	0.78	0.89	0.83	0.83
Avail Cap(c_a), veh/h	326	571	482	236	897	400	326	471	474	371	516	501
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.7	26.2	25.0	36.3	25.9	29.3	33.1	30.2	30.2	31.3	28.5	28.5
Incr Delay (d2), s/veh	12.2	12.3	5.9	9.2	0.4	22.5	16.0	5.6	5.9	21.8	9.7	10.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	10.0	6.3	2.2	3.3	8.5	5.3	5.4	5.5	7.7	7.5	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.9	38.5	30.9	45.5	26.3	51.7	49.0	35.8	36.1	53.1	38.1	38.8
LnGrp LOS	D	D	C	D	C	D	D	D	D	D	D	D
Approach Vol, veh/h		1043			877			786			1041	
Approach Delay, s/veh		37.3			38.7			39.8			42.9	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.2	20.5	10.5	28.7	16.5	24.3	15.2	24.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.5	21.0	10.5	24.0	14.5	23.0	14.5	20.0
Max Q Clear Time (g_c+I1), s	15.6	13.8	6.5	21.5	11.9	17.6	10.6	19.0
Green Ext Time (p_c), s	0.1	1.9	0.1	1.1	0.2	2.1	0.2	0.4

Intersection Summary	
HCM 6th Ctrl Delay	39.7
HCM 6th LOS	D

Olsen-Chandler SP — Near Term Plus 1293 Unit Project PM (Phase 1)
13: Creston Road & Scott Street — HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	52	62	600	44	95	785
Future Volume (Veh/h)	52	62	600	44	95	785
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	56	67	645	47	102	844
Pedestrians	2					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1718	670			694	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1718	670			694	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	36	85			89	
cM capacity (veh/h)	88	458			904	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	123	692	102	844
Volume Left	56	0	102	0
Volume Right	67	47	0	0
cSH	157	1700	904	1700
Volume to Capacity	0.78	0.41	0.11	0.50
Queue Length 95th (ft)	125	0	9	0
Control Delay (s)	81.7	0.0	9.5	0.0
Lane LOS	F		A	
Approach Delay (s)	81.7	0.0	1.0	
Approach LOS	F			

Intersection Summary			
Average Delay	6.3		
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	6.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	52	62	600	44	95	785
Future Vol, veh/h	52	62	600	44	95	785
Conflicting Peds, #/hr	0	0	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	56	67	645	47	102	844

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1719	671	0	0	694	0
Stage 1	671	-	-	-	-	-
Stage 2	1048	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.11	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209	-
Pot Cap-1 Maneuver	99	458	-	-	906	-
Stage 1	510	-	-	-	-	-
Stage 2	339	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	88	457	-	-	904	-
Mov Cap-2 Maneuver	88	-	-	-	-	-
Stage 1	509	-	-	-	-	-
Stage 2	301	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	81	0	1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 157	904	-
HCM Lane V/C Ratio	-	- 0.781	0.113	-
HCM Control Delay (s)	-	- 81	9.5	-
HCM Lane LOS	-	- F	A	-
HCM 95th %tile Q(veh)	-	- 5	0.4	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	8	2	9	166	3	190	11	248	260	299	246	12
Future Volume (vph)	8	2	9	166	3	190	11	248	260	299	246	12
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	9	2	10	178	3	204	12	267	280	322	265	13

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	21	385	279	280	455	146
Volume Left (vph)	9	178	12	0	322	0
Volume Right (vph)	10	204	0	280	0	13
Hadj (s)	-0.18	-0.21	0.04	-0.68	0.37	-0.05
Departure Headway (s)	8.0	6.5	7.1	6.4	7.3	6.8
Degree Utilization, x	0.05	0.69	0.55	0.49	0.92	0.28
Capacity (veh/h)	391	538	486	549	455	513
Control Delay (s)	11.4	22.9	17.2	14.2	48.4	11.2
Approach Delay (s)	11.4	22.9	15.7		39.4	
Approach LOS	B	C	C		E	

Intersection Summary				
Delay	26.5			
Level of Service	D			
Intersection Capacity Utilization	68.1%	ICU Level of Service	C	
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	27.7
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Vol, veh/h	8	2	9	166	3	190	0	11	248	260	299	246
Future Vol, veh/h	8	2	9	166	3	190	0	11	248	260	299	246
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	1	1	1	1	1	1	2	1	1	1	1	1
Mvmt Flow	9	2	10	178	3	204	0	12	267	280	322	265
Number of Lanes	0	1	0	0	1	0	0	0	1	1	0	2

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	11.6	24.2	16.8	40.7
HCM LOS	B	C	C	E

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	4%	0%	42%	46%	71%	0%
Vol Thru, %	96%	0%	11%	1%	29%	91%
Vol Right, %	0%	100%	47%	53%	0%	9%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	259	260	19	359	422	135
LT Vol	11	0	8	166	299	0
Through Vol	248	0	2	3	123	123
RT Vol	0	260	9	190	0	12
Lane Flow Rate	278	280	20	386	454	145
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.551	0.496	0.046	0.71	0.919	0.277
Departure Headway (Hd)	7.122	6.381	8.104	6.626	7.291	6.863
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	507	565	440	548	499	523
Service Time	4.875	4.133	6.184	4.626	5.04	4.613
HCM Lane V/C Ratio	0.548	0.496	0.045	0.704	0.91	0.277
HCM Control Delay	18.3	15.3	11.6	24.2	49.8	12.2
HCM Lane LOS	C	C	B	C	E	B
HCM 95th-tile Q	3.3	2.7	0.1	5.7	10.8	1.1

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBR
Lane Configurations	
Traffic Vol, veh/h	12
Future Vol, veh/h	12
Peak Hour Factor	0.93
Heavy Vehicles, %	1
Mvmt Flow	13
Number of Lanes	0

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	319	247	148	200	198	223
Future Volume (Veh/h)	319	247	148	200	198	223
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	329	255	153	206	204	230
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	613	204	434			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	613	204	434			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	11	68	86			
cM capacity (veh/h)	369	806	1129			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	584	153	103	103	204	230
Volume Left	329	153	0	0	0	0
Volume Right	255	0	0	0	0	230
cSH	655	1129	1700	1700	1700	1700
Volume to Capacity	0.89	0.14	0.06	0.06	0.12	0.14
Queue Length 95th (ft)	276	12	0	0	0	0
Control Delay (s)	37.5	8.7	0.0	0.0	0.0	0.0
Lane LOS	E	A				
Approach Delay (s)	37.5	3.7			0.0	
Approach LOS	E					

Intersection Summary			
Average Delay		16.9	
Intersection Capacity Utilization		46.3%	ICU Level of Service A
Analysis Period (min)		15	

Intersection	
Int Delay, s/veh	15.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	319	247	148	200	198	223
Future Vol, veh/h	319	247	148	200	198	223
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	145	105	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	329	255	153	206	204	230

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	613	204	434	0	-	0
Stage 1	204	-	-	-	-	-
Stage 2	409	-	-	-	-	-
Critical Hdwy	6.615	6.215	4.115	-	-	-
Critical Hdwy Stg 1	5.415	-	-	-	-	-
Critical Hdwy Stg 2	5.815	-	-	-	-	-
Follow-up Hdwy	3.5095	3.3095	2.2095	-	-	-
Pot Cap-1 Maneuver	442	839	1130	-	-	-
Stage 1	832	-	-	-	-	-
Stage 2	642	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	382	839	1130	-	-	-
Mov Cap-2 Maneuver	382	-	-	-	-	-
Stage 1	720	-	-	-	-	-
Stage 2	642	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	33.7	3.7	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1130	-	382	839	-	-
HCM Lane V/C Ratio	0.135	-	0.861	0.304	-	-
HCM Control Delay (s)	8.7	-	51.2	11.2	-	-
HCM Lane LOS	A	-	F	B	-	-
HCM 95th %tile Q(veh)	0.5	-	8.3	1.3	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Near Term Plus 1293-Unit and School Project

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	252	1227	1280	137	164	263
v/c Ratio	0.72	0.38	0.83	0.18	0.63	0.42
Control Delay	56.2	0.3	31.6	3.6	58.7	22.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.2	0.3	31.6	3.6	58.7	22.4
Queue Length 50th (ft)	166	0	408	0	111	104
Queue Length 95th (ft)	#359	0	612	35	225	227
Internal Link Dist (ft)		942	856		514	
Turn Bay Length (ft)	345			330	450	
Base Capacity (vph)	456	3223	2613	1195	456	889
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.38	0.49	0.11	0.36	0.30

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	232	1129	1178	126	151	242
Future Volume (vph)	232	1129	1178	126	151	242
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0	7.3	7.3	4.2	3.7
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1612	3223	3223	1442	1612	1442
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1612	3223	3223	1442	1612	1442
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	252	1227	1280	137	164	263
RTOR Reduction (vph)	0	0	0	71	0	27
Lane Group Flow (vph)	252	1227	1280	66	164	236
Heavy Vehicles (%)	12%	12%	12%	12%	12%	12%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	8	Free!	6		7!	4
Permitted Phases				6		4
Actuated Green, G (s)	24.7	111.2	53.3	53.3	18.2	46.9
Effective Green, g (s)	24.7	111.2	53.3	53.3	18.2	46.9
Actuated g/C Ratio	0.22	1.00	0.48	0.48	0.16	0.42
Clearance Time (s)	3.5		7.3	7.3	4.2	3.7
Vehicle Extension (s)	3.0		4.0	4.0	3.5	3.0
Lane Grp Cap (vph)	358	3223	1544	691	263	608
v/s Ratio Prot	c0.16	0.38	c0.40		c0.10	0.16
v/s Ratio Perm				0.05		
v/c Ratio	0.70	0.38	0.83	0.10	0.62	0.39
Uniform Delay, d1	39.9	0.0	25.0	15.8	43.3	22.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.2	0.3	4.0	0.1	4.8	0.4
Delay (s)	46.0	0.3	29.0	15.9	48.1	22.6
Level of Service	D	A	C	B	D	C
Approach Delay (s)		8.1	27.8		32.4	
Approach LOS		A	C		C	

Intersection Summary

HCM 2000 Control Delay	19.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	111.2	Sum of lost time (s)	15.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

HCM 6th Edition methodology cannot be performed with phasing conflicts.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	227	850	314	39	959	186	308	333	93	190	151
v/c Ratio	0.57	0.63	0.40	0.11	0.82	0.29	0.64	0.43	0.36	0.65	0.40
Control Delay	55.7	32.6	4.8	48.3	40.0	5.0	54.3	39.1	58.1	57.3	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.7	32.6	4.8	48.3	40.0	5.0	54.3	39.1	58.1	57.3	10.6
Queue Length 50th (ft)	80	290	0	12	328	0	108	105	33	131	0
Queue Length 95th (ft)	149	433	63	35	488	50	195	184	73	246	60
Internal Link Dist (ft)		1323			2509			853		451	
Turn Bay Length (ft)	225		485	125		390	160		140		
Base Capacity (vph)	527	2113	1055	549	2113	1010	585	1228	585	651	647
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.40	0.30	0.07	0.45	0.18	0.53	0.27	0.16	0.29	0.23

Intersection Summary

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	209	782	289	36	882	171	283	288	18	86	175	139
Future Volume (vph)	209	782	289	36	882	171	283	288	18	86	175	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3155	3252	1455	3155	3252	1455	3155	3220		3155	1712	1455
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3155	3252	1455	3155	3252	1455	3155	3220		3155	1712	1455
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	227	850	314	39	959	186	308	313	20	93	190	151
RTOR Reduction (vph)	0	0	186	0	0	116	0	3	0	0	0	126
Lane Group Flow (vph)	227	850	128	39	959	70	308	330	0	93	190	25
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	14.1	46.2	46.2	10.3	42.4	42.4	17.2	27.0		9.3	19.1	19.1
Effective Green, g (s)	14.1	46.2	46.2	10.3	42.4	42.4	17.2	27.0		9.3	19.1	19.1
Actuated g/C Ratio	0.12	0.41	0.41	0.09	0.37	0.37	0.15	0.24		0.08	0.17	0.17
Clearance Time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	392	1324	592	286	1215	544	478	766		258	288	245
v/s Ratio Prot	0.07	c0.26		0.01	c0.29		c0.10	0.10		0.03	c0.11	
v/s Ratio Perm			0.09			0.05						0.02
v/c Ratio	0.58	0.64	0.22	0.14	0.79	0.13	0.64	0.43		0.36	0.66	0.10
Uniform Delay, d1	46.8	27.0	21.8	47.5	31.5	23.3	45.2	36.7		49.2	44.1	39.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.1	1.1	0.2	0.1	3.5	0.1	3.0	0.4		0.9	5.4	0.2
Delay (s)	48.9	28.0	22.0	47.5	35.0	23.4	48.2	37.1		50.1	49.5	40.1
Level of Service	D	C	C	D	D	C	D	D		D	D	D
Approach Delay (s)		30.1			33.6			42.4			46.4	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	35.3	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	113.4	Sum of lost time (s)	20.6	
Intersection Capacity Utilization	64.8%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	209	782	289	36	882	171	283	288	18	86	175	139
Future Volume (veh/h)	209	782	289	36	882	171	283	288	18	86	175	139
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1737	1737	1737	1737	1737	1737	1737	1737	1737	1737	1737	1737
Adj Flow Rate, veh/h	227	850	314	39	959	186	308	313	20	93	190	151
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	316	1132	505	293	1241	554	406	710	45	156	257	218
Arrive On Green	0.10	0.34	0.34	0.09	0.38	0.38	0.13	0.23	0.23	0.05	0.15	0.15
Sat Flow, veh/h	3209	3300	1472	3209	3300	1472	3209	3148	200	3209	1737	1472
Grp Volume(v), veh/h	227	850	314	39	959	186	308	163	170	93	190	151
Grp Sat Flow(s),veh/h/ln	1605	1650	1472	1605	1650	1472	1605	1650	1698	1605	1737	1472
Q Serve(g_s), s	5.6	18.7	8.7	0.9	21.0	7.4	7.6	7.0	7.1	2.3	8.6	8.0
Cycle Q Clear(g_c), s	5.6	18.7	8.7	0.9	21.0	7.4	7.6	7.0	7.1	2.3	8.6	8.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.12	1.00		1.00
Lane Grp Cap(c), veh/h	316	1132	505	293	1241	554	406	372	383	156	257	218
V/C Ratio(X)	0.72	0.75	0.62	0.13	0.77	0.34	0.76	0.44	0.44	0.60	0.74	0.69
Avail Cap(c_a), veh/h	704	2816	1256	704	2816	1256	782	825	849	782	868	736
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.9	23.8	8.0	34.3	22.5	18.3	34.6	27.3	27.3	38.2	33.4	33.2
Incr Delay (d2), s/veh	3.1	1.0	1.3	0.1	1.1	0.4	2.9	0.8	0.8	3.6	4.2	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	6.4	4.3	0.3	7.1	2.4	3.0	2.7	2.8	1.0	3.7	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.9	24.9	9.3	34.4	23.6	18.6	37.6	28.1	28.1	41.8	37.6	37.1
LnGrp LOS	D	C	A	C	C	B	D	C	C	D	D	D
Approach Vol, veh/h		1391			1184			641			434	
Approach Delay, s/veh		23.6			23.1			32.7			38.4	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.8	35.4	14.4	17.4	12.1	38.2	8.0	23.8
Change Period (Y+Rc), s	7.3	* 7.3	4.0	5.3	4.0	7.3	4.0	5.3
Max Green Setting (Gmax), s	18.0	* 70	20.0	41.0	18.0	70.0	20.0	41.0
Max Q Clear Time (g_c+I1), s	2.9	20.7	9.6	10.6	7.6	23.0	4.3	9.1
Green Ext Time (p_c), s	0.0	7.4	0.8	1.5	0.5	7.9	0.2	1.9

Intersection Summary	
HCM 6th Ctrl Delay	26.8
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	839	46	284	1080	0	9	0	263	0	0	0
Future Volume (Veh/h)	1	839	46	284	1080	0	9	0	263	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	912	50	309	1174	0	10	0	286	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									1			1
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1174			962			2144	2731	481	2250	2756	587
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1174			962			2144	2731	481	2250	2756	587
tC, single (s)	4.3			4.3			7.7	6.7	7.1	7.7	6.7	7.1
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			53			35	100	44	100	100	100
cM capacity (veh/h)	542			658			15	9	508	6	9	431

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	1	608	354	309	783	391	296	0
Volume Left	1	0	0	309	0	0	10	0
Volume Right	0	0	50	0	0	0	286	0
cSH	542	1700	1700	658	1700	1700	350	1700
Volume to Capacity	0.00	0.36	0.21	0.47	0.46	0.23	0.84	0.00
Queue Length 95th (ft)	0	0	0	63	0	0	192	0
Control Delay (s)	11.7	0.0	0.0	15.2	0.0	0.0	51.9	0.0
Lane LOS	B			C			F	A
Approach Delay (s)	0.0			3.2			51.9	0.0
Approach LOS							F	A

Intersection Summary					
Average Delay	7.3				
Intersection Capacity Utilization	53.7%	ICU Level of Service		A	
Analysis Period (min)	15				

Intersection	
Int Delay, s/veh	5.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	839	46	284	1080	0	9	0	263	0	0	0
Future Vol, veh/h	1	839	46	284	1080	0	9	0	263	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	340	-	-	195	-	-	-	-	25	-	-	25
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	11	11	11	11	11	11	11	11	11	11	11	11
Mvmt Flow	1	912	50	309	1174	0	10	0	286	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1174	0	0	962	0	0	2144	2731	481	2250	2756	587
Stage 1	-	-	-	-	-	-	939	939	-	1792	1792	-
Stage 2	-	-	-	-	-	-	1205	1792	-	458	964	-
Critical Hdwy	4.32	-	-	4.32	-	-	7.72	6.72	7.12	7.72	6.72	7.12
Critical Hdwy Stg 1	-	-	-	-	-	-	6.72	5.72	-	6.72	5.72	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.72	5.72	-	6.72	5.72	-
Follow-up Hdwy	2.31	-	-	2.31	-	-	3.61	4.11	3.41	3.61	4.11	3.41
Pot Cap-1 Maneuver	542	-	-	658	-	-	24	17	508	20	17	431
Stage 1	-	-	-	-	-	-	267	321	-	76	119	-
Stage 2	-	-	-	-	-	-	181	119	-	529	312	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	542	-	-	658	-	-	15	9	508	6	9	431
Mov Cap-2 Maneuver	-	-	-	-	-	-	15	9	-	6	9	-
Stage 1	-	-	-	-	-	-	266	320	-	76	63	-
Stage 2	-	-	-	-	-	-	96	63	-	231	311	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3.2	34.8	0
HCM LOS			D	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	15	508	542	-	-	658	-	-	-	-
HCM Lane V/C Ratio	0.652	0.563	0.002	-	-	0.469	-	-	-	-
HCM Control Delay (s)	$ 443.4	20.8	11.7	-	-	15.2	-	-	0	0
HCM Lane LOS	F	C	B	-	-	C	-	-	A	A
HCM 95th %tile Q(veh)	1.6	3.4	0	-	-	2.5	-	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	365	737	1177	19	5	186
Future Volume (Veh/h)	365	737	1177	19	5	186
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	397	801	1279	21	5	202
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1300				2474	640
vC1, stage 1 conf vol					1279	
vC2, stage 2 conf vol					1194	
vCu, unblocked vol	1300				2474	640
tC, single (s)	4.3				7.0	7.1
tC, 2 stage (s)					6.0	
tF (s)	2.3				3.6	3.4
p0 queue free %	19				88	49
cM capacity (veh/h)	488				41	400

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	397	400	400	640	640	21	207
Volume Left	397	0	0	0	0	0	5
Volume Right	0	0	0	0	0	21	202
cSH	488	1700	1700	1700	1700	1700	410
Volume to Capacity	0.81	0.24	0.24	0.38	0.38	0.01	0.51
Queue Length 95th (ft)	195	0	0	0	0	0	69
Control Delay (s)	37.3	0.0	0.0	0.0	0.0	0.0	24.8
Lane LOS	E						C
Approach Delay (s)	12.4			0.0			24.8
Approach LOS							C

Intersection Summary			
Average Delay		7.4	
Intersection Capacity Utilization		66.1%	ICU Level of Service C
Analysis Period (min)		15	

Intersection	
Int Delay, s/veh	7.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	365	737	1177	19	5	186
Future Vol, veh/h	365	737	1177	19	5	186
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	580	-	-	165	0	25
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	397	801	1279	21	5	202

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1300	0	-	0	2474	640
Stage 1	-	-	-	-	1279	-
Stage 2	-	-	-	-	1195	-
Critical Hdwy	4.3	-	-	-	7	7.1
Critical Hdwy Stg 1	-	-	-	-	6	-
Critical Hdwy Stg 2	-	-	-	-	6	-
Follow-up Hdwy	2.3	-	-	-	3.6	3.4
Pot Cap-1 Maneuver	488	-	-	-	22	399
Stage 1	-	-	-	-	210	-
Stage 2	-	-	-	-	234	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	488	-	-	-	~ 4	399
Mov Cap-2 Maneuver	-	-	-	-	36	-
Stage 1	-	-	-	-	39	-
Stage 2	-	-	-	-	234	-

Approach	EB	WB	SB
HCM Control Delay, s	12.3	0	25.5
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	488	-	-	-	36	399
HCM Lane V/C Ratio	0.813	-	-	-	0.151	0.507
HCM Control Delay (s)	37.2	-	-	-	122	22.9
HCM Lane LOS	E	-	-	-	F	C
HCM 95th %tile Q(veh)	7.8	-	-	-	0.5	2.8

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	723	19	2	1188	0	8	0	1	0	0	0
Future Volume (Veh/h)	0	723	19	2	1188	0	8	0	1	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	786	21	2	1291	0	9	0	1	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									1			
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1291			807			1436	2081	393	1688	2102	646
vC1, stage 1 conf vol							786	786		1295	1295	
vC2, stage 2 conf vol							650	1295		394	807	
vCu, unblocked vol	1291			807			1436	2081	393	1688	2102	646
tC, single (s)	4.4			4.4			7.8	6.8	7.2	7.8	6.8	7.2
tC, 2 stage (s)							6.8	5.8		6.8	5.8	
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			100			97	100	100	100	100	100
cM capacity (veh/h)	477			746			260	182	576	149	181	389

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	393	393	21	2	861	430	10	0
Volume Left	0	0	0	0	2	0	0	9	0
Volume Right	0	0	0	21	0	0	0	1	0
cSH	1700	1700	1700	1700	746	1700	1700	289	1700
Volume to Capacity	0.00	0.23	0.23	0.01	0.00	0.51	0.25	0.03	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	0	3	0
Control Delay (s)	0.0	0.0	0.0	0.0	9.8	0.0	0.0	18.5	0.0
Lane LOS					A			C	A
Approach Delay (s)	0.0				0.0			18.5	0.0
Approach LOS								C	A

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	42.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	723	19	2	1188	0	8	0	1	0	0	0
Future Vol, veh/h	0	723	19	2	1188	0	8	0	1	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	275	305	-	-	-	-	25	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	13	13	13	13	13	13	13	13	13	13	13	13
Mvmt Flow	0	786	21	2	1291	0	9	0	1	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1291	0	0	807	0	0	1436	2081	393	1688	2102	646
Stage 1	-	-	-	-	-	-	786	786	-	1295	1295	-
Stage 2	-	-	-	-	-	-	650	1295	-	393	807	-
Critical Hdwy	4.36	-	-	4.36	-	-	7.76	6.76	7.16	7.76	6.76	7.16
Critical Hdwy Stg 1	-	-	-	-	-	-	6.76	5.76	-	6.76	5.76	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.76	5.76	-	6.76	5.76	-
Follow-up Hdwy	2.33	-	-	2.33	-	-	3.63	4.13	3.43	3.63	4.13	3.43
Pot Cap-1 Maneuver	477	-	-	746	-	-	85	46	576	54	45	389
Stage 1	-	-	-	-	-	-	328	376	-	156	211	-
Stage 2	-	-	-	-	-	-	399	211	-	574	367	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	477	-	-	746	-	-	85	46	576	54	45	389
Mov Cap-2 Maneuver	-	-	-	-	-	-	253	177	-	145	176	-
Stage 1	-	-	-	-	-	-	328	376	-	156	210	-
Stage 2	-	-	-	-	-	-	398	210	-	573	367	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	18.8	0
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	253	576	477	-	-	746	-	-	-
HCM Lane V/C Ratio	0.034	0.002	-	-	-	0.003	-	-	-
HCM Control Delay (s)	19.7	11.3	0	-	-	9.8	-	-	0
HCM Lane LOS	C	B	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0	0	-	-	0	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Traffic Volume (veh/h)	91	120	94	278	103	71	42	433	232	42	337	53
Future Volume (veh/h)	91	120	94	278	103	71	42	433	232	42	337	53
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	99	130	102	302	112	77	46	471	252	46	366	58
Approach Volume (veh/h)		331			491			769			470	
Crossing Volume (veh/h)		714			616			275			460	
High Capacity (veh/h)		786			851			1116			964	
High v/c (veh/h)		0.42			0.58			0.69			0.49	
Low Capacity (veh/h)		624			681			918			781	
Low v/c (veh/h)		0.53			0.72			0.84			0.60	

Intersection Summary						
Maximum v/c High		0.69				
Maximum v/c Low		0.84				
Intersection Capacity Utilization		98.9%	ICU Level of Service		F	

Intersection	
Intersection Delay, s/veh	16.6
Intersection LOS	C

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	331	491	769	470
Demand Flow Rate, veh/h	341	505	792	484
Vehicles Circulating, veh/h	735	634	283	473
Vehicles Exiting, veh/h	222	441	793	666
Ped Vol Crossing Leg, #/h	0	0	3	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	14.4	19.6	18.1	12.8
Approach LOS	B	C	C	B

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	341	505	792	484
Cap Entry Lane, veh/h	652	723	1034	852
Entry HV Adj Factor	0.971	0.972	0.971	0.971
Flow Entry, veh/h	331	491	769	470
Cap Entry, veh/h	633	702	1003	827
V/C Ratio	0.523	0.699	0.766	0.568
Control Delay, s/veh	14.4	19.6	18.1	12.8
LOS	B	C	C	B
95th %tile Queue, veh	3	6	8	4

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Volume (veh/h)	1	15	5	3	70	0	15	1	2	0	0	0
Future Volume (Veh/h)	1	15	5	3	70	0	15	1	2	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	16	5	3	76	0	16	1	2	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	76			21			102	102	18	105	105	76
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	76			21			102	102	18	105	105	76
tC, single (s)	4.2			4.2			7.2	6.6	6.3	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			100			98	100	100	100	100	100
cM capacity (veh/h)	1486			1557			862	774	1043	857	772	969

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	22	79	19	0
Volume Left	1	3	16	0
Volume Right	5	0	2	0
cSH	1486	1557	873	1700
Volume to Capacity	0.00	0.00	0.02	0.00
Queue Length 95th (ft)	0	0	2	0
Control Delay (s)	0.3	0.3	9.2	0.0
Lane LOS	A	A	A	A
Approach Delay (s)	0.3	0.3	9.2	0.0
Approach LOS			A	A

Intersection Summary				
Average Delay			1.7	
Intersection Capacity Utilization			14.7%	ICU Level of Service
Analysis Period (min)			15	

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Vol, veh/h	1	15	5	3	70	0	15	1	2	0	0	0
Future Vol, veh/h	1	15	5	3	70	0	15	1	2	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	8	8	8	8	8	8	8	8	8	8	8	8
Mvmt Flow	1	16	5	3	76	0	16	1	2	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	76	0	0	21	0	0	103	103	19	104	105	76
Stage 1	-	-	-	-	-	-	21	21	-	82	82	-
Stage 2	-	-	-	-	-	-	82	82	-	22	23	-
Critical Hdwy	4.18	-	-	4.18	-	-	7.18	6.58	6.28	7.18	6.58	6.28
Critical Hdwy Stg 1	-	-	-	-	-	-	6.18	5.58	-	6.18	5.58	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.18	5.58	-	6.18	5.58	-
Follow-up Hdwy	2.272	-	-	2.272	-	-	3.572	4.072	3.372	3.572	4.072	3.372
Pot Cap-1 Maneuver	1486	-	-	1557	-	-	863	776	1042	862	774	969
Stage 1	-	-	-	-	-	-	982	866	-	912	815	-
Stage 2	-	-	-	-	-	-	912	815	-	981	864	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1486	-	-	1557	-	-	861	774	1042	858	772	969
Mov Cap-2 Maneuver	-	-	-	-	-	-	861	774	-	858	772	-
Stage 1	-	-	-	-	-	-	981	865	-	911	813	-
Stage 2	-	-	-	-	-	-	910	813	-	977	863	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.3	9.2	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	872	1486	-	-	1557	-	-	-
HCM Lane V/C Ratio	0.022	0.001	-	-	0.002	-	-	-
HCM Control Delay (s)	9.2	7.4	0	-	7.3	0	-	0
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1	370	345	468	680	7	21	139	290	297	35
v/c Ratio	0.01	0.59	0.75	0.53	0.61	0.05	0.13	0.53	0.70	0.71	0.07
Control Delay	49.0	38.0	42.0	19.7	4.2	44.3	44.9	16.3	41.6	41.7	0.3
Queue Delay	0.0	0.0	0.1	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.0	38.0	42.1	20.1	4.5	44.3	44.9	16.3	41.6	41.7	0.3
Queue Length 50th (ft)	1	94	166	157	0	4	11	0	145	148	0
Queue Length 95th (ft)	6	175	332	356	67	19	39	59	308	314	0
Internal Link Dist (ft)		346		307			744			674	
Turn Bay Length (ft)	65		125			140		165	150		185
Base Capacity (vph)	107	982	701	1148	1232	388	409	451	584	595	620
Starvation Cap Reductn	0	0	29	304	150	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.38	0.51	0.55	0.63	0.02	0.05	0.31	0.50	0.50	0.06

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	311	29	317	431	626	6	19	128	453	87	32
Future Volume (vph)	1	311	29	317	431	626	6	19	128	453	87	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (prot)	1752	3449		1752	1845	1568	1752	1845	1544	1665	1695	1521
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (perm)	1752	3449		1752	1845	1568	1752	1845	1544	1665	1695	1521
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1	338	32	345	468	680	7	21	139	492	95	35
RTOR Reduction (vph)	0	5	0	0	0	364	0	0	127	0	0	27
Lane Group Flow (vph)	1	365	0	345	468	316	7	21	12	290	297	8
Confl. Peds. (#/hr)			8						1			5
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	0.8	19.6		22.5	41.3	41.3	7.5	7.5	7.5	21.3	21.3	21.3
Effective Green, g (s)	0.8	19.6		22.5	41.3	41.3	7.5	7.5	7.5	21.3	21.3	21.3
Actuated g/C Ratio	0.01	0.22		0.25	0.46	0.46	0.08	0.08	0.08	0.24	0.24	0.24
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	15	760		443	857	728	147	155	130	398	406	364
v/s Ratio Prot	0.00	0.11		c0.20	c0.25		0.00	c0.01		0.17	c0.18	
v/s Ratio Perm						0.20			0.01			0.01
v/c Ratio	0.07	0.48		0.78	0.55	0.43	0.05	0.14	0.09	0.73	0.73	0.02
Uniform Delay, d1	43.7	30.2		30.9	17.1	16.0	37.4	37.7	37.6	31.1	31.2	25.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	0.5		8.4	0.7	0.4	0.1	0.4	0.3	6.5	6.7	0.0
Delay (s)	45.6	30.7		39.3	17.8	16.4	37.6	38.1	37.9	37.7	37.8	25.9
Level of Service	D	C		D	B	B	D	D	D	D	D	C
Approach Delay (s)		30.7			22.1			37.9			37.1	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	27.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	88.9	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	61.9%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Near Term Plus 1293 Unit Project and School AM
8: Riverside Ave & 13th Street — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	311	29	317	431	626	6	19	128	453	87	32
Future Volume (veh/h)	1	311	29	317	431	626	6	19	128	453	87	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	1	338	32	345	468	680	7	21	139	560	0	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	2	842	79	393	890	754	197	206	174	704	0	309
Arrive On Green	0.00	0.26	0.26	0.22	0.48	0.48	0.11	0.11	0.11	0.20	0.00	0.20
Sat Flow, veh/h	1767	3252	306	1767	1856	1572	1767	1856	1568	3534	0	1553
Grp Volume(v), veh/h	1	182	188	345	468	680	7	21	139	560	0	35
Grp Sat Flow(s),veh/h/ln	1767	1763	1795	1767	1856	1572	1767	1856	1568	1767	0	1553
Q Serve(g_s), s	0.0	7.4	7.5	16.3	15.2	34.2	0.3	0.9	7.5	13.0	0.0	1.6
Cycle Q Clear(g_c), s	0.0	7.4	7.5	16.3	15.2	34.2	0.3	0.9	7.5	13.0	0.0	1.6
Prop In Lane	1.00		0.17	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	2	456	464	393	890	754	197	206	174	704	0	309
V/C Ratio(X)	0.41	0.40	0.40	0.88	0.53	0.90	0.04	0.10	0.80	0.80	0.00	0.11
Avail Cap(c_a), veh/h	102	470	478	665	1085	920	368	387	327	1167	0	513
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	43.1	26.5	26.5	32.4	15.6	20.6	34.2	34.5	37.4	32.9	0.0	28.3
Incr Delay (d2), s/veh	85.1	0.6	0.6	7.2	0.5	10.4	0.1	0.2	8.0	2.1	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	3.1	3.2	7.5	6.1	13.7	0.1	0.4	3.2	5.6	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	128.2	27.0	27.1	39.6	16.1	31.0	34.3	34.7	45.5	35.0	0.0	28.5
LnGrp LOS	F	C	C	D	B	C	C	C	D	C	A	C
Approach Vol, veh/h		371			1493			167			595	
Approach Delay, s/veh		27.3			28.3			43.6			34.6	
Approach LOS		C			C			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	23.7	26.8		21.7	4.6	45.9		14.1				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	32.5	23.0		28.5	5.0	50.5		18.0				
Max Q Clear Time (g_c+I1), s	18.3	9.5		15.0	2.0	36.2		9.5				
Green Ext Time (p_c), s	0.9	1.9		1.9	0.0	5.2		0.3				

Intersection Summary			
HCM 6th Ctrl Delay		30.6	
HCM 6th LOS		C	

Notes

User approved volume balancing among the lanes for turning movement.

Olsen-Chandler SP — Near Term Plus 1293 Unit Project and School AM
9: Paso Robles Street & 13th Street — Queues

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	68	901	49	1255	377	234	12	249	5	8
v/c Ratio	0.36	0.48	0.28	0.71	0.42	0.68	0.03	0.43	0.01	0.01
Control Delay	46.6	14.2	46.1	19.9	6.7	42.0	27.2	6.5	27.0	0.0
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.6	14.5	46.1	19.9	6.7	42.0	27.2	6.5	27.0	0.0
Queue Length 50th (ft)	37	160	26	266	34	123	5	0	2	0
Queue Length 95th (ft)	88	267	69	433	113	216	20	57	12	0
Internal Link Dist (ft)		307		269			836			575
Turn Bay Length (ft)	120		220		145	130		110	95	
Base Capacity (vph)	253	2270	228	2261	1076	585	779	805	583	777
Starvation Cap Reductn	0	623	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.55	0.21	0.56	0.35	0.40	0.02	0.31	0.01	0.01

Intersection Summary

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	781	48	45	1155	347	215	11	229	5	0	7
Future Volume (vph)	63	781	48	45	1155	347	215	11	229	5	0	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1752	3468		1752	3505	1530	1752	1845	1568	1752	1568	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.75	1.00	1.00	0.75	1.00	
Satd. Flow (perm)	1752	3468		1752	3505	1530	1388	1845	1568	1383	1568	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	68	849	52	49	1255	377	234	12	249	5	0	8
RTOR Reduction (vph)	0	4	0	0	0	124	0	0	188	0	6	0
Lane Group Flow (vph)	68	897	0	49	1255	253	234	12	61	5	2	0
Confl. Peds. (#/hr)			6			1						
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		
Actuated Green, G (s)	6.6	44.6		4.5	42.5	42.5	20.3	20.3	20.3	20.3	20.3	
Effective Green, g (s)	6.6	44.6		4.5	42.5	42.5	20.3	20.3	20.3	20.3	20.3	
Actuated g/C Ratio	0.08	0.54		0.05	0.51	0.51	0.24	0.24	0.24	0.24	0.24	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	139	1865		95	1796	784	339	451	383	338	383	
v/s Ratio Prot	c0.04	0.26		0.03	c0.36			0.01			0.00	
v/s Ratio Perm						0.17	c0.17		0.04	0.00		
v/c Ratio	0.49	0.48		0.52	0.70	0.32	0.69	0.03	0.16	0.01	0.01	
Uniform Delay, d1	36.5	11.9		38.1	15.3	11.8	28.4	23.8	24.6	23.7	23.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.7	0.2		4.7	1.2	0.2	5.9	0.0	0.2	0.0	0.0	
Delay (s)	39.2	12.1		42.8	16.5	12.0	34.4	23.8	24.8	23.7	23.7	
Level of Service	D	B		D	B	B	C	C	C	C	C	
Approach Delay (s)		14.0			16.3			29.3			23.7	
Approach LOS		B			B			C			C	

Intersection Summary				
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	82.9	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	65.9%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	781	48	45	1155	347	215	11	229	5	0	7
Future Volume (veh/h)	63	781	48	45	1155	347	215	11	229	5	0	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	68	849	52	49	1255	0	234	12	249	5	0	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	99	1727	106	82	1770		420	408	346	357	0	346
Arrive On Green	0.06	0.51	0.51	0.05	0.50	0.00	0.22	0.22	0.22	0.22	0.00	0.22
Sat Flow, veh/h	1767	3373	207	1767	3526	1572	1396	1856	1572	1110	0	1572
Grp Volume(v), veh/h	68	444	457	49	1255	0	234	12	249	5	0	8
Grp Sat Flow(s),veh/h/ln	1767	1763	1817	1767	1763	1572	1396	1856	1572	1110	0	1572
Q Serve(g_s), s	2.3	10.0	10.0	1.7	16.7	0.0	9.6	0.3	8.9	0.2	0.0	0.2
Cycle Q Clear(g_c), s	2.3	10.0	10.0	1.7	16.7	0.0	9.8	0.3	8.9	0.5	0.0	0.2
Prop In Lane	1.00		0.11	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	99	902	930	82	1770		420	408	346	357	0	346
V/C Ratio(X)	0.69	0.49	0.49	0.60	0.71		0.56	0.03	0.72	0.01	0.00	0.02
Avail Cap(c_a), veh/h	305	1487	1533	276	2917		818	937	794	673	0	794
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.2	9.7	9.7	28.4	11.7	0.0	22.5	18.6	22.0	18.8	0.0	18.6
Incr Delay (d2), s/veh	8.1	0.4	0.4	6.8	0.5	0.0	1.2	0.0	2.8	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	3.3	3.4	0.8	5.5	0.0	3.0	0.1	3.2	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.2	10.1	10.1	35.3	12.2	0.0	23.6	18.7	24.8	18.9	0.0	18.6
LnGrp LOS	D	B	B	D	B		C	B	C	B	A	B
Approach Vol, veh/h		969			1304	A		495			13	
Approach Delay, s/veh		11.9			13.1			24.1			18.7	
Approach LOS		B			B			C			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.3	35.6		17.9	7.9	35.0		17.9				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	9.5	51.3		30.7	10.5	50.3		30.7				
Max Q Clear Time (g_c+I1), s	3.7	12.0		2.5	4.3	18.7		11.8				
Green Ext Time (p_c), s	0.0	7.0		0.0	0.1	11.8		1.5				

Intersection Summary				
HCM 6th Ctrl Delay	14.7			
HCM 6th LOS	B			

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Near Term Plus 1293 Unit Project and School AM
10: River Road/Union Road & Creston Road — Queues

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	214	888	61	954	438	193	49	137	598
v/c Ratio	0.57	0.64	0.41	0.79	0.74	0.23	0.11	0.59	0.86dr
Control Delay	52.5	25.9	57.6	36.0	50.1	34.6	1.0	55.6	34.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.5	25.9	57.6	36.0	50.1	34.6	1.0	55.6	34.9
Queue Length 50th (ft)	72	233	40	302	145	55	0	89	138
Queue Length 95th (ft)	124	336	91	414	225	98	4	165	222
Internal Link Dist (ft)		353		673		608			523
Turn Bay Length (ft)	295		235		140		130	225	
Base Capacity (vph)	438	1603	189	1551	719	999	515	334	975
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.55	0.32	0.62	0.61	0.19	0.10	0.41	0.61

Intersection Summary

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Olsen-Chandler SP — Near Term Plus 1293 Unit Project and School AM
10: River Road/Union Road & Creston Road — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	197	520	297	56	779	98	403	178	45	126	187	363
Future Volume (vph)	197	520	297	56	779	98	403	178	45	126	187	363
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.98		1.00	1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	3328		1770	3475		3433	3539	1583	1770	3189	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	3328		1770	3475		3433	3539	1583	1770	3189	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	214	565	323	61	847	107	438	193	49	137	203	395
RTOR Reduction (vph)	0	65	0	0	8	0	0	0	38	0	158	0
Lane Group Flow (vph)	214	823	0	61	946	0	438	193	11	137	440	0
Confl. Peds. (#/hr)			3									
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	11.1	40.2		7.0	36.1		17.5	23.6	23.6	13.3	19.4	
Effective Green, g (s)	11.1	40.2		7.0	36.1		17.5	23.6	23.6	13.3	19.4	
Actuated g/C Ratio	0.11	0.39		0.07	0.35		0.17	0.23	0.23	0.13	0.19	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	373	1310		121	1228		588	818	365	230	605	
v/s Ratio Prot	c0.06	c0.25		0.03	c0.27		c0.13	c0.05		0.08	c0.14	
v/s Ratio Perm									0.01			
v/c Ratio	0.57	0.63		0.50	0.77		0.74	0.24	0.03	0.60	0.86dr	
Uniform Delay, d1	43.3	24.9		45.9	29.3		40.2	31.9	30.4	41.9	38.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.1	0.9		3.3	3.0		5.1	0.1	0.0	4.1	4.4	
Delay (s)	45.4	25.9		49.2	32.4		45.3	32.1	30.4	46.0	43.2	
Level of Service	D	C		D	C		D	C	C	D	D	
Approach Delay (s)		29.7			33.4			40.5			43.7	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	35.7	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	102.1	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	73.6%	ICU Level of Service	D	
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	197	520	297	56	779	98	403	178	45	126	187	363
Future Volume (veh/h)	197	520	297	56	779	98	403	178	45	126	187	363
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	214	565	0	61	847	107	438	193	49	137	203	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	324	1446		91	1154	146	583	600	268	178	356	
Arrive On Green	0.09	0.41	0.00	0.05	0.36	0.36	0.17	0.17	0.17	0.10	0.10	0.00
Sat Flow, veh/h	3456	3647	0	1781	3169	400	3456	3554	1585	1781	3647	0
Grp Volume(v), veh/h	214	565	0	61	475	479	438	193	49	137	203	0
Grp Sat Flow(s),veh/h/ln	1728	1777	0	1781	1777	1792	1728	1777	1585	1781	1777	0
Q Serve(g_s), s	3.9	7.4	0.0	2.2	15.3	15.3	8.0	3.1	1.7	4.9	3.6	0.0
Cycle Q Clear(g_c), s	3.9	7.4	0.0	2.2	15.3	15.3	8.0	3.1	1.7	4.9	3.6	0.0
Prop In Lane	1.00		0.00	1.00		0.22	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	324	1446		91	647	653	583	600	268	178	356	
V/C Ratio(X)	0.66	0.39		0.67	0.73	0.73	0.75	0.32	0.18	0.77	0.57	
Avail Cap(c_a), veh/h	655	2452		284	1172	1182	1074	1482	661	500	1374	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.9	13.8	0.0	30.7	18.2	18.2	26.1	24.1	23.5	28.9	28.3	0.0
Incr Delay (d2), s/veh	2.3	0.2	0.0	8.3	1.6	1.6	2.0	0.3	0.3	6.8	1.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	2.7	0.0	1.1	5.8	5.9	3.1	1.2	0.6	2.3	1.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.2	14.0	0.0	39.0	19.8	19.8	28.1	24.4	23.8	35.7	29.7	0.0
LnGrp LOS	C	B		D	B	B	C	C	C	D	C	
Approach Vol, veh/h		779	A		1015			680			340	A
Approach Delay, s/veh		18.7			21.0			26.7			32.2	
Approach LOS		B			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.9	31.3	15.6	11.1	10.7	28.5	11.1	15.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	45.5	20.5	25.5	12.5	43.5	18.5	27.5
Max Q Clear Time (g_c+I1), s	4.2	9.4	10.0	5.6	5.9	17.3	6.9	5.1
Green Ext Time (p_c), s	0.0	4.3	1.2	1.0	0.4	6.6	0.2	1.2

Intersection Summary	
HCM 6th Ctrl Delay	23.1
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	71	454	1263	576	101
v/c Ratio	0.41	0.21	0.75	0.74	0.23
Control Delay	49.2	10.0	21.6	39.8	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	49.2	10.0	21.6	39.8	9.1
Queue Length 50th (ft)	35	43	223	142	0
Queue Length 95th (ft)	103	147	#624	#315	47
Internal Link Dist (ft)		1151	2310	505	
Turn Bay Length (ft)	125			120	
Base Capacity (vph)	222	2372	1705	965	517
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.32	0.19	0.74	0.60	0.20

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	65	418	606	556	530	93
Future Volume (vph)	65	418	606	556	530	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.93		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1752	3505	3230		3400	1568
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1752	3505	3230		3400	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	71	454	659	604	576	101
RTOR Reduction (vph)	0	0	112	0	0	79
Lane Group Flow (vph)	71	454	1151	0	576	22
Confl. Peds. (#/hr)				3		
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	NA		Perm	Perm
Protected Phases	5	2	6			
Permitted Phases					4	4
Actuated Green, G (s)	7.0	53.9	42.4		19.7	19.7
Effective Green, g (s)	7.0	53.9	42.4		19.7	19.7
Actuated g/C Ratio	0.08	0.59	0.47		0.22	0.22
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	134	2076	1504		736	339
v/s Ratio Prot	c0.04	0.13	c0.36			
v/s Ratio Perm					c0.17	0.01
v/c Ratio	0.53	0.22	0.77		0.78	0.06
Uniform Delay, d1	40.4	8.7	20.2		33.6	28.3
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.7	0.1	2.4		5.4	0.1
Delay (s)	44.2	8.7	22.5		39.1	28.4
Level of Service	D	A	C		D	C
Approach Delay (s)		13.5	22.5		37.5	
Approach LOS		B	C		D	

Intersection Summary			
HCM 2000 Control Delay	24.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	91.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	128	338	173	60	614	470	324	694	284	714
v/c Ratio	0.55	0.66	0.31	0.42	0.75	0.67	0.90	0.78	0.84	0.75
Control Delay	44.8	33.9	5.8	48.7	37.6	9.3	63.8	36.2	58.8	24.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.8	33.9	5.8	48.7	37.6	9.3	63.8	36.2	58.8	24.9
Queue Length 50th (ft)	68	165	0	33	169	9	182	184	157	126
Queue Length 95th (ft)	124	256	45	73	#239	101	#358	256	#313	196
Internal Link Dist (ft)		1092			186			1440		2310
Turn Bay Length (ft)	150			170		140	230		245	
Base Capacity (vph)	296	615	625	151	879	721	362	1005	340	1062
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.55	0.28	0.40	0.70	0.65	0.90	0.69	0.84	0.67

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	118	311	159	55	565	432	298	588	51	261	343	314
Future Volume (vph)	118	311	159	55	565	432	298	588	51	261	343	314
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1845	1531	1752	3505	1532	1752	3458		1752	3211	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1752	1845	1531	1752	3505	1532	1752	3458		1752	3211	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	128	338	173	60	614	470	324	639	55	284	373	341
RTOR Reduction (vph)	0	0	125	0	0	346	0	7	0	0	186	0
Lane Group Flow (vph)	128	338	48	60	614	124	324	687	0	284	528	0
Confl. Peds. (#/hr)			9			9			4			12
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	9.0	22.9	22.9	5.2	19.1	19.1	17.0	20.9		15.8	19.7	
Effective Green, g (s)	9.0	22.9	22.9	5.2	19.1	19.1	17.0	20.9		15.8	19.7	
Actuated g/C Ratio	0.11	0.28	0.28	0.06	0.23	0.23	0.21	0.25		0.19	0.24	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	190	510	423	110	808	353	359	872		334	763	
v/s Ratio Prot	c0.07	c0.18		0.03	c0.18		c0.18	c0.20		0.16	0.16	
v/s Ratio Perm			0.03			0.08						
v/c Ratio	0.67	0.66	0.11	0.55	0.76	0.35	0.90	0.79		0.85	0.69	
Uniform Delay, d1	35.5	26.5	22.4	37.7	29.7	26.7	32.1	28.9		32.4	28.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.1	3.2	0.1	5.4	4.1	0.6	24.9	4.7		18.3	2.7	
Delay (s)	44.6	29.8	22.5	43.1	33.9	27.3	57.0	33.6		50.7	31.5	
Level of Service	D	C	C	D	C	C	E	C		D	C	
Approach Delay (s)		30.8			31.6			41.1			37.0	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	35.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	82.8	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	74.1%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Near Term Plus 1293 Unit Project and School AM
12: Creston Road & Niblick Road/Sherwood Road — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	311	159	55	565	432	298	588	51	261	343	314
Future Volume (veh/h)	118	311	159	55	565	432	298	588	51	261	343	314
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	128	338	173	60	614	470	324	639	55	284	373	341
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	162	535	449	80	853	376	353	878	76	320	439	386
Arrive On Green	0.09	0.29	0.29	0.05	0.24	0.24	0.20	0.27	0.27	0.18	0.25	0.25
Sat Flow, veh/h	1767	1856	1558	1767	3526	1555	1767	3284	282	1767	1763	1550
Grp Volume(v), veh/h	128	338	173	60	614	470	324	343	351	284	373	341
Grp Sat Flow(s),veh/h/ln	1767	1856	1558	1767	1763	1555	1767	1763	1803	1767	1763	1550
Q Serve(g_s), s	5.9	13.1	7.4	2.8	13.2	20.0	14.9	14.6	14.7	13.0	16.7	17.5
Cycle Q Clear(g_c), s	5.9	13.1	7.4	2.8	13.2	20.0	14.9	14.6	14.7	13.0	16.7	17.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.16	1.00		1.00
Lane Grp Cap(c), veh/h	162	535	449	80	853	376	353	472	482	320	439	386
V/C Ratio(X)	0.79	0.63	0.39	0.75	0.72	1.25	0.92	0.73	0.73	0.89	0.85	0.88
Avail Cap(c_a), veh/h	289	597	501	147	853	376	353	490	502	331	469	412
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.8	25.6	23.6	39.0	28.8	31.3	32.4	27.5	27.5	33.0	29.6	29.9
Incr Delay (d2), s/veh	8.3	1.8	0.5	13.1	3.0	132.6	28.4	5.1	5.1	23.3	13.1	18.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	5.6	2.6	1.4	5.6	20.8	8.8	6.5	6.7	7.4	8.3	8.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.1	27.4	24.1	52.1	31.7	163.9	60.8	32.7	32.6	56.4	42.7	48.7
LnGrp LOS	D	C	C	D	C	F	E	C	C	E	D	D
Approach Vol, veh/h		639			1144			1018			998	
Approach Delay, s/veh		30.1			87.1			41.6			48.6	
Approach LOS		C			F			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.5	26.6	8.2	28.3	21.0	25.1	12.1	24.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	15.5	23.0	6.9	26.6	16.5	22.0	13.5	20.0
Max Q Clear Time (g_c+I1), s	15.0	16.7	4.8	15.1	16.9	19.5	7.9	22.0
Green Ext Time (p_c), s	0.1	2.2	0.0	1.9	0.0	1.1	0.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	55.2
HCM 6th LOS	E

Olsen-Chandler SP — Near Term Plus 1293 Unit Project and School AM
13: Creston Road & Scott Street — HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	46	63	750	52	59	537
Future Volume (Veh/h)	46	63	750	52	59	537
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	68	815	57	64	584
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1556	844			872	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1556	844			872	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	56	81			92	
cM capacity (veh/h)	114	363			773	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	118	872	64	584
Volume Left	50	0	64	0
Volume Right	68	57	0	0
cSH	189	1700	773	1700
Volume to Capacity	0.63	0.51	0.08	0.34
Queue Length 95th (ft)	89	0	7	0
Control Delay (s)	51.5	0.0	10.1	0.0
Lane LOS	F		B	
Approach Delay (s)	51.5	0.0	1.0	
Approach LOS	F			

Intersection Summary			
Average Delay	4.1		
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	4.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	46	63	750	52	59	537
Future Vol, veh/h	46	63	750	52	59	537
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	50	68	815	57	64	584

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1556	844	0	0	872	0
Stage 1	844	-	-	-	-	-
Stage 2	712	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	124	363	-	-	773	-
Stage 1	422	-	-	-	-	-
Stage 2	486	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	114	363	-	-	773	-
Mov Cap-2 Maneuver	114	-	-	-	-	-
Stage 1	422	-	-	-	-	-
Stage 2	446	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	51.5	0	1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	189	773	-
HCM Lane V/C Ratio	-	-	0.627	0.083	-
HCM Control Delay (s)	-	-	51.5	10.1	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	3.6	0.3	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	99	6	40	8	15	98	34	555	3	33	423	85
Future Volume (Veh/h)	99	6	40	8	15	98	34	555	3	33	423	85
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	108	7	43	9	16	107	37	603	3	36	460	92
Pedestrians		6			2						1	
Lane Width (ft)		12.0			12.0						12.0	
Walking Speed (ft/s)		3.5			3.5						3.5	
Percent Blockage		1			0						0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1331	1220	466	1259	1310	608	558			608		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1331	1220	466	1259	1310	608	558			608		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	96	93	93	89	78	96			96		
cM capacity (veh/h)	88	166	593	124	146	495	1007			969		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	158	132	37	606	36	460	92
Volume Left	108	9	37	0	36	0	0
Volume Right	43	107	0	3	0	0	92
cSH	118	331	1007	1700	969	1700	1700
Volume to Capacity	1.34	0.40	0.04	0.36	0.04	0.27	0.05
Queue Length 95th (ft)	265	46	3	0	3	0	0
Control Delay (s)	267.5	22.9	8.7	0.0	8.9	0.0	0.0
Lane LOS	F	C	A		A		
Approach Delay (s)	267.5	22.9	0.5		0.5		
Approach LOS	F	C					

Intersection Summary				
Average Delay	30.2			
Intersection Capacity Utilization	51.0%	ICU Level of Service		A
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	25.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↕		↰	↑	↱
Traffic Vol, veh/h	99	6	40	8	15	98	34	555	3	33	423	85
Future Vol, veh/h	99	6	40	8	15	98	34	555	3	33	423	85
Conflicting Peds, #/hr	1	0	0	0	0	1	6	0	2	2	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	30	-	-	70	-	60
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	108	7	43	9	16	107	37	603	3	36	460	92

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1279	1220	466	1284	1311	608	558	0	0	608	0	0
Stage 1	538	538	-	681	681	-	-	-	-	-	-	-
Stage 2	741	682	-	603	630	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	143	180	597	142	159	496	1013	-	-	970	-	-
Stage 1	527	522	-	440	450	-	-	-	-	-	-	-
Stage 2	408	450	-	486	475	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 96	166	594	120	146	495	1007	-	-	968	-	-
Mov Cap-2 Maneuver	~ 96	166	-	120	146	-	-	-	-	-	-	-
Stage 1	505	500	-	423	432	-	-	-	-	-	-	-
Stage 2	297	432	-	428	455	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	220.4	23	0.5	0.5
HCM LOS	F	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1		SBL	SBT	SBR
Capacity (veh/h)	1007	-	-	128	329	968	-	-
HCM Lane V/C Ratio	0.037	-	-	1.231	0.4	0.037	-	-
HCM Control Delay (s)	8.7	-	-	220.4	23	8.9	-	-
HCM Lane LOS	A	-	-	F	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	9.8	1.9	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↰	↱		↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	20	9	7	291	5	329	9	243	149	262	199	10
Future Volume (vph)	20	9	7	291	5	329	9	243	149	262	199	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	10	8	316	5	358	10	264	162	285	216	11

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	40	679	274	162	393	119
Volume Left (vph)	22	316	10	0	285	0
Volume Right (vph)	8	358	0	162	0	11
Hadj (s)	0.02	-0.19	0.05	-0.67	0.40	-0.03
Departure Headway (s)	8.4	6.5	7.7	7.0	7.8	7.4
Degree Utilization, x	0.09	1.22	0.58	0.31	0.85	0.24
Capacity (veh/h)	395	541	454	507	452	480
Control Delay (s)	12.3	135.8	19.7	11.9	40.3	11.5
Approach Delay (s)	12.3	135.8	16.8		33.6	
Approach LOS	B	F	C		D	

Intersection Summary				
Delay	70.4			
Level of Service	F			
Intersection Capacity Utilization	81.5%	ICU Level of Service	D	
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	75.5
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Vol, veh/h	20	9	7	291	5	329	0	9	243	149	262	199
Future Vol, veh/h	20	9	7	291	5	329	0	9	243	149	262	199
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	10	8	316	5	358	0	10	264	162	285	216
Number of Lanes	0	1	0	0	1	0	0	0	1	1	0	2

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	13.3	143.6	19.4	37.7
HCM LOS	B	F	C	E

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	4%	0%	56%	47%	72%	0%
Vol Thru, %	96%	0%	25%	1%	28%	91%
Vol Right, %	0%	100%	19%	53%	0%	9%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	252	149	36	625	362	110
LT Vol	9	0	20	291	262	0
Through Vol	243	0	9	5	100	100
RT Vol	0	149	7	329	0	10
Lane Flow Rate	274	162	39	679	393	119
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.587	0.315	0.093	1.237	0.857	0.245
Departure Headway (Hd)	8.49	7.741	9.31	6.556	8.578	8.134
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	427	468	387	557	424	444
Service Time	6.19	5.441	7.31	4.594	6.278	5.834
HCM Lane V/C Ratio	0.642	0.346	0.101	1.219	0.927	0.268
HCM Control Delay	22.6	14	13.3	143.6	45	13.5
HCM Lane LOS	C	B	B	F	E	B
HCM 95th-tile Q	3.7	1.3	0.3	25.9	8.5	1

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBR
Lane Configurations	
Traffic Vol, veh/h	10
Future Vol, veh/h	10
Peak Hour Factor	0.92
Heavy Vehicles, %	2
Mvmt Flow	11
Number of Lanes	0

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	193	136	229	208	125	373
Future Volume (Veh/h)	193	136	229	208	125	373
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	210	148	249	226	136	405
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	747	136	541			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	747	136	541			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	20	83	76			
cM capacity (veh/h)	262	885	1017			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	358	249	113	113	136	405
Volume Left	210	249	0	0	0	0
Volume Right	148	0	0	0	0	405
cSH	446	1017	1700	1700	1700	1700
Volume to Capacity	0.80	0.24	0.07	0.07	0.08	0.24
Queue Length 95th (ft)	183	24	0	0	0	0
Control Delay (s)	37.9	9.7	0.0	0.0	0.0	0.0
Lane LOS	E	A				
Approach Delay (s)	37.9	5.1			0.0	
Approach LOS	E					

Intersection Summary			
Average Delay		11.6	
Intersection Capacity Utilization		42.4%	ICU Level of Service A
Analysis Period (min)		15	

Intersection	
Int Delay, s/veh	10.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	193	136	229	208	125	373
Future Vol, veh/h	193	136	229	208	125	373
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	145	105	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	210	148	249	226	136	405

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	747	136	541	0	-	0
Stage 1	136	-	-	-	-	-
Stage 2	611	-	-	-	-	-
Critical Hdwy	6.645	6.245	4.145	-	-	-
Critical Hdwy Stg 1	5.445	-	-	-	-	-
Critical Hdwy Stg 2	5.845	-	-	-	-	-
Follow-up Hdwy	3.5285	3.3285	2.2285	-	-	-
Pot Cap-1 Maneuver	362	909	1020	-	-	-
Stage 1	887	-	-	-	-	-
Stage 2	503	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	274	909	1020	-	-	-
Mov Cap-2 Maneuver	274	-	-	-	-	-
Stage 1	671	-	-	-	-	-
Stage 2	503	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	33.9	5.1	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1020	-	274	909	-	-
HCM Lane V/C Ratio	0.244	-	0.766	0.163	-	-
HCM Control Delay (s)	9.7	-	50.9	9.7	-	-
HCM Lane LOS	A	-	F	A	-	-
HCM 95th %tile Q(veh)	1	-	5.7	0.6	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	0	55	1	117	9	0	0	0	0	324	15
Future Volume (Veh/h)	27	0	55	1	117	9	0	0	0	0	324	15
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	0	60	1	127	10	0	0	0	0	352	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	428	360	360	420	368	0	368			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	428	360	360	420	368	0	368			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	100	91	100	77	99	100			100		
cM capacity (veh/h)	439	567	684	496	561	1085	1191			1623		

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	89	138	368
Volume Left	29	1	0
Volume Right	60	10	16
cSH	579	604	1700
Volume to Capacity	0.15	0.23	0.22
Queue Length 95th (ft)	14	22	0
Control Delay (s)	12.3	13.0	0.0
Lane LOS	B	B	
Approach Delay (s)	12.3	13.0	0.0
Approach LOS	B	B	

Intersection Summary					
Average Delay		4.9			
Intersection Capacity Utilization		36.2%	ICU Level of Service	A	
Analysis Period (min)		15			

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	0	55	1	117	9	0	0	0	0	324	15
Future Vol, veh/h	27	0	55	1	117	9	0	0	0	0	324	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	29	0	60	1	127	10	0	0	0	0	352	16

Major/Minor	Minor2			Minor1						Major2		
Conflicting Flow All	429	360	360	390	368	0				-	-	0
Stage 1	360	360	-	0	0	-				-	-	-
Stage 2	69	0	-	390	368	-				-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22				-	-	-
Critical Hdwy Stg 1	6.12	5.52	-	-	-	-				-	-	-
Critical Hdwy Stg 2	-	-	-	6.12	5.52	-				-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318				-	-	-
Pot Cap-1 Maneuver	536	567	684	569	561	-				0	-	-
Stage 1	658	626	-	-	-	-				0	-	-
Stage 2	-	-	-	634	621	-				0	-	-
Platoon blocked, %											-	-
Mov Cap-1 Maneuver	-	567	684	519	561	-				-	-	-
Mov Cap-2 Maneuver	-	567	-	519	561	-				-	-	-
Stage 1	658	626	-	-	-	-				-	-	-
Stage 2	-	-	-	579	621	-				-	-	-

Approach	EB	WB	SB
HCM Control Delay, s			0
HCM LOS	-	-	

Minor Lane/Major Mvmt	EBLn1	WBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	-	561	-	-	-
HCM Lane V/C Ratio	-	0.229	-	-	-
HCM Control Delay (s)	-	13.3	-	-	-
HCM Lane LOS	-	B	-	-	-
HCM 95th %tile Q(veh)	-	0.9	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	20	336	1217	310	492	91	293	622	349	276
v/c Ratio	0.09	0.72	0.80	0.38	0.44	0.61	0.65	0.37	0.69	0.41
Control Delay	55.7	54.4	37.6	27.5	2.6	79.6	63.1	6.0	61.5	46.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.7	54.4	37.6	27.5	2.6	79.6	63.1	6.0	61.5	46.0
Queue Length 50th (ft)	16	121	454	174	7	78	131	49	151	106
Queue Length 95th (ft)	44	188	646	294	52	#158	192	80	219	155
Internal Link Dist (ft)		521		1372			611			680
Turn Bay Length (ft)	115		515		115	165		290	305	
Base Capacity (vph)	284	593	1667	905	1171	170	647	1785	657	965
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.57	0.73	0.34	0.42	0.54	0.45	0.35	0.53	0.29

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

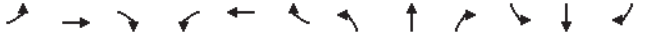
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	194	115	1120	285	453	84	270	572	321	205	49
Future Volume (vph)	18	194	115	1120	285	453	84	270	572	321	205	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.95	0.88	0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3342		3433	1863	1568	1770	3539	2787	3433	3422	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3342		3433	1863	1568	1770	3539	2787	3433	3422	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	211	125	1217	310	492	91	293	622	349	223	53
RTOR Reduction (vph)	0	59	0	0	0	192	0	0	78	0	15	0
Lane Group Flow (vph)	20	277	0	1217	310	300	91	293	544	349	261	0
Confl. Peds. (#/hr)												1
Confl. Bikes (#/hr)						2						
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	15.9	15.9		57.2	57.2	76.4	10.9	16.5	73.7	19.2	24.8	
Effective Green, g (s)	15.9	15.9		57.2	57.2	76.4	10.9	16.5	73.7	19.2	24.8	
Actuated g/C Ratio	0.12	0.12		0.44	0.44	0.59	0.08	0.13	0.57	0.15	0.19	
Clearance Time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	217	410		1518	824	926	149	451	1588	509	656	
v/s Ratio Prot	0.01	c0.08		c0.35	0.17	0.05	0.05	c0.08	0.15	c0.10	0.08	
v/s Ratio Perm						0.14			0.04			
v/c Ratio	0.09	0.68		0.80	0.38	0.32	0.61	0.65	0.34	0.69	0.40	
Uniform Delay, d1	50.3	54.2		31.1	24.1	13.4	57.2	53.7	14.9	52.2	45.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	4.4		3.1	0.3	0.2	7.2	3.2	0.1	3.8	0.4	
Delay (s)	50.5	58.6		34.3	24.4	13.6	64.4	56.9	15.0	56.0	46.1	
Level of Service	D	E		C	C	B	E	E	B	E	D	
Approach Delay (s)		58.2			27.7			31.7			51.6	
Approach LOS		E			C			C			D	

Intersection Summary

HCM 2000 Control Delay	35.2	HCM 2000 Level of Service	D		
HCM 2000 Volume to Capacity ratio	0.74				
Actuated Cycle Length (s)	129.3	Sum of lost time (s)	20.5		
Intersection Capacity Utilization	74.7%	ICU Level of Service	D		
Analysis Period (min)	15				

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	194	115	1120	285	453	84	270	572	321	205	49
Future Volume (veh/h)	18	194	115	1120	285	453	84	270	572	321	205	49
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	20	211	125	1217	310	492	91	293	622	349	223	53
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	223	273	155	1441	780	848	115	569	1610	427	600	140
Arrive On Green	0.13	0.13	0.13	0.42	0.42	0.42	0.06	0.16	0.16	0.12	0.21	0.21
Sat Flow, veh/h	1781	2184	1240	3456	1870	1564	1781	3554	2790	3456	2860	666
Grp Volume(v), veh/h	20	170	166	1217	310	492	91	293	622	349	137	139
Grp Sat Flow(s),veh/h/ln	1781	1777	1647	1728	1870	1564	1781	1777	1395	1728	1777	1749
Q Serve(g_s), s	1.2	10.9	11.5	37.2	13.6	24.8	5.9	8.9	14.3	11.6	7.7	8.0
Cycle Q Clear(g_c), s	1.2	10.9	11.5	37.2	13.6	24.8	5.9	8.9	14.3	11.6	7.7	8.0
Prop In Lane	1.00		0.75	1.00		1.00	1.00		1.00	1.00		0.38
Lane Grp Cap(c), veh/h	223	222	206	1441	780	848	115	569	1610	427	372	367
V/C Ratio(X)	0.09	0.76	0.81	0.84	0.40	0.58	0.79	0.52	0.39	0.82	0.37	0.38
Avail Cap(c_a), veh/h	309	308	286	1812	980	1016	185	702	1714	715	534	525
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.5	49.7	50.0	30.8	23.9	18.1	54.2	45.2	13.5	50.2	39.8	39.9
Incr Delay (d2), s/veh	0.2	7.3	11.0	3.1	0.3	0.6	11.6	0.7	0.2	3.9	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	5.3	5.4	15.4	5.9	8.5	3.0	3.9	9.1	5.2	3.5	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.7	57.0	61.1	34.0	24.3	18.7	65.7	45.9	13.7	54.1	40.4	40.5
LnGrp LOS	D	E	E	C	C	B	E	D	B	D	D	D
Approach Vol, veh/h		356			2019			1006			625	
Approach Delay, s/veh		58.3			28.8			27.8			48.1	
Approach LOS		E			C			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	19.2	24.6		19.3	13.4	30.4		54.4				
Change Period (Y+Rc), s	* 4.7	5.8		4.6	5.8	* 5.8		5.4				
Max Green Setting (Gmax), s	* 24	23.2		20.4	12.2	* 35		61.6				
Max Q Clear Time (g_c+I1), s	13.6	16.3		13.5	7.9	10.0		39.2				
Green Ext Time (p_c), s	0.9	2.5		1.2	0.1	1.6		9.8				

Intersection Summary												
HCM 6th Ctrl Delay			34.2									
HCM 6th LOS			C									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	111	705	298	130	1427	700	407	317	454
v/c Ratio	0.56	0.57	0.40	0.68	1.04	0.93	0.66	0.86	0.75
Control Delay	63.4	32.9	5.0	67.1	68.3	63.0	47.4	66.1	45.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.4	32.9	5.0	67.1	68.3	63.0	47.4	66.1	45.0
Queue Length 50th (ft)	40	220	0	90	~578	254	143	217	138
Queue Length 95th (ft)	74	306	63	#174	#783	#401	196	#385	194
Internal Link Dist (ft)		1510			1609		962		896
Turn Bay Length (ft)	140			80		150		110	
Base Capacity (vph)	200	1230	745	214	1373	754	816	400	871
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.57	0.40	0.61	1.04	0.93	0.50	0.79	0.52

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
19: S. River Road & Niblick Road

Near Term Plus 1293 Unit Project and School AM
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	649	274	120	1020	293	644	321	53	292	273	144
Future Volume (vph)	102	649	274	120	1020	293	644	321	53	292	273	144
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3539	1583	1770	3402		3433	3454		1770	3356	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	3539	1583	1770	3402		3433	3454		1770	3356	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	111	705	298	130	1109	318	700	349	58	317	297	157
RTOR Reduction (vph)	0	0	194	0	21	0	0	12	0	0	62	0
Lane Group Flow (vph)	111	705	104	130	1406	0	700	395	0	317	392	0
Confl. Peds. (#/hr)						10			5			
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	6.5	38.9	38.9	12.0	44.4		24.6	19.6		23.2	18.2	
Effective Green, g (s)	6.5	38.9	38.9	12.0	44.4		24.6	19.6		23.2	18.2	
Actuated g/C Ratio	0.06	0.35	0.35	0.11	0.40		0.22	0.18		0.21	0.16	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	199	1232	551	190	1352		756	606		367	546	
v/s Ratio Prot	0.03	0.20		c0.07	c0.41		c0.20	0.11		c0.18	0.12	
v/s Ratio Perm			0.07									
v/c Ratio	0.56	0.57	0.19	0.68	1.04		0.93	0.65		0.86	0.72	
Uniform Delay, d1	51.2	29.6	25.4	48.0	33.6		42.7	42.9		42.7	44.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.4	0.6	0.2	9.8	35.5		17.1	2.5		18.5	4.5	
Delay (s)	54.6	30.3	25.6	57.8	69.1		59.8	45.4		61.3	48.8	
Level of Service	D	C	C	E	E		E	D		E	D	
Approach Delay (s)		31.4			68.2			54.5			53.9	
Approach LOS		C			E			D			D	

Intersection Summary					
HCM 2000 Control Delay	53.4	HCM 2000 Level of Service		D	
HCM 2000 Volume to Capacity ratio	0.99				
Actuated Cycle Length (s)	111.7	Sum of lost time (s)		18.0	
Intersection Capacity Utilization	87.5%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

Olsen-Chandler SP
19: S. River Road & Niblick Road

Near Term Plus 1293 Unit Project and School AM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	102	649	274	120	1020	293	644	321	53	292	273	144
Future Volume (veh/h)	102	649	274	120	1020	293	644	321	53	292	273	144
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	111	705	298	130	1109	318	700	349	58	317	297	157
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	167	1281	571	158	1094	310	751	586	96	348	386	199
Arrive On Green	0.05	0.36	0.36	0.09	0.40	0.40	0.22	0.19	0.19	0.20	0.17	0.17
Sat Flow, veh/h	3456	3554	1585	1781	2728	773	3456	3050	502	1781	2268	1169
Grp Volume(v), veh/h	111	705	298	130	718	709	700	202	205	317	231	223
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1781	1777	1724	1728	1777	1775	1781	1777	1660
Q Serve(g_s), s	3.5	17.5	8.7	7.9	44.3	44.3	22.0	11.4	11.7	19.2	13.7	14.2
Cycle Q Clear(g_c), s	3.5	17.5	8.7	7.9	44.3	44.3	22.0	11.4	11.7	19.2	13.7	14.2
Prop In Lane	1.00		1.00	1.00		0.45	1.00		0.28	1.00		0.70
Lane Grp Cap(c), veh/h	167	1281	571	158	713	692	751	341	341	348	302	282
V/C Ratio(X)	0.67	0.55	0.52	0.82	1.01	1.02	0.93	0.59	0.60	0.91	0.76	0.79
Avail Cap(c_a), veh/h	203	1281	571	218	713	692	754	418	418	407	436	407
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.7	28.2	7.9	49.4	33.1	33.1	42.4	40.7	40.8	43.5	43.7	43.9
Incr Delay (d2), s/veh	5.9	0.5	0.9	15.9	35.5	40.7	18.2	1.6	1.7	22.1	4.8	6.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	7.2	5.5	4.1	24.9	25.2	11.0	5.0	5.1	10.4	6.3	6.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.6	28.7	8.7	65.4	68.6	73.7	60.6	42.3	42.5	65.6	48.6	50.4
LnGrp LOS	E	C	A	E	F	F	E	D	D	E	D	D
Approach Vol, veh/h		1114			1557			1107			771	
Approach Delay, s/veh		26.2			70.7			53.9			56.1	
Approach LOS		C			E			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.3	44.3	28.5	23.3	9.8	48.8	26.1	25.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	13.5	37.3	24.1	27.1	6.5	44.3	25.2	26.0
Max Q Clear Time (g_c+I1), s	9.9	19.5	24.0	16.2	5.5	46.3	21.2	13.7
Green Ext Time (p_c), s	0.1	5.3	0.1	1.9	0.0	0.0	0.4	1.7

Intersection Summary	
HCM 6th Ctrl Delay	53.2
HCM 6th LOS	D

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	489	166	14	889	212	9
v/c Ratio	0.58	0.21	0.04	0.56	0.44	0.02
Control Delay	13.3	2.9	9.0	11.0	15.5	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.3	2.9	9.0	11.0	15.5	7.2
Queue Length 50th (ft)	64	0	1	60	31	0
Queue Length 95th (ft)	237	29	13	191	105	8
Internal Link Dist (ft)	1629			570	669	
Turn Bay Length (ft)			75			50
Base Capacity (vph)	1549	1309	632	2942	1286	1153
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.32	0.13	0.02	0.30	0.16	0.01

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	450	153	13	818	195	8
Future Volume (vph)	450	153	13	818	195	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1845	1532	1750	3505	1752	1568
Flt Permitted	1.00	1.00	0.41	1.00	0.95	1.00
Satd. Flow (perm)	1845	1532	753	3505	1752	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	489	166	14	889	212	9
RTOR Reduction (vph)	0	89	0	0	0	6
Lane Group Flow (vph)	489	77	14	889	212	3
Confl. Peds. (#/hr)		4	4		1	
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Turn Type	NA	Perm	Perm	NA	Perm	Prot
Protected Phases	2			6		8
Permitted Phases		2	6		8	
Actuated Green, G (s)	19.7	19.7	19.7	19.7	12.0	12.0
Effective Green, g (s)	19.7	19.7	19.7	19.7	12.0	12.0
Actuated g/C Ratio	0.46	0.46	0.46	0.46	0.28	0.28
Clearance Time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	855	710	349	1624	494	442
v/s Ratio Prot	c0.27			0.25		0.00
v/s Ratio Perm		0.05	0.02		c0.12	
v/c Ratio	0.57	0.11	0.04	0.55	0.43	0.01
Uniform Delay, d1	8.3	6.4	6.2	8.2	12.5	11.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6	0.0	0.0	0.2	0.2	0.0
Delay (s)	8.9	6.5	6.2	8.4	12.7	11.0
Level of Service	A	A	A	A	B	B
Approach Delay (s)	8.3			8.4	12.6	
Approach LOS	A			A	B	

Intersection Summary				
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	42.5	Sum of lost time (s)	10.8
Intersection Capacity Utilization	43.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Near Term Plus 1293 Unit Project and School AM
20: Commerce Way & Sherwood Road — HCM 6th Signalized Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	450	153	13	818	195	8
Future Volume (veh/h)	450	153	13	818	195	8
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	489	166	14	889	212	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	785	662	404	1492	393	349
Arrive On Green	0.42	0.42	0.42	0.42	0.22	0.22
Sat Flow, veh/h	1856	1565	771	3618	1767	1572
Grp Volume(v), veh/h	489	166	14	889	212	9
Grp Sat Flow(s),veh/h/ln	1856	1565	771	1763	1767	1572
Q Serve(g_s), s	6.3	2.1	0.4	5.9	3.2	0.1
Cycle Q Clear(g_c), s	6.3	2.1	6.7	5.9	3.2	0.1
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	785	662	404	1492	393	349
V/C Ratio(X)	0.62	0.25	0.03	0.60	0.54	0.03
Avail Cap(c_a), veh/h	2108	1778	953	4005	1717	1528
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	6.9	5.7	9.5	6.8	10.5	9.3
Incr Delay (d2), s/veh	0.3	0.1	0.0	0.1	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.3	0.0	0.9	0.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	7.2	5.7	9.5	6.9	10.9	9.3
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h	655			903	221	
Approach Delay, s/veh	6.8			7.0	10.8	
Approach LOS	A			A	B	

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	18.3				18.3	12.2
Change Period (Y+Rc), s	5.4				5.4	5.4
Max Green Setting (Gmax), s	34.6				34.6	29.6
Max Q Clear Time (g_c+I1), s	8.3				8.7	5.2
Green Ext Time (p_c), s	2.1				4.2	0.3

Intersection Summary			
HCM 6th Ctrl Delay		7.4	
HCM 6th LOS		A	

Olsen-Chandler SP — Near Term Plus 1293 Unit Project and School AM
21: Fontana Road & Sherwood Road — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	367	91	5	771	0	61	0	5	0	0	0
Future Volume (Veh/h)	0	367	91	5	771	0	61	0	5	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	399	99	5	838	0	66	0	5	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									4			
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		650										
pX, platoon unblocked				0.80			0.80	0.80	0.80	0.80	0.80	
vC, conflicting volume	838			498			878	1296	448	1299	1346	419
vC1, stage 1 conf vol							448	448		848	848	
vC2, stage 2 conf vol							429	848		451	498	
vCu, unblocked vol	838			249			723	1246	187	1249	1308	419
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			86	100	99	100	100	100
cM capacity (veh/h)	792			1052			472	331	659	290	323	583

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	498	424	419	71	0
Volume Left	0	5	0	66	0
Volume Right	99	0	0	5	0
cSH	792	1052	1700	508	1700
Volume to Capacity	0.00	0.00	0.25	0.14	0.00
Queue Length 95th (ft)	0	0	0	12	0
Control Delay (s)	0.0	0.2	0.0	13.6	0.0
Lane LOS		A		B	A
Approach Delay (s)	0.0	0.1		13.6	0.0
Approach LOS				B	A

Intersection Summary					
Average Delay		0.7			
Intersection Capacity Utilization		34.9%	ICU Level of Service		A
Analysis Period (min)		15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	367	91	5	771	0	61	0	5	0	0	0
Future Vol, veh/h	0	367	91	5	771	0	61	0	5	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	399	99	5	838	0	66	0	5	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	838	0	0	498	0	0	878	1297	449	1299	1346	419
Stage 1	-	-	-	-	-	-	449	449	-	848	848	-
Stage 2	-	-	-	-	-	-	429	848	-	451	498	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.23	7.33	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.519	4.019	3.319
Pot Cap-1 Maneuver	794	-	-	1064	-	-	255	161	609	128	151	584
Stage 1	-	-	-	-	-	-	588	571	-	323	377	-
Stage 2	-	-	-	-	-	-	575	377	-	587	543	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	794	-	-	1064	-	-	253	160	609	126	150	584
Mov Cap-2 Maneuver	-	-	-	-	-	-	446	324	-	285	318	-
Stage 1	-	-	-	-	-	-	588	571	-	323	374	-
Stage 2	-	-	-	-	-	-	570	374	-	582	543	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.1	14.2	0
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	446	609	794	-	-	1064	-	-	-
HCM Lane V/C Ratio	0.149	0.009	-	-	-	0.005	-	-	-
HCM Control Delay (s)	14.5	11	0	-	-	8.4	0	-	0
HCM Lane LOS	B	B	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	0.5	0	0	-	-	0	-	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Traffic Volume (veh/h)	44	169	104	25	308	4	254	12	35	8	12	89
Future Volume (veh/h)	44	169	104	25	308	4	254	12	35	8	12	89
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	48	184	113	27	335	4	276	13	38	9	13	97
Approach Volume (veh/h)		345			366			327			119	
Crossing Volume (veh/h)		49			337			241			638	
High Capacity (veh/h)		1333			1063			1147			836	
High v/c (veh/h)		0.26			0.34			0.29			0.14	
Low Capacity (veh/h)		1114			870			945			668	
Low v/c (veh/h)		0.31			0.42			0.35			0.18	

Intersection Summary				
Maximum v/c High		0.34		
Maximum v/c Low		0.42		
Intersection Capacity Utilization		58.6%	ICU Level of Service	B

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	6.7
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	345	366	327	119
Demand Flow Rate, veh/h	352	374	334	121
Vehicles Circulating, veh/h	50	344	246	652
Vehicles Exiting, veh/h	723	236	156	66
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.2	8.1	6.5	7.1
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	352	374	334	121
Cap Entry Lane, veh/h	1311	972	1074	710
Entry HV Adj Factor	0.981	0.979	0.978	0.981
Flow Entry, veh/h	345	366	327	119
Cap Entry, veh/h	1286	952	1050	696
V/C Ratio	0.268	0.385	0.311	0.171
Control Delay, s/veh	5.2	8.1	6.5	7.1
LOS	A	A	A	A
95th %tile Queue, veh	1	2	1	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	19	13	24	1	28	16	40	173	1	12	103	26
Future Volume (vph)	19	13	24	1	28	16	40	173	1	12	103	26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	14	26	1	30	17	43	188	1	13	112	28

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	61	48	232	153
Volume Left (vph)	21	1	43	13
Volume Right (vph)	26	17	1	28
Hadj (s)	-0.05	-0.07	0.17	0.04
Departure Headway (s)	4.8	4.8	4.5	4.5
Degree Utilization, x	0.08	0.06	0.29	0.19
Capacity (veh/h)	683	681	772	768
Control Delay (s)	8.2	8.1	9.4	8.5
Approach Delay (s)	8.2	8.1	9.4	8.5
Approach LOS	A	A	A	A

Intersection Summary				
Delay	8.8			
Level of Service	A			
Intersection Capacity Utilization	36.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	8.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	19	13	24	1	28	16	40	173	1	12	103	26
Future Vol, veh/h	19	13	24	1	28	16	40	173	1	12	103	26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	8	8	8	8	8	8	8	8	8	8	8	8
Mvmt Flow	21	14	26	1	30	17	43	188	1	13	112	28
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.2	8.2	9.4	8.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	19%	34%	2%	9%
Vol Thru, %	81%	23%	62%	73%
Vol Right, %	0%	43%	36%	18%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	214	56	45	141
LT Vol	40	19	1	12
Through Vol	173	13	28	103
RT Vol	1	24	16	26
Lane Flow Rate	233	61	49	153
Geometry Grp	1	1	1	1
Degree of Util (X)	0.291	0.081	0.065	0.19
Departure Headway (Hd)	4.506	4.793	4.789	4.466
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	800	747	747	805
Service Time	2.525	2.822	2.82	2.487
HCM Lane V/C Ratio	0.291	0.082	0.066	0.19
HCM Control Delay	9.4	8.2	8.2	8.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1.2	0.3	0.2	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	83	20	0	155	18	40	69	0	7	46	92
Future Volume (Veh/h)	45	83	20	0	155	18	40	69	0	7	46	92
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	49	90	22	0	168	20	43	75	0	8	50	100
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	188			112			502	387	101	414	388	178
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	188			112			502	387	101	414	388	178
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			100			89	86	100	98	90	88
cM capacity (veh/h)	1374			1465			380	525	949	472	524	860

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	161	188	118	8	150
Volume Left	49	0	43	8	0
Volume Right	22	20	0	0	100
cSH	1374	1465	461	472	709
Volume to Capacity	0.04	0.00	0.26	0.02	0.21
Queue Length 95th (ft)	3	0	25	1	20
Control Delay (s)	2.6	0.0	15.5	12.8	11.4
Lane LOS	A		C	B	B
Approach Delay (s)	2.6	0.0	15.5	11.5	
Approach LOS			C	B	

Intersection Summary				
Average Delay	6.5			
Intersection Capacity Utilization	44.6%	ICU Level of Service		A
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	6.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↰	↕	
Traffic Vol, veh/h	45	83	20	0	155	18	40	69	0	7	46	92
Future Vol, veh/h	45	83	20	0	155	18	40	69	0	7	46	92
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	49	90	22	0	168	20	43	75	0	8	50	100

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	188	0	0	112	0	0	452	387	101	415	388	178
Stage 1	-	-	-	-	-	-	199	199	-	178	178	-
Stage 2	-	-	-	-	-	-	253	188	-	237	210	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	1374	-	-	1465	-	-	514	544	949	544	544	860
Stage 1	-	-	-	-	-	-	798	733	-	819	748	-
Stage 2	-	-	-	-	-	-	747	741	-	762	725	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1374	-	-	1465	-	-	409	523	949	471	523	860
Mov Cap-2 Maneuver	-	-	-	-	-	-	409	523	-	471	523	-
Stage 1	-	-	-	-	-	-	768	705	-	788	748	-
Stage 2	-	-	-	-	-	-	616	741	-	655	697	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.3	0	15.1	11.5
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	474	1374	-	-	1465	-	-	471	708
HCM Lane V/C Ratio	0.25	0.036	-	-	-	-	-	0.016	0.212
HCM Control Delay (s)	15.1	7.7	0	-	0	-	-	12.8	11.4
HCM Lane LOS	C	A	A	-	A	-	-	B	B
HCM 95th %tile Q(veh)	1	0.1	-	-	0	-	-	0	0.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Right Turn Channelized						
Traffic Volume (veh/h)	4	156	132	8	125	76
Future Volume (veh/h)	4	156	132	8	125	76
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	170	143	9	136	83
Approach Volume (veh/h)	174		152			219
Crossing Volume (veh/h)	143		136			4
High Capacity (veh/h)	1238		1245			1380
High v/c (veh/h)	0.14		0.12			0.16
Low Capacity (veh/h)	1028		1034			1157
Low v/c (veh/h)	0.17		0.15			0.19

Intersection Summary			
Maximum v/c High	0.16		
Maximum v/c Low	0.19		
Intersection Capacity Utilization	38.2%	ICU Level of Service	A

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	4.2
Intersection LOS	A

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	174	152	219
Demand Flow Rate, veh/h	177	155	224
Vehicles Circulating, veh/h	146	139	4
Vehicles Exiting, veh/h	148	89	319
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	4.4	4.2	4.0
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	177	155	224
Cap Entry Lane, veh/h	1189	1197	1374
Entry HV Adj Factor	0.983	0.982	0.979
Flow Entry, veh/h	174	152	219
Cap Entry, veh/h	1169	1175	1346
V/C Ratio	0.149	0.129	0.163
Control Delay, s/veh	4.4	4.2	4.0
LOS	A	A	A
95th %tile Queue, veh	1	0	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	71	87	5	1	6
Future Volume (Veh/h)	3	71	87	5	1	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	77	95	5	1	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	100				180	98
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	100				180	98
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1486				805	956

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	80	100	8
Volume Left	3	0	1
Volume Right	0	5	7
cSH	1486	1700	934
Volume to Capacity	0.00	0.06	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.3	0.0	8.9
Lane LOS	A		A
Approach Delay (s)	0.3	0.0	8.9
Approach LOS			A

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	16.2%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	71	87	5	1	6
Future Vol, veh/h	3	71	87	5	1	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	3	77	95	5	1	7

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	100	0	-	0	181	98
Stage 1	-	-	-	-	98	-
Stage 2	-	-	-	-	83	-
Critical Hdwy	4.13	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.227	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	1486	-	-	-	806	955
Stage 1	-	-	-	-	923	-
Stage 2	-	-	-	-	938	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1486	-	-	-	804	955
Mov Cap-2 Maneuver	-	-	-	-	804	-
Stage 1	-	-	-	-	921	-
Stage 2	-	-	-	-	938	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1486	-	-	-	930
HCM Lane V/C Ratio	0.002	-	-	-	0.008
HCM Control Delay (s)	7.4	0	-	-	8.9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	257	1292	1300	119	126	231
v/c Ratio	0.68	0.39	0.82	0.15	0.53	0.36
Control Delay	49.8	0.3	29.0	3.6	54.3	20.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.8	0.3	29.0	3.6	54.3	20.2
Queue Length 50th (ft)	154	0	374	0	78	81
Queue Length 95th (ft)	312	0	571	32	170	182
Internal Link Dist (ft)		1017	748		574	
Turn Bay Length (ft)	345			330	450	
Base Capacity (vph)	503	3312	2843	1289	503	977
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.39	0.46	0.09	0.25	0.24

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	254	1279	1287	118	125	229
Future Volume (vph)	254	1279	1287	118	125	229
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0	7.3	7.3	4.2	3.7
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1656	3312	3312	1482	1656	1482
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1656	3312	3312	1482	1656	1482
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	257	1292	1300	119	126	231
RTOR Reduction (vph)	0	0	0	62	0	26
Lane Group Flow (vph)	257	1292	1300	57	126	205
Heavy Vehicles (%)	9%	9%	9%	9%	9%	9%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	8	Free!	6		7!	4
Permitted Phases				6		4
Actuated Green, G (s)	23.8	103.1	49.5	49.5	14.8	42.6
Effective Green, g (s)	23.8	103.1	49.5	49.5	14.8	42.6
Actuated g/C Ratio	0.23	1.00	0.48	0.48	0.14	0.41
Clearance Time (s)	3.5		7.3	7.3	4.2	3.7
Vehicle Extension (s)	3.0		4.0	4.0	3.5	3.0
Lane Grp Cap (vph)	382	3312	1590	711	237	612
v/s Ratio Prot	c0.16	0.39	c0.39		c0.08	0.14
v/s Ratio Perm				0.04		
v/c Ratio	0.67	0.39	0.82	0.08	0.53	0.34
Uniform Delay, d1	36.1	0.0	22.9	14.5	40.9	20.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.6	0.3	3.6	0.1	2.6	0.3
Delay (s)	40.7	0.3	26.5	14.6	43.5	20.9
Level of Service	D	A	C	B	D	C
Approach Delay (s)		7.0	25.5		28.9	
Approach LOS		A	C		C	

Intersection Summary				
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	103.1	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	69.5%	ICU Level of Service	C	
Analysis Period (min)	15			

! Phase conflict between lane groups.
c Critical Lane Group

HCM 6th Edition methodology cannot be performed with phasing conflicts.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	196	971	281	52	887	127	251	285	193	337	312
v/c Ratio	0.53	0.76	0.38	0.20	0.80	0.22	0.59	0.33	0.53	0.77	0.56
Control Delay	58.8	38.4	5.0	58.5	43.2	6.4	58.0	35.9	58.8	56.2	14.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.8	38.4	5.0	58.5	43.2	6.4	58.0	35.9	58.8	56.2	14.4
Queue Length 50th (ft)	72	343	0	19	316	0	92	86	71	236	39
Queue Length 95th (ft)	139	536	63	48	495	46	171	156	138	424	149
Internal Link Dist (ft)		1323			2509			853		451	
Turn Bay Length (ft)	225		485	125		390	160		140		
Base Capacity (vph)	526	2110	1027	526	2110	978	585	1219	585	650	708
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.46	0.27	0.10	0.42	0.13	0.43	0.23	0.33	0.52	0.44

Intersection Summary

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	190	942	273	50	860	123	243	230	47	187	327	303
Future Volume (vph)	190	942	273	50	860	123	243	230	47	187	327	303
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3273	3374	1475	3273	3374	1489	3273	3281		3273	1776	1509
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3273	3374	1475	3273	3374	1489	3273	3281		3273	1776	1509
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	196	971	281	52	887	127	251	237	48	193	337	312
RTOR Reduction (vph)	0	0	174	0	0	84	0	10	0	0	0	185
Lane Group Flow (vph)	196	971	107	52	887	43	251	275	0	193	337	127
Confl. Peds. (#/hr)			1			1			2			
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	13.2	44.7	44.7	8.2	39.7	39.7	15.1	30.9		13.1	28.9	28.9
Effective Green, g (s)	13.2	44.7	44.7	8.2	39.7	39.7	15.1	30.9		13.1	28.9	28.9
Actuated g/C Ratio	0.11	0.38	0.38	0.07	0.34	0.34	0.13	0.26		0.11	0.25	0.25
Clearance Time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	367	1283	561	228	1139	503	420	862		364	436	371
v/s Ratio Prot	0.06	c0.29		0.02	c0.26		c0.08	0.08		0.06	c0.19	
v/s Ratio Perm			0.07			0.03						0.08
v/c Ratio	0.53	0.76	0.19	0.23	0.78	0.09	0.60	0.32		0.53	0.77	0.34
Uniform Delay, d1	49.2	31.7	24.3	51.7	35.0	26.5	48.3	34.8		49.3	41.2	36.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	1.5	2.6	0.2	0.2	3.4	0.1	2.3	0.2		1.5	8.3	0.6
Delay (s)	50.7	34.3	24.5	51.8	38.4	26.6	50.6	35.1		50.8	49.5	37.0
Level of Service	D	C	C	D	D	C	D	D		D	D	D
Approach Delay (s)		34.6			37.6			42.3			45.2	
Approach LOS		C			D			D			D	

Intersection Summary				
HCM 2000 Control Delay	38.8	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	117.5	Sum of lost time (s)	20.6	
Intersection Capacity Utilization	70.7%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	190	942	273	50	860	123	243	230	47	187	327	303
Future Volume (veh/h)	190	942	273	50	860	123	243	230	47	187	327	303
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	196	971	281	52	887	127	251	237	48	193	337	312
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	275	1244	554	105	1190	530	336	753	150	274	443	376
Arrive On Green	0.08	0.36	0.36	0.03	0.35	0.35	0.10	0.27	0.27	0.08	0.25	0.25
Sat Flow, veh/h	3319	3413	1520	3319	3413	1521	3319	2835	564	3319	1796	1522
Grp Volume(v), veh/h	196	971	281	52	887	127	251	141	144	193	337	312
Grp Sat Flow(s),veh/h/ln	1659	1706	1520	1659	1706	1521	1659	1706	1693	1659	1796	1522
Q Serve(g_s), s	5.4	23.6	8.8	1.4	21.4	5.6	6.9	6.2	6.4	5.3	16.3	18.2
Cycle Q Clear(g_c), s	5.4	23.6	8.8	1.4	21.4	5.6	6.9	6.2	6.4	5.3	16.3	18.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.33	1.00		1.00
Lane Grp Cap(c), veh/h	275	1244	554	105	1190	530	336	453	450	274	443	376
V/C Ratio(X)	0.71	0.78	0.51	0.49	0.75	0.24	0.75	0.31	0.32	0.70	0.76	0.83
Avail Cap(c_a), veh/h	639	2554	1138	639	2554	1138	710	748	742	710	787	667
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.8	26.4	9.8	44.5	26.8	21.6	40.9	27.5	27.6	41.8	32.7	33.4
Incr Delay (d2), s/veh	3.4	1.1	0.7	1.3	0.9	0.2	3.3	0.4	0.4	3.3	2.7	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	8.7	0.1	0.6	7.9	1.9	2.9	2.5	2.5	2.2	7.1	6.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.2	27.5	10.5	45.9	27.8	21.9	44.2	27.9	28.0	45.1	35.4	38.1
LnGrp LOS	D	C	B	D	C	C	D	C	C	D	D	D
Approach Vol, veh/h		1448			1066			536			842	
Approach Delay, s/veh		26.6			27.9			35.5			38.6	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.3	41.4	13.5	28.4	11.8	39.9	11.7	30.2
Change Period (Y+Rc), s	7.3	* 7.3	4.0	5.3	4.0	7.3	4.0	5.3
Max Green Setting (Gmax), s	18.0	* 70	20.0	41.0	18.0	70.0	20.0	41.0
Max Q Clear Time (g_c+I1), s	3.4	25.6	8.9	20.2	7.4	23.4	7.3	8.4
Green Ext Time (p_c), s	0.0	8.5	0.6	2.9	0.4	6.8	0.5	1.6

Intersection Summary	
HCM 6th Ctrl Delay	30.8
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1074	102	324	1015	0	18	0	390	0	0	0
Future Volume (Veh/h)	0	1074	102	324	1015	0	18	0	390	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	1107	105	334	1046	0	19	0	402	0	0	0
Pedestrians											1	
Lane Width (ft)											12.0	
Walking Speed (ft/s)											3.5	
Percent Blockage											0	
Right turn flare (veh)									1			1
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1047			1212			2350	2874	606	2268	2927	524
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1047			1212			2350	2874	606	2268	2927	524
tC, single (s)	4.2			4.2			7.6	6.6	7.0	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			39			0	100	6	100	100	100
cM capacity (veh/h)	631			544			9	6	428	1	5	485

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	738	474	334	697	349	421	0
Volume Left	0	0	0	334	0	0	19	0
Volume Right	0	0	105	0	0	0	402	0
cSH	1700	1700	1700	544	1700	1700	146	1700
Volume to Capacity	0.00	0.43	0.28	0.61	0.41	0.21	2.88	0.00
Queue Length 95th (ft)	0	0	0	103	0	0	961	0
Control Delay (s)	0.0	0.0	0.0	21.6	0.0	0.0	911.4	0.0
Lane LOS				C			F	A
Approach Delay (s)	0.0			5.2			911.4	0.0
Approach LOS							F	A

Intersection Summary					
Average Delay		129.7			
Intersection Capacity Utilization		64.2%	ICU Level of Service		C
Analysis Period (min)		15			

Intersection	
Int Delay, s/veh	18.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1074	102	324	1015	0	18	0	390	0	0	0
Future Vol, veh/h	0	1074	102	324	1015	0	18	0	390	0	0	0
Conflicting Peds, #/hr	1	0	0	0	0	1	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	340	-	-	195	-	-	-	-	25	-	-	25
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	0	1107	105	334	1046	0	19	0	402	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1047	0	0	1212	0	0	2351	2875	606	2269	2927	524
Stage 1	-	-	-	-	-	-	1160	1160	-	1715	1715	-
Stage 2	-	-	-	-	-	-	1191	1715	-	554	1212	-
Critical Hdwy	4.24	-	-	4.24	-	-	7.64	6.64	7.04	7.64	6.64	7.04
Critical Hdwy Stg 1	-	-	-	-	-	-	6.64	5.64	-	6.64	5.64	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.64	5.64	-	6.64	5.64	-
Follow-up Hdwy	2.27	-	-	2.27	-	-	3.57	4.07	3.37	3.57	4.07	3.37
Pot Cap-1 Maneuver	631	-	-	544	-	-	~ 18	15	428	21	14	485
Stage 1	-	-	-	-	-	-	200	258	-	89	136	-
Stage 2	-	-	-	-	-	-	191	136	-	472	243	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	630	-	-	544	-	-	~ 9	6	428	1	5	485
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 9	6	-	1	5	-
Stage 1	-	-	-	-	-	-	200	258	-	89	52	-
Stage 2	-	-	-	-	-	-	74	52	-	29	243	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	5.2	115.5	0
HCM LOS			F	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	9	428	630	-	-	544	-	-	-	-
HCM Lane V/C Ratio	2.062	0.939	-	-	-	0.614	-	-	-	-
HCM Control Delay (s)	$ 1298.3	60.9	0	-	-	21.6	-	-	0	0
HCM Lane LOS	F	F	A	-	-	C	-	-	A	A
HCM 95th %tile Q(veh)	3.3	10.8	0	-	-	4.1	-	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	284	1180	978	13	11	363
Future Volume (Veh/h)	284	1180	978	13	11	363
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	302	1255	1040	14	12	386
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						1
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1054				2272	520
vC1, stage 1 conf vol					1040	
vC2, stage 2 conf vol					1232	
vCu, unblocked vol	1054				2272	520
tC, single (s)	4.3				7.0	7.1
tC, 2 stage (s)					6.0	
tF (s)	2.3				3.6	3.4
p0 queue free %	51				88	20
cM capacity (veh/h)	611				102	481

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	SB 1
Volume Total	302	628	628	520	520	14	398
Volume Left	302	0	0	0	0	0	12
Volume Right	0	0	0	0	0	14	386
cSH	611	1700	1700	1700	1700	1700	495
Volume to Capacity	0.49	0.37	0.37	0.31	0.31	0.01	0.80
Queue Length 95th (ft)	68	0	0	0	0	0	189
Control Delay (s)	16.5	0.0	0.0	0.0	0.0	0.0	36.8
Lane LOS	C						E
Approach Delay (s)	3.2			0.0			36.8
Approach LOS							E

Intersection Summary			
Average Delay		6.5	
Intersection Capacity Utilization		56.2%	ICU Level of Service
Analysis Period (min)		15	

Intersection	
Int Delay, s/veh	6.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	284	1180	978	13	11	363
Future Vol, veh/h	284	1180	978	13	11	363
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	580	-	-	165	0	25
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	302	1255	1040	14	12	386

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1054	0	-	0	2272	520
Stage 1	-	-	-	-	1040	-
Stage 2	-	-	-	-	1232	-
Critical Hdwy	4.3	-	-	-	7	7.1
Critical Hdwy Stg 1	-	-	-	-	6	-
Critical Hdwy Stg 2	-	-	-	-	6	-
Follow-up Hdwy	2.3	-	-	-	3.6	3.4
Pot Cap-1 Maneuver	611	-	-	-	31	481
Stage 1	-	-	-	-	284	-
Stage 2	-	-	-	-	223	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	611	-	-	-	16	481
Mov Cap-2 Maneuver	-	-	-	-	113	-
Stage 1	-	-	-	-	144	-
Stage 2	-	-	-	-	223	-

Approach	EB	WB	SB
HCM Control Delay, s	3.2	0	36.6
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	611	-	-	-	113	481
HCM Lane V/C Ratio	0.494	-	-	-	0.104	0.803
HCM Control Delay (s)	16.5	-	-	-	40.5	36.5
HCM Lane LOS	C	-	-	-	E	E
HCM 95th %tile Q(veh)	2.7	-	-	-	0.3	7.5

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1180	11	1	975	0	17	0	4	0	0	1
Future Volume (Veh/h)	0	1180	11	1	975	0	17	0	4	0	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	1216	11	1	1005	0	18	0	4	0	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									1			
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1005			1227			1722	2223	608	1617	2234	502
vC1, stage 1 conf vol							1216	1216		1007	1007	
vC2, stage 2 conf vol							506	1007		610	1227	
vCu, unblocked vol	1005			1227			1722	2223	608	1617	2234	502
tC, single (s)	4.3			4.3			7.7	6.7	7.1	7.7	6.7	7.1
tC, 2 stage (s)							6.7	5.7		6.7	5.7	
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			100			89	100	99	100	100	100
cM capacity (veh/h)	628			512			165	180	415	209	178	489

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	608	608	11	1	670	335	22	1
Volume Left	0	0	0	0	1	0	0	18	0
Volume Right	0	0	0	11	0	0	0	4	1
cSH	1700	1700	1700	1700	512	1700	1700	202	489
Volume to Capacity	0.00	0.36	0.36	0.01	0.00	0.39	0.20	0.11	0.00
Queue Length 95th (ft)	0	0	0	0	0	0	0	9	0
Control Delay (s)	0.0	0.0	0.0	0.0	12.1	0.0	0.0	26.6	12.4
Lane LOS					B			D	B
Approach Delay (s)	0.0				0.0			26.6	12.4
Approach LOS								D	B

Intersection Summary				
Average Delay		0.3		
Intersection Capacity Utilization		49.3%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection	
Int Delay, s/veh	0.3

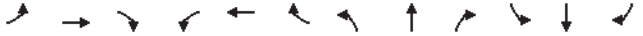
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1180	11	1	975	0	17	0	4	0	0	1
Future Vol, veh/h	0	1180	11	1	975	0	17	0	4	0	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	275	305	-	-	-	-	25	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	12	12	12	12	12	12	12	12	12	12	12	12
Mvmt Flow	0	1216	11	1	1005	0	18	0	4	0	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1005	0	0	1227	0	0	1721	2223	608	1615	2234	503
Stage 1	-	-	-	-	-	-	1216	1216	-	1007	1007	-
Stage 2	-	-	-	-	-	-	505	1007	-	608	1227	-
Critical Hdwy	4.34	-	-	4.34	-	-	7.74	6.74	7.14	7.74	6.74	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	6.74	5.74	-	6.74	5.74	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.74	5.74	-	6.74	5.74	-
Follow-up Hdwy	2.32	-	-	2.32	-	-	3.62	4.12	3.42	3.62	4.12	3.42
Pot Cap-1 Maneuver	628	-	-	512	-	-	52	38	415	62	37	488
Stage 1	-	-	-	-	-	-	177	233	-	240	296	-
Stage 2	-	-	-	-	-	-	493	296	-	426	230	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	628	-	-	512	-	-	52	38	415	61	37	488
Mov Cap-2 Maneuver	-	-	-	-	-	-	161	175	-	204	173	-
Stage 1	-	-	-	-	-	-	177	233	-	240	295	-
Stage 2	-	-	-	-	-	-	491	295	-	422	230	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	27	12.4
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	161	415	628	-	-	512	-	-	488
HCM Lane V/C Ratio	0.109	0.01	-	-	-	0.002	-	-	0.002
HCM Control Delay (s)	30.1	13.8	0	-	-	12	-	-	12.4
HCM Lane LOS	D	B	A	-	-	B	-	-	B
HCM 95th %tile Q(veh)	0.4	0	0	-	-	0	-	-	0

Reso A - Exhibit C2 (EIR Technical Appendix)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Traffic Volume (veh/h)	69	235	64	314	204	109	49	299	294	34	480	95
Future Volume (veh/h)	69	235	64	314	204	109	49	299	294	34	480	95
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	74	253	69	338	219	117	53	322	316	37	516	102
Approach Volume (veh/h)		396			674			691			655	
Crossing Volume (veh/h)		891			449			364			610	
High Capacity (veh/h)		681			972			1040			855	
High v/c (veh/h)		0.58			0.69			0.66			0.77	
Low Capacity (veh/h)		533			789			850			685	
Low v/c (veh/h)		0.74			0.85			0.81			0.96	

Intersection Summary					
Maximum v/c High		0.77			
Maximum v/c Low		0.96			
Intersection Capacity Utilization		115.5%	ICU Level of Service		H

Intersection	
Intersection Delay, s/veh	25.1
Intersection LOS	D

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	396	674	691	655
Demand Flow Rate, veh/h	401	680	698	661
Vehicles Circulating, veh/h	899	454	368	616
Vehicles Exiting, veh/h	378	612	932	518
Ped Vol Crossing Leg, #/h	1	1	1	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	25.8	21.4	17.4	36.7
Approach LOS	D	C	C	E

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	401	680	698	661
Cap Entry Lane, veh/h	552	868	948	736
Entry HV Adj Factor	0.989	0.991	0.990	0.991
Flow Entry, veh/h	396	674	691	655
Cap Entry, veh/h	545	860	938	729
V/C Ratio	0.727	0.783	0.736	0.898
Control Delay, s/veh	25.8	21.4	17.4	36.7
LOS	D	C	C	E
95th %tile Queue, veh	6	8	7	12

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Volume (veh/h)	1	80	10	2	60	0	10	1	1	0	0	0
Future Volume (Veh/h)	1	80	10	2	60	0	10	1	1	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	87	11	2	65	0	11	1	1	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	65			98			164	164	92	165	169	65
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	65			98			164	164	92	165	169	65
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	100	100	100	100	100
cM capacity (veh/h)	1524			1483			796	724	959	792	719	993

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	99	67	13	0
Volume Left	1	2	11	0
Volume Right	11	0	1	0
cSH	1524	1483	800	1700
Volume to Capacity	0.00	0.00	0.02	0.00
Queue Length 95th (ft)	0	0	1	0
Control Delay (s)	0.1	0.2	9.6	0.0
Lane LOS	A	A	A	A
Approach Delay (s)	0.1	0.2	9.6	0.0
Approach LOS			A	A

Intersection Summary					
Average Delay			0.8		
Intersection Capacity Utilization			15.2%	ICU Level of Service	A
Analysis Period (min)			15		

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Vol, veh/h	1	80	10	2	60	0	10	1	1	0	0	0
Future Vol, veh/h	1	80	10	2	60	0	10	1	1	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	1	87	11	2	65	0	11	1	1	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	65	0	0	98	0	0	164	164	93	165	169	65
Stage 1	-	-	-	-	-	-	95	95	-	69	69	-
Stage 2	-	-	-	-	-	-	69	69	-	96	100	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	1524	-	-	1483	-	-	796	725	959	795	720	993
Stage 1	-	-	-	-	-	-	907	812	-	936	834	-
Stage 2	-	-	-	-	-	-	936	834	-	906	808	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1524	-	-	1483	-	-	794	724	959	792	719	993
Mov Cap-2 Maneuver	-	-	-	-	-	-	794	724	-	792	719	-
Stage 1	-	-	-	-	-	-	906	811	-	935	833	-
Stage 2	-	-	-	-	-	-	935	833	-	903	807	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.2	9.6	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	799	1524	-	-	1483	-	-	-
HCM Lane V/C Ratio	0.016	0.001	-	-	0.001	-	-	-
HCM Control Delay (s)	9.6	7.4	0	-	7.4	0	-	0
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	21	522	255	464	652	6	47	281	358	359	110
v/c Ratio	0.19	0.69	0.70	0.57	0.62	0.03	0.26	0.69	0.76	0.75	0.21
Control Delay	54.3	40.3	47.8	25.6	4.9	44.2	47.2	15.1	43.7	43.0	4.2
Queue Delay	0.0	0.0	0.0	1.1	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.3	40.3	47.8	26.7	5.4	44.2	47.2	15.1	43.7	43.0	4.2
Queue Length 50th (ft)	12	148	141	184	0	3	27	0	198	198	0
Queue Length 95th (ft)	44	255	268	401	81	17	69	80	#407	#390	28
Internal Link Dist (ft)		346		307			744			674	
Turn Bay Length (ft)	65		125			140		165	150		185
Base Capacity (vph)	108	995	542	984	1125	378	398	560	631	641	665
Starvation Cap Reductn	0	0	9	298	143	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.52	0.48	0.68	0.66	0.02	0.12	0.50	0.57	0.56	0.17

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	460	31	240	436	613	6	44	264	590	84	103
Future Volume (vph)	20	460	31	240	436	613	6	44	264	590	84	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1787	3534		1787	1881	1558	1787	1881	1599	1698	1722	1560
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00
Satd. Flow (perm)	1787	3534		1787	1881	1558	1787	1881	1599	1698	1722	1560
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	21	489	33	255	464	652	6	47	281	628	89	110
RTOR Reduction (vph)	0	4	0	0	0	375	0	0	254	0	0	80
Lane Group Flow (vph)	21	518	0	255	464	277	6	47	27	358	359	30
Confl. Peds. (#/hr)			4			2						2
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	1.7	22.9		18.8	40.0	40.0	8.9	8.9	8.9	25.7	25.7	25.7
Effective Green, g (s)	1.7	22.9		18.8	40.0	40.0	8.9	8.9	8.9	25.7	25.7	25.7
Actuated g/C Ratio	0.02	0.24		0.20	0.42	0.42	0.09	0.09	0.09	0.27	0.27	0.27
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	32	858		356	797	660	168	177	150	462	469	425
v/s Ratio Prot	0.01	0.15		c0.14	c0.25		0.00	c0.02		c0.21	0.21	
v/s Ratio Perm						0.18			0.02			0.02
v/c Ratio	0.66	0.60		0.72	0.58	0.42	0.04	0.27	0.18	0.77	0.77	0.07
Uniform Delay, d1	46.0	31.7		35.3	20.8	19.0	38.8	39.7	39.3	31.6	31.5	25.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	39.4	1.2		6.7	1.1	0.4	0.1	0.8	0.6	7.9	7.3	0.1
Delay (s)	85.4	32.9		42.0	21.8	19.4	38.9	40.5	39.9	39.6	38.8	25.5
Level of Service	F	C		D	C	B	D	D	D	D	D	C
Approach Delay (s)		34.9			24.4			40.0			37.4	
Approach LOS		C			C			D			D	

Intersection Summary

HCM 2000 Control Delay	31.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	94.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	460	31	240	436	613	6	44	264	590	84	103
Future Volume (veh/h)	20	460	31	240	436	613	6	44	264	590	84	103
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	21	489	33	255	464	652	6	47	281	692	0	110
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	39	949	64	290	790	653	305	320	271	807	0	358
Arrive On Green	0.02	0.28	0.28	0.16	0.42	0.42	0.17	0.17	0.17	0.22	0.00	0.22
Sat Flow, veh/h	1795	3404	229	1795	1885	1559	1795	1885	1598	3591	0	1591
Grp Volume(v), veh/h	21	257	265	255	464	652	6	47	281	692	0	110
Grp Sat Flow(s),veh/h/ln	1795	1791	1842	1795	1885	1559	1795	1885	1598	1795	0	1591
Q Serve(g_s), s	1.3	13.2	13.2	15.1	20.7	45.5	0.3	2.3	18.5	20.2	0.0	6.3
Cycle Q Clear(g_c), s	1.3	13.2	13.2	15.1	20.7	45.5	0.3	2.3	18.5	20.2	0.0	6.3
Prop In Lane	1.00		0.12	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	39	499	514	290	790	653	305	320	271	807	0	358
V/C Ratio(X)	0.54	0.51	0.52	0.88	0.59	1.00	0.02	0.15	1.04	0.86	0.00	0.31
Avail Cap(c_a), veh/h	87	499	514	436	790	653	305	320	271	1070	0	474
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.8	33.1	33.1	44.7	24.4	31.6	37.7	38.6	45.3	40.6	0.0	35.2
Incr Delay (d2), s/veh	11.3	0.9	0.9	12.7	1.1	34.7	0.0	0.2	64.6	5.5	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	5.9	6.1	7.7	9.3	22.8	0.1	1.1	12.1	9.4	0.0	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.1	34.0	34.0	57.4	25.6	66.3	37.8	38.8	109.9	46.1	0.0	35.7
LnGrp LOS	E	C	C	E	C	E	D	D	F	D	A	D
Approach Vol, veh/h		543			1371			334			802	
Approach Delay, s/veh		35.2			50.9			98.6			44.7	
Approach LOS		D			D			F			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	22.1	34.9		29.0	6.9	50.2		23.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	26.5	24.5		32.5	5.3	45.7		18.5				
Max Q Clear Time (g_c+I1), s	17.1	15.2		22.2	3.3	47.5		20.5				
Green Ext Time (p_c), s	0.5	2.2		2.3	0.0	0.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			51.7									
HCM 6th LOS			D									

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	91	1323	20	1083	266	276	30	447	8	27
v/c Ratio	0.42	0.70	0.15	0.69	0.34	0.66	0.05	0.77	0.02	0.04
Control Delay	45.5	18.6	47.5	23.8	8.2	34.7	22.6	28.1	22.4	0.1
Queue Delay	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.5	19.4	47.5	23.8	8.2	34.7	22.6	28.1	22.4	0.1
Queue Length 50th (ft)	47	218	10	243	27	131	12	153	3	0
Queue Length 95th (ft)	109	482	38	409	96	233	33	290	14	0
Internal Link Dist (ft)		307		269			836			575
Turn Bay Length (ft)	120		220		145	130		110	95	
Base Capacity (vph)	311	2306	137	2066	980	727	983	903	725	931
Starvation Cap Reductn	0	624	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.79	0.15	0.52	0.27	0.38	0.03	0.50	0.01	0.03

Intersection Summary

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	1200	31	19	1007	247	257	28	416	7	0	25
Future Volume (vph)	85	1200	31	19	1007	247	257	28	416	7	0	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	3558		1787	3574	1564	1787	1881	1599	1787	1599	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.74	1.00	1.00	0.74	1.00	
Satd. Flow (perm)	1787	3558		1787	3574	1564	1391	1881	1599	1388	1599	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	91	1290	33	20	1083	266	276	30	447	8	0	27
RTOR Reduction (vph)	0	1	0	0	0	99	0	0	100	0	19	0
Lane Group Flow (vph)	91	1322	0	20	1083	167	276	30	347	8	8	0
Confl. Peds. (#/hr)			5									
Confl. Bikes (#/hr)			1			2						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		
Actuated Green, G (s)	7.5	42.8		1.7	37.0	37.0	24.4	24.4	24.4	24.4	24.4	
Effective Green, g (s)	7.5	42.8		1.7	37.0	37.0	24.4	24.4	24.4	24.4	24.4	
Actuated g/C Ratio	0.09	0.52		0.02	0.45	0.45	0.30	0.30	0.30	0.30	0.30	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	162	1848		36	1604	702	411	556	473	411	473	
v/s Ratio Prot	c0.05	c0.37		0.01	0.30			0.02			0.01	
v/s Ratio Perm						0.11	0.20		c0.22	0.01		
v/c Ratio	0.56	0.72		0.56	0.68	0.24	0.67	0.05	0.73	0.02	0.02	
Uniform Delay, d1	35.9	15.1		40.0	17.9	14.0	25.5	20.7	26.1	20.5	20.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.4	1.3		17.3	1.1	0.2	4.3	0.0	5.8	0.0	0.0	
Delay (s)	40.3	16.5		57.2	19.1	14.2	29.8	20.8	31.9	20.6	20.5	
Level of Service	D	B		E	B	B	C	C	C	C	C	
Approach Delay (s)		18.0			18.7			30.7			20.5	
Approach LOS		B			B			C			C	

Intersection Summary				
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	82.4	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	75.3%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	1200	31	19	1007	247	257	28	416	7	0	25
Future Volume (veh/h)	85	1200	31	19	1007	247	257	28	416	7	0	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	91	1290	33	20	1083	0	276	30	447	8	0	27
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	119	1676	43	41	1529		533	610	517	387	0	517
Arrive On Green	0.07	0.47	0.47	0.02	0.43	0.00	0.32	0.32	0.32	0.32	0.00	0.32
Sat Flow, veh/h	1795	3566	91	1795	3582	1598	1394	1885	1598	925	0	1598
Grp Volume(v), veh/h	91	647	676	20	1083	0	276	30	447	8	0	27
Grp Sat Flow(s),veh/h/ln	1795	1791	1866	1795	1791	1598	1394	1885	1598	925	0	1598
Q Serve(g_s), s	3.7	22.1	22.1	0.8	18.3	0.0	12.5	0.8	19.3	0.4	0.0	0.9
Cycle Q Clear(g_c), s	3.7	22.1	22.1	0.8	18.3	0.0	13.3	0.8	19.3	1.2	0.0	0.9
Prop In Lane	1.00		0.05	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	119	842	877	41	1529		533	610	517	387	0	517
V/C Ratio(X)	0.77	0.77	0.77	0.49	0.71		0.52	0.05	0.87	0.02	0.00	0.05
Avail Cap(c_a), veh/h	305	1182	1231	134	2023		793	962	815	560	0	815
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.8	16.2	16.2	35.5	17.3	0.0	21.7	17.1	23.4	17.5	0.0	17.1
Incr Delay (d2), s/veh	9.8	2.0	2.0	8.7	0.8	0.0	0.8	0.0	5.9	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	8.5	8.9	0.4	7.0	0.0	3.9	0.3	7.5	0.1	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.6	18.2	18.1	44.2	18.1	0.0	22.5	17.1	29.3	17.5	0.0	17.2
LnGrp LOS	D	B	B	D	B		C	B	C	B	A	B
Approach Vol, veh/h		1414			1103	A		753			35	
Approach Delay, s/veh		19.8			18.6			26.3			17.2	
Approach LOS		B			B			C			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.2	39.0		28.3	9.4	35.9		28.3				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.5	48.5		37.5	12.5	41.5		37.5				
Max Q Clear Time (g_c+I1), s	2.8	24.1		3.2	5.7	20.3		21.3				
Green Ext Time (p_c), s	0.0	10.4		0.1	0.1	8.3		2.5				

Intersection Summary				
HCM 6th Ctrl Delay	20.8			
HCM 6th LOS	C			

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Near Term Plus 1293 Unit Project and School PM
10: River Road & Creston Road — Queues

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	415	1293	63	770	308	232	67	73	577
v/c Ratio	0.69	0.80	0.41	0.63	0.67	0.27	0.14	0.47	0.76
Control Delay	48.0	27.8	57.5	30.4	52.8	36.1	0.6	60.3	28.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	27.8	57.5	30.4	52.8	36.1	0.6	60.3	28.9
Queue Length 50th (ft)	141	378	42	221	106	72	0	49	105
Queue Length 95th (ft)	211	528	94	320	#170	114	0	106	177
Internal Link Dist (ft)		353		673		608			523
Turn Bay Length (ft)	295		235		140		130	225	
Base Capacity (vph)	783	1940	197	1577	527	1062	570	182	1006
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.67	0.32	0.49	0.58	0.22	0.12	0.40	0.57

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Olsen-Chandler SP — Near Term Plus 1293 Unit Project and School PM
10: River Road & Creston Road — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	394	836	392	60	654	78	293	220	64	69	222	326
Future Volume (vph)	394	836	392	60	654	78	293	220	64	69	222	326
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.98		1.00	1.00	0.85	1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3467	3388		1787	3512		3467	3574	1599	1787	3230	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3467	3388		1787	3512		3467	3574	1599	1787	3230	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	415	880	413	63	688	82	308	232	67	73	234	343
RTOR Reduction (vph)	0	45	0	0	8	0	0	0	51	0	230	0
Lane Group Flow (vph)	415	1248	0	63	762	0	308	232	16	73	347	0
Confl. Peds. (#/hr)			1			1						1
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	17.4	46.4		6.9	35.9		13.3	24.1	24.1	6.8	17.6	
Effective Green, g (s)	17.4	46.4		6.9	35.9		13.3	24.1	24.1	6.8	17.6	
Actuated g/C Ratio	0.17	0.45		0.07	0.35		0.13	0.24	0.24	0.07	0.17	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	590	1538		120	1233		451	842	377	118	556	
v/s Ratio Prot	c0.12	c0.37		0.04	0.22		c0.09	0.06		0.04	c0.11	
v/s Ratio Perm									0.01			
v/c Ratio	0.70	0.81		0.53	0.62		0.68	0.28	0.04	0.62	0.62	
Uniform Delay, d1	40.0	24.1		46.1	27.5		42.4	31.9	30.1	46.4	39.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.8	3.4		4.1	0.9		4.2	0.2	0.0	9.3	2.2	
Delay (s)	43.8	27.5		50.2	28.4		46.7	32.1	30.2	55.7	41.4	
Level of Service	D	C		D	C		D	C	C	E	D	
Approach Delay (s)		31.4			30.0			39.3			43.0	
Approach LOS		C			C			D			D	

Intersection Summary

HCM 2000 Control Delay	34.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	102.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	80.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	394	836	392	60	654	78	293	220	64	69	222	326
Future Volume (veh/h)	394	836	392	60	654	78	293	220	64	69	222	326
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	415	880	0	63	688	82	308	232	67	73	234	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	574	1494		96	984	117	439	656	292	103	410	
Arrive On Green	0.16	0.42	0.00	0.05	0.31	0.31	0.13	0.18	0.18	0.06	0.11	0.00
Sat Flow, veh/h	3483	3676	0	1795	3218	383	3483	3582	1598	1795	3676	0
Grp Volume(v), veh/h	415	880	0	63	383	387	308	232	67	73	234	0
Grp Sat Flow(s),veh/h/ln	1742	1791	0	1795	1791	1810	1742	1791	1598	1795	1791	0
Q Serve(g_s), s	7.0	11.8	0.0	2.1	11.7	11.8	5.3	3.5	2.2	2.5	3.9	0.0
Cycle Q Clear(g_c), s	7.0	11.8	0.0	2.1	11.7	11.8	5.3	3.5	2.2	2.5	3.9	0.0
Prop In Lane	1.00		0.00	1.00		0.21	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	574	1494		96	548	553	439	656	292	103	410	
V/C Ratio(X)	0.72	0.59		0.66	0.70	0.70	0.70	0.35	0.23	0.71	0.57	
Avail Cap(c_a), veh/h	1202	3077		303	1222	1235	811	1628	726	280	1352	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	24.7	14.0	0.0	28.9	19.1	19.1	26.1	22.2	21.7	28.8	26.1	0.0
Incr Delay (d2), s/veh	1.7	0.4	0.0	7.5	1.6	1.6	2.0	0.3	0.4	8.5	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	4.3	0.0	1.1	4.6	4.6	2.1	1.4	0.8	1.2	1.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.4	14.4	0.0	36.4	20.7	20.7	28.1	22.5	22.1	37.3	27.4	0.0
LnGrp LOS	C	B		D	C	C	C	C	C	D	C	
Approach Vol, veh/h		1295	A		833			607			307	A
Approach Delay, s/veh		18.3			21.9			25.3			29.7	
Approach LOS		B			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.8	30.5	12.4	11.6	14.8	23.5	8.1	15.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.5	53.5	14.5	23.5	21.5	42.5	9.7	28.3
Max Q Clear Time (g_c+I1), s	4.1	13.8	7.3	5.9	9.0	13.8	4.5	5.5
Green Ext Time (p_c), s	0.0	7.6	0.6	1.1	1.2	5.1	0.1	1.5

Intersection Summary	
HCM 6th Ctrl Delay	21.8
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	58	510	1031	674	73
v/c Ratio	0.29	0.28	0.74	0.65	0.14
Control Delay	43.4	12.3	22.0	30.6	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	43.4	12.3	22.0	30.6	8.9
Queue Length 50th (ft)	24	56	161	131	0
Queue Length 95th (ft)	88	171	407	#372	40
Internal Link Dist (ft)		1151	2310	505	
Turn Bay Length (ft)	125			120	
Base Capacity (vph)	268	2646	2044	1340	654
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.22	0.19	0.50	0.50	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	56	495	511	489	654	71
Future Volume (vph)	56	495	511	489	654	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.93		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1787	3574	3285		3467	1578
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1787	3574	3285		3467	1578
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	58	510	527	504	674	73
RTOR Reduction (vph)	0	0	137	0	0	52
Lane Group Flow (vph)	58	510	894	0	674	21
Confl. Peds. (#/hr)				4		1
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	NA		Perm	Perm
Protected Phases	5	2	6			
Permitted Phases					4	4
Actuated Green, G (s)	6.3	39.5	28.7		22.6	22.6
Effective Green, g (s)	6.3	39.5	28.7		22.6	22.6
Actuated g/C Ratio	0.08	0.50	0.36		0.29	0.29
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	142	1787	1193		991	451
v/s Ratio Prot	c0.03	0.14	c0.27			
v/s Ratio Perm					c0.19	0.01
v/c Ratio	0.41	0.29	0.75		0.68	0.05
Uniform Delay, d1	34.6	11.5	22.0		25.0	20.4
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.9	0.1	2.6		1.9	0.0
Delay (s)	36.5	11.6	24.6		26.9	20.4
Level of Service	D	B	C		C	C
Approach Delay (s)		14.1	24.6		26.3	
Approach LOS		B	C		C	

Intersection Summary				
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	79.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	64.1%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Near Term Plus 1293 Unit Project and School PM
12: Creston Road & Niblick Road/Sherwood Road — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	199	589	369	110	486	396	237	575	378	738
v/c Ratio	0.73	1.08	0.51	0.56	0.63	0.61	0.82	0.73	1.08	0.81
Control Delay	52.2	94.8	5.9	49.3	35.0	7.8	59.7	36.0	107.5	37.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.2	94.8	5.9	49.3	35.0	7.8	59.7	36.0	107.5	37.3
Queue Length 50th (ft)	108	~404	0	60	131	0	132	152	~256	198
Queue Length 95th (ft)	#200	#605	66	113	183	75	#255	210	#428	#273
Internal Link Dist (ft)		1092			186			1440		2310
Turn Bay Length (ft)	150			170		140	230		245	
Base Capacity (vph)	308	546	717	223	850	677	308	888	350	968
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.65	1.08	0.51	0.49	0.57	0.58	0.77	0.65	1.08	0.76

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Olsen-Chandler SP — Near Term Plus 1293 Unit Project and School PM
12: Creston Road & Niblick Road/Sherwood Road — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	187	554	347	103	457	372	223	463	77	355	548	146
Future Volume (vph)	187	554	347	103	457	372	223	463	77	355	548	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1881	1571	1787	3574	1578	1787	3498		1787	3443	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	1881	1571	1787	3574	1578	1787	3498		1787	3443	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	199	589	369	110	486	396	237	493	82	378	583	155
RTOR Reduction (vph)	0	0	263	0	0	307	0	15	0	0	27	0
Lane Group Flow (vph)	199	589	106	110	486	89	237	560	0	378	711	0
Confl. Peds. (#/hr)			4			1						10
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	13.0	24.7	24.7	7.7	19.4	19.4	13.8	18.9		16.7	21.8	
Effective Green, g (s)	13.0	24.7	24.7	7.7	19.4	19.4	13.8	18.9		16.7	21.8	
Actuated g/C Ratio	0.15	0.29	0.29	0.09	0.23	0.23	0.16	0.22		0.19	0.25	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	270	540	451	159	806	355	286	768		347	872	
v/s Ratio Prot	c0.11	c0.31		0.06	0.14		0.13	0.16		c0.21	c0.21	
v/s Ratio Perm			0.07			0.06						
v/c Ratio	0.74	1.09	0.23	0.69	0.60	0.25	0.83	0.73		1.09	0.82	
Uniform Delay, d1	34.9	30.6	23.4	38.0	29.8	27.3	35.0	31.2		34.6	30.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.0	65.7	0.3	12.2	1.3	0.4	17.6	3.5		74.4	5.9	
Delay (s)	44.9	96.4	23.7	50.2	31.1	27.7	52.6	34.7		109.0	36.1	
Level of Service	D	F	C	D	C	C	D	C		F	D	
Approach Delay (s)		64.3			31.9			39.9			60.8	
Approach LOS		E			C			D			E	

Intersection Summary				
HCM 2000 Control Delay	50.6	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.02			
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	84.8%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Near Term Plus 1293 Unit Project and School PM
12: Creston Road & Niblick Road/Sherwood Road — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	187	554	347	103	457	372	223	463	77	355	548	146
Future Volume (veh/h)	187	554	347	103	457	372	223	463	77	355	548	146
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	199	589	369	110	486	396	237	493	82	378	583	155
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	239	562	475	141	873	389	276	624	103	361	698	185
Arrive On Green	0.13	0.30	0.30	0.08	0.24	0.24	0.15	0.20	0.20	0.20	0.25	0.25
Sat Flow, veh/h	1795	1885	1591	1795	3582	1596	1795	3075	509	1795	2792	740
Grp Volume(v), veh/h	199	589	369	110	486	396	237	286	289	378	373	365
Grp Sat Flow(s),veh/h/ln	1795	1885	1591	1795	1791	1596	1795	1791	1794	1795	1791	1741
Q Serve(g_s), s	8.9	24.5	17.4	4.9	9.7	20.0	10.6	12.4	12.6	16.5	16.2	16.3
Cycle Q Clear(g_c), s	8.9	24.5	17.4	4.9	9.7	20.0	10.6	12.4	12.6	16.5	16.2	16.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.28	1.00		0.43
Lane Grp Cap(c), veh/h	239	562	475	141	873	389	276	364	364	361	448	435
V/C Ratio(X)	0.83	1.05	0.78	0.78	0.56	1.02	0.86	0.79	0.79	1.05	0.83	0.84
Avail Cap(c_a), veh/h	317	562	475	230	873	389	317	458	459	361	502	488
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.7	28.8	26.3	37.1	27.2	31.0	33.8	31.0	31.1	32.8	29.2	29.2
Incr Delay (d2), s/veh	13.3	50.9	8.0	9.0	0.8	50.5	18.4	7.0	7.4	60.3	10.6	11.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	18.1	7.1	2.4	4.0	12.6	5.8	5.8	5.9	12.9	7.9	7.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.9	79.7	34.3	46.2	28.0	81.5	52.2	38.0	38.5	93.1	39.7	40.4
LnGrp LOS	D	F	C	D	C	F	D	D	D	F	D	D
Approach Vol, veh/h		1157			992			812			1116	
Approach Delay, s/veh		59.8			51.4			42.3			58.0	
Approach LOS		E			D			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.0	21.2	10.9	29.0	17.1	25.0	15.4	24.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	16.5	21.0	10.5	24.0	14.5	23.0	14.5	20.0
Max Q Clear Time (g_c+I1), s	18.5	14.6	6.9	26.5	12.6	18.3	10.9	22.0
Green Ext Time (p_c), s	0.0	1.8	0.1	0.0	0.1	1.9	0.2	0.0

Intersection Summary	
HCM 6th Ctrl Delay	53.8
HCM 6th LOS	D

Olsen-Chandler SP — Near Term Plus 1293 Unit Project and School PM
13: Creston Road & Scott Street — HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	54	66	620	47	100	808
Future Volume (Veh/h)	54	66	620	47	100	808
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	58	71	667	51	108	869
Pedestrians	2					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1780	694			720	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1780	694			720	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	27	84			88	
cM capacity (veh/h)	80	443			885	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	129	718	108	869
Volume Left	58	0	108	0
Volume Right	71	51	0	0
cSH	145	1700	885	1700
Volume to Capacity	0.89	0.42	0.12	0.51
Queue Length 95th (ft)	150	0	10	0
Control Delay (s)	107.3	0.0	9.6	0.0
Lane LOS	F		A	
Approach Delay (s)	107.3	0.0	1.1	
Approach LOS	F			

Intersection Summary			
Average Delay	8.2		
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	8.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	54	66	620	47	100	808
Future Vol, veh/h	54	66	620	47	100	808
Conflicting Peds, #/hr	0	0	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	58	71	667	51	108	869

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1780	695	0	0	720	0
Stage 1	695	-	-	-	-	-
Stage 2	1085	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.11	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209	-
Pot Cap-1 Maneuver	91	444	-	-	886	-
Stage 1	497	-	-	-	-	-
Stage 2	326	-	-	-	-	-
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	80	443	-	-	884	-
Mov Cap-2 Maneuver	80	-	-	-	-	-
Stage 1	496	-	-	-	-	-
Stage 2	286	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	105.9	0	1.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	146	884	-
HCM Lane V/C Ratio	-	-	0.884	0.122	-
HCM Control Delay (s)	-	-	105.9	9.6	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	6	0.4	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	113	4	14	4	1	38	22	429	10	48	560	134
Future Volume (Veh/h)	113	4	14	4	1	38	22	429	10	48	560	134
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Hourly flow rate (vph)	114	4	14	4	1	38	22	433	10	48	566	135
Pedestrians		5									4	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		3.5									3.5	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1186	1154	571	1160	1284	442	706			443		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1186	1154	571	1160	1284	442	706			443		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	22	98	97	97	99	94	98			96		
cM capacity (veh/h)	146	184	520	157	154	615	893			1122		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	132	43	22	443	48	566	135
Volume Left	114	4	22	0	48	0	0
Volume Right	14	38	0	10	0	0	135
cSH	159	459	893	1700	1122	1700	1700
Volume to Capacity	0.83	0.09	0.02	0.26	0.04	0.33	0.08
Queue Length 95th (ft)	139	8	2	0	3	0	0
Control Delay (s)	89.5	13.7	9.1	0.0	8.4	0.0	0.0
Lane LOS	F	B	A		A		
Approach Delay (s)	89.5	13.7	0.4		0.5		
Approach LOS	F	B					

Intersection Summary				
Average Delay	9.4			
Intersection Capacity Utilization	56.8%	ICU Level of Service	B	
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	113	4	14	4	1	38	22	429	10	48	560	134
Future Vol, veh/h	113	4	14	4	1	38	22	429	10	48	560	134
Conflicting Peds, #/hr	4	0	0	0	0	4	5	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	30	-	-	70	-	60
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	99	99	99	99	99	99	99	99	99	99	99	99
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	114	4	14	4	1	38	22	433	10	48	566	135

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1173	1154	571	1221	1284	442	706	0	0	443	0	0
Stage 1	667	667	-	482	482	-	-	-	-	-	-	-
Stage 2	506	487	-	739	802	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	170	198	522	157	166	618	897	-	-	1122	-	-
Stage 1	450	458	-	567	555	-	-	-	-	-	-	-
Stage 2	551	552	-	411	398	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	149	184	520	143	154	616	893	-	-	1122	-	-
Mov Cap-2 Maneuver	149	184	-	143	154	-	-	-	-	-	-	-
Stage 1	437	436	-	553	541	-	-	-	-	-	-	-
Stage 2	501	538	-	379	379	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	85.3	13.9	0.4	0.5
HCM LOS	F	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	893	-	-	162	447	1122	-	-
HCM Lane V/C Ratio	0.025	-	-	0.817	0.097	0.043	-	-
HCM Control Delay (s)	9.1	-	-	85.3	13.9	8.4	-	-
HCM Lane LOS	A	-	-	F	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	5.4	0.3	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	8	2	9	184	3	204	11	248	286	320	246	12
Future Volume (vph)	8	2	9	184	3	204	11	248	286	320	246	12
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	9	2	10	198	3	219	12	267	308	344	265	13

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	21	420	279	308	477	146
Volume Left (vph)	9	198	12	0	344	0
Volume Right (vph)	10	219	0	308	0	13
Hadj (s)	-0.18	-0.20	0.04	-0.68	0.38	-0.05
Departure Headway (s)	8.4	6.6	7.4	6.6	7.5	7.1
Degree Utilization, x	0.05	0.77	0.57	0.57	1.00	0.29
Capacity (veh/h)	393	535	478	541	474	499
Control Delay (s)	11.8	28.8	18.6	16.8	66.8	11.7
Approach Delay (s)	11.8	28.8	17.6		54.0	
Approach LOS	B	D	C		F	

Intersection Summary				
Delay	34.1			
Level of Service	D			
Intersection Capacity Utilization	71.1%	ICU Level of Service	C	
Analysis Period (min)	15			

Intersection	
Intersection Delay, s/veh	35.5
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Vol, veh/h	8	2	9	184	3	204	0	11	248	286	320	246
Future Vol, veh/h	8	2	9	184	3	204	0	11	248	286	320	246
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	1	1	1	1	1	1	2	1	1	1	1	1
Mvmt Flow	9	2	10	198	3	219	0	12	267	308	344	265
Number of Lanes	0	1	0	0	1	0	0	0	1	1	0	2

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	12	30.5	18.7	55.5
HCM LOS	B	D	C	F

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	4%	0%	42%	47%	72%	0%
Vol Thru, %	96%	0%	11%	1%	28%	91%
Vol Right, %	0%	100%	47%	52%	0%	9%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	259	286	19	391	443	135
LT Vol	11	0	8	184	320	0
Through Vol	248	0	2	3	123	123
RT Vol	0	286	9	204	0	12
Lane Flow Rate	278	308	20	420	476	145
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.572	0.568	0.048	0.788	0.999	0.287
Departure Headway (Hd)	7.395	6.652	8.513	6.744	7.55	7.115
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	487	541	419	538	481	505
Service Time	5.149	4.405	6.6	4.78	5.299	4.864
HCM Lane V/C Ratio	0.571	0.569	0.048	0.781	0.99	0.287
HCM Control Delay	19.6	17.9	12	30.5	68.5	12.7
HCM Lane LOS	C	C	B	D	F	B
HCM 95th-tile Q	3.5	3.5	0.2	7.3	13.3	1.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBR
Lane Configurations	
Traffic Vol, veh/h	12
Future Vol, veh/h	12
Peak Hour Factor	0.93
Heavy Vehicles, %	1
Mvmt Flow	13
Number of Lanes	0

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	345	247	148	200	198	241
Future Volume (Veh/h)	345	247	148	200	198	241
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	356	255	153	206	204	248
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	613	204	452			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	613	204	452			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	3	68	86			
cM capacity (veh/h)	368	806	1112			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	611	153	103	103	204	248
Volume Left	356	153	0	0	0	0
Volume Right	255	0	0	0	0	248
cSH	592	1112	1700	1700	1700	1700
Volume to Capacity	1.03	0.14	0.06	0.06	0.12	0.15
Queue Length 95th (ft)	408	12	0	0	0	0
Control Delay (s)	71.7	8.8	0.0	0.0	0.0	0.0
Lane LOS	F	A				
Approach Delay (s)	71.7	3.7			0.0	
Approach LOS	F					

Intersection Summary			
Average Delay		31.7	
Intersection Capacity Utilization		47.7%	ICU Level of Service A
Analysis Period (min)		15	

Intersection	
Int Delay, s/veh	19

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	345	247	148	200	198	241
Future Vol, veh/h	345	247	148	200	198	241
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	145	105	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	356	255	153	206	204	248

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	613	204	452	0	-	0
Stage 1	204	-	-	-	-	-
Stage 2	409	-	-	-	-	-
Critical Hdwy	6.615	6.215	4.115	-	-	-
Critical Hdwy Stg 1	5.415	-	-	-	-	-
Critical Hdwy Stg 2	5.815	-	-	-	-	-
Follow-up Hdwy	3.5095	3.3095	2.2095	-	-	-
Pot Cap-1 Maneuver	442	839	1113	-	-	-
Stage 1	832	-	-	-	-	-
Stage 2	642	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	381	839	1113	-	-	-
Mov Cap-2 Maneuver	381	-	-	-	-	-
Stage 1	718	-	-	-	-	-
Stage 2	642	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	42.1	3.7	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1113	-	381	839	-	-
HCM Lane V/C Ratio	0.137	-	0.934	0.304	-	-
HCM Control Delay (s)	8.7	-	64.2	11.2	-	-
HCM Lane LOS	A	-	F	B	-	-
HCM 95th %tile Q(veh)	0.5	-	10.1	1.3	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	27	0	109	0	183	14	0	0	0	0	283	34
Future Volume (Veh/h)	27	0	109	0	183	14	0	0	0	0	283	34
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	0	118	0	199	15	0	0	0	0	308	37
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	434	326	326	444	345	0	345			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	434	326	326	444	345	0	345			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	100	84	100	66	99	100			100		
cM capacity (veh/h)	386	593	717	439	580	1088	1220			1630		

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	147	214	345
Volume Left	29	0	0
Volume Right	118	15	37
cSH	614	611	1700
Volume to Capacity	0.24	0.35	0.20
Queue Length 95th (ft)	23	39	0
Control Delay (s)	12.7	14.0	0.0
Lane LOS	B	B	
Approach Delay (s)	12.7	14.0	0.0
Approach LOS	B	B	

Intersection Summary					
Average Delay		6.9			
Intersection Capacity Utilization		44.8%	ICU Level of Service	A	
Analysis Period (min)		15			

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	0	109	0	183	14	0	0	0	0	283	34
Future Vol, veh/h	27	0	109	0	183	14	0	0	0	0	283	34
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	29	0	118	0	199	15	0	0	0	0	308	37

Major/Minor	Minor2			Minor1					Major2		
Conflicting Flow All	434	327	327	386	345	0			-	-	0
Stage 1	327	327	-	0	0	-			-	-	-
Stage 2	107	0	-	386	345	-			-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21			-	-	-
Critical Hdwy Stg 1	6.11	5.51	-	-	-	-			-	-	-
Critical Hdwy Stg 2	-	-	-	6.11	5.51	-			-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309			-	-	-
Pot Cap-1 Maneuver	534	593	717	574	580	-			0	-	-
Stage 1	688	650	-	-	-	-			0	-	-
Stage 2	-	-	-	639	638	-			0	-	-
Platoon blocked, %										-	-
Mov Cap-1 Maneuver	-	593	717	479	580	-			-	-	-
Mov Cap-2 Maneuver	-	593	-	479	580	-			-	-	-
Stage 1	688	650	-	-	-	-			-	-	-
Stage 2	-	-	-	533	638	-			-	-	-

Approach	EB	WB	SB
HCM Control Delay, s			0
HCM LOS	-	-	

Minor Lane/Major Mvmt	EBLn1	WBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	-	580	-	-	-
HCM Lane V/C Ratio	-	0.343	-	-	-
HCM Control Delay (s)	-	14.4	-	-	-
HCM Lane LOS	-	B	-	-	-
HCM 95th %tile Q(veh)	-	1.5	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	52	444	769	209	442	99	368	1204	634	324
v/c Ratio	0.18	0.78	0.71	0.36	0.43	0.59	0.71	0.90	0.81	0.33
Control Delay	52.5	62.2	46.2	39.8	4.0	74.4	63.0	30.7	57.8	37.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.5	62.2	46.2	39.8	4.0	74.4	63.0	30.7	57.8	37.1
Queue Length 50th (ft)	40	188	314	145	23	86	166	306	274	112
Queue Length 95th (ft)	86	268	429	240	83	154	230	#413	364	162
Internal Link Dist (ft)		521		1372			611			680
Turn Bay Length (ft)	115		515		115	165		290	305	
Base Capacity (vph)	334	662	1107	600	1089	222	774	1361	939	1274
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.67	0.69	0.35	0.41	0.45	0.48	0.88	0.68	0.25

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

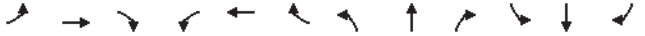
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	329	102	746	203	429	96	357	1168	615	256	58
Future Volume (vph)	50	329	102	746	203	429	96	357	1168	615	256	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.95	0.88	0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	3435		3467	1881	1585	1787	3574	2814	3467	3475	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	3435		3467	1881	1585	1787	3574	2814	3467	3475	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	52	339	105	769	209	442	99	368	1204	634	264	60
RTOR Reduction (vph)	0	19	0	0	0	175	0	0	48	0	14	0
Lane Group Flow (vph)	52	425	0	769	209	267	99	368	1156	634	310	0
Confl. Peds. (#/hr)						2						
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	21.0	21.0		41.2	41.2	71.1	12.4	19.1	60.3	29.9	36.6	
Effective Green, g (s)	21.0	21.0		41.2	41.2	71.1	12.4	19.1	60.3	29.9	36.6	
Actuated g/C Ratio	0.16	0.16		0.31	0.31	0.54	0.09	0.15	0.46	0.23	0.28	
Clearance Time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	284	547		1084	588	855	168	518	1288	787	965	
v/s Ratio Prot	0.03	c0.12		0.22	0.11	0.07	0.06	0.10	c0.28	c0.18	0.09	
v/s Ratio Perm						0.10			0.13			
v/c Ratio	0.18	0.78		0.71	0.36	0.31	0.59	0.71	0.90	0.81	0.32	
Uniform Delay, d1	47.9	53.1		40.0	35.0	16.8	57.2	53.7	32.9	48.2	37.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	6.8		2.2	0.4	0.2	5.2	4.6	8.5	6.0	0.2	
Delay (s)	48.2	59.9		42.1	35.4	17.0	62.4	58.2	41.4	54.2	37.9	
Level of Service	D	E		D	D	B	E	E	D	D	D	
Approach Delay (s)		58.7			33.3			46.3			48.7	
Approach LOS		E			C			D			D	

Intersection Summary

HCM 2000 Control Delay	44.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	131.7	Sum of lost time (s)	20.5
Intersection Capacity Utilization	83.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	329	102	746	203	429	96	357	1168	615	256	58
Future Volume (veh/h)	50	329	102	746	203	429	96	357	1168	615	256	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	52	339	105	769	209	442	99	368	1204	634	264	60
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	273	410	125	914	495	749	123	785	1355	720	1014	227
Arrive On Green	0.15	0.15	0.15	0.26	0.26	0.26	0.07	0.22	0.22	0.21	0.35	0.35
Sat Flow, veh/h	1795	2694	820	3483	1885	1594	1795	3582	2812	3483	2909	650
Grp Volume(v), veh/h	52	223	221	769	209	442	99	368	1204	634	161	163
Grp Sat Flow(s),veh/h/ln	1795	1791	1723	1742	1885	1594	1795	1791	1406	1742	1791	1768
Q Serve(g_s), s	3.3	15.5	16.0	26.9	11.8	26.2	7.0	11.5	28.2	22.7	8.3	8.5
Cycle Q Clear(g_c), s	3.3	15.5	16.0	26.9	11.8	26.2	7.0	11.5	28.2	22.7	8.3	8.5
Prop In Lane	1.00		0.48	1.00		1.00	1.00		1.00	1.00		0.37
Lane Grp Cap(c), veh/h	273	273	262	914	495	749	123	785	1355	720	624	616
V/C Ratio(X)	0.19	0.82	0.84	0.84	0.42	0.59	0.80	0.47	0.89	0.88	0.26	0.26
Avail Cap(c_a), veh/h	340	340	327	1126	610	846	226	785	1355	956	658	650
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.6	52.8	53.0	44.9	39.3	25.1	59.1	43.7	24.6	49.5	30.0	30.1
Incr Delay (d2), s/veh	0.3	12.1	14.7	4.9	0.6	0.9	11.4	0.4	7.6	7.6	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	8.0	8.1	12.0	5.5	9.7	3.5	5.0	20.8	10.6	3.6	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.9	64.9	67.8	49.8	39.9	25.9	70.5	44.1	32.2	57.1	30.2	30.3
LnGrp LOS	D	E	E	D	D	C	E	D	C	E	C	C
Approach Vol, veh/h		496			1420			1671			958	
Approach Delay, s/veh		64.4			40.9			37.1			48.0	
Approach LOS		E			D			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	31.3	34.0		24.2	14.6	50.7		39.2				
Change Period (Y+Rc), s	* 4.7	5.8		4.6	5.8	* 5.8		5.4				
Max Green Setting (Gmax), s	* 35	28.2		24.4	16.2	* 47		41.6				
Max Q Clear Time (g_c+I1), s	24.7	30.2		18.0	9.0	10.5		28.9				
Green Ext Time (p_c), s	1.9	0.0		1.6	0.1	2.1		4.9				

Intersection Summary												
HCM 6th Ctrl Delay			43.6									
HCM 6th LOS			D									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	269	1069	667	121	942	451	372	219	559
v/c Ratio	0.64	0.84	0.76	0.62	0.78	0.79	0.50	0.78	0.77
Control Delay	54.6	40.8	15.3	63.0	37.9	56.3	37.9	65.2	47.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.6	40.8	15.3	63.0	37.9	56.3	37.9	65.2	47.0
Queue Length 50th (ft)	98	380	114	86	318	165	117	154	194
Queue Length 95th (ft)	148	#530	297	154	427	#246	168	#277	261
Internal Link Dist (ft)		1510			1609		962		896
Turn Bay Length (ft)	140			80		150		110	
Base Capacity (vph)	499	1346	904	240	1289	628	906	324	902
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.79	0.74	0.50	0.73	0.72	0.41	0.68	0.62

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	258	1026	640	116	745	159	433	273	84	210	408	129
Future Volume (vph)	258	1026	640	116	745	159	433	273	84	210	408	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.96		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3467	3574	1599	1787	3471		3467	3447		1787	3433	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3467	3574	1599	1787	3471		3467	3447		1787	3433	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	269	1069	667	121	776	166	451	284	88	219	425	134
RTOR Reduction (vph)	0	0	312	0	14	0	0	25	0	0	26	0
Lane Group Flow (vph)	269	1069	355	121	928	0	451	347	0	219	533	0
Confl. Peds. (#/hr)						2						3
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	13.3	38.8	38.8	11.9	37.4		17.9	23.0		17.2	22.3	
Effective Green, g (s)	13.3	38.8	38.8	11.9	37.4		17.9	23.0		17.2	22.3	
Actuated g/C Ratio	0.12	0.36	0.36	0.11	0.34		0.16	0.21		0.16	0.20	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	423	1273	569	195	1192		569	728		282	702	
v/s Ratio Prot	c0.08	c0.30		0.07	0.27		c0.13	0.10		0.12	c0.16	
v/s Ratio Perm			0.22									
v/c Ratio	0.64	0.84	0.62	0.62	0.78		0.79	0.48		0.78	0.76	
Uniform Delay, d1	45.5	32.2	29.0	46.3	32.0		43.7	37.7		44.0	40.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.1	5.0	2.1	6.0	3.3		7.5	0.5		12.6	4.7	
Delay (s)	48.6	37.2	31.2	52.3	35.3		51.2	38.2		56.6	45.5	
Level of Service	D	D	C	D	D		D	D		E	D	
Approach Delay (s)		36.7			37.2			45.3			48.6	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM 2000 Control Delay	40.3	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	108.9	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	78.3%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	258	1026	640	116	745	159	433	273	84	210	408	129
Future Volume (veh/h)	258	1026	640	116	745	159	433	273	84	210	408	129
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	269	1069	667	121	776	166	451	284	88	219	425	134
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	352	1327	592	152	1039	222	541	579	176	256	541	169
Arrive On Green	0.10	0.37	0.37	0.08	0.35	0.35	0.16	0.21	0.21	0.14	0.20	0.20
Sat Flow, veh/h	3483	3582	1598	1795	2934	628	3483	2706	822	1795	2683	838
Grp Volume(v), veh/h	269	1069	667	121	474	468	451	186	186	219	282	277
Grp Sat Flow(s),veh/h/ln	1742	1791	1598	1795	1791	1771	1742	1791	1737	1795	1791	1730
Q Serve(g_s), s	7.2	25.6	21.4	6.3	22.2	22.2	12.0	8.7	9.0	11.4	14.3	14.5
Cycle Q Clear(g_c), s	7.2	25.6	21.4	6.3	22.2	22.2	12.0	8.7	9.0	11.4	14.3	14.5
Prop In Lane	1.00		1.00	1.00		0.35	1.00		0.47	1.00		0.48
Lane Grp Cap(c), veh/h	352	1327	592	152	634	627	541	383	372	256	361	348
V/C Ratio(X)	0.76	0.81	1.13	0.79	0.75	0.75	0.83	0.49	0.50	0.85	0.78	0.79
Avail Cap(c_a), veh/h	564	1517	676	272	740	731	710	515	499	366	515	497
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.9	27.0	11.0	43.0	27.1	27.1	39.2	33.0	33.1	40.0	36.2	36.3
Incr Delay (d2), s/veh	3.5	2.9	76.9	9.0	3.5	3.6	6.6	1.0	1.0	12.8	5.0	5.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	10.7	19.0	3.1	9.5	9.4	5.4	3.7	3.8	5.8	6.5	6.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.4	30.0	87.9	51.9	30.7	30.7	45.8	33.9	34.1	52.8	41.2	42.0
LnGrp LOS	D	C	F	D	C	C	D	C	C	D	D	D
Approach Vol, veh/h		2005			1063			823			778	
Approach Delay, s/veh		51.3			33.1			40.5			44.8	
Approach LOS		D			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.6	39.9	19.3	23.8	14.2	38.4	18.2	25.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	14.5	40.5	19.5	27.5	15.5	39.5	19.5	27.5
Max Q Clear Time (g_c+I1), s	8.3	27.6	14.0	16.5	9.2	24.2	13.4	11.0
Green Ext Time (p_c), s	0.1	7.8	0.8	2.4	0.5	5.1	0.3	1.8

Intersection Summary	
HCM 6th Ctrl Delay	44.2
HCM 6th LOS	D

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	870	213	23	648	248	20
v/c Ratio	0.80	0.22	0.12	0.31	0.62	0.05
Control Delay	20.0	2.2	10.4	8.0	27.5	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.0	2.2	10.4	8.0	27.5	8.2
Queue Length 50th (ft)	200	0	3	50	79	0
Queue Length 95th (ft)	#622	32	20	131	137	13
Internal Link Dist (ft)	1629			570	669	
Turn Bay Length (ft)			75			50
Base Capacity (vph)	1084	987	188	2060	835	759
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.22	0.12	0.31	0.30	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	800	196	21	596	228	18
Future Volume (vph)	800	196	21	596	228	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1827	1518	1735	3471	1732	1553
Flt Permitted	1.00	1.00	0.17	1.00	0.95	1.00
Satd. Flow (perm)	1827	1518	317	3471	1732	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	870	213	23	648	248	20
RTOR Reduction (vph)	0	86	0	0	0	15
Lane Group Flow (vph)	870	127	23	648	248	5
Confl. Peds. (#/hr)		2	2		3	
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type	NA	Perm	Perm	NA	Perm	Prot
Protected Phases	2			6		8
Permitted Phases		2	6		8	
Actuated Green, G (s)	36.7	36.7	36.7	36.7	14.2	14.2
Effective Green, g (s)	36.7	36.7	36.7	36.7	14.2	14.2
Actuated g/C Ratio	0.59	0.59	0.59	0.59	0.23	0.23
Clearance Time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	1086	902	188	2064	398	357
v/s Ratio Prot	c0.48			0.19		0.00
v/s Ratio Perm		0.08	0.07		c0.14	
v/c Ratio	0.80	0.14	0.12	0.31	0.62	0.02
Uniform Delay, d1	9.7	5.5	5.5	6.2	21.3	18.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.1	0.0	0.1	0.0	2.2	0.0
Delay (s)	13.8	5.6	5.6	6.3	23.5	18.4
Level of Service	B	A	A	A	C	B
Approach Delay (s)	12.1			6.2	23.1	
Approach LOS	B			A	C	

Intersection Summary				
HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	61.7	Sum of lost time (s)	10.8	
Intersection Capacity Utilization	63.7%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Near Term Plus 1293 Unit Project and School PM
20: Commerce Way & Sherwood Road — HCM 6th Signalized Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	800	196	21	596	228	18
Future Volume (veh/h)	800	196	21	596	228	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	870	213	23	648	248	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	1017	860	253	1933	325	289
Arrive On Green	0.55	0.55	0.55	0.55	0.19	0.19
Sat Flow, veh/h	1841	1557	512	3589	1753	1560
Grp Volume(v), veh/h	870	213	23	648	248	20
Grp Sat Flow(s),veh/h/ln	1841	1557	512	1749	1753	1560
Q Serve(g_s), s	16.5	2.9	1.6	4.2	5.5	0.4
Cycle Q Clear(g_c), s	16.5	2.9	18.2	4.2	5.5	0.4
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1017	860	253	1933	325	289
V/C Ratio(X)	0.86	0.25	0.09	0.34	0.76	0.07
Avail Cap(c_a), veh/h	1546	1308	400	2938	1260	1121
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.8	4.8	15.5	5.1	15.9	13.8
Incr Delay (d2), s/veh	2.0	0.1	0.1	0.0	1.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.5	0.2	0.7	1.9	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.8	4.8	15.6	5.1	17.3	13.9
LnGrp LOS	A	A	B	A	B	B
Approach Vol, veh/h	1083			671	268	
Approach Delay, s/veh	8.8			5.5	17.1	
Approach LOS	A			A	B	

Timer - Assigned Phs	2	6	8
Phs Duration (G+Y+Rc), s	28.2	28.2	13.0
Change Period (Y+Rc), s	5.4	5.4	5.4
Max Green Setting (Gmax), s	34.6	34.6	29.6
Max Q Clear Time (g_c+I1), s	18.5	20.2	7.5
Green Ext Time (p_c), s	4.0	2.6	0.3

Intersection Summary	
HCM 6th Ctrl Delay	8.8
HCM 6th LOS	A

Olsen-Chandler SP — Near Term Plus 1293 Unit Project and School PM
21: Fontana Road & Sherwood Road — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	754	64	11	507	0	110	0	11	0	0	0
Future Volume (Veh/h)	0	754	64	11	507	0	110	0	11	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	820	70	12	551	0	120	0	12	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									4			
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		650										
pX, platoon unblocked				0.57			0.57	0.57	0.57	0.57	0.57	
vC, conflicting volume	551			890			1154	1430	855	1436	1465	276
vC1, stage 1 conf vol							855	855		575	575	
vC2, stage 2 conf vol							300	575		861	890	
vCu, unblocked vol	551			423			890	1376	361	1387	1438	276
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			63	100	97	100	100	100
cM capacity (veh/h)	1015			642			324	289	360	264	269	722

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	890	288	276	132	0
Volume Left	0	12	0	120	0
Volume Right	70	0	0	12	0
cSH	1015	642	1700	357	1700
Volume to Capacity	0.00	0.02	0.16	0.37	0.00
Queue Length 95th (ft)	0	1	0	42	0
Control Delay (s)	0.0	0.7	0.0	21.8	0.0
Lane LOS		A		C	A
Approach Delay (s)	0.0	0.3		21.8	0.0
Approach LOS				C	A

Intersection Summary					
Average Delay	1.9				
Intersection Capacity Utilization	56.3%	ICU Level of Service		B	
Analysis Period (min)	15				

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↰	↱		↕	
Traffic Vol, veh/h	0	754	64	11	507	0	110	0	11	0	0	0
Future Vol, veh/h	0	754	64	11	507	0	110	0	11	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	820	70	12	551	0	120	0	12	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	551	0	0	890	0	0	1155	1430	855	1436	1465	276
Stage 1	-	-	-	-	-	-	855	855	-	575	575	-
Stage 2	-	-	-	-	-	-	300	575	-	861	890	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.23	7.33	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.519	4.019	3.319
Pot Cap-1 Maneuver	1017	-	-	759	-	-	163	134	357	102	128	722
Stage 1	-	-	-	-	-	-	352	374	-	471	502	-
Stage 2	-	-	-	-	-	-	685	502	-	349	360	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1017	-	-	759	-	-	160	131	357	97	125	722
Mov Cap-2 Maneuver	-	-	-	-	-	-	317	305	-	268	290	-
Stage 1	-	-	-	-	-	-	352	374	-	471	490	-
Stage 2	-	-	-	-	-	-	669	490	-	337	360	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.3	22.4	0
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	317	357	1017	-	-	759	-	-	-
HCM Lane V/C Ratio	0.377	0.033	-	-	-	0.016	-	-	-
HCM Control Delay (s)	23.1	15.4	0	-	-	9.8	0.1	-	0
HCM Lane LOS	C	C	A	-	-	A	A	-	A
HCM 95th %tile Q(veh)	1.7	0.1	0	-	-	0	-	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Traffic Volume (veh/h)	83	311	255	44	189	9	159	12	34	6	12	52
Future Volume (veh/h)	83	311	255	44	189	9	159	12	34	6	12	52
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	90	338	277	48	205	10	173	13	37	7	13	57
Approach Volume (veh/h)		705			263			223			77	
Crossing Volume (veh/h)		68			276			435			426	
High Capacity (veh/h)		1313			1115			983			990	
High v/c (veh/h)		0.54			0.24			0.23			0.08	
Low Capacity (veh/h)		1096			917			799			805	
Low v/c (veh/h)		0.64			0.29			0.28			0.10	

Intersection Summary				
Maximum v/c High	0.54			
Maximum v/c Low	0.64			
Intersection Capacity Utilization	69.4%	ICU Level of Service		C

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	7.9
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	705	263	223	77
Demand Flow Rate, veh/h	720	268	227	78
Vehicles Circulating, veh/h	69	281	444	434
Vehicles Exiting, veh/h	443	390	345	115
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	9.2	6.1	6.9	5.0
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	720	268	227	78
Cap Entry Lane, veh/h	1286	1036	877	886
Entry HV Adj Factor	0.979	0.981	0.981	0.984
Flow Entry, veh/h	705	263	223	77
Cap Entry, veh/h	1260	1016	861	872
V/C Ratio	0.560	0.259	0.259	0.088
Control Delay, s/veh	9.2	6.1	6.9	5.0
LOS	A	A	A	A
95th %tile Queue, veh	4	1	1	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	24	26	51	1	19	20	32	140	3	25	195	14
Future Volume (vph)	24	26	51	1	19	20	32	140	3	25	195	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	28	55	1	21	22	35	152	3	27	212	15

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	109	44	190	254
Volume Left (vph)	26	1	35	27
Volume Right (vph)	55	22	3	15
Hadj (s)	-0.24	-0.28	0.04	0.00
Departure Headway (s)	4.8	4.8	4.6	4.5
Degree Utilization, x	0.14	0.06	0.24	0.32
Capacity (veh/h)	686	665	744	763
Control Delay (s)	8.6	8.1	9.1	9.6
Approach Delay (s)	8.6	8.1	9.1	9.6
Approach LOS	A	A	A	A

Intersection Summary				
Delay	9.1			
Level of Service	A			
Intersection Capacity Utilization	34.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	9.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	24	26	51	1	19	20	32	140	3	25	195	14
Future Vol, veh/h	24	26	51	1	19	20	32	140	3	25	195	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	26	28	55	1	21	22	35	152	3	27	212	15
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.6	8.1	9.1	9.6
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	18%	24%	3%	11%
Vol Thru, %	80%	26%	47%	83%
Vol Right, %	2%	50%	50%	6%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	175	101	40	234
LT Vol	32	24	1	25
Through Vol	140	26	19	195
RT Vol	3	51	20	14
Lane Flow Rate	190	110	43	254
Geometry Grp	1	1	1	1
Degree of Util (X)	0.243	0.144	0.058	0.317
Departure Headway (Hd)	4.592	4.726	4.779	4.485
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	780	756	746	801
Service Time	2.628	2.77	2.829	2.518
HCM Lane V/C Ratio	0.244	0.146	0.058	0.317
HCM Control Delay	9.1	8.6	8.1	9.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1	0.5	0.2	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	82	151	46	1	97	14	31	61	1	17	79	64
Future Volume (Veh/h)	82	151	46	1	97	14	31	61	1	17	79	64
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	89	164	50	1	105	15	34	66	1	18	86	70
Pedestrians								6				
Lane Width (ft)								12.0				
Walking Speed (ft/s)								3.5				
Percent Blockage								1				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	120			220			600	495	195	516	512	112
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	120			220			600	495	195	516	512	112
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			89	85	100	95	80	93
cM capacity (veh/h)	1474			1347			307	446	844	397	435	943

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	303	121	101	18	156
Volume Left	89	1	34	18	0
Volume Right	50	15	1	0	70
cSH	1474	1347	389	397	574
Volume to Capacity	0.06	0.00	0.26	0.05	0.27
Queue Length 95th (ft)	5	0	26	4	27
Control Delay (s)	2.6	0.1	17.5	14.5	13.6
Lane LOS	A	A	C	B	B
Approach Delay (s)	2.6	0.1	17.5	13.7	
Approach LOS			C	B	

Intersection Summary				
Average Delay	7.1			
Intersection Capacity Utilization	45.1%	ICU Level of Service		A
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	6.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↰	↕	
Traffic Vol, veh/h	82	151	46	1	97	14	31	61	1	17	79	64
Future Vol, veh/h	82	151	46	1	97	14	31	61	1	17	79	64
Conflicting Peds, #/hr	0	0	6	6	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	89	164	50	1	105	15	34	66	1	18	86	70

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	120	0	0	220	0	0	566	495	195	516	513	113
Stage 1	-	-	-	-	-	-	373	373	-	115	115	-
Stage 2	-	-	-	-	-	-	193	122	-	401	398	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	1474	-	-	1355	-	-	436	477	849	471	466	943
Stage 1	-	-	-	-	-	-	650	620	-	892	802	-
Stage 2	-	-	-	-	-	-	811	797	-	628	605	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1474	-	-	1347	-	-	323	441	844	394	431	943
Mov Cap-2 Maneuver	-	-	-	-	-	-	323	441	-	394	431	-
Stage 1	-	-	-	-	-	-	602	574	-	830	801	-
Stage 2	-	-	-	-	-	-	670	796	-	516	560	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.2	0.1	17.2	13.8
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	395	1474	-	-	1347	-	-	394	569
HCM Lane V/C Ratio	0.256	0.06	-	-	0.001	-	-	0.047	0.273
HCM Control Delay (s)	17.2	7.6	0	-	7.7	0	-	14.6	13.7
HCM Lane LOS	C	A	A	-	A	A	-	B	B
HCM 95th %tile Q(veh)	1	0.2	-	-	0	-	-	0.1	1.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Right Turn Channelized						
Traffic Volume (veh/h)	9	127	96	6	167	140
Future Volume (veh/h)	9	127	96	6	167	140
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	138	104	7	182	152
Approach Volume (veh/h)	148		111			334
Crossing Volume (veh/h)	104		182			10
High Capacity (veh/h)	1277		1201			1374
High v/c (veh/h)	0.12		0.09			0.24
Low Capacity (veh/h)	1063		994			1151
Low v/c (veh/h)	0.14		0.11			0.29

Intersection Summary			
Maximum v/c High	0.24		
Maximum v/c Low	0.29		
Intersection Capacity Utilization	38.3%	ICU Level of Service	A

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	4.5
Intersection LOS	A

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	148	111	334
Demand Flow Rate, veh/h	151	113	341
Vehicles Circulating, veh/h	106	186	10
Vehicles Exiting, veh/h	193	165	247
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	4.0	4.1	4.8
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	151	113	341
Cap Entry Lane, veh/h	1238	1141	1366
Entry HV Adj Factor	0.980	0.982	0.979
Flow Entry, veh/h	148	111	334
Cap Entry, veh/h	1214	1120	1338
V/C Ratio	0.122	0.099	0.250
Control Delay, s/veh	4.0	4.1	4.8
LOS	A	A	A
95th %tile Queue, veh	0	0	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	6	86	102	5	3	6
Future Volume (Veh/h)	6	86	102	5	3	6
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	93	111	5	3	7
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	116				220	114
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	116				220	114
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1460				760	934

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	100	116	10
Volume Left	7	0	3
Volume Right	0	5	7
cSH	1460	1700	874
Volume to Capacity	0.00	0.07	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.6	0.0	9.2
Lane LOS	A		A
Approach Delay (s)	0.6	0.0	9.2
Approach LOS			A

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	19.5%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	86	102	5	3	6
Future Vol, veh/h	6	86	102	5	3	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	7	93	111	5	3	7

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	116	0	-	0	221	114
Stage 1	-	-	-	-	114	-
Stage 2	-	-	-	-	107	-
Critical Hdwy	4.14	-	-	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	2.236	-	-	-	3.536	3.336
Pot Cap-1 Maneuver	1460	-	-	-	763	933
Stage 1	-	-	-	-	906	-
Stage 2	-	-	-	-	912	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1460	-	-	-	759	933
Mov Cap-2 Maneuver	-	-	-	-	759	-
Stage 1	-	-	-	-	901	-
Stage 2	-	-	-	-	912	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1460	-	-	-	867
HCM Lane V/C Ratio	0.004	-	-	-	0.011
HCM Control Delay (s)	7.5	0	-	-	9.2
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Near Term Plus 1293-Unit and School Project (Mitigated)

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	839	46	284	1080	0	9	0	263	0	0	0
Future Vol, veh/h	1	839	46	284	1080	0	9	0	263	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	340	-	-	195	-	-	-	-	-	-	-	25
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	11	11	11	11	11	11	11	11	11	11	11	11
Mvmt Flow	1	912	50	309	1174	0	10	0	286	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1174	0	0	962	0	0	2144	-	481	2250	2756	587
Stage 1	-	-	-	-	-	-	939	-	-	1792	1792	-
Stage 2	-	-	-	-	-	-	1205	-	-	458	964	-
Critical Hdwy	4.32	-	-	4.32	-	-	7.72	-	7.12	7.72	6.72	7.12
Critical Hdwy Stg 1	-	-	-	-	-	-	6.72	-	-	6.72	5.72	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.72	-	-	6.72	5.72	-
Follow-up Hdwy	2.31	-	-	2.31	-	-	3.61	-	3.41	3.61	4.11	3.41
Pot Cap-1 Maneuver	542	-	-	658	-	-	24	0	508	20	17	431
Stage 1	-	-	-	-	-	-	267	0	-	76	119	-
Stage 2	-	-	-	-	-	-	181	0	-	529	312	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	542	-	-	658	-	-	15	-	508	6	9	431
Mov Cap-2 Maneuver	-	-	-	-	-	-	15	-	-	6	9	-
Stage 1	-	-	-	-	-	-	266	-	-	76	63	-
Stage 2	-	-	-	-	-	-	96	-	-	231	311	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3.2	20.8	0
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	508	542	-	-	658	-	-	-	-
HCM Lane V/C Ratio	0.563	0.002	-	-	0.469	-	-	-	-
HCM Control Delay (s)	20.8	11.7	-	-	15.2	-	-	0	0
HCM Lane LOS	C	B	-	-	C	-	-	A	A
HCM 95th %tile Q(veh)	3.4	0	-	-	2.5	-	-	-	-

Intersection	
Int Delay, s/veh	7.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	365	737	1177	19	5	186
Future Vol, veh/h	365	737	1177	19	5	186
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	580	-	-	165	-	-
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	397	801	1279	21	5	202

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1300	0	-	0	2474	640
Stage 1	-	-	-	-	1279	-
Stage 2	-	-	-	-	1195	-
Critical Hdwy	4.3	-	-	-	7	7.1
Critical Hdwy Stg 1	-	-	-	-	6	-
Critical Hdwy Stg 2	-	-	-	-	6	-
Follow-up Hdwy	2.3	-	-	-	3.6	3.4
Pot Cap-1 Maneuver	488	-	-	-	22	399
Stage 1	-	-	-	-	210	-
Stage 2	-	-	-	-	234	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	488	-	-	-	~ 4	399
Mov Cap-2 Maneuver	-	-	-	-	36	-
Stage 1	-	-	-	-	39	-
Stage 2	-	-	-	-	234	-

Approach	EB	WB	SB
HCM Control Delay, s	12.3	0	22.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	488	-	-	-	399
HCM Lane V/C Ratio	0.813	-	-	-	0.507
HCM Control Delay (s)	37.2	-	-	-	22.9
HCM Lane LOS	E	-	-	-	C
HCM 95th %tile Q(veh)	7.8	-	-	-	2.8

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1	370	345	468	680	7	21	139	290	297	35
v/c Ratio	0.01	0.34	0.82	0.44	0.47	0.07	0.21	0.27	0.69	0.69	0.07
Control Delay	44.0	31.7	42.4	9.9	2.3	49.2	52.7	4.7	43.6	43.6	0.3
Queue Delay	0.0	0.0	1.1	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.0	31.8	43.5	10.2	2.6	49.2	52.7	4.7	43.6	43.6	0.3
Queue Length 50th (ft)	1	108	225	65	4	5	14	5	178	184	0
Queue Length 95th (ft)	6	161	321	123	60	19	40	26	278	285	0
Internal Link Dist (ft)		346		307			744			674	
Turn Bay Length (ft)	65		125			140		165	150		185
Base Capacity (vph)	109	1150	499	1074	1458	96	101	579	471	480	541
Starvation Cap Reductn	0	0	40	193	313	0	0	0	0	0	0
Spillback Cap Reductn	0	51	0	0	0	0	0	1	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.34	0.75	0.53	0.59	0.07	0.21	0.24	0.62	0.62	0.06

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	311	29	317	431	626	6	19	128	453	87	32
Future Volume (veh/h)	1	311	29	317	431	626	6	19	128	453	87	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	1	338	32	345	468	680	7	21	139	560	0	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	331	467	44	792	751	934	84	88	778	669	0	294
Arrive On Green	0.19	0.14	0.14	0.75	0.68	0.68	0.05	0.05	0.05	0.19	0.00	0.19
Sat Flow, veh/h	1767	3248	305	1767	1856	1572	1767	1856	1563	3534	0	1552
Grp Volume(v), veh/h	1	182	188	345	468	680	7	21	139	560	0	35
Grp Sat Flow(s),veh/h/ln	1767	1763	1790	1767	1856	1572	1767	1856	1563	1767	0	1552
Q Serve(g_s), s	0.0	10.4	10.5	7.7	14.8	36.1	0.4	1.1	0.0	16.0	0.0	2.0
Cycle Q Clear(g_c), s	0.0	10.4	10.5	7.7	14.8	36.1	0.4	1.1	0.0	16.0	0.0	2.0
Prop In Lane	1.00		0.17	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	331	254	258	792	751	934	84	88	778	669	0	294
V/C Ratio(X)	0.00	0.72	0.73	0.44	0.62	0.73	0.08	0.24	0.18	0.84	0.00	0.12
Avail Cap(c_a), veh/h	331	403	409	792	857	1024	84	88	779	959	0	421
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.72	0.72	0.72	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	34.7	42.9	43.0	8.3	12.5	8.7	47.8	48.2	14.7	41.0	0.0	35.3
Incr Delay (d2), s/veh	0.0	16.1	16.5	0.3	0.8	1.7	0.4	1.4	0.1	4.5	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	5.7	5.9	2.3	4.5	11.8	0.2	0.6	1.8	7.3	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.7	59.0	59.5	8.5	13.4	10.4	48.3	49.6	14.8	45.5	0.0	35.5
LnGrp LOS	C	E	E	A	B	B	D	D	B	D	A	D
Approach Vol, veh/h		371			1493			167			595	
Approach Delay, s/veh		59.2			10.9			20.6			44.9	
Approach LOS		E			B			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	51.5	19.6		24.4	24.2	47.0		9.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	29.5	24.0		28.5	5.0	48.5		5.0				
Max Q Clear Time (g_c+I1), s	9.7	12.5		18.0	2.0	38.1		3.1				
Green Ext Time (p_c), s	1.0	1.7		1.7	0.0	4.4		0.1				

Intersection Summary		
HCM 6th Ctrl Delay	26.1	
HCM 6th LOS	C	

Notes

User approved volume balancing among the lanes for turning movement.
User approved changes to right turn type.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	68	901	49	1255	377	234	12	249	5	8
v/c Ratio	0.44	0.44	0.35	0.62	0.39	0.75	0.03	0.47	0.02	0.02
Control Delay	45.0	14.5	51.9	19.4	8.1	51.5	27.5	8.5	26.8	0.0
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.0	14.8	51.9	19.4	8.1	51.5	27.5	8.5	26.8	0.0
Queue Length 50th (ft)	41	202	32	288	50	148	6	13	3	0
Queue Length 95th (ft)	m64	248	67	481	151	207	19	68	11	0
Internal Link Dist (ft)		307		269			836			575
Turn Bay Length (ft)	120		220		145	130		110	95	
Base Capacity (vph)	176	2028	148	2014	970	545	725	753	543	726
Starvation Cap Reductn	0	536	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	37	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.60	0.33	0.63	0.39	0.43	0.02	0.33	0.01	0.01

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	781	48	45	1155	347	215	11	229	5	0	7
Future Volume (veh/h)	63	781	48	45	1155	347	215	11	229	5	0	7
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	68	849	52	49	1255	0	234	12	249	5	0	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	87	2143	131	64	2194		342	371	314	285	0	314
Arrive On Green	0.10	1.00	1.00	0.04	0.62	0.00	0.20	0.20	0.20	0.20	0.00	0.20
Sat Flow, veh/h	1767	3373	207	1767	3526	1572	1396	1856	1572	1110	0	1572
Grp Volume(v), veh/h	68	444	457	49	1255	0	234	12	249	5	0	8
Grp Sat Flow(s),veh/h/ln	1767	1763	1817	1767	1763	1572	1396	1856	1572	1110	0	1572
Q Serve(g_s), s	3.9	0.0	0.0	2.9	21.9	0.0	17.0	0.5	15.8	0.4	0.0	0.4
Cycle Q Clear(g_c), s	3.9	0.0	0.0	2.9	21.9	0.0	17.4	0.5	15.8	0.9	0.0	0.4
Prop In Lane	1.00		0.11	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	87	1120	1154	64	2194		342	371	314	285	0	314
V/C Ratio(X)	0.78	0.40	0.40	0.77	0.57		0.68	0.03	0.79	0.02	0.00	0.03
Avail Cap(c_a), veh/h	163	1120	1154	126	2194		612	730	619	499	0	619
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.89	0.89	0.89	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.8	0.0	0.0	50.2	11.6	0.0	40.8	33.8	39.9	34.2	0.0	33.8
Incr Delay (d2), s/veh	12.7	0.9	0.9	17.1	1.1	0.0	2.4	0.0	4.5	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	0.3	0.3	1.6	8.2	0.0	6.0	0.2	6.4	0.1	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.5	0.9	0.9	67.2	12.7	0.0	43.2	33.9	44.4	34.2	0.0	33.8
LnGrp LOS	E	A	A	E	B		D	C	D	C	A	C
Approach Vol, veh/h		969			1304	A		495			13	
Approach Delay, s/veh		5.0			14.8			43.6			34.0	
Approach LOS		A			B			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.3	71.2		25.5	9.7	69.8		25.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	7.5	42.7		41.3	9.7	40.5		41.3				
Max Q Clear Time (g_c+I1), s	5.9	2.0		2.9	5.9	23.9		19.4				
Green Ext Time (p_c), s	0.0	7.0		0.0	0.0	8.6		1.6				

Intersection Summary	
HCM 6th Ctrl Delay	16.6
HCM 6th LOS	B

Notes

User approved changes to right turn type.
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	128	338	173	60	614	470	324	694	284	373	341
v/c Ratio	0.82	0.33	0.30	0.37	0.66	0.74	0.82	0.64	0.70	0.53	0.77
Control Delay	80.4	27.6	6.3	47.1	32.7	18.3	51.3	28.1	49.5	34.0	29.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.4	27.6	6.3	47.1	32.7	18.3	51.3	28.1	49.5	34.0	29.6
Queue Length 50th (ft)	73	82	0	32	161	76	171	167	80	98	92
Queue Length 95th (ft)	#198	132	50	77	236	209	#347	238	#155	150	202
Internal Link Dist (ft)		1092			186			1440		2310	
Turn Bay Length (ft)	150			170		140	230		245		25
Base Capacity (vph)	157	1103	599	199	1176	721	451	1464	419	1008	557
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.82	0.31	0.29	0.30	0.52	0.65	0.72	0.47	0.68	0.37	0.61

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	311	159	55	565	432	298	588	51	261	343	314
Future Volume (veh/h)	118	311	159	55	565	432	298	588	51	261	343	314
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	128	338	173	60	614	470	324	639	55	284	373	341
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	138	1148	508	77	1027	454	358	1120	96	351	850	373
Arrive On Green	0.08	0.33	0.33	0.04	0.29	0.29	0.20	0.34	0.34	0.10	0.24	0.24
Sat Flow, veh/h	1767	3526	1559	1767	3526	1558	1767	3284	282	3428	3526	1549
Grp Volume(v), veh/h	128	338	173	60	614	470	324	343	351	284	373	341
Grp Sat Flow(s),veh/h/ln	1767	1763	1559	1767	1763	1558	1767	1763	1804	1714	1763	1549
Q Serve(g_s), s	6.9	6.9	8.1	3.2	14.4	28.0	17.2	15.3	15.3	7.8	8.6	20.6
Cycle Q Clear(g_c), s	6.9	6.9	8.1	3.2	14.4	28.0	17.2	15.3	15.3	7.8	8.6	20.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.16	1.00		1.00
Lane Grp Cap(c), veh/h	138	1148	508	77	1027	454	358	601	615	351	850	373
V/C Ratio(X)	0.93	0.29	0.34	0.78	0.60	1.04	0.91	0.57	0.57	0.81	0.44	0.91
Avail Cap(c_a), veh/h	138	1148	508	175	1027	454	395	646	661	367	880	387
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.0	24.2	24.6	45.5	29.2	34.1	37.4	25.9	25.9	42.2	31.0	35.5
Incr Delay (d2), s/veh	55.2	0.1	0.4	15.2	1.0	51.7	22.6	1.0	1.0	12.2	0.4	25.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	2.8	2.9	1.7	5.9	16.5	9.5	6.3	6.5	3.8	3.6	10.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	99.3	24.3	25.0	60.7	30.2	85.8	60.1	27.0	27.0	54.4	31.3	60.7
LnGrp LOS	F	C	C	E	C	F	E	C	C	D	C	E
Approach Vol, veh/h		639			1144			1018			998	
Approach Delay, s/veh		39.5			54.6			37.5			47.9	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.3	37.3	8.7	35.8	24.0	27.7	12.0	32.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	10.3	35.2	9.5	26.0	21.5	24.0	7.5	28.0
Max Q Clear Time (g_c+I1), s	9.8	17.3	5.2	10.1	19.2	22.6	8.9	30.0
Green Ext Time (p_c), s	0.1	3.9	0.0	2.3	0.2	0.6	0.0	0.0

Intersection Summary

HCM 6th Ctrl Delay	45.7
HCM 6th LOS	D

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	118	872	64	584
v/c Ratio	0.53	0.68	0.16	0.40
Control Delay	26.8	12.9	3.2	4.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	26.8	12.9	3.2	4.1
Queue Length 50th (ft)	27	260	5	72
Queue Length 95th (ft)	76	497	16	150
Internal Link Dist (ft)	2642	1057		1090
Turn Bay Length (ft)			60	
Base Capacity (vph)	641	1286	402	1477
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.18	0.68	0.16	0.40

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	46	63	750	52	59	537
Future Volume (veh/h)	46	63	750	52	59	537
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1870	1870	1870	1870
Adj Flow Rate, veh/h	50	68	815	57	64	584
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	2	2	2	2
Cap, veh/h	63	86	1216	85	438	1493
Arrive On Green	0.09	0.09	0.70	0.70	0.04	0.80
Sat Flow, veh/h	699	951	1728	121	1781	1870
Grp Volume(v), veh/h	119	0	0	872	64	584
Grp Sat Flow(s),veh/h/ln	1664	0	0	1849	1781	1870
Q Serve(g_s), s	6.3	0.0	0.0	23.8	0.8	8.2
Cycle Q Clear(g_c), s	6.3	0.0	0.0	23.8	0.8	8.2
Prop In Lane	0.42	0.57		0.07	1.00	
Lane Grp Cap(c), veh/h	151	0	0	1301	438	1493
V/C Ratio(X)	0.79	0.00	0.00	0.67	0.15	0.39
Avail Cap(c_a), veh/h	592	0	0	1301	460	1493
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	0.81	1.00	1.00
Uniform Delay (d), s/veh	40.1	0.0	0.0	7.5	6.6	2.7
Incr Delay (d2), s/veh	8.7	0.0	0.0	2.2	0.2	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.0	0.0	7.9	0.3	2.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	48.8	0.0	0.0	9.7	6.7	3.4
LnGrp LOS	D	A	A	A	A	A
Approach Vol, veh/h	119		872			648
Approach Delay, s/veh	48.8		9.7			3.8
Approach LOS	D		A			A

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	8.5	68.3				76.8	13.2
Change Period (Y+Rc), s	4.5	5.0				5.0	5.0
Max Green Setting (Gmax), s	5.1	38.4				48.0	32.0
Max Q Clear Time (g_c+I1), s	2.8	25.8				10.2	8.3
Green Ext Time (p_c), s	0.0	5.1				4.2	0.3

Intersection Summary		
HCM 6th Ctrl Delay	10.2	
HCM 6th LOS	B	

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	158	132	37	606	36	460	92
v/c Ratio	0.46	0.30	0.18	0.56	0.17	0.42	0.10
Control Delay	20.3	8.6	27.7	13.4	27.7	11.2	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.3	8.6	27.7	13.4	27.7	11.2	3.1
Queue Length 50th (ft)	28	5	9	90	9	62	0
Queue Length 95th (ft)	91	44	40	308	39	211	21
Internal Link Dist (ft)	560	1033		1337		1057	
Turn Bay Length (ft)			30		70		60
Base Capacity (vph)	891	1044	207	1242	207	1244	1057
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.13	0.18	0.49	0.17	0.37	0.09
Intersection Summary							

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	99	6	40	8	15	98	34	555	3	33	423	85
Future Volume (veh/h)	99	6	40	8	15	98	34	555	3	33	423	85
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	108	7	43	9	16	107	37	603	3	36	460	92
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	315	22	67	109	40	207	76	786	4	74	789	664
Arrive On Green	0.16	0.16	0.16	0.16	0.16	0.16	0.04	0.42	0.42	0.04	0.42	0.42
Sat Flow, veh/h	998	142	426	56	251	1313	1781	1859	9	1781	1870	1574
Grp Volume(v), veh/h	158	0	0	132	0	0	37	0	606	36	460	92
Grp Sat Flow(s),veh/h/ln	1566	0	0	1620	0	0	1781	0	1869	1781	1870	1574
Q Serve(g_s), s	0.3	0.0	0.0	0.0	0.0	0.0	0.8	0.0	10.6	0.8	7.2	1.4
Cycle Q Clear(g_c), s	3.2	0.0	0.0	2.9	0.0	0.0	0.8	0.0	10.6	0.8	7.2	1.4
Prop In Lane	0.68		0.27	0.07		0.81	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	405	0	0	355	0	0	76	0	790	74	789	664
V/C Ratio(X)	0.39	0.00	0.00	0.37	0.00	0.00	0.49	0.00	0.77	0.49	0.58	0.14
Avail Cap(c_a), veh/h	1145	0	0	1225	0	0	232	0	1389	232	1390	1170
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.9	0.0	0.0	14.8	0.0	0.0	18.0	0.0	9.5	18.0	8.5	6.8
Incr Delay (d2), s/veh	0.6	0.0	0.0	0.6	0.0	0.0	4.8	0.0	1.6	4.9	0.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	0.0	1.0	0.0	0.0	0.4	0.0	3.1	0.4	2.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.5	0.0	0.0	15.5	0.0	0.0	22.8	0.0	11.0	22.9	9.2	6.9
LnGrp LOS	B	A	A	B	A	A	C	A	B	C	A	A
Approach Vol, veh/h		158			132			643			588	
Approach Delay, s/veh		15.5			15.5			11.7			9.7	
Approach LOS		B			B			B			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.6	21.2		10.5	6.6	21.2		10.5				
Change Period (Y+Rc), s	5.0	5.0		4.5	5.0	5.0		4.5				
Max Green Setting (Gmax), s	5.0	28.5		27.0	5.0	28.5		27.0				
Max Q Clear Time (g_c+I1), s	2.8	12.6		5.2	2.8	9.2		4.9				
Green Ext Time (p_c), s	0.0	3.5		0.9	0.0	3.0		0.7				
Intersection Summary												
HCM 6th Ctrl Delay			11.6									
HCM 6th LOS			B									

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	40	321	358	10	264	162	285	227
v/c Ratio	0.29	0.67	0.54	0.07	0.64	0.32	0.72	0.13
Control Delay	38.1	32.3	6.3	38.9	35.3	4.6	42.6	12.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.1	32.3	6.3	38.9	35.3	4.6	42.6	12.9
Queue Length 50th (ft)	15	136	0	5	117	0	129	28
Queue Length 95th (ft)	50	243	63	22	209	32	#308	70
Internal Link Dist (ft)	284	314			712			1337
Turn Bay Length (ft)							120	
Base Capacity (vph)	139	722	813	160	646	675	427	1848
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.44	0.44	0.06	0.41	0.24	0.67	0.12

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	9	7	291	5	329	9	243	149	262	199	10
Future Volume (veh/h)	20	9	7	291	5	329	9	243	149	262	199	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.86	1.00		0.95	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	22	10	8	316	5	358	10	264	162	285	216	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	36	16	13	538	9	463	22	371	309	332	1280	65
Arrive On Green	0.04	0.04	0.04	0.31	0.31	0.31	0.01	0.20	0.20	0.19	0.37	0.37
Sat Flow, veh/h	934	425	340	1755	28	1510	1781	1870	1557	1781	3440	174
Grp Volume(v), veh/h	40	0	0	321	0	358	10	264	162	285	111	116
Grp Sat Flow(s),veh/h/ln	1699	0	0	1783	0	1510	1781	1870	1557	1781	1777	1837
Q Serve(g_s), s	1.6	0.0	0.0	10.7	0.0	15.2	0.4	9.3	6.5	10.9	2.9	3.0
Cycle Q Clear(g_c), s	1.6	0.0	0.0	10.7	0.0	15.2	0.4	9.3	6.5	10.9	2.9	3.0
Prop In Lane	0.55		0.20	0.98		1.00	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	65	0	0	546	0	463	22	371	309	332	661	684
V/C Ratio(X)	0.61	0.00	0.00	0.59	0.00	0.77	0.44	0.71	0.52	0.86	0.17	0.17
Avail Cap(c_a), veh/h	121	0	0	684	0	580	152	612	509	405	834	862
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.3	0.0	0.0	20.6	0.0	22.2	34.5	26.3	25.2	27.7	14.8	14.8
Incr Delay (d2), s/veh	8.9	0.0	0.0	1.0	0.0	5.1	13.2	2.5	1.4	14.3	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	4.4	0.0	5.8	0.2	4.0	2.3	5.7	1.1	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.2	0.0	0.0	21.6	0.0	27.2	47.7	28.8	26.6	42.0	14.9	14.9
LnGrp LOS	D	A	A	C	A	C	D	C	C	D	B	B
Approach Vol, veh/h		40			679			436			512	
Approach Delay, s/veh		42.2			24.6			28.4			30.0	
Approach LOS		D			C			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	18.1	19.0		7.2	5.9	31.2		26.0				
Change Period (Y+Rc), s	5.0	5.0		4.5	5.0	5.0		4.5				
Max Green Setting (Gmax), s	16.0	23.0		5.0	6.0	33.0		27.0				
Max Q Clear Time (g_c+I1), s	12.9	11.3		3.6	2.4	5.0		17.2				
Green Ext Time (p_c), s	0.3	1.5		0.0	0.0	1.2		2.6				

Intersection Summary

HCM 6th Ctrl Delay	27.7
HCM 6th LOS	C

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	18.3
Intersection LOS	C

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	193	136	229	208	125	373
Future Vol, veh/h	193	136	229	208	125	373
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	210	148	249	226	136	405
Number of Lanes	1	1	1	2	1	1

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	3
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	2	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	3	0	2
HCM Control Delay	15.9	15.5	22.4
HCM LOS	C	C	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	0%
Vol Thru, %	0%	100%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	229	104	104	193	136	125	373
LT Vol	229	0	0	193	0	0	0
Through Vol	0	104	104	0	0	125	0
RT Vol	0	0	0	0	136	0	373
Lane Flow Rate	249	113	113	210	148	136	405
Geometry Grp	8	8	8	8	8	8	8
Degree of Util (X)	0.545	0.232	0.175	0.478	0.287	0.274	0.738
Departure Headway (Hd)	7.886	7.374	5.584	8.208	6.989	7.272	6.555
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	458	487	642	438	514	495	551
Service Time	5.628	5.116	3.326	5.951	4.732	5.009	4.293
HCM Lane V/C Ratio	0.544	0.232	0.176	0.479	0.288	0.275	0.735
HCM Control Delay	19.7	12.3	9.5	18.3	12.5	12.7	25.6
HCM Lane LOS	C	B	A	C	B	B	D
HCM 95th-tile Q	3.2	0.9	0.6	2.5	1.2	1.1	6.3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	20	211	125	1217	423	379	91	293	622	349	276
v/c Ratio	0.07	0.71	0.33	0.99	0.68	0.41	0.84	0.59	0.40	0.87	0.40
Control Delay	33.8	50.6	6.0	54.3	31.7	3.0	98.7	42.5	4.1	63.9	31.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.8	50.6	6.0	54.3	31.7	3.0	98.7	42.5	4.1	63.9	31.0
Queue Length 50th (ft)	10	117	0	362	209	0	54	85	26	105	67
Queue Length 95th (ft)	31	201	32	#569	356	48	#154	131	48	#200	107
Internal Link Dist (ft)		521			1372			611			680
Turn Bay Length (ft)	115		115	515		115	165		290	305	
Base Capacity (vph)	346	364	432	1231	620	915	108	700	1560	401	888
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.58	0.29	0.99	0.68	0.41	0.84	0.42	0.40	0.87	0.31

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	194	115	1120	285	453	84	270	572	321	205	49
Future Volume (veh/h)	18	194	115	1120	285	453	84	270	572	321	205	49
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	20	211	125	1217	446	401	91	293	622	349	223	53
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	249	262	222	1253	658	732	107	617	1466	397	619	144
Arrive On Green	0.14	0.14	0.14	0.35	0.35	0.35	0.06	0.17	0.17	0.11	0.22	0.22
Sat Flow, veh/h	1781	1870	1585	3563	1870	1564	1781	3554	2790	3456	2860	666
Grp Volume(v), veh/h	20	211	125	1217	446	401	91	293	622	349	137	139
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1564	1781	1777	1395	1728	1777	1749
Q Serve(g_s), s	0.9	10.2	6.9	31.4	18.9	17.1	4.7	6.9	12.7	9.3	6.1	6.3
Cycle Q Clear(g_c), s	0.9	10.2	6.9	31.4	18.9	17.1	4.7	6.9	12.7	9.3	6.1	6.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.38
Lane Grp Cap(c), veh/h	249	262	222	1253	658	732	107	617	1466	397	385	379
V/C Ratio(X)	0.08	0.81	0.56	0.97	0.68	0.55	0.85	0.48	0.42	0.88	0.36	0.37
Avail Cap(c_a), veh/h	342	359	304	1253	658	732	107	690	1523	397	442	435
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.9	38.9	37.4	29.7	25.7	17.8	43.4	34.7	13.5	40.6	31.0	31.1
Incr Delay (d2), s/veh	0.1	9.1	2.2	18.8	2.8	0.9	44.2	0.6	0.2	19.8	0.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	5.3	2.7	15.7	8.4	5.8	3.3	2.9	7.0	5.0	2.6	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.0	48.0	39.7	48.5	28.5	18.7	87.6	35.3	13.7	60.4	31.6	31.7
LnGrp LOS	D	D	D	D	C	B	F	D	B	E	C	C
Approach Vol, veh/h		356			2064			1006			625	
Approach Delay, s/veh		44.4			38.4			26.7			47.7	
Approach LOS		D			D			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.4	22.0		17.6	11.4	26.0		38.2				
Change Period (Y+Rc), s	* 4.7	5.8		4.6	5.8	* 5.8		5.4				
Max Green Setting (Gmax), s	* 11	18.1		17.9	5.6	* 23		32.8				
Max Q Clear Time (g_c+I1), s	11.3	14.7		12.2	6.7	8.3		33.4				
Green Ext Time (p_c), s	0.0	1.5		0.9	0.0	1.3		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	37.4
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	111	705	298	130	1109	318	700	407	317	297	157
v/c Ratio	0.58	0.66	0.18	0.74	0.91	0.33	0.79	0.61	0.84	0.59	0.43
Control Delay	56.4	32.6	0.9	67.3	42.3	5.0	38.6	36.1	56.2	42.1	14.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.4	32.6	0.9	67.3	42.3	5.0	38.6	36.1	56.2	42.1	14.4
Queue Length 50th (ft)	31	179	0	72	306	26	191	108	170	83	24
Queue Length 95th (ft)	#77	297	10	#195	#558	90	271	153	#381	138	58
Internal Link Dist (ft)		1510			1609			962		896	
Turn Bay Length (ft)	140			80			150		110		
Base Capacity (vph)	193	1062	1691	175	1214	960	891	1198	384	1191	363
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.66	0.18	0.74	0.91	0.33	0.79	0.34	0.83	0.25	0.43

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Olsen-Chandler SP — Near Term Plus 1293 Unit Project and School AM - Mitigated
19: S. River Road & Niblick Road — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	102	649	274	120	1020	293	644	321	53	292	273	144
Future Volume (veh/h)	102	649	274	120	1020	293	644	321	53	292	273	144
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	111	705	298	130	1109	318	700	349	58	317	297	157
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	192	1139	1531	162	1265	878	788	519	85	358	508	315
Arrive On Green	0.06	0.32	0.32	0.09	0.36	0.36	0.23	0.17	0.17	0.20	0.14	0.14
Sat Flow, veh/h	3456	3554	2790	1781	3554	1572	3456	3050	502	1781	3554	1585
Grp Volume(v), veh/h	111	705	298	130	1109	318	700	202	205	317	297	157
Grp Sat Flow(s),veh/h/ln	1728	1777	1395	1781	1777	1572	1728	1777	1775	1781	1777	1585
Q Serve(g_s), s	2.6	13.9	1.4	5.9	24.2	9.3	16.2	8.8	9.0	14.3	6.5	3.7
Cycle Q Clear(g_c), s	2.6	13.9	1.4	5.9	24.2	9.3	16.2	8.8	9.0	14.3	6.5	3.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.28	1.00		1.00
Lane Grp Cap(c), veh/h	192	1139	1531	162	1265	878	788	302	302	358	508	315
V/C Ratio(X)	0.58	0.62	0.19	0.80	0.88	0.36	0.89	0.67	0.68	0.89	0.58	0.50
Avail Cap(c_a), veh/h	213	1166	1552	193	1334	908	846	667	666	423	1308	672
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.2	23.9	2.8	36.9	25.0	10.2	31.0	32.2	32.3	32.2	33.2	11.4
Incr Delay (d2), s/veh	3.1	1.0	0.1	17.9	6.6	0.3	10.8	2.5	2.7	17.6	1.1	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	5.6	0.4	3.3	10.4	2.8	7.5	3.8	3.9	7.6	2.7	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.3	24.8	2.8	54.9	31.6	10.4	41.8	34.7	34.9	49.8	34.3	12.6
LnGrp LOS	D	C	A	D	C	B	D	C	C	D	C	B
Approach Vol, veh/h		1114			1557			1107			771	
Approach Delay, s/veh		20.6			29.2			39.2			36.3	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.1	31.1	23.4	16.3	9.1	34.0	21.1	18.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.0	27.2	20.3	30.5	5.1	31.1	19.7	31.1
Max Q Clear Time (g_c+I1), s	7.9	15.9	18.2	8.5	4.6	26.2	16.3	11.0
Green Ext Time (p_c), s	0.0	4.4	0.6	2.2	0.0	3.3	0.3	2.1

Intersection Summary	
HCM 6th Ctrl Delay	30.7
HCM 6th LOS	C

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	10.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1074	102	324	1015	0	18	0	390	0	0	0
Future Vol, veh/h	0	1074	102	324	1015	0	18	0	390	0	0	0
Conflicting Peds, #/hr	1	0	0	0	0	1	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	340	-	-	195	-	-	-	-	-	-	-	25
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	0	1107	105	334	1046	0	19	0	402	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1047	0	0	1212	0	0	2351	-	606	2269	2927	524
Stage 1	-	-	-	-	-	-	1160	-	-	1715	1715	-
Stage 2	-	-	-	-	-	-	1191	-	-	554	1212	-
Critical Hdwy	4.24	-	-	4.24	-	-	7.64	-	7.04	7.64	6.64	7.04
Critical Hdwy Stg 1	-	-	-	-	-	-	6.64	-	-	6.64	5.64	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.64	-	-	6.64	5.64	-
Follow-up Hdwy	2.27	-	-	2.27	-	-	3.57	-	3.37	3.57	4.07	3.37
Pot Cap-1 Maneuver	631	-	-	544	-	-	~ 18	0	428	21	14	485
Stage 1	-	-	-	-	-	-	200	0	-	89	136	-
Stage 2	-	-	-	-	-	-	191	0	-	472	243	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	630	-	-	544	-	-	~ 9	-	428	1	5	485
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 9	-	-	1	5	-
Stage 1	-	-	-	-	-	-	200	-	-	89	52	-
Stage 2	-	-	-	-	-	-	74	-	-	29	243	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	5.2	60.9	0
HCM LOS			F	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	428	630	-	-	544	-	-	-	-
HCM Lane V/C Ratio	0.939	-	-	-	0.614	-	-	-	-
HCM Control Delay (s)	60.9	0	-	-	21.6	-	-	0	0
HCM Lane LOS	F	A	-	-	C	-	-	A	A
HCM 95th %tile Q(veh)	10.8	0	-	-	4.1	-	-	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	6.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	284	1180	978	13	11	363
Future Vol, veh/h	284	1180	978	13	11	363
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	580	-	-	165	-	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	302	1255	1040	14	12	386

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1054	0	-	0	2272	520
Stage 1	-	-	-	-	1040	-
Stage 2	-	-	-	-	1232	-
Critical Hdwy	4.3	-	-	-	7	7.1
Critical Hdwy Stg 1	-	-	-	-	6	-
Critical Hdwy Stg 2	-	-	-	-	6	-
Follow-up Hdwy	2.3	-	-	-	3.6	3.4
Pot Cap-1 Maneuver	611	-	-	-	31	481
Stage 1	-	-	-	-	284	-
Stage 2	-	-	-	-	223	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	611	-	-	-	16	481
Mov Cap-2 Maneuver	-	-	-	-	113	-
Stage 1	-	-	-	-	144	-
Stage 2	-	-	-	-	223	-

Approach	EB	WB	SB
HCM Control Delay, s	3.2	0	36.5
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	611	-	-	-	481
HCM Lane V/C Ratio	0.494	-	-	-	0.803
HCM Control Delay (s)	16.5	-	-	-	36.5
HCM Lane LOS	C	-	-	-	E
HCM 95th %tile Q(veh)	2.7	-	-	-	7.5

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	21	522	255	464	652	6	47	281	358	359	110
v/c Ratio	0.20	0.46	0.77	0.48	0.48	0.06	0.42	0.63	0.76	0.75	0.19
Control Delay	44.8	27.9	39.8	10.7	2.5	41.5	52.6	17.5	40.8	40.1	1.3
Queue Delay	0.0	0.0	0.0	0.3	0.1	0.0	0.0	0.5	0.1	0.1	0.0
Total Delay	44.8	27.9	39.8	10.9	2.6	41.5	52.6	18.0	40.9	40.2	1.3
Queue Length 50th (ft)	12	143	141	67	16	3	26	39	180	180	0
Queue Length 95th (ft)	35	187	#235	161	0	16	#63	97	#326	#311	6
Internal Link Dist (ft)		346		307			744			674	
Turn Bay Length (ft)	65		125			140		165	150		185
Base Capacity (vph)	107	1180	372	965	1368	107	113	482	499	506	586
Starvation Cap Reductn	0	0	0	120	133	0	0	0	0	0	0
Spillback Cap Reductn	0	20	0	0	0	0	0	34	3	3	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.45	0.69	0.55	0.53	0.06	0.42	0.63	0.72	0.71	0.19

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	460	31	240	436	613	6	44	264	590	84	103
Future Volume (veh/h)	20	460	31	240	436	613	6	44	264	590	84	103
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	21	489	33	255	464	652	6	47	281	692	0	110
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	41	638	43	591	931	1135	100	105	615	818	0	362
Arrive On Green	0.02	0.19	0.19	0.11	0.16	0.16	0.06	0.06	0.06	0.23	0.00	0.23
Sat Flow, veh/h	1795	3403	229	1795	1885	1560	1795	1885	1598	3591	0	1591
Grp Volume(v), veh/h	21	257	265	255	464	652	6	47	281	692	0	110
Grp Sat Flow(s),veh/h/ln	1795	1791	1841	1795	1885	1560	1795	1885	1598	1795	0	1591
Q Serve(g_s), s	1.0	12.2	12.3	12.0	20.2	20.1	0.3	2.2	0.0	16.6	0.0	5.2
Cycle Q Clear(g_c), s	1.0	12.2	12.3	12.0	20.2	20.1	0.3	2.2	0.0	16.6	0.0	5.2
Prop In Lane	1.00		0.12	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	41	336	345	591	931	1135	100	105	615	818	0	362
V/C Ratio(X)	0.52	0.77	0.77	0.43	0.50	0.57	0.06	0.45	0.46	0.85	0.00	0.30
Avail Cap(c_a), veh/h	106	458	470	591	931	1135	100	105	615	1017	0	451
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.75	0.75	0.75	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	43.5	34.7	34.7	32.2	27.5	10.4	40.3	41.2	20.7	33.2	0.0	28.8
Incr Delay (d2), s/veh	9.7	15.3	15.2	0.4	0.3	0.5	0.2	3.0	0.5	5.6	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	6.7	6.9	5.8	10.2	15.3	0.1	1.1	4.3	7.6	0.0	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.2	50.0	49.9	32.6	27.8	10.9	40.5	44.2	21.2	38.8	0.0	29.3
LnGrp LOS	D	D	D	C	C	B	D	D	C	D	A	C
Approach Vol, veh/h		543			1371			334			802	
Approach Delay, s/veh		50.0			20.7			24.8			37.5	
Approach LOS		D			C			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	34.1	21.4		25.0	6.5	49.0		9.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	18.5	23.0		25.5	5.3	36.2		5.0				
Max Q Clear Time (g_c+I1), s	14.0	14.3		18.6	3.0	22.2		4.2				
Green Ext Time (p_c), s	0.3	2.1		1.9	0.0	5.0		0.1				

Intersection Summary

HCM 6th Ctrl Delay	30.8
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	91	1323	20	1083	266	276	30	447	8	27
v/c Ratio	0.56	0.62	0.18	0.58	0.29	0.76	0.06	0.85	0.02	0.05
Control Delay	45.9	11.0	44.3	18.5	4.4	44.3	22.8	35.6	21.9	0.2
Queue Delay	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.9	11.6	44.3	18.5	4.4	44.3	22.8	35.6	21.9	0.2
Queue Length 50th (ft)	49	215	11	241	12	141	12	159	3	0
Queue Length 95th (ft)	m79	326	34	325	57	220	31	266	13	0
Internal Link Dist (ft)		307		269			836			575
Turn Bay Length (ft)	120		220		145	130		110	95	
Base Capacity (vph)	174	2127	110	1865	924	440	595	610	439	673
Starvation Cap Reductn	0	371	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	29	0	0	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.75	0.18	0.59	0.29	0.63	0.05	0.73	0.02	0.04

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	1200	31	19	1007	247	257	28	416	7	0	25
Future Volume (veh/h)	85	1200	31	19	1007	247	257	28	416	7	0	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	91	1290	33	20	1083	0	276	30	447	8	0	27
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	117	1510	39	225	1733		483	568	481	348	0	481
Arrive On Green	0.07	0.42	0.42	0.13	0.48	0.00	0.30	0.30	0.30	0.30	0.00	0.30
Sat Flow, veh/h	1795	3566	91	1795	3582	1598	1394	1885	1598	925	0	1598
Grp Volume(v), veh/h	91	648	675	20	1083	0	276	30	447	8	0	27
Grp Sat Flow(s),veh/h/ln	1795	1791	1866	1795	1791	1598	1394	1885	1598	925	0	1598
Q Serve(g_s), s	4.5	29.4	29.4	0.9	20.1	0.0	15.8	1.0	24.4	0.6	0.0	1.1
Cycle Q Clear(g_c), s	4.5	29.4	29.4	0.9	20.1	0.0	16.9	1.0	24.4	1.6	0.0	1.1
Prop In Lane	1.00		0.05	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	117	758	790	225	1733		483	568	481	348	0	481
V/C Ratio(X)	0.78	0.85	0.85	0.09	0.63		0.57	0.05	0.93	0.02	0.00	0.06
Avail Cap(c_a), veh/h	170	854	889	225	1733		505	597	506	362	0	506
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.78	0.78	0.78	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.4	23.4	23.4	34.8	17.2	0.0	28.3	22.3	30.5	22.9	0.0	22.4
Incr Delay (d2), s/veh	10.5	9.5	9.2	0.2	1.7	0.0	1.4	0.0	23.2	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	13.7	14.2	0.4	8.2	0.0	5.2	0.4	12.0	0.1	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.9	32.9	32.6	35.0	18.9	0.0	29.8	22.4	53.7	22.9	0.0	22.4
LnGrp LOS	D	C	C	C	B		C	C	D	C	A	C
Approach Vol, veh/h		1414			1103	A		753			35	
Approach Delay, s/veh		34.0			19.2			43.7			22.5	
Approach LOS		C			B			D			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.8	42.6		31.6	10.4	48.0		31.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	42.9		28.5	8.5	39.5		28.5				
Max Q Clear Time (g_c+I1), s	2.9	31.4		3.6	6.5	22.1		26.4				
Green Ext Time (p_c), s	0.0	6.7		0.1	0.0	7.5		0.7				

Intersection Summary	
HCM 6th Ctrl Delay	31.1
HCM 6th LOS	C

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	199	589	369	110	486	396	237	575	378	583	155
v/c Ratio	0.75	0.58	0.46	0.52	0.62	0.60	0.75	0.63	0.73	0.71	0.24
Control Delay	55.3	30.2	11.0	46.0	33.0	16.7	51.0	30.0	45.4	35.2	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.3	30.2	11.0	46.0	33.0	16.7	51.0	30.0	45.4	35.2	10.6
Queue Length 50th (ft)	102	148	70	55	122	102	118	133	99	147	27
Queue Length 95th (ft)	#251	223	156	121	183	200	#274	210	#197	229	73
Internal Link Dist (ft)		1092			186			1440		2310	
Turn Bay Length (ft)	150			170		140	230		245		25
Base Capacity (vph)	277	1219	828	265	1197	670	343	1228	537	1108	647
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.48	0.45	0.42	0.41	0.59	0.69	0.47	0.70	0.53	0.24

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	187	554	347	103	457	372	223	463	77	355	548	146
Future Volume (veh/h)	187	554	347	103	457	372	223	463	77	355	548	146
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	199	589	369	110	486	396	237	493	82	378	583	155
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	238	1143	756	141	950	637	278	753	125	467	801	564
Arrive On Green	0.13	0.32	0.32	0.08	0.27	0.27	0.16	0.24	0.24	0.13	0.22	0.22
Sat Flow, veh/h	1795	3582	1592	1795	3582	1596	1795	3075	509	3483	3582	1576
Grp Volume(v), veh/h	199	589	369	110	486	396	237	286	289	378	583	155
Grp Sat Flow(s),veh/h/ln	1795	1791	1592	1795	1791	1596	1795	1791	1794	1742	1791	1576
Q Serve(g_s), s	8.7	10.8	12.8	4.8	9.3	16.0	10.3	11.6	11.7	8.5	12.2	5.7
Cycle Q Clear(g_c), s	8.7	10.8	12.8	4.8	9.3	16.0	10.3	11.6	11.7	8.5	12.2	5.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.28	1.00		1.00
Lane Grp Cap(c), veh/h	238	1143	756	141	950	637	278	438	439	467	801	564
V/C Ratio(X)	0.84	0.52	0.49	0.78	0.51	0.62	0.85	0.65	0.66	0.81	0.73	0.27
Avail Cap(c_a), veh/h	279	1223	791	267	1201	749	346	623	624	541	1112	701
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.1	22.4	14.5	36.4	25.2	19.3	33.1	27.3	27.4	33.9	29.0	18.5
Incr Delay (d2), s/veh	17.3	0.4	0.5	8.8	0.4	1.2	15.3	1.7	1.7	8.0	1.5	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	4.2	4.1	2.4	3.7	5.5	5.5	4.9	5.0	4.0	5.1	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.3	22.7	15.0	45.2	25.6	20.5	48.4	29.0	29.1	41.8	30.5	18.8
LnGrp LOS	D	C	B	D	C	C	D	C	C	D	C	B
Approach Vol, veh/h		1157			992			812			1116	
Approach Delay, s/veh		25.2			25.7			34.7			32.7	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.3	24.2	10.8	30.2	17.0	22.5	15.2	25.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	12.5	28.0	12.0	27.5	15.5	25.0	12.5	27.0
Max Q Clear Time (g_c+I1), s	10.5	13.7	6.8	14.8	12.3	14.2	10.7	18.0
Green Ext Time (p_c), s	0.3	2.9	0.1	4.2	0.2	3.3	0.1	3.1

Intersection Summary	
HCM 6th Ctrl Delay	29.3
HCM 6th LOS	C

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	129	718	108	869
v/c Ratio	0.55	0.57	0.21	0.58
Control Delay	27.7	11.3	3.4	6.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	27.7	11.3	3.4	6.1
Queue Length 50th (ft)	32	192	10	142
Queue Length 95th (ft)	82	385	26	298
Internal Link Dist (ft)	2642	1037		1110
Turn Bay Length (ft)			60	
Base Capacity (vph)	648	1270	516	1486
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.20	0.57	0.21	0.58

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	54	66	620	47	100	808
Future Volume (veh/h)	54	66	620	47	100	808
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1885	1885	1885	1885
Adj Flow Rate, veh/h	58	71	667	51	108	869
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	1	1	1	1
Cap, veh/h	73	90	1192	91	539	1492
Arrive On Green	0.10	0.10	0.69	0.69	0.05	0.79
Sat Flow, veh/h	751	919	1729	132	1795	1885
Grp Volume(v), veh/h	130	0	0	718	108	869
Grp Sat Flow(s),veh/h/ln	1682	0	0	1861	1795	1885
Q Serve(g_s), s	6.8	0.0	0.0	17.6	1.4	16.1
Cycle Q Clear(g_c), s	6.8	0.0	0.0	17.6	1.4	16.1
Prop In Lane	0.45	0.55		0.07	1.00	
Lane Grp Cap(c), veh/h	164	0	0	1283	539	1492
V/C Ratio(X)	0.79	0.00	0.00	0.56	0.20	0.58
Avail Cap(c_a), veh/h	598	0	0	1283	555	1492
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	0.92	1.00	1.00
Uniform Delay (d), s/veh	39.7	0.0	0.0	7.1	5.2	3.6
Incr Delay (d2), s/veh	8.3	0.0	0.0	1.6	0.2	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	0.0	6.0	0.3	4.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	48.0	0.0	0.0	8.7	5.3	5.3
LnGrp LOS	D	A	A	A	A	A
Approach Vol, veh/h	130		718			977
Approach Delay, s/veh	48.0		8.7			5.3
Approach LOS	D		A			A

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	9.2	67.0			76.2	13.8
Change Period (Y+Rc), s	4.5	5.0			5.0	5.0
Max Green Setting (Gmax), s	5.5	38.5			48.5	32.0
Max Q Clear Time (g_c+I1), s	3.4	19.6			18.1	8.8
Green Ext Time (p_c), s	0.0	4.8			7.4	0.3

Intersection Summary	
HCM 6th Ctrl Delay	9.7
HCM 6th LOS	A

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	132	43	22	443	48	566	135
v/c Ratio	0.43	0.11	0.10	0.41	0.23	0.49	0.14
Control Delay	20.1	8.1	23.1	11.1	24.4	10.9	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.1	8.1	23.1	11.1	24.4	10.9	3.8
Queue Length 50th (ft)	22	1	4	53	10	74	3
Queue Length 95th (ft)	77	21	25	192	43	#278	34
Internal Link Dist (ft)	560	1033		1337		1037	
Turn Bay Length (ft)			30		70		60
Base Capacity (vph)	867	1024	213	1145	213	1192	1022
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.04	0.10	0.39	0.23	0.47	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	113	4	14	4	1	38	22	429	10	48	560	134
Future Volume (veh/h)	113	4	14	4	1	38	22	429	10	48	560	134
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.98	0.99		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	114	4	14	4	1	38	22	433	10	48	566	135
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	374	14	24	121	18	215	49	709	16	95	776	654
Arrive On Green	0.15	0.15	0.15	0.15	0.15	0.15	0.03	0.39	0.39	0.05	0.41	0.41
Sat Flow, veh/h	1211	91	154	69	116	1403	1795	1835	42	1795	1885	1588
Grp Volume(v), veh/h	132	0	0	43	0	0	22	0	443	48	566	135
Grp Sat Flow(s),veh/h/ln	1456	0	0	1587	0	0	1795	0	1877	1795	1885	1588
Q Serve(g_s), s	2.1	0.0	0.0	0.0	0.0	0.0	0.4	0.0	6.7	0.9	9.0	1.9
Cycle Q Clear(g_c), s	2.9	0.0	0.0	0.8	0.0	0.0	0.4	0.0	6.7	0.9	9.0	1.9
Prop In Lane	0.86		0.11	0.09		0.88	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	412	0	0	354	0	0	49	0	725	95	776	654
V/C Ratio(X)	0.32	0.00	0.00	0.12	0.00	0.00	0.45	0.00	0.61	0.50	0.73	0.21
Avail Cap(c_a), veh/h	1255	0	0	1301	0	0	252	0	1239	252	1245	1048
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.9	0.0	0.0	13.1	0.0	0.0	17.0	0.0	8.8	16.4	8.8	6.7
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.2	0.0	0.0	6.2	0.0	0.8	4.1	1.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	0.3	0.0	0.0	0.2	0.0	1.9	0.4	2.5	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.3	0.0	0.0	13.3	0.0	0.0	23.2	0.0	9.6	20.5	10.1	6.9
LnGrp LOS	B	A	A	B	A	A	C	A	A	C	B	A
Approach Vol, veh/h		132			43			465			749	
Approach Delay, s/veh		14.3			13.3			10.3			10.2	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.9	18.7		10.0	6.0	19.7		10.0				
Change Period (Y+Rc), s	5.0	5.0		4.5	5.0	5.0		4.5				
Max Green Setting (Gmax), s	5.0	23.5		27.0	5.0	23.5		27.0				
Max Q Clear Time (g_c+I1), s	2.9	8.7		4.9	2.4	11.0		2.8				
Green Ext Time (p_c), s	0.0	2.3		0.7	0.0	3.3		0.2				

Intersection Summary	
HCM 6th Ctrl Delay	10.7
HCM 6th LOS	B

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	21	201	219	12	267	308	344	278
v/c Ratio	0.13	0.54	0.44	0.08	0.61	0.51	0.72	0.14
Control Delay	27.1	29.7	7.1	35.5	29.8	6.5	36.9	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.1	29.7	7.1	35.5	29.8	6.5	36.9	9.6
Queue Length 50th (ft)	4	61	0	4	79	0	102	16
Queue Length 95th (ft)	28	152	52	23	197	59	#355	75
Internal Link Dist (ft)	284	314			712			1337
Turn Bay Length (ft)							120	
Base Capacity (vph)	166	823	834	149	691	782	477	2046
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.24	0.26	0.08	0.39	0.39	0.72	0.14

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	2	9	184	3	204	11	248	286	320	246	12
Future Volume (veh/h)	8	2	9	184	3	204	11	248	286	320	246	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	9	2	10	198	3	219	12	267	308	344	265	13
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	18	4	20	350	5	314	27	466	393	397	1574	77
Arrive On Green	0.02	0.02	0.02	0.20	0.20	0.20	0.02	0.25	0.25	0.22	0.45	0.45
Sat Flow, veh/h	726	161	806	1770	27	1585	1795	1885	1588	1795	3471	169
Grp Volume(v), veh/h	21	0	0	201	0	219	12	267	308	344	136	142
Grp Sat Flow(s),veh/h/ln	1693	0	0	1797	0	1585	1795	1885	1588	1795	1791	1850
Q Serve(g_s), s	0.8	0.0	0.0	6.2	0.0	7.9	0.4	7.6	11.1	11.3	2.8	2.8
Cycle Q Clear(g_c), s	0.8	0.0	0.0	6.2	0.0	7.9	0.4	7.6	11.1	11.3	2.8	2.8
Prop In Lane	0.43		0.48	0.99		1.00	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	41	0	0	355	0	314	27	466	393	397	812	839
V/C Ratio(X)	0.51	0.00	0.00	0.57	0.00	0.70	0.44	0.57	0.78	0.87	0.17	0.17
Avail Cap(c_a), veh/h	151	0	0	804	0	709	146	675	568	467	961	993
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.6	0.0	0.0	22.3	0.0	23.0	30.0	20.3	21.6	23.1	9.9	9.9
Incr Delay (d2), s/veh	9.2	0.0	0.0	1.4	0.0	2.8	11.0	1.1	4.5	13.9	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	2.6	0.0	3.0	0.2	3.0	4.0	5.9	0.9	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.8	0.0	0.0	23.7	0.0	25.8	41.0	21.4	26.1	37.0	10.0	10.0
LnGrp LOS	D	A	A	C	A	C	D	C	C	D	B	B
Approach Vol, veh/h		21			420			587			622	
Approach Delay, s/veh		38.8			24.8			24.3			24.9	
Approach LOS		D			C			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	18.6	20.2		6.0	5.9	32.9		16.7				
Change Period (Y+Rc), s	5.0	5.0		4.5	5.0	5.0		4.5				
Max Green Setting (Gmax), s	16.0	22.0		5.5	5.0	33.0		27.5				
Max Q Clear Time (g_c+I1), s	13.3	13.1		2.8	2.4	4.8		9.9				
Green Ext Time (p_c), s	0.3	1.7		0.0	0.0	1.5		1.9				

Intersection Summary		
HCM 6th Ctrl Delay	24.8	
HCM 6th LOS	C	

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	19
Intersection LOS	C

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	345	247	148	200	198	241
Future Vol, veh/h	345	247	148	200	198	241
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	356	255	153	206	204	248
Number of Lanes	1	1	1	2	1	1

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	3
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	2	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	3	0	2
HCM Control Delay	24.4	13.3	16.1
HCM LOS	C	B	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	0%
Vol Thru, %	0%	100%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	148	100	100	345	247	198	241
LT Vol	148	0	0	345	0	0	0
Through Vol	0	100	100	0	0	198	0
RT Vol	0	0	0	0	247	0	241
Lane Flow Rate	153	103	103	356	255	204	248
Geometry Grp	8	8	8	8	8	8	8
Degree of Util (X)	0.355	0.225	0.175	0.763	0.461	0.436	0.481
Departure Headway (Hd)	8.381	7.867	6.103	7.727	6.514	7.689	6.968
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	430	457	588	469	553	469	517
Service Time	6.125	5.611	3.846	5.467	4.253	5.432	4.711
HCM Lane V/C Ratio	0.356	0.225	0.175	0.759	0.461	0.435	0.48
HCM Control Delay	15.7	12.9	10.1	31.4	14.7	16.3	16
HCM Lane LOS	C	B	B	D	B	C	C
HCM 95th-tile Q	1.6	0.9	0.6	6.5	2.4	2.2	2.6

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	52	444	769	209	442	99	368	1204	634	324
v/c Ratio	0.16	0.66	0.76	0.38	0.50	0.88	0.61	0.86	1.98	0.46
Control Delay	28.7	32.5	32.5	26.3	4.1	99.3	35.4	16.7	473.4	27.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.7	32.5	32.5	26.3	4.1	99.3	35.4	16.7	473.4	27.8
Queue Length 50th (ft)	22	97	179	83	2	50	90	134	~258	68
Queue Length 95th (ft)	54	154	#292	158	58	#153	137	211	#392	110
Internal Link Dist (ft)		521		1372			611			680
Turn Bay Length (ft)	115		515		115	165		290	305	
Base Capacity (vph)	406	813	1013	549	885	113	967	1396	321	1062
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.55	0.76	0.38	0.50	0.88	0.38	0.86	1.98	0.31

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	329	102	746	203	429	96	357	1168	615	256	58
Future Volume (veh/h)	50	329	102	746	203	429	96	357	1168	615	256	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	52	339	105	769	209	442	99	368	1204	634	264	60
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	291	437	133	931	504	562	104	887	1447	295	761	170
Arrive On Green	0.16	0.16	0.16	0.27	0.27	0.27	0.06	0.25	0.25	0.08	0.26	0.26
Sat Flow, veh/h	1795	2694	820	3483	1885	1594	1795	3582	2812	3483	2909	650
Grp Volume(v), veh/h	52	223	221	769	209	442	99	368	1204	634	161	163
Grp Sat Flow(s),veh/h/ln	1795	1791	1723	1742	1885	1594	1795	1791	1406	1742	1791	1768
Q Serve(g_s), s	2.2	10.3	10.6	17.9	7.9	21.4	4.7	7.4	21.3	7.3	6.3	6.5
Cycle Q Clear(g_c), s	2.2	10.3	10.6	17.9	7.9	21.4	4.7	7.4	21.3	7.3	6.3	6.5
Prop In Lane	1.00		0.48	1.00		1.00	1.00		1.00	1.00		0.37
Lane Grp Cap(c), veh/h	291	291	280	931	504	562	104	887	1447	295	468	462
V/C Ratio(X)	0.18	0.77	0.79	0.83	0.41	0.79	0.95	0.42	0.83	2.15	0.34	0.35
Avail Cap(c_a), veh/h	373	372	358	931	504	562	104	887	1447	295	491	485
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.1	34.5	34.6	29.6	26.0	25.0	40.4	27.2	15.3	39.4	25.8	25.9
Incr Delay (d2), s/veh	0.3	7.2	8.8	6.2	0.5	7.3	71.7	0.3	4.3	526.8	0.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	5.0	5.1	7.8	3.4	8.6	4.1	3.0	13.1	24.7	2.7	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.4	41.7	43.4	35.8	26.5	32.3	112.1	27.5	19.6	566.2	26.2	26.3
LnGrp LOS	C	D	D	D	C	C	F	C	B	F	C	C
Approach Vol, veh/h		496			1420			1671			958	
Approach Delay, s/veh		41.4			33.4			26.8			383.6	
Approach LOS		D			C			C			F	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.0	27.1		18.6	10.8	28.3		28.4				
Change Period (Y+Rc), s	* 4.7	5.8		4.6	5.8	* 5.8		5.4				
Max Green Setting (Gmax), s	7.3	21.3		17.9	5.0	* 24		23.0				
Max Q Clear Time (g_c+I1), s	9.3	23.3		12.6	6.7	8.5		23.4				
Green Ext Time (p_c), s	0.0	0.0		1.4	0.0	1.6		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	105.7
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	269	1069	667	121	776	166	451	372	219	425	134
v/c Ratio	0.75	0.88	0.43	0.81	0.68	0.27	0.87	0.51	0.82	0.59	0.25
Control Delay	51.2	36.3	5.2	77.1	28.6	5.1	54.1	27.1	60.7	32.3	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.2	36.3	5.2	77.1	28.6	5.1	54.1	27.1	60.7	32.3	6.7
Queue Length 50th (ft)	67	253	28	60	170	0	112	77	106	103	14
Queue Length 95th (ft)	#155	#493	89	#183	298	44	#246	115	#276	145	35
Internal Link Dist (ft)		1510			1609			962		896	
Turn Bay Length (ft)	140			80			150		110		
Base Capacity (vph)	359	1218	1535	149	1148	623	518	1328	267	1347	533
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.88	0.43	0.81	0.68	0.27	0.87	0.28	0.82	0.32	0.25

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	258	1026	640	116	745	159	433	273	84	210	408	129
Future Volume (veh/h)	258	1026	640	116	745	159	433	273	84	210	408	129
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	269	1069	667	121	776	166	451	284	88	219	425	134
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	354	1239	1403	153	1180	525	533	515	156	259	651	451
Arrive On Green	0.10	0.35	0.35	0.09	0.33	0.33	0.15	0.19	0.19	0.14	0.18	0.18
Sat Flow, veh/h	3483	3582	2812	1795	3582	1595	3483	2706	822	1795	3582	1590
Grp Volume(v), veh/h	269	1069	667	121	776	166	451	186	186	219	425	134
Grp Sat Flow(s),veh/h/ln	1742	1791	1406	1795	1791	1595	1742	1791	1737	1795	1791	1590
Q Serve(g_s), s	5.8	21.4	3.4	5.1	14.3	6.0	9.7	7.2	7.5	9.1	8.5	2.7
Cycle Q Clear(g_c), s	5.8	21.4	3.4	5.1	14.3	6.0	9.7	7.2	7.5	9.1	8.5	2.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.47	1.00		1.00
Lane Grp Cap(c), veh/h	354	1239	1403	153	1180	525	533	341	331	259	651	451
V/C Ratio(X)	0.76	0.86	0.48	0.79	0.66	0.32	0.85	0.55	0.56	0.85	0.65	0.30
Avail Cap(c_a), veh/h	381	1286	1440	159	1212	540	548	711	689	283	1422	793
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.6	23.4	3.9	34.5	22.1	19.3	31.7	28.1	28.2	32.0	29.2	8.2
Incr Delay (d2), s/veh	8.1	6.1	0.3	22.5	1.3	0.3	11.5	1.4	1.5	19.2	1.1	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	9.1	0.8	3.1	5.6	2.1	4.7	3.0	3.0	5.1	3.5	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.7	29.6	4.2	57.0	23.3	19.6	43.1	29.5	29.7	51.3	30.3	8.6
LnGrp LOS	D	C	A	E	C	B	D	C	C	D	C	A
Approach Vol, veh/h		2005			1063			823			778	
Approach Delay, s/veh		22.7			26.6			37.0			32.5	
Approach LOS		C			C			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	31.1	16.3	18.5	12.3	29.8	15.6	19.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	27.6	12.1	30.5	8.4	26.0	12.1	30.5
Max Q Clear Time (g_c+I1), s	7.7	23.4	11.7	10.5	7.8	16.3	11.1	9.5
Green Ext Time (p_c), s	0.0	3.2	0.1	2.9	0.1	3.9	0.1	2.0

Intersection Summary	
HCM 6th Ctrl Delay	27.8
HCM 6th LOS	C

Cumulative

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	435	1747	1680	212	202	342
v/c Ratio	0.80	0.54	0.94	0.24	0.77	0.63
Control Delay	71.2	0.7	42.2	5.5	80.0	43.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.2	0.7	42.2	5.5	80.0	43.3
Queue Length 50th (ft)	224	0	786	22	202	281
Queue Length 95th (ft)	298	0	#1079	69	304	396
Internal Link Dist (ft)		942	856		514	
Turn Bay Length (ft)	345			330	450	
Base Capacity (vph)	662	3223	2047	975	341	660
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.54	0.82	0.22	0.59	0.52

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	400	1607	1546	195	186	315
Future Volume (vph)	400	1607	1546	195	186	315
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0	7.3	7.3	4.2	3.7
Lane Util. Factor	0.97	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3127	3223	3223	1442	1612	1442
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3127	3223	3223	1442	1612	1442
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	435	1747	1680	212	202	342
RTOR Reduction (vph)	0	0	0	72	0	10
Lane Group Flow (vph)	435	1747	1680	140	202	332
Heavy Vehicles (%)	12%	12%	12%	12%	12%	12%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	8	Free!	6		7!	4
Permitted Phases				6		4
Actuated Green, G (s)	25.6	145.4	80.9	80.9	23.9	53.5
Effective Green, g (s)	25.6	145.4	80.9	80.9	23.9	53.5
Actuated g/C Ratio	0.18	1.00	0.56	0.56	0.16	0.37
Clearance Time (s)	3.5		7.3	7.3	4.2	3.7
Vehicle Extension (s)	3.0		4.0	4.0	3.5	3.0
Lane Grp Cap (vph)	550	3223	1793	802	264	530
v/s Ratio Prot	c0.14	0.54	c0.52		c0.13	0.23
v/s Ratio Perm				0.10		
v/c Ratio	0.79	0.54	0.94	0.17	0.77	0.63
Uniform Delay, d1	57.3	0.0	29.9	15.8	58.1	37.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.6	0.7	10.0	0.1	12.8	2.3
Delay (s)	65.0	0.7	39.9	16.0	70.8	40.1
Level of Service	E	A	D	B	E	D
Approach Delay (s)		13.5	37.2		51.5	
Approach LOS		B	D		D	

Intersection Summary			
HCM 2000 Control Delay	27.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	145.4	Sum of lost time (s)	15.0
Intersection Capacity Utilization	77.4%	ICU Level of Service	D
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

HCM 6th Edition methodology cannot be performed with phasing conflicts.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	435	1132	383	439	1176	326	412	630	251	245	304
v/c Ratio	1.13	0.89	0.48	1.08	0.91	0.43	0.96	0.86	0.71	0.70	0.65
Control Delay	141.8	53.2	4.8	128.3	54.9	6.0	98.4	67.8	78.0	67.0	24.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	141.8	53.2	4.8	128.3	54.9	6.0	98.4	67.8	78.0	67.0	24.1
Queue Length 50th (ft)	~270	556	0	~260	581	12	~220	317	127	228	83
Queue Length 95th (ft)	#434	693	68	#439	733	83	#382	424	192	345	199
Internal Link Dist (ft)		1323			2509			853		451	
Turn Bay Length (ft)	225		485	125		390	160		140		
Base Capacity (vph)	386	1550	894	405	1550	853	430	894	430	477	558
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.13	0.73	0.43	1.08	0.76	0.38	0.96	0.70	0.58	0.51	0.54

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Cumulative AM
2: Golden Hill Road & SR 46 E — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	400	1041	352	404	1082	300	379	495	85	231	225	280
Future Volume (vph)	400	1041	352	404	1082	300	379	495	85	231	225	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3155	3252	1455	3155	3252	1455	3155	3175		3155	1712	1455
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3155	3252	1455	3155	3252	1455	3155	3175		3155	1712	1455
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	435	1132	383	439	1176	326	412	538	92	251	245	304
RTOR Reduction (vph)	0	0	233	0	0	185	0	8	0	0	0	168
Lane Group Flow (vph)	435	1132	150	439	1176	141	412	622	0	251	245	136
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	18.4	58.3	58.3	19.3	59.2	59.2	20.4	34.3		16.8	30.7	30.7
Effective Green, g (s)	18.4	58.3	58.3	19.3	59.2	59.2	20.4	34.3		16.8	30.7	30.7
Actuated g/C Ratio	0.12	0.39	0.39	0.13	0.40	0.40	0.14	0.23		0.11	0.21	0.21
Clearance Time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	388	1269	568	407	1289	576	431	729		355	352	299
v/s Ratio Prot	c0.14	0.35		c0.14	c0.36		c0.13	c0.20		0.08	0.14	
v/s Ratio Perm			0.10			0.10						0.09
v/c Ratio	1.12	0.89	0.26	1.08	0.91	0.25	0.96	0.85		0.71	0.70	0.46
Uniform Delay, d1	65.5	42.6	30.9	65.0	42.6	30.1	64.0	55.1		63.9	55.0	52.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	82.8	8.3	0.2	67.3	9.9	0.2	31.9	9.5		6.3	5.9	1.1
Delay (s)	148.2	50.8	31.2	132.3	52.5	30.3	95.9	64.6		70.2	60.9	53.1
Level of Service	F	D	C	F	D	C	F	E		E	E	D
Approach Delay (s)		68.7			66.8			77.0			60.8	
Approach LOS		E			E			E			E	

Intersection Summary				
HCM 2000 Control Delay	68.5	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	0.97			
Actuated Cycle Length (s)	149.3	Sum of lost time (s)	20.6	
Intersection Capacity Utilization	81.5%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Olsen-Chandler SP — Cumulative AM
2: Golden Hill Road & SR 46 E — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	400	1041	352	404	1082	300	379	495	85	231	225	280
Future Volume (veh/h)	400	1041	352	404	1082	300	379	495	85	231	225	280
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1737	1737	1737	1737	1737	1737	1737	1737	1737	1737	1737	1737
Adj Flow Rate, veh/h	435	1132	383	439	1176	326	412	538	92	251	245	304
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	365	1270	566	365	1339	597	406	726	124	296	389	329
Arrive On Green	0.11	0.38	0.38	0.11	0.41	0.41	0.13	0.26	0.26	0.09	0.22	0.22
Sat Flow, veh/h	3209	3300	1472	3209	3300	1472	3209	2814	479	3209	1737	1472
Grp Volume(v), veh/h	435	1132	383	439	1176	326	412	315	315	251	245	304
Grp Sat Flow(s),veh/h/ln	1605	1650	1472	1605	1650	1472	1605	1650	1643	1605	1737	1472
Q Serve(g_s), s	18.0	50.8	23.2	18.0	52.0	26.7	20.0	27.6	27.9	12.2	20.2	31.9
Cycle Q Clear(g_c), s	18.0	50.8	23.2	18.0	52.0	26.7	20.0	27.6	27.9	12.2	20.2	31.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.29	1.00		1.00
Lane Grp Cap(c), veh/h	365	1270	566	365	1339	597	406	426	424	296	389	329
V/C Ratio(X)	1.19	0.89	0.68	1.20	0.88	0.55	1.02	0.74	0.74	0.85	0.63	0.92
Avail Cap(c_a), veh/h	365	1461	652	365	1461	652	406	428	426	406	450	382
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	70.1	45.6	18.6	70.1	43.4	35.9	69.1	53.8	53.9	70.7	55.5	60.0
Incr Delay (d2), s/veh	109.9	6.6	2.3	114.2	6.1	0.8	48.6	6.6	6.9	11.6	2.2	25.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.8	21.0	8.1	13.0	21.3	9.7	10.9	12.2	12.2	5.4	9.0	14.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	180.0	52.2	20.9	184.3	49.5	36.7	117.6	60.4	60.8	82.3	57.7	85.6
LnGrp LOS	F	D	C	F	D	D	F	E	E	F	E	F
Approach Vol, veh/h		1950			1941			1042			800	
Approach Delay, s/veh		74.6			77.8			83.1			76.0	
Approach LOS		E			E			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	25.3	68.2	24.0	40.7	22.0	71.5	18.6	46.1
Change Period (Y+Rc), s	7.3	* 7.3	4.0	5.3	4.0	7.3	4.0	5.3
Max Green Setting (Gmax), s	18.0	* 70	20.0	41.0	18.0	70.0	20.0	41.0
Max Q Clear Time (g_c+I1), s	20.0	52.8	22.0	33.9	20.0	54.0	14.2	29.9
Green Ext Time (p_c), s	0.0	8.1	0.0	1.4	0.0	7.8	0.4	2.8

Intersection Summary	
HCM 6th Ctrl Delay	77.4
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↱		↱
Traffic Volume (veh/h)	0	1281	1686	30	0	100
Future Volume (Veh/h)	0	1281	1686	30	0	100
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1392	1833	33	0	109
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1866				2529	916
vC1, stage 1 conf vol					1833	
vC2, stage 2 conf vol					696	
vCu, unblocked vol	1866				2529	916
tC, single (s)	4.3				7.0	7.1
tC, 2 stage (s)					6.0	
tF (s)	2.3				3.6	3.4
p0 queue free %	100				100	58
cM capacity (veh/h)	288				98	260

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	SB 1
Volume Total	696	696	916	916	33	109
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	33	109
cSH	1700	1700	1700	1700	1700	260
Volume to Capacity	0.41	0.41	0.54	0.54	0.02	0.42
Queue Length 95th (ft)	0	0	0	0	0	49
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	28.5
Lane LOS						D
Approach Delay (s)	0.0		0.0			28.5
Approach LOS						D

Intersection Summary				
Average Delay		0.9		
Intersection Capacity Utilization		59.5%	ICU Level of Service	B
Analysis Period (min)		15		

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↱		↱
Traffic Vol, veh/h	0	1281	1686	30	0	100
Future Vol, veh/h	0	1281	1686	30	0	100
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	165	-	-
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	0	1392	1833	33	0	109

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	917
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.4
Pot Cap-1 Maneuver	0	-	-	-	0	259
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	259
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	28.6
HCM LOS			D

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	259
HCM Lane V/C Ratio	-	-	-	0.42
HCM Control Delay (s)	-	-	-	28.6
HCM Lane LOS	-	-	-	D
HCM 95th %tile Q(veh)	-	-	-	2

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1225	56	3	1690	0	26	0	10	0	0	0
Future Volume (Veh/h)	0	1225	56	3	1690	0	26	0	10	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1332	61	3	1837	0	28	0	11	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									1			
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1837			1393			2256	3175	666	2514	3236	918
vC1, stage 1 conf vol							1332	1332		1843	1843	
vC2, stage 2 conf vol							924	1843		672	1393	
vCu, unblocked vol	1837			1393			2256	3175	666	2514	3236	918
tC, single (s)	4.4			4.4			7.8	6.8	7.2	7.8	6.8	7.2
tC, 2 stage (s)							6.8	5.8		6.8	5.8	
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			99			78	100	97	100	100	100
cM capacity (veh/h)	286			434			125	92	377	65	89	253

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	666	666	61	3	1225	612	39	0
Volume Left	0	0	0	0	3	0	0	28	0
Volume Right	0	0	0	61	0	0	0	11	0
cSH	1700	1700	1700	1700	434	1700	1700	175	1700
Volume to Capacity	0.00	0.39	0.39	0.04	0.01	0.72	0.36	0.22	0.00
Queue Length 95th (ft)	0	0	0	0	1	0	0	21	0
Control Delay (s)	0.0	0.0	0.0	0.0	13.4	0.0	0.0	34.2	0.0
Lane LOS					B			D	A
Approach Delay (s)	0.0				0.0			34.2	0.0
Approach LOS								D	A

Intersection Summary				
Average Delay		0.4		
Intersection Capacity Utilization		56.7%	ICU Level of Service	B
Analysis Period (min)		15		

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1225	56	3	1690	0	26	0	10	0	0	0
Future Vol, veh/h	0	1225	56	3	1690	0	26	0	10	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	275	305	-	-	-	-	25	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	13	13	13	13	13	13	13	13	13	13	13	13
Mvmt Flow	0	1332	61	3	1837	0	28	0	11	0	0	0

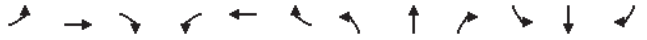
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1837	0	0	1393	0	0	2257	3175	666	2509	3236	919
Stage 1	-	-	-	-	-	-	1332	1332	-	1843	1843	-
Stage 2	-	-	-	-	-	-	925	1843	-	666	1393	-
Critical Hdwy	4.36	-	-	4.36	-	-	7.76	6.76	7.16	7.76	6.76	7.16
Critical Hdwy Stg 1	-	-	-	-	-	-	6.76	5.76	-	6.76	5.76	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.76	5.76	-	6.76	5.76	-
Follow-up Hdwy	2.33	-	-	2.33	-	-	3.63	4.13	3.43	3.63	4.13	3.43
Pot Cap-1 Maneuver	286	-	-	434	-	-	~ 19	8	377	12	8	253
Stage 1	-	-	-	-	-	-	148	202	-	69	110	-
Stage 2	-	-	-	-	-	-	269	110	-	390	188	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	286	-	-	434	-	-	~ 19	8	377	12	8	253
Mov Cap-2 Maneuver	-	-	-	-	-	-	122	89	-	64	87	-
Stage 1	-	-	-	-	-	-	148	202	-	69	109	-
Stage 2	-	-	-	-	-	-	267	109	-	379	188	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	35.3	0
HCM LOS			E	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	122	377	286	-	-	434	-	-	-
HCM Lane V/C Ratio	0.232	0.029	-	-	-	0.008	-	-	-
HCM Control Delay (s)	43.2	14.8	0	-	-	13.4	-	-	0
HCM Lane LOS	E	B	A	-	-	B	-	-	A
HCM 95th %tile Q(veh)	0.8	0.1	0	-	-	0	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Reso A - Exhibit C2 (EIR Technical Appendix)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized			MOYes									
Traffic Volume (veh/h)	204	222	150	314	200	156	63	569	285	100	535	250
Future Volume (veh/h)	204	222	150	314	200	156	63	569	285	100	535	250
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	222	241	163	341	217	170	68	618	310	109	582	272
Approach Volume (veh/h)		463			728			996			963	
Crossing Volume (veh/h)		1032			908			572			626	
High Capacity (veh/h)		606			671			881			844	
High v/c (veh/h)		0.76			1.08			1.13			1.14	
Low Capacity (veh/h)		469			525			708			675	
Low v/c (veh/h)		0.99			1.39			1.41			1.43	

Intersection Summary												
Maximum v/c High			1.14									
Maximum v/c Low			1.43									
Intersection Capacity Utilization			112.7%		ICU Level of Service				H			

Intersection	
Intersection Delay, s/veh	24.8
Intersection LOS	C

Approach	EB	WB	NB	SB
Entry Lanes	2	2	2	2
Conflicting Circle Lanes	1	2	2	2
Adj Approach Flow, veh/h	626	728	996	963
Demand Flow Rate, veh/h	645	750	1026	991
Vehicles Circulating, veh/h	1062	936	589	645
Vehicles Exiting, veh/h	574	679	950	1041
Ped Vol Crossing Leg, #/h	0	0	3	0
Ped Cap Adj	1.000	1.000	0.998	1.000
Approach Delay, s/veh	10.7	18.6	27.7	35.8
Approach LOS	B	C	D	E

Lane	Left	Right	Bypass	Left	Right	Left	Right	Left	Right
Designated Moves	LT	TR	R	L	TR	LT	R	LT	R
Assumed Moves	LT	TR	R	L	TR	LT	R	LT	R
RT Channelized			Free						
Lane Util	0.470	0.530		0.468	0.532	0.689	0.311	0.717	0.283
Follow-Up Headway, s	2.535	2.535		2.667	2.535	2.667	2.535	2.667	2.535
Critical Headway, s	4.544	4.544	168	4.645	4.328	4.645	4.328	4.645	4.328
Entry Flow, veh/h	224	253	1957	351	399	707	319	711	280
Cap Entry Lane, veh/h	540	540	0.971	571	641	785	861	746	821
Entry HV Adj Factor	0.971	0.969	163	0.972	0.971	0.971	0.972	0.971	0.971
Flow Entry, veh/h	218	245	1900	341	387	686	310	691	272
Cap Entry, veh/h	525	524	0.086	554	622	761	835	724	797
V/C Ratio	0.415	0.468	0.0	0.615	0.623	0.902	0.371	0.953	0.341
Control Delay, s/veh	13.7	15.1	A	19.4	18.0	36.2	8.7	46.6	8.5
LOS	B	C	0	C	C	E	A	E	A
95th %tile Queue, veh	2	2		4	4	12	2	14	2

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Volume (veh/h)	5	35	5	5	87	0	20	5	2	0	0	0
Future Volume (Veh/h)	5	35	5	5	87	0	20	5	2	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	38	5	5	95	0	22	5	2	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	95			43			156	156	40	160	158	95
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	95			43			156	156	40	160	158	95
tC, single (s)	4.2			4.2			7.2	6.6	6.3	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			100			97	99	100	100	100	100
cM capacity (veh/h)	1462			1528			794	721	1014	782	718	945

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	48	100	29	0
Volume Left	5	5	22	0
Volume Right	5	0	2	0
cSH	1462	1528	792	1700
Volume to Capacity	0.00	0.00	0.04	0.00
Queue Length 95th (ft)	0	0	3	0
Control Delay (s)	0.8	0.4	9.7	0.0
Lane LOS	A	A	A	A
Approach Delay (s)	0.8	0.4	9.7	0.0
Approach LOS			A	A

Intersection Summary					
Average Delay			2.0		
Intersection Capacity Utilization			15.6%	ICU Level of Service	A
Analysis Period (min)			15		

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Vol, veh/h	5	35	5	5	87	0	20	5	2	0	0	0
Future Vol, veh/h	5	35	5	5	87	0	20	5	2	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	8	8	8	8	8	8	8	8	8	8	8	8
Mvmt Flow	5	38	5	5	95	0	22	5	2	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	95	0	0	43	0	0	156	156	41	159	158	95
Stage 1	-	-	-	-	-	-	51	51	-	105	105	-
Stage 2	-	-	-	-	-	-	105	105	-	54	53	-
Critical Hdwy	4.18	-	-	4.18	-	-	7.18	6.58	6.28	7.18	6.58	6.28
Critical Hdwy Stg 1	-	-	-	-	-	-	6.18	5.58	-	6.18	5.58	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.18	5.58	-	6.18	5.58	-
Follow-up Hdwy	2.272	-	-	2.272	-	-	3.572	4.072	3.372	3.572	4.072	3.372
Pot Cap-1 Maneuver	1462	-	-	1528	-	-	797	725	1013	793	723	945
Stage 1	-	-	-	-	-	-	947	841	-	886	797	-
Stage 2	-	-	-	-	-	-	886	797	-	943	839	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1462	-	-	1528	-	-	793	720	1013	783	718	945
Mov Cap-2 Maneuver	-	-	-	-	-	-	793	720	-	783	718	-
Stage 1	-	-	-	-	-	-	943	838	-	882	795	-
Stage 2	-	-	-	-	-	-	883	795	-	931	836	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0.4	9.7	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	791	1462	-	-	1528	-	-	-
HCM Lane V/C Ratio	0.037	0.004	-	-	0.004	-	-	-
HCM Control Delay (s)	9.7	7.5	0	-	7.4	0	-	0
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	11	419	388	478	734	11	22	166	339	344	43
v/c Ratio	0.11	0.66	0.80	0.53	0.64	0.08	0.15	0.60	0.77	0.77	0.09
Control Delay	53.3	42.6	47.5	20.8	4.4	46.9	47.8	17.1	47.4	47.1	0.3
Queue Delay	0.0	0.0	0.8	1.3	0.6	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.3	42.6	48.3	22.1	5.0	46.9	47.8	17.1	47.4	47.1	0.3
Queue Length 50th (ft)	7	130	224	192	0	7	13	0	201	204	0
Queue Length 95th (ft)	28	201	#419	376	74	26	41	65	#394	#398	0
Internal Link Dist (ft)		346		307			744			674	
Turn Bay Length (ft)	65		125			140		165	150		185
Base Capacity (vph)	96	873	604	1029	1199	345	363	438	538	547	581
Starvation Cap Reductn	0	0	59	340	169	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.48	0.71	0.69	0.71	0.03	0.06	0.38	0.63	0.63	0.07

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	353	32	357	440	675	10	20	153	537	91	40
Future Volume (vph)	10	353	32	357	440	675	10	20	153	537	91	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (prot)	1752	3450		1752	1845	1568	1752	1845	1543	1665	1692	1519
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (perm)	1752	3450		1752	1845	1568	1752	1845	1543	1665	1692	1519
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	384	35	388	478	734	11	22	166	584	99	43
RTOR Reduction (vph)	0	5	0	0	0	386	0	0	153	0	0	32
Lane Group Flow (vph)	11	414	0	388	478	348	11	22	13	339	344	11
Confl. Peds. (#/hr)			8						1			5
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	0.8	21.2		26.1	46.5	46.5	7.7	7.7	7.7	25.0	25.0	25.0
Effective Green, g (s)	0.8	21.2		26.1	46.5	46.5	7.7	7.7	7.7	25.0	25.0	25.0
Actuated g/C Ratio	0.01	0.22		0.27	0.47	0.47	0.08	0.08	0.08	0.26	0.26	0.26
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	14	746		466	875	744	137	144	121	424	431	387
v/s Ratio Prot	0.01	0.12		c0.22	c0.26		0.01	c0.01		c0.20	0.20	
v/s Ratio Perm						0.22			0.01			0.01
v/c Ratio	0.79	0.55		0.83	0.55	0.47	0.08	0.15	0.11	0.80	0.80	0.03
Uniform Delay, d1	48.5	34.2		33.9	18.3	17.4	41.9	42.1	42.0	34.2	34.1	27.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	130.6	0.9		12.1	0.7	0.5	0.3	0.5	0.4	10.1	9.9	0.0
Delay (s)	179.1	35.1		45.9	19.0	17.9	42.1	42.6	42.4	44.3	44.1	27.4
Level of Service	F	D		D	B	B	D	D	D	D	D	C
Approach Delay (s)		38.8			25.0			42.4			43.2	
Approach LOS		D			C			D			D	

Intersection Summary

HCM 2000 Control Delay	32.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	98.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
8: Riverside Ave & 13th Street

Cumulative AM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	353	32	357	440	675	10	20	153	537	91	40
Future Volume (veh/h)	10	353	32	357	440	675	10	20	153	537	91	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	384	35	388	478	734	11	22	166	655	0	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	23	806	73	424	880	745	221	232	196	762	0	335
Arrive On Green	0.01	0.25	0.25	0.24	0.47	0.47	0.12	0.12	0.12	0.22	0.00	0.22
Sat Flow, veh/h	1767	3264	296	1767	1856	1572	1767	1856	1569	3534	0	1554
Grp Volume(v), veh/h	11	206	213	388	478	734	11	22	166	655	0	43
Grp Sat Flow(s),veh/h/ln	1767	1763	1797	1767	1856	1572	1767	1856	1569	1767	0	1554
Q Serve(g_s), s	0.6	10.4	10.6	22.3	19.1	48.1	0.6	1.1	10.8	18.6	0.0	2.3
Cycle Q Clear(g_c), s	0.6	10.4	10.6	22.3	19.1	48.1	0.6	1.1	10.8	18.6	0.0	2.3
Prop In Lane	1.00		0.16	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	23	435	444	424	880	745	221	232	196	762	0	335
V/C Ratio(X)	0.48	0.47	0.48	0.91	0.54	0.98	0.05	0.09	0.85	0.86	0.00	0.13
Avail Cap(c_a), veh/h	85	435	444	533	880	745	305	320	270	998	0	439
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.2	33.5	33.6	38.6	19.5	27.1	40.2	40.5	44.7	39.4	0.0	33.0
Incr Delay (d2), s/veh	14.4	0.8	0.8	17.8	0.7	29.1	0.1	0.2	16.2	6.1	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	4.6	4.7	11.6	8.1	23.1	0.3	0.5	5.0	8.5	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.6	34.3	34.4	56.4	20.1	56.2	40.3	40.6	60.9	45.5	0.0	33.2
LnGrp LOS	E	C	C	E	C	E	D	D	E	D	A	C
Approach Vol, veh/h		430			1600			199			698	
Approach Delay, s/veh		35.2			45.5			57.5			44.8	
Approach LOS		D			D			E			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	29.6	30.3		27.0	5.9	54.0		17.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	31.5	23.0		29.5	5.0	49.5		18.0				
Max Q Clear Time (g_c+I1), s	24.3	12.6		20.6	2.6	50.1		12.8				
Green Ext Time (p_c), s	0.8	1.9		1.9	0.0	0.0		0.3				

Intersection Summary			
HCM 6th Ctrl Delay		44.6	
HCM 6th LOS		D	

Notes

User approved volume balancing among the lanes for turning movement.

Olsen-Chandler SP
9: Paso Robles Street & 13th Street

Cumulative AM
Queues

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	76	1057	57	1354	424	235	22	272	11	11
v/c Ratio	0.43	0.56	0.35	0.72	0.44	0.72	0.05	0.50	0.03	0.02
Control Delay	51.9	15.7	50.2	19.4	6.3	47.2	29.6	11.0	29.6	0.1
Queue Delay	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.9	16.2	50.2	19.4	6.3	47.2	29.6	11.0	29.6	0.1
Queue Length 50th (ft)	47	214	35	321	41	141	11	24	6	0
Queue Length 95th (ft)	98	305	78	445	114	228	31	95	20	0
Internal Link Dist (ft)		307		269			836			575
Turn Bay Length (ft)	120		220		145	130		110	95	
Base Capacity (vph)	212	2281	201	2284	1097	485	647	697	481	669
Starvation Cap Reductn	0	696	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.67	0.28	0.59	0.39	0.48	0.03	0.39	0.02	0.02

Intersection Summary

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Cumulative AM
9: Paso Robles Street & 13th Street — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	922	51	52	1246	390	216	20	250	10	0	10
Future Volume (vph)	70	922	51	52	1246	390	216	20	250	10	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1752	3471		1752	3505	1530	1752	1845	1568	1752	1568	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.75	1.00	1.00	0.74	1.00	
Satd. Flow (perm)	1752	3471		1752	3505	1530	1384	1845	1568	1371	1568	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	1002	55	57	1354	424	235	22	272	11	0	11
RTOR Reduction (vph)	0	4	0	0	0	134	0	0	173	0	8	0
Lane Group Flow (vph)	76	1053	0	57	1354	290	235	22	99	11	3	0
Confl. Peds. (#/hr)			6			1						
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		
Actuated Green, G (s)	6.5	47.2		6.0	46.7	46.7	20.6	20.6	20.6	20.6	20.6	
Effective Green, g (s)	6.5	47.2		6.0	46.7	46.7	20.6	20.6	20.6	20.6	20.6	
Actuated g/C Ratio	0.07	0.54		0.07	0.53	0.53	0.24	0.24	0.24	0.24	0.24	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	130	1876		120	1874	818	326	435	369	323	369	
v/s Ratio Prot	c0.04	0.30		0.03	c0.39			0.01			0.00	
v/s Ratio Perm						0.19	c0.17		0.06	0.01		
v/c Ratio	0.58	0.56		0.47	0.72	0.35	0.72	0.05	0.27	0.03	0.01	
Uniform Delay, d1	39.1	13.2		39.1	15.4	11.7	30.7	25.8	27.2	25.7	25.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.6	0.4		2.9	1.4	0.3	7.6	0.0	0.4	0.0	0.0	
Delay (s)	45.6	13.6		42.1	16.8	11.9	38.3	25.8	27.6	25.7	25.5	
Level of Service	D	B		D	B	B	D	C	C	C	C	
Approach Delay (s)		15.8			16.5			32.3			25.6	
Approach LOS		B			B			C			C	

Intersection Summary				
HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	87.3	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	68.5%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Olsen-Chandler SP — Cumulative AM
9: Paso Robles Street & 13th Street — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	922	51	52	1246	390	216	20	250	10	0	10
Future Volume (veh/h)	70	922	51	52	1246	390	216	20	250	10	0	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	76	1002	55	57	1354	0	235	22	272	11	0	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	100	1807	99	86	1848		403	405	343	332	0	343
Arrive On Green	0.06	0.53	0.53	0.05	0.52	0.00	0.22	0.22	0.22	0.22	0.00	0.22
Sat Flow, veh/h	1767	3397	186	1767	3526	1572	1392	1856	1572	1077	0	1572
Grp Volume(v), veh/h	76	520	537	57	1354	0	235	22	272	11	0	11
Grp Sat Flow(s),veh/h/ln	1767	1763	1821	1767	1763	1572	1392	1856	1572	1077	0	1572
Q Serve(g_s), s	2.8	13.1	13.1	2.1	19.9	0.0	10.7	0.6	11.0	0.5	0.0	0.4
Cycle Q Clear(g_c), s	2.8	13.1	13.1	2.1	19.9	0.0	11.1	0.6	11.0	1.2	0.0	0.4
Prop In Lane	1.00		0.10	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	100	938	969	86	1848		403	405	343	332	0	343
V/C Ratio(X)	0.76	0.55	0.55	0.66	0.73		0.58	0.05	0.79	0.03	0.00	0.03
Avail Cap(c_a), veh/h	250	1444	1492	237	2862		670	760	644	538	0	644
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.2	10.4	10.4	31.4	12.3	0.0	25.0	20.8	24.8	21.2	0.0	20.7
Incr Delay (d2), s/veh	11.3	0.5	0.5	8.4	0.6	0.0	1.3	0.1	4.2	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	4.5	4.6	1.1	6.7	0.0	3.4	0.3	4.2	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.5	10.9	10.9	39.8	12.9	0.0	26.4	20.8	29.0	21.3	0.0	20.7
LnGrp LOS	D	B	B	D	B		C	C	C	C	A	C
Approach Vol, veh/h		1133			1411	A		529			22	
Approach Delay, s/veh		13.1			14.0			27.5			21.0	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.8	40.2		19.1	8.3	39.7		19.1				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	9.0	55.0		27.5	9.5	54.5		27.5				
Max Q Clear Time (g_c+I1), s	4.1	15.1		3.2	4.8	21.9		13.1				
Green Ext Time (p_c), s	0.0	8.8		0.0	0.1	13.3		1.5				

Intersection Summary			
HCM 6th Ctrl Delay	16.0		
HCM 6th LOS	B		

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Cumulative AM
10: River Road/Union Road & Creston Road — Queues

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	342	942	65	1143	391	203	54	165	698
v/c Ratio	0.83	0.61	0.48	0.86	0.81	0.27	0.13	0.75	1.07dr
Control Delay	68.1	24.2	64.6	39.3	62.6	39.7	2.2	70.5	49.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.1	24.2	64.6	39.3	62.6	39.7	2.2	70.5	49.8
Queue Length 50th (ft)	134	263	48	401	151	69	0	122	210
Queue Length 95th (ft)	#217	334	96	493	#229	106	8	#222	#326
Internal Link Dist (ft)		353		673		608			523
Turn Bay Length (ft)	295		235		140		130	225	
Base Capacity (vph)	420	1608	156	1500	506	783	424	246	808
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.59	0.42	0.76	0.77	0.26	0.13	0.67	0.86

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Olsen-Chandler SP — Cumulative AM
10: River Road/Union Road & Creston Road — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	315	575	292	60	878	174	360	187	50	152	192	450
Future Volume (vph)	315	575	292	60	878	174	360	187	50	152	192	450
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.98		1.00	1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	3343		1770	3444		3433	3539	1583	1770	3167	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	3343		1770	3444		3433	3539	1583	1770	3167	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	342	625	317	65	954	189	391	203	54	165	209	489
RTOR Reduction (vph)	0	52	0	0	14	0	0	0	43	0	146	0
Lane Group Flow (vph)	342	890	0	65	1129	0	391	203	11	165	552	0
Confl. Peds. (#/hr)			3									
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	13.5	50.5		7.2	44.2		15.8	24.1	24.1	14.0	22.3	
Effective Green, g (s)	13.5	50.5		7.2	44.2		15.8	24.1	24.1	14.0	22.3	
Actuated g/C Ratio	0.12	0.44		0.06	0.39		0.14	0.21	0.21	0.12	0.20	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	407	1483		111	1337		476	749	335	217	620	
v/s Ratio Prot	c0.10	0.27		0.04	c0.33		c0.11	0.06		0.09	c0.17	
v/s Ratio Perm									0.01			
v/c Ratio	0.84	0.60		0.59	0.84		0.82	0.27	0.03	0.76	1.07dr	
Uniform Delay, d1	49.1	24.0		51.8	31.7		47.6	37.5	35.6	48.3	44.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	14.4	0.7		7.7	5.1		10.9	0.2	0.0	14.5	15.0	
Delay (s)	63.5	24.7		59.5	36.7		58.5	37.7	35.7	62.8	59.6	
Level of Service	E	C		E	D		E	D	D	E	E	
Approach Delay (s)		35.0			38.0			50.1			60.2	
Approach LOS		D			D			D			E	

Intersection Summary

HCM 2000 Control Delay	43.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	113.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	83.9%	ICU Level of Service	E
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Cumulative AM
10: River Road/Union Road & Creston Road — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	315	575	292	60	878	174	360	187	50	152	192	450
Future Volume (veh/h)	315	575	292	60	878	174	360	187	50	152	192	450
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	342	625	0	65	954	189	391	203	54	165	209	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	438	1740		85	1211	240	495	435	194	205	334	
Arrive On Green	0.13	0.49	0.00	0.05	0.41	0.41	0.14	0.12	0.12	0.11	0.09	0.00
Sat Flow, veh/h	3456	3647	0	1781	2950	584	3456	3554	1585	1781	3647	0
Grp Volume(v), veh/h	342	625	0	65	574	569	391	203	54	165	209	0
Grp Sat Flow(s),veh/h/ln	1728	1777	0	1781	1777	1757	1728	1777	1585	1781	1777	0
Q Serve(g_s), s	7.7	8.7	0.0	2.9	22.5	22.5	8.7	4.2	2.5	7.2	4.5	0.0
Cycle Q Clear(g_c), s	7.7	8.7	0.0	2.9	22.5	22.5	8.7	4.2	2.5	7.2	4.5	0.0
Prop In Lane	1.00		0.00	1.00		0.33	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	438	1740		85	729	721	495	435	194	205	334	
V/C Ratio(X)	0.78	0.36		0.76	0.79	0.79	0.79	0.47	0.28	0.81	0.63	
Avail Cap(c_a), veh/h	593	2318		221	1075	1062	714	1086	484	348	1046	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.8	12.6	0.0	37.6	20.5	20.5	33.1	32.6	31.8	34.5	34.8	0.0
Incr Delay (d2), s/veh	4.7	0.1	0.0	13.1	2.4	2.5	3.8	0.8	0.8	7.3	1.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	3.2	0.0	1.5	8.9	8.9	3.7	1.8	0.9	3.3	1.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.5	12.7	0.0	50.7	22.9	23.0	36.9	33.4	32.6	41.8	36.8	0.0
LnGrp LOS	D	B		D	C	C	D	C	C	D	D	
Approach Vol, veh/h		967	A		1208			648			374	A
Approach Delay, s/veh		21.8			24.4			35.4			39.0	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.3	43.6	15.9	12.0	14.6	37.3	13.7	14.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.9	52.1	16.5	23.5	13.7	48.3	15.6	24.4
Max Q Clear Time (g_c+I1), s	4.9	10.7	10.7	6.5	9.7	24.5	9.2	6.2
Green Ext Time (p_c), s	0.0	4.9	0.7	1.0	0.5	8.2	0.2	1.2

Intersection Summary	
HCM 6th Ctrl Delay	27.6
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Olsen-Chandler SP — Cumulative AM
11: Creston Road & Golden Hill Road — Queues

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	96	453	1313	620	143
v/c Ratio	0.67	0.22	0.81	0.73	0.29
Control Delay	67.3	10.2	23.4	39.5	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	67.3	10.2	23.4	39.5	8.2
Queue Length 50th (ft)	51	47	238	157	0
Queue Length 95th (ft)	#183	143	#612	#374	56
Internal Link Dist (ft)		1151	2310	505	
Turn Bay Length (ft)	125			120	
Base Capacity (vph)	143	2307	1799	845	497
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.67	0.20	0.73	0.73	0.29

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	88	417	641	567	570	132
Future Volume (vph)	88	417	641	567	570	132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.93		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1752	3505	3235		3400	1568
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1752	3505	3235		3400	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	96	453	697	616	620	143
RTOR Reduction (vph)	0	0	120	0	0	109
Lane Group Flow (vph)	96	453	1193	0	620	34
Confl. Peds. (#/hr)				3		
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	NA		Perm	Perm
Protected Phases	5	2	6			
Permitted Phases					4	4
Actuated Green, G (s)	7.4	53.6	41.7		22.4	22.4
Effective Green, g (s)	7.4	53.6	41.7		22.4	22.4
Actuated g/C Ratio	0.08	0.57	0.45		0.24	0.24
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	138	2009	1442		814	375
v/s Ratio Prot	c0.05	0.13	c0.37			
v/s Ratio Perm					c0.18	0.02
v/c Ratio	0.70	0.23	0.83		0.76	0.09
Uniform Delay, d1	42.0	9.8	22.7		33.1	27.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	14.2	0.1	4.1		4.2	0.1
Delay (s)	56.1	9.8	26.8		37.3	27.7
Level of Service	E	A	C		D	C
Approach Delay (s)		17.9	26.8		35.5	
Approach LOS		B	C		D	

Intersection Summary			
HCM 2000 Control Delay	27.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	93.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	68.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Cumulative AM
12: Creston Road & Niblick Road/Sherwood Road — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	142	290	149	80	580	525	235	607	248	317	311
v/c Ratio	0.60	0.24	0.24	0.43	0.59	0.75	0.70	0.72	0.56	0.50	0.59
Control Delay	52.4	24.2	5.4	50.3	31.1	16.8	49.1	37.9	45.4	38.7	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.4	24.2	5.4	50.3	31.1	16.8	49.1	37.9	45.4	38.7	9.7
Queue Length 50th (ft)	76	64	0	43	151	74	124	164	68	86	0
Queue Length 95th (ft)	#190	116	44	110	235	224	#277	286	139	163	81
Internal Link Dist (ft)		1092			186			1440		2310	
Turn Bay Length (ft)	150		150	170		140	230		245		100
Base Capacity (vph)	295	1766	841	276	1729	940	457	1246	556	915	625
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.48	0.16	0.18	0.29	0.34	0.56	0.51	0.49	0.45	0.35	0.50

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Olsen-Chandler SP — Cumulative AM
12: Creston Road & Niblick Road/Sherwood Road — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	131	267	137	74	534	483	216	516	42	228	292	286
Future Volume (vph)	131	267	137	74	534	483	216	516	42	228	292	286
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1752	3505	1529	1752	3505	1530	1752	3460		3400	3505	1523
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1752	3505	1529	1752	3505	1530	1752	3460		3400	3505	1523
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	142	290	149	80	580	525	235	561	46	248	317	311
RTOR Reduction (vph)	0	0	98	0	0	262	0	5	0	0	0	254
Lane Group Flow (vph)	142	290	51	80	580	263	235	602	0	248	317	57
Confl. Peds. (#/hr)			9			9			4			12
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	12.3	31.1	31.1	7.9	26.7	26.7	17.3	21.9		11.9	16.5	16.5
Effective Green, g (s)	12.3	31.1	31.1	7.9	26.7	26.7	17.3	21.9		11.9	16.5	16.5
Actuated g/C Ratio	0.14	0.34	0.34	0.09	0.29	0.29	0.19	0.24		0.13	0.18	0.18
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	237	1200	523	152	1030	449	333	834		445	636	276
v/s Ratio Prot	c0.08	c0.08		0.05	0.17		c0.13	c0.17		0.07	0.09	
v/s Ratio Perm			0.03			c0.17						0.04
v/c Ratio	0.60	0.24	0.10	0.53	0.56	0.59	0.71	0.72		0.56	0.50	0.20
Uniform Delay, d1	36.9	21.4	20.3	39.7	27.1	27.3	34.4	31.6		37.0	33.4	31.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.0	0.1	0.1	3.3	0.7	2.0	6.7	3.1		1.5	0.6	0.4
Delay (s)	41.0	21.5	20.4	42.9	27.8	29.3	41.0	34.7		38.5	34.0	31.9
Level of Service	D	C	C	D	C	C	D	C		D	C	C
Approach Delay (s)		26.0			29.5			36.5			34.6	
Approach LOS		C			C			D			C	

Intersection Summary

HCM 2000 Control Delay	31.9	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.66				
Actuated Cycle Length (s)	90.8	Sum of lost time (s)		18.0	
Intersection Capacity Utilization	65.0%	ICU Level of Service		C	
Analysis Period (min)	15				

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
12: Creston Road & Niblick Road/Sherwood Road

Cumulative AM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	131	267	137	74	534	483	216	516	42	228	292	286
Future Volume (veh/h)	131	267	137	74	534	483	216	516	42	228	292	286
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	142	290	149	80	580	525	235	561	46	248	317	311
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	172	1437	637	103	1298	575	269	896	73	318	749	328
Arrive On Green	0.10	0.41	0.41	0.06	0.37	0.37	0.15	0.27	0.27	0.09	0.21	0.21
Sat Flow, veh/h	1767	3526	1562	1767	3526	1561	1767	3298	270	3428	3526	1546
Grp Volume(v), veh/h	142	290	149	80	580	525	235	299	308	248	317	311
Grp Sat Flow(s),veh/h/ln	1767	1763	1562	1767	1763	1561	1767	1763	1806	1714	1763	1546
Q Serve(g_s), s	8.4	5.6	6.6	4.7	13.2	33.9	13.8	15.8	15.9	7.5	8.2	21.0
Cycle Q Clear(g_c), s	8.4	5.6	6.6	4.7	13.2	33.9	13.8	15.8	15.9	7.5	8.2	21.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.15	1.00		1.00
Lane Grp Cap(c), veh/h	172	1437	637	103	1298	575	269	479	491	318	749	328
V/C Ratio(X)	0.83	0.20	0.23	0.78	0.45	0.91	0.87	0.62	0.63	0.78	0.42	0.95
Avail Cap(c_a), veh/h	242	1444	640	227	1414	626	375	514	526	456	749	328
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.9	20.3	20.6	49.2	25.3	31.9	43.9	33.8	33.9	47.0	36.1	41.2
Incr Delay (d2), s/veh	14.7	0.1	0.2	11.9	0.2	17.1	15.2	2.1	2.1	5.4	0.4	36.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	2.2	2.4	2.4	5.3	14.8	7.1	6.9	7.1	3.4	3.5	11.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.6	20.3	20.7	61.1	25.5	49.0	59.1	36.0	36.0	52.4	36.5	77.2
LnGrp LOS	E	C	C	E	C	D	E	D	D	D	D	E
Approach Vol, veh/h		581			1185			842			876	
Approach Delay, s/veh		30.5			38.3			42.4			55.4	
Approach LOS		C			D			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.3	33.3	10.7	47.7	20.6	27.0	14.8	43.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	14.1	30.9	13.6	43.4	22.5	22.5	14.5	42.5
Max Q Clear Time (g_c+I1), s	9.5	17.9	6.7	8.6	15.8	23.0	10.4	35.9
Green Ext Time (p_c), s	0.3	2.9	0.1	2.3	0.4	0.0	0.1	3.1

Intersection Summary	
HCM 6th Ctrl Delay	42.3
HCM 6th LOS	D

Olsen-Chandler SP
13: Creston Road & Scott Street

Cumulative AM
HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	40	47	720	54	54	500
Future Volume (Veh/h)	40	47	720	54	54	500
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	43	51	783	59	59	543
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1474	812			842	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1474	812			842	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	67	87			93	
cM capacity (veh/h)	129	379			794	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	94	842	59	543
Volume Left	43	0	59	0
Volume Right	51	59	0	0
cSH	201	1700	794	1700
Volume to Capacity	0.47	0.50	0.07	0.32
Queue Length 95th (ft)	56	0	6	0
Control Delay (s)	37.7	0.0	9.9	0.0
Lane LOS	E		A	
Approach Delay (s)	37.7	0.0	1.0	
Approach LOS	E			

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	2.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	40	47	720	54	54	500
Future Vol, veh/h	40	47	720	54	54	500
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	51	783	59	59	543

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1474	813	0	0	842	0
Stage 1	813	-	-	-	-	-
Stage 2	661	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	139	378	-	-	794	-
Stage 1	436	-	-	-	-	-
Stage 2	514	-	-	-	-	-
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	129	378	-	-	794	-
Mov Cap-2 Maneuver	129	-	-	-	-	-
Stage 1	436	-	-	-	-	-
Stage 2	476	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	38.2	0	1
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	200	794	-
HCM Lane V/C Ratio	-	-	0.473	0.074	-
HCM Control Delay (s)	-	-	38.2	9.9	-
HCM Lane LOS	-	-	E	A	-
HCM 95th %tile Q(veh)	-	-	2.3	0.2	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	137	10	42	10	20	104	35	482	10	35	391	93
Future Volume (Veh/h)	137	10	42	10	20	104	35	482	10	35	391	93
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	149	11	46	11	22	113	38	524	11	38	425	101
Pedestrians		6			2						1	
Lane Width (ft)		12.0			12.0						12.0	
Walking Speed (ft/s)		3.5			3.5						3.5	
Percent Blockage		1			0						0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1232	1120	431	1160	1216	532	532			537		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1232	1120	431	1160	1216	532	532			537		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	94	93	92	87	79	96			96		
cM capacity (veh/h)	102	190	621	143	167	546	1030			1029		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	206	146	38	535	38	425	101
Volume Left	149	11	38	0	38	0	0
Volume Right	46	113	0	11	0	0	101
cSH	130	351	1030	1700	1029	1700	1700
Volume to Capacity	1.59	0.42	0.04	0.31	0.04	0.25	0.06
Queue Length 95th (ft)	369	50	3	0	3	0	0
Control Delay (s)	357.3	22.4	8.6	0.0	8.6	0.0	0.0
Lane LOS	F	C	A		A		
Approach Delay (s)	357.3	22.4	0.6		0.6		
Approach LOS	F	C					

Intersection Summary				
Average Delay	52.1			
Intersection Capacity Utilization	58.0%	ICU Level of Service		B
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	43.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↕		↰	↑	↱
Traffic Vol, veh/h	137	10	42	10	20	104	35	482	10	35	391	93
Future Vol, veh/h	137	10	42	10	20	104	35	482	10	35	391	93
Conflicting Peds, #/hr	1	0	0	0	0	1	6	0	2	2	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	30	-	-	70	-	60
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	149	11	46	11	22	113	38	524	11	38	425	101

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1181	1120	431	1188	1216	533	532	0	0	537	0	0
Stage 1	507	507	-	608	608	-	-	-	-	-	-	-
Stage 2	674	613	-	580	608	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	167	206	624	165	181	547	1036	-	-	1031	-	-
Stage 1	548	539	-	483	486	-	-	-	-	-	-	-
Stage 2	444	483	-	500	486	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 112	190	620	138	167	545	1030	-	-	1029	-	-
Mov Cap-2 Maneuver	~ 112	190	-	138	167	-	-	-	-	-	-	-
Stage 1	525	516	-	464	467	-	-	-	-	-	-	-
Stage 2	323	464	-	437	465	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	298.6	22.4	0.6	0.6
HCM LOS	F	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1030	-	-	141	350	1029	-	-
HCM Lane V/C Ratio	0.037	-	-	1.457	0.416	0.037	-	-
HCM Control Delay (s)	8.6	-	-	298.6	22.4	8.6	-	-
HCM Lane LOS	A	-	-	F	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	13.7	2	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↰	↱		↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	20	10	12	221	10	261	15	250	120	245	199	10
Future Volume (vph)	20	10	12	221	10	261	15	250	120	245	199	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	11	13	240	11	284	16	272	130	266	216	11

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	46	535	288	130	374	119
Volume Left (vph)	22	240	16	0	266	0
Volume Right (vph)	13	284	0	130	0	11
Hadj (s)	-0.04	-0.19	0.06	-0.67	0.39	-0.03
Departure Headway (s)	8.4	6.5	7.8	7.0	7.9	7.5
Degree Utilization, x	0.11	0.96	0.62	0.25	0.82	0.25
Capacity (veh/h)	400	552	454	507	442	467
Control Delay (s)	12.4	53.9	21.7	11.2	37.2	11.7
Approach Delay (s)	12.4	53.9	18.4		31.1	
Approach LOS	B	F	C		D	

Intersection Summary				
Delay	35.1			
Level of Service	E			
Intersection Capacity Utilization	74.4%	ICU Level of Service	D	
Analysis Period (min)	15			

Intersection	
Intersection Delay, s/veh	36.7
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Vol, veh/h	20	10	12	221	10	261	0	15	250	120	245	199
Future Vol, veh/h	20	10	12	221	10	261	0	15	250	120	245	199
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	11	13	240	11	284	0	16	272	130	266	216
Number of Lanes	0	1	0	0	1	0	0	0	1	1	0	2

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	12.6	56.6	19.4	31.9
HCM LOS	B	F	C	D

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	6%	0%	48%	45%	71%	0%
Vol Thru, %	94%	0%	24%	2%	29%	91%
Vol Right, %	0%	100%	29%	53%	0%	9%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	265	120	42	492	345	110
LT Vol	15	0	20	221	245	0
Through Vol	250	0	10	10	100	100
RT Vol	0	120	12	261	0	10
Lane Flow Rate	288	130	46	535	374	119
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.621	0.254	0.109	0.969	0.821	0.247
Departure Headway (Hd)	7.76	7.006	8.584	6.522	7.892	7.459
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	464	510	420	556	457	480
Service Time	5.548	4.793	6.584	4.581	5.676	5.242
HCM Lane V/C Ratio	0.621	0.255	0.11	0.962	0.818	0.248
HCM Control Delay	22.6	12.2	12.6	56.6	38	12.7
HCM Lane LOS	C	B	B	F	E	B
HCM 95th-tile Q	4.1	1	0.4	13.1	7.8	1

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBR
Lane Configurations	
Traffic Vol, veh/h	10
Future Vol, veh/h	10
Peak Hour Factor	0.92
Heavy Vehicles, %	2
Mvmt Flow	11
Number of Lanes	0

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	165	135	221	208	122	336
Future Volume (Veh/h)	165	135	221	208	122	336
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	179	147	240	226	133	365
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	726	133	498			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	726	133	498			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	35	83	77			
cM capacity (veh/h)	276	888	1055			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	326	240	113	113	133	365
Volume Left	179	240	0	0	0	0
Volume Right	147	0	0	0	0	365
cSH	503	1055	1700	1700	1700	1700
Volume to Capacity	0.65	0.23	0.07	0.07	0.08	0.21
Queue Length 95th (ft)	115	22	0	0	0	0
Control Delay (s)	26.0	9.4	0.0	0.0	0.0	0.0
Lane LOS	D	A				
Approach Delay (s)	26.0	4.8			0.0	
Approach LOS	D					

Intersection Summary			
Average Delay	8.3		
Intersection Capacity Utilization	39.7%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	7.9

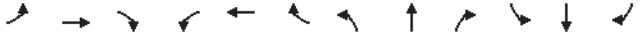
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	165	135	221	208	122	336
Future Vol, veh/h	165	135	221	208	122	336
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	145	105	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	179	147	240	226	133	365

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	726	133	498	0	-	0
Stage 1	133	-	-	-	-	-
Stage 2	593	-	-	-	-	-
Critical Hdwy	6.645	6.245	4.145	-	-	-
Critical Hdwy Stg 1	5.445	-	-	-	-	-
Critical Hdwy Stg 2	5.845	-	-	-	-	-
Follow-up Hdwy	3.5285	3.3285	2.2285	-	-	-
Pot Cap-1 Maneuver	373	913	1058	-	-	-
Stage 1	890	-	-	-	-	-
Stage 2	514	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	288	913	1058	-	-	-
Mov Cap-2 Maneuver	288	-	-	-	-	-
Stage 1	688	-	-	-	-	-
Stage 2	514	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	24.2	4.8	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1058	-	288	913	-	-
HCM Lane V/C Ratio	0.227	-	0.623	0.161	-	-
HCM Control Delay (s)	9.4	-	36.1	9.7	-	-
HCM Lane LOS	A	-	E	A	-	-
HCM 95th %tile Q(veh)	0.9	-	3.9	0.6	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	3	188	10	0	0	0	0	386	20
Future Volume (Veh/h)	0	0	0	3	188	10	0	0	0	0	386	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	3	204	11	0	0	0	0	420	22
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	533	431	431	431	442	0	442			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	533	431	431	431	442	0	442			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	99	60	99	100			100		
cM capacity (veh/h)	312	517	624	535	510	1085	1118			1623		

Direction, Lane #	WB 1	SB 1
Volume Total	218	442
Volume Left	3	0
Volume Right	11	22
cSH	531	1700
Volume to Capacity	0.41	0.26
Queue Length 95th (ft)	50	0
Control Delay (s)	16.4	0.0
Lane LOS	C	
Approach Delay (s)	16.4	0.0
Approach LOS	C	

Intersection Summary				
Average Delay	5.4			
Intersection Capacity Utilization	38.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	3	188	10	0	0	0	0	386	20
Future Vol, veh/h	0	0	0	3	188	10	0	0	0	0	386	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	2	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	3	204	11	0	0	0	0	420	22

Major/Minor	Minor1			Major2		
Conflicting Flow All	431	442	-	-	-	0
Stage 1	0	0	-	-	-	-
Stage 2	431	442	-	-	-	-
Critical Hdwy	6.42	6.52	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-
Follow-up Hdwy	3.518	4.018	-	-	-	-
Pot Cap-1 Maneuver	581	510	0	0	-	-
Stage 1	-	-	0	0	-	-
Stage 2	655	576	0	0	-	-
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	581	0	-	-	-	-
Mov Cap-2 Maneuver	581	0	-	-	-	-
Stage 1	-	0	-	-	-	-
Stage 2	655	0	-	-	-	-

Approach	WB	SB
HCM Control Delay, s	14.6	0
HCM LOS	B	

Minor Lane/Major Mvmt	WBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	581	-	-	-
HCM Lane V/C Ratio	0.357	-	-	-
HCM Control Delay (s)	14.6	0	-	-
HCM Lane LOS	B	A	-	-
HCM 95th %tile Q(veh)	1.6	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	25	359	1072	413	551	126	315	540	408	329
v/c Ratio	0.11	0.75	0.75	0.53	0.50	0.65	0.68	0.34	0.73	0.51
Control Delay	57.4	58.5	36.7	32.4	4.5	74.9	64.2	6.6	62.6	46.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.4	58.5	36.7	32.4	4.5	74.9	64.2	6.6	62.6	46.7
Queue Length 50th (ft)	21	142	410	271	41	114	149	51	187	127
Queue Length 95th (ft)	53	209	539	407	112	189	207	75	256	185
Internal Link Dist (ft)		521		1372			611			680
Turn Bay Length (ft)	115		515		115	165		290	305	
Base Capacity (vph)	270	564	1695	920	1141	262	619	1789	685	791
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.64	0.63	0.45	0.48	0.48	0.51	0.30	0.60	0.42

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	211	120	986	380	507	116	290	497	375	210	93
Future Volume (vph)	23	211	120	986	380	507	116	290	497	375	210	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.95	0.88	0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3347		3433	1863	1569	1770	3539	2787	3433	3353	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3347		3433	1863	1569	1770	3539	2787	3433	3353	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	229	130	1072	413	551	126	315	540	408	228	101
RTOR Reduction (vph)	0	53	0	0	0	180	0	0	58	0	34	0
Lane Group Flow (vph)	25	306	0	1072	413	371	126	315	482	408	295	0
Confl. Peds. (#/hr)												1
Confl. Bikes (#/hr)						2						
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	16.5	16.5		54.7	54.7	75.9	14.5	17.2	71.9	21.2	23.9	
Effective Green, g (s)	16.5	16.5		54.7	54.7	75.9	14.5	17.2	71.9	21.2	23.9	
Actuated g/C Ratio	0.13	0.13		0.42	0.42	0.58	0.11	0.13	0.55	0.16	0.18	
Clearance Time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	224	424		1443	783	915	197	467	1540	559	615	
v/s Ratio Prot	0.01	c0.09		c0.31	0.22	0.07	0.07	c0.09	0.13	c0.12	0.09	
v/s Ratio Perm						0.17			0.04			
v/c Ratio	0.11	0.72		0.74	0.53	0.41	0.64	0.67	0.31	0.73	0.48	
Uniform Delay, d1	50.3	54.6		31.8	28.1	14.8	55.3	53.8	15.7	51.7	47.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	6.0		2.1	0.6	0.3	6.7	3.8	0.1	4.8	0.6	
Delay (s)	50.5	60.5		33.9	28.7	15.1	62.0	57.6	15.9	56.5	48.1	
Level of Service	D	E		C	C	B	E	E	B	E	D	
Approach Delay (s)		59.9			27.7			35.2			52.8	
Approach LOS		E			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	36.9	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	130.1	Sum of lost time (s)	20.5	
Intersection Capacity Utilization	73.6%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Cumulative AM
18: US 101 Ramps/Spring Street & 1st Street/Niblick Road — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	211	120	986	380	507	116	290	497	375	210	93
Future Volume (veh/h)	23	211	120	986	380	507	116	290	497	375	210	93
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	25	229	130	1072	413	551	126	315	540	408	228	101
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	235	293	160	1354	733	839	155	536	1514	493	475	204
Arrive On Green	0.13	0.13	0.13	0.39	0.39	0.39	0.09	0.15	0.15	0.14	0.20	0.20
Sat Flow, veh/h	1781	2217	1212	3456	1870	1564	1781	3554	2790	3456	2420	1037
Grp Volume(v), veh/h	25	182	177	1072	413	551	126	315	540	408	165	164
Grp Sat Flow(s),veh/h/ln	1781	1777	1652	1728	1870	1564	1781	1777	1395	1728	1777	1681
Q Serve(g_s), s	1.4	11.1	11.7	30.7	19.3	28.4	7.8	9.3	12.3	12.9	9.2	9.7
Cycle Q Clear(g_c), s	1.4	11.1	11.7	30.7	19.3	28.4	7.8	9.3	12.3	12.9	9.2	9.7
Prop In Lane	1.00		0.73	1.00		1.00	1.00		1.00	1.00		0.62
Lane Grp Cap(c), veh/h	235	235	218	1354	733	839	155	536	1514	493	349	330
V/C Ratio(X)	0.11	0.77	0.81	0.79	0.56	0.66	0.81	0.59	0.36	0.83	0.47	0.50
Avail Cap(c_a), veh/h	308	307	286	1929	1044	1099	299	703	1645	780	455	430
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.8	47.1	47.3	30.1	26.6	18.8	50.3	44.4	14.5	46.7	39.9	40.1
Incr Delay (d2), s/veh	0.2	8.7	12.6	1.5	0.7	0.9	9.7	1.0	0.1	4.2	1.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	5.5	5.6	12.4	8.4	9.7	3.8	4.0	7.5	5.8	4.1	4.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.0	55.8	59.9	31.6	27.3	19.7	60.0	45.4	14.7	51.0	40.9	41.3
LnGrp LOS	D	E	E	C	C	B	E	D	B	D	D	D
Approach Vol, veh/h		384			2036			981			737	
Approach Delay, s/veh		56.9			27.5			30.4			46.6	
Approach LOS		E			C			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	20.7	22.7		19.4	15.6	27.8		49.3				
Change Period (Y+Rc), s	* 4.7	5.8		4.6	5.8	* 5.8		5.4				
Max Green Setting (Gmax), s	* 25	22.2		19.4	18.8	* 29		62.6				
Max Q Clear Time (g_c+I1), s	14.9	14.3		13.7	9.8	11.7		32.7				
Green Ext Time (p_c), s	1.1	2.6		1.1	0.2	1.7		11.3				

Intersection Summary			
HCM 6th Ctrl Delay		34.3	
HCM 6th LOS		C	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Olsen-Chandler SP — Cumulative AM
19: S. River Road & Niblick Road — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	120	728	282	110	1288	648	372	288	505
v/c Ratio	0.76	0.57	0.38	0.62	0.90	0.96	0.58	0.85	0.76
Control Delay	83.6	31.2	4.8	64.6	39.0	71.1	44.3	67.5	42.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	83.6	31.2	4.8	64.6	39.0	71.1	44.3	67.5	42.2
Queue Length 50th (ft)	44	217	0	77	424	242	129	200	149
Queue Length 95th (ft)	#104	310	59	145	#626	#398	178	#373	208
Internal Link Dist (ft)		1510			1609		962		896
Turn Bay Length (ft)	140			80		150		110	
Base Capacity (vph)	157	1320	767	209	1535	676	840	361	895
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.55	0.37	0.53	0.84	0.96	0.44	0.80	0.56

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
19: S. River Road & Niblick Road

Cumulative AM
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	670	259	101	945	240	596	300	42	265	265	200
Future Volume (vph)	110	670	259	101	945	240	596	300	42	265	265	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.98		1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3539	1583	1770	3414		3433	3466		1770	3311	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	3539	1583	1770	3414		3433	3466		1770	3311	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	728	282	110	1027	261	648	326	46	288	288	217
RTOR Reduction (vph)	0	0	180	0	19	0	0	10	0	0	82	0
Lane Group Flow (vph)	120	728	102	110	1269	0	648	362	0	288	423	0
Confl. Peds. (#/hr)						10			5			
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	5.0	39.6	39.6	11.0	45.6		21.7	20.1		21.0	19.4	
Effective Green, g (s)	5.0	39.6	39.6	11.0	45.6		21.7	20.1		21.0	19.4	
Actuated g/C Ratio	0.05	0.36	0.36	0.10	0.42		0.20	0.18		0.19	0.18	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	156	1277	571	177	1419		679	635		338	585	
v/s Ratio Prot	0.03	0.21		c0.06	c0.37		c0.19	0.10		c0.16	0.13	
v/s Ratio Perm			0.06									
v/c Ratio	0.77	0.57	0.18	0.62	0.89		0.95	0.57		0.85	0.72	
Uniform Delay, d1	51.8	28.2	23.9	47.4	29.8		43.5	40.9		42.8	42.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	20.1	0.6	0.2	6.6	7.6		23.7	1.2		18.3	4.4	
Delay (s)	71.9	28.8	24.1	54.0	37.4		67.2	42.1		61.1	47.0	
Level of Service	E	C	C	D	D		E	D		E	D	
Approach Delay (s)		32.2			38.7			58.0			52.1	
Approach LOS		C			D			E			D	

Intersection Summary					
HCM 2000 Control Delay	44.0	HCM 2000 Level of Service	D		
HCM 2000 Volume to Capacity ratio	0.91				
Actuated Cycle Length (s)	109.7	Sum of lost time (s)	18.0		
Intersection Capacity Utilization	83.9%	ICU Level of Service	E		
Analysis Period (min)	15				
c Critical Lane Group					

Olsen-Chandler SP
19: S. River Road & Niblick Road

Cumulative AM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	670	259	101	945	240	596	300	42	265	265	200
Future Volume (veh/h)	110	670	259	101	945	240	596	300	42	265	265	200
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	120	728	282	110	1027	261	648	326	46	288	288	217
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	157	1341	598	137	1146	290	676	635	89	319	364	267
Arrive On Green	0.05	0.38	0.38	0.08	0.41	0.41	0.20	0.20	0.20	0.18	0.19	0.19
Sat Flow, veh/h	3456	3554	1585	1781	2804	709	3456	3128	437	1781	1957	1432
Grp Volume(v), veh/h	120	728	282	110	649	639	648	184	188	288	261	244
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1781	1777	1737	1728	1777	1788	1781	1777	1613
Q Serve(g_s), s	3.8	17.6	8.2	6.7	37.4	37.8	20.4	10.1	10.3	17.4	15.4	16.0
Cycle Q Clear(g_c), s	3.8	17.6	8.2	6.7	37.4	37.8	20.4	10.1	10.3	17.4	15.4	16.0
Prop In Lane	1.00		1.00	1.00		0.41	1.00		0.24	1.00		0.89
Lane Grp Cap(c), veh/h	157	1341	598	137	726	710	676	361	363	319	331	300
V/C Ratio(X)	0.76	0.54	0.47	0.80	0.89	0.90	0.96	0.51	0.52	0.90	0.79	0.81
Avail Cap(c_a), veh/h	157	1341	598	209	784	767	676	424	426	362	437	396
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.8	26.8	8.0	49.9	30.2	30.4	43.7	38.9	39.0	44.2	42.6	42.9
Incr Delay (d2), s/veh	19.6	0.5	0.6	12.1	12.1	13.1	24.7	1.1	1.1	23.5	6.9	9.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	7.3	5.0	3.4	17.5	17.4	10.8	4.4	4.5	9.5	7.2	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.4	27.2	8.5	62.0	42.3	43.5	68.4	40.0	40.1	67.7	49.6	52.3
LnGrp LOS	E	C	A	E	D	D	E	D	D	E	D	D
Approach Vol, veh/h		1130			1398			1020			793	
Approach Delay, s/veh		27.3			44.4			58.1			57.0	
Approach LOS		C			D			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	46.0	26.0	25.0	9.5	49.4	24.1	26.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	12.9	40.6	21.5	27.0	5.0	48.5	22.3	26.2
Max Q Clear Time (g_c+I1), s	8.7	19.6	22.4	18.0	5.8	39.8	19.4	12.3
Green Ext Time (p_c), s	0.1	5.8	0.0	2.0	0.0	5.1	0.2	1.7

Intersection Summary	
HCM 6th Ctrl Delay	45.5
HCM 6th LOS	D

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	270	236	5	557	413	4
v/c Ratio	0.44	0.36	0.01	0.48	0.65	0.01
Control Delay	13.3	3.7	10.0	12.1	16.5	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	13.3	3.7	10.0	12.1	16.5	8.2
Queue Length 50th (ft)	38	0	1	42	58	0
Queue Length 95th (ft)	121	35	7	113	205	5
Internal Link Dist (ft)	1629			570	669	
Turn Bay Length (ft)			75			50
Base Capacity (vph)	1616	1367	954	3070	1459	1307
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.17	0.01	0.18	0.28	0.00

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	248	217	5	512	380	4
Future Volume (vph)	248	217	5	512	380	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1845	1532	1749	3505	1752	1568
Flt Permitted	1.00	1.00	0.59	1.00	0.95	1.00
Satd. Flow (perm)	1845	1532	1092	3505	1752	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	270	236	5	557	413	4
RTOR Reduction (vph)	0	156	0	0	0	1
Lane Group Flow (vph)	270	80	5	557	413	3
Confl. Peds. (#/hr)		4	4		1	
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Turn Type	NA	Perm	Perm	NA	Perm	Prot
Protected Phases	2			6		8
Permitted Phases		2	6		8	
Actuated Green, G (s)	12.9	12.9	12.9	12.9	14.2	14.2
Effective Green, g (s)	12.9	12.9	12.9	12.9	14.2	14.2
Actuated g/C Ratio	0.34	0.34	0.34	0.34	0.37	0.37
Clearance Time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	627	521	371	1192	656	587
v/s Ratio Prot	0.15			c0.16		0.00
v/s Ratio Perm		0.05	0.00		c0.24	
v/c Ratio	0.43	0.15	0.01	0.47	0.63	0.00
Uniform Delay, d1	9.7	8.7	8.3	9.8	9.7	7.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	0.1	0.0	0.1	1.4	0.0
Delay (s)	9.8	8.8	8.3	9.9	11.1	7.4
Level of Service	A	A	A	A	B	A
Approach Delay (s)	9.3			9.9	11.0	
Approach LOS	A			A	B	

Intersection Summary				
HCM 2000 Control Delay	10.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	37.9	Sum of lost time (s)	10.8	
Intersection Capacity Utilization	44.4%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	248	217	5	512	380	4
Future Volume (veh/h)	248	217	5	512	380	4
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	270	236	5	557	413	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	580	488	434	1102	522	465
Arrive On Green	0.31	0.31	0.31	0.31	0.30	0.30
Sat Flow, veh/h	1856	1562	884	3618	1767	1572
Grp Volume(v), veh/h	270	236	5	557	413	4
Grp Sat Flow(s),veh/h/ln	1856	1562	884	1763	1767	1572
Q Serve(g_s), s	3.2	3.4	0.1	3.6	5.9	0.0
Cycle Q Clear(g_c), s	3.2	3.4	3.4	3.6	5.9	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	580	488	434	1102	522	465
V/C Ratio(X)	0.47	0.48	0.01	0.51	0.79	0.01
Avail Cap(c_a), veh/h	2262	1905	1235	4298	1962	1746
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.6	7.7	9.0	7.7	8.9	6.9
Incr Delay (d2), s/veh	0.2	0.3	0.0	0.1	1.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.6	0.0	0.7	1.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	7.8	7.9	9.0	7.9	10.0	6.9
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h	506			562	417	
Approach Delay, s/veh	7.9			7.9	9.9	
Approach LOS	A			A	A	

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	14.0				14.0	13.5
Change Period (Y+Rc), s	5.4				5.4	5.4
Max Green Setting (Gmax), s	33.6				33.6	30.6
Max Q Clear Time (g_c+I1), s	5.4				5.6	7.9
Green Ext Time (p_c), s	1.3				2.4	0.6

Intersection Summary			
HCM 6th Ctrl Delay		8.5	
HCM 6th LOS		A	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	15	0	24	1	3	10	40	266	0	0	137	50
Future Volume (vph)	15	0	24	1	3	10	40	266	0	0	137	50
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	0	26	1	3	11	43	289	0	0	149	54

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	42	15	332	203
Volume Left (vph)	16	1	43	0
Volume Right (vph)	26	11	0	54
Hadj (s)	-0.16	-0.29	0.16	-0.02
Departure Headway (s)	5.0	4.9	4.4	4.4
Degree Utilization, x	0.06	0.02	0.41	0.25
Capacity (veh/h)	648	651	797	794
Control Delay (s)	8.3	8.0	10.4	8.8
Approach Delay (s)	8.3	8.0	10.4	8.8
Approach LOS	A	A	B	A

Intersection Summary					
Delay		9.7			
Level of Service		A			
Intersection Capacity Utilization		43.6%	ICU Level of Service		A
Analysis Period (min)		15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	9.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	0	24	1	3	10	40	266	0	0	137	50
Future Vol, veh/h	15	0	24	1	3	10	40	266	0	0	137	50
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	8	8	8	8	8	8	8	8	8	8	8	8
Mvmt Flow	16	0	26	1	3	11	43	289	0	0	149	54
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.3	8	10.5	8.8
HCM LOS	A	A	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	13%	38%	7%	0%
Vol Thru, %	87%	0%	21%	73%
Vol Right, %	0%	62%	71%	27%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	306	39	14	187
LT Vol	40	15	1	0
Through Vol	266	0	3	137
RT Vol	0	24	10	50
Lane Flow Rate	333	42	15	203
Geometry Grp	1	1	1	1
Degree of Util (X)	0.409	0.058	0.021	0.246
Departure Headway (Hd)	4.43	4.949	4.869	4.365
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	818	723	735	823
Service Time	2.43	2.982	2.903	2.384
HCM Lane V/C Ratio	0.407	0.058	0.02	0.247
HCM Control Delay	10.5	8.3	8	8.8
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	2	0.2	0.1	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	10	15	0	9	25	30	116	0	7	57	117
Future Volume (Veh/h)	85	10	15	0	9	25	30	116	0	7	57	117
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	92	11	16	0	10	27	33	126	0	8	62	127
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	37			27			384	240	19	290	234	24
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	37			27			384	240	19	290	234	24
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			93	80	100	98	90	88
cM capacity (veh/h)	1561			1574			442	619	1053	531	623	1047

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	119	37	159	8	189
Volume Left	92	0	33	8	0
Volume Right	16	27	0	0	127
cSH	1561	1574	572	531	856
Volume to Capacity	0.06	0.00	0.28	0.02	0.22
Queue Length 95th (ft)	5	0	28	1	21
Control Delay (s)	5.9	0.0	13.7	11.9	10.4
Lane LOS	A		B	B	B
Approach Delay (s)	5.9	0.0	13.7	10.5	
Approach LOS			B	B	

Intersection Summary				
Average Delay	9.6			
Intersection Capacity Utilization	40.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	9.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	85	10	15	0	9	25	30	116	0	7	57	117
Future Vol, veh/h	85	10	15	0	9	25	30	116	0	7	57	117
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	92	11	16	0	10	27	33	126	0	8	62	127

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	37	0	0	27	0	0	321	240	19	290	235	24
Stage 1	-	-	-	-	-	-	203	203	-	24	24	-
Stage 2	-	-	-	-	-	-	118	37	-	266	211	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	1561	-	-	1574	-	-	628	658	1053	658	662	1047
Stage 1	-	-	-	-	-	-	794	730	-	989	871	-
Stage 2	-	-	-	-	-	-	882	860	-	735	724	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1561	-	-	1574	-	-	487	619	1053	530	622	1047
Mov Cap-2 Maneuver	-	-	-	-	-	-	487	619	-	530	622	-
Stage 1	-	-	-	-	-	-	746	686	-	930	871	-
Stage 2	-	-	-	-	-	-	720	860	-	564	681	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	5.8	0	13.4	10.5
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	586	1561	-	-	1574	-	-	530	856
HCM Lane V/C Ratio	0.271	0.059	-	-	-	-	-	0.014	0.221
HCM Control Delay (s)	13.4	7.5	0	-	0	-	-	11.9	10.4
HCM Lane LOS	B	A	A	-	A	-	-	B	B
HCM 95th %tile Q(veh)	1.1	0.2	-	-	0	-	-	0	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	45	80	10	5	10
Future Volume (Veh/h)	5	45	80	10	5	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	49	87	11	5	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	98				152	92
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	98				152	92
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	99
cM capacity (veh/h)	1489				835	962

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	54	98	16
Volume Left	5	0	5
Volume Right	0	11	11
cSH	1489	1700	918
Volume to Capacity	0.00	0.06	0.02
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.7	0.0	9.0
Lane LOS	A		A
Approach Delay (s)	0.7	0.0	9.0
Approach LOS			A

Intersection Summary				
Average Delay		1.1		
Intersection Capacity Utilization		16.5%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	45	80	10	5	10
Future Vol, veh/h	5	45	80	10	5	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	5	49	87	11	5	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	98	0	-	0	152	93
Stage 1	-	-	-	-	93	-
Stage 2	-	-	-	-	59	-
Critical Hdwy	4.13	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.227	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	1489	-	-	-	837	961
Stage 1	-	-	-	-	928	-
Stage 2	-	-	-	-	961	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1489	-	-	-	834	961
Mov Cap-2 Maneuver	-	-	-	-	834	-
Stage 1	-	-	-	-	925	-
Stage 2	-	-	-	-	961	-

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1489	-	-	-	915
HCM Lane V/C Ratio	0.004	-	-	-	0.018
HCM Control Delay (s)	7.4	0	-	-	9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	334	1599	1606	158	152	302
v/c Ratio	0.63	0.48	0.89	0.18	0.60	0.56
Control Delay	55.5	0.5	31.2	4.5	61.6	35.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.5	0.5	31.2	4.5	61.6	35.6
Queue Length 50th (ft)	122	0	530	10	108	170
Queue Length 95th (ft)	223	0	836	49	226	335
Internal Link Dist (ft)		1017	748		574	
Turn Bay Length (ft)	345			330	450	
Base Capacity (vph)	862	3312	2572	1179	444	857
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.48	0.62	0.13	0.34	0.35

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	331	1583	1590	156	150	299
Future Volume (vph)	331	1583	1590	156	150	299
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0	7.3	7.3	4.2	3.7
Lane Util. Factor	0.97	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3213	3312	3312	1482	1656	1482
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3213	3312	3312	1482	1656	1482
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	334	1599	1606	158	152	302
RTOR Reduction (vph)	0	0	0	57	0	13
Lane Group Flow (vph)	334	1599	1606	101	152	289
Heavy Vehicles (%)	9%	9%	9%	9%	9%	9%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	8	Free!	6		7!	4
Permitted Phases				6		4
Actuated Green, G (s)	19.7	118.1	65.1	65.1	18.3	42.0
Effective Green, g (s)	19.7	118.1	65.1	65.1	18.3	42.0
Actuated g/C Ratio	0.17	1.00	0.55	0.55	0.15	0.36
Clearance Time (s)	3.5		7.3	7.3	4.2	3.7
Vehicle Extension (s)	3.0		4.0	4.0	3.5	3.0
Lane Grp Cap (vph)	535	3312	1825	816	256	527
v/s Ratio Prot	c0.10	0.48	c0.48		0.09	c0.20
v/s Ratio Perm				0.07		
v/c Ratio	0.62	0.48	0.88	0.12	0.59	0.55
Uniform Delay, d1	45.8	0.0	23.1	12.8	46.4	30.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	0.5	5.5	0.1	3.9	1.2
Delay (s)	48.0	0.5	28.6	12.9	50.3	31.6
Level of Service	D	A	C	B	D	C
Approach Delay (s)		8.7	27.2		37.9	
Approach LOS		A	C		D	

Intersection Summary				
HCM 2000 Control Delay	19.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.78			
Actuated Cycle Length (s)	118.1	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	74.6%	ICU Level of Service	D	
Analysis Period (min)	15			

! Phase conflict between lane groups.
c Critical Lane Group

HCM 6th Edition methodology cannot be performed with phasing conflicts.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	392	1028	367	398	1134	216	345	486	264	341	320
v/c Ratio	0.96	0.86	0.48	0.85	0.90	0.31	0.81	0.61	0.71	0.85	0.63
Control Delay	98.4	51.8	5.1	79.1	53.6	4.8	78.7	51.9	75.8	76.1	23.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	98.4	51.8	5.1	79.1	53.6	4.8	78.7	51.9	75.8	76.1	23.5
Queue Length 50th (ft)	199	487	0	197	543	0	170	211	129	319	89
Queue Length 95th (ft)	#372	603	68	#360	679	54	#289	308	200	#493	216
Internal Link Dist (ft)		1323			2509			853		451	
Turn Bay Length (ft)	225		485	125		390	160		140		
Base Capacity (vph)	410	1646	913	471	1646	836	456	943	456	507	584
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.62	0.40	0.85	0.69	0.26	0.76	0.52	0.58	0.67	0.55

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Cumulative PM
2: Golden Hill Road & SR 46 E — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	380	997	356	386	1100	210	335	362	110	256	331	310
Future Volume (vph)	380	997	356	386	1100	210	335	362	110	256	331	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3273	3374	1488	3273	3374	1488	3273	3245		3273	1776	1509
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3273	3374	1488	3273	3374	1488	3273	3245		3273	1776	1509
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	392	1028	367	398	1134	216	345	373	113	264	341	320
RTOR Reduction (vph)	0	0	236	0	0	135	0	17	0	0	0	167
Lane Group Flow (vph)	392	1028	131	398	1134	81	345	469	0	264	341	153
Confl. Peds. (#/hr)			1			1			2			
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	18.4	52.2	52.2	21.1	54.9	54.9	19.2	35.4		16.7	32.9	32.9
Effective Green, g (s)	18.4	52.2	52.2	21.1	54.9	54.9	19.2	35.4		16.7	32.9	32.9
Actuated g/C Ratio	0.13	0.36	0.36	0.14	0.38	0.38	0.13	0.24		0.11	0.23	0.23
Clearance Time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	412	1206	532	473	1268	559	430	786		374	400	340
v/s Ratio Prot	c0.12	0.30		0.12	c0.34		c0.11	0.14		0.08	c0.19	
v/s Ratio Perm			0.09			0.05						0.10
v/c Ratio	0.95	0.85	0.25	0.84	0.89	0.15	0.80	0.60		0.71	0.85	0.45
Uniform Delay, d1	63.4	43.3	33.0	60.8	42.8	30.1	61.6	49.0		62.3	54.2	48.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	32.0	6.0	0.2	12.3	8.4	0.1	10.3	1.2		6.0	15.9	1.0
Delay (s)	95.3	49.3	33.3	73.1	51.2	30.2	71.9	50.2		68.3	70.2	49.7
Level of Service	F	D	C	E	D	C	E	D		E	E	D
Approach Delay (s)		56.1			53.6			59.2			62.5	
Approach LOS		E			D			E			E	

Intersection Summary				
HCM 2000 Control Delay	56.9	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	146.0	Sum of lost time (s)	20.6	
Intersection Capacity Utilization	85.4%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Olsen-Chandler SP — Cumulative PM
2: Golden Hill Road & SR 46 E — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	380	997	356	386	1100	210	335	362	110	256	331	310
Future Volume (veh/h)	380	997	356	386	1100	210	335	362	110	256	331	310
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	392	1028	367	398	1134	216	345	373	113	264	341	320
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	413	1206	537	429	1300	579	394	664	199	316	419	355
Arrive On Green	0.12	0.35	0.35	0.13	0.38	0.38	0.12	0.26	0.26	0.10	0.23	0.23
Sat Flow, veh/h	3319	3413	1521	3319	3413	1521	3319	2588	774	3319	1796	1522
Grp Volume(v), veh/h	392	1028	367	398	1134	216	345	244	242	264	341	320
Grp Sat Flow(s),veh/h/ln	1659	1706	1521	1659	1706	1521	1659	1706	1655	1659	1796	1522
Q Serve(g_s), s	16.9	40.3	20.7	17.1	44.5	14.8	14.8	17.9	18.4	11.3	26.0	29.5
Cycle Q Clear(g_c), s	16.9	40.3	20.7	17.1	44.5	14.8	14.8	17.9	18.4	11.3	26.0	29.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.47	1.00		1.00
Lane Grp Cap(c), veh/h	413	1206	537	429	1300	579	394	438	425	316	419	355
V/C Ratio(X)	0.95	0.85	0.68	0.93	0.87	0.37	0.87	0.56	0.57	0.83	0.81	0.90
Avail Cap(c_a), veh/h	413	1653	737	429	1653	737	459	484	470	459	510	432
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	62.8	43.2	19.3	62.2	41.5	32.3	62.6	46.6	46.8	64.2	52.4	53.8
Incr Delay (d2), s/veh	31.3	3.3	1.5	25.9	4.5	0.4	15.3	1.2	1.3	8.6	8.2	19.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.7	16.7	7.3	8.5	18.5	5.5	7.0	7.7	7.7	5.1	12.5	13.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	94.0	46.6	20.8	88.1	45.9	32.7	77.9	47.7	48.1	72.8	60.7	73.0
LnGrp LOS	F	D	C	F	D	C	E	D	D	E	E	E
Approach Vol, veh/h		1787			1748			831			925	
Approach Delay, s/veh		51.7			53.9			60.4			68.4	
Approach LOS		D			D			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	26.0	58.3	21.2	39.0	22.0	62.3	17.8	42.4
Change Period (Y+Rc), s	7.3	* 7.3	4.0	5.3	4.0	7.3	4.0	5.3
Max Green Setting (Gmax), s	18.0	* 70	20.0	41.0	18.0	70.0	20.0	41.0
Max Q Clear Time (g_c+I1), s	19.1	42.3	16.8	31.5	18.9	46.5	13.3	20.4
Green Ext Time (p_c), s	0.0	8.8	0.4	2.2	0.0	8.5	0.5	2.7

Intersection Summary	
HCM 6th Ctrl Delay	56.7
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↱		↱
Traffic Volume (veh/h)	0	1550	1596	20	0	100
Future Volume (Veh/h)	0	1550	1596	20	0	100
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	1649	1698	21	0	106
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1719				2522	849
vC1, stage 1 conf vol					1698	
vC2, stage 2 conf vol					824	
vCu, unblocked vol	1719				2522	849
tC, single (s)	4.3				7.0	7.1
tC, 2 stage (s)					6.0	
tF (s)	2.3				3.6	3.4
p0 queue free %	100				100	63
cM capacity (veh/h)	331				114	289

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	SB 1
Volume Total	824	824	849	849	21	106
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	21	106
cSH	1700	1700	1700	1700	1700	289
Volume to Capacity	0.48	0.48	0.50	0.50	0.01	0.37
Queue Length 95th (ft)	0	0	0	0	0	41
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	24.5
Lane LOS						C
Approach Delay (s)	0.0		0.0			24.5
Approach LOS						C

Intersection Summary				
Average Delay		0.7		
Intersection Capacity Utilization		57.0%	ICU Level of Service	B
Analysis Period (min)		15		

Intersection	
Int Delay, s/veh	0.8

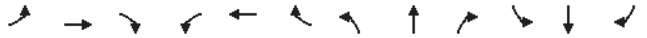
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↱		↱
Traffic Vol, veh/h	0	1550	1596	20	0	100
Future Vol, veh/h	0	1550	1596	20	0	100
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	165	-	-
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	0	1649	1698	21	0	106

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	849
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.4
Pot Cap-1 Maneuver	0	-	-	-	0	289
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	289
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	24.5
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	289
HCM Lane V/C Ratio	-	-	-	0.368
HCM Control Delay (s)	-	-	-	24.5
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	1.6

Reso A - Exhibit C2 (EIR Technical Appendix)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1517	33	3	1556	0	50	0	6	0	0	10
Future Volume (Veh/h)	0	1517	33	3	1556	0	50	0	6	0	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	1564	34	3	1604	0	52	0	6	0	0	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									1			
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1604			1598			2382	3174	782	2395	3208	802
vC1, stage 1 conf vol							1564	1564		1610	1610	
vC2, stage 2 conf vol							818	1610		785	1598	
vCu, unblocked vol	1604			1598			2382	3174	782	2395	3208	802
tC, single (s)	4.3			4.3			7.7	6.7	7.1	7.7	6.7	7.1
tC, 2 stage (s)							6.7	5.7		6.7	5.7	
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			99			46	100	98	100	100	97
cM capacity (veh/h)	360			362			97	100	316	91	98	307

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	782	782	34	3	1069	535	58	10
Volume Left	0	0	0	0	3	0	0	52	0
Volume Right	0	0	0	34	0	0	0	6	10
cSH	1700	1700	1700	1700	362	1700	1700	106	307
Volume to Capacity	0.00	0.46	0.46	0.02	0.01	0.63	0.31	0.55	0.03
Queue Length 95th (ft)	0	0	0	0	1	0	0	63	3
Control Delay (s)	0.0	0.0	0.0	0.0	15.0	0.0	0.0	73.7	17.1
Lane LOS					C			F	C
Approach Delay (s)	0.0				0.0			73.7	17.1
Approach LOS								F	C

Intersection Summary				
Average Delay	1.4			
Intersection Capacity Utilization	59.1%	ICU Level of Service	B	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1517	33	3	1556	0	50	0	6	0	0	10
Future Vol, veh/h	0	1517	33	3	1556	0	50	0	6	0	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	275	305	-	-	-	-	25	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	12	12	12	12	12	12	12	12	12	12	12	12
Mvmt Flow	0	1564	34	3	1604	0	52	0	6	0	0	10

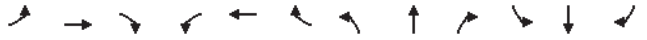
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1604	0	0	1598	0	0	2372	3174	782	2392	3208	802
Stage 1	-	-	-	-	-	-	1564	1564	-	1610	1610	-
Stage 2	-	-	-	-	-	-	808	1610	-	782	1598	-
Critical Hdwy	4.34	-	-	4.34	-	-	7.74	6.74	7.14	7.74	6.74	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	6.74	5.74	-	6.74	5.74	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.74	5.74	-	6.74	5.74	-
Follow-up Hdwy	2.32	-	-	2.32	-	-	3.62	4.12	3.42	3.62	4.12	3.42
Pot Cap-1 Maneuver	360	-	-	362	-	-	~ 16	9	316	15	8	307
Stage 1	-	-	-	-	-	-	106	155	-	99	147	-
Stage 2	-	-	-	-	-	-	320	147	-	332	149	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	360	-	-	362	-	-	~ 15	9	316	15	8	307
Mov Cap-2 Maneuver	-	-	-	-	-	-	95	98	-	90	95	-
Stage 1	-	-	-	-	-	-	106	155	-	99	146	-
Stage 2	-	-	-	-	-	-	307	146	-	326	149	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	73.9	17.1
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	95	316	360	-	-	362	-	-	307
HCM Lane V/C Ratio	0.543	0.02	-	-	-	0.009	-	-	0.034
HCM Control Delay (s)	80.8	16.6	0	-	-	15	-	-	17.1
HCM Lane LOS	F	C	A	-	-	C	-	-	C
HCM 95th %tile Q(veh)	2.5	0.1	0	-	-	0	-	-	0.1

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Reso A - Exhibit C2 (EIR Technical Appendix)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized			MOYes									
Traffic Volume (veh/h)	300	350	150	311	280	180	62	389	348	100	584	300
Future Volume (veh/h)	300	350	150	311	280	180	62	389	348	100	584	300
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	323	376	161	334	301	194	67	418	374	108	628	323
Approach Volume (veh/h)		699			829			859			1059	
Crossing Volume (veh/h)		1070			808			807			702	
High Capacity (veh/h)		588			728			729			794	
High v/c (veh/h)		1.19			1.14			1.18			1.33	
Low Capacity (veh/h)		453			574			575			631	
Low v/c (veh/h)		1.54			1.44			1.50			1.68	

Intersection Summary												
Maximum v/c High			1.33									
Maximum v/c Low			1.68									
Intersection Capacity Utilization			117.6%		ICU Level of Service				H			

Intersection	
Intersection Delay, s/veh	29.4
Intersection LOS	D

Approach	EB	WB	NB	SB
Entry Lanes	2	2	2	2
Conflicting Circle Lanes	1	2	2	2
Adj Approach Flow, veh/h	860	829	859	1059
Demand Flow Rate, veh/h	869	837	868	1069
Vehicles Circulating, veh/h	1080	816	815	709
Vehicles Exiting, veh/h	698	867	971	944
Ped Vol Crossing Leg, #/h	1	1	1	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	18.7	17.8	20.5	54.6
Approach LOS	C	C	C	F

Lane	Left	Right	Bypass	Left	Right	Left	Right	Left	Right
Designated Moves	LT	TR	R	L	TR	LT	R	LT	R
Assumed Moves	LT	TR	R	L	TR	LT	R	LT	R
RT Channelized			Free						
Lane Util	0.470	0.530		0.403	0.597	0.565	0.435	0.695	0.305
Follow-Up Headway, s	2.535	2.535		2.667	2.535	2.667	2.535	2.667	2.535
Critical Headway, s	4.544	4.544	163	4.645	4.328	4.645	4.328	4.645	4.328
Entry Flow, veh/h	332	374	1919	337	500	490	378	743	326
Cap Entry Lane, veh/h	531	531	0.990	637	710	638	710	703	777
Entry HV Adj Factor	0.990	0.991	161	0.991	0.990	0.989	0.989	0.990	0.991
Flow Entry, veh/h	329	371	1900	334	495	485	374	736	323
Cap Entry, veh/h	526	527	0.085	631	702	631	703	696	770
V/C Ratio	0.625	0.704	0.0	0.529	0.705	0.768	0.532	1.057	0.419
Control Delay, s/veh	20.7	25.0	A	14.6	19.9	25.9	13.5	74.1	10.1
LOS	C	C	0	B	C	D	B	F	B
95th %tile Queue, veh	4	6		3	6	7	3	19	2

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	112	15	5	97	0	15	1	5	0	0	0
Future Volume (Veh/h)	1	112	15	5	97	0	15	1	5	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	122	16	5	105	0	16	1	5	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	105			138			247	247	130	252	255	105
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	105			138			247	247	130	252	255	105
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	100	99	100	100	100
cM capacity (veh/h)	1474			1433			700	649	914	690	643	944

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	139	110	22	0
Volume Left	1	5	16	0
Volume Right	16	0	5	0
cSH	1474	1433	737	1700
Volume to Capacity	0.00	0.00	0.03	0.00
Queue Length 95th (ft)	0	0	2	0
Control Delay (s)	0.1	0.4	10.0	0.0
Lane LOS	A	A	B	A
Approach Delay (s)	0.1	0.4	10.0	0.0
Approach LOS			B	A

Intersection Summary				
Average Delay			1.0	
Intersection Capacity Utilization			18.4%	ICU Level of Service
Analysis Period (min)			15	

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	112	15	5	97	0	15	1	5	0	0	0
Future Vol, veh/h	1	112	15	5	97	0	15	1	5	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	1	122	16	5	105	0	16	1	5	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	105	0	0	138	0	0	247	247	130	250	255	105
Stage 1	-	-	-	-	-	-	132	132	-	115	115	-
Stage 2	-	-	-	-	-	-	115	115	-	135	140	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	1474	-	-	1433	-	-	703	652	914	699	645	944
Stage 1	-	-	-	-	-	-	867	783	-	885	797	-
Stage 2	-	-	-	-	-	-	885	797	-	864	777	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1474	-	-	1433	-	-	700	649	914	691	642	944
Mov Cap-2 Maneuver	-	-	-	-	-	-	700	649	-	691	642	-
Stage 1	-	-	-	-	-	-	866	782	-	884	794	-
Stage 2	-	-	-	-	-	-	881	794	-	857	776	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.4	10	0
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	738	1474	-	-	1433	-	-	-
HCM Lane V/C Ratio	0.031	0.001	-	-	0.004	-	-	-
HCM Control Delay (s)	10	7.4	0	-	7.5	0	-	0
HCM Lane LOS	B	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	21	527	309	495	744	7	54	319	376	376	117
v/c Ratio	0.22	0.72	0.78	0.59	0.67	0.04	0.30	0.72	0.78	0.77	0.22
Control Delay	58.0	44.4	52.5	27.0	5.4	45.4	49.8	15.4	46.4	45.5	4.9
Queue Delay	0.0	0.0	0.1	3.1	0.7	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.0	44.4	52.6	30.1	6.1	45.4	49.8	15.4	46.4	45.5	4.9
Queue Length 50th (ft)	14	171	193	223	0	4	35	0	234	234	0
Queue Length 95th (ft)	44	264	#358	445	91	19	76	85	#436	#430	34
Internal Link Dist (ft)		346		307			744			674	
Turn Bay Length (ft)	65		125			140		165	150		185
Base Capacity (vph)	94	902	503	927	1144	344	362	565	605	615	643
Starvation Cap Reductn	0	0	8	321	149	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.58	0.62	0.82	0.75	0.02	0.15	0.56	0.62	0.61	0.18

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	463	32	290	465	699	7	51	300	609	98	110
Future Volume (vph)	20	463	32	290	465	699	7	51	300	609	98	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (prot)	1787	3533		1787	1881	1557	1787	1881	1599	1698	1725	1560
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (perm)	1787	3533		1787	1881	1557	1787	1881	1599	1698	1725	1560
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	21	493	34	309	495	744	7	54	319	648	104	117
RTOR Reduction (vph)	0	4	0	0	0	422	0	0	289	0	0	84
Lane Group Flow (vph)	21	523	0	309	495	322	7	54	30	376	376	33
Confl. Peds. (#/hr)			4			2						2
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	1.7	23.2		21.9	43.4	43.4	9.4	9.4	9.4	27.9	27.9	27.9
Effective Green, g (s)	1.7	23.2		21.9	43.4	43.4	9.4	9.4	9.4	27.9	27.9	27.9
Actuated g/C Ratio	0.02	0.23		0.22	0.43	0.43	0.09	0.09	0.09	0.28	0.28	0.28
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	30	816		389	813	673	167	176	149	471	479	433
v/s Ratio Prot	0.01	0.15		c0.17	c0.26		0.00	c0.03		c0.22	0.22	
v/s Ratio Perm						0.21			0.02			0.02
v/c Ratio	0.70	0.64		0.79	0.61	0.48	0.04	0.31	0.20	0.80	0.78	0.08
Uniform Delay, d1	49.1	34.8		37.1	22.0	20.4	41.4	42.5	42.0	33.6	33.5	26.7
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	52.7	1.7		10.7	1.3	0.5	0.1	1.0	0.7	9.2	8.2	0.1
Delay (s)	101.8	36.6		47.8	23.3	20.9	41.5	43.5	42.7	42.8	41.7	26.8
Level of Service	F	D		D	C	C	D	D	D	D	D	C
Approach Delay (s)		39.1			27.0			42.8			40.2	
Approach LOS		D			C			D			D	

Intersection Summary

HCM 2000 Control Delay	34.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	100.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
8: Riverside Ave & 13th Street

Cumulative PM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	463	32	290	465	699	7	51	300	609	98	110
Future Volume (veh/h)	20	463	32	290	465	699	7	51	300	609	98	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	21	493	34	309	495	744	7	54	319	722	0	117
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	39	834	57	343	782	647	297	312	264	839	0	372
Arrive On Green	0.02	0.25	0.25	0.19	0.41	0.41	0.17	0.17	0.17	0.23	0.00	0.23
Sat Flow, veh/h	1795	3398	234	1795	1885	1559	1795	1885	1598	3591	0	1591
Grp Volume(v), veh/h	21	259	268	309	495	744	7	54	319	722	0	117
Grp Sat Flow(s),veh/h/ln	1795	1791	1841	1795	1885	1559	1795	1885	1598	1795	0	1591
Q Serve(g_s), s	1.3	14.0	14.1	18.4	22.8	45.4	0.4	2.7	18.1	21.1	0.0	6.7
Cycle Q Clear(g_c), s	1.3	14.0	14.1	18.4	22.8	45.4	0.4	2.7	18.1	21.1	0.0	6.7
Prop In Lane	1.00		0.13	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	39	440	452	343	782	647	297	312	264	839	0	372
V/C Ratio(X)	0.54	0.59	0.59	0.90	0.63	1.15	0.02	0.17	1.21	0.86	0.00	0.31
Avail Cap(c_a), veh/h	82	440	452	435	782	647	297	312	264	1099	0	487
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	53.0	36.4	36.5	43.3	25.4	32.0	38.3	39.2	45.7	40.2	0.0	34.7
Incr Delay (d2), s/veh	11.3	2.1	2.1	18.5	1.7	84.6	0.0	0.3	123.2	5.6	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	6.4	6.6	9.9	10.4	31.7	0.2	1.3	16.1	9.8	0.0	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.3	38.5	38.5	61.7	27.1	116.6	38.3	39.5	168.9	45.8	0.0	35.2
LnGrp LOS	E	D	D	E	C	F	D	D	F	D	A	D
Approach Vol, veh/h		548			1548			380			839	
Approach Delay, s/veh		39.5			77.0			148.1			44.3	
Approach LOS		D			E			F			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	25.4	31.4		30.1	6.9	49.9		22.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	26.5	23.9		33.5	5.0	45.4		18.1				
Max Q Clear Time (g_c+I1), s	20.4	16.1		23.1	3.3	47.4		20.1				
Green Ext Time (p_c), s	0.5	2.0		2.5	0.0	0.0		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		70.7	
HCM 6th LOS		E	

Notes

User approved volume balancing among the lanes for turning movement.

Olsen-Chandler SP
9: Paso Robles Street & 13th Street

Cumulative PM
Queues

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	94	1381	30	1253	369	280	32	508	9	32
v/c Ratio	0.53	0.75	0.27	0.76	0.44	0.63	0.05	0.85	0.02	0.05
Control Delay	56.3	22.1	54.2	25.7	8.8	35.7	23.9	37.3	23.5	0.2
Queue Delay	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.3	23.3	54.2	25.7	8.8	35.7	23.9	37.3	23.5	0.2
Queue Length 50th (ft)	60	380	20	356	52	155	14	237	4	0
Queue Length 95th (ft)	#122	490	51	460	128	246	35	#415	15	0
Internal Link Dist (ft)		307		269			836			575
Turn Bay Length (ft)	120		220		145	130		110	95	
Base Capacity (vph)	205	2181	110	2012	983	595	808	761	595	761
Starvation Cap Reductn	0	533	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.84	0.27	0.62	0.38	0.47	0.04	0.67	0.02	0.04

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Cumulative PM
9: Paso Robles Street & 13th Street — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	1244	40	28	1165	343	260	30	472	8	0	30
Future Volume (vph)	87	1244	40	28	1165	343	260	30	472	8	0	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	3554		1787	3574	1564	1787	1881	1599	1787	1599	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.74	1.00	1.00	0.74	1.00	
Satd. Flow (perm)	1787	3554		1787	3574	1564	1385	1881	1599	1385	1599	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	94	1338	43	30	1253	369	280	32	508	9	0	32
RTOR Reduction (vph)	0	2	0	0	0	125	0	0	89	0	22	0
Lane Group Flow (vph)	94	1379	0	30	1253	244	280	32	419	9	10	0
Confl. Peds. (#/hr)			5									
Confl. Bikes (#/hr)			1			2						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		
Actuated Green, G (s)	6.7	46.6		2.6	42.5	42.5	28.8	28.8	28.8	28.8	28.8	
Effective Green, g (s)	6.7	46.6		2.6	42.5	42.5	28.8	28.8	28.8	28.8	28.8	
Actuated g/C Ratio	0.07	0.51		0.03	0.46	0.46	0.31	0.31	0.31	0.31	0.31	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	130	1810		50	1660	726	435	592	503	435	503	
v/s Ratio Prot	c0.05	c0.39		0.02	0.35			0.02			0.01	
v/s Ratio Perm						0.16	0.20		c0.26	0.01		
v/c Ratio	0.72	0.76		0.60	0.75	0.34	0.64	0.05	0.83	0.02	0.02	
Uniform Delay, d1	41.5	18.0		43.9	20.2	15.5	26.9	21.9	29.1	21.6	21.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	17.9	2.0		17.9	2.0	0.3	3.3	0.0	11.3	0.0	0.0	
Delay (s)	59.4	20.0		61.8	22.2	15.8	30.2	21.9	40.4	21.6	21.6	
Level of Service	E	B		E	C	B	C	C	D	C	C	
Approach Delay (s)		22.5			21.5			36.2			21.6	
Approach LOS		C			C			D			C	

Intersection Summary				
HCM 2000 Control Delay	24.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	91.5	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	80.3%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Olsen-Chandler SP — Cumulative PM
9: Paso Robles Street & 13th Street — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	1244	40	28	1165	343	260	30	472	8	0	30
Future Volume (veh/h)	87	1244	40	28	1165	343	260	30	472	8	0	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	94	1338	43	30	1253	0	280	32	508	9	0	32
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	121	1657	53	53	1542		547	656	556	376	0	556
Arrive On Green	0.07	0.47	0.47	0.03	0.43	0.00	0.35	0.35	0.35	0.35	0.00	0.35
Sat Flow, veh/h	1795	3538	114	1795	3582	1598	1388	1885	1598	872	0	1598
Grp Volume(v), veh/h	94	676	705	30	1253	0	280	32	508	9	0	32
Grp Sat Flow(s),veh/h/ln	1795	1791	1861	1795	1791	1598	1388	1885	1598	872	0	1598
Q Serve(g_s), s	4.5	28.3	28.4	1.4	26.8	0.0	14.7	1.0	26.6	0.6	0.0	1.2
Cycle Q Clear(g_c), s	4.5	28.3	28.4	1.4	26.8	0.0	15.9	1.0	26.6	1.6	0.0	1.2
Prop In Lane	1.00		0.06	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	121	839	871	53	1542		547	656	556	376	0	556
V/C Ratio(X)	0.78	0.81	0.81	0.56	0.81		0.51	0.05	0.91	0.02	0.00	0.06
Avail Cap(c_a), veh/h	195	1041	1082	105	1902		626	764	648	426	0	648
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	40.2	19.9	19.9	41.9	21.8	0.0	24.3	18.9	27.3	19.5	0.0	19.0
Incr Delay (d2), s/veh	10.2	3.9	3.8	9.1	2.3	0.0	0.7	0.0	16.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	11.8	12.3	0.8	11.1	0.0	4.7	0.4	12.0	0.1	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.4	23.8	23.7	51.0	24.1	0.0	25.0	19.0	43.3	19.5	0.0	19.0
LnGrp LOS	D	C	C	D	C		C	B	D	B	A	B
Approach Vol, veh/h		1475			1283	A		820			41	
Approach Delay, s/veh		25.4			24.8			36.1			19.1	
Approach LOS		C			C			D			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.1	45.5		35.0	10.4	42.2		35.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	50.9		35.5	9.5	46.5		35.5				
Max Q Clear Time (g_c+I1), s	3.4	30.4		3.6	6.5	28.8		28.6				
Green Ext Time (p_c), s	0.0	10.1		0.2	0.0	8.9		1.9				

Intersection Summary			
HCM 6th Ctrl Delay	27.6		
HCM 6th LOS	C		

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	508	1308	105	946	296	255	74	133	827
v/c Ratio	0.83	0.87	0.72	0.80	0.75	0.33	0.16	0.69	0.93dr
Control Delay	58.7	34.7	80.7	39.7	62.4	40.0	0.8	69.0	43.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.7	34.7	80.7	39.7	62.4	40.0	0.8	69.0	43.2
Queue Length 50th (ft)	197	438	81	336	116	89	0	100	224
Queue Length 95th (ft)	#273	540	#171	418	#175	129	1	#177	#342
Internal Link Dist (ft)		353		673		608			523
Turn Bay Length (ft)	295		235		140		130	225	
Base Capacity (vph)	668	1668	152	1306	419	814	469	222	958
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.78	0.69	0.72	0.71	0.31	0.16	0.60	0.86

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	483	849	393	100	754	144	281	242	70	126	286	500
Future Volume (vph)	483	849	393	100	754	144	281	242	70	126	286	500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.98		1.00	1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3467	3390		1787	3480		3467	3574	1599	1787	3205	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3467	3390		1787	3480		3467	3574	1599	1787	3205	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	508	894	414	105	794	152	296	255	74	133	301	526
RTOR Reduction (vph)	0	47	0	0	13	0	0	0	58	0	230	0
Lane Group Flow (vph)	508	1261	0	105	933	0	296	255	16	133	597	0
Confl. Peds. (#/hr)			1			1						1
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	19.9	48.6		9.2	37.9		12.9	24.6	24.6	12.3	24.0	
Effective Green, g (s)	19.9	48.6		9.2	37.9		12.9	24.6	24.6	12.3	24.0	
Actuated g/C Ratio	0.18	0.43		0.08	0.34		0.11	0.22	0.22	0.11	0.21	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	612	1461		145	1170		396	780	349	195	682	
v/s Ratio Prot	c0.15	c0.37		0.06	0.27		c0.09	0.07		0.07	c0.19	
v/s Ratio Perm									0.01			
v/c Ratio	0.83	0.86		0.72	0.80		0.75	0.33	0.05	0.68	0.93dr	
Uniform Delay, d1	44.8	29.0		50.5	33.9		48.3	37.1	34.8	48.3	42.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	9.3	5.5		16.4	3.9		7.5	0.2	0.1	9.4	12.1	
Delay (s)	54.1	34.6		66.9	37.8		55.8	37.3	34.8	57.8	55.0	
Level of Service	D	C		E	D		E	D	C	E	E	
Approach Delay (s)		40.0			40.7			45.8			55.4	
Approach LOS		D			D			D			E	

Intersection Summary					
HCM 2000 Control Delay	44.3	HCM 2000 Level of Service	D		
HCM 2000 Volume to Capacity ratio	0.87				
Actuated Cycle Length (s)	112.7	Sum of lost time (s)	18.0		
Intersection Capacity Utilization	88.7%	ICU Level of Service	E		
Analysis Period (min)	15				

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
10: River Road & Creston Road

Cumulative PM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	483	849	393	100	754	144	281	242	70	126	286	500
Future Volume (veh/h)	483	849	393	100	754	144	281	242	70	126	286	500
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	508	894	0	105	794	152	296	255	74	133	301	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	636	1613		135	1026	196	397	526	235	170	457	
Arrive On Green	0.18	0.45	0.00	0.08	0.34	0.34	0.11	0.15	0.15	0.09	0.13	0.00
Sat Flow, veh/h	3483	3676	0	1795	2991	573	3483	3582	1598	1795	3676	0
Grp Volume(v), veh/h	508	894	0	105	475	471	296	255	74	133	301	0
Grp Sat Flow(s),veh/h/ln	1742	1791	0	1795	1791	1773	1742	1791	1598	1795	1791	0
Q Serve(g_s), s	10.8	14.1	0.0	4.4	18.3	18.3	6.4	5.1	3.2	5.6	6.2	0.0
Cycle Q Clear(g_c), s	10.8	14.1	0.0	4.4	18.3	18.3	6.4	5.1	3.2	5.6	6.2	0.0
Prop In Lane	1.00		0.00	1.00		0.32	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	636	1613		135	615	608	397	526	235	170	457	
V/C Ratio(X)	0.80	0.55		0.78	0.77	0.77	0.75	0.48	0.32	0.78	0.66	
Avail Cap(c_a), veh/h	969	2480		221	962	952	609	1164	519	323	1182	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.2	15.6	0.0	35.1	22.7	22.7	33.1	30.3	29.5	34.2	32.1	0.0
Incr Delay (d2), s/veh	2.8	0.3	0.0	9.2	2.1	2.1	2.8	0.7	0.8	7.7	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	5.4	0.0	2.2	7.5	7.4	2.7	2.1	1.2	2.6	2.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.0	15.9	0.0	44.3	24.8	24.8	36.0	31.0	30.2	41.9	33.7	0.0
LnGrp LOS	C	B		D	C	C	D	C	C	D	C	
Approach Vol, veh/h		1402	A		1051			625			434	A
Approach Delay, s/veh		22.1			26.8			33.2			36.2	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.3	39.3	13.3	14.3	18.6	31.0	11.8	15.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.5	53.5	13.5	25.5	21.5	41.5	13.9	25.1
Max Q Clear Time (g_c+I1), s	6.4	16.1	8.4	8.2	12.8	20.3	7.6	7.1
Green Ext Time (p_c), s	0.1	7.7	0.5	1.5	1.3	6.2	0.1	1.6

Intersection Summary	
HCM 6th Ctrl Delay	27.2
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Olsen-Chandler SP
11: Creston Road & Golden Hill Road

Cumulative PM
Queues

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	92	518	1197	625	91
v/c Ratio	0.54	0.25	0.79	0.69	0.19
Control Delay	54.5	11.1	22.3	34.9	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	54.5	11.1	22.3	34.9	8.9
Queue Length 50th (ft)	43	55	194	135	0
Queue Length 95th (ft)	#168	170	#490	#348	45
Internal Link Dist (ft)		1151	2310	505	
Turn Bay Length (ft)	125			120	
Base Capacity (vph)	171	2539	1931	1059	544
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.54	0.20	0.62	0.59	0.17

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	89	502	570	591	606	88
Future Volume (vph)	89	502	570	591	606	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.92		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1787	3574	3273		3467	1578
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1787	3574	3273		3467	1578
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	92	518	588	609	625	91
RTOR Reduction (vph)	0	0	146	0	0	68
Lane Group Flow (vph)	92	518	1051	0	625	23
Confl. Peds. (#/hr)				4		1
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	NA		Perm	Perm
Protected Phases	5	2	6			
Permitted Phases					4	4
Actuated Green, G (s)	7.9	47.2	34.8		21.5	21.5
Effective Green, g (s)	7.9	47.2	34.8		21.5	21.5
Actuated g/C Ratio	0.09	0.55	0.41		0.25	0.25
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	164	1963	1325		867	394
v/s Ratio Prot	c0.05	0.14	c0.32			
v/s Ratio Perm					c0.18	0.01
v/c Ratio	0.56	0.26	0.79		0.72	0.06
Uniform Delay, d1	37.3	10.2	22.4		29.5	24.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	4.3	0.1	3.4		3.0	0.1
Delay (s)	41.7	10.3	25.8		32.4	24.6
Level of Service	D	B	C		C	C
Approach Delay (s)		15.0	25.8		31.4	
Approach LOS		B	C		C	

Intersection Summary			
HCM 2000 Control Delay	24.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	85.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	213	600	322	153	431	433	216	456	338	539	149
v/c Ratio	0.68	0.65	0.51	0.60	0.54	0.63	0.68	0.54	0.61	0.69	0.36
Control Delay	51.3	36.0	7.9	52.3	36.3	8.0	50.8	34.6	44.1	40.5	16.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.3	36.0	7.9	52.3	36.3	8.0	50.8	34.6	44.1	40.5	16.2
Queue Length 50th (ft)	122	171	8	88	122	0	123	121	100	157	23
Queue Length 95th (ft)	239	267	82	183	198	84	239	211	171	262	88
Internal Link Dist (ft)		1092			186			1440		2310	
Turn Bay Length (ft)	150		150	170		140	230		245		100
Base Capacity (vph)	432	1426	808	351	1265	838	452	1090	857	1064	532
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.42	0.40	0.44	0.34	0.52	0.48	0.42	0.39	0.51	0.28

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	200	564	303	144	405	407	203	366	63	318	507	140
Future Volume (vph)	200	564	303	144	405	407	203	366	63	318	507	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1787	3574	1571	1787	3574	1578	1787	3495		3467	3574	1557
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1787	3574	1571	1787	3574	1578	1787	3495		3467	3574	1557
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	213	600	322	153	431	433	216	389	67	338	539	149
RTOR Reduction (vph)	0	0	225	0	0	335	0	11	0	0	0	79
Lane Group Flow (vph)	213	600	97	153	431	98	216	445	0	338	539	70
Confl. Peds. (#/hr)			4			1						10
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	16.4	24.1	24.1	13.4	21.1	21.1	16.7	22.2		15.1	20.6	20.6
Effective Green, g (s)	16.4	24.1	24.1	13.4	21.1	21.1	16.7	22.2		15.1	20.6	20.6
Actuated g/C Ratio	0.18	0.26	0.26	0.14	0.23	0.23	0.18	0.24		0.16	0.22	0.22
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	315	928	407	258	812	358	321	836		564	793	345
v/s Ratio Prot	c0.12	c0.17		0.09	0.12		c0.12	0.13		0.10	c0.15	
v/s Ratio Perm			0.06			0.06						0.05
v/c Ratio	0.68	0.65	0.24	0.59	0.53	0.28	0.67	0.53		0.60	0.68	0.20
Uniform Delay, d1	35.7	30.6	27.1	37.1	31.5	29.5	35.5	30.8		36.0	33.1	29.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.7	1.6	0.3	3.6	0.7	0.4	5.5	0.7		1.7	2.3	0.3
Delay (s)	41.4	32.1	27.4	40.8	32.2	30.0	41.0	31.4		37.8	35.4	29.7
Level of Service	D	C	C	D	C	C	D	C		D	D	C
Approach Delay (s)		32.5			32.5			34.5			35.4	
Approach LOS		C			C			C			D	

Intersection Summary				
HCM 2000 Control Delay	33.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	92.8	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	64.4%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
12: Creston Road & Niblick Road/Sherwood Road

Cumulative PM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	564	303	144	405	407	203	366	63	318	507	140
Future Volume (veh/h)	200	564	303	144	405	407	203	366	63	318	507	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	213	600	322	153	431	433	216	389	67	338	539	149
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	255	1232	548	190	1104	492	258	670	114	442	723	318
Arrive On Green	0.14	0.34	0.34	0.11	0.31	0.31	0.14	0.22	0.22	0.13	0.20	0.20
Sat Flow, veh/h	1795	3582	1592	1795	3582	1596	1795	3059	523	3483	3582	1574
Grp Volume(v), veh/h	213	600	322	153	431	433	216	226	230	338	539	149
Grp Sat Flow(s),veh/h/ln	1795	1791	1592	1795	1791	1596	1795	1791	1791	1742	1791	1574
Q Serve(g_s), s	10.2	11.6	14.7	7.3	8.3	22.7	10.3	10.0	10.1	8.3	12.5	7.4
Cycle Q Clear(g_c), s	10.2	11.6	14.7	7.3	8.3	22.7	10.3	10.0	10.1	8.3	12.5	7.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.29	1.00		1.00
Lane Grp Cap(c), veh/h	255	1232	548	190	1104	492	258	392	392	442	723	318
V/C Ratio(X)	0.84	0.49	0.59	0.80	0.39	0.88	0.84	0.58	0.59	0.76	0.75	0.47
Avail Cap(c_a), veh/h	438	1443	642	357	1281	571	459	549	549	870	1078	473
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.8	22.8	23.8	38.5	24.0	28.9	36.7	30.8	30.8	37.2	33.0	31.0
Incr Delay (d2), s/veh	7.1	0.3	1.0	7.7	0.2	13.4	7.0	1.3	1.4	2.8	1.6	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	4.6	5.3	3.5	3.4	9.9	4.9	4.3	4.4	3.6	5.4	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.9	23.1	24.8	46.2	24.2	42.4	43.7	32.1	32.2	40.0	34.6	32.1
LnGrp LOS	D	C	C	D	C	D	D	C	C	D	C	C
Approach Vol, veh/h		1135			1017			672			1026	
Approach Delay, s/veh		27.5			35.2			35.9			36.0	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.7	23.8	13.8	34.8	17.2	22.3	17.0	31.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	22.0	27.0	17.5	35.5	22.5	26.5	21.5	31.5
Max Q Clear Time (g_c+I1), s	10.3	12.1	9.3	16.7	12.3	14.5	12.2	24.7
Green Ext Time (p_c), s	0.9	2.3	0.2	4.8	0.4	3.2	0.4	2.5

Intersection Summary	
HCM 6th Ctrl Delay	33.3
HCM 6th LOS	C

Olsen-Chandler SP
13: Creston Road & Scott Street

Cumulative PM
HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	56	56	608	43	85	802
Future Volume (Veh/h)	56	56	608	43	85	802
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	60	60	654	46	91	862
Pedestrians	2					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1723	679			702	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1723	679			702	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	32	87			90	
cM capacity (veh/h)	88	452			898	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	120	700	91	862
Volume Left	60	0	91	0
Volume Right	60	46	0	0
cSH	148	1700	898	1700
Volume to Capacity	0.81	0.41	0.10	0.51
Queue Length 95th (ft)	130	0	8	0
Control Delay (s)	90.3	0.0	9.5	0.0
Lane LOS	F		A	
Approach Delay (s)	90.3	0.0	0.9	
Approach LOS	F			

Intersection Summary			
Average Delay	6.6		
Intersection Capacity Utilization	55.9%	ICU Level of Service	B
Analysis Period (min)	15		

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	6.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	56	56	608	43	85	802
Future Vol, veh/h	56	56	608	43	85	802
Conflicting Peds, #/hr	0	0	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	60	60	654	46	91	862

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1723	679	0	0	702	0
Stage 1	679	-	-	-	-	-
Stage 2	1044	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.11	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209	-
Pot Cap-1 Maneuver	99	453	-	-	900	-
Stage 1	506	-	-	-	-	-
Stage 2	341	-	-	-	-	-
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	89	452	-	-	898	-
Mov Cap-2 Maneuver	89	-	-	-	-	-
Stage 1	505	-	-	-	-	-
Stage 2	307	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	89.2	0	0.9
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	149	898	-
HCM Lane V/C Ratio	-	-	0.808	0.102	-
HCM Control Delay (s)	-	-	89.2	9.5	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	5.2	0.3	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	128	10	16	10	10	42	24	408	10	53	539	161
Future Volume (Veh/h)	128	10	16	10	10	42	24	408	10	53	539	161
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Hourly flow rate (vph)	129	10	16	10	10	42	24	412	10	54	544	163
Pedestrians		5									4	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		3.5									3.5	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1168	1127	549	1138	1285	421	712			422		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1168	1127	549	1138	1285	421	712			422		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	9	95	97	94	93	93	97			95		
cM capacity (veh/h)	142	189	535	157	153	632	888			1143		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	155	62	24	422	54	544	163
Volume Left	129	10	24	0	54	0	0
Volume Right	16	42	0	10	0	0	163
cSH	156	317	888	1700	1143	1700	1700
Volume to Capacity	0.99	0.20	0.03	0.25	0.05	0.32	0.10
Queue Length 95th (ft)	189	18	2	0	4	0	0
Control Delay (s)	128.2	19.1	9.2	0.0	8.3	0.0	0.0
Lane LOS	F	C	A		A		
Approach Delay (s)	128.2	19.1	0.5		0.6		
Approach LOS	F	C					

Intersection Summary					
Average Delay	15.3				
Intersection Capacity Utilization	57.0%	ICU Level of Service		B	
Analysis Period (min)	15				

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	14.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	128	10	16	10	10	42	24	408	10	53	539	161
Future Vol, veh/h	128	10	16	10	10	42	24	408	10	53	539	161
Conflicting Peds, #/hr	4	0	0	0	0	4	5	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	30	-	-	70	-	60
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	99	99	99	99	99	99	99	99	99	99	99	99
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	129	10	16	10	10	42	24	412	10	54	544	163

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1152	1127	549	1212	1285	421	712	0	0	422	0	0
Stage 1	657	657	-	465	465	-	-	-	-	-	-	-
Stage 2	495	470	-	747	820	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	175	205	537	160	165	635	892	-	-	1143	-	-
Stage 1	456	463	-	580	565	-	-	-	-	-	-	-
Stage 2	558	562	-	407	390	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	145	189	534	141	152	633	888	-	-	1143	-	-
Mov Cap-2 Maneuver	145	189	-	141	152	-	-	-	-	-	-	-
Stage 1	441	439	-	564	550	-	-	-	-	-	-	-
Stage 2	495	547	-	367	370	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	122.7	19.8	0.5	0.6
HCM LOS	F	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	888	-	-	159	305	1143	-	-
HCM Lane V/C Ratio	0.027	-	-	0.978	0.205	0.047	-	-
HCM Control Delay (s)	9.2	-	-	122.7	19.8	8.3	-	-
HCM Lane LOS	A	-	-	F	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	7.4	0.8	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	10	10	16	136	10	160	14	271	209	271	265	20
Future Volume (vph)	10	10	16	136	10	160	14	271	209	271	265	20
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	11	11	17	146	11	172	15	291	225	291	285	22

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	39	329	306	225	434	165
Volume Left (vph)	11	146	15	0	291	0
Volume Right (vph)	17	172	0	225	0	22
Hadj (s)	-0.19	-0.21	0.04	-0.68	0.35	-0.08
Departure Headway (s)	7.6	6.5	6.9	6.1	7.0	6.6
Degree Utilization, x	0.08	0.59	0.59	0.38	0.85	0.30
Capacity (veh/h)	408	529	502	565	498	531
Control Delay (s)	11.3	18.4	17.9	11.7	36.6	11.2
Approach Delay (s)	11.3	18.4	15.3		29.6	
Approach LOS	B	C	C		D	

Intersection Summary				
Delay	21.6			
Level of Service	C			
Intersection Capacity Utilization	65.6%	ICU Level of Service	C	
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	22.7
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Vol, veh/h	10	10	16	136	10	160	0	14	271	209	271	265
Future Vol, veh/h	10	10	16	136	10	160	0	14	271	209	271	265
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	1	1	1	1	1	1	2	1	1	1	1	1
Mvmt Flow	11	11	17	146	11	172	0	15	291	225	291	285
Number of Lanes	0	1	0	0	1	0	0	0	1	1	0	2

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	11.5	19.1	16.4	31
HCM LOS	B	C	C	D

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	5%	0%	28%	44%	67%	0%
Vol Thru, %	95%	0%	28%	3%	33%	87%
Vol Right, %	0%	100%	44%	52%	0%	13%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	285	209	36	306	404	153
LT Vol	14	0	10	136	271	0
Through Vol	271	0	10	10	133	133
RT Vol	0	209	16	160	0	20
Lane Flow Rate	306	225	39	329	434	164
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.588	0.385	0.083	0.603	0.85	0.301
Departure Headway (Hd)	6.905	6.163	7.701	6.601	7.053	6.615
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	521	582	464	549	512	543
Service Time	4.653	3.91	5.768	4.601	4.798	4.361
HCM Lane V/C Ratio	0.587	0.387	0.084	0.599	0.848	0.302
HCM Control Delay	19.1	12.7	11.5	19.1	38.1	12.2
HCM Lane LOS	C	B	B	C	E	B
HCM 95th-tile Q	3.8	1.8	0.3	4	8.8	1.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBR
Lane Configurations	
Traffic Vol, veh/h	20
Future Vol, veh/h	20
Peak Hour Factor	0.93
Heavy Vehicles, %	1
Mvmt Flow	22
Number of Lanes	0

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	269	253	150	225	210	206
Future Volume (Veh/h)	269	253	150	225	210	206
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	277	261	155	232	216	212
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	642	216	428			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	642	216	428			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	22	67	86			
cM capacity (veh/h)	353	792	1135			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	538	155	116	116	216	212
Volume Left	277	155	0	0	0	0
Volume Right	261	0	0	0	0	212
cSH	686	1135	1700	1700	1700	1700
Volume to Capacity	0.78	0.14	0.07	0.07	0.13	0.12
Queue Length 95th (ft)	193	12	0	0	0	0
Control Delay (s)	28.3	8.7	0.0	0.0	0.0	0.0
Lane LOS	D	A				
Approach Delay (s)	28.3	3.5			0.0	
Approach LOS	D					

Intersection Summary			
Average Delay		12.2	
Intersection Capacity Utilization		44.3%	ICU Level of Service A
Analysis Period (min)		15	

Intersection	
Int Delay, s/veh	11.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	269	253	150	225	210	206
Future Vol, veh/h	269	253	150	225	210	206
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	145	105	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	277	261	155	232	216	212

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	642	216	428	0	-	0
Stage 1	216	-	-	-	-	-
Stage 2	426	-	-	-	-	-
Critical Hdwy	6.615	6.215	4.115	-	-	-
Critical Hdwy Stg 1	5.415	-	-	-	-	-
Critical Hdwy Stg 2	5.815	-	-	-	-	-
Follow-up Hdwy	3.5095	3.3095	2.2095	-	-	-
Pot Cap-1 Maneuver	424	826	1136	-	-	-
Stage 1	822	-	-	-	-	-
Stage 2	630	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	366	826	1136	-	-	-
Mov Cap-2 Maneuver	366	-	-	-	-	-
Stage 1	710	-	-	-	-	-
Stage 2	630	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	26.1	3.5	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1136	-	366	826	-	-
HCM Lane V/C Ratio	0.136	-	0.758	0.316	-	-
HCM Control Delay (s)	8.7	-	39.9	11.4	-	-
HCM Lane LOS	A	-	E	B	-	-
HCM 95th %tile Q(veh)	0.5	-	6.1	1.4	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	308	20	0	0	0	0	400	53
Future Volume (Veh/h)	0	0	0	0	308	20	0	0	0	0	400	53
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	335	22	0	0	0	0	435	58
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	632	464	464	464	493	0	493			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	632	464	464	464	493	0	493			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	30	98	100			100		
cM capacity (veh/h)	167	497	600	510	478	1088	1076			1630		

Direction, Lane #	WB 1	SB 1
Volume Total	357	493
Volume Left	0	0
Volume Right	22	58
cSH	499	1700
Volume to Capacity	0.72	0.29
Queue Length 95th (ft)	143	0
Control Delay (s)	28.3	0.0
Lane LOS	D	
Approach Delay (s)	28.3	0.0
Approach LOS	D	

Intersection Summary				
Average Delay	11.9			
Intersection Capacity Utilization	47.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	308	20	0	0	0	0	400	53
Future Vol, veh/h	0	0	0	0	308	20	0	0	0	0	400	53
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	2	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	0	0	0	0	335	22	0	0	0	0	435	58

Major/Minor	Minor1			Major2		
Conflicting Flow All	464	493	-	-	-	0
Stage 1	0	0	-	-	-	-
Stage 2	464	493	-	-	-	-
Critical Hdwy	6.41	6.51	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	5.41	5.51	-	-	-	-
Follow-up Hdwy	3.509	4.009	-	-	-	-
Pot Cap-1 Maneuver	558	478	0	0	-	-
Stage 1	-	-	0	0	-	-
Stage 2	635	549	0	0	-	-
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	558	0	-	-	-	-
Mov Cap-2 Maneuver	558	0	-	-	-	-
Stage 1	-	0	-	-	-	-
Stage 2	635	0	-	-	-	-

Approach	WB	SB
HCM Control Delay, s		0
HCM LOS	-	

Minor Lane/Major Mvmt	WBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	0	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Cumulative PM
18: US 101 Ramps/Spring Street & 1st Street/Niblick Road — Queues

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	75	459	689	264	521	141	424	1063	755	461
v/c Ratio	0.27	0.83	0.67	0.48	0.51	0.69	0.80	0.81	0.87	0.46
Control Delay	57.7	68.6	47.8	44.8	8.2	78.7	70.5	24.7	62.3	40.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.7	68.6	47.8	44.8	8.2	78.7	70.5	24.7	62.3	40.4
Queue Length 50th (ft)	65	219	305	211	102	135	212	259	364	177
Queue Length 95th (ft)	118	#298	376	303	188	207	275	317	444	241
Internal Link Dist (ft)		521		1372			611			680
Turn Bay Length (ft)	115		515		115	165		290	305	
Base Capacity (vph)	305	607	1129	612	1049	268	605	1390	970	1068
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.76	0.61	0.43	0.50	0.53	0.70	0.76	0.78	0.43

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Olsen-Chandler SP — Cumulative PM
18: US 101 Ramps/Spring Street & 1st Street/Niblick Road — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	333	113	668	256	505	137	411	1031	732	325	122
Future Volume (vph)	73	333	113	668	256	505	137	411	1031	732	325	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.95	0.88	0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	3426		3467	1881	1586	1787	3574	2814	3467	3428	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	3426		3467	1881	1586	1787	3574	2814	3467	3428	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	75	343	116	689	264	521	141	424	1063	755	335	126
RTOR Reduction (vph)	0	22	0	0	0	140	0	0	49	0	26	0
Lane Group Flow (vph)	75	437	0	689	264	381	141	424	1014	755	435	0
Confl. Peds. (#/hr)						2						
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	21.6	21.6		41.1	41.1	76.1	16.0	20.7	61.8	35.0	39.7	
Effective Green, g (s)	21.6	21.6		41.1	41.1	76.1	16.0	20.7	61.8	35.0	39.7	
Actuated g/C Ratio	0.16	0.16		0.30	0.30	0.55	0.12	0.15	0.44	0.25	0.29	
Clearance Time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	277	532		1025	556	868	205	532	1252	873	979	
v/s Ratio Prot	0.04	c0.13		0.20	0.14	0.11	0.08	0.12	c0.24	c0.22	0.13	
v/s Ratio Perm						0.13			0.12			
v/c Ratio	0.27	0.82		0.67	0.47	0.44	0.69	0.80	0.81	0.86	0.44	
Uniform Delay, d1	51.7	56.8		43.0	40.1	18.7	59.0	57.1	33.5	49.7	40.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	9.9		1.8	0.6	0.4	9.2	8.1	4.1	8.9	0.3	
Delay (s)	52.2	66.7		44.7	40.7	19.1	68.3	65.2	37.5	58.6	40.9	
Level of Service	D	E		D	D	B	E	E	D	E	D	
Approach Delay (s)		64.6			34.9			47.4			51.9	
Approach LOS		E			C			D			D	

Intersection Summary

HCM 2000 Control Delay	46.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	138.9	Sum of lost time (s)	20.5
Intersection Capacity Utilization	82.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Cumulative PM
18: US 101 Ramps/Spring Street & 1st Street/Niblick Road — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	73	333	113	668	256	505	137	411	1031	732	325	122
Future Volume (veh/h)	73	333	113	668	256	505	137	411	1031	732	325	122
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	75	343	116	689	264	521	141	424	1063	755	335	126
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	275	403	134	985	533	834	167	617	1279	836	796	294
Arrive On Green	0.15	0.15	0.15	0.28	0.28	0.28	0.09	0.17	0.17	0.24	0.31	0.31
Sat Flow, veh/h	1795	2629	874	3483	1885	1594	1795	3582	2812	3483	2560	946
Grp Volume(v), veh/h	75	232	227	689	264	521	141	424	1063	755	233	228
Grp Sat Flow(s),veh/h/ln	1795	1791	1712	1742	1885	1594	1795	1791	1406	1742	1791	1715
Q Serve(g_s), s	5.0	17.0	17.5	23.8	15.7	31.2	10.4	15.0	23.2	28.3	13.9	14.3
Cycle Q Clear(g_c), s	5.0	17.0	17.5	23.8	15.7	31.2	10.4	15.0	23.2	28.3	13.9	14.3
Prop In Lane	1.00		0.51	1.00		1.00	1.00		1.00	1.00		0.55
Lane Grp Cap(c), veh/h	275	274	262	985	533	834	167	617	1279	836	557	533
V/C Ratio(X)	0.27	0.85	0.87	0.70	0.50	0.62	0.84	0.69	0.83	0.90	0.42	0.43
Avail Cap(c_a), veh/h	312	311	297	1153	624	911	274	617	1279	990	557	533
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.4	55.5	55.7	43.2	40.3	22.8	60.1	52.4	26.3	49.7	36.8	36.9
Incr Delay (d2), s/veh	0.5	17.2	20.9	1.6	0.7	1.2	11.8	3.2	4.8	10.3	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	9.0	9.1	10.3	7.3	11.5	5.2	6.9	18.8	13.5	6.2	6.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.0	72.7	76.7	44.8	41.0	24.0	72.0	55.6	31.1	60.0	37.3	37.5
LnGrp LOS	D	E	E	D	D	C	E	E	C	E	D	D
Approach Vol, veh/h		534			1474			1628			1216	
Approach Delay, s/veh		71.4			36.7			41.0			51.4	
Approach LOS		E			D			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	37.0	29.0		25.2	18.3	47.7		43.5				
Change Period (Y+Rc), s	* 4.7	5.8		4.6	5.8	* 5.8		5.4				
Max Green Setting (Gmax), s	* 38	23.2		23.4	20.6	* 41		44.6				
Max Q Clear Time (g_c+I1), s	30.3	25.2		19.5	12.4	16.3		33.2				
Green Ext Time (p_c), s	2.0	0.0		1.2	0.2	2.9		4.9				

Intersection Summary			
HCM 6th Ctrl Delay			45.7
HCM 6th LOS			D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Olsen-Chandler SP — Cumulative PM
19: S. River Road & Niblick Road — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	281	991	653	125	910	425	355	178	551
v/c Ratio	0.72	0.76	0.74	0.67	0.73	0.78	0.46	0.71	0.76
Control Delay	59.5	35.3	14.4	67.5	33.9	56.1	37.4	61.9	46.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.5	35.3	14.4	67.5	33.9	56.1	37.4	61.9	46.5
Queue Length 50th (ft)	107	333	112	92	293	159	114	129	195
Queue Length 95th (ft)	#170	432	278	#177	385	#235	164	209	258
Internal Link Dist (ft)		1510			1609		962		896
Turn Bay Length (ft)	140			80		150		110	
Base Capacity (vph)	417	1490	939	211	1456	607	898	316	902
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.67	0.70	0.59	0.63	0.70	0.40	0.56	0.61

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
19: S. River Road & Niblick Road

Cumulative PM
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	270	951	627	120	735	138	408	271	70	171	399	130
Future Volume (vph)	270	951	627	120	735	138	408	271	70	171	399	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3467	3574	1599	1787	3481		3467	3464		1787	3430	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3467	3574	1599	1787	3481		3467	3464		1787	3430	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	281	991	653	125	766	144	425	282	73	178	416	135
RTOR Reduction (vph)	0	0	297	0	13	0	0	19	0	0	27	0
Lane Group Flow (vph)	281	991	356	125	897	0	425	336	0	178	524	0
Confl. Peds. (#/hr)						2						3
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	12.2	39.3	39.3	11.3	38.4		17.0	23.7		15.2	21.9	
Effective Green, g (s)	12.2	39.3	39.3	11.3	38.4		17.0	23.7		15.2	21.9	
Actuated g/C Ratio	0.11	0.37	0.37	0.11	0.36		0.16	0.22		0.14	0.20	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	393	1306	584	187	1243		548	763		252	698	
v/s Ratio Prot	c0.08	c0.28		0.07	0.26		c0.12	0.10		0.10	c0.15	
v/s Ratio Perm			0.22									
v/c Ratio	0.72	0.76	0.61	0.67	0.72		0.78	0.44		0.71	0.75	
Uniform Delay, d1	46.0	29.9	27.8	46.3	29.9		43.4	36.2		44.0	40.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.1	2.6	1.8	8.7	2.1		6.8	0.4		8.7	4.6	
Delay (s)	52.1	32.5	29.7	55.0	32.0		50.2	36.6		52.7	44.8	
Level of Service	D	C	C	E	C		D	D		D	D	
Approach Delay (s)		34.4			34.8			44.0			46.7	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	38.2	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	107.5	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	75.5%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Olsen-Chandler SP
19: S. River Road & Niblick Road

Cumulative PM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	270	951	627	120	735	138	408	271	70	171	399	130
Future Volume (veh/h)	270	951	627	120	735	138	408	271	70	171	399	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	281	991	653	125	766	144	425	282	73	178	416	135
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	361	1315	587	157	1055	198	517	649	165	216	536	172
Arrive On Green	0.10	0.37	0.37	0.09	0.35	0.35	0.15	0.23	0.23	0.12	0.20	0.20
Sat Flow, veh/h	3483	3582	1598	1795	3008	565	3483	2828	719	1795	2663	855
Grp Volume(v), veh/h	281	991	653	125	456	454	425	177	178	178	278	273
Grp Sat Flow(s),veh/h/ln	1742	1791	1598	1795	1791	1782	1742	1791	1756	1795	1791	1727
Q Serve(g_s), s	7.2	22.3	20.6	6.3	20.4	20.4	10.9	7.8	8.0	8.9	13.5	13.8
Cycle Q Clear(g_c), s	7.2	22.3	20.6	6.3	20.4	20.4	10.9	7.8	8.0	8.9	13.5	13.8
Prop In Lane	1.00		1.00	1.00		0.32	1.00		0.41	1.00		0.50
Lane Grp Cap(c), veh/h	361	1315	587	157	628	625	517	411	403	216	360	347
V/C Ratio(X)	0.78	0.75	1.11	0.80	0.73	0.73	0.82	0.43	0.44	0.82	0.77	0.78
Avail Cap(c_a), veh/h	481	1713	764	244	853	849	701	522	512	365	526	507
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.2	25.5	10.9	41.2	26.0	26.0	38.0	30.3	30.4	39.5	34.7	34.8
Incr Delay (d2), s/veh	5.7	1.4	68.3	9.6	2.0	2.0	5.7	0.7	0.8	7.7	4.3	5.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	9.1	17.2	3.1	8.5	8.4	4.9	3.3	3.3	4.2	6.1	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.9	26.9	79.2	50.8	28.0	28.0	43.7	31.0	31.1	47.3	39.0	39.8
LnGrp LOS	D	C	F	D	C	C	D	C	C	D	D	D
Approach Vol, veh/h		1925			1035			780			729	
Approach Delay, s/veh		47.4			30.8			38.0			41.3	
Approach LOS		D			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.5	38.3	18.2	23.0	14.0	36.8	15.6	25.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	12.5	44.0	18.5	27.0	12.7	43.8	18.7	26.8
Max Q Clear Time (g_c+I1), s	8.3	24.3	12.9	15.8	9.2	22.4	10.9	10.0
Green Ext Time (p_c), s	0.1	9.5	0.8	2.4	0.3	5.6	0.3	1.7

Intersection Summary	
HCM 6th Ctrl Delay	40.9
HCM 6th LOS	D

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	526	413	17	416	402	11
v/c Ratio	0.68	0.47	0.07	0.29	0.70	0.02
Control Delay	17.0	3.3	10.1	10.0	22.7	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.0	3.3	10.1	10.0	22.7	10.4
Queue Length 50th (ft)	103	0	2	34	90	1
Queue Length 95th (ft)	258	42	14	82	237	11
Internal Link Dist (ft)	1629			570	669	
Turn Bay Length (ft)			75			50
Base Capacity (vph)	1455	1293	491	2765	1070	962
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.32	0.03	0.15	0.38	0.01

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	484	380	16	383	370	10
Future Volume (vph)	484	380	16	383	370	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1827	1519	1734	3471	1733	1553
Flt Permitted	1.00	1.00	0.34	1.00	0.95	1.00
Satd. Flow (perm)	1827	1519	617	3471	1733	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	526	413	17	416	402	11
RTOR Reduction (vph)	0	235	0	0	0	4
Lane Group Flow (vph)	526	178	17	416	402	7
Confl. Peds. (#/hr)		2	2		3	
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type	NA	Perm	Perm	NA	Perm	Prot
Protected Phases	2			6		8
Permitted Phases		2	6		8	
Actuated Green, G (s)	20.3	20.3	20.3	20.3	16.0	16.0
Effective Green, g (s)	20.3	20.3	20.3	20.3	16.0	16.0
Actuated g/C Ratio	0.43	0.43	0.43	0.43	0.34	0.34
Clearance Time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	787	654	265	1495	588	527
v/s Ratio Prot	c0.29			0.12		0.00
v/s Ratio Perm		0.12	0.03		c0.23	
v/c Ratio	0.67	0.27	0.06	0.28	0.68	0.01
Uniform Delay, d1	10.7	8.6	7.8	8.7	13.4	10.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.7	0.1	0.0	0.0	2.6	0.0
Delay (s)	12.4	8.7	7.9	8.7	16.0	10.3
Level of Service	B	A	A	A	B	B
Approach Delay (s)	10.8			8.7	15.8	
Approach LOS	B			A	B	

Intersection Summary				
HCM 2000 Control Delay	11.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	47.1	Sum of lost time (s)	10.8	
Intersection Capacity Utilization	55.0%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	484	380	16	383	370	10
Future Volume (veh/h)	484	380	16	383	370	10
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	526	413	17	416	402	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	725	612	304	1377	497	442
Arrive On Green	0.39	0.39	0.39	0.39	0.28	0.28
Sat Flow, veh/h	1841	1556	587	3589	1753	1560
Grp Volume(v), veh/h	526	413	17	416	402	11
Grp Sat Flow(s),veh/h/ln	1841	1556	587	1749	1753	1560
Q Serve(g_s), s	8.1	7.3	0.8	2.7	7.1	0.2
Cycle Q Clear(g_c), s	8.1	7.3	9.0	2.7	7.1	0.2
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	725	612	304	1377	497	442
V/C Ratio(X)	0.73	0.67	0.06	0.30	0.81	0.02
Avail Cap(c_a), veh/h	2048	1731	726	3890	1415	1259
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.6	8.4	12.4	7.0	11.1	8.6
Incr Delay (d2), s/veh	0.5	0.5	0.0	0.0	1.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	1.4	0.1	0.5	1.9	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	9.1	8.9	12.4	7.0	12.4	8.7
LnGrp LOS	A	A	B	A	B	A
Approach Vol, veh/h	939			433	413	
Approach Delay, s/veh	9.0			7.2	12.3	
Approach LOS	A			A	B	

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	18.6				18.6	14.9
Change Period (Y+Rc), s	5.4				5.4	5.4
Max Green Setting (Gmax), s	37.2				37.2	27.0
Max Q Clear Time (g_c+I1), s	10.1				11.0	9.1
Green Ext Time (p_c), s	2.8				1.8	0.6

Intersection Summary	
HCM 6th Ctrl Delay	9.3
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	60	0	54	0	5	10	32	179	2	20	332	60
Future Volume (vph)	60	0	54	0	5	10	32	179	2	20	332	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	65	0	59	0	5	11	35	195	2	22	361	65

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	124	16	232	448
Volume Left (vph)	65	0	35	22
Volume Right (vph)	59	11	2	65
Hadj (s)	-0.16	-0.40	0.04	-0.06
Departure Headway (s)	5.3	5.3	4.8	4.5
Degree Utilization, x	0.18	0.02	0.31	0.56
Capacity (veh/h)	602	569	709	773
Control Delay (s)	9.5	8.4	10.0	13.2
Approach Delay (s)	9.5	8.4	10.0	13.2
Approach LOS	A	A	B	B

Intersection Summary					
Delay	11.6				
Level of Service	B				
Intersection Capacity Utilization	44.4%	ICU Level of Service		A	
Analysis Period (min)	15				

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	11.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	60	0	54	0	5	10	32	179	2	20	332	60
Future Vol, veh/h	60	0	54	0	5	10	32	179	2	20	332	60
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	65	0	59	0	5	11	35	195	2	22	361	65
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.5	8.5	10	13.1
HCM LOS	A	A	A	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	15%	53%	0%	5%
Vol Thru, %	84%	0%	33%	81%
Vol Right, %	1%	47%	67%	15%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	213	114	15	412
LT Vol	32	60	0	20
Through Vol	179	0	5	332
RT Vol	2	54	10	60
Lane Flow Rate	232	124	16	448
Geometry Grp	1	1	1	1
Degree of Util (X)	0.309	0.181	0.024	0.557
Departure Headway (Hd)	4.799	5.27	5.24	4.477
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	746	675	675	802
Service Time	2.856	3.347	3.338	2.524
HCM Lane V/C Ratio	0.311	0.184	0.024	0.559
HCM Control Delay	10	9.5	8.5	13.1
HCM Lane LOS	A	A	A	B
HCM 95th-tile Q	1.3	0.7	0.1	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	12	34	0	9	22	23	94	0	17	159	110
Future Volume (Veh/h)	117	12	34	0	9	22	23	94	0	17	159	110
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	127	13	37	0	10	24	25	102	0	18	173	120
Pedestrians								6				
Lane Width (ft)								12.0				
Walking Speed (ft/s)								3.5				
Percent Blockage								1				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	34			56			520	326	38	358	332	22
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	34			56			520	326	38	358	332	22
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	92			100			91	81	100	96	68	89
cM capacity (veh/h)	1584			1546			291	543	1032	480	539	1058

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	177	34	127	18	293
Volume Left	127	0	25	18	0
Volume Right	37	24	0	0	120
cSH	1584	1546	464	480	674
Volume to Capacity	0.08	0.00	0.27	0.04	0.43
Queue Length 95th (ft)	7	0	28	3	55
Control Delay (s)	5.5	0.0	15.7	12.8	14.4
Lane LOS	A		C	B	B
Approach Delay (s)	5.5	0.0	15.7	14.3	
Approach LOS			C	B	

Intersection Summary				
Average Delay	11.4			
Intersection Capacity Utilization	47.3%	ICU Level of Service		A
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	11.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	117	12	34	0	9	22	23	94	0	17	159	110
Future Vol, veh/h	117	12	34	0	9	22	23	94	0	17	159	110
Conflicting Peds, #/hr	0	0	6	6	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	127	13	37	0	10	24	25	102	0	18	173	120

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	34	0	0	56	0	0	461	326	38	359	332	22
Stage 1	-	-	-	-	-	-	292	292	-	22	22	-
Stage 2	-	-	-	-	-	-	169	34	-	337	310	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	1584	-	-	1555	-	-	512	594	1037	598	589	1058
Stage 1	-	-	-	-	-	-	718	673	-	999	879	-
Stage 2	-	-	-	-	-	-	835	869	-	679	661	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1584	-	-	1546	-	-	318	541	1031	480	537	1058
Mov Cap-2 Maneuver	-	-	-	-	-	-	318	541	-	480	537	-
Stage 1	-	-	-	-	-	-	655	613	-	916	879	-
Stage 2	-	-	-	-	-	-	595	869	-	519	602	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	5.4	0	15.3	14.3
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	475	1584	-	-	1546	-	-	480	672
HCM Lane V/C Ratio	0.268	0.08	-	-	-	-	-	0.038	0.435
HCM Control Delay (s)	15.3	7.5	0	-	0	-	-	12.8	14.4
HCM Lane LOS	C	A	A	-	A	-	-	B	B
HCM 95th %tile Q(veh)	1.1	0.3	-	-	0	-	-	0.1	2.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	10	75	83	10	5	10
Future Volume (Veh/h)	10	75	83	10	5	10
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	82	90	11	5	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	101				200	96
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	101				200	96
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	99
cM capacity (veh/h)	1479				779	956

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	93	101	16
Volume Left	11	0	5
Volume Right	0	11	11
cSH	1479	1700	892
Volume to Capacity	0.01	0.06	0.02
Queue Length 95th (ft)	1	0	1
Control Delay (s)	0.9	0.0	9.1
Lane LOS	A		A
Approach Delay (s)	0.9	0.0	9.1
Approach LOS			A

Intersection Summary				
Average Delay		1.1		
Intersection Capacity Utilization		21.2%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	75	83	10	5	10
Future Vol, veh/h	10	75	83	10	5	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	11	82	90	11	5	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	101	0	-	0	200	96
Stage 1	-	-	-	-	96	-
Stage 2	-	-	-	-	104	-
Critical Hdwy	4.14	-	-	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	2.236	-	-	-	3.536	3.336
Pot Cap-1 Maneuver	1479	-	-	-	784	955
Stage 1	-	-	-	-	923	-
Stage 2	-	-	-	-	915	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1479	-	-	-	778	955
Mov Cap-2 Maneuver	-	-	-	-	778	-
Stage 1	-	-	-	-	916	-
Stage 2	-	-	-	-	915	-

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	9.1
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1479	-	-	-	888
HCM Lane V/C Ratio	0.007	-	-	-	0.018
HCM Control Delay (s)	7.5	0	-	-	9.1
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Reso A - Exhibit C2 (EIR Technical Appendix)

Cumulative Plus 1293-Unit Project

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	435	1761	1723	220	204	342
v/c Ratio	0.81	0.55	0.95	0.25	0.78	0.65
Control Delay	74.0	0.7	43.1	5.7	83.3	45.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.0	0.7	43.1	5.7	83.3	45.1
Queue Length 50th (ft)	225	0	832	24	204	282
Queue Length 95th (ft)	298	0	#1128	74	307	397
Internal Link Dist (ft)		942	856		514	
Turn Bay Length (ft)	345			330	450	
Base Capacity (vph)	637	3223	1970	945	328	635
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.55	0.87	0.23	0.62	0.54

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	400	1620	1585	202	188	315
Future Volume (vph)	400	1620	1585	202	188	315
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0	7.3	7.3	4.2	3.7
Lane Util. Factor	0.97	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3127	3223	3223	1442	1612	1442
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3127	3223	3223	1442	1612	1442
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	435	1761	1723	220	204	342
RTOR Reduction (vph)	0	0	0	72	0	10
Lane Group Flow (vph)	435	1761	1723	148	204	332
Heavy Vehicles (%)	12%	12%	12%	12%	12%	12%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	8	Free!	6		7!	4
Permitted Phases				6		4
Actuated Green, G (s)	25.8	149.7	84.7	84.7	24.2	54.0
Effective Green, g (s)	25.8	149.7	84.7	84.7	24.2	54.0
Actuated g/C Ratio	0.17	1.00	0.57	0.57	0.16	0.36
Clearance Time (s)	3.5		7.3	7.3	4.2	3.7
Vehicle Extension (s)	3.0		4.0	4.0	3.5	3.0
Lane Grp Cap (vph)	538	3223	1823	815	260	520
v/s Ratio Prot	c0.14	0.55	c0.53		c0.13	0.23
v/s Ratio Perm				0.10		
v/c Ratio	0.81	0.55	0.95	0.18	0.78	0.64
Uniform Delay, d1	59.6	0.0	30.3	15.7	60.2	39.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.7	0.7	10.8	0.1	14.7	2.6
Delay (s)	68.3	0.7	41.2	15.9	75.0	42.3
Level of Service	E	A	D	B	E	D
Approach Delay (s)		14.1	38.3		54.5	
Approach LOS		B	D		D	

Intersection Summary				
HCM 2000 Control Delay	28.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	149.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	78.6%	ICU Level of Service	D
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

HCM 6th Edition methodology cannot be performed with phasing conflicts.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	435	1146	385	441	1176	326	462	660	253	249	304
v/c Ratio	1.14	0.90	0.48	1.12	0.92	0.43	1.09	0.88	0.72	0.69	0.64
Control Delay	148.6	54.3	4.8	141.4	55.6	6.2	130.2	70.1	79.3	66.3	23.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	148.6	54.3	4.8	141.4	55.6	6.2	130.2	70.1	79.3	66.3	23.9
Queue Length 50th (ft)	~284	581	0	~281	600	15	~291	342	132	235	85
Queue Length 95th (ft)	#434	706	69	#441	733	87	#446	448	193	351	200
Internal Link Dist (ft)		1323			2509			853		451	
Turn Bay Length (ft)	225		485	125		390	160		140		
Base Capacity (vph)	380	1526	887	392	1526	843	423	879	423	470	552
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.14	0.75	0.43	1.13	0.77	0.39	1.09	0.75	0.60	0.53	0.55

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	400	1054	354	406	1082	300	425	515	92	233	229	280
Future Volume (vph)	400	1054	354	406	1082	300	425	515	92	233	229	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3155	3252	1455	3155	3252	1455	3155	3172		3155	1712	1455
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3155	3252	1455	3155	3252	1455	3155	3172		3155	1712	1455
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	435	1146	385	441	1176	326	462	560	100	253	249	304
RTOR Reduction (vph)	0	0	234	0	0	182	0	8	0	0	0	165
Lane Group Flow (vph)	435	1146	151	441	1176	144	462	652	0	253	249	139
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	18.3	59.4	59.4	18.9	60.0	60.0	20.4	35.6		17.0	32.2	32.2
Effective Green, g (s)	18.3	59.4	59.4	18.9	60.0	60.0	20.4	35.6		17.0	32.2	32.2
Actuated g/C Ratio	0.12	0.39	0.39	0.12	0.40	0.40	0.13	0.23		0.11	0.21	0.21
Clearance Time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	381	1275	570	393	1287	576	424	745		354	363	309
v/s Ratio Prot	c0.14	0.35		c0.14	c0.36		c0.15	c0.21		0.08	0.15	
v/s Ratio Perm			0.10			0.10						0.10
v/c Ratio	1.14	0.90	0.26	1.12	0.91	0.25	1.09	0.87		0.71	0.69	0.45
Uniform Delay, d1	66.6	43.2	31.2	66.3	43.3	30.7	65.5	55.8		64.9	55.0	51.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	90.6	8.7	0.3	82.9	10.1	0.2	70.0	11.1		6.7	5.3	1.0
Delay (s)	157.2	51.9	31.5	149.2	53.4	30.9	135.6	66.9		71.6	60.3	53.0
Level of Service	F	D	C	F	D	C	F	E		E	E	D
Approach Delay (s)		71.2			71.3			95.2			61.1	
Approach LOS		E			E			F			E	

Intersection Summary				
HCM 2000 Control Delay	74.5	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	1.01			
Actuated Cycle Length (s)	151.5	Sum of lost time (s)	20.6	
Intersection Capacity Utilization	82.7%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	400	1054	354	406	1082	300	425	515	92	233	229	280
Future Volume (veh/h)	400	1054	354	406	1082	300	425	515	92	233	229	280
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1737	1737	1737	1737	1737	1737	1737	1737	1737	1737	1737	1737
Adj Flow Rate, veh/h	435	1146	385	441	1176	326	462	560	100	253	249	304
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	363	1280	571	363	1348	601	403	716	127	298	388	329
Arrive On Green	0.11	0.39	0.39	0.11	0.41	0.41	0.13	0.26	0.26	0.09	0.22	0.22
Sat Flow, veh/h	3209	3300	1472	3209	3300	1472	3209	2793	497	3209	1737	1472
Grp Volume(v), veh/h	435	1146	385	441	1176	326	462	330	330	253	249	304
Grp Sat Flow(s),veh/h/ln	1605	1650	1472	1605	1650	1472	1605	1650	1640	1605	1737	1472
Q Serve(g_s), s	18.0	51.9	23.5	18.0	52.2	26.8	20.0	29.6	29.8	12.4	20.7	32.2
Cycle Q Clear(g_c), s	18.0	51.9	23.5	18.0	52.2	26.8	20.0	29.6	29.8	12.4	20.7	32.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.30	1.00		1.00
Lane Grp Cap(c), veh/h	363	1280	571	363	1348	601	403	423	421	298	388	329
V/C Ratio(X)	1.20	0.90	0.67	1.22	0.87	0.54	1.15	0.78	0.78	0.85	0.64	0.92
Avail Cap(c_a), veh/h	363	1451	647	363	1451	647	403	425	422	403	447	379
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	70.6	45.7	18.6	70.6	43.3	35.8	69.6	55.0	55.1	71.2	56.0	60.5
Incr Delay (d2), s/veh	113.3	7.0	2.3	119.8	5.8	0.8	91.1	9.0	9.3	12.1	2.5	26.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.9	21.5	8.2	13.2	21.3	9.7	13.2	13.3	13.3	5.6	9.3	14.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	184.0	52.8	21.0	190.4	49.1	36.6	160.8	64.0	64.5	83.3	58.5	86.5
LnGrp LOS	F	D	C	F	D	D	F	E	E	F	E	F
Approach Vol, veh/h		1966			1943			1122			806	
Approach Delay, s/veh		75.6			79.1			104.0			76.8	
Approach LOS		E			E			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	25.3	69.1	24.0	40.9	22.0	72.4	18.8	46.1
Change Period (Y+Rc), s	7.3	* 7.3	4.0	5.3	4.0	7.3	4.0	5.3
Max Green Setting (Gmax), s	18.0	* 70	20.0	41.0	18.0	70.0	20.0	41.0
Max Q Clear Time (g_c+I1), s	20.0	53.9	22.0	34.2	20.0	54.2	14.4	31.8
Green Ext Time (p_c), s	0.0	7.9	0.0	1.4	0.0	7.8	0.4	2.6

Intersection Summary		
HCM 6th Ctrl Delay	82.4	
HCM 6th LOS	F	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↱		↱
Traffic Volume (veh/h)	0	1288	1688	30	0	100
Future Volume (Veh/h)	0	1288	1688	30	0	100
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1400	1835	33	0	109
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1868				2535	918
vC1, stage 1 conf vol					1835	
vC2, stage 2 conf vol					700	
vCu, unblocked vol	1868				2535	918
tC, single (s)	4.3				7.0	7.1
tC, 2 stage (s)					6.0	
tF (s)	2.3				3.6	3.4
p0 queue free %	100				100	58
cM capacity (veh/h)	288				98	259

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	SB 1
Volume Total	700	700	918	918	33	109
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	33	109
cSH	1700	1700	1700	1700	1700	259
Volume to Capacity	0.41	0.41	0.54	0.54	0.02	0.42
Queue Length 95th (ft)	0	0	0	0	0	49
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	28.6
Lane LOS						D
Approach Delay (s)	0.0		0.0			28.6
Approach LOS						D

Intersection Summary				
Average Delay		0.9		
Intersection Capacity Utilization		59.5%	ICU Level of Service	B
Analysis Period (min)		15		

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↱		↱
Traffic Vol, veh/h	0	1288	1688	30	0	100
Future Vol, veh/h	0	1288	1688	30	0	100
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	165	-	-
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	0	1400	1835	33	0	109

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	918
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.4
Pot Cap-1 Maneuver	0	-	-	-	0	259
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	259
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	28.6
HCM LOS			D

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	259
HCM Lane V/C Ratio	-	-	-	0.42
HCM Control Delay (s)	-	-	-	28.6
HCM Lane LOS	-	-	-	D
HCM 95th %tile Q(veh)	-	-	-	2

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1232	56	3	1692	0	26	0	10	0	0	0
Future Volume (Veh/h)	0	1232	56	3	1692	0	26	0	10	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1339	61	3	1839	0	28	0	11	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									1			
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1839			1400			2264	3184	670	2520	3245	920
vC1, stage 1 conf vol							1339	1339		1845	1845	
vC2, stage 2 conf vol							926	1845		675	1400	
vCu, unblocked vol	1839			1400			2264	3184	670	2520	3245	920
tC, single (s)	4.4			4.4			7.8	6.8	7.2	7.8	6.8	7.2
tC, 2 stage (s)							6.8	5.8		6.8	5.8	
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			99			77	100	97	100	100	100
cM capacity (veh/h)	285			431			124	91	375	65	89	253

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	670	670	61	3	1226	613	39	0
Volume Left	0	0	0	0	3	0	0	28	0
Volume Right	0	0	0	61	0	0	0	11	0
cSH	1700	1700	1700	1700	431	1700	1700	173	1700
Volume to Capacity	0.00	0.39	0.39	0.04	0.01	0.72	0.36	0.23	0.00
Queue Length 95th (ft)	0	0	0	0	1	0	0	21	0
Control Delay (s)	0.0	0.0	0.0	0.0	13.4	0.0	0.0	34.5	0.0
Lane LOS					B			D	A
Approach Delay (s)	0.0				0.0			34.5	0.0
Approach LOS								D	A

Intersection Summary				
Average Delay		0.4		
Intersection Capacity Utilization		56.8%	ICU Level of Service	B
Analysis Period (min)		15		

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1232	56	3	1692	0	26	0	10	0	0	0
Future Vol, veh/h	0	1232	56	3	1692	0	26	0	10	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	275	305	-	-	-	-	25	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	13	13	13	13	13	13	13	13	13	13	13	13
Mvmt Flow	0	1339	61	3	1839	0	28	0	11	0	0	0

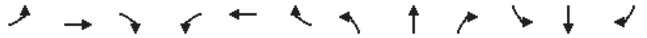
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1839	0	0	1400	0	0	2265	3184	670	2515	3245	920
Stage 1	-	-	-	-	-	-	1339	1339	-	1845	1845	-
Stage 2	-	-	-	-	-	-	926	1845	-	670	1400	-
Critical Hdwy	4.36	-	-	4.36	-	-	7.76	6.76	7.16	7.76	6.76	7.16
Critical Hdwy Stg 1	-	-	-	-	-	-	6.76	5.76	-	6.76	5.76	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.76	5.76	-	6.76	5.76	-
Follow-up Hdwy	2.33	-	-	2.33	-	-	3.63	4.13	3.43	3.63	4.13	3.43
Pot Cap-1 Maneuver	285	-	-	431	-	-	~ 19	8	375	12	8	253
Stage 1	-	-	-	-	-	-	146	200	-	68	110	-
Stage 2	-	-	-	-	-	-	268	110	-	388	186	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	285	-	-	431	-	-	~ 19	8	375	12	8	253
Mov Cap-2 Maneuver	-	-	-	-	-	-	121	89	-	63	87	-
Stage 1	-	-	-	-	-	-	146	200	-	68	109	-
Stage 2	-	-	-	-	-	-	266	109	-	377	186	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	35.6	0
HCM LOS			E	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	121	375	285	-	-	431	-	-	-
HCM Lane V/C Ratio	0.234	0.029	-	-	-	0.008	-	-	-
HCM Control Delay (s)	43.6	14.9	0	-	-	13.4	-	-	0
HCM Lane LOS	E	B	A	-	-	B	-	-	A
HCM 95th %tile Q(veh)	0.9	0.1	0	-	-	0	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Reso A - Exhibit C2 (EIR Technical Appendix)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized			MOYes									
Traffic Volume (veh/h)	204	222	150	318	200	156	63	655	298	100	548	250
Future Volume (veh/h)	204	222	150	318	200	156	63	655	298	100	548	250
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	222	241	163	346	217	170	68	712	324	109	596	272
Approach Volume (veh/h)		463			733			1104			977	
Crossing Volume (veh/h)		1051			1002			572			631	
High Capacity (veh/h)		597			621			881			840	
High v/c (veh/h)		0.78			1.18			1.25			1.16	
Low Capacity (veh/h)		461			482			708			672	
Low v/c (veh/h)		1.00			1.52			1.56			1.45	

Intersection Summary												
Maximum v/c High			1.25									
Maximum v/c Low			1.56									
Intersection Capacity Utilization			117.9%		ICU Level of Service				H			

Intersection	
Intersection Delay, s/veh	33.2
Intersection LOS	D

Approach	EB	WB	NB	SB
Entry Lanes	2	2	2	2
Conflicting Circle Lanes	1	2	2	2
Adj Approach Flow, veh/h	626	733	1104	977
Demand Flow Rate, veh/h	645	755	1137	1006
Vehicles Circulating, veh/h	1082	1032	589	650
Vehicles Exiting, veh/h	574	694	970	1137
Ped Vol Crossing Leg, #/h	0	0	3	0
Ped Cap Adj	1.000	1.000	0.998	1.000
Approach Delay, s/veh	11.0	23.0	46.6	40.0
Approach LOS	B	C	E	E

Lane	Left	Right	Bypass	Left	Right	Left	Right	Left	Right
Designated Moves	LT	TR	R	L	TR	LT	R	LT	R
Assumed Moves	LT	TR	R	L	TR	LT	R	LT	R
RT Channelized			Free						
Lane Util	0.470	0.530		0.472	0.528	0.706	0.294	0.722	0.278
Follow-Up Headway, s	2.535	2.535		2.667	2.535	2.667	2.535	2.667	2.535
Critical Headway, s	4.544	4.544	168	4.645	4.328	4.645	4.328	4.645	4.328
Entry Flow, veh/h	224	253	1957	356	399	803	334	726	280
Cap Entry Lane, veh/h	530	530	0.971	522	591	785	861	742	817
Entry HV Adj Factor	0.971	0.969	163	0.972	0.971	0.971	0.970	0.971	0.971
Flow Entry, veh/h	218	245	1900	346	387	780	324	705	272
Cap Entry, veh/h	515	514	0.086	508	574	761	834	721	794
V/C Ratio	0.422	0.477	0.0	0.681	0.676	1.024	0.389	0.978	0.343
Control Delay, s/veh	14.1	15.6	A	24.3	21.7	62.2	9.0	52.1	8.6
LOS	B	C	0	C	C	F	A	F	A
95th %tile Queue, veh	2	3		5	5	18	2	15	2

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Volume (veh/h)	5	42	5	9	89	0	20	5	15	0	0	0
Future Volume (Veh/h)	5	42	5	9	89	0	20	5	15	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	46	5	10	97	0	22	5	16	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	97			51			176	176	48	194	178	97
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	97			51			176	176	48	194	178	97
tC, single (s)	4.2			4.2			7.2	6.6	6.3	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			99			97	99	98	100	100	100
cM capacity (veh/h)	1460			1518			768	700	1003	731	698	943

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	56	107	43	0
Volume Left	5	10	22	0
Volume Right	5	0	16	0
cSH	1460	1518	831	1700
Volume to Capacity	0.00	0.01	0.05	0.00
Queue Length 95th (ft)	0	0	4	0
Control Delay (s)	0.7	0.7	9.6	0.0
Lane LOS	A	A	A	A
Approach Delay (s)	0.7	0.7	9.6	0.0
Approach LOS			A	A

Intersection Summary					
Average Delay			2.6		
Intersection Capacity Utilization			16.8%	ICU Level of Service	A
Analysis Period (min)			15		

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Vol, veh/h	5	42	5	9	89	0	20	5	15	0	0	0
Future Vol, veh/h	5	42	5	9	89	0	20	5	15	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	8	8	8	8	8	8	8	8	8	8	8	8
Mvmt Flow	5	46	5	10	97	0	22	5	16	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	97	0	0	51	0	0	176	176	49	186	178	97
Stage 1	-	-	-	-	-	-	59	59	-	117	117	-
Stage 2	-	-	-	-	-	-	117	117	-	69	61	-
Critical Hdwy	4.18	-	-	4.18	-	-	7.18	6.58	6.28	7.18	6.58	6.28
Critical Hdwy Stg 1	-	-	-	-	-	-	6.18	5.58	-	6.18	5.58	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.18	5.58	-	6.18	5.58	-
Follow-up Hdwy	2.272	-	-	2.272	-	-	3.572	4.072	3.372	3.572	4.072	3.372
Pot Cap-1 Maneuver	1460	-	-	1518	-	-	773	707	1003	762	705	943
Stage 1	-	-	-	-	-	-	938	834	-	873	787	-
Stage 2	-	-	-	-	-	-	873	787	-	926	832	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1460	-	-	1518	-	-	767	699	1003	739	697	943
Mov Cap-2 Maneuver	-	-	-	-	-	-	767	699	-	739	697	-
Stage 1	-	-	-	-	-	-	934	831	-	870	781	-
Stage 2	-	-	-	-	-	-	867	781	-	901	829	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.7	9.6	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	830	1460	-	-	1518	-	-	-
HCM Lane V/C Ratio	0.052	0.004	-	-	0.006	-	-	-
HCM Control Delay (s)	9.6	7.5	0	-	7.4	0	-	0
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	11	426	388	500	762	11	22	166	344	348	43
v/c Ratio	0.12	0.67	0.80	0.55	0.66	0.08	0.15	0.60	0.78	0.78	0.09
Control Delay	53.5	43.0	47.9	21.4	4.6	47.1	48.0	17.2	47.7	47.3	0.3
Queue Delay	0.0	0.0	0.9	1.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.5	43.0	48.8	23.0	5.2	47.1	48.0	17.2	47.7	47.3	0.3
Queue Length 50th (ft)	7	133	227	208	0	7	14	0	206	208	0
Queue Length 95th (ft)	28	204	#419	398	74	26	41	65	#404	#405	0
Internal Link Dist (ft)		346		307			744			674	
Turn Bay Length (ft)	65		125			140		165	150		185
Base Capacity (vph)	95	867	599	1021	1208	342	360	435	533	541	577
Starvation Cap Reductn	0	0	59	335	162	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.49	0.72	0.73	0.73	0.03	0.06	0.38	0.65	0.64	0.07

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	360	32	357	460	701	10	20	153	546	91	40
Future Volume (vph)	10	360	32	357	460	701	10	20	153	546	91	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (prot)	1752	3451		1752	1845	1568	1752	1845	1543	1665	1692	1519
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (perm)	1752	3451		1752	1845	1568	1752	1845	1543	1665	1692	1519
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	391	35	388	500	762	11	22	166	593	99	43
RTOR Reduction (vph)	0	5	0	0	0	401	0	0	153	0	0	32
Lane Group Flow (vph)	11	421	0	388	500	361	11	22	13	344	348	11
Confl. Peds. (#/hr)			8						1			5
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	0.8	21.3		26.3	46.8	46.8	7.7	7.7	7.7	25.4	25.4	25.4
Effective Green, g (s)	0.8	21.3		26.3	46.8	46.8	7.7	7.7	7.7	25.4	25.4	25.4
Actuated g/C Ratio	0.01	0.22		0.27	0.47	0.47	0.08	0.08	0.08	0.26	0.26	0.26
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	14	744		466	874	743	136	143	120	428	435	390
v/s Ratio Prot	0.01	0.12		c0.22	c0.27		0.01	c0.01		c0.21	0.21	
v/s Ratio Perm						0.23			0.01			0.01
v/c Ratio	0.79	0.57		0.83	0.57	0.49	0.08	0.15	0.11	0.80	0.80	0.03
Uniform Delay, d1	48.9	34.6		34.1	18.7	17.7	42.2	42.5	42.3	34.3	34.3	27.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	130.6	1.0		12.1	0.9	0.5	0.3	0.5	0.4	10.5	10.1	0.0
Delay (s)	179.4	35.6		46.2	19.6	18.2	42.5	43.0	42.7	44.8	44.4	27.4
Level of Service	F	D		D	B	B	D	D	D	D	D	C
Approach Delay (s)		39.2			25.2			42.7			43.6	
Approach LOS		D			C			D			D	

Intersection Summary

HCM 2000 Control Delay	32.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	98.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	360	32	357	460	701	10	20	153	546	91	40
Future Volume (veh/h)	10	360	32	357	460	701	10	20	153	546	91	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	391	35	388	500	762	11	22	166	664	0	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	23	802	71	424	877	743	221	232	196	770	0	339
Arrive On Green	0.01	0.25	0.25	0.24	0.47	0.47	0.12	0.12	0.12	0.22	0.00	0.22
Sat Flow, veh/h	1767	3269	291	1767	1856	1572	1767	1856	1569	3534	0	1554
Grp Volume(v), veh/h	11	210	216	388	500	762	11	22	166	664	0	43
Grp Sat Flow(s),veh/h/ln	1767	1763	1797	1767	1856	1572	1767	1856	1569	1767	0	1554
Q Serve(g_s), s	0.6	10.7	10.8	22.4	20.4	49.5	0.6	1.1	10.9	19.0	0.0	2.3
Cycle Q Clear(g_c), s	0.6	10.7	10.8	22.4	20.4	49.5	0.6	1.1	10.9	19.0	0.0	2.3
Prop In Lane	1.00		0.16	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	23	433	441	424	877	743	221	232	196	770	0	339
V/C Ratio(X)	0.48	0.49	0.49	0.91	0.57	1.03	0.05	0.09	0.85	0.86	0.00	0.13
Avail Cap(c_a), veh/h	84	433	441	531	877	743	304	319	269	995	0	438
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.3	33.9	33.9	38.8	20.0	27.6	40.4	40.6	44.9	39.5	0.0	33.0
Incr Delay (d2), s/veh	14.4	0.8	0.8	17.9	0.9	39.7	0.1	0.2	16.4	6.4	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	4.7	4.8	11.7	8.7	25.8	0.3	0.5	5.0	8.7	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.8	34.7	34.8	56.7	20.8	67.4	40.5	40.8	61.2	45.8	0.0	33.1
LnGrp LOS	E	C	C	E	C	F	D	D	E	D	A	C
Approach Vol, veh/h		437			1650			199			707	
Approach Delay, s/veh		35.5			50.8			57.8			45.1	
Approach LOS		D			D			E			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	29.7	30.2		27.3	5.9	54.0		17.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	31.5	23.0		29.5	5.0	49.5		18.0				
Max Q Clear Time (g_c+I1), s	24.4	12.8		21.0	2.6	51.5		12.9				
Green Ext Time (p_c), s	0.8	1.9		1.9	0.0	0.0		0.3				

Intersection Summary			
HCM 6th Ctrl Delay			47.7
HCM 6th LOS			D

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	76	1073	57	1404	432	235	22	272	11	11
v/c Ratio	0.44	0.56	0.35	0.74	0.45	0.72	0.05	0.50	0.03	0.02
Control Delay	52.5	15.7	50.6	20.0	6.6	47.8	29.7	11.3	29.6	0.1
Queue Delay	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.5	16.3	50.6	20.0	6.6	47.8	29.7	11.3	29.6	0.1
Queue Length 50th (ft)	47	219	35	341	46	141	11	25	6	0
Queue Length 95th (ft)	98	312	78	473	122	228	31	97	20	0
Internal Link Dist (ft)		307		269			836			575
Turn Bay Length (ft)	120		220		145	130		110	95	
Base Capacity (vph)	207	2258	196	2261	1086	474	632	684	470	655
Starvation Cap Reductn	0	691	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.68	0.29	0.62	0.40	0.50	0.03	0.40	0.02	0.02

Intersection Summary

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	937	51	52	1292	397	216	20	250	10	0	10
Future Volume (vph)	70	937	51	52	1292	397	216	20	250	10	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1752	3472		1752	3505	1530	1752	1845	1568	1752	1568	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.75	1.00	1.00	0.74	1.00	
Satd. Flow (perm)	1752	3472		1752	3505	1530	1384	1845	1568	1371	1568	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	1018	55	57	1404	432	235	22	272	11	0	11
RTOR Reduction (vph)	0	4	0	0	0	130	0	0	171	0	8	0
Lane Group Flow (vph)	76	1069	0	57	1404	302	235	22	101	11	3	0
Confl. Peds. (#/hr)			6			1						
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		
Actuated Green, G (s)	6.5	48.3		6.0	47.8	47.8	20.8	20.8	20.8	20.8	20.8	
Effective Green, g (s)	6.5	48.3		6.0	47.8	47.8	20.8	20.8	20.8	20.8	20.8	
Actuated g/C Ratio	0.07	0.55		0.07	0.54	0.54	0.23	0.23	0.23	0.23	0.23	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	128	1892		118	1890	825	324	433	368	321	368	
v/s Ratio Prot	c0.04	0.31		0.03	c0.40			0.01			0.00	
v/s Ratio Perm						0.20	c0.17		0.06	0.01		
v/c Ratio	0.59	0.57		0.48	0.74	0.37	0.73	0.05	0.28	0.03	0.01	
Uniform Delay, d1	39.8	13.2		39.8	15.7	11.7	31.3	26.3	27.7	26.2	26.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	7.2	0.4		3.1	1.6	0.3	7.8	0.0	0.4	0.0	0.0	
Delay (s)	47.0	13.6		42.9	17.3	12.0	39.1	26.3	28.1	26.2	26.0	
Level of Service	D	B		D	B	B	D	C	C	C	C	
Approach Delay (s)		15.8			16.9			32.9			26.1	
Approach LOS		B			B			C			C	

Intersection Summary				
HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	88.6	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	69.8%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	937	51	52	1292	397	216	20	250	10	0	10
Future Volume (veh/h)	70	937	51	52	1292	397	216	20	250	10	0	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	76	1018	55	57	1404	0	235	22	272	11	0	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	98	1841	99	85	1883		397	402	340	326	0	340
Arrive On Green	0.06	0.54	0.54	0.05	0.53	0.00	0.22	0.22	0.22	0.22	0.00	0.22
Sat Flow, veh/h	1767	3400	184	1767	3526	1572	1392	1856	1572	1077	0	1572
Grp Volume(v), veh/h	76	528	545	57	1404	0	235	22	272	11	0	11
Grp Sat Flow(s),veh/h/ln	1767	1763	1821	1767	1763	1572	1392	1856	1572	1077	0	1572
Q Serve(g_s), s	3.0	13.6	13.6	2.2	21.4	0.0	11.1	0.7	11.4	0.6	0.0	0.4
Cycle Q Clear(g_c), s	3.0	13.6	13.6	2.2	21.4	0.0	11.5	0.7	11.4	1.2	0.0	0.4
Prop In Lane	1.00		0.10	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	98	954	986	85	1883		397	402	340	326	0	340
V/C Ratio(X)	0.78	0.55	0.55	0.67	0.75		0.59	0.05	0.80	0.03	0.00	0.03
Avail Cap(c_a), veh/h	241	1394	1440	229	2763		646	734	622	519	0	622
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.4	10.4	10.4	32.6	12.5	0.0	26.0	21.6	25.8	22.1	0.0	21.5
Incr Delay (d2), s/veh	12.3	0.5	0.5	8.9	0.6	0.0	1.4	0.1	4.3	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	4.6	4.8	1.1	7.3	0.0	3.6	0.3	4.4	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.7	10.9	10.9	41.4	13.2	0.0	27.5	21.7	30.1	22.1	0.0	21.5
LnGrp LOS	D	B	B	D	B		C	C	C	C	A	C
Approach Vol, veh/h		1149			1461	A		529			22	
Approach Delay, s/veh		13.2			14.3			28.6			21.8	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.8	42.2		19.6	8.4	41.6		19.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	9.0	55.0		27.5	9.5	54.5		27.5				
Max Q Clear Time (g_c+I1), s	4.2	15.6		3.2	5.0	23.4		13.5				
Green Ext Time (p_c), s	0.0	9.0		0.0	0.1	13.7		1.5				

Intersection Summary			
HCM 6th Ctrl Delay	16.3		
HCM 6th LOS	B		

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	342	960	65	1193	413	203	54	170	698
v/c Ratio	0.85	0.61	0.49	0.88	0.86	0.27	0.13	0.78	1.09dr
Control Delay	70.5	24.2	65.5	40.8	67.6	40.3	2.2	73.3	52.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.5	24.2	65.5	40.8	67.6	40.3	2.2	73.3	52.5
Queue Length 50th (ft)	136	271	49	429	163	70	0	129	216
Queue Length 95th (ft)	#217	342	96	525	#249	106	8	#230	#330
Internal Link Dist (ft)		353		673		608			523
Turn Bay Length (ft)	295		235		140		130	225	
Base Capacity (vph)	411	1577	153	1468	496	762	415	242	791
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.61	0.42	0.81	0.83	0.27	0.13	0.70	0.88

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	315	584	299	60	911	187	380	187	50	156	192	450
Future Volume (vph)	315	584	299	60	911	187	380	187	50	156	192	450
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.97		1.00	1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	3342		1770	3442		3433	3539	1583	1770	3167	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	3342		1770	3442		3433	3539	1583	1770	3167	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	342	635	325	65	990	203	413	203	54	170	209	489
RTOR Reduction (vph)	0	53	0	0	15	0	0	0	43	0	142	0
Lane Group Flow (vph)	342	907	0	65	1178	0	413	203	11	170	556	0
Confl. Peds. (#/hr)			3									
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	13.5	52.1		7.3	45.9		16.1	24.3	24.3	14.3	22.5	
Effective Green, g (s)	13.5	52.1		7.3	45.9		16.1	24.3	24.3	14.3	22.5	
Actuated g/C Ratio	0.12	0.45		0.06	0.40		0.14	0.21	0.21	0.12	0.19	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	399	1501		111	1361		476	741	331	218	614	
v/s Ratio Prot	c0.10	0.27		0.04	c0.34		c0.12	0.06		0.10	c0.18	
v/s Ratio Perm									0.01			
v/c Ratio	0.86	0.60		0.59	0.87		0.87	0.27	0.03	0.78	1.09dr	
Uniform Delay, d1	50.3	24.2		52.9	32.2		48.9	38.5	36.5	49.3	45.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	16.4	0.7		7.7	6.0		15.3	0.2	0.0	16.1	16.9	
Delay (s)	66.7	24.9		60.5	38.2		64.2	38.7	36.5	65.4	62.6	
Level of Service	E	C		E	D		E	D	D	E	E	
Approach Delay (s)		35.8			39.4			54.2			63.2	
Approach LOS		D			D			D			E	

Intersection Summary

HCM 2000 Control Delay	45.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	116.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	85.8%	ICU Level of Service	E
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	315	584	299	60	911	187	380	187	50	156	192	450
Future Volume (veh/h)	315	584	299	60	911	187	380	187	50	156	192	450
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	342	635	0	65	990	203	413	203	54	170	209	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	433	1771		84	1232	252	510	436	195	209	328	
Arrive On Green	0.13	0.50	0.00	0.05	0.42	0.42	0.15	0.12	0.12	0.12	0.09	0.00
Sat Flow, veh/h	3456	3647	0	1781	2931	600	3456	3554	1585	1781	3647	0
Grp Volume(v), veh/h	342	635	0	65	600	593	413	203	54	170	209	0
Grp Sat Flow(s),veh/h/ln	1728	1777	0	1781	1777	1753	1728	1777	1585	1781	1777	0
Q Serve(g_s), s	8.1	9.1	0.0	3.0	24.7	24.9	9.7	4.5	2.6	7.8	4.8	0.0
Cycle Q Clear(g_c), s	8.1	9.1	0.0	3.0	24.7	24.9	9.7	4.5	2.6	7.8	4.8	0.0
Prop In Lane	1.00		0.00	1.00		0.34	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	433	1771		84	747	737	510	436	195	209	328	
V/C Ratio(X)	0.79	0.36		0.77	0.80	0.81	0.81	0.47	0.28	0.82	0.64	
Avail Cap(c_a), veh/h	565	2209		210	1024	1010	680	1034	461	332	996	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	35.6	12.8	0.0	39.5	21.3	21.3	34.6	34.2	33.4	36.1	36.7	0.0
Incr Delay (d2), s/veh	5.7	0.1	0.0	14.0	3.3	3.4	5.4	0.8	0.8	8.2	2.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	3.4	0.0	1.6	10.1	10.0	4.3	1.9	1.0	3.7	2.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.3	13.0	0.0	53.5	24.6	24.7	40.0	35.0	34.2	44.3	38.8	0.0
LnGrp LOS	D	B		D	C	C	D	C	C	D	D	
Approach Vol, veh/h		977	A		1258			670			379	A
Approach Delay, s/veh		22.9			26.1			38.0			41.2	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.5	46.3	16.9	12.2	15.0	39.7	14.3	14.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.9	52.1	16.5	23.5	13.7	48.3	15.6	24.4
Max Q Clear Time (g_c+I1), s	5.0	11.1	11.7	6.8	10.1	26.9	9.8	6.5
Green Ext Time (p_c), s	0.0	5.0	0.7	1.0	0.4	8.4	0.2	1.2

Intersection Summary	
HCM 6th Ctrl Delay	29.3
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	96	476	1408	627	143
v/c Ratio	0.71	0.22	0.83	0.79	0.30
Control Delay	73.4	10.0	24.3	43.9	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	73.4	10.0	24.3	43.9	8.2
Queue Length 50th (ft)	53	50	276	167	0
Queue Length 95th (ft)	#183	151	#701	#381	56
Internal Link Dist (ft)		1151	2310	505	
Turn Bay Length (ft)	125			120	
Base Capacity (vph)	135	2165	1699	793	475
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.71	0.22	0.83	0.79	0.30

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	88	438	708	587	577	132
Future Volume (vph)	88	438	708	587	577	132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.93		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1752	3505	3244		3400	1568
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1752	3505	3244		3400	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	96	476	770	638	627	143
RTOR Reduction (vph)	0	0	106	0	0	111
Lane Group Flow (vph)	96	476	1302	0	627	32
Confl. Peds. (#/hr)				3		
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	NA		Perm	Perm
Protected Phases	5	2	6			
Permitted Phases					4	4
Actuated Green, G (s)	7.3	58.6	46.8		22.1	22.1
Effective Green, g (s)	7.3	58.6	46.8		22.1	22.1
Actuated g/C Ratio	0.07	0.59	0.48		0.22	0.22
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	129	2085	1541		762	351
v/s Ratio Prot	c0.05	0.14	c0.40			
v/s Ratio Perm					c0.18	0.02
v/c Ratio	0.74	0.23	0.84		0.82	0.09
Uniform Delay, d1	44.7	9.4	22.7		36.3	30.2
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	20.5	0.1	4.5		7.2	0.1
Delay (s)	65.2	9.4	27.1		43.5	30.4
Level of Service	E	A	C		D	C
Approach Delay (s)		18.8	27.1		41.1	
Approach LOS		B	C		D	

Intersection Summary			
HCM 2000 Control Delay	29.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	98.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	142	370	153	95	804	618	249	625	277	322	311
v/c Ratio	0.66	0.28	0.23	0.52	0.69	0.82	0.77	0.76	0.66	0.52	0.63
Control Delay	62.0	24.8	5.1	58.3	33.7	22.9	59.2	43.5	53.7	43.4	14.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.0	24.8	5.1	58.3	33.7	22.9	59.2	43.5	53.7	43.4	14.3
Queue Length 50th (ft)	94	94	0	63	251	166	163	210	94	107	22
Queue Length 95th (ft)	#190	146	44	127	342	354	#303	295	154	166	116
Internal Link Dist (ft)		1092			186			1440		2310	
Turn Bay Length (ft)	150		150	170		140	230		245		100
Base Capacity (vph)	256	1538	754	241	1506	865	398	1085	485	797	556
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.24	0.20	0.39	0.53	0.71	0.63	0.58	0.57	0.40	0.56

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	131	340	141	87	740	569	229	529	46	255	296	286
Future Volume (vph)	131	340	141	87	740	569	229	529	46	255	296	286
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1752	3505	1527	1752	3505	1528	1752	3458		3400	3505	1519
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1752	3505	1527	1752	3505	1528	1752	3458		3400	3505	1519
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	142	370	153	95	804	618	249	575	50	277	322	311
RTOR Reduction (vph)	0	0	95	0	0	242	0	5	0	0	0	226
Lane Group Flow (vph)	142	370	58	95	804	376	249	620	0	277	322	85
Confl. Peds. (#/hr)			9			9			4			12
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	12.6	39.2	39.2	8.8	35.4	35.4	18.9	24.4		12.7	18.2	18.2
Effective Green, g (s)	12.6	39.2	39.2	8.8	35.4	35.4	18.9	24.4		12.7	18.2	18.2
Actuated g/C Ratio	0.12	0.38	0.38	0.09	0.34	0.34	0.18	0.24		0.12	0.18	0.18
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	214	1332	580	149	1203	524	321	818		418	618	268
v/s Ratio Prot	c0.08	c0.11		0.05	0.23		c0.14	c0.18		0.08	0.09	
v/s Ratio Perm			0.04			c0.25						0.06
v/c Ratio	0.66	0.28	0.10	0.64	0.67	0.72	0.78	0.76		0.66	0.52	0.32
Uniform Delay, d1	43.2	22.1	20.6	45.6	28.8	29.5	40.1	36.6		43.2	38.5	37.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	7.5	0.1	0.1	8.6	1.4	4.7	11.1	4.0		3.9	0.8	0.7
Delay (s)	50.7	22.3	20.7	54.2	30.3	34.1	51.2	40.6		47.1	39.3	37.7
Level of Service	D	C	C	D	C	C	D	D		D	D	D
Approach Delay (s)		28.0			33.3			43.7			41.1	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	36.5	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	103.1	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	70.8%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
12: Creston Road & Niblick Road/Sherwood Road

Cumulative Plus 1293 Unit Project AM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	131	340	141	87	740	569	229	529	46	255	296	286
Future Volume (veh/h)	131	340	141	87	740	569	229	529	46	255	296	286
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	142	370	153	95	804	618	249	575	50	277	322	311
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	171	1446	641	120	1344	595	281	856	74	342	712	312
Arrive On Green	0.10	0.41	0.41	0.07	0.38	0.38	0.16	0.26	0.26	0.10	0.20	0.20
Sat Flow, veh/h	1767	3526	1562	1767	3526	1561	1767	3281	285	3428	3526	1544
Grp Volume(v), veh/h	142	370	153	95	804	618	249	308	317	277	322	311
Grp Sat Flow(s),veh/h/ln	1767	1763	1562	1767	1763	1561	1767	1763	1803	1714	1763	1544
Q Serve(g_s), s	8.8	7.7	7.1	5.9	20.4	42.5	15.4	17.5	17.6	8.8	8.9	22.4
Cycle Q Clear(g_c), s	8.8	7.7	7.1	5.9	20.4	42.5	15.4	17.5	17.6	8.8	8.9	22.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.16	1.00		1.00
Lane Grp Cap(c), veh/h	171	1446	641	120	1344	595	281	460	470	342	712	312
V/C Ratio(X)	0.83	0.26	0.24	0.79	0.60	1.04	0.89	0.67	0.67	0.81	0.45	1.00
Avail Cap(c_a), veh/h	230	1446	641	216	1344	595	357	489	500	434	712	312
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.5	21.7	21.5	51.2	27.6	34.5	45.9	36.9	36.9	49.1	39.1	44.5
Incr Delay (d2), s/veh	17.0	0.1	0.2	11.0	0.7	47.1	19.3	3.3	3.3	8.8	0.5	50.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	3.1	2.6	2.9	8.4	23.0	8.2	7.8	8.0	4.2	3.9	12.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.5	21.8	21.7	62.2	28.4	81.6	65.2	40.2	40.2	58.0	39.5	94.7
LnGrp LOS	E	C	C	E	C	F	E	D	D	E	D	F
Approach Vol, veh/h		665			1517			874			910	
Approach Delay, s/veh		31.3			52.2			47.3			64.0	
Approach LOS		C			D			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.6	33.6	12.1	50.2	22.2	27.0	15.3	47.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	14.1	30.9	13.6	43.4	22.5	22.5	14.5	42.5
Max Q Clear Time (g_c+I1), s	10.8	19.6	7.9	9.7	17.4	24.4	10.8	44.5
Green Ext Time (p_c), s	0.3	2.8	0.1	2.9	0.3	0.0	0.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	50.3
HCM 6th LOS	D

Olsen-Chandler SP
13: Creston Road & Scott Street

Cumulative Plus 1293 Unit Project AM
HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	47	54	744	56	56	520
Future Volume (Veh/h)	47	54	744	56	56	520
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	51	59	809	61	61	565
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1526	840			870	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1526	840			870	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	57	84			92	
cM capacity (veh/h)	119	365			775	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	110	870	61	565
Volume Left	51	0	61	0
Volume Right	59	61	0	0
cSH	187	1700	775	1700
Volume to Capacity	0.59	0.51	0.08	0.33
Queue Length 95th (ft)	81	0	6	0
Control Delay (s)	48.7	0.0	10.0	0.0
Lane LOS	E		B	
Approach Delay (s)	48.7	0.0	1.0	
Approach LOS	E			

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	59.1%	ICU Level of Service	B
Analysis Period (min)	15		

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	3.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	47	54	744	56	56	520
Future Vol, veh/h	47	54	744	56	56	520
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	51	59	809	61	61	565

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1527	840	0	0	870	0
Stage 1	840	-	-	-	-	-
Stage 2	687	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	129	365	-	-	775	-
Stage 1	424	-	-	-	-	-
Stage 2	499	-	-	-	-	-
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	119	365	-	-	775	-
Mov Cap-2 Maneuver	119	-	-	-	-	-
Stage 1	424	-	-	-	-	-
Stage 2	460	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	49	0	1
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	186	775	-
HCM Lane V/C Ratio	-	-	0.59	0.079	-
HCM Control Delay (s)	-	-	49	10	-
HCM Lane LOS	-	-	E	B	-
HCM 95th %tile Q(veh)	-	-	3.2	0.3	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	139	10	42	10	20	104	35	508	10	35	400	100
Future Volume (Veh/h)	139	10	42	10	20	104	35	508	10	35	400	100
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	151	11	46	11	22	113	38	552	11	38	435	109
Pedestrians		6			2						1	
Lane Width (ft)		12.0			12.0						12.0	
Walking Speed (ft/s)		3.5			3.5						3.5	
Percent Blockage		1			0						0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1270	1158	441	1198	1262	560	550			565		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1270	1158	441	1198	1262	560	550			565		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	94	92	92	86	79	96			96		
cM capacity (veh/h)	95	180	613	134	156	526	1014			1005		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	208	146	38	563	38	435	109
Volume Left	151	11	38	0	38	0	0
Volume Right	46	113	0	11	0	0	109
cSH	120	334	1014	1700	1005	1700	1700
Volume to Capacity	1.73	0.44	0.04	0.33	0.04	0.26	0.06
Queue Length 95th (ft)	397	53	3	0	3	0	0
Control Delay (s)	423.5	23.9	8.7	0.0	8.7	0.0	0.0
Lane LOS	F	C	A		A		
Approach Delay (s)	423.5	23.9	0.5		0.6		
Approach LOS	F	C					

Intersection Summary				
Average Delay	60.0			
Intersection Capacity Utilization	58.1%	ICU Level of Service	B	
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	51.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	139	10	42	10	20	104	35	508	10	35	400	100
Future Vol, veh/h	139	10	42	10	20	104	35	508	10	35	400	100
Conflicting Peds, #/hr	1	0	0	0	0	1	6	0	2	2	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	30	-	-	70	-	60
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	151	11	46	11	22	113	38	552	11	38	435	109

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1219	1158	441	1230	1262	561	550	0	0	565	0	0
Stage 1	517	517	-	636	636	-	-	-	-	-	-	-
Stage 2	702	641	-	594	626	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	157	196	616	154	170	527	1020	-	-	1007	-	-
Stage 1	541	534	-	466	472	-	-	-	-	-	-	-
Stage 2	429	469	-	491	477	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 103	180	612	128	156	525	1014	-	-	1005	-	-
Mov Cap-2 Maneuver	~ 103	180	-	128	156	-	-	-	-	-	-	-
Stage 1	518	511	-	448	454	-	-	-	-	-	-	-
Stage 2	308	451	-	428	456	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 361.8	24.2	0.5	0.6
HCM LOS	F	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1014	-	-	130	331	1005	-	-
HCM Lane V/C Ratio	0.038	-	-	1.597	0.44	0.038	-	-
HCM Control Delay (s)	8.7	-	-	$ 361.8	24.2	8.7	-	-
HCM Lane LOS	A	-	-	F	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	14.9	2.2	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	20	10	12	273	10	287	15	250	138	254	199	10
Future Volume (vph)	20	10	12	273	10	287	15	250	138	254	199	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	11	13	297	11	312	16	272	150	276	216	11

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	46	620	288	150	384	119
Volume Left (vph)	22	297	16	0	276	0
Volume Right (vph)	13	312	0	150	0	11
Hadj (s)	-0.04	-0.17	0.06	-0.67	0.39	-0.03
Departure Headway (s)	8.4	6.5	7.7	7.0	7.8	7.4
Degree Utilization, x	0.11	1.12	0.62	0.29	0.84	0.25
Capacity (veh/h)	397	546	454	506	449	478
Control Delay (s)	12.4	100.3	21.1	11.6	38.4	11.6
Approach Delay (s)	12.4	100.3	17.9		32.1	
Approach LOS	B	F	C		D	

Intersection Summary				
Delay	54.0			
Level of Service	F			
Intersection Capacity Utilization	79.3%	ICU Level of Service	D	
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	56.3
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Vol, veh/h	20	10	12	273	10	287	0	15	250	138	254	199
Future Vol, veh/h	20	10	12	273	10	287	0	15	250	138	254	199
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	11	13	297	11	312	0	16	272	150	276	216
Number of Lanes	0	1	0	0	1	0	0	0	1	1	0	2

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	13.1	102.9	19.8	34.7
HCM LOS	B	F	C	D

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	6%	0%	48%	48%	72%	0%
Vol Thru, %	94%	0%	24%	2%	28%	91%
Vol Right, %	0%	100%	29%	50%	0%	9%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	265	138	42	570	354	110
LT Vol	15	0	20	273	254	0
Through Vol	250	0	10	10	100	100
RT Vol	0	138	12	287	0	10
Lane Flow Rate	288	150	46	620	384	119
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.617	0.291	0.108	1.127	0.837	0.245
Departure Headway (Hd)	8.242	7.484	8.987	6.546	8.364	7.925
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	441	483	401	551	438	456
Service Time	5.942	5.184	6.987	4.637	6.064	5.625
HCM Lane V/C Ratio	0.653	0.311	0.115	1.125	0.877	0.261
HCM Control Delay	23.3	13.2	13.1	102.9	41.4	13.2
HCM Lane LOS	C	B	B	F	E	B
HCM 95th-tile Q	4	1.2	0.4	20	8	1

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBR
Lane Configurations	
Traffic Vol, veh/h	10
Future Vol, veh/h	10
Peak Hour Factor	0.92
Heavy Vehicles, %	2
Mvmt Flow	11
Number of Lanes	0

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	183	135	221	208	122	388
Future Volume (Veh/h)	183	135	221	208	122	388
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	199	147	240	226	133	422
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	726	133	555			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	726	133	555			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	27	83	76			
cM capacity (veh/h)	272	888	1005			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	346	240	113	113	133	422
Volume Left	199	240	0	0	0	0
Volume Right	147	0	0	0	0	422
cSH	473	1005	1700	1700	1700	1700
Volume to Capacity	0.73	0.24	0.07	0.07	0.08	0.25
Queue Length 95th (ft)	149	23	0	0	0	0
Control Delay (s)	31.4	9.7	0.0	0.0	0.0	0.0
Lane LOS	D	A				
Approach Delay (s)	31.4	5.0			0.0	
Approach LOS	D					

Intersection Summary				
Average Delay		9.6		
Intersection Capacity Utilization		42.9%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection	
Int Delay, s/veh	9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	183	135	221	208	122	388
Future Vol, veh/h	183	135	221	208	122	388
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	145	105	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	199	147	240	226	133	422

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	726	133	555	0	-	0
Stage 1	133	-	-	-	-	-
Stage 2	593	-	-	-	-	-
Critical Hdwy	6.645	6.245	4.145	-	-	-
Critical Hdwy Stg 1	5.445	-	-	-	-	-
Critical Hdwy Stg 2	5.845	-	-	-	-	-
Follow-up Hdwy	3.5285	3.3285	2.2285	-	-	-
Pot Cap-1 Maneuver	373	913	1007	-	-	-
Stage 1	890	-	-	-	-	-
Stage 2	514	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	284	913	1007	-	-	-
Mov Cap-2 Maneuver	284	-	-	-	-	-
Stage 1	678	-	-	-	-	-
Stage 2	514	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	28.7	5	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1007	-	284	913	-	-
HCM Lane V/C Ratio	0.239	-	0.7	0.161	-	-
HCM Control Delay (s)	9.7	-	42.7	9.7	-	-
HCM Lane LOS	A	-	E	A	-	-
HCM 95th %tile Q(veh)	0.9	-	4.8	0.6	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	3	190	10	0	0	0	0	386	20
Future Volume (Veh/h)	0	0	0	3	190	10	0	0	0	0	386	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	3	207	11	0	0	0	0	420	22
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	534	431	431	431	442	0	442			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	534	431	431	431	442	0	442			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	99	59	99	100			100		
cM capacity (veh/h)	309	517	624	535	510	1085	1118			1623		

Direction, Lane #	WB 1	SB 1
Volume Total	221	442
Volume Left	3	0
Volume Right	11	22
cSH	530	1700
Volume to Capacity	0.42	0.26
Queue Length 95th (ft)	51	0
Control Delay (s)	16.6	0.0
Lane LOS	C	
Approach Delay (s)	16.6	0.0
Approach LOS	C	

Intersection Summary				
Average Delay	5.5			
Intersection Capacity Utilization	38.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	3	190	10	0	0	0	0	386	20
Future Vol, veh/h	0	0	0	3	190	10	0	0	0	0	386	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	2	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	3	207	11	0	0	0	0	420	22

Major/Minor	Minor1			Major2		
Conflicting Flow All	431	442	-	-	-	0
Stage 1	0	0	-	-	-	-
Stage 2	431	442	-	-	-	-
Critical Hdwy	6.42	6.52	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-
Follow-up Hdwy	3.518	4.018	-	-	-	-
Pot Cap-1 Maneuver	581	510	0	0	-	-
Stage 1	-	-	0	0	-	-
Stage 2	655	576	0	0	-	-
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	581	0	-	-	-	-
Mov Cap-2 Maneuver	581	0	-	-	-	-
Stage 1	-	0	-	-	-	-
Stage 2	655	0	-	-	-	-

Approach	WB	SB
HCM Control Delay, s	14.7	0
HCM LOS	B	

Minor Lane/Major Mvmt	WBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	581	-	-	-
HCM Lane V/C Ratio	0.361	-	-	-
HCM Control Delay (s)	14.7	0	-	-
HCM Lane LOS	B	A	-	-
HCM 95th %tile Q(veh)	1.6	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	25	367	1193	435	579	126	315	582	420	329
v/c Ratio	0.11	0.78	0.81	0.54	0.52	0.66	0.69	0.36	0.75	0.51
Control Delay	58.1	62.6	40.1	33.1	5.0	78.1	66.9	7.2	65.0	47.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.1	62.6	40.1	33.1	5.0	78.1	66.9	7.2	65.0	47.8
Queue Length 50th (ft)	21	151	498	300	52	116	152	63	195	128
Queue Length 95th (ft)	53	216	628	433	135	189	207	86	264	185
Internal Link Dist (ft)		521		1372			611			680
Turn Bay Length (ft)	115		515		115	165		290	305	
Base Capacity (vph)	255	533	1602	869	1141	247	585	1714	647	750
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.69	0.74	0.50	0.51	0.51	0.54	0.34	0.65	0.44

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	218	120	1098	400	533	116	290	535	386	210	93
Future Volume (vph)	23	218	120	1098	400	533	116	290	535	386	210	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.95	0.88	0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3351		3433	1863	1569	1770	3539	2787	3433	3352	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3351		3433	1863	1569	1770	3539	2787	3433	3352	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	237	130	1193	435	579	126	315	582	420	228	101
RTOR Reduction (vph)	0	50	0	0	0	174	0	0	52	0	34	0
Lane Group Flow (vph)	25	317	0	1193	435	405	126	315	530	420	295	0
Confl. Peds. (#/hr)												1
Confl. Bikes (#/hr)						2						
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	17.1	17.1		58.7	58.7	81.0	14.7	17.5	76.2	22.3	25.1	
Effective Green, g (s)	17.1	17.1		58.7	58.7	81.0	14.7	17.5	76.2	22.3	25.1	
Actuated g/C Ratio	0.13	0.13		0.43	0.43	0.60	0.11	0.13	0.56	0.16	0.18	
Clearance Time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	222	421		1480	803	933	191	455	1560	562	618	
v/s Ratio Prot	0.01	c0.09		c0.35	0.23	0.07	0.07	c0.09	0.15	c0.12	0.09	
v/s Ratio Perm						0.19			0.04			
v/c Ratio	0.11	0.75		0.81	0.54	0.43	0.66	0.69	0.34	0.75	0.48	
Uniform Delay, d1	52.8	57.5		33.7	28.7	15.0	58.3	56.7	16.3	54.2	49.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	7.5		3.3	0.7	0.3	8.0	4.5	0.1	5.4	0.6	
Delay (s)	53.0	64.9		37.1	29.5	15.4	66.3	61.2	16.4	59.6	50.2	
Level of Service	D	E		D	C	B	E	E	B	E	D	
Approach Delay (s)		64.2			29.9			36.4			55.5	
Approach LOS		E			C			D			E	

Intersection Summary				
HCM 2000 Control Delay	38.8	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.77			
Actuated Cycle Length (s)	136.1	Sum of lost time (s)	20.5	
Intersection Capacity Utilization	77.3%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Cumulative Plus 1293 Unit Project AM
18: US 101 Ramps/Spring Street & 1st Street/Niblick Road — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	218	120	1098	400	533	116	290	535	386	210	93
Future Volume (veh/h)	23	218	120	1098	400	533	116	290	535	386	210	93
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	25	237	130	1193	435	579	126	315	582	420	228	101
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	231	292	154	1430	774	874	153	530	1570	494	478	205
Arrive On Green	0.13	0.13	0.13	0.41	0.41	0.41	0.09	0.15	0.15	0.14	0.20	0.20
Sat Flow, veh/h	1781	2245	1188	3456	1870	1564	1781	3554	2790	3456	2420	1037
Grp Volume(v), veh/h	25	186	181	1193	435	579	126	315	582	420	165	164
Grp Sat Flow(s),veh/h/ln	1781	1777	1656	1728	1870	1564	1781	1777	1395	1728	1777	1681
Q Serve(g_s), s	1.5	12.7	13.3	38.6	22.2	32.5	8.7	10.3	14.4	14.8	10.3	10.8
Cycle Q Clear(g_c), s	1.5	12.7	13.3	38.6	22.2	32.5	8.7	10.3	14.4	14.8	10.3	10.8
Prop In Lane	1.00		0.72	1.00		1.00	1.00		1.00	1.00		0.62
Lane Grp Cap(c), veh/h	231	231	215	1430	774	874	153	530	1570	494	351	332
V/C Ratio(X)	0.11	0.80	0.84	0.83	0.56	0.66	0.82	0.59	0.37	0.85	0.47	0.49
Avail Cap(c_a), veh/h	277	276	258	1734	939	1011	268	632	1651	701	409	387
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.9	52.7	53.0	32.7	27.9	19.5	56.1	49.6	15.1	52.2	44.3	44.5
Incr Delay (d2), s/veh	0.2	13.5	18.9	3.1	0.6	1.3	10.5	1.1	0.1	7.0	1.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	6.6	6.7	16.1	9.8	11.4	4.3	4.6	9.1	6.9	4.6	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.1	66.3	71.9	35.8	28.6	20.8	66.6	50.6	15.2	59.2	45.3	45.7
LnGrp LOS	D	E	E	D	C	C	E	D	B	E	D	D
Approach Vol, veh/h		392			2207			1023			749	
Approach Delay, s/veh		67.7			30.5			32.4			53.1	
Approach LOS		E			C			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	22.5	24.4		20.8	16.5	30.4		57.0				
Change Period (Y+Rc), s	* 4.7	5.8		4.6	5.8	* 5.8		5.4				
Max Green Setting (Gmax), s	* 25	22.2		19.4	18.8	* 29		62.6				
Max Q Clear Time (g_c+I1), s	16.8	16.4		15.3	10.7	12.8		40.6				
Green Ext Time (p_c), s	1.0	2.2		0.9	0.2	1.7		11.1				

Intersection Summary			
HCM 6th Ctrl Delay		38.2	
HCM 6th LOS		D	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Olsen-Chandler SP — Cumulative Plus 1293 Unit Project AM
19: S. River Road & Niblick Road — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	120	786	291	132	1483	676	387	300	507
v/c Ratio	0.79	0.60	0.38	0.72	1.00	1.04	0.63	0.89	0.77
Control Delay	88.4	32.3	4.7	71.4	55.7	89.8	46.4	73.4	44.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.4	32.3	4.7	71.4	55.7	89.8	46.4	73.4	44.4
Queue Length 50th (ft)	45	243	0	93	543	~271	134	212	153
Queue Length 95th (ft)	#104	341	60	#188	#799	#424	185	#396	213
Internal Link Dist (ft)		1510			1609		962		896
Turn Bay Length (ft)	140			80		150		110	
Base Capacity (vph)	151	1306	767	202	1483	653	811	349	861
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.60	0.38	0.65	1.00	1.04	0.48	0.86	0.59

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
19: S. River Road & Niblick Road

Cumulative Plus 1293 Unit Project AM
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	723	268	121	1091	273	622	307	49	276	267	200
Future Volume (vph)	110	723	268	121	1091	273	622	307	49	276	267	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.98		1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3539	1583	1770	3416		3433	3458		1770	3312	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	3539	1583	1770	3416		3433	3458		1770	3312	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	786	291	132	1186	297	676	334	53	300	290	217
RTOR Reduction (vph)	0	0	183	0	18	0	0	11	0	0	75	0
Lane Group Flow (vph)	120	786	108	132	1465	0	676	376	0	300	432	0
Confl. Peds. (#/hr)						10			5			
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	5.0	41.8	41.8	11.8	48.6		21.5	19.9		21.6	20.0	
Effective Green, g (s)	5.0	41.8	41.8	11.8	48.6		21.5	19.9		21.6	20.0	
Actuated g/C Ratio	0.04	0.37	0.37	0.10	0.43		0.19	0.18		0.19	0.18	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	151	1307	585	184	1467		652	608		338	585	
v/s Ratio Prot	0.03	0.22		c0.07	c0.43		c0.20	0.11		c0.17	0.13	
v/s Ratio Perm			0.07									
v/c Ratio	0.79	0.60	0.18	0.72	1.00		1.04	0.62		0.89	0.74	
Uniform Delay, d1	53.5	28.9	24.1	49.0	32.2		45.8	43.1		44.6	44.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	24.3	0.8	0.2	12.5	23.0		45.1	1.9		23.3	4.9	
Delay (s)	77.9	29.7	24.3	61.6	55.3		90.9	45.0		67.8	48.9	
Level of Service	E	C	C	E	E		F	D		E	D	
Approach Delay (s)		33.2			55.8			74.2			56.0	
Approach LOS		C			E			E			E	

Intersection Summary					
HCM 2000 Control Delay	54.2	HCM 2000 Level of Service		D	
HCM 2000 Volume to Capacity ratio	1.00				
Actuated Cycle Length (s)	113.1	Sum of lost time (s)		18.0	
Intersection Capacity Utilization	89.8%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

Olsen-Chandler SP
19: S. River Road & Niblick Road

Cumulative Plus 1293 Unit Project AM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	723	268	121	1091	273	622	307	49	276	267	200
Future Volume (veh/h)	110	723	268	121	1091	273	622	307	49	276	267	200
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	120	786	291	132	1186	297	676	334	53	300	290	217
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	152	1349	602	160	1199	297	651	581	91	328	362	263
Arrive On Green	0.04	0.38	0.38	0.09	0.43	0.43	0.19	0.19	0.19	0.18	0.18	0.18
Sat Flow, veh/h	3456	3554	1585	1781	2819	697	3456	3073	483	1781	1963	1427
Grp Volume(v), veh/h	120	786	291	132	742	741	676	192	195	300	262	245
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1781	1777	1739	1728	1777	1779	1781	1777	1613
Q Serve(g_s), s	3.9	20.1	9.1	8.3	47.0	48.5	21.5	11.2	11.4	18.8	16.1	16.7
Cycle Q Clear(g_c), s	3.9	20.1	9.1	8.3	47.0	48.5	21.5	11.2	11.4	18.8	16.1	16.7
Prop In Lane	1.00		1.00	1.00		0.40	1.00		0.27	1.00		0.88
Lane Grp Cap(c), veh/h	152	1349	602	160	756	740	651	336	336	328	328	298
V/C Ratio(X)	0.79	0.58	0.48	0.83	0.98	1.00	1.04	0.57	0.58	0.92	0.80	0.82
Avail Cap(c_a), veh/h	152	1349	602	201	756	740	651	408	409	348	421	382
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.0	28.2	8.7	51.0	32.3	32.8	46.3	42.0	42.1	45.7	44.5	44.7
Incr Delay (d2), s/veh	24.2	0.6	0.6	19.7	28.3	33.5	45.4	1.5	1.6	27.1	8.1	10.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	8.3	2.9	4.5	24.9	26.0	13.1	4.9	5.0	10.6	7.6	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	78.2	28.8	9.3	70.8	60.6	66.3	91.6	43.6	43.7	72.8	52.6	55.6
LnGrp LOS	E	C	A	E	E	F	F	D	D	E	D	E
Approach Vol, veh/h		1197			1615			1063			807	
Approach Delay, s/veh		29.0			64.0			74.2			61.0	
Approach LOS		C			E			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.7	47.8	26.0	25.5	9.5	53.0	25.5	26.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	12.9	40.6	21.5	27.0	5.0	48.5	22.3	26.2
Max Q Clear Time (g_c+I1), s	10.3	22.1	23.5	18.7	5.9	50.5	20.8	13.4
Green Ext Time (p_c), s	0.1	6.0	0.0	1.9	0.0	0.0	0.1	1.7

Intersection Summary			
HCM 6th Ctrl Delay	56.9		
HCM 6th LOS	E		

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	392	236	13	910	413	7
v/c Ratio	0.54	0.32	0.04	0.66	0.67	0.01
Control Delay	14.6	3.2	10.3	14.5	19.4	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.6	3.2	10.3	14.5	19.4	8.8
Queue Length 50th (ft)	69	0	2	88	81	1
Queue Length 95th (ft)	182	35	12	198	208	7
Internal Link Dist (ft)	1629			570	669	
Turn Bay Length (ft)			75			50
Base Capacity (vph)	1427	1235	667	2711	1264	1133
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.19	0.02	0.34	0.33	0.01

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	361	217	12	837	380	6
Future Volume (vph)	361	217	12	837	380	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1845	1532	1749	3505	1752	1568
Flt Permitted	1.00	1.00	0.47	1.00	0.95	1.00
Satd. Flow (perm)	1845	1532	864	3505	1752	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	392	236	13	910	413	7
RTOR Reduction (vph)	0	142	0	0	0	3
Lane Group Flow (vph)	392	94	13	910	413	4
Confl. Peds. (#/hr)		4	4		1	
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Turn Type	NA	Perm	Perm	NA	Perm	Prot
Protected Phases	2			6		8
Permitted Phases		2	6		8	
Actuated Green, G (s)	17.7	17.7	17.7	17.7	15.9	15.9
Effective Green, g (s)	17.7	17.7	17.7	17.7	15.9	15.9
Actuated g/C Ratio	0.40	0.40	0.40	0.40	0.36	0.36
Clearance Time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	735	610	344	1397	627	561
v/s Ratio Prot	0.21			c0.26		0.00
v/s Ratio Perm		0.06	0.02		c0.24	
v/c Ratio	0.53	0.15	0.04	0.65	0.66	0.01
Uniform Delay, d1	10.2	8.6	8.2	10.8	12.0	9.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	0.0	0.0	0.8	1.9	0.0
Delay (s)	10.6	8.6	8.2	11.7	13.9	9.2
Level of Service	B	A	A	B	B	A
Approach Delay (s)	9.8			11.6	13.8	
Approach LOS	A			B	B	

Intersection Summary				
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	44.4	Sum of lost time (s)	10.8
Intersection Capacity Utilization	53.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	361	217	12	837	380	6
Future Volume (veh/h)	361	217	12	837	380	6
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.99	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	392	236	13	910	413	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	732	617	395	1390	508	452
Arrive On Green	0.39	0.39	0.39	0.39	0.29	0.29
Sat Flow, veh/h	1856	1565	790	3618	1767	1572
Grp Volume(v), veh/h	392	236	13	910	413	7
Grp Sat Flow(s),veh/h/ln	1856	1565	790	1763	1767	1572
Q Serve(g_s), s	5.5	3.7	0.4	7.2	7.4	0.1
Cycle Q Clear(g_c), s	5.5	3.7	5.9	7.2	7.4	0.1
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	732	617	395	1390	508	452
V/C Ratio(X)	0.54	0.38	0.03	0.65	0.81	0.02
Avail Cap(c_a), veh/h	1836	1548	866	3488	1592	1417
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.9	7.3	10.2	8.4	11.2	8.7
Incr Delay (d2), s/veh	0.2	0.1	0.0	0.2	1.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.7	0.1	1.5	2.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.1	7.5	10.2	8.6	12.5	8.7
LnGrp LOS	A	A	B	A	B	A
Approach Vol, veh/h	628			923	420	
Approach Delay, s/veh	7.9			8.6	12.4	
Approach LOS	A			A	B	

Timer - Assigned Phs	2	6	8
Phs Duration (G+Y+Rc), s	18.8	18.8	15.2
Change Period (Y+Rc), s	5.4	5.4	5.4
Max Green Setting (Gmax), s	33.6	33.6	30.6
Max Q Clear Time (g_c+I1), s	7.5	9.2	9.4
Green Ext Time (p_c), s	1.8	4.2	0.6

Intersection Summary	
HCM 6th Ctrl Delay	9.2
HCM 6th LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	265	102	7	782	0	61	0	12	0	0	5
Future Volume (Veh/h)	0	265	102	7	782	0	61	0	12	0	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	288	111	8	850	0	66	0	13	0	0	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									4			
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		650										
pX, platoon unblocked				0.84			0.84	0.84	0.84	0.84	0.84	
vC, conflicting volume	850			399			790	1210	344	1216	1265	425
vC1, stage 1 conf vol							344	344		866	866	
vC2, stage 2 conf vol							446	866		350	399	
vCu, unblocked vol	850			194			657	1155	128	1163	1221	425
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			87	100	98	100	100	99
cM capacity (veh/h)	784			1160			492	337	757	291	330	578

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	399	433	425	79	5
Volume Left	0	8	0	66	0
Volume Right	111	0	0	13	5
cSH	784	1160	1700	589	578
Volume to Capacity	0.00	0.01	0.25	0.13	0.01
Queue Length 95th (ft)	0	1	0	12	1
Control Delay (s)	0.0	0.2	0.0	12.8	11.3
Lane LOS		A		B	B
Approach Delay (s)	0.0	0.1		12.8	11.3
Approach LOS				B	B

Intersection Summary					
Average Delay	0.9				
Intersection Capacity Utilization	43.2%	ICU Level of Service		A	
Analysis Period (min)	15				

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	265	102	7	782	0	61	0	12	0	0	5
Future Vol, veh/h	0	265	102	7	782	0	61	0	12	0	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	288	111	8	850	0	66	0	13	0	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	850	0	0	399	0	0	785	1210	344	1216	1265	425
Stage 1	-	-	-	-	-	-	344	344	-	866	866	-
Stage 2	-	-	-	-	-	-	441	866	-	350	399	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.23	7.33	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.519	4.019	3.319
Pot Cap-1 Maneuver	786	-	-	1158	-	-	296	182	698	147	169	578
Stage 1	-	-	-	-	-	-	671	636	-	315	369	-
Stage 2	-	-	-	-	-	-	566	369	-	666	601	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	786	-	-	1158	-	-	290	180	698	143	167	578
Mov Cap-2 Maneuver	-	-	-	-	-	-	470	327	-	286	322	-
Stage 1	-	-	-	-	-	-	671	636	-	315	364	-
Stage 2	-	-	-	-	-	-	553	364	-	654	601	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	13.3	11.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	470	698	786	-	-	1158	-	-	578
HCM Lane V/C Ratio	0.141	0.019	-	-	-	0.007	-	-	0.009
HCM Control Delay (s)	13.9	10.3	0	-	-	8.1	0.1	-	11.3
HCM Lane LOS	B	B	A	-	-	A	A	-	B
HCM 95th %tile Q(veh)	0.5	0.1	0	-	-	0	-	-	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Traffic Volume (veh/h)	80	106	86	23	246	82	230	190	37	38	152	249
Future Volume (veh/h)	80	106	86	23	246	82	230	190	37	38	152	249
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	87	115	93	25	267	89	250	207	40	41	165	271
Approach Volume (veh/h)		295			381			497			477	
Crossing Volume (veh/h)		231			544			243			542	
High Capacity (veh/h)		1156			901			1145			903	
High v/c (veh/h)		0.26			0.42			0.43			0.53	
Low Capacity (veh/h)		953			726			943			727	
Low v/c (veh/h)		0.31			0.52			0.53			0.66	

Intersection Summary					
Maximum v/c High		0.53			
Maximum v/c Low		0.66			
Intersection Capacity Utilization		98.1%	ICU Level of Service		F

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	10.8
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	295	381	497	477
Demand Flow Rate, veh/h	301	389	507	486
Vehicles Circulating, veh/h	235	555	248	552
Vehicles Exiting, veh/h	803	200	288	391
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	6.1	11.7	8.8	15.0
Approach LOS	A	B	A	C

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	301	389	507	486
Cap Entry Lane, veh/h	1086	783	1071	786
Entry HV Adj Factor	0.979	0.979	0.980	0.981
Flow Entry, veh/h	295	381	497	477
Cap Entry, veh/h	1063	767	1050	771
V/C Ratio	0.277	0.497	0.473	0.618
Control Delay, s/veh	6.1	11.7	8.8	15.0
LOS	A	B	A	C
95th %tile Queue, veh	1	3	3	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	17	5	24	1	17	19	40	275	1	9	163	57
Future Volume (vph)	17	5	24	1	17	19	40	275	1	9	163	57
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	5	26	1	18	21	43	299	1	10	177	62

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	49	40	343	249
Volume Left (vph)	18	1	43	10
Volume Right (vph)	26	21	1	62
Hadj (s)	-0.11	-0.17	0.16	-0.01
Departure Headway (s)	5.2	5.2	4.6	4.5
Degree Utilization, x	0.07	0.06	0.44	0.31
Capacity (veh/h)	610	612	766	765
Control Delay (s)	8.6	8.5	11.1	9.6
Approach Delay (s)	8.6	8.5	11.1	9.6
Approach LOS	A	A	B	A

Intersection Summary				
Delay	10.2			
Level of Service	B			
Intersection Capacity Utilization	47.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	10.2
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	17	5	24	1	17	19	40	275	1	9	163	57
Future Vol, veh/h	17	5	24	1	17	19	40	275	1	9	163	57
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	8	8	8	8	8	8	8	8	8	8	8	8
Mvmt Flow	18	5	26	1	18	21	43	299	1	10	177	62
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.6	8.5	11.1	9.6
HCM LOS	A	A	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	13%	37%	3%	4%
Vol Thru, %	87%	11%	46%	71%
Vol Right, %	0%	52%	51%	25%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	316	46	37	229
LT Vol	40	17	1	9
Through Vol	275	5	17	163
RT Vol	1	24	19	57
Lane Flow Rate	343	50	40	249
Geometry Grp	1	1	1	1
Degree of Util (X)	0.435	0.072	0.057	0.311
Departure Headway (Hd)	4.558	5.185	5.139	4.501
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	790	688	694	799
Service Time	2.588	3.238	3.193	2.533
HCM Lane V/C Ratio	0.434	0.073	0.058	0.312
HCM Control Delay	11.1	8.6	8.5	9.6
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	2.2	0.2	0.2	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Volume (veh/h)	85	37	15	0	89	25	30	123	1	7	77	117
Future Volume (Veh/h)	85	37	15	0	89	25	30	123	1	7	77	117
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	92	40	16	0	97	27	33	134	1	8	84	127
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	124			56			512	356	48	410	350	110
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	124			56			512	356	48	410	350	110
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			90	75	100	98	84	86
cM capacity (veh/h)	1450			1536			340	531	1015	420	534	937

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	148	124	168	8	211
Volume Left	92	0	33	8	0
Volume Right	16	27	1	0	127
cSH	1450	1536	479	420	721
Volume to Capacity	0.06	0.00	0.35	0.02	0.29
Queue Length 95th (ft)	5	0	39	1	30
Control Delay (s)	4.9	0.0	16.5	13.7	12.0
Lane LOS	A		C	B	B
Approach Delay (s)	4.9	0.0	16.5	12.1	
Approach LOS			C	B	

Intersection Summary				
Average Delay	9.3			
Intersection Capacity Utilization	43.7%	ICU Level of Service		A
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	9.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↰	↕	
Traffic Vol, veh/h	85	37	15	0	89	25	30	123	1	7	77	117
Future Vol, veh/h	85	37	15	0	89	25	30	123	1	7	77	117
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	92	40	16	0	97	27	33	134	1	8	84	127

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	124	0	0	56	0	0	448	356	48	411	351	111
Stage 1	-	-	-	-	-	-	232	232	-	111	111	-
Stage 2	-	-	-	-	-	-	216	124	-	300	240	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	1450	-	-	1536	-	-	518	567	1015	548	570	937
Stage 1	-	-	-	-	-	-	766	709	-	889	800	-
Stage 2	-	-	-	-	-	-	782	789	-	705	703	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1450	-	-	1536	-	-	375	530	1015	420	532	937
Mov Cap-2 Maneuver	-	-	-	-	-	-	375	530	-	420	532	-
Stage 1	-	-	-	-	-	-	715	662	-	830	800	-
Stage 2	-	-	-	-	-	-	605	789	-	525	657	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	4.7	0	16	12.2
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	492	1450	-	-	1536	-	-	420	720
HCM Lane V/C Ratio	0.34	0.064	-	-	-	-	-	0.018	0.293
HCM Control Delay (s)	16	7.7	0	-	0	-	-	13.7	12.1
HCM Lane LOS	C	A	A	-	A	-	-	B	B
HCM 95th %tile Q(veh)	1.5	0.2	-	-	0	-	-	0.1	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Right Turn Channelized						
Traffic Volume (veh/h)	8	166	144	21	123	56
Future Volume (veh/h)	8	166	144	21	123	56
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	180	157	23	134	61
Approach Volume (veh/h)	189		180			195
Crossing Volume (veh/h)	157		134			9
High Capacity (veh/h)	1225		1247			1375
High v/c (veh/h)	0.15		0.14			0.14
Low Capacity (veh/h)	1016		1036			1152
Low v/c (veh/h)	0.19		0.17			0.17

Intersection Summary			
Maximum v/c High	0.15		
Maximum v/c Low	0.19		
Intersection Capacity Utilization	39.3%	ICU Level of Service	A

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	4.3
Intersection LOS	A

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	189	180	195
Demand Flow Rate, veh/h	193	183	199
Vehicles Circulating, veh/h	160	137	9
Vehicles Exiting, veh/h	160	71	344
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	4.6	4.4	3.9
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	193	183	199
Cap Entry Lane, veh/h	1172	1200	1367
Entry HV Adj Factor	0.979	0.983	0.979
Flow Entry, veh/h	189	180	195
Cap Entry, veh/h	1148	1179	1338
V/C Ratio	0.165	0.153	0.146
Control Delay, s/veh	4.6	4.4	3.9
LOS	A	A	A
95th %tile Queue, veh	1	1	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	18	72	90	10	5	14
Future Volume (Veh/h)	18	72	90	10	5	14
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	78	98	11	5	15
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	109				222	104
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	109				222	104
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				99	98
cM capacity (veh/h)	1475				754	949

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	98	109	20
Volume Left	20	0	5
Volume Right	0	11	15
cSH	1475	1700	891
Volume to Capacity	0.01	0.06	0.02
Queue Length 95th (ft)	1	0	2
Control Delay (s)	1.6	0.0	9.1
Lane LOS	A		A
Approach Delay (s)	1.6	0.0	9.1
Approach LOS			A

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	21.5%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	18	72	90	10	5	14
Future Vol, veh/h	18	72	90	10	5	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	20	78	98	11	5	15

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	109	0	-	0	222	104
Stage 1	-	-	-	-	104	-
Stage 2	-	-	-	-	118	-
Critical Hdwy	4.13	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.227	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	1475	-	-	-	764	948
Stage 1	-	-	-	-	918	-
Stage 2	-	-	-	-	905	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1475	-	-	-	753	948
Mov Cap-2 Maneuver	-	-	-	-	753	-
Stage 1	-	-	-	-	905	-
Stage 2	-	-	-	-	905	-

Approach	EB	WB	SB
HCM Control Delay, s	1.5	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1475	-	-	-	888
HCM Lane V/C Ratio	0.013	-	-	-	0.023
HCM Control Delay (s)	7.5	0	-	-	9.2
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	334	1643	1633	162	159	302
v/c Ratio	0.64	0.50	0.89	0.18	0.62	0.57
Control Delay	57.4	0.5	32.1	4.6	63.5	36.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.4	0.5	32.1	4.6	63.5	36.9
Queue Length 50th (ft)	128	0	565	11	118	180
Queue Length 95th (ft)	224	0	877	51	235	336
Internal Link Dist (ft)		1017	748		574	
Turn Bay Length (ft)	345			330	450	
Base Capacity (vph)	835	3312	2513	1155	430	830
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.50	0.65	0.14	0.37	0.36

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	331	1627	1617	160	157	299
Future Volume (vph)	331	1627	1617	160	157	299
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0	7.3	7.3	4.2	3.7
Lane Util. Factor	0.97	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3213	3312	3312	1482	1656	1482
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3213	3312	3312	1482	1656	1482
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	334	1643	1633	162	159	302
RTOR Reduction (vph)	0	0	0	57	0	12
Lane Group Flow (vph)	334	1643	1633	105	159	290
Heavy Vehicles (%)	9%	9%	9%	9%	9%	9%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	8	Free!	6		7!	4
Permitted Phases				6		4
Actuated Green, G (s)	20.0	121.5	67.5	67.5	19.0	43.0
Effective Green, g (s)	20.0	121.5	67.5	67.5	19.0	43.0
Actuated g/C Ratio	0.16	1.00	0.56	0.56	0.16	0.35
Clearance Time (s)	3.5		7.3	7.3	4.2	3.7
Vehicle Extension (s)	3.0		4.0	4.0	3.5	3.0
Lane Grp Cap (vph)	528	3312	1840	823	258	524
v/s Ratio Prot	c0.10	0.50	c0.49		c0.10	0.20
v/s Ratio Perm				0.07		
v/c Ratio	0.63	0.50	0.89	0.13	0.62	0.55
Uniform Delay, d1	47.3	0.0	23.7	12.9	47.8	31.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.5	0.5	5.8	0.1	4.5	1.3
Delay (s)	49.8	0.5	29.4	13.0	52.4	32.8
Level of Service	D	A	C	B	D	C
Approach Delay (s)		8.9	28.0		39.6	
Approach LOS		A	C		D	

Intersection Summary				
HCM 2000 Control Delay	20.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	121.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

HCM 6th Edition methodology cannot be performed with phasing conflicts.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	392	1073	374	405	1134	216	377	505	271	356	320
v/c Ratio	0.98	0.87	0.48	0.95	0.90	0.31	0.85	0.61	0.73	0.88	0.63
Control Delay	104.8	52.9	5.0	97.4	55.1	4.8	82.0	52.1	77.9	78.8	23.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	104.8	52.9	5.0	97.4	55.1	4.8	82.0	52.1	77.9	78.8	23.4
Queue Length 50th (ft)	~211	521	0	209	556	0	192	225	136	340	92
Queue Length 95th (ft)	#372	628	68	#388	679	54	#330	322	205	#539	217
Internal Link Dist (ft)		1323			2509			853		451	
Turn Bay Length (ft)	225		485	125		390	160		140		
Base Capacity (vph)	400	1606	904	425	1606	821	445	920	445	495	575
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.67	0.41	0.95	0.71	0.26	0.85	0.55	0.61	0.72	0.56

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	380	1041	363	393	1100	210	366	375	114	263	345	310
Future Volume (vph)	380	1041	363	393	1100	210	366	375	114	263	345	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3273	3374	1488	3273	3374	1488	3273	3245		3273	1776	1509
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3273	3374	1488	3273	3374	1488	3273	3245		3273	1776	1509
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	392	1073	374	405	1134	216	377	387	118	271	356	320
RTOR Reduction (vph)	0	0	237	0	0	135	0	16	0	0	0	165
Lane Group Flow (vph)	392	1073	137	405	1134	81	377	489	0	271	356	155
Confl. Peds. (#/hr)			1			1			2			
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	18.3	54.4	54.4	19.5	55.6	55.6	20.3	37.5		17.0	34.2	34.2
Effective Green, g (s)	18.3	54.4	54.4	19.5	55.6	55.6	20.3	37.5		17.0	34.2	34.2
Actuated g/C Ratio	0.12	0.37	0.37	0.13	0.37	0.37	0.14	0.25		0.11	0.23	0.23
Clearance Time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	401	1231	543	428	1259	555	445	816		373	407	346
v/s Ratio Prot	c0.12	0.32		c0.12	c0.34		c0.12	c0.15		0.08	c0.20	
v/s Ratio Perm			0.09			0.05						0.10
v/c Ratio	0.98	0.87	0.25	0.95	0.90	0.15	0.85	0.60		0.73	0.87	0.45
Uniform Delay, d1	65.1	44.0	33.1	64.2	44.1	31.0	62.8	49.1		63.8	55.3	49.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	38.6	7.0	0.2	29.7	9.1	0.1	13.9	1.2		6.9	18.4	0.9
Delay (s)	103.7	51.1	33.3	93.9	53.2	31.1	76.7	50.3		70.7	73.8	50.2
Level of Service	F	D	C	F	D	C	E	D		E	E	D
Approach Delay (s)		58.7			59.8			61.6			64.9	
Approach LOS		E			E			E			E	

Intersection Summary				
HCM 2000 Control Delay	60.6	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	0.90			
Actuated Cycle Length (s)	149.0	Sum of lost time (s)	20.6	
Intersection Capacity Utilization	87.0%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	380	1041	363	393	1100	210	366	375	114	263	345	310
Future Volume (veh/h)	380	1041	363	393	1100	210	366	375	114	263	345	310
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	392	1073	374	405	1134	216	377	387	118	271	356	320
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	397	1241	553	397	1316	586	420	675	203	321	416	353
Arrive On Green	0.12	0.36	0.36	0.12	0.39	0.39	0.13	0.26	0.26	0.10	0.23	0.23
Sat Flow, veh/h	3319	3413	1521	3319	3413	1521	3319	2583	778	3319	1796	1522
Grp Volume(v), veh/h	392	1073	374	405	1134	216	377	254	251	271	356	320
Grp Sat Flow(s),veh/h/ln	1659	1706	1521	1659	1706	1521	1659	1706	1654	1659	1796	1522
Q Serve(g_s), s	17.8	43.9	21.3	18.0	46.0	15.3	16.9	19.5	19.9	12.1	28.6	30.8
Cycle Q Clear(g_c), s	17.8	43.9	21.3	18.0	46.0	15.3	16.9	19.5	19.9	12.1	28.6	30.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.47	1.00		1.00
Lane Grp Cap(c), veh/h	397	1241	553	397	1316	586	420	446	432	321	416	353
V/C Ratio(X)	0.99	0.86	0.68	1.02	0.86	0.37	0.90	0.57	0.58	0.84	0.86	0.91
Avail Cap(c_a), veh/h	397	1587	707	397	1587	707	441	465	450	441	489	415
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	66.2	44.5	18.9	66.3	42.6	33.1	64.8	48.2	48.4	66.9	55.4	56.3
Incr Delay (d2), s/veh	41.8	4.3	1.8	50.5	4.4	0.4	20.3	1.5	1.7	10.5	12.3	21.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.6	18.4	7.6	10.2	19.2	5.7	8.2	8.4	8.3	5.5	14.2	13.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	108.0	48.7	20.6	116.8	47.0	33.5	85.1	49.8	50.1	77.4	67.8	77.6
LnGrp LOS	F	D	C	F	D	C	F	D	D	E	E	E
Approach Vol, veh/h		1839			1755			882			947	
Approach Delay, s/veh		55.6			61.4			65.0			73.8	
Approach LOS		E			E			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	25.3	62.0	23.0	40.2	22.0	65.3	18.5	44.7
Change Period (Y+Rc), s	7.3	* 7.3	4.0	5.3	4.0	7.3	4.0	5.3
Max Green Setting (Gmax), s	18.0	* 70	20.0	41.0	18.0	70.0	20.0	41.0
Max Q Clear Time (g_c+I1), s	20.0	45.9	18.9	32.8	19.8	48.0	14.1	21.9
Green Ext Time (p_c), s	0.0	8.8	0.2	2.1	0.0	8.3	0.5	2.7

Intersection Summary	
HCM 6th Ctrl Delay	62.2
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↱		↱
Traffic Volume (veh/h)	0	1554	1603	20	0	100
Future Volume (Veh/h)	0	1554	1603	20	0	100
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	1653	1705	21	0	106
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1726				2532	852
vC1, stage 1 conf vol					1705	
vC2, stage 2 conf vol					826	
vCu, unblocked vol	1726				2532	852
tC, single (s)	4.3				7.0	7.1
tC, 2 stage (s)					6.0	
tF (s)	2.3				3.6	3.4
p0 queue free %	100				100	63
cM capacity (veh/h)	329				113	287

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	SB 1
Volume Total	826	826	852	852	21	106
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	21	106
cSH	1700	1700	1700	1700	1700	287
Volume to Capacity	0.49	0.49	0.50	0.50	0.01	0.37
Queue Length 95th (ft)	0	0	0	0	0	41
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	24.7
Lane LOS						C
Approach Delay (s)	0.0		0.0			24.7
Approach LOS						C

Intersection Summary			
Average Delay		0.8	
Intersection Capacity Utilization		57.2%	ICU Level of Service
Analysis Period (min)		15	

Intersection	
Int Delay, s/veh	0.8

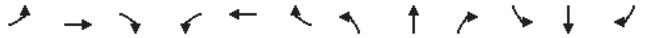
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↱		↱
Traffic Vol, veh/h	0	1554	1603	20	0	100
Future Vol, veh/h	0	1554	1603	20	0	100
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	165	-	-
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	0	1653	1705	21	0	106

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	853
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.4
Pot Cap-1 Maneuver	0	-	-	-	0	287
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	287
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	24.7
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	287
HCM Lane V/C Ratio	-	-	-	0.371
HCM Control Delay (s)	-	-	-	24.7
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	1.6

Reso A - Exhibit C2 (EIR Technical Appendix)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1521	33	3	1563	0	50	0	6	0	0	10
Future Volume (Veh/h)	0	1521	33	3	1563	0	50	0	6	0	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	1568	34	3	1611	0	52	0	6	0	0	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									1			
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1611			1602			2390	3185	784	2404	3219	806
vC1, stage 1 conf vol							1568	1568		1617	1617	
vC2, stage 2 conf vol							822	1617		787	1602	
vCu, unblocked vol	1611			1602			2390	3185	784	2404	3219	806
tC, single (s)	4.3			4.3			7.7	6.7	7.1	7.7	6.7	7.1
tC, 2 stage (s)							6.7	5.7		6.7	5.7	
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			99			46	100	98	100	100	97
cM capacity (veh/h)	358			361			96	100	315	90	97	305

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	784	784	34	3	1074	537	58	10
Volume Left	0	0	0	0	3	0	0	52	0
Volume Right	0	0	0	34	0	0	0	6	10
cSH	1700	1700	1700	1700	361	1700	1700	106	305
Volume to Capacity	0.00	0.46	0.46	0.02	0.01	0.63	0.32	0.55	0.03
Queue Length 95th (ft)	0	0	0	0	1	0	0	64	3
Control Delay (s)	0.0	0.0	0.0	0.0	15.1	0.0	0.0	74.5	17.2
Lane LOS					C			F	C
Approach Delay (s)	0.0				0.0			74.5	17.2
Approach LOS								F	C

Intersection Summary				
Average Delay		1.4		
Intersection Capacity Utilization		59.3%	ICU Level of Service	B
Analysis Period (min)		15		

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1521	33	3	1563	0	50	0	6	0	0	10
Future Vol, veh/h	0	1521	33	3	1563	0	50	0	6	0	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	275	305	-	-	-	-	25	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	12	12	12	12	12	12	12	12	12	12	12	12
Mvmt Flow	0	1568	34	3	1611	0	52	0	6	0	0	10

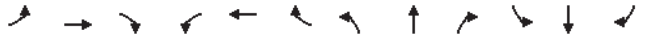
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1611	0	0	1602	0	0	2380	3185	784	2401	3219	806
Stage 1	-	-	-	-	-	-	1568	1568	-	1617	1617	-
Stage 2	-	-	-	-	-	-	812	1617	-	784	1602	-
Critical Hdwy	4.34	-	-	4.34	-	-	7.74	6.74	7.14	7.74	6.74	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	6.74	5.74	-	6.74	5.74	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.74	5.74	-	6.74	5.74	-
Follow-up Hdwy	2.32	-	-	2.32	-	-	3.62	4.12	3.42	3.62	4.12	3.42
Pot Cap-1 Maneuver	358	-	-	361	-	-	~ 16	8	315	15	8	305
Stage 1	-	-	-	-	-	-	105	154	-	98	146	-
Stage 2	-	-	-	-	-	-	318	146	-	331	148	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	358	-	-	361	-	-	~ 15	8	315	15	8	305
Mov Cap-2 Maneuver	-	-	-	-	-	-	94	97	-	89	94	-
Stage 1	-	-	-	-	-	-	105	154	-	98	145	-
Stage 2	-	-	-	-	-	-	305	145	-	325	148	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	75.3	17.2
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	94	315	358	-	-	361	-	-	305
HCM Lane V/C Ratio	0.548	0.02	-	-	-	0.009	-	-	0.034
HCM Control Delay (s)	82.3	16.7	0	-	-	15.1	-	-	17.2
HCM Lane LOS	F	C	A	-	-	C	-	-	C
HCM 95th %tile Q(veh)	2.5	0.1	0	-	-	0	-	-	0.1

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Reso A - Exhibit C2 (EIR Technical Appendix)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized			MOYes									
Traffic Volume (veh/h)	300	350	150	325	280	180	62	447	357	100	628	300
Future Volume (veh/h)	300	350	150	325	280	180	62	447	357	100	628	300
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	323	376	161	349	301	194	67	481	384	108	675	323
Approach Volume (veh/h)		699			844			932			1106	
Crossing Volume (veh/h)		1132			871			807			717	
High Capacity (veh/h)		558			692			729			784	
High v/c (veh/h)		1.25			1.22			1.28			1.41	
Low Capacity (veh/h)		428			542			575			623	
Low v/c (veh/h)		1.63			1.56			1.62			1.78	

Intersection Summary												
Maximum v/c High			1.41									
Maximum v/c Low			1.78									
Intersection Capacity Utilization			123.0%		ICU Level of Service				H			

Intersection	
Intersection Delay, s/veh	38.7
Intersection LOS	E

Approach	EB	WB	NB	SB
Entry Lanes	2	2	2	2
Conflicting Circle Lanes	1	2	2	2
Adj Approach Flow, veh/h	860	844	932	1106
Demand Flow Rate, veh/h	869	852	942	1117
Vehicles Circulating, veh/h	1143	880	815	724
Vehicles Exiting, veh/h	698	877	1034	1008
Ped Vol Crossing Leg, #/h	1	1	1	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	21.6	20.7	27.0	75.7
Approach LOS	C	C	D	F

Lane	Left	Right	Bypass	Left	Right	Left	Right	Left	Right
Designated Moves	LT	TR	R	L	TR	LT	R	LT	R
Assumed Moves	LT	TR	R	L	TR	LT	R	LT	R
RT Channelized			Free						
Lane Util	0.470	0.530		0.413	0.587	0.588	0.412	0.708	0.292
Follow-Up Headway, s	2.535	2.535		2.667	2.535	2.667	2.535	2.667	2.535
Critical Headway, s	4.544	4.544	163	4.645	4.328	4.645	4.328	4.645	4.328
Entry Flow, veh/h	332	374	1919	352	500	554	388	791	326
Cap Entry Lane, veh/h	502	502	0.990	601	672	638	710	694	767
Entry HV Adj Factor	0.990	0.991	161	0.991	0.990	0.990	0.990	0.990	0.991
Flow Entry, veh/h	329	371	1900	349	495	548	384	783	323
Cap Entry, veh/h	497	497	0.085	596	665	631	703	687	760
V/C Ratio	0.662	0.745	0.0	0.586	0.744	0.869	0.546	1.141	0.425
Control Delay, s/veh	23.6	29.2	A	17.2	23.2	36.2	13.8	102.6	10.3
LOS	C	D	0	C	C	E	B	F	B
95th %tile Queue, veh	5	6		4	7	10	3	24	2

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	117	15	20	105	0	15	1	15	0	0	0
Future Volume (Veh/h)	1	117	15	20	105	0	15	1	15	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	127	16	22	114	0	16	1	16	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	114			143			295	295	135	312	303	114
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	114			143			295	295	135	312	303	114
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			98	100	98	100	100	100
cM capacity (veh/h)	1463			1427			645	603	909	617	597	933

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	144	136	33	0
Volume Left	1	22	16	0
Volume Right	16	0	16	0
cSH	1463	1427	749	1700
Volume to Capacity	0.00	0.02	0.04	0.00
Queue Length 95th (ft)	0	1	3	0
Control Delay (s)	0.1	1.3	10.0	0.0
Lane LOS	A	A	B	A
Approach Delay (s)	0.1	1.3	10.0	0.0
Approach LOS			B	A

Intersection Summary					
Average Delay			1.7		
Intersection Capacity Utilization			27.1%	ICU Level of Service	A
Analysis Period (min)			15		

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	117	15	20	105	0	15	1	15	0	0	0
Future Vol, veh/h	1	117	15	20	105	0	15	1	15	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	1	127	16	22	114	0	16	1	16	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	114	0	0	143	0	0	295	295	135	304	303	114
Stage 1	-	-	-	-	-	-	137	137	-	158	158	-
Stage 2	-	-	-	-	-	-	158	158	-	146	145	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	1463	-	-	1427	-	-	653	613	909	644	607	933
Stage 1	-	-	-	-	-	-	861	779	-	840	763	-
Stage 2	-	-	-	-	-	-	840	763	-	852	773	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1463	-	-	1427	-	-	645	603	909	623	597	933
Mov Cap-2 Maneuver	-	-	-	-	-	-	645	603	-	623	597	-
Stage 1	-	-	-	-	-	-	860	778	-	839	751	-
Stage 2	-	-	-	-	-	-	827	751	-	835	772	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.2	10	0
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	749	1463	-	-	1427	-	-	-
HCM Lane V/C Ratio	0.045	0.001	-	-	0.015	-	-	-
HCM Control Delay (s)	10	7.5	0	-	7.6	0	-	0
HCM Lane LOS	B	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	21	551	309	510	762	7	54	319	387	396	117
v/c Ratio	0.23	0.75	0.78	0.61	0.68	0.04	0.30	0.72	0.79	0.80	0.21
Control Delay	58.6	45.6	53.6	27.7	5.5	45.6	50.3	15.6	47.3	47.5	4.8
Queue Delay	0.0	0.0	0.1	4.4	0.8	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.6	45.6	53.8	32.2	6.3	45.6	50.3	15.6	47.3	47.5	4.8
Queue Length 50th (ft)	14	184	199	240	0	5	36	0	248	253	0
Queue Length 95th (ft)	44	277	#358	463	93	19	76	85	#458	#467	34
Internal Link Dist (ft)		346		307			744			674	
Turn Bay Length (ft)	65		125			140		165	150		185
Base Capacity (vph)	93	885	493	913	1147	337	355	560	593	602	633
Starvation Cap Reductn	0	0	9	320	147	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.62	0.64	0.86	0.76	0.02	0.15	0.57	0.65	0.66	0.18

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	486	32	290	479	716	7	51	300	638	98	110
Future Volume (vph)	20	486	32	290	479	716	7	51	300	638	98	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1787	3535		1787	1881	1557	1787	1881	1599	1698	1724	1560
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00
Satd. Flow (perm)	1787	3535		1787	1881	1557	1787	1881	1599	1698	1724	1560
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	21	517	34	309	510	762	7	54	319	679	104	117
RTOR Reduction (vph)	0	4	0	0	0	433	0	0	290	0	0	84
Lane Group Flow (vph)	21	547	0	309	510	329	7	54	29	387	396	33
Confl. Peds. (#/hr)			4			2						2
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	1.7	23.7		22.0	44.0	44.0	9.4	9.4	9.4	28.8	28.8	28.8
Effective Green, g (s)	1.7	23.7		22.0	44.0	44.0	9.4	9.4	9.4	28.8	28.8	28.8
Actuated g/C Ratio	0.02	0.23		0.22	0.43	0.43	0.09	0.09	0.09	0.28	0.28	0.28
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	29	822		385	812	672	164	173	147	479	487	440
v/s Ratio Prot	0.01	0.15		c0.17	c0.27		0.00	c0.03		0.23	c0.23	
v/s Ratio Perm						0.21			0.02			0.02
v/c Ratio	0.72	0.67		0.80	0.63	0.49	0.04	0.31	0.20	0.81	0.81	0.08
Uniform Delay, d1	49.9	35.5		37.9	22.6	20.9	42.1	43.2	42.8	34.0	34.0	26.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	61.8	2.0		11.5	1.5	0.6	0.1	1.0	0.7	9.7	10.0	0.1
Delay (s)	111.7	37.5		49.3	24.1	21.4	42.3	44.3	43.4	43.6	44.0	26.9
Level of Service	F	D		D	C	C	D	D	D	D	D	C
Approach Delay (s)		40.3			27.7			43.5			41.6	
Approach LOS		D			C			D			D	

Intersection Summary

HCM 2000 Control Delay	35.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	101.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
8: Riverside Ave & 13th Street

Cumulative Plus 1293 Unit Project PM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	486	32	290	479	716	7	51	300	638	98	110
Future Volume (veh/h)	20	486	32	290	479	716	7	51	300	638	98	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	21	517	34	309	510	762	7	54	319	753	0	117
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	39	823	54	342	774	640	294	309	262	866	0	384
Arrive On Green	0.02	0.24	0.24	0.19	0.41	0.41	0.16	0.16	0.16	0.24	0.00	0.24
Sat Flow, veh/h	1795	3410	224	1795	1885	1559	1795	1885	1598	3591	0	1591
Grp Volume(v), veh/h	21	271	280	309	510	762	7	54	319	753	0	117
Grp Sat Flow(s),veh/h/ln	1795	1791	1843	1795	1885	1559	1795	1885	1598	1795	0	1591
Q Serve(g_s), s	1.3	15.0	15.0	18.6	24.2	45.4	0.4	2.7	18.1	22.3	0.0	6.7
Cycle Q Clear(g_c), s	1.3	15.0	15.0	18.6	24.2	45.4	0.4	2.7	18.1	22.3	0.0	6.7
Prop In Lane	1.00		0.12	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	39	432	445	342	774	640	294	309	262	866	0	384
V/C Ratio(X)	0.54	0.63	0.63	0.90	0.66	1.19	0.02	0.17	1.22	0.87	0.00	0.30
Avail Cap(c_a), veh/h	81	432	445	430	774	640	294	309	262	1088	0	482
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	53.6	37.5	37.5	43.7	26.3	32.6	38.8	39.8	46.2	40.3	0.0	34.3
Incr Delay (d2), s/veh	11.4	2.9	2.8	18.9	2.1	100.6	0.0	0.3	128.3	6.4	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	6.9	7.2	10.0	11.1	34.4	0.2	1.3	16.4	10.4	0.0	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.9	40.3	40.3	62.7	28.4	133.2	38.8	40.1	174.5	46.7	0.0	34.8
LnGrp LOS	E	D	D	E	C	F	D	D	F	D	A	C
Approach Vol, veh/h		572			1581			380			870	
Approach Delay, s/veh		41.2			85.6			152.9			45.1	
Approach LOS		D			F			F			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	25.6	31.2		31.2	6.9	49.9		22.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	26.5	23.9		33.5	5.0	45.4		18.1				
Max Q Clear Time (g_c+I1), s	20.6	17.0		24.3	3.3	47.4		20.1				
Green Ext Time (p_c), s	0.5	1.9		2.4	0.0	0.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			75.3									
HCM 6th LOS			E									

Notes

User approved volume balancing among the lanes for turning movement.

Olsen-Chandler SP
9: Paso Robles Street & 13th Street

Cumulative Plus 1293 Unit Project PM
Queues

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	94	1435	30	1286	373	280	32	508	9	32
v/c Ratio	0.53	0.78	0.28	0.78	0.44	0.63	0.05	0.85	0.02	0.05
Control Delay	56.8	23.1	54.6	26.4	9.1	35.8	23.9	37.9	23.5	0.2
Queue Delay	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.8	24.5	54.6	26.4	9.1	35.8	23.9	37.9	23.5	0.2
Queue Length 50th (ft)	61	407	20	373	55	155	14	239	4	0
Queue Length 95th (ft)	#122	522	51	478	132	246	35	#418	15	0
Internal Link Dist (ft)		307		269			836			575
Turn Bay Length (ft)	120		220		145	130		110	95	
Base Capacity (vph)	202	2186	108	1980	969	586	795	749	586	749
Starvation Cap Reductn	0	518	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.86	0.28	0.65	0.38	0.48	0.04	0.68	0.02	0.04

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
9: Paso Robles Street & 13th Street

Cumulative Plus 1293 Unit Project PM
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	1295	40	28	1196	347	260	30	472	8	0	30
Future Volume (vph)	87	1295	40	28	1196	347	260	30	472	8	0	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	3555		1787	3574	1564	1787	1881	1599	1787	1599	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.74	1.00	1.00	0.74	1.00	
Satd. Flow (perm)	1787	3555		1787	3574	1564	1385	1881	1599	1385	1599	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	94	1392	43	30	1286	373	280	32	508	9	0	32
RTOR Reduction (vph)	0	2	0	0	0	123	0	0	87	0	22	0
Lane Group Flow (vph)	94	1433	0	30	1286	250	280	32	421	9	10	0
Confl. Peds. (#/hr)			5									
Confl. Bikes (#/hr)			1			2						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		
Actuated Green, G (s)	6.7	47.2		2.7	43.2	43.2	29.1	29.1	29.1	29.1	29.1	
Effective Green, g (s)	6.7	47.2		2.7	43.2	43.2	29.1	29.1	29.1	29.1	29.1	
Actuated g/C Ratio	0.07	0.51		0.03	0.47	0.47	0.31	0.31	0.31	0.31	0.31	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	129	1814		52	1669	730	435	591	503	435	503	
v/s Ratio Prot	c0.05	c0.40		0.02	0.36			0.02			0.01	
v/s Ratio Perm						0.16	0.20		c0.26	0.01		
v/c Ratio	0.73	0.79		0.58	0.77	0.34	0.64	0.05	0.84	0.02	0.02	
Uniform Delay, d1	42.0	18.6		44.3	20.5	15.6	27.2	22.1	29.5	21.9	21.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	18.5	2.4		14.6	2.3	0.3	3.3	0.0	11.5	0.0	0.0	
Delay (s)	60.5	21.0		58.9	22.8	15.9	30.5	22.1	41.0	21.9	21.9	
Level of Service	E	C		E	C	B	C	C	D	C	C	
Approach Delay (s)		23.4			21.9			36.7			21.9	
Approach LOS		C			C			D			C	

Intersection Summary				
HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	92.5	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	81.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Olsen-Chandler SP
9: Paso Robles Street & 13th Street

Cumulative Plus 1293 Unit Project PM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	1295	40	28	1196	347	260	30	472	8	0	30
Future Volume (veh/h)	87	1295	40	28	1196	347	260	30	472	8	0	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	94	1392	43	30	1286	0	280	32	508	9	0	32
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	121	1680	52	53	1562		542	653	553	372	0	553
Arrive On Green	0.07	0.47	0.47	0.03	0.44	0.00	0.35	0.35	0.35	0.35	0.00	0.35
Sat Flow, veh/h	1795	3544	109	1795	3582	1598	1388	1885	1598	872	0	1598
Grp Volume(v), veh/h	94	703	732	30	1286	0	280	32	508	9	0	32
Grp Sat Flow(s),veh/h/ln	1795	1791	1862	1795	1791	1598	1388	1885	1598	872	0	1598
Q Serve(g_s), s	4.6	30.5	30.6	1.5	28.4	0.0	15.1	1.0	27.4	0.6	0.0	1.2
Cycle Q Clear(g_c), s	4.6	30.5	30.6	1.5	28.4	0.0	16.3	1.0	27.4	1.6	0.0	1.2
Prop In Lane	1.00		0.06	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	121	849	883	53	1562		542	653	553	372	0	553
V/C Ratio(X)	0.78	0.83	0.83	0.57	0.82		0.52	0.05	0.92	0.02	0.00	0.06
Avail Cap(c_a), veh/h	190	1015	1056	102	1855		610	745	632	415	0	632
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.2	20.4	20.5	43.0	22.3	0.0	25.0	19.5	28.1	20.1	0.0	19.6
Incr Delay (d2), s/veh	10.3	4.9	4.9	9.3	2.7	0.0	0.8	0.0	17.2	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	13.0	13.6	0.8	11.8	0.0	4.9	0.4	12.5	0.1	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.5	25.4	25.3	52.3	25.0	0.0	25.8	19.5	45.4	20.1	0.0	19.6
LnGrp LOS	D	C	C	D	C		C	B	D	C	A	B
Approach Vol, veh/h		1529			1316	A		820			41	
Approach Delay, s/veh		27.0			25.6			37.7			19.7	
Approach LOS		C			C			D			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.1	47.1		35.6	10.5	43.7		35.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	50.9		35.5	9.5	46.5		35.5				
Max Q Clear Time (g_c+I1), s	3.5	32.6		3.6	6.6	30.4		29.4				
Green Ext Time (p_c), s	0.0	9.9		0.2	0.0	8.6		1.7				

Intersection Summary			
HCM 6th Ctrl Delay	28.8		
HCM 6th LOS	C		

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	508	1362	105	979	309	255	74	147	827
v/c Ratio	0.84	0.89	0.74	0.81	0.79	0.34	0.17	0.75	0.94dr
Control Delay	59.8	36.4	82.9	40.3	65.7	40.8	0.8	73.6	44.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.8	36.4	82.9	40.3	65.7	40.8	0.8	73.6	44.9
Queue Length 50th (ft)	197	469	81	353	122	89	0	111	226
Queue Length 95th (ft)	#273	577	#171	437	#187	129	1	#204	#345
Internal Link Dist (ft)		353		673		608			523
Turn Bay Length (ft)	295		235		140		130	225	
Base Capacity (vph)	653	1633	148	1278	410	791	460	217	940
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.83	0.71	0.77	0.75	0.32	0.16	0.68	0.88

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	483	879	415	100	777	153	294	242	70	140	286	500
Future Volume (vph)	483	879	415	100	777	153	294	242	70	140	286	500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.98		1.00	1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3467	3387		1787	3478		3467	3574	1599	1787	3205	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3467	3387		1787	3478		3467	3574	1599	1787	3205	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	508	925	437	105	818	161	309	255	74	147	301	526
RTOR Reduction (vph)	0	47	0	0	14	0	0	0	58	0	227	0
Lane Group Flow (vph)	508	1315	0	105	965	0	309	255	16	147	600	0
Confl. Peds. (#/hr)			1			1						1
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	20.1	50.4		9.2	39.5		13.0	24.5	24.5	12.8	24.3	
Effective Green, g (s)	20.1	50.4		9.2	39.5		13.0	24.5	24.5	12.8	24.3	
Actuated g/C Ratio	0.17	0.44		0.08	0.34		0.11	0.21	0.21	0.11	0.21	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	606	1485		143	1195		392	762	340	199	677	
v/s Ratio Prot	c0.15	c0.39		0.06	0.28		c0.09	0.07		0.08	c0.19	
v/s Ratio Perm									0.01			
v/c Ratio	0.84	0.89		0.73	0.81		0.79	0.33	0.05	0.74	0.94dr	
Uniform Delay, d1	45.8	29.6		51.7	34.2		49.6	38.3	35.9	49.4	44.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	9.9	6.7		17.6	4.1		10.1	0.3	0.1	13.4	13.3	
Delay (s)	55.7	36.3		69.3	38.4		59.7	38.6	36.0	62.8	57.2	
Level of Service	E	D		E	D		E	D	D	E	E	
Approach Delay (s)		41.6			41.4			48.5			58.1	
Approach LOS		D			D			D			E	

Intersection Summary

HCM 2000 Control Delay	46.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	114.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	90.6%	ICU Level of Service	E
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	483	879	415	100	777	153	294	242	70	140	286	500
Future Volume (veh/h)	483	879	415	100	777	153	294	242	70	140	286	500
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	508	925	0	105	818	161	309	255	74	147	301	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	631	1634		135	1042	205	406	501	223	185	452	
Arrive On Green	0.18	0.46	0.00	0.08	0.35	0.35	0.12	0.14	0.14	0.10	0.13	0.00
Sat Flow, veh/h	3483	3676	0	1795	2976	586	3483	3582	1598	1795	3676	0
Grp Volume(v), veh/h	508	925	0	105	492	487	309	255	74	147	301	0
Grp Sat Flow(s),veh/h/ln	1742	1791	0	1795	1791	1770	1742	1791	1598	1795	1791	0
Q Serve(g_s), s	11.1	15.1	0.0	4.6	19.6	19.6	6.9	5.3	3.3	6.4	6.4	0.0
Cycle Q Clear(g_c), s	11.1	15.1	0.0	4.6	19.6	19.6	6.9	5.3	3.3	6.4	6.4	0.0
Prop In Lane	1.00		0.00	1.00		0.33	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	631	1634		135	627	620	406	501	223	185	452	
V/C Ratio(X)	0.81	0.57		0.78	0.78	0.78	0.76	0.51	0.33	0.80	0.67	
Avail Cap(c_a), veh/h	940	2405		214	933	922	590	1128	503	313	1146	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	31.3	15.9	0.0	36.2	23.2	23.2	34.1	31.7	30.9	34.9	33.2	0.0
Incr Delay (d2), s/veh	3.2	0.3	0.0	9.3	2.6	2.7	3.5	0.8	0.9	7.6	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	5.8	0.0	2.3	8.1	8.0	2.9	2.2	1.3	3.0	2.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.5	16.2	0.0	45.5	25.8	25.9	37.6	32.5	31.8	42.5	34.9	0.0
LnGrp LOS	C	B		D	C	C	D	C	C	D	C	
Approach Vol, veh/h		1433	A		1084			638			448	A
Approach Delay, s/veh		22.7			27.7			34.9			37.4	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.5	40.8	13.8	14.5	18.9	32.4	12.7	15.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.5	53.5	13.5	25.5	21.5	41.5	13.9	25.1
Max Q Clear Time (g_c+I1), s	6.6	17.1	8.9	8.4	13.1	21.6	8.4	7.3
Green Ext Time (p_c), s	0.1	8.0	0.5	1.5	1.3	6.3	0.2	1.6

Intersection Summary	
HCM 6th Ctrl Delay	28.2
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	92	588	1257	647	91
v/c Ratio	0.58	0.28	0.80	0.72	0.19
Control Delay	58.9	11.3	23.1	37.3	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	58.9	11.3	23.1	37.3	9.0
Queue Length 50th (ft)	47	67	223	154	0
Queue Length 95th (ft)	#168	194	#570	#368	45
Internal Link Dist (ft)		1151	2310	505	
Turn Bay Length (ft)	125			120	
Base Capacity (vph)	159	2362	1812	985	513
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.58	0.25	0.69	0.66	0.18

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	89	570	615	604	628	88
Future Volume (vph)	89	570	615	604	628	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.93		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1787	3574	3281		3467	1578
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1787	3574	3281		3467	1578
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	92	588	634	623	647	91
RTOR Reduction (vph)	0	0	134	0	0	68
Lane Group Flow (vph)	92	588	1123	0	647	23
Confl. Peds. (#/hr)				4		1
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	NA		Perm	Perm
Protected Phases	5	2	6			
Permitted Phases					4	4
Actuated Green, G (s)	7.8	50.8	38.5		22.5	22.5
Effective Green, g (s)	7.8	50.8	38.5		22.5	22.5
Actuated g/C Ratio	0.09	0.56	0.42		0.25	0.25
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	153	2001	1392		860	391
v/s Ratio Prot	c0.05	0.16	c0.34			
v/s Ratio Perm					c0.19	0.01
v/c Ratio	0.60	0.29	0.81		0.75	0.06
Uniform Delay, d1	40.0	10.5	22.8		31.5	26.0
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	6.5	0.1	3.5		3.8	0.1
Delay (s)	46.5	10.6	26.4		35.3	26.1
Level of Service	D	B	C		D	C
Approach Delay (s)		15.4	26.4		34.1	
Approach LOS		B	C		C	

Intersection Summary			
HCM 2000 Control Delay	25.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	90.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	70.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	213	853	337	163	580	496	226	481	433	554	149
v/c Ratio	0.72	0.79	0.54	0.67	0.60	0.66	0.74	0.65	0.72	0.73	0.37
Control Delay	58.5	41.1	14.8	60.0	37.5	10.8	58.1	41.8	49.7	46.1	18.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.5	41.1	14.8	60.0	37.5	10.8	58.1	41.8	49.7	46.1	18.0
Queue Length 50th (ft)	148	292	60	114	188	32	157	161	155	197	30
Queue Length 95th (ft)	241	401	162	195	270	151	252	227	219	273	92
Internal Link Dist (ft)		1092			186			1440		2310	
Turn Bay Length (ft)	150		150	170		140	230		245		100
Base Capacity (vph)	383	1265	699	311	1128	797	401	950	760	944	481
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.67	0.48	0.52	0.51	0.62	0.56	0.51	0.57	0.59	0.31

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	200	802	317	153	545	466	212	375	77	407	521	140
Future Volume (vph)	200	802	317	153	545	466	212	375	77	407	521	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1787	3574	1570	1787	3574	1577	1787	3483		3467	3574	1554
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1787	3574	1570	1787	3574	1577	1787	3483		3467	3574	1554
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	213	853	337	163	580	496	226	399	82	433	554	149
RTOR Reduction (vph)	0	0	156	0	0	318	0	15	0	0	0	77
Lane Group Flow (vph)	213	853	181	163	580	178	226	466	0	433	554	72
Confl. Peds. (#/hr)			4			1						10
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	17.2	31.3	31.3	14.2	28.3	28.3	17.9	21.8		18.2	22.1	22.1
Effective Green, g (s)	17.2	31.3	31.3	14.2	28.3	28.3	17.9	21.8		18.2	22.1	22.1
Actuated g/C Ratio	0.17	0.30	0.30	0.14	0.27	0.27	0.17	0.21		0.18	0.21	0.21
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	296	1080	474	245	977	431	309	733		609	763	331
v/s Ratio Prot	c0.12	c0.24		0.09	0.16		c0.13	0.13		0.12	c0.15	
v/s Ratio Perm			0.12			0.11						0.05
v/c Ratio	0.72	0.79	0.38	0.67	0.59	0.41	0.73	0.64		0.71	0.73	0.22
Uniform Delay, d1	40.9	33.1	28.5	42.4	32.6	30.8	40.5	37.2		40.2	37.9	33.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	8.1	3.9	0.5	6.7	1.0	0.6	8.6	1.8		3.9	3.5	0.3
Delay (s)	49.0	37.0	29.0	49.1	33.6	31.5	49.1	39.0		44.1	41.3	33.9
Level of Service	D	D	C	D	C	C	D	D		D	D	C
Approach Delay (s)		36.9			34.8			42.3			41.4	
Approach LOS		D			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	38.3	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.77			
Actuated Cycle Length (s)	103.5	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	72.2%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
12: Creston Road & Niblick Road/Sherwood Road

Cumulative Plus 1293 Unit Project PM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	802	317	153	545	466	212	375	77	407	521	140
Future Volume (veh/h)	200	802	317	153	545	466	212	375	77	407	521	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	213	853	337	163	580	496	226	399	82	433	554	149
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	251	1275	567	198	1170	521	265	575	117	530	712	313
Arrive On Green	0.14	0.36	0.36	0.11	0.33	0.33	0.15	0.19	0.19	0.15	0.20	0.20
Sat Flow, veh/h	1795	3582	1592	1795	3582	1596	1795	2964	604	3483	3582	1574
Grp Volume(v), veh/h	213	853	337	163	580	496	226	240	241	433	554	149
Grp Sat Flow(s),veh/h/ln	1795	1791	1592	1795	1791	1596	1795	1791	1777	1742	1791	1574
Q Serve(g_s), s	11.1	19.3	16.6	8.5	12.5	29.2	11.8	12.0	12.2	11.6	14.1	8.1
Cycle Q Clear(g_c), s	11.1	19.3	16.6	8.5	12.5	29.2	11.8	12.0	12.2	11.6	14.1	8.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.34	1.00		1.00
Lane Grp Cap(c), veh/h	251	1275	567	198	1170	521	265	348	345	530	712	313
V/C Ratio(X)	0.85	0.67	0.59	0.82	0.50	0.95	0.85	0.69	0.70	0.82	0.78	0.48
Avail Cap(c_a), veh/h	402	1324	588	327	1175	523	421	503	499	798	988	434
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.3	26.2	25.3	41.8	26.0	31.6	39.9	36.0	36.1	39.4	36.5	34.1
Incr Delay (d2), s/veh	9.3	1.3	1.5	8.2	0.3	27.5	9.5	2.4	2.6	4.1	2.7	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	8.0	6.2	4.1	5.1	14.5	5.8	5.3	5.4	5.1	6.3	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.6	27.4	26.8	50.0	26.3	59.1	49.5	38.4	38.7	43.5	39.2	35.2
LnGrp LOS	D	C	C	D	C	E	D	D	D	D	D	D
Approach Vol, veh/h		1403			1239			707			1136	
Approach Delay, s/veh		30.6			42.6			42.0			40.3	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.1	23.2	15.1	38.7	18.7	23.6	17.9	35.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	22.0	27.0	17.5	35.5	22.5	26.5	21.5	31.5
Max Q Clear Time (g_c+I1), s	13.6	14.2	10.5	21.3	13.8	16.1	13.1	31.2
Green Ext Time (p_c), s	1.0	2.3	0.2	5.9	0.4	3.0	0.4	0.2

Intersection Summary	
HCM 6th Ctrl Delay	38.2
HCM 6th LOS	D

Olsen-Chandler SP
13: Creston Road & Scott Street

Cumulative Plus 1293 Unit Project PM
HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	61	60	635	51	92	832
Future Volume (Veh/h)	61	60	635	51	92	832
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	66	65	683	55	99	895
Pedestrians	2					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1806	712			740	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1806	712			740	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	15	85			89	
cM capacity (veh/h)	77	433			869	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	131	738	99	895
Volume Left	66	0	99	0
Volume Right	65	55	0	0
cSH	131	1700	869	1700
Volume to Capacity	1.00	0.43	0.11	0.53
Queue Length 95th (ft)	176	0	10	0
Control Delay (s)	144.5	0.0	9.7	0.0
Lane LOS	F		A	
Approach Delay (s)	144.5	0.0	1.0	
Approach LOS	F			

Intersection Summary			
Average Delay	10.7		
Intersection Capacity Utilization	58.7%	ICU Level of Service	B
Analysis Period (min)	15		

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	10.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	61	60	635	51	92	832
Future Vol, veh/h	61	60	635	51	92	832
Conflicting Peds, #/hr	0	0	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	66	65	683	55	99	895

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1806	713	0	0	740	0
Stage 1	713	-	-	-	-	-
Stage 2	1093	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.11	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209	-
Pot Cap-1 Maneuver	88	434	-	-	871	-
Stage 1	488	-	-	-	-	-
Stage 2	323	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	78	433	-	-	869	-
Mov Cap-2 Maneuver	78	-	-	-	-	-
Stage 1	487	-	-	-	-	-
Stage 2	286	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	141.8	0	1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	131	869	-
HCM Lane V/C Ratio	-	-	0.993	0.114	-
HCM Control Delay (s)	-	-	141.8	9.7	-
HCM Lane LOS	-	-	F	A	-
HCM 95th %tile Q(veh)	-	-	6.9	0.4	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	136	10	17	10	10	42	25	425	10	53	568	166
Future Volume (Veh/h)	136	10	17	10	10	42	25	425	10	53	568	166
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Hourly flow rate (vph)	137	10	17	10	10	42	25	429	10	54	574	168
Pedestrians		5									4	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		3.5									3.5	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1217	1176	579	1188	1339	438	747			439		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1217	1176	579	1188	1339	438	747			439		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	94	97	93	93	93	97			95		
cM capacity (veh/h)	130	177	514	144	141	618	862			1126		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	164	62	25	439	54	574	168
Volume Left	137	10	25	0	54	0	0
Volume Right	17	42	0	10	0	0	168
cSH	143	298	862	1700	1126	1700	1700
Volume to Capacity	1.14	0.21	0.03	0.26	0.05	0.34	0.10
Queue Length 95th (ft)	231	19	2	0	4	0	0
Control Delay (s)	180.3	20.2	9.3	0.0	8.4	0.0	0.0
Lane LOS	F	C	A		A		
Approach Delay (s)	180.3	20.2	0.5		0.6		
Approach LOS	F	C					

Intersection Summary				
Average Delay	21.2			
Intersection Capacity Utilization	59.0%	ICU Level of Service	B	
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	20.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	136	10	17	10	10	42	25	425	10	53	568	166
Future Vol, veh/h	136	10	17	10	10	42	25	425	10	53	568	166
Conflicting Peds, #/hr	4	0	0	0	0	4	5	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	30	-	-	70	-	60
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	99	99	99	99	99	99	99	99	99	99	99	99
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	137	10	17	10	10	42	25	429	10	54	574	168

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1201	1176	579	1264	1339	438	747	0	0	439	0	0
Stage 1	687	687	-	484	484	-	-	-	-	-	-	-
Stage 2	514	489	-	780	855	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	162	192	517	147	153	621	866	-	-	1126	-	-
Stage 1	439	449	-	566	554	-	-	-	-	-	-	-
Stage 2	545	551	-	390	376	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 133	177	515	128	141	619	862	-	-	1126	-	-
Mov Cap-2 Maneuver	~ 133	177	-	128	141	-	-	-	-	-	-	-
Stage 1	424	425	-	550	538	-	-	-	-	-	-	-
Stage 2	482	535	-	350	356	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	170.8	21.1	0.5	0.6
HCM LOS	F	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	862	-	-	147	286	1126	-	-
HCM Lane V/C Ratio	0.029	-	-	1.12	0.219	0.048	-	-
HCM Control Delay (s)	9.3	-	-	170.8	21.1	8.4	-	-
HCM Lane LOS	A	-	-	F	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	9	0.8	0.1	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	10	10	16	171	10	178	14	271	267	301	265	20
Future Volume (vph)	10	10	16	171	10	178	14	271	267	301	265	20
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	11	11	17	184	11	191	15	291	287	324	285	22

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	39	386	306	287	467	165
Volume Left (vph)	11	184	15	0	324	0
Volume Right (vph)	17	191	0	287	0	22
Hadj (s)	-0.19	-0.18	0.04	-0.68	0.36	-0.08
Departure Headway (s)	8.2	6.7	7.3	6.6	7.5	7.0
Degree Utilization, x	0.09	0.72	0.62	0.53	0.97	0.32
Capacity (veh/h)	387	386	480	540	467	501
Control Delay (s)	12.0	25.3	20.5	15.4	60.3	12.1
Approach Delay (s)	12.0	25.3	18.0		47.7	
Approach LOS	B	D	C		E	

Intersection Summary				
Delay	31.0			
Level of Service	D			
Intersection Capacity Utilization	69.5%	ICU Level of Service	C	
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	32.1
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Vol, veh/h	10	10	16	171	10	178	0	14	271	267	301	265
Future Vol, veh/h	10	10	16	171	10	178	0	14	271	267	301	265
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	1	1	1	1	1	1	2	1	1	1	1	1
Mvmt Flow	11	11	17	184	11	191	0	15	291	287	324	285
Number of Lanes	0	1	0	0	1	0	0	0	1	1	0	2

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	12.3	26.5	19.1	49.1
HCM LOS	B	D	C	E

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	5%	0%	28%	48%	69%	0%
Vol Thru, %	95%	0%	28%	3%	31%	87%
Vol Right, %	0%	100%	44%	50%	0%	13%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	285	267	36	359	434	153
LT Vol	14	0	10	171	301	0
Through Vol	271	0	10	10	133	133
RT Vol	0	267	16	178	0	20
Lane Flow Rate	306	287	39	386	466	164
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.625	0.526	0.09	0.733	0.972	0.321
Departure Headway (Hd)	7.345	6.599	8.345	6.839	7.504	7.053
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	490	545	428	529	485	510
Service Time	5.101	4.354	6.429	4.882	5.256	4.804
HCM Lane V/C Ratio	0.624	0.527	0.091	0.73	0.961	0.322
HCM Control Delay	21.6	16.5	12.3	26.5	61.8	13.1
HCM Lane LOS	C	C	B	D	F	B
HCM 95th-tile Q	4.2	3	0.3	6.1	12.4	1.4

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBR
Lane Configurations	
Traffic Vol, veh/h	20
Future Vol, veh/h	20
Peak Hour Factor	0.93
Heavy Vehicles, %	1
Mvmt Flow	22
Number of Lanes	0

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	327	253	150	225	210	241
Future Volume (Veh/h)	327	253	150	225	210	241
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	337	261	155	232	216	248
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	642	216	464			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	642	216	464			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	4	67	86			
cM capacity (veh/h)	351	792	1101			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	598	155	116	116	216	248
Volume Left	337	155	0	0	0	0
Volume Right	261	0	0	0	0	248
cSH	584	1101	1700	1700	1700	1700
Volume to Capacity	1.02	0.14	0.07	0.07	0.13	0.15
Queue Length 95th (ft)	398	12	0	0	0	0
Control Delay (s)	70.3	8.8	0.0	0.0	0.0	0.0
Lane LOS	F	A				
Approach Delay (s)	70.3	3.5			0.0	
Approach LOS	F					

Intersection Summary			
Average Delay		30.0	
Intersection Capacity Utilization		47.5%	ICU Level of Service A
Analysis Period (min)		15	

Intersection	
Int Delay, s/veh	18

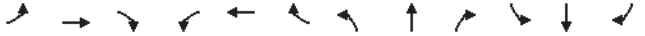
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	327	253	150	225	210	241
Future Vol, veh/h	327	253	150	225	210	241
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	145	105	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	337	261	155	232	216	248

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	642	216	464	0	-	0
Stage 1	216	-	-	-	-	-
Stage 2	426	-	-	-	-	-
Critical Hdwy	6.615	6.215	4.115	-	-	-
Critical Hdwy Stg 1	5.415	-	-	-	-	-
Critical Hdwy Stg 2	5.815	-	-	-	-	-
Follow-up Hdwy	3.5095	3.3095	2.2095	-	-	-
Pot Cap-1 Maneuver	424	826	1102	-	-	-
Stage 1	822	-	-	-	-	-
Stage 2	630	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	364	826	1102	-	-	-
Mov Cap-2 Maneuver	364	-	-	-	-	-
Stage 1	706	-	-	-	-	-
Stage 2	630	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	41.4	3.5	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1102	-	364	826	-	-
HCM Lane V/C Ratio	0.14	-	0.926	0.316	-	-
HCM Control Delay (s)	8.8	-	64.6	11.4	-	-
HCM Lane LOS	A	-	F	B	-	-
HCM 95th %tile Q(veh)	0.5	-	9.7	1.4	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	315	20	0	0	0	0	400	53
Future Volume (Veh/h)	0	0	0	0	315	20	0	0	0	0	400	53
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	342	22	0	0	0	0	435	58
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	635	464	464	464	493	0	493			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	635	464	464	464	493	0	493			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	29	98	100			100		
cM capacity (veh/h)	161	497	600	510	478	1088	1076			1630		

Direction, Lane #	WB 1	SB 1
Volume Total	364	493
Volume Left	0	0
Volume Right	22	58
cSH	499	1700
Volume to Capacity	0.73	0.29
Queue Length 95th (ft)	150	0
Control Delay (s)	29.3	0.0
Lane LOS	D	
Approach Delay (s)	29.3	0.0
Approach LOS	D	

Intersection Summary				
Average Delay	12.5			
Intersection Capacity Utilization	47.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	315	20	0	0	0	0	400	53
Future Vol, veh/h	0	0	0	0	315	20	0	0	0	0	400	53
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	2	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	0	0	0	0	342	22	0	0	0	0	435	58

Major/Minor	Minor1			Major2		
Conflicting Flow All	464	493	-	-	-	0
Stage 1	0	0	-	-	-	-
Stage 2	464	493	-	-	-	-
Critical Hdwy	6.41	6.51	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	5.41	5.51	-	-	-	-
Follow-up Hdwy	3.509	4.009	-	-	-	-
Pot Cap-1 Maneuver	558	478	0	0	-	-
Stage 1	-	-	0	0	-	-
Stage 2	635	549	0	0	-	-
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	558	0	-	-	-	-
Mov Cap-2 Maneuver	558	0	-	-	-	-
Stage 1	-	0	-	-	-	-
Stage 2	635	0	-	-	-	-

Approach	WB	SB
HCM Control Delay, s		0
HCM LOS	-	

Minor Lane/Major Mvmt	WBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	0	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	75	482	767	277	539	141	424	1192	793	461
v/c Ratio	0.27	0.88	0.73	0.48	0.53	0.70	0.82	0.90	0.90	0.46
Control Delay	58.2	74.9	50.5	45.5	8.7	81.4	73.7	33.6	67.1	41.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.2	74.9	50.5	45.5	8.7	81.4	73.7	33.6	67.1	41.2
Queue Length 50th (ft)	65	233	349	224	114	135	212	317	388	177
Queue Length 95th (ft)	118	#325	426	318	203	207	275	431	#496	241
Internal Link Dist (ft)		521		1372			611			680
Turn Bay Length (ft)	115		515		115	165		290	305	
Base Capacity (vph)	290	578	1075	583	1043	256	576	1338	924	1034
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.83	0.71	0.48	0.52	0.55	0.74	0.89	0.86	0.45

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	355	113	744	269	523	137	411	1156	769	325	122
Future Volume (vph)	73	355	113	744	269	523	137	411	1156	769	325	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.95	0.88	0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	3433		3467	1881	1585	1787	3574	2814	3467	3428	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	3433		3467	1881	1585	1787	3574	2814	3467	3428	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	75	366	116	767	277	539	141	424	1192	793	335	126
RTOR Reduction (vph)	0	20	0	0	0	137	0	0	48	0	26	0
Lane Group Flow (vph)	75	462	0	767	277	402	141	424	1144	793	435	0
Confl. Peds. (#/hr)						2						
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	22.3	22.3		43.9	43.9	80.5	16.2	21.0	64.9	36.6	41.4	
Effective Green, g (s)	22.3	22.3		43.9	43.9	80.5	16.2	21.0	64.9	36.6	41.4	
Actuated g/C Ratio	0.15	0.15		0.30	0.30	0.56	0.11	0.15	0.45	0.25	0.29	
Clearance Time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	276	530		1054	572	884	200	520	1265	879	983	
v/s Ratio Prot	0.04	c0.13		0.22	0.15	0.12	0.08	0.12	c0.27	c0.23	0.13	
v/s Ratio Perm						0.14			0.13			
v/c Ratio	0.27	0.87		0.73	0.48	0.46	0.70	0.82	0.90	0.90	0.44	
Uniform Delay, d1	53.8	59.6		44.9	41.0	18.9	61.7	59.8	36.8	52.1	42.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	14.5		2.5	0.6	0.4	10.7	9.5	9.3	12.4	0.3	
Delay (s)	54.4	74.1		47.4	41.6	19.3	72.5	69.3	46.1	64.5	42.3	
Level of Service	D	E		D	D	B	E	E	D	E	D	
Approach Delay (s)		71.5			36.8			53.8			56.4	
Approach LOS		E			D			D			E	

Intersection Summary

HCM 2000 Control Delay	51.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	144.3	Sum of lost time (s)	20.5
Intersection Capacity Utilization	88.1%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	73	355	113	744	269	523	137	411	1156	769	325	122
Future Volume (veh/h)	73	355	113	744	269	523	137	411	1156	769	325	122
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	75	366	116	767	277	539	141	424	1192	793	335	126
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	280	417	130	994	538	850	166	592	1267	862	799	295
Arrive On Green	0.16	0.16	0.16	0.29	0.29	0.29	0.09	0.17	0.17	0.25	0.31	0.31
Sat Flow, veh/h	1795	2676	835	3483	1885	1594	1795	3582	2812	3483	2560	946
Grp Volume(v), veh/h	75	243	239	767	277	539	141	424	1192	793	233	228
Grp Sat Flow(s),veh/h/ln	1795	1791	1720	1742	1885	1594	1795	1791	1406	1742	1791	1715
Q Serve(g_s), s	5.2	18.6	19.1	28.3	17.3	33.5	10.9	15.7	23.2	31.1	14.4	14.8
Cycle Q Clear(g_c), s	5.2	18.6	19.1	28.3	17.3	33.5	10.9	15.7	23.2	31.1	14.4	14.8
Prop In Lane	1.00		0.49	1.00		1.00	1.00		1.00	1.00		0.55
Lane Grp Cap(c), veh/h	280	279	268	994	538	850	166	592	1267	862	559	536
V/C Ratio(X)	0.27	0.87	0.89	0.77	0.51	0.63	0.85	0.72	0.94	0.92	0.42	0.43
Avail Cap(c_a), veh/h	299	299	287	1107	599	902	263	592	1267	950	559	536
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.2	57.9	58.1	46.0	42.0	23.1	62.7	55.5	27.5	51.5	38.1	38.3
Incr Delay (d2), s/veh	0.5	22.3	26.4	3.1	0.8	1.3	13.7	4.1	13.5	13.1	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	10.2	10.3	12.5	8.1	12.4	5.5	7.3	23.5	15.1	6.5	6.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.7	80.2	84.5	49.0	42.8	24.5	76.4	59.6	41.1	64.6	38.6	38.8
LnGrp LOS	D	F	F	D	D	C	E	E	D	E	D	D
Approach Vol, veh/h		557			1583			1757			1254	
Approach Delay, s/veh		78.3			39.6			48.4			55.1	
Approach LOS		E			D			D			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	39.4	29.0		26.5	18.8	49.6		45.5				
Change Period (Y+Rc), s	* 4.7	5.8		4.6	5.8	* 5.8		5.4				
Max Green Setting (Gmax), s	* 38	23.2		23.4	20.6	* 41		44.6				
Max Q Clear Time (g_c+I1), s	33.1	25.2		21.1	12.9	16.8		35.5				
Green Ext Time (p_c), s	1.6	0.0		0.8	0.2	2.9		4.6				

Intersection Summary			
HCM 6th Ctrl Delay		50.5	
HCM 6th LOS		D	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	281	1168	683	139	1037	443	382	217	558
v/c Ratio	0.75	0.86	0.77	0.74	0.79	0.82	0.52	0.81	0.78
Control Delay	63.0	41.1	16.8	74.7	36.6	60.4	39.3	70.1	49.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.0	41.1	16.8	74.7	36.6	60.4	39.3	70.1	49.0
Queue Length 50th (ft)	107	424	150	103	354	168	123	158	198
Queue Length 95th (ft)	#170	#552	330	#206	457	#251	173	#283	262
Internal Link Dist (ft)		1510			1609		962		896
Turn Bay Length (ft)	140			80		150		110	
Base Capacity (vph)	394	1408	907	200	1377	574	851	299	854
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.83	0.75	0.69	0.75	0.77	0.45	0.73	0.65

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
19: S. River Road & Niblick Road

Cumulative Plus 1293 Unit Project PM
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	270	1121	656	133	834	161	425	275	92	208	406	130
Future Volume (vph)	270	1121	656	133	834	161	425	275	92	208	406	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.96		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3467	3574	1599	1787	3479		3467	3440		1787	3431	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3467	3574	1599	1787	3479		3467	3440		1787	3431	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	281	1168	683	139	869	168	443	286	96	217	423	135
RTOR Reduction (vph)	0	0	285	0	13	0	0	28	0	0	26	0
Lane Group Flow (vph)	281	1168	398	139	1024	0	443	354	0	217	532	0
Confl. Peds. (#/hr)						2						3
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	12.3	42.6	42.6	11.8	42.1		17.6	23.1		17.0	22.5	
Effective Green, g (s)	12.3	42.6	42.6	11.8	42.1		17.6	23.1		17.0	22.5	
Actuated g/C Ratio	0.11	0.38	0.38	0.10	0.37		0.16	0.21		0.15	0.20	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	379	1353	605	187	1301		542	706		270	686	
v/s Ratio Prot	c0.08	c0.33		0.08	0.29		c0.13	0.10		0.12	c0.15	
v/s Ratio Perm			0.25									
v/c Ratio	0.74	0.86	0.66	0.74	0.79		0.82	0.50		0.80	0.77	
Uniform Delay, d1	48.6	32.3	28.9	48.9	31.2		45.9	39.6		46.1	42.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.6	5.9	2.6	14.7	3.2		9.3	0.6		15.8	5.5	
Delay (s)	56.2	38.2	31.5	63.6	34.4		55.2	40.2		61.9	48.1	
Level of Service	E	D	C	E	C		E	D		E	D	
Approach Delay (s)		38.4			37.9			48.2			51.9	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM 2000 Control Delay	42.1	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	112.5	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	81.6%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Olsen-Chandler SP
19: S. River Road & Niblick Road

Cumulative Plus 1293 Unit Project PM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	270	1121	656	133	834	161	425	275	92	208	406	130
Future Volume (veh/h)	270	1121	656	133	834	161	425	275	92	208	406	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	281	1168	683	139	869	168	443	286	96	217	423	135
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	350	1389	620	169	1142	221	519	544	179	250	524	165
Arrive On Green	0.10	0.39	0.39	0.09	0.38	0.38	0.15	0.21	0.21	0.14	0.20	0.20
Sat Flow, veh/h	3483	3582	1598	1795	2992	578	3483	2649	871	1795	2674	845
Grp Volume(v), veh/h	281	1168	683	139	520	517	443	191	191	217	282	276
Grp Sat Flow(s),veh/h/ln	1742	1791	1598	1795	1791	1780	1742	1791	1728	1795	1791	1728
Q Serve(g_s), s	8.2	30.8	24.8	7.9	26.3	26.3	12.9	9.9	10.2	12.3	15.6	15.9
Cycle Q Clear(g_c), s	8.2	30.8	24.8	7.9	26.3	26.3	12.9	9.9	10.2	12.3	15.6	15.9
Prop In Lane	1.00		1.00	1.00		0.32	1.00		0.50	1.00		0.49
Lane Grp Cap(c), veh/h	350	1389	620	169	683	679	519	368	355	250	351	338
V/C Ratio(X)	0.80	0.84	1.10	0.82	0.76	0.76	0.85	0.52	0.54	0.87	0.80	0.82
Avail Cap(c_a), veh/h	426	1516	676	216	755	750	620	462	446	323	465	449
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.7	28.9	12.0	46.2	28.0	28.0	43.1	36.8	36.9	43.8	39.9	40.0
Incr Delay (d2), s/veh	8.9	4.1	67.4	17.7	4.1	4.2	9.8	1.1	1.3	17.5	7.4	8.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	13.2	19.2	4.3	11.4	11.4	6.1	4.3	4.3	6.5	7.4	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.7	33.0	79.5	63.9	32.1	32.2	52.9	37.9	38.2	61.3	47.3	48.5
LnGrp LOS	D	C	F	E	C	C	D	D	D	E	D	D
Approach Vol, veh/h		2132			1176			825			775	
Approach Delay, s/veh		50.8			35.9			46.0			51.6	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.3	44.8	20.0	24.8	14.9	44.2	19.0	25.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	12.5	44.0	18.5	27.0	12.7	43.8	18.7	26.8
Max Q Clear Time (g_c+I1), s	9.9	32.8	14.9	17.9	10.2	28.3	14.3	12.2
Green Ext Time (p_c), s	0.1	7.5	0.6	2.2	0.2	5.8	0.2	1.8

Intersection Summary	
HCM 6th Ctrl Delay	46.5
HCM 6th LOS	D

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	922	413	22	657	402	18
v/c Ratio	0.91	0.40	0.21	0.34	0.81	0.04
Control Delay	31.5	2.5	15.9	9.9	35.8	11.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.5	2.5	15.9	9.9	35.8	11.7
Queue Length 50th (ft)	317	0	4	72	153	2
Queue Length 95th (ft)	#679	42	23	132	247	15
Internal Link Dist (ft)	1629			570	669	
Turn Bay Length (ft)			75			50
Base Capacity (vph)	1009	1024	107	1919	694	629
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.40	0.21	0.34	0.58	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	848	380	20	604	370	17
Future Volume (vph)	848	380	20	604	370	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1827	1518	1735	3471	1732	1553
Flt Permitted	1.00	1.00	0.11	1.00	0.95	1.00
Satd. Flow (perm)	1827	1518	195	3471	1732	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	922	413	22	657	402	18
RTOR Reduction (vph)	0	185	0	0	0	7
Lane Group Flow (vph)	922	228	22	657	402	11
Confl. Peds. (#/hr)		2	2		3	
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type	NA	Perm	Perm	NA	Perm	Prot
Protected Phases	2			6		8
Permitted Phases		2	6		8	
Actuated Green, G (s)	37.4	37.4	37.4	37.4	19.4	19.4
Effective Green, g (s)	37.4	37.4	37.4	37.4	19.4	19.4
Actuated g/C Ratio	0.55	0.55	0.55	0.55	0.29	0.29
Clearance Time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	1010	839	107	1920	497	445
v/s Ratio Prot	c0.50			0.19		0.01
v/s Ratio Perm		0.15	0.11		c0.23	
v/c Ratio	0.91	0.27	0.21	0.34	0.81	0.02
Uniform Delay, d1	13.6	7.9	7.6	8.3	22.4	17.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.0	0.1	0.3	0.0	8.9	0.0
Delay (s)	25.6	8.0	8.0	8.4	31.3	17.3
Level of Service	C	A	A	A	C	B
Approach Delay (s)	20.2			8.3	30.7	
Approach LOS	C			A	C	

Intersection Summary

HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	67.6	Sum of lost time (s)	10.8
Intersection Capacity Utilization	74.1%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	848	380	20	604	370	17
Future Volume (veh/h)	848	380	20	604	370	17
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	922	413	22	657	402	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	1025	867	166	1947	459	408
Arrive On Green	0.56	0.56	0.56	0.56	0.26	0.26
Sat Flow, veh/h	1841	1557	403	3589	1753	1560
Grp Volume(v), veh/h	922	413	22	657	402	18
Grp Sat Flow(s),veh/h/ln	1841	1557	403	1749	1753	1560
Q Serve(g_s), s	26.5	9.5	3.0	6.1	13.1	0.5
Cycle Q Clear(g_c), s	26.5	9.5	29.5	6.1	13.1	0.5
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1025	867	166	1947	459	408
V/C Ratio(X)	0.90	0.48	0.13	0.34	0.88	0.04
Avail Cap(c_a), veh/h	1151	974	194	2187	796	708
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.7	8.0	24.8	7.2	21.0	16.4
Incr Delay (d2), s/veh	8.4	0.2	0.1	0.0	2.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.8	2.3	0.3	1.6	4.9	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.1	8.1	24.9	7.2	23.4	16.4
LnGrp LOS	C	A	C	A	C	B
Approach Vol, veh/h	1335			679	420	
Approach Delay, s/veh	16.4			7.8	23.1	
Approach LOS	B			A	C	

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	38.5				38.5	21.0
Change Period (Y+Rc), s	5.4				5.4	5.4
Max Green Setting (Gmax), s	37.2				37.2	27.0
Max Q Clear Time (g_c+I1), s	28.5				31.5	15.1
Green Ext Time (p_c), s	3.5				1.6	0.5

Intersection Summary			
HCM 6th Ctrl Delay		15.2	
HCM 6th LOS		B	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	793	63	18	480	10	135	0	15	0	0	10
Future Volume (Veh/h)	10	793	63	18	480	10	135	0	15	0	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	862	68	20	522	11	147	0	16	0	0	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									4			
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		650										
pX, platoon unblocked				0.48			0.48	0.48	0.48	0.48	0.48	
vC, conflicting volume	533			930			1230	1491	896	1494	1520	266
vC1, stage 1 conf vol							918	918		568	568	
vC2, stage 2 conf vol							312	573		926	952	
vCu, unblocked vol	533			322			942	1481	251	1487	1540	266
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			97			50	100	96	100	100	98
cM capacity (veh/h)	1031			597			295	262	362	237	238	732

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	941	281	272	163	11
Volume Left	11	20	0	147	0
Volume Right	68	0	11	16	11
cSH	1031	597	1700	327	732
Volume to Capacity	0.01	0.03	0.16	0.50	0.02
Queue Length 95th (ft)	1	3	0	66	1
Control Delay (s)	0.3	1.2	0.0	27.4	10.0
Lane LOS	A	A		D	A
Approach Delay (s)	0.3	0.6		27.4	10.0
Approach LOS				D	A

Intersection Summary					
Average Delay		3.1			
Intersection Capacity Utilization		74.4%	ICU Level of Service		D
Analysis Period (min)		15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	793	63	18	480	10	135	0	15	0	0	10
Future Vol, veh/h	10	793	63	18	480	10	135	0	15	0	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	862	68	20	522	11	147	0	16	0	0	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	533	0	0	930	0	0	1219	1491	896	1494	1520	267
Stage 1	-	-	-	-	-	-	918	918	-	568	568	-
Stage 2	-	-	-	-	-	-	301	573	-	926	952	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.23	7.33	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.519	4.019	3.319
Pot Cap-1 Maneuver	1033	-	-	733	-	-	~ 146	123	338	93	118	732
Stage 1	-	-	-	-	-	-	325	350	-	476	505	-
Stage 2	-	-	-	-	-	-	684	503	-	321	337	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1033	-	-	733	-	-	~ 137	116	338	84	111	732
Mov Cap-2 Maneuver	-	-	-	-	-	-	287	282	-	238	265	-
Stage 1	-	-	-	-	-	-	318	342	-	466	485	-
Stage 2	-	-	-	-	-	-	648	483	-	299	330	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.5	28.6	10
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	287	338	1033	-	-	733	-	-	732
HCM Lane V/C Ratio	0.511	0.048	0.011	-	-	0.027	-	-	0.015
HCM Control Delay (s)	30	16.2	8.5	0	-	10	0.2	-	10
HCM Lane LOS	D	C	A	A	-	B	A	-	B
HCM 95th %tile Q(veh)	2.7	0.2	0	-	-	0.1	-	-	0

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Traffic Volume (veh/h)	245	265	233	43	160	50	149	157	33	75	304	173
Future Volume (veh/h)	245	265	233	43	160	50	149	157	33	75	304	173
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	266	288	253	47	174	54	162	171	36	82	330	188
Approach Volume (veh/h)		807			275			369			600	
Crossing Volume (veh/h)		459			599			636			383	
High Capacity (veh/h)		964			862			837			1025	
High v/c (veh/h)		0.84			0.32			0.44			0.59	
Low Capacity (veh/h)		782			691			669			836	
Low v/c (veh/h)		1.03			0.40			0.55			0.72	

Intersection Summary				
Maximum v/c High		0.84		
Maximum v/c Low		1.03		
Intersection Capacity Utilization		111.1%	ICU Level of Service	H

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	25.6
Intersection LOS	D

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	807	275	369	600
Demand Flow Rate, veh/h	823	280	376	613
Vehicles Circulating, veh/h	469	610	649	390
Vehicles Exiting, veh/h	534	415	643	500
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	44.6	9.8	13.4	14.7
Approach LOS	E	A	B	B

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	823	280	376	613
Cap Entry Lane, veh/h	855	741	712	927
Entry HV Adj Factor	0.981	0.980	0.980	0.979
Flow Entry, veh/h	807	275	369	600
Cap Entry, veh/h	839	726	698	908
V/C Ratio	0.962	0.378	0.528	0.661
Control Delay, s/veh	44.6	9.8	13.4	14.7
LOS	E	A	B	B
95th %tile Queue, veh	16	2	3	5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	67	17	54	1	16	21	32	208	3	31	349	64
Future Volume (vph)	67	17	54	1	16	21	32	208	3	31	349	64
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	73	18	59	1	17	23	35	226	3	34	379	70

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	150	41	264	483
Volume Left (vph)	73	1	35	34
Volume Right (vph)	59	23	3	70
Hadj (s)	-0.12	-0.31	0.04	-0.06
Departure Headway (s)	5.7	5.7	5.1	4.8
Degree Utilization, x	0.24	0.07	0.38	0.64
Capacity (veh/h)	553	509	667	732
Control Delay (s)	10.4	9.1	11.2	15.9
Approach Delay (s)	10.4	9.1	11.2	15.9
Approach LOS	B	A	B	C

Intersection Summary				
Delay	13.4			
Level of Service	B			
Intersection Capacity Utilization	49.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	13.5
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	67	17	54	1	16	21	32	208	3	31	349	64
Future Vol, veh/h	67	17	54	1	16	21	32	208	3	31	349	64
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	73	18	59	1	17	23	35	226	3	34	379	70
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.5	9.2	11.2	16
HCM LOS	B	A	B	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	13%	49%	3%	7%
Vol Thru, %	86%	12%	42%	79%
Vol Right, %	1%	39%	55%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	243	138	38	444
LT Vol	32	67	1	31
Through Vol	208	17	16	349
RT Vol	3	54	21	64
Lane Flow Rate	264	150	41	483
Geometry Grp	1	1	1	1
Degree of Util (X)	0.376	0.236	0.066	0.643
Departure Headway (Hd)	5.118	5.667	5.723	4.793
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	703	633	625	758
Service Time	3.147	3.707	3.771	2.793
HCM Lane V/C Ratio	0.376	0.237	0.066	0.637
HCM Control Delay	11.2	10.5	9.2	16
HCM Lane LOS	B	B	A	C
HCM 95th-tile Q	1.8	0.9	0.2	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	100	34	1	63	22	23	116	1	17	172	110
Future Volume (Veh/h)	117	100	34	1	63	22	23	116	1	17	172	110
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	127	109	37	1	68	24	25	126	1	18	187	120
Pedestrians								6				
Lane Width (ft)								12.0				
Walking Speed (ft/s)								3.5				
Percent Blockage								1				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	92			152			683	482	134	528	488	80
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	92			152			683	482	134	528	488	80
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	92			100			87	71	100	95	57	88
cM capacity (veh/h)	1509			1427			199	442	913	337	438	983

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	273	93	152	18	307
Volume Left	127	1	25	18	0
Volume Right	37	24	1	0	120
cSH	1509	1427	369	337	559
Volume to Capacity	0.08	0.00	0.41	0.05	0.55
Queue Length 95th (ft)	7	0	49	4	83
Control Delay (s)	3.9	0.1	21.4	16.3	19.0
Lane LOS	A	A	C	C	C
Approach Delay (s)	3.9	0.1	21.4	18.8	
Approach LOS			C	C	

Intersection Summary				
Average Delay	12.4			
Intersection Capacity Utilization	53.1%	ICU Level of Service		A
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	12.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↰	↕	
Traffic Vol, veh/h	117	100	34	1	63	22	23	116	1	17	172	110
Future Vol, veh/h	117	100	34	1	63	22	23	116	1	17	172	110
Conflicting Peds, #/hr	0	0	6	6	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	127	109	37	1	68	24	25	126	1	18	187	120

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	92	0	0	152	0	0	624	482	134	527	488	80
Stage 1	-	-	-	-	-	-	388	388	-	82	82	-
Stage 2	-	-	-	-	-	-	236	94	-	445	406	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	1509	-	-	1435	-	-	399	485	918	463	482	983
Stage 1	-	-	-	-	-	-	638	611	-	929	829	-
Stage 2	-	-	-	-	-	-	769	819	-	594	600	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1509	-	-	1427	-	-	216	437	913	335	435	983
Mov Cap-2 Maneuver	-	-	-	-	-	-	216	437	-	335	435	-
Stage 1	-	-	-	-	-	-	576	552	-	844	828	-
Stage 2	-	-	-	-	-	-	522	818	-	416	542	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.5	0.1	21	18.9
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	375	1509	-	-	1427	-	-	335	556
HCM Lane V/C Ratio	0.406	0.084	-	-	0.001	-	-	0.055	0.551
HCM Control Delay (s)	21	7.6	0	-	7.5	0	-	16.4	19.1
HCM Lane LOS	C	A	A	-	A	A	-	C	C
HCM 95th %tile Q(veh)	1.9	0.3	-	-	0	-	-	0.2	3.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Right Turn Channelized						
Traffic Volume (veh/h)	24	133	105	14	170	162
Future Volume (veh/h)	24	133	105	14	170	162
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	145	114	15	185	176
Approach Volume (veh/h)	171		129			361
Crossing Volume (veh/h)	114		185			26
High Capacity (veh/h)	1267		1198			1357
High v/c (veh/h)	0.13		0.11			0.27
Low Capacity (veh/h)	1054		992			1136
Low v/c (veh/h)	0.16		0.13			0.32

Intersection Summary				
Maximum v/c High	0.27			
Maximum v/c Low	0.32			
Intersection Capacity Utilization	40.8%	ICU Level of Service		A

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	4.7
Intersection LOS	A

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	171	129	361
Demand Flow Rate, veh/h	175	131	369
Vehicles Circulating, veh/h	116	189	27
Vehicles Exiting, veh/h	204	207	264
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	4.2	4.2	5.1
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	175	131	369
Cap Entry Lane, veh/h	1226	1138	1342
Entry HV Adj Factor	0.977	0.983	0.980
Flow Entry, veh/h	171	129	361
Cap Entry, veh/h	1198	1118	1315
V/C Ratio	0.143	0.115	0.275
Control Delay, s/veh	4.2	4.2	5.1
LOS	A	A	A
95th %tile Queue, veh	0	0	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	20	94	114	10	5	25
Future Volume (Veh/h)	20	94	114	10	5	25
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	102	124	11	5	27
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	135				276	130
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	135				276	130
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				99	97
cM capacity (veh/h)	1437				699	915

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	124	135	32
Volume Left	22	0	5
Volume Right	0	11	27
cSH	1437	1700	873
Volume to Capacity	0.02	0.08	0.04
Queue Length 95th (ft)	1	0	3
Control Delay (s)	1.4	0.0	9.3
Lane LOS	A		A
Approach Delay (s)	1.4	0.0	9.3
Approach LOS			A

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	26.0%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	20	94	114	10	5	25
Future Vol, veh/h	20	94	114	10	5	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	22	102	124	11	5	27

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	135	0	-	0	276	130
Stage 1	-	-	-	-	130	-
Stage 2	-	-	-	-	146	-
Critical Hdwy	4.14	-	-	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	2.236	-	-	-	3.536	3.336
Pot Cap-1 Maneuver	1437	-	-	-	709	914
Stage 1	-	-	-	-	891	-
Stage 2	-	-	-	-	876	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1437	-	-	-	698	914
Mov Cap-2 Maneuver	-	-	-	-	698	-
Stage 1	-	-	-	-	877	-
Stage 2	-	-	-	-	876	-

Approach	EB	WB	SB
HCM Control Delay, s	1.3	0	9.3
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1437	-	-	-	869
HCM Lane V/C Ratio	0.015	-	-	-	0.038
HCM Control Delay (s)	7.5	0	-	-	9.3
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Reso A - Exhibit C2 (EIR Technical Appendix)

Cumulative Plus 1293-Unit Project (Phase 1)

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	20	10	12	257	10	279	15	250	132	251	199	10
Future Volume (vph)	20	10	12	257	10	279	15	250	132	251	199	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	11	13	279	11	303	16	272	143	273	216	11

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	46	593	288	143	381	119
Volume Left (vph)	22	279	16	0	273	0
Volume Right (vph)	13	303	0	143	0	11
Hadj (s)	-0.04	-0.18	0.06	-0.67	0.39	-0.03
Departure Headway (s)	8.3	6.5	7.7	7.0	7.8	7.4
Degree Utilization, x	0.11	1.07	0.62	0.28	0.83	0.25
Capacity (veh/h)	397	548	454	506	450	478
Control Delay (s)	12.3	83.2	21.1	11.4	37.5	11.6
Approach Delay (s)	12.3	83.2	17.9		31.4	
Approach LOS	B	F	C		D	

Intersection Summary					
Delay		46.7			
Level of Service		E			
Intersection Capacity Utilization		77.8%	ICU Level of Service		D
Analysis Period (min)		15			

Intersection	
Intersection Delay, s/veh	50.4
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Vol, veh/h	20	10	12	257	10	279	0	15	250	132	251	199
Future Vol, veh/h	20	10	12	257	10	279	0	15	250	132	251	199
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	11	13	279	11	303	0	16	272	143	273	216
Number of Lanes	0	1	0	0	1	0	0	0	1	1	0	2

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	12.9	90	19.6	33.5
HCM LOS	B	F	C	D

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	6%	0%	48%	47%	72%	0%
Vol Thru, %	94%	0%	24%	2%	28%	91%
Vol Right, %	0%	100%	29%	51%	0%	9%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	265	132	42	546	351	110
LT Vol	15	0	20	257	251	0
Through Vol	250	0	10	10	100	100
RT Vol	0	132	12	279	0	10
Lane Flow Rate	288	143	46	593	381	119
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.615	0.277	0.108	1.089	0.828	0.245
Departure Headway (Hd)	8.141	7.384	8.867	6.605	8.264	7.826
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	446	489	407	552	442	462
Service Time	5.841	5.084	6.867	4.609	5.964	5.526
HCM Lane V/C Ratio	0.646	0.292	0.113	1.074	0.862	0.258
HCM Control Delay	23	12.9	12.9	90	39.9	13
HCM Lane LOS	C	B	B	F	E	B
HCM 95th-tile Q	4	1.1	0.4	18.2	7.9	1

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBR
Lane Configurations	
Traffic Vol, veh/h	10
Future Vol, veh/h	10
Peak Hour Factor	0.92
Heavy Vehicles, %	2
Mvmt Flow	11
Number of Lanes	0

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	177	135	221	208	122	372
Future Volume (Veh/h)	177	135	221	208	122	372
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	192	147	240	226	133	404
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	726	133	537			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	726	133	537			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	30	83	76			
cM capacity (veh/h)	273	888	1020			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	339	240	113	113	133	404
Volume Left	192	240	0	0	0	0
Volume Right	147	0	0	0	0	404
cSH	483	1020	1700	1700	1700	1700
Volume to Capacity	0.70	0.24	0.07	0.07	0.08	0.24
Queue Length 95th (ft)	136	23	0	0	0	0
Control Delay (s)	29.3	9.6	0.0	0.0	0.0	0.0
Lane LOS	D	A				
Approach Delay (s)	29.3	4.9			0.0	
Approach LOS	D					

Intersection Summary				
Average Delay	9.1			
Intersection Capacity Utilization	41.9%	ICU Level of Service		A
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	8.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	177	135	221	208	122	372
Future Vol, veh/h	177	135	221	208	122	372
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	145	105	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	192	147	240	226	133	404

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	726	133	537	0	-	0
Stage 1	133	-	-	-	-	-
Stage 2	593	-	-	-	-	-
Critical Hdwy	6.645	6.245	4.145	-	-	-
Critical Hdwy Stg 1	5.445	-	-	-	-	-
Critical Hdwy Stg 2	5.845	-	-	-	-	-
Follow-up Hdwy	3.5285	3.3285	2.2285	-	-	-
Pot Cap-1 Maneuver	373	913	1023	-	-	-
Stage 1	890	-	-	-	-	-
Stage 2	514	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	285	913	1023	-	-	-
Mov Cap-2 Maneuver	285	-	-	-	-	-
Stage 1	681	-	-	-	-	-
Stage 2	514	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	27.1	4.9	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1023	-	285	913	-	-
HCM Lane V/C Ratio	0.235	-	0.675	0.161	-	-
HCM Control Delay (s)	9.6	-	40.3	9.7	-	-
HCM Lane LOS	A	-	E	A	-	-
HCM 95th %tile Q(veh)	0.9	-	4.5	0.6	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	10	10	16	161	10	173	14	271	250	292	265	20
Future Volume (vph)	10	10	16	161	10	173	14	271	250	292	265	20
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	11	11	17	173	11	186	15	291	269	314	285	22

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	39	370	306	269	457	165
Volume Left (vph)	11	173	15	0	314	0
Volume Right (vph)	17	186	0	269	0	22
Hadj (s)	-0.19	-0.19	0.04	-0.68	0.36	-0.08
Departure Headway (s)	8.0	6.7	7.2	6.5	7.4	6.9
Degree Utilization, x	0.09	0.68	0.61	0.48	0.93	0.32
Capacity (veh/h)	393	525	482	541	457	508
Control Delay (s)	11.8	22.8	19.7	14.1	51.7	11.9
Approach Delay (s)	11.8	22.8	17.1		41.2	
Approach LOS	B	C	C		E	

Intersection Summary					
Delay			27.6		
Level of Service			D		
Intersection Capacity Utilization			68.4%	ICU Level of Service	C
Analysis Period (min)			15		

Intersection	
Intersection Delay, s/veh	28.8
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Vol, veh/h	10	10	16	161	10	173	0	14	271	250	292	265
Future Vol, veh/h	10	10	16	161	10	173	0	14	271	250	292	265
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	1	1	1	1	1	1	2	1	1	1	1	1
Mvmt Flow	11	11	17	173	11	186	0	15	291	269	314	285
Number of Lanes	0	1	0	0	1	0	0	0	1	1	0	2

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	12	23.9	18.2	42.6
HCM LOS	B	C	C	E

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	5%	0%	28%	47%	69%	0%
Vol Thru, %	95%	0%	28%	3%	31%	87%
Vol Right, %	0%	100%	44%	50%	0%	13%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	285	250	36	344	425	153
LT Vol	14	0	10	161	292	0
Through Vol	271	0	10	10	133	133
RT Vol	0	250	16	173	0	20
Lane Flow Rate	306	269	39	370	456	164
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.614	0.483	0.088	0.695	0.935	0.315
Departure Headway (Hd)	7.215	6.47	8.152	6.761	7.372	6.925
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	500	556	438	536	493	518
Service Time	4.969	4.223	6.23	4.801	5.123	4.675
HCM Lane V/C Ratio	0.612	0.484	0.089	0.69	0.925	0.317
HCM Control Delay	20.8	15.2	12	23.9	53.3	12.8
HCM Lane LOS	C	C	B	C	F	B
HCM 95th-tile Q	4.1	2.6	0.3	5.4	11.2	1.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBR
Lane Configurations	
Traffic Vol, veh/h	20
Future Vol, veh/h	20
Peak Hour Factor	0.93
Heavy Vehicles, %	1
Mvmt Flow	22
Number of Lanes	0

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	310	253	150	225	210	231
Future Volume (Veh/h)	310	253	150	225	210	231
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	320	261	155	232	216	238
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	642	216	454			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	642	216	454			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	9	67	86			
cM capacity (veh/h)	352	792	1110			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	581	155	116	116	216	238
Volume Left	320	155	0	0	0	0
Volume Right	261	0	0	0	0	238
cSH	615	1110	1700	1700	1700	1700
Volume to Capacity	0.95	0.14	0.07	0.07	0.13	0.14
Queue Length 95th (ft)	320	12	0	0	0	0
Control Delay (s)	50.0	8.8	0.0	0.0	0.0	0.0
Lane LOS	E	A				
Approach Delay (s)	50.0	3.5			0.0	
Approach LOS	E					

Intersection Summary				
Average Delay	21.4			
Intersection Capacity Utilization	46.5%	ICU Level of Service		A
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	15.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	310	253	150	225	210	231
Future Vol, veh/h	310	253	150	225	210	231
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	145	105	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	320	261	155	232	216	238

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	642	216	454	0	-	0
Stage 1	216	-	-	-	-	-
Stage 2	426	-	-	-	-	-
Critical Hdwy	6.615	6.215	4.115	-	-	-
Critical Hdwy Stg 1	5.415	-	-	-	-	-
Critical Hdwy Stg 2	5.815	-	-	-	-	-
Follow-up Hdwy	3.5095	3.3095	2.2095	-	-	-
Pot Cap-1 Maneuver	424	826	1111	-	-	-
Stage 1	822	-	-	-	-	-
Stage 2	630	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	365	826	1111	-	-	-
Mov Cap-2 Maneuver	365	-	-	-	-	-
Stage 1	707	-	-	-	-	-
Stage 2	630	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	35.5	3.5	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1111	-	365	826	-	-
HCM Lane V/C Ratio	0.139	-	0.876	0.316	-	-
HCM Control Delay (s)	8.8	-	55.2	11.4	-	-
HCM Lane LOS	A	-	F	B	-	-
HCM 95th %tile Q(veh)	0.5	-	8.5	1.4	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Cumulative Plus 1293-Unit and School Project

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	435	1773	1733	221	207	342
v/c Ratio	0.82	0.55	0.95	0.25	0.80	0.65
Control Delay	75.1	0.7	43.4	5.8	84.8	45.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.1	0.7	43.4	5.8	84.8	45.8
Queue Length 50th (ft)	225	0	850	25	208	283
Queue Length 95th (ft)	298	0	#1141	74	312	398
Internal Link Dist (ft)		942	856		514	
Turn Bay Length (ft)	345			330	450	
Base Capacity (vph)	627	3223	1939	933	323	624
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.55	0.89	0.24	0.64	0.55

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	400	1631	1594	203	190	315
Future Volume (vph)	400	1631	1594	203	190	315
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0	7.3	7.3	4.2	3.7
Lane Util. Factor	0.97	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3127	3223	3223	1442	1612	1442
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3127	3223	3223	1442	1612	1442
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	435	1773	1733	221	207	342
RTOR Reduction (vph)	0	0	0	71	0	9
Lane Group Flow (vph)	435	1773	1733	150	207	333
Heavy Vehicles (%)	12%	12%	12%	12%	12%	12%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	8	Free!	6		7!	4
Permitted Phases				6		4
Actuated Green, G (s)	25.9	151.5	86.1	86.1	24.5	54.4
Effective Green, g (s)	25.9	151.5	86.1	86.1	24.5	54.4
Actuated g/C Ratio	0.17	1.00	0.57	0.57	0.16	0.36
Clearance Time (s)	3.5		7.3	7.3	4.2	3.7
Vehicle Extension (s)	3.0		4.0	4.0	3.5	3.0
Lane Grp Cap (vph)	534	3223	1831	819	260	517
v/s Ratio Prot	c0.14	0.55	c0.54		c0.13	0.23
v/s Ratio Perm				0.10		
v/c Ratio	0.81	0.55	0.95	0.18	0.80	0.64
Uniform Delay, d1	60.5	0.0	30.5	15.8	61.1	40.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.3	0.7	10.9	0.1	15.8	2.8
Delay (s)	69.8	0.7	41.5	15.9	76.9	43.2
Level of Service	E	A	D	B	E	D
Approach Delay (s)		14.3	38.6		55.9	
Approach LOS		B	D		E	

Intersection Summary				
HCM 2000 Control Delay	29.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	151.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

HCM 6th Edition methodology cannot be performed with phasing conflicts.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	435	1158	387	443	1176	326	474	665	255	253	304
v/c Ratio	1.15	0.91	0.48	1.15	0.92	0.43	1.13	0.88	0.72	0.70	0.64
Control Delay	149.8	54.8	4.8	150.2	55.7	6.2	139.8	70.5	79.8	66.6	23.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	149.8	54.8	4.8	150.2	55.7	6.2	139.8	70.5	79.8	66.6	23.8
Queue Length 50th (ft)	~286	592	0	~291	604	15	~308	347	134	240	85
Queue Length 95th (ft)	#434	716	68	#445	733	87	#461	452	194	357	200
Internal Link Dist (ft)		1323			2509			853		451	
Turn Bay Length (ft)	225		485	125		390	160		140		
Base Capacity (vph)	379	1521	886	385	1521	841	421	876	421	468	550
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.15	0.76	0.44	1.15	0.77	0.39	1.13	0.76	0.61	0.54	0.55

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	400	1065	356	408	1082	300	436	519	93	235	233	280
Future Volume (vph)	400	1065	356	408	1082	300	436	519	93	235	233	280
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3155	3252	1455	3155	3252	1455	3155	3172		3155	1712	1455
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3155	3252	1455	3155	3252	1455	3155	3172		3155	1712	1455
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	435	1158	387	443	1176	326	474	564	101	255	253	304
RTOR Reduction (vph)	0	0	234	0	0	182	0	8	0	0	0	165
Lane Group Flow (vph)	435	1158	153	443	1176	144	474	657	0	255	253	139
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%	11%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	18.3	59.9	59.9	18.6	60.2	60.2	20.3	35.8		17.0	32.5	32.5
Effective Green, g (s)	18.3	59.9	59.9	18.6	60.2	60.2	20.3	35.8		17.0	32.5	32.5
Actuated g/C Ratio	0.12	0.39	0.39	0.12	0.40	0.40	0.13	0.24		0.11	0.21	0.21
Clearance Time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	380	1282	573	386	1288	576	421	747		353	366	311
v/s Ratio Prot	c0.14	0.36		c0.14	c0.36		c0.15	c0.21		0.08	0.15	
v/s Ratio Perm			0.10			0.10						0.10
v/c Ratio	1.14	0.90	0.27	1.15	0.91	0.25	1.13	0.88		0.72	0.69	0.45
Uniform Delay, d1	66.8	43.3	31.1	66.7	43.4	30.7	65.8	56.0		65.2	55.1	51.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	91.7	9.1	0.3	92.5	10.0	0.2	82.8	11.5		7.1	5.5	1.0
Delay (s)	158.5	52.4	31.4	159.1	53.4	30.9	148.6	67.4		72.3	60.6	52.9
Level of Service	F	D	C	F	D	C	F	E		E	E	D
Approach Delay (s)		71.6			73.7			101.2			61.4	
Approach LOS		E			E			F			E	

Intersection Summary				
HCM 2000 Control Delay	76.6	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	1.01			
Actuated Cycle Length (s)	151.9	Sum of lost time (s)	20.6	
Intersection Capacity Utilization	83.2%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	400	1065	356	408	1082	300	436	519	93	235	233	280
Future Volume (veh/h)	400	1065	356	408	1082	300	436	519	93	235	233	280
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1737	1737	1737	1737	1737	1737	1737	1737	1737	1737	1737	1737
Adj Flow Rate, veh/h	435	1158	387	443	1176	326	474	564	101	255	253	304
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	361	1288	574	361	1356	605	401	712	127	299	388	329
Arrive On Green	0.11	0.39	0.39	0.11	0.41	0.41	0.12	0.26	0.26	0.09	0.22	0.22
Sat Flow, veh/h	3209	3300	1472	3209	3300	1472	3209	2792	498	3209	1737	1472
Grp Volume(v), veh/h	435	1158	387	443	1176	326	474	333	332	255	253	304
Grp Sat Flow(s),veh/h/ln	1605	1650	1472	1605	1650	1472	1605	1650	1640	1605	1737	1472
Q Serve(g_s), s	18.0	52.8	23.7	18.0	52.3	26.9	20.0	30.1	30.3	12.5	21.2	32.4
Cycle Q Clear(g_c), s	18.0	52.8	23.7	18.0	52.3	26.9	20.0	30.1	30.3	12.5	21.2	32.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.30	1.00		1.00
Lane Grp Cap(c), veh/h	361	1288	574	361	1356	605	401	421	418	299	388	329
V/C Ratio(X)	1.21	0.90	0.67	1.23	0.87	0.54	1.18	0.79	0.79	0.85	0.65	0.92
Avail Cap(c_a), veh/h	361	1442	643	361	1442	643	401	422	420	401	445	377
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	71.1	45.9	18.7	71.1	43.2	35.7	70.1	55.7	55.8	71.5	56.5	60.9
Incr Delay (d2), s/veh	116.2	7.4	2.4	124.9	5.6	0.8	105.1	9.7	10.1	12.5	2.8	26.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.0	22.0	8.3	13.5	21.3	9.7	14.0	13.6	13.6	5.6	9.5	14.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	187.3	53.3	21.1	196.0	48.9	36.5	175.2	65.4	65.9	84.1	59.3	87.2
LnGrp LOS	F	D	C	F	D	D	F	E	E	F	E	F
Approach Vol, veh/h		1980			1945			1139			812	
Approach Delay, s/veh		76.4			80.3			111.2			77.5	
Approach LOS		E			F			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	25.3	69.8	24.0	41.1	22.0	73.1	18.9	46.2
Change Period (Y+Rc), s	7.3	* 7.3	4.0	5.3	4.0	7.3	4.0	5.3
Max Green Setting (Gmax), s	18.0	* 70	20.0	41.0	18.0	70.0	20.0	41.0
Max Q Clear Time (g_c+I1), s	20.0	54.8	22.0	34.4	20.0	54.3	14.5	32.3
Green Ext Time (p_c), s	0.0	7.7	0.0	1.4	0.0	7.7	0.4	2.6

Intersection Summary		
HCM 6th Ctrl Delay	84.6	
HCM 6th LOS	F	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	1289	1690	30	0	100
Future Volume (Veh/h)	0	1289	1690	30	0	100
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1401	1837	33	0	109
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1870				2538	918
vC1, stage 1 conf vol					1837	
vC2, stage 2 conf vol					700	
vCu, unblocked vol	1870				2538	918
tC, single (s)	4.3				7.0	7.1
tC, 2 stage (s)					6.0	
tF (s)	2.3				3.6	3.4
p0 queue free %	100				100	58
cM capacity (veh/h)	287				97	259

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	SB 1
Volume Total	700	700	918	918	33	109
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	33	109
cSH	1700	1700	1700	1700	1700	259
Volume to Capacity	0.41	0.41	0.54	0.54	0.02	0.42
Queue Length 95th (ft)	0	0	0	0	0	49
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	28.7
Lane LOS						D
Approach Delay (s)	0.0		0.0			28.7
Approach LOS						D

Intersection Summary				
Average Delay		0.9		
Intersection Capacity Utilization		59.6%	ICU Level of Service	B
Analysis Period (min)		15		

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1289	1690	30	0	100
Future Vol, veh/h	0	1289	1690	30	0	100
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	165	-	-
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	0	1401	1837	33	0	109

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	919
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.4
Pot Cap-1 Maneuver	0	-	-	-	0	259
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	259
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	28.6
HCM LOS			D

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	259
HCM Lane V/C Ratio	-	-	-	0.42
HCM Control Delay (s)	-	-	-	28.6
HCM Lane LOS	-	-	-	D
HCM 95th %tile Q(veh)	-	-	-	2

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1233	56	3	1694	0	26	0	10	0	0	0
Future Volume (Veh/h)	0	1233	56	3	1694	0	26	0	10	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	1340	61	3	1841	0	28	0	11	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									1			
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1841			1401			2266	3187	670	2522	3248	920
vC1, stage 1 conf vol							1340	1340		1847	1847	
vC2, stage 2 conf vol							926	1847		676	1401	
vCu, unblocked vol	1841			1401			2266	3187	670	2522	3248	920
tC, single (s)	4.4			4.4			7.8	6.8	7.2	7.8	6.8	7.2
tC, 2 stage (s)							6.8	5.8		6.8	5.8	
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			99			77	100	97	100	100	100
cM capacity (veh/h)	284			431			124	91	375	65	89	253

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	670	670	61	3	1227	614	39	0
Volume Left	0	0	0	0	3	0	0	28	0
Volume Right	0	0	0	61	0	0	0	11	0
cSH	1700	1700	1700	1700	431	1700	1700	173	1700
Volume to Capacity	0.00	0.39	0.39	0.04	0.01	0.72	0.36	0.23	0.00
Queue Length 95th (ft)	0	0	0	0	1	0	0	21	0
Control Delay (s)	0.0	0.0	0.0	0.0	13.4	0.0	0.0	34.5	0.0
Lane LOS					B			D	A
Approach Delay (s)	0.0				0.0			34.5	0.0
Approach LOS								D	A

Intersection Summary				
Average Delay		0.4		
Intersection Capacity Utilization		56.8%	ICU Level of Service	B
Analysis Period (min)		15		

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1233	56	3	1694	0	26	0	10	0	0	0
Future Vol, veh/h	0	1233	56	3	1694	0	26	0	10	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	275	305	-	-	-	-	25	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	13	13	13	13	13	13	13	13	13	13	13	13
Mvmt Flow	0	1340	61	3	1841	0	28	0	11	0	0	0

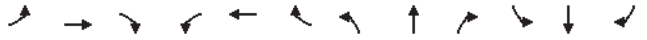
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1841	0	0	1401	0	0	2267	3187	670	2517	3248	921
Stage 1	-	-	-	-	-	-	1340	1340	-	1847	1847	-
Stage 2	-	-	-	-	-	-	927	1847	-	670	1401	-
Critical Hdwy	4.36	-	-	4.36	-	-	7.76	6.76	7.16	7.76	6.76	7.16
Critical Hdwy Stg 1	-	-	-	-	-	-	6.76	5.76	-	6.76	5.76	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.76	5.76	-	6.76	5.76	-
Follow-up Hdwy	2.33	-	-	2.33	-	-	3.63	4.13	3.43	3.63	4.13	3.43
Pot Cap-1 Maneuver	284	-	-	431	-	-	~ 19	8	375	12	7	252
Stage 1	-	-	-	-	-	-	146	200	-	68	109	-
Stage 2	-	-	-	-	-	-	268	109	-	388	186	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	284	-	-	431	-	-	~ 19	8	375	12	7	252
Mov Cap-2 Maneuver	-	-	-	-	-	-	121	88	-	63	86	-
Stage 1	-	-	-	-	-	-	146	200	-	68	108	-
Stage 2	-	-	-	-	-	-	266	108	-	377	186	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	35.6	0
HCM LOS			E	A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	121	375	284	-	-	431	-	-	-
HCM Lane V/C Ratio	0.234	0.029	-	-	-	0.008	-	-	-
HCM Control Delay (s)	43.6	14.9	0	-	-	13.4	-	-	0
HCM Lane LOS	E	B	A	-	-	B	-	-	A
HCM 95th %tile Q(veh)	0.9	0.1	0	-	-	0	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Reso A - Exhibit C2 (EIR Technical Appendix)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized			MOYes									
Traffic Volume (veh/h)	204	222	150	322	200	156	63	675	301	100	559	250
Future Volume (veh/h)	204	222	150	322	200	156	63	675	301	100	559	250
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	222	241	163	350	217	170	68	734	327	109	608	272
Approach Volume (veh/h)		463			737			1129			989	
Crossing Volume (veh/h)		1067			1024			572			635	
High Capacity (veh/h)		589			610			881			838	
High v/c (veh/h)		0.79			1.21			1.28			1.18	
Low Capacity (veh/h)		454			472			708			670	
Low v/c (veh/h)		1.02			1.56			1.59			1.48	

Intersection Summary												
Maximum v/c High			1.28									
Maximum v/c Low			1.59									
Intersection Capacity Utilization			119.5%		ICU Level of Service				H			

Intersection	
Intersection Delay, s/veh	36.8
Intersection LOS	E

Approach	EB	WB	NB	SB
Entry Lanes	2	2	2	2
Conflicting Circle Lanes	1	2	2	2
Adj Approach Flow, veh/h	626	737	1129	989
Demand Flow Rate, veh/h	645	759	1163	1018
Vehicles Circulating, veh/h	1099	1055	589	655
Vehicles Exiting, veh/h	574	697	987	1160
Ped Vol Crossing Leg, #/h	0	0	3	0
Ped Cap Adj	1.000	1.000	0.998	1.000
Approach Delay, s/veh	11.3	24.4	52.8	43.8
Approach LOS	B	C	F	E

Lane	Left	Right	Bypass	Left	Right	Left	Right	Left	Right
Designated Moves	LT	TR	R	L	TR	LT	R	LT	R
Assumed Moves	LT	TR	R	L	TR	LT	R	LT	R
RT Channelized			Free						
Lane Util	0.470	0.530		0.474	0.526	0.710	0.290	0.725	0.275
Follow-Up Headway, s	2.535	2.535		2.667	2.535	2.667	2.535	2.667	2.535
Critical Headway, s	4.544	4.544	168	4.645	4.328	4.645	4.328	4.645	4.328
Entry Flow, veh/h	224	253	1957	360	399	826	337	738	280
Cap Entry Lane, veh/h	522	522	0.971	511	579	785	861	739	814
Entry HV Adj Factor	0.971	0.969	163	0.972	0.971	0.971	0.970	0.971	0.971
Flow Entry, veh/h	218	245	1900	350	387	802	327	717	272
Cap Entry, veh/h	507	506	0.086	497	562	761	834	718	791
V/C Ratio	0.429	0.484	0.0	0.704	0.689	1.054	0.392	0.999	0.344
Control Delay, s/veh	14.5	16.0	A	26.2	22.8	70.7	9.0	57.2	8.6
LOS	B	C	0	D	C	F	A	F	A
95th %tile Queue, veh	2	3		5	5	20	2	16	2

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Volume (veh/h)	5	43	5	13	91	0	20	5	18	0	0	0
Future Volume (Veh/h)	5	43	5	13	91	0	20	5	18	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	47	5	14	99	0	22	5	20	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	99			52			186	186	50	209	189	99
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	99			52			186	186	50	209	189	99
tC, single (s)	4.2			4.2			7.2	6.6	6.3	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			99			97	99	98	100	100	100
cM capacity (veh/h)	1457			1516			754	689	1002	710	686	941

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	57	113	47	0
Volume Left	5	14	22	0
Volume Right	5	0	20	0
cSH	1457	1516	833	1700
Volume to Capacity	0.00	0.01	0.06	0.00
Queue Length 95th (ft)	0	1	4	0
Control Delay (s)	0.7	1.0	9.6	0.0
Lane LOS	A	A	A	A
Approach Delay (s)	0.7	1.0	9.6	0.0
Approach LOS			A	A

Intersection Summary					
Average Delay			2.8		
Intersection Capacity Utilization			17.9%	ICU Level of Service	A
Analysis Period (min)			15		

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Vol, veh/h	5	43	5	13	91	0	20	5	18	0	0	0
Future Vol, veh/h	5	43	5	13	91	0	20	5	18	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	8	8	8	8	8	8	8	8	8	8	8	8
Mvmt Flow	5	47	5	14	99	0	22	5	20	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	99	0	0	52	0	0	187	187	50	199	189	99
Stage 1	-	-	-	-	-	-	60	60	-	127	127	-
Stage 2	-	-	-	-	-	-	127	127	-	72	62	-
Critical Hdwy	4.18	-	-	4.18	-	-	7.18	6.58	6.28	7.18	6.58	6.28
Critical Hdwy Stg 1	-	-	-	-	-	-	6.18	5.58	-	6.18	5.58	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.18	5.58	-	6.18	5.58	-
Follow-up Hdwy	2.272	-	-	2.272	-	-	3.572	4.072	3.372	3.572	4.072	3.372
Pot Cap-1 Maneuver	1457	-	-	1516	-	-	760	697	1002	747	695	941
Stage 1	-	-	-	-	-	-	937	833	-	863	780	-
Stage 2	-	-	-	-	-	-	863	780	-	923	832	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1457	-	-	1516	-	-	752	687	1002	720	685	941
Mov Cap-2 Maneuver	-	-	-	-	-	-	752	687	-	720	685	-
Stage 1	-	-	-	-	-	-	933	830	-	860	772	-
Stage 2	-	-	-	-	-	-	854	772	-	895	829	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.9	9.6	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	830	1457	-	-	1516	-	-	-
HCM Lane V/C Ratio	0.056	0.004	-	-	0.009	-	-	-
HCM Control Delay (s)	9.6	7.5	0	-	7.4	0	-	0
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	11	432	388	504	768	11	22	166	349	351	43
v/c Ratio	0.12	0.68	0.81	0.56	0.66	0.08	0.15	0.60	0.78	0.78	0.09
Control Delay	53.7	43.2	48.4	21.6	4.6	47.2	48.1	17.3	48.2	47.5	0.3
Queue Delay	0.0	0.0	0.9	1.7	0.6	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.7	43.2	49.3	23.2	5.2	47.2	48.1	17.3	48.2	47.5	0.3
Queue Length 50th (ft)	7	136	229	211	0	7	14	0	210	211	0
Queue Length 95th (ft)	28	207	#419	403	76	26	41	65	#412	#412	0
Internal Link Dist (ft)		346		307			744			674	
Turn Bay Length (ft)	65		125			140		165	150		185
Base Capacity (vph)	94	861	595	1017	1208	339	358	433	529	537	574
Starvation Cap Reductn	0	0	60	335	162	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.50	0.73	0.74	0.73	0.03	0.06	0.38	0.66	0.65	0.07

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	365	32	357	464	707	10	20	153	553	91	40
Future Volume (vph)	10	365	32	357	464	707	10	20	153	553	91	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (prot)	1752	3452		1752	1845	1568	1752	1845	1543	1665	1692	1519
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Satd. Flow (perm)	1752	3452		1752	1845	1568	1752	1845	1543	1665	1692	1519
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	397	35	388	504	768	11	22	166	601	99	43
RTOR Reduction (vph)	0	5	0	0	0	404	0	0	153	0	0	32
Lane Group Flow (vph)	11	427	0	388	504	364	11	22	13	349	351	11
Confl. Peds. (#/hr)			8						1			5
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	0.8	21.5		26.3	47.0	47.0	7.7	7.7	7.7	25.7	25.7	25.7
Effective Green, g (s)	0.8	21.5		26.3	47.0	47.0	7.7	7.7	7.7	25.7	25.7	25.7
Actuated g/C Ratio	0.01	0.22		0.27	0.47	0.47	0.08	0.08	0.08	0.26	0.26	0.26
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	14	748		464	874	742	135	143	119	431	438	393
v/s Ratio Prot	0.01	0.12		c0.22	c0.27		0.01	c0.01		c0.21	0.21	
v/s Ratio Perm						0.23			0.01			0.01
v/c Ratio	0.79	0.57		0.84	0.58	0.49	0.08	0.15	0.11	0.81	0.80	0.03
Uniform Delay, d1	49.1	34.7		34.4	18.9	17.9	42.5	42.7	42.6	34.5	34.4	27.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	130.6	1.1		12.3	0.9	0.5	0.3	0.5	0.4	10.7	10.1	0.0
Delay (s)	179.7	35.8		46.8	19.8	18.4	42.7	43.2	43.0	45.2	44.5	27.5
Level of Service	F	D		D	B	B	D	D	D	D	D	C
Approach Delay (s)		39.3			25.5			43.0			43.8	
Approach LOS		D			C			D			D	

Intersection Summary

HCM 2000 Control Delay	33.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	99.2	Sum of lost time (s)	18.0
Intersection Capacity Utilization	68.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Cumulative Plus 1293 Unit Project and School AM
8: Riverside Ave & 13th Street — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	365	32	357	464	707	10	20	153	553	91	40
Future Volume (veh/h)	10	365	32	357	464	707	10	20	153	553	91	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	397	35	388	504	768	11	22	166	672	0	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	23	799	70	424	874	741	221	232	196	777	0	342
Arrive On Green	0.01	0.24	0.24	0.24	0.47	0.47	0.12	0.12	0.12	0.22	0.00	0.22
Sat Flow, veh/h	1767	3274	287	1767	1856	1572	1767	1856	1569	3534	0	1555
Grp Volume(v), veh/h	11	213	219	388	504	768	11	22	166	672	0	43
Grp Sat Flow(s),veh/h/ln	1767	1763	1798	1767	1856	1572	1767	1856	1569	1767	0	1555
Q Serve(g_s), s	0.6	10.9	11.0	22.5	20.7	49.5	0.6	1.1	10.9	19.2	0.0	2.3
Cycle Q Clear(g_c), s	0.6	10.9	11.0	22.5	20.7	49.5	0.6	1.1	10.9	19.2	0.0	2.3
Prop In Lane	1.00		0.16	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	23	430	439	424	874	741	221	232	196	777	0	342
V/C Ratio(X)	0.48	0.49	0.50	0.92	0.58	1.04	0.05	0.09	0.85	0.86	0.00	0.13
Avail Cap(c_a), veh/h	84	430	439	530	874	741	303	318	269	992	0	436
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.5	34.1	34.2	38.9	20.2	27.8	40.5	40.7	45.0	39.5	0.0	32.9
Incr Delay (d2), s/veh	14.4	0.9	0.9	18.0	0.9	43.0	0.1	0.2	16.5	6.6	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	4.8	5.0	11.7	8.9	26.4	0.3	0.5	5.1	8.9	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.9	35.0	35.1	56.9	21.1	70.8	40.6	40.9	61.5	46.1	0.0	33.1
LnGrp LOS	E	D	D	E	C	F	D	D	E	D	A	C
Approach Vol, veh/h		443			1660			199			715	
Approach Delay, s/veh		35.8			52.5			58.1			45.3	
Approach LOS		D			D			E			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	29.7	30.2		27.6	5.9	54.0		17.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	31.5	23.0		29.5	5.0	49.5		18.0				
Max Q Clear Time (g_c+I1), s	24.5	13.0		21.2	2.6	51.5		12.9				
Green Ext Time (p_c), s	0.7	1.9		1.9	0.0	0.0		0.3				

Intersection Summary			
HCM 6th Ctrl Delay		48.7	
HCM 6th LOS		D	

Notes

User approved volume balancing among the lanes for turning movement.

Olsen-Chandler SP — Cumulative Plus 1293 Unit Project and School AM
9: Paso Robles Street & 13th Street — Queues

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	76	1088	57	1416	433	235	22	272	11	11
v/c Ratio	0.44	0.57	0.35	0.75	0.45	0.72	0.05	0.51	0.03	0.02
Control Delay	52.5	15.9	50.7	20.2	6.6	47.8	29.7	11.6	29.6	0.1
Queue Delay	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.5	16.4	50.7	20.2	6.6	47.8	29.7	11.6	29.6	0.1
Queue Length 50th (ft)	47	223	35	345	46	141	11	27	6	0
Queue Length 95th (ft)	98	318	78	479	123	228	31	99	20	0
Internal Link Dist (ft)		307		269			836			575
Turn Bay Length (ft)	120		220		145	130		110	95	
Base Capacity (vph)	207	2256	196	2259	1085	473	631	681	469	654
Starvation Cap Reductn	0	686	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.69	0.29	0.63	0.40	0.50	0.03	0.40	0.02	0.02

Intersection Summary

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Cumulative Plus 1293 Unit Project and School AM
9: Paso Robles Street & 13th Street — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	950	51	52	1303	398	216	20	250	10	0	10
Future Volume (vph)	70	950	51	52	1303	398	216	20	250	10	0	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1752	3472		1752	3505	1530	1752	1845	1568	1752	1568	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.75	1.00	1.00	0.74	1.00	
Satd. Flow (perm)	1752	3472		1752	3505	1530	1384	1845	1568	1371	1568	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	1033	55	57	1416	433	235	22	272	11	0	11
RTOR Reduction (vph)	0	4	0	0	0	130	0	0	168	0	8	0
Lane Group Flow (vph)	76	1084	0	57	1416	303	235	22	104	11	3	0
Confl. Peds. (#/hr)			6			1						
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		
Actuated Green, G (s)	6.5	48.4		6.0	47.9	47.9	20.8	20.8	20.8	20.8	20.8	
Effective Green, g (s)	6.5	48.4		6.0	47.9	47.9	20.8	20.8	20.8	20.8	20.8	
Actuated g/C Ratio	0.07	0.55		0.07	0.54	0.54	0.23	0.23	0.23	0.23	0.23	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	128	1894		118	1892	826	324	432	367	321	367	
v/s Ratio Prot	c0.04	0.31		0.03	c0.40			0.01			0.00	
v/s Ratio Perm						0.20	c0.17		0.07	0.01		
v/c Ratio	0.59	0.57		0.48	0.75	0.37	0.73	0.05	0.28	0.03	0.01	
Uniform Delay, d1	39.8	13.3		39.9	15.7	11.7	31.3	26.3	27.8	26.2	26.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	7.2	0.4		3.1	1.7	0.3	7.8	0.0	0.4	0.0	0.0	
Delay (s)	47.0	13.7		42.9	17.4	12.0	39.2	26.4	28.3	26.2	26.0	
Level of Service	D	B		D	B	B	D	C	C	C	C	
Approach Delay (s)		15.9			16.9			33.0			26.1	
Approach LOS		B			B			C			C	

Intersection Summary				
HCM 2000 Control Delay	19.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	88.7	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	70.1%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Olsen-Chandler SP — Cumulative Plus 1293 Unit Project and School AM
9: Paso Robles Street & 13th Street — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	950	51	52	1303	398	216	20	250	10	0	10
Future Volume (veh/h)	70	950	51	52	1303	398	216	20	250	10	0	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	76	1033	55	57	1416	0	235	22	272	11	0	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	98	1851	99	84	1890		396	401	340	325	0	340
Arrive On Green	0.06	0.54	0.54	0.05	0.54	0.00	0.22	0.22	0.22	0.22	0.00	0.22
Sat Flow, veh/h	1767	3403	181	1767	3526	1572	1392	1856	1572	1077	0	1572
Grp Volume(v), veh/h	76	535	553	57	1416	0	235	22	272	11	0	11
Grp Sat Flow(s),veh/h/ln	1767	1763	1822	1767	1763	1572	1392	1856	1572	1077	0	1572
Q Serve(g_s), s	3.0	14.0	14.0	2.2	21.8	0.0	11.2	0.7	11.5	0.6	0.0	0.4
Cycle Q Clear(g_c), s	3.0	14.0	14.0	2.2	21.8	0.0	11.6	0.7	11.5	1.2	0.0	0.4
Prop In Lane	1.00		0.10	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	98	959	991	84	1890		396	401	340	325	0	340
V/C Ratio(X)	0.78	0.56	0.56	0.67	0.75		0.59	0.05	0.80	0.03	0.00	0.03
Avail Cap(c_a), veh/h	239	1382	1428	227	2738		641	727	616	514	0	616
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.7	10.5	10.5	32.9	12.6	0.0	26.3	21.8	26.1	22.3	0.0	21.7
Incr Delay (d2), s/veh	12.3	0.5	0.5	9.0	0.7	0.0	1.4	0.1	4.4	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	4.8	4.9	1.1	7.5	0.0	3.6	0.3	4.4	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.0	11.0	11.0	41.9	13.3	0.0	27.7	21.9	30.5	22.4	0.0	21.8
LnGrp LOS	D	B	B	D	B		C	C	C	C	A	C
Approach Vol, veh/h		1164			1473	A		529			22	
Approach Delay, s/veh		13.2			14.4			28.9			22.1	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.9	42.7		19.7	8.4	42.1		19.7				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	9.0	55.0		27.5	9.5	54.5		27.5				
Max Q Clear Time (g_c+I1), s	4.2	16.0		3.2	5.0	23.8		13.6				
Green Ext Time (p_c), s	0.0	9.2		0.0	0.1	13.8		1.5				

Intersection Summary			
HCM 6th Ctrl Delay	16.4		
HCM 6th LOS	B		

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	342	972	65	1205	417	203	54	174	698
v/c Ratio	0.85	0.62	0.49	0.89	0.87	0.27	0.13	0.79	1.09dr
Control Delay	70.8	24.4	65.5	41.3	68.6	40.5	2.3	74.8	53.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.8	24.4	65.5	41.3	68.6	40.5	2.3	74.8	53.0
Queue Length 50th (ft)	136	276	49	435	165	70	0	132	216
Queue Length 95th (ft)	#217	349	96	533	#253	106	8	#240	#331
Internal Link Dist (ft)		353		673		608			523
Turn Bay Length (ft)	295		235		140		130	225	
Base Capacity (vph)	409	1575	153	1462	494	757	413	241	788
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.62	0.42	0.82	0.84	0.27	0.13	0.72	0.89

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	315	591	304	60	918	190	384	187	50	160	192	450
Future Volume (vph)	315	591	304	60	918	190	384	187	50	160	192	450
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.97		1.00	1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	3341		1770	3441		3433	3539	1583	1770	3167	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	3341		1770	3441		3433	3539	1583	1770	3167	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	342	642	330	65	998	207	417	203	54	174	209	489
RTOR Reduction (vph)	0	53	0	0	14	0	0	0	43	0	141	0
Lane Group Flow (vph)	342	919	0	65	1191	0	417	203	11	174	557	0
Confl. Peds. (#/hr)			3									
Confl. Bikes (#/hr)						1						
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	13.5	52.4		7.3	46.2		16.1	24.2	24.2	14.4	22.5	
Effective Green, g (s)	13.5	52.4		7.3	46.2		16.1	24.2	24.2	14.4	22.5	
Actuated g/C Ratio	0.12	0.45		0.06	0.40		0.14	0.21	0.21	0.12	0.19	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	398	1505		111	1366		475	736	329	219	612	
v/s Ratio Prot	c0.10	0.28		0.04	c0.35		c0.12	0.06		0.10	c0.18	
v/s Ratio Perm									0.01			
v/c Ratio	0.86	0.61		0.59	0.87		0.88	0.28	0.03	0.79	1.09dr	
Uniform Delay, d1	50.5	24.2		53.0	32.3		49.1	38.7	36.7	49.5	45.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	16.6	0.7		7.7	6.4		16.6	0.2	0.0	17.8	17.4	
Delay (s)	67.1	25.0		60.7	38.7		65.7	38.9	36.8	67.3	63.4	
Level of Service	E	C		E	D		E	D	D	E	E	
Approach Delay (s)		35.9			39.8			55.3			64.1	
Approach LOS		D			D			E			E	

Intersection Summary

HCM 2000 Control Delay	46.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	116.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	86.2%	ICU Level of Service	E
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	315	591	304	60	918	190	384	187	50	160	192	450
Future Volume (veh/h)	315	591	304	60	918	190	384	187	50	160	192	450
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	342	642	0	65	998	207	417	203	54	174	209	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	431	1778		84	1236	256	512	430	192	212	326	
Arrive On Green	0.12	0.50	0.00	0.05	0.42	0.42	0.15	0.12	0.12	0.12	0.09	0.00
Sat Flow, veh/h	3456	3647	0	1781	2924	605	3456	3554	1585	1781	3647	0
Grp Volume(v), veh/h	342	642	0	65	606	599	417	203	54	174	209	0
Grp Sat Flow(s),veh/h/ln	1728	1777	0	1781	1777	1752	1728	1777	1585	1781	1777	0
Q Serve(g_s), s	8.1	9.3	0.0	3.1	25.3	25.4	9.9	4.5	2.6	8.1	4.8	0.0
Cycle Q Clear(g_c), s	8.1	9.3	0.0	3.1	25.3	25.4	9.9	4.5	2.6	8.1	4.8	0.0
Prop In Lane	1.00		0.00	1.00		0.35	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	431	1778		84	751	741	512	430	192	212	326	
V/C Ratio(X)	0.79	0.36		0.77	0.81	0.81	0.81	0.47	0.28	0.82	0.64	
Avail Cap(c_a), veh/h	559	2185		208	1013	999	673	1023	456	328	986	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	36.0	12.9	0.0	39.9	21.4	21.5	34.9	34.7	33.9	36.4	37.1	0.0
Incr Delay (d2), s/veh	5.9	0.1	0.0	13.9	3.5	3.7	5.8	0.8	0.8	9.1	2.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	3.5	0.0	1.6	10.4	10.3	4.4	1.9	1.0	3.8	2.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.9	13.0	0.0	53.9	25.0	25.2	40.7	35.5	34.7	45.5	39.2	0.0
LnGrp LOS	D	B		D	C	C	D	D	C	D	D	
Approach Vol, veh/h		984	A		1270			674			383	A
Approach Delay, s/veh		23.1			26.5			38.7			42.1	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.5	46.9	17.1	12.3	15.1	40.3	14.6	14.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.9	52.1	16.5	23.5	13.7	48.3	15.6	24.4
Max Q Clear Time (g_c+I1), s	5.1	11.3	11.9	6.8	10.1	27.4	10.1	6.5
Green Ext Time (p_c), s	0.0	5.1	0.7	1.0	0.4	8.4	0.2	1.2

Intersection Summary	
HCM 6th Ctrl Delay	29.8
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	96	493	1428	633	143
v/c Ratio	0.71	0.23	0.84	0.80	0.30
Control Delay	73.4	10.1	24.9	44.2	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	73.4	10.1	24.9	44.2	8.2
Queue Length 50th (ft)	53	52	285	169	0
Queue Length 95th (ft)	#183	156	#719	#386	56
Internal Link Dist (ft)		1151	2310	505	
Turn Bay Length (ft)	125			120	
Base Capacity (vph)	135	2165	1699	793	475
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.71	0.23	0.84	0.80	0.30

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	88	454	723	591	582	132
Future Volume (vph)	88	454	723	591	582	132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.93		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1752	3505	3246		3400	1568
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1752	3505	3246		3400	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	96	493	786	642	633	143
RTOR Reduction (vph)	0	0	104	0	0	111
Lane Group Flow (vph)	96	493	1324	0	633	32
Confl. Peds. (#/hr)				3		
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	NA		Perm	Perm
Protected Phases	5	2	6			
Permitted Phases					4	4
Actuated Green, G (s)	7.3	58.6	46.8		22.1	22.1
Effective Green, g (s)	7.3	58.6	46.8		22.1	22.1
Actuated g/C Ratio	0.07	0.59	0.48		0.22	0.22
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	129	2085	1542		762	351
v/s Ratio Prot	c0.05	0.14	c0.41			
v/s Ratio Perm					c0.19	0.02
v/c Ratio	0.74	0.24	0.86		0.83	0.09
Uniform Delay, d1	44.7	9.4	22.9		36.4	30.2
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	20.5	0.1	5.0		7.7	0.1
Delay (s)	65.2	9.5	27.9		44.1	30.4
Level of Service	E	A	C		D	C
Approach Delay (s)		18.6	27.9		41.6	
Approach LOS		B	C		D	

Intersection Summary			
HCM 2000 Control Delay	29.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	98.5	Sum of lost time (s)	18.0
Intersection Capacity Utilization	71.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Cumulative Plus 1293 Unit Project and School AM
12: Creston Road & Niblick Road/Sherwood Road — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	142	433	158	98	855	640	252	632	301	326	311
v/c Ratio	0.67	0.32	0.23	0.54	0.72	0.84	0.79	0.77	0.71	0.52	0.63
Control Delay	63.8	25.4	5.0	59.9	34.8	25.1	61.0	44.7	56.6	44.2	15.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.8	25.4	5.0	59.9	34.8	25.1	61.0	44.7	56.6	44.2	15.0
Queue Length 50th (ft)	98	115	0	68	276	192	172	222	108	115	27
Queue Length 95th (ft)	#190	171	45	130	368	#396	#309	299	#175	167	121
Internal Link Dist (ft)		1092			186			1440		2310	
Turn Bay Length (ft)	150		150	170		140	230		245		100
Base Capacity (vph)	249	1493	739	234	1462	850	387	1053	470	774	543
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.29	0.21	0.42	0.58	0.75	0.65	0.60	0.64	0.42	0.57

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Olsen-Chandler SP — Cumulative Plus 1293 Unit Project and School AM
12: Creston Road & Niblick Road/Sherwood Road — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	131	398	145	90	787	589	232	532	50	277	300	286
Future Volume (vph)	131	398	145	90	787	589	232	532	50	277	300	286
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1752	3505	1526	1752	3505	1527	1752	3454		3400	3505	1518
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1752	3505	1526	1752	3505	1527	1752	3454		3400	3505	1518
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	142	433	158	98	855	640	252	578	54	301	326	311
RTOR Reduction (vph)	0	0	97	0	0	239	0	6	0	0	0	221
Lane Group Flow (vph)	142	433	61	98	855	401	252	626	0	301	326	90
Confl. Peds. (#/hr)			9			9			4			12
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	12.7	40.7	40.7	9.0	37.0	37.0	19.3	24.9		13.1	18.7	18.7
Effective Green, g (s)	12.7	40.7	40.7	9.0	37.0	37.0	19.3	24.9		13.1	18.7	18.7
Actuated g/C Ratio	0.12	0.39	0.39	0.09	0.35	0.35	0.18	0.24		0.12	0.18	0.18
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	210	1349	587	149	1226	534	319	813		421	620	268
v/s Ratio Prot	c0.08	c0.12		0.06	0.24		c0.14	c0.18		0.09	0.09	
v/s Ratio Perm			0.04			c0.26						0.06
v/c Ratio	0.68	0.32	0.10	0.66	0.70	0.75	0.79	0.77		0.71	0.53	0.34
Uniform Delay, d1	44.5	22.8	20.8	46.9	29.5	30.3	41.3	37.7		44.5	39.5	38.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	8.3	0.1	0.1	10.0	1.8	5.9	12.2	4.4		5.7	0.8	0.8
Delay (s)	52.9	22.9	20.9	56.9	31.3	36.2	53.5	42.2		50.2	40.3	38.8
Level of Service	D	C	C	E	C	D	D	D		D	D	D
Approach Delay (s)		28.3			34.8			45.4			43.0	
Approach LOS		C			C			D			D	

Intersection Summary

HCM 2000 Control Delay	37.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	105.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Cumulative Plus 1293 Unit Project and School AM
12: Creston Road & Niblick Road/Sherwood Road — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	131	398	145	90	787	589	232	532	50	277	300	286
Future Volume (veh/h)	131	398	145	90	787	589	232	532	50	277	300	286
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	142	433	158	98	855	640	252	578	54	301	326	311
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	171	1436	636	123	1341	594	283	832	78	364	710	311
Arrive On Green	0.10	0.41	0.41	0.07	0.38	0.38	0.16	0.26	0.26	0.11	0.20	0.20
Sat Flow, veh/h	1767	3526	1562	1767	3526	1561	1767	3258	304	3428	3526	1544
Grp Volume(v), veh/h	142	433	158	98	855	640	252	312	320	301	326	311
Grp Sat Flow(s),veh/h/ln	1767	1763	1562	1767	1763	1561	1767	1763	1799	1714	1763	1544
Q Serve(g_s), s	8.8	9.3	7.4	6.1	22.2	42.5	15.6	17.9	18.0	9.6	9.1	22.5
Cycle Q Clear(g_c), s	8.8	9.3	7.4	6.1	22.2	42.5	15.6	17.9	18.0	9.6	9.1	22.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.17	1.00		1.00
Lane Grp Cap(c), veh/h	171	1436	636	123	1341	594	283	450	460	364	710	311
V/C Ratio(X)	0.83	0.30	0.25	0.79	0.64	1.08	0.89	0.69	0.70	0.83	0.46	1.00
Avail Cap(c_a), veh/h	229	1436	636	215	1341	594	356	488	498	433	710	311
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.6	22.4	21.8	51.2	28.3	34.6	45.9	37.6	37.7	48.9	39.2	44.6
Incr Delay (d2), s/veh	17.1	0.1	0.2	10.9	1.0	59.5	19.8	3.8	3.8	10.8	0.5	50.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	3.7	0.0	3.0	9.2	25.0	8.3	8.1	8.3	4.6	3.9	12.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.7	22.5	22.0	62.1	29.3	94.1	65.7	41.5	41.5	59.7	39.7	95.5
LnGrp LOS	E	C	C	E	C	F	E	D	D	E	D	F
Approach Vol, veh/h		733			1593			884			938	
Approach Delay, s/veh		30.9			57.4			48.4			64.6	
Approach LOS		C			E			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.4	33.0	12.3	50.0	22.4	27.0	15.3	47.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	14.1	30.9	13.6	43.4	22.5	22.5	14.5	42.5
Max Q Clear Time (g_c+I1), s	11.6	20.0	8.1	11.3	17.6	24.5	10.8	44.5
Green Ext Time (p_c), s	0.3	2.8	0.1	3.4	0.3	0.0	0.1	0.0

Intersection Summary	
HCM 6th Ctrl Delay	52.4
HCM 6th LOS	D

Olsen-Chandler SP — Cumulative Plus 1293 Unit Project and School AM
13: Creston Road & Scott Street — HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	48	55	752	58	58	528
Future Volume (Veh/h)	48	55	752	58	58	528
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	52	60	817	63	63	574
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1548	848			880	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1548	848			880	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	55	83			92	
cM capacity (veh/h)	115	361			768	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	112	880	63	574
Volume Left	52	0	63	0
Volume Right	60	63	0	0
cSH	181	1700	768	1700
Volume to Capacity	0.62	0.52	0.08	0.34
Queue Length 95th (ft)	87	0	7	0
Control Delay (s)	52.5	0.0	10.1	0.0
Lane LOS	F		B	
Approach Delay (s)	52.5	0.0	1.0	
Approach LOS	F			

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	60.9%	ICU Level of Service	B
Analysis Period (min)	15		

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	48	55	752	58	58	528
Future Vol, veh/h	48	55	752	58	58	528
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	52	60	817	63	63	574

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1549	849	0	0	880	0
Stage 1	849	-	-	-	-	-
Stage 2	700	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	125	361	-	-	768	-
Stage 1	419	-	-	-	-	-
Stage 2	493	-	-	-	-	-
Platoon blocked, %				-	-	
Mov Cap-1 Maneuver	115	361	-	-	768	-
Mov Cap-2 Maneuver	115	-	-	-	-	-
Stage 1	419	-	-	-	-	-
Stage 2	453	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	52.7	0	1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	181	768	-
HCM Lane V/C Ratio	-	-	0.619	0.082	-
HCM Control Delay (s)	-	-	52.7	10.1	-
HCM Lane LOS	-	-	F	B	-
HCM 95th %tile Q(veh)	-	-	3.5	0.3	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	141	10	42	10	20	104	35	514	10	35	407	101
Future Volume (Veh/h)	141	10	42	10	20	104	35	514	10	35	407	101
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	153	11	46	11	22	113	38	559	11	38	442	110
Pedestrians		6			2						1	
Lane Width (ft)		12.0			12.0						12.0	
Walking Speed (ft/s)		3.5			3.5						3.5	
Percent Blockage		1			0						0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1284	1172	448	1212	1276	568	558			572		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1284	1172	448	1212	1276	568	558			572		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	94	92	92	86	78	96			96		
cM capacity (veh/h)	92	177	607	131	153	521	1007			999		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	210	146	38	570	38	442	110
Volume Left	153	11	38	0	38	0	0
Volume Right	46	113	0	11	0	0	110
cSH	117	328	1007	1700	999	1700	1700
Volume to Capacity	1.80	0.44	0.04	0.34	0.04	0.26	0.06
Queue Length 95th (ft)	411	55	3	0	3	0	0
Control Delay (s)	454.7	24.5	8.7	0.0	8.7	0.0	0.0
Lane LOS	F	C	A		A		
Approach Delay (s)	454.7	24.5	0.5		0.6		
Approach LOS	F	C					

Intersection Summary				
Average Delay	64.2			
Intersection Capacity Utilization	58.3%	ICU Level of Service		B
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	54.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↕		↰	↑	↱
Traffic Vol, veh/h	141	10	42	10	20	104	35	514	10	35	407	101
Future Vol, veh/h	141	10	42	10	20	104	35	514	10	35	407	101
Conflicting Peds, #/hr	1	0	0	0	0	1	6	0	2	2	0	6
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	30	-	-	70	-	60
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	153	11	46	11	22	113	38	559	11	38	442	110

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1233	1172	448	1245	1277	568	558	0	0	572	0	0
Stage 1	524	524	-	643	643	-	-	-	-	-	-	-
Stage 2	709	648	-	602	634	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	154	192	611	151	166	522	1013	-	-	1001	-	-
Stage 1	537	530	-	462	468	-	-	-	-	-	-	-
Stage 2	425	466	-	486	473	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 101	176	608	125	152	521	1007	-	-	999	-	-
Mov Cap-2 Maneuver	~ 101	176	-	125	152	-	-	-	-	-	-	-
Stage 1	514	507	-	444	449	-	-	-	-	-	-	-
Stage 2	304	447	-	423	452	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 386.4	24.7	0.5	0.6
HCM LOS	F	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1007	-	-	127	326	999	-	-
HCM Lane V/C Ratio	0.038	-	-	1.652	0.447	0.038	-	-
HCM Control Delay (s)	8.7	-	-	$ 386.4	24.7	8.7	-	-
HCM Lane LOS	A	-	-	F	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	15.4	2.2	0.1	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↰	↱		↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	20	10	12	286	10	293	15	250	152	261	199	10
Future Volume (vph)	20	10	12	286	10	293	15	250	152	261	199	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	11	13	311	11	318	16	272	165	284	216	11

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	46	640	288	165	392	119
Volume Left (vph)	22	311	16	0	284	0
Volume Right (vph)	13	318	0	165	0	11
Hadj (s)	-0.04	-0.17	0.06	-0.67	0.40	-0.03
Departure Headway (s)	8.4	6.5	7.7	7.0	7.9	7.4
Degree Utilization, x	0.11	1.16	0.62	0.32	0.86	0.25
Capacity (veh/h)	395	533	453	504	449	476
Control Delay (s)	12.4	115.8	21.2	12.1	41.1	11.6
Approach Delay (s)	12.4	115.8	17.9		34.2	
Approach LOS	B	F	C		D	

Intersection Summary			
Delay	60.8		
Level of Service	F		
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	64.5
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Vol, veh/h	20	10	12	286	10	293	0	15	250	152	261	199
Future Vol, veh/h	20	10	12	286	10	293	0	15	250	152	261	199
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	11	13	311	11	318	0	16	272	165	284	216
Number of Lanes	0	1	0	0	1	0	0	0	1	1	0	2

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	13.3	121.1	20.2	37.6
HCM LOS	B	F	C	E

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	6%	0%	48%	49%	72%	0%
Vol Thru, %	94%	0%	24%	2%	28%	91%
Vol Right, %	0%	100%	29%	50%	0%	9%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	265	152	42	589	361	110
LT Vol	15	0	20	286	261	0
Through Vol	250	0	10	10	100	100
RT Vol	0	152	12	293	0	10
Lane Flow Rate	288	165	46	640	392	119
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.619	0.322	0.108	1.177	0.858	0.246
Departure Headway (Hd)	8.387	7.628	9.179	6.62	8.504	8.061
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	435	474	393	551	431	449
Service Time	6.087	5.328	7.179	4.687	6.204	5.761
HCM Lane V/C Ratio	0.662	0.348	0.117	1.162	0.91	0.265
HCM Control Delay	23.8	13.9	13.3	121.1	44.9	13.4
HCM Lane LOS	C	B	B	F	E	B
HCM 95th-tile Q	4.1	1.4	0.4	22.5	8.5	1

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBR
Lane Configurations	
Traffic Vol, veh/h	10
Future Vol, veh/h	10
Peak Hour Factor	0.92
Heavy Vehicles, %	2
Mvmt Flow	11
Number of Lanes	0

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	197	135	221	208	122	401
Future Volume (Veh/h)	197	135	221	208	122	401
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	214	147	240	226	133	436
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	726	133	569			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	726	133	569			
tC, single (s)	6.9	7.0	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	21	83	76			
cM capacity (veh/h)	271	888	993			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	361	240	113	113	133	436
Volume Left	214	240	0	0	0	0
Volume Right	147	0	0	0	0	436
cSH	457	993	1700	1700	1700	1700
Volume to Capacity	0.79	0.24	0.07	0.07	0.08	0.26
Queue Length 95th (ft)	177	24	0	0	0	0
Control Delay (s)	36.3	9.8	0.0	0.0	0.0	0.0
Lane LOS	E	A				
Approach Delay (s)	36.3	5.0			0.0	
Approach LOS	E					

Intersection Summary			
Average Delay		11.1	
Intersection Capacity Utilization		43.7%	ICU Level of Service A
Analysis Period (min)		15	

Intersection	
Int Delay, s/veh	10.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	197	135	221	208	122	401
Future Vol, veh/h	197	135	221	208	122	401
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	145	105	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	214	147	240	226	133	436

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	726	133	569	0	-	0
Stage 1	133	-	-	-	-	-
Stage 2	593	-	-	-	-	-
Critical Hdwy	6.645	6.245	4.145	-	-	-
Critical Hdwy Stg 1	5.445	-	-	-	-	-
Critical Hdwy Stg 2	5.845	-	-	-	-	-
Follow-up Hdwy	3.5285	3.3285	2.2285	-	-	-
Pot Cap-1 Maneuver	373	913	995	-	-	-
Stage 1	890	-	-	-	-	-
Stage 2	514	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	283	913	995	-	-	-
Mov Cap-2 Maneuver	283	-	-	-	-	-
Stage 1	676	-	-	-	-	-
Stage 2	514	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	32.8	5	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	995	-	283	913	-	-
HCM Lane V/C Ratio	0.241	-	0.757	0.161	-	-
HCM Control Delay (s)	9.8	-	48.6	9.7	-	-
HCM Lane LOS	A	-	E	A	-	-
HCM 95th %tile Q(veh)	0.9	-	5.6	0.6	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	3	192	10	0	0	0	0	386	20
Future Volume (Veh/h)	0	0	0	3	192	10	0	0	0	0	386	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	3	209	11	0	0	0	0	420	22
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	536	431	431	431	442	0	442			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	536	431	431	431	442	0	442			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	99	59	99	100			100		
cM capacity (veh/h)	307	517	624	535	510	1085	1118			1623		

Direction, Lane #	WB 1	SB 1
Volume Total	223	442
Volume Left	3	0
Volume Right	11	22
cSH	530	1700
Volume to Capacity	0.42	0.26
Queue Length 95th (ft)	52	0
Control Delay (s)	16.6	0.0
Lane LOS	C	
Approach Delay (s)	16.6	0.0
Approach LOS	C	

Intersection Summary				
Average Delay	5.6			
Intersection Capacity Utilization	38.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	3	192	10	0	0	0	0	386	20
Future Vol, veh/h	0	0	0	3	192	10	0	0	0	0	386	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	2	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	3	209	11	0	0	0	0	420	22

Major/Minor	Minor1			Major2		
Conflicting Flow All	431	442	-	-	-	0
Stage 1	0	0	-	-	-	-
Stage 2	431	442	-	-	-	-
Critical Hdwy	6.42	6.52	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-	-	-	-
Follow-up Hdwy	3.518	4.018	-	-	-	-
Pot Cap-1 Maneuver	581	510	0	0	-	-
Stage 1	-	-	0	0	-	-
Stage 2	655	576	0	0	-	-
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	581	0	-	-	-	-
Mov Cap-2 Maneuver	581	0	-	-	-	-
Stage 1	-	0	-	-	-	-
Stage 2	655	0	-	-	-	-

Approach	WB	SB
HCM Control Delay, s	14.7	0
HCM LOS	B	

Minor Lane/Major Mvmt	WBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	581	-	-	-
HCM Lane V/C Ratio	0.365	-	-	-
HCM Control Delay (s)	14.7	0	-	-
HCM Lane LOS	B	A	-	-
HCM 95th %tile Q(veh)	1.7	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	25	372	1222	439	586	126	315	615	429	329
v/c Ratio	0.11	0.79	0.82	0.55	0.53	0.67	0.70	0.38	0.76	0.50
Control Delay	58.1	64.1	41.2	33.4	5.2	78.8	67.6	7.6	66.1	48.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.1	64.1	41.2	33.4	5.2	78.8	67.6	7.6	66.1	48.0
Queue Length 50th (ft)	21	155	523	308	56	117	153	71	201	129
Queue Length 95th (ft)	53	221	651	438	141	189	207	94	270	185
Internal Link Dist (ft)		521		1372			611			680
Turn Bay Length (ft)	115		515		115	165		290	305	
Base Capacity (vph)	252	524	1580	857	1140	244	577	1691	639	740
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.71	0.77	0.51	0.51	0.52	0.55	0.36	0.67	0.44

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	223	120	1124	404	539	116	290	566	395	210	93
Future Volume (vph)	23	223	120	1124	404	539	116	290	566	395	210	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.95	0.88	0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	3354		3433	1863	1569	1770	3539	2787	3433	3352	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	3354		3433	1863	1569	1770	3539	2787	3433	3352	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	242	130	1222	439	586	126	315	615	429	228	101
RTOR Reduction (vph)	0	47	0	0	0	174	0	0	48	0	34	0
Lane Group Flow (vph)	25	325	0	1222	439	412	126	315	567	429	295	0
Confl. Peds. (#/hr)												1
Confl. Bikes (#/hr)						2						
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	17.4	17.4		59.6	59.6	82.2	14.7	17.6	77.2	22.6	25.5	
Effective Green, g (s)	17.4	17.4		59.6	59.6	82.2	14.7	17.6	77.2	22.6	25.5	
Actuated g/C Ratio	0.13	0.13		0.43	0.43	0.60	0.11	0.13	0.56	0.16	0.19	
Clearance Time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	223	423		1485	806	936	188	452	1562	563	620	
v/s Ratio Prot	0.01	c0.10		c0.36	0.24	0.07	0.07	c0.09	0.16	c0.12	0.09	
v/s Ratio Perm						0.19			0.05			
v/c Ratio	0.11	0.77		0.82	0.54	0.44	0.67	0.70	0.36	0.76	0.48	
Uniform Delay, d1	53.3	58.2		34.4	29.0	15.2	59.2	57.5	16.7	55.0	50.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	8.1		3.8	0.8	0.3	9.0	4.6	0.1	6.0	0.6	
Delay (s)	53.5	66.3		38.2	29.7	15.5	68.2	62.1	16.8	61.0	50.7	
Level of Service	D	E		D	C	B	E	E	B	E	D	
Approach Delay (s)		65.5			30.6			36.5			56.5	
Approach LOS		E			C			D			E	

Intersection Summary				
HCM 2000 Control Delay	39.5	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.78			
Actuated Cycle Length (s)	137.7	Sum of lost time (s)	20.5	
Intersection Capacity Utilization	78.4%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Cumulative Plus 1293 Unit Project and School AM
18: US 101 Ramps/Spring Street & 1st Street/Niblick Road — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	223	120	1124	404	539	116	290	566	395	210	93
Future Volume (veh/h)	23	223	120	1124	404	539	116	290	566	395	210	93
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	25	242	130	1222	439	586	126	315	615	429	228	101
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	231	293	152	1437	778	879	152	540	1584	499	490	210
Arrive On Green	0.13	0.13	0.13	0.42	0.42	0.42	0.09	0.15	0.15	0.14	0.20	0.20
Sat Flow, veh/h	1781	2262	1174	3456	1870	1564	1781	3554	2790	3456	2420	1037
Grp Volume(v), veh/h	25	188	184	1222	439	586	126	315	615	429	165	164
Grp Sat Flow(s),veh/h/ln	1781	1777	1659	1728	1870	1564	1781	1777	1395	1728	1777	1681
Q Serve(g_s), s	1.6	13.4	14.0	41.4	23.2	34.1	9.0	10.7	15.8	15.7	10.6	11.2
Cycle Q Clear(g_c), s	1.6	13.4	14.0	41.4	23.2	34.1	9.0	10.7	15.8	15.7	10.6	11.2
Prop In Lane	1.00		0.71	1.00		1.00	1.00		1.00	1.00		0.62
Lane Grp Cap(c), veh/h	231	230	215	1437	778	879	152	540	1584	499	360	340
V/C Ratio(X)	0.11	0.82	0.85	0.85	0.56	0.67	0.83	0.58	0.39	0.86	0.46	0.48
Avail Cap(c_a), veh/h	267	266	248	1669	903	984	258	609	1638	675	393	372
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.8	54.9	55.2	34.2	28.9	20.0	58.3	51.1	15.5	54.2	45.5	45.7
Incr Delay (d2), s/veh	0.2	15.9	21.8	3.9	0.6	1.5	10.8	1.1	0.2	8.4	0.9	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	7.1	7.2	17.5	10.3	12.1	4.4	4.7	10.0	7.4	4.8	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.0	70.8	77.0	38.1	29.5	21.5	69.2	52.3	15.7	62.6	46.4	46.7
LnGrp LOS	D	E	E	D	C	C	E	D	B	E	D	D
Approach Vol, veh/h		397			2247			1056			758	
Approach Delay, s/veh		72.3			32.1			33.0			55.6	
Approach LOS		E			C			C			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	23.4	25.5		21.4	16.9	32.0		59.3				
Change Period (Y+Rc), s	* 4.7	5.8		4.6	5.8	* 5.8		5.4				
Max Green Setting (Gmax), s	* 25	22.2		19.4	18.8	* 29		62.6				
Max Q Clear Time (g_c+I1), s	17.7	17.8		16.0	11.0	13.2		43.4				
Green Ext Time (p_c), s	1.0	1.8		0.8	0.2	1.7		10.5				

Intersection Summary			
HCM 6th Ctrl Delay		39.9	
HCM 6th LOS		D	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Olsen-Chandler SP — Cumulative Plus 1293 Unit Project and School AM
19: S. River Road & Niblick Road — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	120	830	299	136	1527	683	394	310	509
v/c Ratio	0.79	0.64	0.39	0.73	1.03	1.05	0.64	0.91	0.77
Control Delay	88.5	33.2	4.7	72.4	63.7	93.1	46.8	75.9	44.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.5	33.2	4.7	72.4	63.7	93.1	46.8	75.9	44.6
Queue Length 50th (ft)	45	262	0	96	~617	~277	136	221	155
Queue Length 95th (ft)	#104	364	61	#196	#837	#430	188	#415	215
Internal Link Dist (ft)		1510			1609		962		896
Turn Bay Length (ft)	140			80		150		110	
Base Capacity (vph)	151	1300	770	202	1482	652	811	348	858
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.79	0.64	0.39	0.67	1.03	1.05	0.49	0.89	0.59

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP
19: S. River Road & Niblick Road

Cumulative Plus 1293 Unit Project and School AM
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	110	764	275	125	1125	280	628	308	54	285	269	200
Future Volume (vph)	110	764	275	125	1125	280	628	308	54	285	269	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.98		1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3433	3539	1583	1770	3416		3433	3450		1770	3313	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3433	3539	1583	1770	3416		3433	3450		1770	3313	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	120	830	299	136	1223	304	683	335	59	310	292	217
RTOR Reduction (vph)	0	0	189	0	18	0	0	12	0	0	73	0
Lane Group Flow (vph)	120	830	110	136	1509	0	683	382	0	310	436	0
Confl. Peds. (#/hr)						10			5			
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	5.0	41.6	41.6	12.0	48.6		21.6	19.8		21.9	20.1	
Effective Green, g (s)	5.0	41.6	41.6	12.0	48.6		21.6	19.8		21.9	20.1	
Actuated g/C Ratio	0.04	0.37	0.37	0.11	0.43		0.19	0.17		0.19	0.18	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	151	1299	581	187	1465		654	602		342	587	
v/s Ratio Prot	0.03	0.23		c0.08	c0.44		c0.20	0.11		c0.18	0.13	
v/s Ratio Perm			0.07									
v/c Ratio	0.79	0.64	0.19	0.73	1.03		1.04	0.63		0.91	0.74	
Uniform Delay, d1	53.6	29.6	24.4	49.1	32.3		45.9	43.4		44.7	44.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	24.3	1.0	0.2	13.2	31.6		47.3	2.2		26.3	5.0	
Delay (s)	78.0	30.7	24.5	62.2	64.0		93.1	45.6		71.0	49.2	
Level of Service	E	C	C	E	E		F	D		E	D	
Approach Delay (s)		33.8			63.8			75.7			57.5	
Approach LOS		C			E			E			E	

Intersection Summary					
HCM 2000 Control Delay	57.6	HCM 2000 Level of Service		E	
HCM 2000 Volume to Capacity ratio	1.02				
Actuated Cycle Length (s)	113.3	Sum of lost time (s)		18.0	
Intersection Capacity Utilization	91.2%	ICU Level of Service		F	
Analysis Period (min)	15				
c Critical Lane Group					

Olsen-Chandler SP
19: S. River Road & Niblick Road

Cumulative Plus 1293 Unit Project and School AM
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	764	275	125	1125	280	628	308	54	285	269	200
Future Volume (veh/h)	110	764	275	125	1125	280	628	308	54	285	269	200
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	120	830	299	136	1223	304	683	335	59	310	292	217
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	151	1340	597	164	1201	294	651	557	97	337	364	263
Arrive On Green	0.04	0.38	0.38	0.09	0.43	0.43	0.19	0.18	0.18	0.19	0.18	0.18
Sat Flow, veh/h	3456	3554	1585	1781	2825	692	3456	3021	526	1781	1969	1422
Grp Volume(v), veh/h	120	830	299	136	763	764	683	195	199	310	263	246
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1781	1777	1740	1728	1777	1771	1781	1777	1614
Q Serve(g_s), s	3.9	21.7	9.4	8.6	48.5	48.5	21.5	11.5	11.8	19.5	16.1	16.7
Cycle Q Clear(g_c), s	3.9	21.7	9.4	8.6	48.5	48.5	21.5	11.5	11.8	19.5	16.1	16.7
Prop In Lane	1.00		1.00	1.00		0.40	1.00		0.30	1.00		0.88
Lane Grp Cap(c), veh/h	151	1340	597	164	755	740	651	327	326	337	329	299
V/C Ratio(X)	0.79	0.62	0.50	0.83	1.01	1.03	1.05	0.60	0.61	0.92	0.80	0.82
Avail Cap(c_a), veh/h	151	1340	597	201	755	740	651	408	407	348	420	382
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.0	28.9	8.9	50.9	32.8	32.8	46.3	42.7	42.8	45.4	44.5	44.7
Incr Delay (d2), s/veh	24.3	0.9	0.7	20.8	35.2	42.0	48.8	1.7	1.8	28.5	8.2	11.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	9.0	3.0	4.7	26.9	27.8	13.4	5.1	5.2	11.1	7.7	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	78.3	29.8	9.6	71.7	68.0	74.8	95.1	44.4	44.6	73.9	52.7	55.8
LnGrp LOS	E	C	A	E	F	F	F	D	D	E	D	E
Approach Vol, veh/h		1249			1663			1077			819	
Approach Delay, s/veh		29.6			71.4			76.6			61.6	
Approach LOS		C			E			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	47.5	26.0	25.6	9.5	53.0	26.1	25.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	12.9	40.6	21.5	27.0	5.0	48.5	22.3	26.2
Max Q Clear Time (g_c+I1), s	10.6	23.7	23.5	18.7	5.9	50.5	21.5	13.8
Green Ext Time (p_c), s	0.1	6.1	0.0	1.9	0.0	0.0	0.1	1.7

Intersection Summary	
HCM 6th Ctrl Delay	60.0
HCM 6th LOS	E

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	488	236	14	991	413	9
v/c Ratio	0.64	0.31	0.05	0.69	0.68	0.02
Control Delay	16.6	3.1	10.5	14.9	20.7	9.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	16.6	3.1	10.5	14.9	20.7	9.4
Queue Length 50th (ft)	96	0	2	104	90	1
Queue Length 95th (ft)	241	35	13	225	222	9
Internal Link Dist (ft)	1629			570	669	
Turn Bay Length (ft)			75			50
Base Capacity (vph)	1370	1196	503	2604	1204	1080
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.20	0.03	0.38	0.34	0.01

Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	449	217	13	912	380	8
Future Volume (vph)	449	217	13	912	380	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1845	1531	1750	3505	1752	1568
Flt Permitted	1.00	1.00	0.37	1.00	0.95	1.00
Satd. Flow (perm)	1845	1531	678	3505	1752	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	488	236	14	991	413	9
RTOR Reduction (vph)	0	137	0	0	0	3
Lane Group Flow (vph)	488	99	14	991	413	6
Confl. Peds. (#/hr)		4	4		1	
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Turn Type	NA	Perm	Perm	NA	Perm	Prot
Protected Phases	2			6		8
Permitted Phases		2	6		8	
Actuated Green, G (s)	19.7	19.7	19.7	19.7	16.5	16.5
Effective Green, g (s)	19.7	19.7	19.7	19.7	16.5	16.5
Actuated g/C Ratio	0.42	0.42	0.42	0.42	0.35	0.35
Clearance Time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	773	641	284	1469	615	550
v/s Ratio Prot	0.26			c0.28		0.00
v/s Ratio Perm		0.06	0.02		c0.24	
v/c Ratio	0.63	0.15	0.05	0.67	0.67	0.01
Uniform Delay, d1	10.8	8.5	8.1	11.1	12.9	9.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2	0.0	0.0	1.0	2.3	0.0
Delay (s)	12.0	8.5	8.1	12.0	15.2	9.9
Level of Service	B	A	A	B	B	A
Approach Delay (s)	10.9			12.0	15.1	
Approach LOS	B			B	B	

Intersection Summary				
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	47.0	Sum of lost time (s)	10.8
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Cumulative Plus 1293 Unit Project and School AM
20: Commerce Way & Sherwood Road — HCM 6th Signalized Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	449	217	13	912	380	8
Future Volume (veh/h)	449	217	13	912	380	8
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	488	236	14	991	413	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3
Cap, veh/h	770	649	349	1462	504	449
Arrive On Green	0.41	0.41	0.41	0.41	0.29	0.29
Sat Flow, veh/h	1856	1565	723	3618	1767	1572
Grp Volume(v), veh/h	488	236	14	991	413	9
Grp Sat Flow(s),veh/h/ln	1856	1565	723	1763	1767	1572
Q Serve(g_s), s	7.5	3.7	0.6	8.2	7.8	0.1
Cycle Q Clear(g_c), s	7.5	3.7	8.1	8.2	7.8	0.1
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	770	649	349	1462	504	449
V/C Ratio(X)	0.63	0.36	0.04	0.68	0.82	0.02
Avail Cap(c_a), veh/h	1731	1460	724	3290	1502	1336
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.4	7.3	11.6	8.6	12.0	9.2
Incr Delay (d2), s/veh	0.3	0.1	0.0	0.2	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.7	0.1	1.8	2.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.7	7.4	11.6	8.8	13.3	9.3
LnGrp LOS	A	A	B	A	B	A
Approach Vol, veh/h	724			1005	422	
Approach Delay, s/veh	8.3			8.8	13.2	
Approach LOS	A			A	B	

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	20.3				20.3	15.7
Change Period (Y+Rc), s	5.4				5.4	5.4
Max Green Setting (Gmax), s	33.6				33.6	30.6
Max Q Clear Time (g_c+I1), s	9.5				10.2	9.8
Green Ext Time (p_c), s	2.2				4.7	0.6

Intersection Summary			
HCM 6th Ctrl Delay		9.5	
HCM 6th LOS		A	

Olsen-Chandler SP — Cumulative Plus 1293 Unit Project and School AM
21: Fontana Road & Sherwood Road — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	344	113	9	850	0	70	0	13	0	0	5
Future Volume (Veh/h)	0	344	113	9	850	0	70	0	13	0	0	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	374	123	10	924	0	76	0	14	0	0	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									4			
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		650										
pX, platoon unblocked				0.78			0.78	0.78	0.78	0.78	0.78	
vC, conflicting volume	924			497			922	1380	436	1386	1441	462
vC1, stage 1 conf vol							436	436		944	944	
vC2, stage 2 conf vol							487	944		442	497	
vCu, unblocked vol	924			219			762	1346	140	1355	1425	462
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			83	100	98	100	100	99
cM capacity (veh/h)	735			1055			447	302	691	256	294	547

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	497	472	462	90	5
Volume Left	0	10	0	76	0
Volume Right	123	0	0	14	5
cSH	735	1055	1700	530	547
Volume to Capacity	0.00	0.01	0.27	0.17	0.01
Queue Length 95th (ft)	0	1	0	15	1
Control Delay (s)	0.0	0.3	0.0	14.0	11.6
Lane LOS		A		B	B
Approach Delay (s)	0.0	0.1		14.0	11.6
Approach LOS				B	B

Intersection Summary					
Average Delay		1.0			
Intersection Capacity Utilization		47.0%	ICU Level of Service		A
Analysis Period (min)		15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	344	113	9	850	0	70	0	13	0	0	5
Future Vol, veh/h	0	344	113	9	850	0	70	0	13	0	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	374	123	10	924	0	76	0	14	0	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	924	0	0	497	0	0	918	1380	436	1387	1441	462
Stage 1	-	-	-	-	-	-	436	436	-	944	944	-
Stage 2	-	-	-	-	-	-	482	944	-	443	497	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.23	7.33	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.519	4.019	3.319
Pot Cap-1 Maneuver	737	-	-	1065	-	-	239	144	619	111	132	547
Stage 1	-	-	-	-	-	-	598	579	-	283	340	-
Stage 2	-	-	-	-	-	-	535	340	-	593	544	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	737	-	-	1065	-	-	233	141	619	107	129	547
Mov Cap-2 Maneuver	-	-	-	-	-	-	423	295	-	253	289	-
Stage 1	-	-	-	-	-	-	598	579	-	283	334	-
Stage 2	-	-	-	-	-	-	520	334	-	579	544	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	14.7	11.6
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	423	619	737	-	-	1065	-	-	547
HCM Lane V/C Ratio	0.18	0.023	-	-	-	0.009	-	-	0.01
HCM Control Delay (s)	15.4	11	0	-	-	8.4	0.1	-	11.6
HCM Lane LOS	C	B	A	-	-	A	A	-	B
HCM 95th %tile Q(veh)	0.6	0.1	0	-	-	0	-	-	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Traffic Volume (veh/h)	99	147	91	25	281	98	235	198	38	56	160	267
Future Volume (veh/h)	99	147	91	25	281	98	235	198	38	56	160	267
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	108	160	99	27	305	107	255	215	41	61	174	290
Approach Volume (veh/h)		367			439			511			525	
Crossing Volume (veh/h)		262			578			329			587	
High Capacity (veh/h)		1128			877			1069			871	
High v/c (veh/h)		0.33			0.50			0.48			0.60	
Low Capacity (veh/h)		928			704			876			699	
Low v/c (veh/h)		0.40			0.62			0.58			0.75	

Intersection Summary				
Maximum v/c High		0.60		
Maximum v/c Low		0.75		
Intersection Capacity Utilization		107.8%	ICU Level of Service	G

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	13.5
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	367	439	511	525
Demand Flow Rate, veh/h	374	448	521	535
Vehicles Circulating, veh/h	267	589	335	599
Vehicles Exiting, veh/h	867	267	306	438
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	7.2	14.6	10.6	19.7
Approach LOS	A	B	B	C

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	374	448	521	535
Cap Entry Lane, veh/h	1051	757	981	749
Entry HV Adj Factor	0.981	0.980	0.980	0.980
Flow Entry, veh/h	367	439	511	525
Cap Entry, veh/h	1031	741	961	734
V/C Ratio	0.356	0.592	0.531	0.714
Control Delay, s/veh	7.2	14.6	10.6	19.7
LOS	A	B	B	C
95th %tile Queue, veh	2	4	3	6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	19	9	24	1	20	22	40	282	1	12	169	58
Future Volume (vph)	19	9	24	1	20	22	40	282	1	12	169	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	10	26	1	22	24	43	307	1	13	184	63

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	57	47	351	260
Volume Left (vph)	21	1	43	13
Volume Right (vph)	26	24	1	63
Hadj (s)	-0.06	-0.17	0.16	0.00
Departure Headway (s)	5.3	5.3	4.6	4.6
Degree Utilization, x	0.08	0.07	0.45	0.33
Capacity (veh/h)	596	600	754	752
Control Delay (s)	8.8	8.6	11.4	9.9
Approach Delay (s)	8.8	8.6	11.4	9.9
Approach LOS	A	A	B	A

Intersection Summary				
Delay	10.5			
Level of Service	B			
Intersection Capacity Utilization	45.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	10.4
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	19	9	24	1	20	22	40	282	1	12	169	58
Future Vol, veh/h	19	9	24	1	20	22	40	282	1	12	169	58
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	8	8	8	8	8	8	8	8	8	8	8	8
Mvmt Flow	21	10	26	1	22	24	43	307	1	13	184	63
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.8	8.6	11.4	9.8
HCM LOS	A	A	B	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	12%	37%	2%	5%
Vol Thru, %	87%	17%	47%	71%
Vol Right, %	0%	46%	51%	24%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	323	52	43	239
LT Vol	40	19	1	12
Through Vol	282	9	20	169
RT Vol	1	24	22	58
Lane Flow Rate	351	57	47	260
Geometry Grp	1	1	1	1
Degree of Util (X)	0.45	0.083	0.068	0.329
Departure Headway (Hd)	4.611	5.281	5.201	4.558
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	779	674	684	787
Service Time	2.649	3.345	3.265	2.599
HCM Lane V/C Ratio	0.451	0.085	0.069	0.33
HCM Control Delay	11.4	8.8	8.6	9.8
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	2.4	0.3	0.2	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	59	15	0	107	25	30	128	1	7	81	117
Future Volume (Veh/h)	85	59	15	0	107	25	30	128	1	7	81	117
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	92	64	16	0	116	27	33	139	1	8	88	127
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	143			80			556	399	72	456	394	130
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	143			80			556	399	72	456	394	130
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			89	72	100	98	83	86
cM capacity (veh/h)	1427			1505			311	501	985	383	505	915

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	172	143	173	8	215
Volume Left	92	0	33	8	0
Volume Right	16	27	1	0	127
cSH	1427	1505	450	383	687
Volume to Capacity	0.06	0.00	0.38	0.02	0.31
Queue Length 95th (ft)	5	0	45	2	33
Control Delay (s)	4.4	0.0	17.9	14.6	12.6
Lane LOS	A		C	B	B
Approach Delay (s)	4.4	0.0	17.9	12.7	
Approach LOS			C	B	

Intersection Summary				
Average Delay	9.4			
Intersection Capacity Utilization	49.1%	ICU Level of Service		A
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	9.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↰	↑	
Traffic Vol, veh/h	85	59	15	0	107	25	30	128	1	7	81	117
Future Vol, veh/h	85	59	15	0	107	25	30	128	1	7	81	117
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	92	64	16	0	116	27	33	139	1	8	88	127

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	143	0	0	80	0	0	493	399	72	456	394	130
Stage 1	-	-	-	-	-	-	256	256	-	130	130	-
Stage 2	-	-	-	-	-	-	237	143	-	326	264	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	1427	-	-	1505	-	-	483	536	985	511	539	914
Stage 1	-	-	-	-	-	-	744	692	-	869	785	-
Stage 2	-	-	-	-	-	-	762	775	-	682	686	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1427	-	-	1505	-	-	341	500	985	381	502	914
Mov Cap-2 Maneuver	-	-	-	-	-	-	341	500	-	381	502	-
Stage 1	-	-	-	-	-	-	693	645	-	810	785	-
Stage 2	-	-	-	-	-	-	582	775	-	498	639	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	4.1	0	17.4	12.8
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	461	1427	-	-	1505	-	-	381	684
HCM Lane V/C Ratio	0.375	0.065	-	-	-	-	-	0.02	0.315
HCM Control Delay (s)	17.4	7.7	0	-	0	-	-	14.6	12.7
HCM Lane LOS	C	A	A	-	A	-	-	B	B
HCM 95th %tile Q(veh)	1.7	0.2	-	-	0	-	-	0.1	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Right Turn Channelized						
Traffic Volume (veh/h)	13	180	175	25	138	92
Future Volume (veh/h)	13	180	175	25	138	92
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	196	190	27	150	100
Approach Volume (veh/h)	210		217			250
Crossing Volume (veh/h)	190		150			14
High Capacity (veh/h)	1193		1232			1370
High v/c (veh/h)	0.18		0.18			0.18
Low Capacity (veh/h)	988		1022			1148
Low v/c (veh/h)	0.21		0.21			0.22

Intersection Summary				
Maximum v/c High	0.18			
Maximum v/c Low	0.22			
Intersection Capacity Utilization	45.1%	ICU Level of Service		A

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	4.6
Intersection LOS	A

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	210	217	250
Demand Flow Rate, veh/h	214	222	255
Vehicles Circulating, veh/h	194	153	14
Vehicles Exiting, veh/h	181	116	394
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	4.9	4.8	4.3
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	214	222	255
Cap Entry Lane, veh/h	1132	1180	1360
Entry HV Adj Factor	0.981	0.978	0.980
Flow Entry, veh/h	210	217	250
Cap Entry, veh/h	1111	1155	1334
V/C Ratio	0.189	0.188	0.187
Control Delay, s/veh	4.9	4.8	4.3
LOS	A	A	A
95th %tile Queue, veh	1	1	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	21	78	97	10	5	18
Future Volume (Veh/h)	21	78	97	10	5	18
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	85	105	11	5	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	116				242	110
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	116				242	110
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				99	98
cM capacity (veh/h)	1466				733	940

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	108	116	25
Volume Left	23	0	5
Volume Right	0	11	20
cSH	1466	1700	890
Volume to Capacity	0.02	0.07	0.03
Queue Length 95th (ft)	1	0	2
Control Delay (s)	1.7	0.0	9.2
Lane LOS	A		A
Approach Delay (s)	1.7	0.0	9.2
Approach LOS			A

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	21.9%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	21	78	97	10	5	18
Future Vol, veh/h	21	78	97	10	5	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	23	85	105	11	5	20

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	116	0	-	0	242	111
Stage 1	-	-	-	-	111	-
Stage 2	-	-	-	-	131	-
Critical Hdwy	4.13	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.227	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	1466	-	-	-	744	940
Stage 1	-	-	-	-	911	-
Stage 2	-	-	-	-	893	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1466	-	-	-	732	940
Mov Cap-2 Maneuver	-	-	-	-	732	-
Stage 1	-	-	-	-	896	-
Stage 2	-	-	-	-	893	-

Approach	EB	WB	SB
HCM Control Delay, s	1.6	0	9.2
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1466	-	-	-	885
HCM Lane V/C Ratio	0.016	-	-	-	0.028
HCM Control Delay (s)	7.5	0	-	-	9.2
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Group Flow (vph)	334	1645	1636	163	160	302
v/c Ratio	0.65	0.50	0.89	0.19	0.62	0.57
Control Delay	57.7	0.5	32.2	4.6	63.6	37.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.7	0.5	32.2	4.6	63.6	37.0
Queue Length 50th (ft)	128	0	568	12	120	181
Queue Length 95th (ft)	225	0	882	52	238	336
Internal Link Dist (ft)		1017	748		574	
Turn Bay Length (ft)	345			330	450	
Base Capacity (vph)	831	3312	2506	1153	428	826
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.50	0.65	0.14	0.37	0.37

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	331	1629	1620	161	158	299
Future Volume (vph)	331	1629	1620	161	158	299
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0	7.3	7.3	4.2	3.7
Lane Util. Factor	0.97	0.95	0.95	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	3213	3312	3312	1482	1656	1482
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	3213	3312	3312	1482	1656	1482
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	334	1645	1636	163	160	302
RTOR Reduction (vph)	0	0	0	57	0	12
Lane Group Flow (vph)	334	1645	1636	106	160	290
Heavy Vehicles (%)	9%	9%	9%	9%	9%	9%
Turn Type	Prot	NA	NA	Perm	Prot	Prot
Protected Phases	8	Free!	6		7!	4
Permitted Phases				6		4
Actuated Green, G (s)	19.9	122.0	67.9	67.9	19.2	43.1
Effective Green, g (s)	19.9	122.0	67.9	67.9	19.2	43.1
Actuated g/C Ratio	0.16	1.00	0.56	0.56	0.16	0.35
Clearance Time (s)	3.5		7.3	7.3	4.2	3.7
Vehicle Extension (s)	3.0		4.0	4.0	3.5	3.0
Lane Grp Cap (vph)	524	3312	1843	824	260	523
v/s Ratio Prot	c0.10	0.50	c0.49		c0.10	0.20
v/s Ratio Perm				0.07		
v/c Ratio	0.64	0.50	0.89	0.13	0.62	0.56
Uniform Delay, d1	47.7	0.0	23.7	12.9	48.0	31.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.5	0.5	5.8	0.1	4.5	1.3
Delay (s)	50.2	0.5	29.5	13.0	52.4	33.0
Level of Service	D	A	C	B	D	C
Approach Delay (s)		8.9	28.0		39.7	
Approach LOS		A	C		D	

Intersection Summary				
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	122.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		

! Phase conflict between lane groups.
c Critical Lane Group

HCM 6th Edition methodology cannot be performed with phasing conflicts.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	392	1075	375	406	1134	216	380	507	272	357	320
v/c Ratio	0.98	0.87	0.48	0.96	0.90	0.31	0.86	0.61	0.73	0.88	0.63
Control Delay	105.1	53.0	5.0	98.6	55.2	4.8	82.8	52.1	77.8	79.0	23.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	105.1	53.0	5.0	98.6	55.2	4.8	82.8	52.1	77.8	79.0	23.3
Queue Length 50th (ft)	~211	523	1	210	556	0	194	225	136	341	92
Queue Length 95th (ft)	#372	629	69	#390	679	54	#334	323	206	#541	217
Internal Link Dist (ft)		1323			2509			853		451	
Turn Bay Length (ft)	225		485	125		390	160		140		
Base Capacity (vph)	400	1604	903	424	1604	821	444	920	444	495	574
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.98	0.67	0.42	0.96	0.71	0.26	0.86	0.55	0.61	0.72	0.56

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	380	1043	364	394	1100	210	369	376	115	264	346	310
Future Volume (vph)	380	1043	364	394	1100	210	369	376	115	264	346	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Lane Util. Factor	0.97	0.95	1.00	0.97	0.95	1.00	0.97	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00	0.99	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3273	3374	1488	3273	3374	1488	3273	3244		3273	1776	1509
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3273	3374	1488	3273	3374	1488	3273	3244		3273	1776	1509
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	392	1075	375	406	1134	216	380	388	119	272	357	320
RTOR Reduction (vph)	0	0	237	0	0	135	0	17	0	0	0	165
Lane Group Flow (vph)	392	1075	138	406	1134	81	380	490	0	272	357	155
Confl. Peds. (#/hr)			1			1			2			
Heavy Vehicles (%)	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	18.3	54.5	54.5	19.4	55.6	55.6	20.3	37.5		17.0	34.2	34.2
Effective Green, g (s)	18.3	54.5	54.5	19.4	55.6	55.6	20.3	37.5		17.0	34.2	34.2
Actuated g/C Ratio	0.12	0.37	0.37	0.13	0.37	0.37	0.14	0.25		0.11	0.23	0.23
Clearance Time (s)	4.0	7.3	7.3	4.0	7.3	7.3	4.0	5.3		4.0	5.3	5.3
Vehicle Extension (s)	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	401	1234	544	426	1259	555	445	816		373	407	346
v/s Ratio Prot	c0.12	0.32		c0.12	c0.34		c0.12	c0.15		0.08	c0.20	
v/s Ratio Perm			0.09			0.05						0.10
v/c Ratio	0.98	0.87	0.25	0.95	0.90	0.15	0.85	0.60		0.73	0.88	0.45
Uniform Delay, d1	65.1	44.0	33.0	64.3	44.1	31.0	62.9	49.1		63.8	55.4	49.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	38.6	7.0	0.2	31.4	9.1	0.1	14.7	1.2		7.0	18.7	0.9
Delay (s)	103.7	51.0	33.3	95.7	53.2	31.1	77.6	50.4		70.8	74.1	50.2
Level of Service	F	D	C	F	D	C	E	D		E	E	D
Approach Delay (s)		58.6			60.3			62.0			65.1	
Approach LOS		E			E			E			E	

Intersection Summary				
HCM 2000 Control Delay	60.8	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	0.90			
Actuated Cycle Length (s)	149.0	Sum of lost time (s)	20.6	
Intersection Capacity Utilization	87.2%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	380	1043	364	394	1100	210	369	376	115	264	346	310
Future Volume (veh/h)	380	1043	364	394	1100	210	369	376	115	264	346	310
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	392	1075	375	406	1134	216	380	388	119	272	357	320
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	396	1242	554	396	1317	587	422	675	204	322	416	352
Arrive On Green	0.12	0.36	0.36	0.12	0.39	0.39	0.13	0.26	0.26	0.10	0.23	0.23
Sat Flow, veh/h	3319	3413	1521	3319	3413	1521	3319	2579	781	3319	1796	1522
Grp Volume(v), veh/h	392	1075	375	406	1134	216	380	255	252	272	357	320
Grp Sat Flow(s),veh/h/ln	1659	1706	1521	1659	1706	1521	1659	1706	1654	1659	1796	1522
Q Serve(g_s), s	17.8	44.2	21.5	18.0	46.2	15.4	17.0	19.6	20.0	12.2	28.8	30.9
Cycle Q Clear(g_c), s	17.8	44.2	21.5	18.0	46.2	15.4	17.0	19.6	20.0	12.2	28.8	30.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.47	1.00		1.00
Lane Grp Cap(c), veh/h	396	1242	554	396	1317	587	422	447	433	322	416	352
V/C Ratio(X)	0.99	0.87	0.68	1.03	0.86	0.37	0.90	0.57	0.58	0.85	0.86	0.91
Avail Cap(c_a), veh/h	396	1582	705	396	1582	705	439	463	449	439	488	413
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	66.4	44.6	18.9	66.5	42.7	33.2	65.0	48.4	48.6	67.1	55.7	56.5
Incr Delay (d2), s/veh	42.8	4.3	1.8	52.2	4.4	0.4	20.8	1.6	1.8	10.7	12.7	21.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.7	18.5	7.7	10.3	19.3	5.7	8.4	8.5	8.4	5.6	14.3	13.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	109.2	48.9	20.7	118.7	47.1	33.6	85.8	50.0	50.3	77.8	68.4	77.9
LnGrp LOS	F	D	C	F	D	C	F	D	D	E	E	E
Approach Vol, veh/h		1842			1756			887			949	
Approach Delay, s/veh		56.0			62.0			65.4			74.3	
Approach LOS		E			E			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	25.3	62.3	23.2	40.3	22.0	65.6	18.6	44.8
Change Period (Y+Rc), s	7.3	* 7.3	4.0	5.3	4.0	7.3	4.0	5.3
Max Green Setting (Gmax), s	18.0	* 70	20.0	41.0	18.0	70.0	20.0	41.0
Max Q Clear Time (g_c+I1), s	20.0	46.2	19.0	32.9	19.8	48.2	14.2	22.0
Green Ext Time (p_c), s	0.0	8.8	0.2	2.1	0.0	8.3	0.5	2.7

Intersection Summary	
HCM 6th Ctrl Delay	62.7
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↱		↱
Traffic Volume (veh/h)	0	1555	1604	20	0	100
Future Volume (Veh/h)	0	1555	1604	20	0	100
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	0	1654	1706	21	0	106
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	TWLTL			
Median storage veh)			2			
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1727				2533	853
vC1, stage 1 conf vol					1706	
vC2, stage 2 conf vol					827	
vCu, unblocked vol	1727				2533	853
tC, single (s)	4.3				7.0	7.1
tC, 2 stage (s)					6.0	
tF (s)	2.3				3.6	3.4
p0 queue free %	100				100	63
cM capacity (veh/h)	328				112	287

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	SB 1
Volume Total	827	827	853	853	21	106
Volume Left	0	0	0	0	0	0
Volume Right	0	0	0	0	21	106
cSH	1700	1700	1700	1700	1700	287
Volume to Capacity	0.49	0.49	0.50	0.50	0.01	0.37
Queue Length 95th (ft)	0	0	0	0	0	41
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	24.7
Lane LOS						C
Approach Delay (s)	0.0		0.0			24.7
Approach LOS						C

Intersection Summary			
Average Delay		0.8	
Intersection Capacity Utilization		57.2%	ICU Level of Service
Analysis Period (min)		15	

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑	↱		↱
Traffic Vol, veh/h	0	1555	1604	20	0	100
Future Vol, veh/h	0	1555	1604	20	0	100
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	165	-	-
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	0	1654	1706	21	0	106

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	853
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.4
Pot Cap-1 Maneuver	0	-	-	-	0	287
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	287
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	24.7
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	287
HCM Lane V/C Ratio	-	-	-	0.371
HCM Control Delay (s)	-	-	-	24.7
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	1.6

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1522	33	3	1564	0	50	0	6	0	0	10
Future Volume (Veh/h)	0	1522	33	3	1564	0	50	0	6	0	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	0	1569	34	3	1612	0	52	0	6	0	0	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									1			
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1612			1603			2391	3187	784	2406	3221	806
vC1, stage 1 conf vol							1569	1569		1618	1618	
vC2, stage 2 conf vol							822	1618		788	1603	
vCu, unblocked vol	1612			1603			2391	3187	784	2406	3221	806
tC, single (s)	4.3			4.3			7.7	6.7	7.1	7.7	6.7	7.1
tC, 2 stage (s)							6.7	5.7		6.7	5.7	
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			99			46	100	98	100	100	97
cM capacity (veh/h)	357			360			96	100	315	90	97	305

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	0	784	784	34	3	1075	537	58	10
Volume Left	0	0	0	0	3	0	0	52	0
Volume Right	0	0	0	34	0	0	0	6	10
cSH	1700	1700	1700	1700	360	1700	1700	105	305
Volume to Capacity	0.00	0.46	0.46	0.02	0.01	0.63	0.32	0.55	0.03
Queue Length 95th (ft)	0	0	0	0	1	0	0	64	3
Control Delay (s)	0.0	0.0	0.0	0.0	15.1	0.0	0.0	74.7	17.2
Lane LOS					C			F	C
Approach Delay (s)	0.0				0.0			74.7	17.2
Approach LOS								F	C

Intersection Summary				
Average Delay		1.4		
Intersection Capacity Utilization		59.3%	ICU Level of Service	B
Analysis Period (min)		15		

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1522	33	3	1564	0	50	0	6	0	0	10
Future Vol, veh/h	0	1522	33	3	1564	0	50	0	6	0	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	275	-	275	305	-	-	-	-	25	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	12	12	12	12	12	12	12	12	12	12	12	12
Mvmt Flow	0	1569	34	3	1612	0	52	0	6	0	0	10

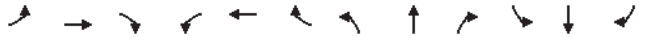
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1612	0	0	1603	0	0	2381	3187	785	2403	3221	806
Stage 1	-	-	-	-	-	-	1569	1569	-	1618	1618	-
Stage 2	-	-	-	-	-	-	812	1618	-	785	1603	-
Critical Hdwy	4.34	-	-	4.34	-	-	7.74	6.74	7.14	7.74	6.74	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	6.74	5.74	-	6.74	5.74	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.74	5.74	-	6.74	5.74	-
Follow-up Hdwy	2.32	-	-	2.32	-	-	3.62	4.12	3.42	3.62	4.12	3.42
Pot Cap-1 Maneuver	357	-	-	360	-	-	~ 16	8	315	15	8	305
Stage 1	-	-	-	-	-	-	105	154	-	97	145	-
Stage 2	-	-	-	-	-	-	318	145	-	331	148	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	357	-	-	360	-	-	~ 15	8	315	15	8	305
Mov Cap-2 Maneuver	-	-	-	-	-	-	94	97	-	88	94	-
Stage 1	-	-	-	-	-	-	105	154	-	97	144	-
Stage 2	-	-	-	-	-	-	305	144	-	325	148	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	75.3	17.2
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	94	315	357	-	-	360	-	-	305
HCM Lane V/C Ratio	0.548	0.02	-	-	-	0.009	-	-	0.034
HCM Control Delay (s)	82.3	16.7	0	-	-	15.1	-	-	17.2
HCM Lane LOS	F	C	A	-	-	C	-	-	C
HCM 95th %tile Q(veh)	2.5	0.1	0	-	-	0	-	-	0.1

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Reso A - Exhibit C2 (EIR Technical Appendix)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized			MOYes									
Traffic Volume (veh/h)	300	350	150	326	280	180	62	453	358	100	630	300
Future Volume (veh/h)	300	350	150	326	280	180	62	453	358	100	630	300
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	323	376	161	351	301	194	67	487	385	108	677	323
Approach Volume (veh/h)		699			846			939			1108	
Crossing Volume (veh/h)		1136			877			807			719	
High Capacity (veh/h)		557			688			729			783	
High v/c (veh/h)		1.26			1.23			1.29			1.42	
Low Capacity (veh/h)		426			539			575			622	
Low v/c (veh/h)		1.64			1.57			1.63			1.78	

Intersection Summary												
Maximum v/c High			1.42									
Maximum v/c Low			1.78									
Intersection Capacity Utilization			123.4%		ICU Level of Service				H			

Intersection	
Intersection Delay, s/veh	39.6
Intersection LOS	E

Approach	EB	WB	NB	SB
Entry Lanes	2	2	2	2
Conflicting Circle Lanes	1	2	2	2
Adj Approach Flow, veh/h	860	846	939	1108
Demand Flow Rate, veh/h	869	855	949	1119
Vehicles Circulating, veh/h	1148	886	815	727
Vehicles Exiting, veh/h	698	878	1039	1014
Ped Vol Crossing Leg, #/h	1	1	1	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	21.9	21.0	27.8	77.3
Approach LOS	C	C	D	F

Lane	Left	Right	Bypass	Left	Right	Left	Right	Left	Right
Designated Moves	LT	TR	R	L	TR	LT	R	LT	R
Assumed Moves	LT	TR	R	L	TR	LT	R	LT	R
RT Channelized			Free						
Lane Util	0.470	0.530		0.415	0.585	0.590	0.410	0.709	0.291
Follow-Up Headway, s	2.535	2.535		2.667	2.535	2.667	2.535	2.667	2.535
Critical Headway, s	4.544	4.544	163	4.645	4.328	4.645	4.328	4.645	4.328
Entry Flow, veh/h	332	374	1919	355	500	560	389	793	326
Cap Entry Lane, veh/h	500	500	0.990	597	669	638	710	692	765
Entry HV Adj Factor	0.990	0.991	161	0.989	0.990	0.990	0.990	0.990	0.991
Flow Entry, veh/h	329	371	1900	351	495	554	385	785	323
Cap Entry, veh/h	494	495	0.085	591	662	631	703	685	758
V/C Ratio	0.665	0.749	0.0	0.594	0.748	0.878	0.548	1.147	0.426
Control Delay, s/veh	23.9	29.6	A	17.6	23.5	37.5	13.9	104.9	10.4
LOS	C	D	0	C	C	E	B	F	B
95th %tile Queue, veh	5	6		4	7	10	3	25	2

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Volume (veh/h)	1	118	15	21	106	0	15	1	16	0	0	0
Future Volume (Veh/h)	1	118	15	21	106	0	15	1	16	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	128	16	23	115	0	16	1	17	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	115			144			299	299	136	316	307	115
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	115			144			299	299	136	316	307	115
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			98	100	98	100	100	100
cM capacity (veh/h)	1462			1426			641	600	907	612	593	932

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	145	138	34	0
Volume Left	1	23	16	0
Volume Right	16	0	17	0
cSH	1462	1426	749	1700
Volume to Capacity	0.00	0.02	0.05	0.00
Queue Length 95th (ft)	0	1	4	0
Control Delay (s)	0.1	1.4	10.0	0.0
Lane LOS	A	A	B	A
Approach Delay (s)	0.1	1.4	10.0	0.0
Approach LOS			B	A

Intersection Summary				
Average Delay			1.7	
Intersection Capacity Utilization			27.2%	ICU Level of Service
Analysis Period (min)			15	

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Vol, veh/h	1	118	15	21	106	0	15	1	16	0	0	0
Future Vol, veh/h	1	118	15	21	106	0	15	1	16	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	1	128	16	23	115	0	16	1	17	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	115	0	0	144	0	0	299	299	136	308	307	115
Stage 1	-	-	-	-	-	-	138	138	-	161	161	-
Stage 2	-	-	-	-	-	-	161	161	-	147	146	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	1462	-	-	1426	-	-	649	610	907	641	604	932
Stage 1	-	-	-	-	-	-	860	779	-	836	761	-
Stage 2	-	-	-	-	-	-	836	761	-	851	772	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1462	-	-	1426	-	-	640	599	907	619	593	932
Mov Cap-2 Maneuver	-	-	-	-	-	-	640	599	-	619	593	-
Stage 1	-	-	-	-	-	-	859	778	-	835	748	-
Stage 2	-	-	-	-	-	-	822	748	-	833	771	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.3	10	0
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	749	1462	-	-	1426	-	-	-
HCM Lane V/C Ratio	0.046	0.001	-	-	0.016	-	-	-
HCM Control Delay (s)	10	7.5	0	-	7.6	0	-	0
HCM Lane LOS	B	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	21	552	309	511	764	7	54	319	388	396	117
v/c Ratio	0.23	0.75	0.78	0.61	0.69	0.04	0.30	0.72	0.79	0.80	0.21
Control Delay	58.6	45.7	53.6	27.8	5.5	45.6	50.3	15.6	47.4	47.5	4.8
Queue Delay	0.0	0.0	0.1	4.5	0.8	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.6	45.7	53.8	32.3	6.3	45.6	50.3	15.6	47.4	47.5	4.8
Queue Length 50th (ft)	14	184	199	240	0	5	36	0	248	253	0
Queue Length 95th (ft)	44	277	#358	464	94	19	76	85	#458	#467	34
Internal Link Dist (ft)		346		307			744			674	
Turn Bay Length (ft)	65		125			140		165	150		185
Base Capacity (vph)	93	885	493	913	1148	337	355	560	593	602	633
Starvation Cap Reductn	0	0	9	320	146	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.62	0.64	0.86	0.76	0.02	0.15	0.57	0.65	0.66	0.18

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	487	32	290	480	718	7	51	300	639	98	110
Future Volume (vph)	20	487	32	290	480	718	7	51	300	639	98	110
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	1.00	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00
Satd. Flow (prot)	1787	3535		1787	1881	1557	1787	1881	1599	1698	1724	1560
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00
Satd. Flow (perm)	1787	3535		1787	1881	1557	1787	1881	1599	1698	1724	1560
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	21	518	34	309	511	764	7	54	319	680	104	117
RTOR Reduction (vph)	0	4	0	0	0	434	0	0	290	0	0	84
Lane Group Flow (vph)	21	548	0	309	511	330	7	54	29	388	396	33
Confl. Peds. (#/hr)			4			2						2
Confl. Bikes (#/hr)						2						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases						6			8			4
Actuated Green, G (s)	1.7	23.7		22.0	44.0	44.0	9.4	9.4	9.4	28.8	28.8	28.8
Effective Green, g (s)	1.7	23.7		22.0	44.0	44.0	9.4	9.4	9.4	28.8	28.8	28.8
Actuated g/C Ratio	0.02	0.23		0.22	0.43	0.43	0.09	0.09	0.09	0.28	0.28	0.28
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	29	822		385	812	672	164	173	147	479	487	440
v/s Ratio Prot	0.01	0.16		c0.17	c0.27		0.00	c0.03		0.23	c0.23	
v/s Ratio Perm						0.21			0.02			0.02
v/c Ratio	0.72	0.67		0.80	0.63	0.49	0.04	0.31	0.20	0.81	0.81	0.08
Uniform Delay, d1	49.9	35.5		37.9	22.6	20.9	42.1	43.2	42.8	34.0	34.0	26.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	61.8	2.1		11.5	1.5	0.6	0.1	1.0	0.7	10.0	10.0	0.1
Delay (s)	111.7	37.6		49.3	24.1	21.4	42.3	44.3	43.4	44.0	44.0	26.9
Level of Service	F	D		D	C	C	D	D	D	D	D	C
Approach Delay (s)		40.3			27.7			43.5			41.8	
Approach LOS		D			C			D			D	

Intersection Summary

HCM 2000 Control Delay	35.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	101.9	Sum of lost time (s)	18.0
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	487	32	290	480	718	7	51	300	639	98	110
Future Volume (veh/h)	20	487	32	290	480	718	7	51	300	639	98	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	21	518	34	309	511	764	7	54	319	754	0	117
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	39	823	54	342	774	640	294	309	261	867	0	384
Arrive On Green	0.02	0.24	0.24	0.19	0.41	0.41	0.16	0.16	0.16	0.24	0.00	0.24
Sat Flow, veh/h	1795	3410	223	1795	1885	1559	1795	1885	1598	3591	0	1591
Grp Volume(v), veh/h	21	271	281	309	511	764	7	54	319	754	0	117
Grp Sat Flow(s),veh/h/ln	1795	1791	1843	1795	1885	1559	1795	1885	1598	1795	0	1591
Q Serve(g_s), s	1.3	15.0	15.1	18.6	24.2	45.4	0.4	2.7	18.1	22.3	0.0	6.7
Cycle Q Clear(g_c), s	1.3	15.0	15.1	18.6	24.2	45.4	0.4	2.7	18.1	22.3	0.0	6.7
Prop In Lane	1.00		0.12	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	39	432	445	342	774	640	294	309	261	867	0	384
V/C Ratio(X)	0.54	0.63	0.63	0.90	0.66	1.19	0.02	0.18	1.22	0.87	0.00	0.30
Avail Cap(c_a), veh/h	81	432	445	430	774	640	294	309	261	1088	0	482
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	53.6	37.5	37.5	43.7	26.4	32.6	38.8	39.8	46.2	40.3	0.0	34.3
Incr Delay (d2), s/veh	11.4	2.9	2.9	18.9	2.1	102.0	0.0	0.3	128.4	6.5	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	7.0	7.2	10.0	11.1	34.6	0.2	1.3	16.4	10.4	0.0	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.0	40.4	40.4	62.7	28.4	134.6	38.9	40.1	174.7	46.7	0.0	34.8
LnGrp LOS	E	D	D	E	C	F	D	D	F	D	A	C
Approach Vol, veh/h		573			1584			380			871	
Approach Delay, s/veh		41.3			86.3			153.0			45.1	
Approach LOS		D			F			F			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	25.6	31.2		31.2	6.9	49.9		22.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	26.5	23.9		33.5	5.0	45.4		18.1				
Max Q Clear Time (g_c+I1), s	20.6	17.1		24.3	3.3	47.4		20.1				
Green Ext Time (p_c), s	0.5	1.9		2.4	0.0	0.0		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			75.7									
HCM 6th LOS			E									

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	94	1439	30	1289	374	280	32	508	9	32
v/c Ratio	0.53	0.78	0.28	0.78	0.44	0.63	0.05	0.85	0.02	0.05
Control Delay	56.8	23.1	54.6	26.4	9.1	35.8	23.9	38.0	23.5	0.2
Queue Delay	0.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.8	24.6	54.6	26.4	9.1	35.8	23.9	38.0	23.5	0.2
Queue Length 50th (ft)	61	410	20	374	56	155	14	239	4	0
Queue Length 95th (ft)	#122	524	51	480	133	246	35	#418	15	0
Internal Link Dist (ft)		307		269			836			575
Turn Bay Length (ft)	120		220		145	130		110	95	
Base Capacity (vph)	202	2187	108	1980	969	586	795	749	586	749
Starvation Cap Reductn	0	517	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.86	0.28	0.65	0.39	0.48	0.04	0.68	0.02	0.04

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Cumulative Plus 1293 Unit Project and School PM
9: Paso Robles Street & 13th Street — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	1298	40	28	1199	348	260	30	472	8	0	30
Future Volume (vph)	87	1298	40	28	1199	348	260	30	472	8	0	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	3555		1787	3574	1564	1787	1881	1599	1787	1599	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.74	1.00	1.00	0.74	1.00	
Satd. Flow (perm)	1787	3555		1787	3574	1564	1385	1881	1599	1385	1599	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	94	1396	43	30	1289	374	280	32	508	9	0	32
RTOR Reduction (vph)	0	2	0	0	0	123	0	0	87	0	22	0
Lane Group Flow (vph)	94	1437	0	30	1289	251	280	32	421	9	10	0
Confl. Peds. (#/hr)			5									
Confl. Bikes (#/hr)			1			2						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		
Actuated Green, G (s)	6.7	47.3		2.7	43.3	43.3	29.1	29.1	29.1	29.1	29.1	
Effective Green, g (s)	6.7	47.3		2.7	43.3	43.3	29.1	29.1	29.1	29.1	29.1	
Actuated g/C Ratio	0.07	0.51		0.03	0.47	0.47	0.31	0.31	0.31	0.31	0.31	
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	129	1815		52	1671	731	435	591	502	435	502	
v/s Ratio Prot	c0.05	c0.40		0.02	0.36			0.02			0.01	
v/s Ratio Perm						0.16	0.20		c0.26	0.01		
v/c Ratio	0.73	0.79		0.58	0.77	0.34	0.64	0.05	0.84	0.02	0.02	
Uniform Delay, d1	42.1	18.6		44.4	20.5	15.6	27.3	22.1	29.6	21.9	21.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	18.5	2.4		14.6	2.3	0.3	3.3	0.0	11.7	0.0	0.0	
Delay (s)	60.5	21.1		58.9	22.8	15.9	30.5	22.2	41.2	21.9	21.9	
Level of Service	E	C		E	C	B	C	C	D	C	C	
Approach Delay (s)		23.5			21.9			36.8			21.9	
Approach LOS		C			C			D			C	

Intersection Summary				
HCM 2000 Control Delay	25.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	92.6	Sum of lost time (s)	13.5	
Intersection Capacity Utilization	81.8%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Olsen-Chandler SP — Cumulative Plus 1293 Unit Project and School PM
9: Paso Robles Street & 13th Street — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	1298	40	28	1199	348	260	30	472	8	0	30
Future Volume (veh/h)	87	1298	40	28	1199	348	260	30	472	8	0	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	94	1396	43	30	1289	0	280	32	508	9	0	32
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	121	1682	52	53	1564		542	653	553	372	0	553
Arrive On Green	0.07	0.47	0.47	0.03	0.44	0.00	0.35	0.35	0.35	0.35	0.00	0.35
Sat Flow, veh/h	1795	3544	109	1795	3582	1598	1388	1885	1598	872	0	1598
Grp Volume(v), veh/h	94	704	735	30	1289	0	280	32	508	9	0	32
Grp Sat Flow(s),veh/h/ln	1795	1791	1862	1795	1791	1598	1388	1885	1598	872	0	1598
Q Serve(g_s), s	4.6	30.7	30.8	1.5	28.5	0.0	15.2	1.0	27.4	0.6	0.0	1.2
Cycle Q Clear(g_c), s	4.6	30.7	30.8	1.5	28.5	0.0	16.4	1.0	27.4	1.6	0.0	1.2
Prop In Lane	1.00		0.06	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	121	850	884	53	1564		542	653	553	372	0	553
V/C Ratio(X)	0.78	0.83	0.83	0.57	0.82		0.52	0.05	0.92	0.02	0.00	0.06
Avail Cap(c_a), veh/h	189	1013	1053	102	1850		609	744	630	414	0	630
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.3	20.5	20.5	43.1	22.3	0.0	25.1	19.6	28.2	20.1	0.0	19.6
Incr Delay (d2), s/veh	10.3	5.0	5.0	9.3	2.7	0.0	0.8	0.0	17.4	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	13.1	13.6	0.8	11.9	0.0	4.9	0.4	12.5	0.1	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.6	25.5	25.5	52.5	25.0	0.0	25.9	19.6	45.6	20.1	0.0	19.7
LnGrp LOS	D	C	C	D	C		C	B	D	C	A	B
Approach Vol, veh/h		1533			1319	A		820			41	
Approach Delay, s/veh		27.1			25.7			37.8			19.8	
Approach LOS		C			C			D			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.1	47.2		35.7	10.5	43.8		35.7				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	50.9		35.5	9.5	46.5		35.5				
Max Q Clear Time (g_c+I1), s	3.5	32.8		3.6	6.6	30.5		29.4				
Green Ext Time (p_c), s	0.0	9.9		0.2	0.0	8.6		1.7				

Intersection Summary			
HCM 6th Ctrl Delay	28.9		
HCM 6th LOS	C		

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	508	1364	105	982	311	255	74	148	827
v/c Ratio	0.84	0.89	0.74	0.81	0.79	0.34	0.17	0.75	0.94dr
Control Delay	59.9	36.5	82.9	40.4	66.0	40.8	0.8	73.8	45.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.9	36.5	82.9	40.4	66.0	40.8	0.8	73.8	45.0
Queue Length 50th (ft)	197	470	81	354	122	89	0	112	226
Queue Length 95th (ft)	#273	577	#171	439	#189	129	1	#207	#345
Internal Link Dist (ft)		353		673		608			523
Turn Bay Length (ft)	295		235		140		130	225	
Base Capacity (vph)	653	1632	148	1277	410	789	459	217	940
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.84	0.71	0.77	0.76	0.32	0.16	0.68	0.88

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
dr Defacto Right Lane. Recode with 1 though lane as a right lane.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	483	880	416	100	779	154	295	242	70	141	286	500
Future Volume (vph)	483	880	416	100	779	154	295	242	70	141	286	500
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	0.97	0.95		1.00	0.95		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	0.98		1.00	1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3467	3387		1787	3478		3467	3574	1599	1787	3205	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3467	3387		1787	3478		3467	3574	1599	1787	3205	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	508	926	438	105	820	162	311	255	74	148	301	526
RTOR Reduction (vph)	0	48	0	0	14	0	0	0	58	0	227	0
Lane Group Flow (vph)	508	1316	0	105	968	0	311	255	16	148	600	0
Confl. Peds. (#/hr)			1			1						1
Confl. Bikes (#/hr)			1			1						
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases									8			
Actuated Green, G (s)	20.1	50.4		9.2	39.5		13.1	24.5	24.5	12.8	24.2	
Effective Green, g (s)	20.1	50.4		9.2	39.5		13.1	24.5	24.5	12.8	24.2	
Actuated g/C Ratio	0.17	0.44		0.08	0.34		0.11	0.21	0.21	0.11	0.21	
Clearance Time (s)	4.5	4.5		4.5	4.5		4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	606	1485		143	1195		395	762	340	199	675	
v/s Ratio Prot	c0.15	c0.39		0.06	0.28		c0.09	0.07		0.08	c0.19	
v/s Ratio Perm									0.01			
v/c Ratio	0.84	0.89		0.73	0.81		0.79	0.33	0.05	0.74	0.94dr	
Uniform Delay, d1	45.8	29.6		51.7	34.3		49.5	38.3	35.9	49.5	44.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	9.9	6.7		17.6	4.3		10.0	0.3	0.1	14.0	13.5	
Delay (s)	55.7	36.4		69.3	38.6		59.5	38.6	36.0	63.4	57.6	
Level of Service	E	D		E	D		E	D	D	E	E	
Approach Delay (s)		41.6			41.5			48.4			58.4	
Approach LOS		D			D			D			E	

Intersection Summary				
HCM 2000 Control Delay	46.1	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	114.9	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	90.7%	ICU Level of Service	E	
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	483	880	416	100	779	154	295	242	70	141	286	500
Future Volume (veh/h)	483	880	416	100	779	154	295	242	70	141	286	500
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	508	926	0	105	820	162	311	255	74	148	301	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	630	1636		135	1043	206	408	500	223	186	451	
Arrive On Green	0.18	0.46	0.00	0.08	0.35	0.35	0.12	0.14	0.14	0.10	0.13	0.00
Sat Flow, veh/h	3483	3676	0	1795	2973	587	3483	3582	1598	1795	3676	0
Grp Volume(v), veh/h	508	926	0	105	494	488	311	255	74	148	301	0
Grp Sat Flow(s),veh/h/ln	1742	1791	0	1795	1791	1770	1742	1791	1598	1795	1791	0
Q Serve(g_s), s	11.2	15.1	0.0	4.6	19.8	19.8	6.9	5.3	3.3	6.4	6.4	0.0
Cycle Q Clear(g_c), s	11.2	15.1	0.0	4.6	19.8	19.8	6.9	5.3	3.3	6.4	6.4	0.0
Prop In Lane	1.00		0.00	1.00		0.33	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	630	1636		135	628	621	408	500	223	186	451	
V/C Ratio(X)	0.81	0.57		0.78	0.79	0.79	0.76	0.51	0.33	0.80	0.67	
Avail Cap(c_a), veh/h	937	2397		213	930	919	588	1125	502	312	1143	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	31.4	15.9	0.0	36.3	23.3	23.3	34.2	31.9	31.0	35.0	33.3	0.0
Incr Delay (d2), s/veh	3.2	0.3	0.0	9.3	2.7	2.7	3.6	0.8	0.9	7.6	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	5.8	0.0	2.3	8.2	8.1	3.0	2.2	1.3	3.0	2.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.6	16.2	0.0	45.6	26.0	26.0	37.8	32.7	31.9	42.6	35.0	0.0
LnGrp LOS	C	B		D	C	C	D	C	C	D	D	
Approach Vol, veh/h		1434	A		1087			640			449	A
Approach Delay, s/veh		22.7			27.9			35.1			37.5	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.5	41.0	13.9	14.6	19.0	32.5	12.8	15.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.5	53.5	13.5	25.5	21.5	41.5	13.9	25.1
Max Q Clear Time (g_c+I1), s	6.6	17.1	8.9	8.4	13.2	21.8	8.4	7.3
Green Ext Time (p_c), s	0.1	8.0	0.4	1.5	1.3	6.3	0.2	1.6

Intersection Summary	
HCM 6th Ctrl Delay	28.3
HCM 6th LOS	C

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	92	591	1263	648	91
v/c Ratio	0.58	0.28	0.80	0.73	0.19
Control Delay	59.2	11.3	23.2	37.5	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	59.2	11.3	23.2	37.5	9.0
Queue Length 50th (ft)	47	67	226	155	0
Queue Length 95th (ft)	#168	195	#577	#368	45
Internal Link Dist (ft)		1151	2310	505	
Turn Bay Length (ft)	125			120	
Base Capacity (vph)	158	2351	1804	980	511
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.58	0.25	0.70	0.66	0.18

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	89	573	620	605	629	88
Future Volume (vph)	89	573	620	605	629	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.99		1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.93		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1787	3574	3282		3467	1578
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1787	3574	3282		3467	1578
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	92	591	639	624	648	91
RTOR Reduction (vph)	0	0	133	0	0	69
Lane Group Flow (vph)	92	591	1130	0	648	23
Confl. Peds. (#/hr)				4		1
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	NA		Perm	Perm
Protected Phases	5	2	6			
Permitted Phases					4	4
Actuated Green, G (s)	7.8	51.1	38.8		22.5	22.5
Effective Green, g (s)	7.8	51.1	38.8		22.5	22.5
Actuated g/C Ratio	0.09	0.56	0.43		0.25	0.25
Clearance Time (s)	4.5	4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	153	2006	1399		857	390
v/s Ratio Prot	c0.05	0.17	c0.34			
v/s Ratio Perm					c0.19	0.01
v/c Ratio	0.60	0.29	0.81		0.76	0.06
Uniform Delay, d1	40.1	10.5	22.8		31.7	26.2
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	6.5	0.1	3.5		3.8	0.1
Delay (s)	46.6	10.6	26.4		35.5	26.2
Level of Service	D	B	C		D	C
Approach Delay (s)		15.4	26.4		34.4	
Approach LOS		B	C		C	

Intersection Summary			
HCM 2000 Control Delay	25.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	91.0	Sum of lost time (s)	18.0
Intersection Capacity Utilization	70.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Edition methodology does not support exclusive ped or hold phases.

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Cumulative Plus 1293 Unit Project and School PM
12: Creston Road & Niblick Road/Sherwood Road — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	213	867	338	164	594	502	227	483	438	555	149
v/c Ratio	0.72	0.80	0.54	0.67	0.61	0.67	0.74	0.65	0.72	0.74	0.37
Control Delay	58.6	41.7	15.2	60.3	37.7	11.6	58.4	42.0	50.0	46.3	18.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.6	41.7	15.2	60.3	37.7	11.6	58.4	42.0	50.0	46.3	18.0
Queue Length 50th (ft)	149	300	63	115	194	39	158	162	157	198	30
Queue Length 95th (ft)	241	408	166	196	278	165	254	228	221	273	92
Internal Link Dist (ft)		1092			186			1440		2310	
Turn Bay Length (ft)	150		150	170		140	230		245		100
Base Capacity (vph)	381	1258	695	310	1123	791	399	945	756	939	479
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.69	0.49	0.53	0.53	0.63	0.57	0.51	0.58	0.59	0.31

Intersection Summary

Olsen-Chandler SP — Cumulative Plus 1293 Unit Project and School PM
12: Creston Road & Niblick Road/Sherwood Road — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	200	815	318	154	558	472	213	376	78	412	522	140
Future Volume (vph)	200	815	318	154	558	472	213	376	78	412	522	140
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		0.97	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1787	3574	1570	1787	3574	1577	1787	3482		3467	3574	1554
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1787	3574	1570	1787	3574	1577	1787	3482		3467	3574	1554
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	213	867	338	164	594	502	227	400	83	438	555	149
RTOR Reduction (vph)	0	0	154	0	0	312	0	15	0	0	0	77
Lane Group Flow (vph)	213	867	184	164	594	190	227	468	0	438	555	72
Confl. Peds. (#/hr)			4			1						10
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						6
Actuated Green, G (s)	17.2	31.6	31.6	14.2	28.6	28.6	18.0	21.8		18.3	22.1	22.1
Effective Green, g (s)	17.2	31.6	31.6	14.2	28.6	28.6	18.0	21.8		18.3	22.1	22.1
Actuated g/C Ratio	0.17	0.30	0.30	0.14	0.28	0.28	0.17	0.21		0.18	0.21	0.21
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5		4.5	4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	295	1086	477	244	983	434	309	730		610	760	330
v/s Ratio Prot	c0.12	c0.24		0.09	0.17		c0.13	0.13		0.13	c0.16	
v/s Ratio Perm			0.12			0.12						0.05
v/c Ratio	0.72	0.80	0.39	0.67	0.60	0.44	0.73	0.64		0.72	0.73	0.22
Uniform Delay, d1	41.1	33.2	28.5	42.6	32.7	31.0	40.7	37.5		40.4	38.1	33.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	8.4	4.2	0.5	7.1	1.1	0.7	8.7	1.9		4.0	3.6	0.3
Delay (s)	49.5	37.4	29.0	49.7	33.8	31.7	49.4	39.4		44.4	41.7	34.1
Level of Service	D	D	C	D	C	C	D	D		D	D	C
Approach Delay (s)		37.2			35.0			42.6			41.8	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM 2000 Control Delay	38.6	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.77			
Actuated Cycle Length (s)	103.9	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	72.7%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Cumulative Plus 1293 Unit Project and School PM
12: Creston Road & Niblick Road/Sherwood Road — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	815	318	154	558	472	213	376	78	412	522	140
Future Volume (veh/h)	200	815	318	154	558	472	213	376	78	412	522	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	213	867	338	164	594	502	227	400	83	438	555	149
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	251	1274	566	199	1170	522	266	572	118	534	712	313
Arrive On Green	0.14	0.36	0.36	0.11	0.33	0.33	0.15	0.19	0.19	0.15	0.20	0.20
Sat Flow, veh/h	1795	3582	1592	1795	3582	1596	1795	2958	608	3483	3582	1574
Grp Volume(v), veh/h	213	867	338	164	594	502	227	241	242	438	555	149
Grp Sat Flow(s),veh/h/ln	1795	1791	1592	1795	1791	1596	1795	1791	1776	1742	1791	1574
Q Serve(g_s), s	11.2	19.8	16.7	8.6	12.9	29.8	11.9	12.1	12.3	11.7	14.2	8.1
Cycle Q Clear(g_c), s	11.2	19.8	16.7	8.6	12.9	29.8	11.9	12.1	12.3	11.7	14.2	8.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.34	1.00		1.00
Lane Grp Cap(c), veh/h	251	1274	566	199	1170	522	266	346	343	534	712	313
V/C Ratio(X)	0.85	0.68	0.60	0.82	0.51	0.96	0.85	0.70	0.71	0.82	0.78	0.48
Avail Cap(c_a), veh/h	400	1319	586	326	1170	522	419	502	497	795	985	433
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.5	26.4	25.4	41.9	26.2	31.9	40.1	36.2	36.3	39.5	36.6	34.2
Incr Delay (d2), s/veh	9.4	1.4	1.6	8.4	0.4	30.0	9.8	2.5	2.7	4.3	2.7	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	8.2	6.2	4.2	5.3	15.1	5.8	5.4	5.4	5.2	6.3	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.9	27.8	27.0	50.3	26.5	61.9	49.8	38.7	39.0	43.8	39.4	35.3
LnGrp LOS	D	C	C	D	C	E	D	D	D	D	D	D
Approach Vol, veh/h		1418			1260			710			1142	
Approach Delay, s/veh		30.9			43.7			42.4			40.5	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.3	23.1	15.2	38.8	18.8	23.7	18.0	36.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	22.0	27.0	17.5	35.5	22.5	26.5	21.5	31.5
Max Q Clear Time (g_c+I1), s	13.7	14.3	10.6	21.8	13.9	16.2	13.2	31.8
Green Ext Time (p_c), s	1.0	2.3	0.2	5.8	0.4	3.0	0.4	0.0

Intersection Summary	
HCM 6th Ctrl Delay	38.7
HCM 6th LOS	D

Olsen-Chandler SP — Cumulative Plus 1293 Unit Project and School PM
13: Creston Road & Scott Street — HCM Unsignalized Intersection Capacity Analysis

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	62	61	637	52	93	834
Future Volume (Veh/h)	62	61	637	52	93	834
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	67	66	685	56	100	897
Pedestrians	2					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1812	715			743	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1812	715			743	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	13	85			88	
cM capacity (veh/h)	77	432			867	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	133	741	100	897
Volume Left	67	0	100	0
Volume Right	66	56	0	0
cSH	129	1700	867	1700
Volume to Capacity	1.03	0.44	0.12	0.53
Queue Length 95th (ft)	182	0	10	0
Control Delay (s)	152.5	0.0	9.7	0.0
Lane LOS	F		A	
Approach Delay (s)	152.5	0.0	1.0	
Approach LOS	F			

Intersection Summary			
Average Delay	11.4		
Intersection Capacity Utilization	59.0%	ICU Level of Service	B
Analysis Period (min)	15		

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	11.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	62	61	637	52	93	834
Future Vol, veh/h	62	61	637	52	93	834
Conflicting Peds, #/hr	0	0	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	60	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	67	66	685	56	100	897

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1812	715	0	0	743	0
Stage 1	715	-	-	-	-	-
Stage 2	1097	-	-	-	-	-
Critical Hdwy	6.41	6.21	-	-	4.11	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	-	-	2.209	-
Pot Cap-1 Maneuver	87	432	-	-	869	-
Stage 1	486	-	-	-	-	-
Stage 2	321	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	77	431	-	-	867	-
Mov Cap-2 Maneuver	77	-	-	-	-	-
Stage 1	485	-	-	-	-	-
Stage 2	284	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	149.3	0	1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	- 130	867	-
HCM Lane V/C Ratio	-	- 1.017	0.115	-
HCM Control Delay (s)	-	- 149.3	9.7	-
HCM Lane LOS	-	- F	A	-
HCM 95th %tile Q(veh)	-	- 7.2	0.4	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	137	10	17	10	10	42	25	427	10	53	569	167
Future Volume (Veh/h)	137	10	17	10	10	42	25	427	10	53	569	167
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Hourly flow rate (vph)	138	10	17	10	10	42	25	431	10	54	575	169
Pedestrians		5									4	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		3.5									3.5	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1220	1179	580	1191	1343	440	749			441		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1220	1179	580	1191	1343	440	749			441		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	94	97	93	93	93	97			95		
cM capacity (veh/h)	129	176	514	143	140	617	860			1124		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	165	62	25	441	54	575	169
Volume Left	138	10	25	0	54	0	0
Volume Right	17	42	0	10	0	0	169
cSH	143	297	860	1700	1124	1700	1700
Volume to Capacity	1.16	0.21	0.03	0.26	0.05	0.34	0.10
Queue Length 95th (ft)	235	19	2	0	4	0	0
Control Delay (s)	185.4	20.3	9.3	0.0	8.4	0.0	0.0
Lane LOS	F	C	A		A		
Approach Delay (s)	185.4	20.3	0.5		0.6		
Approach LOS	F	C					

Intersection Summary				
Average Delay	21.8			
Intersection Capacity Utilization	59.1%	ICU Level of Service		B
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	20.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰	↑↱		↰	↑	↱
Traffic Vol, veh/h	137	10	17	10	10	42	25	427	10	53	569	167
Future Vol, veh/h	137	10	17	10	10	42	25	427	10	53	569	167
Conflicting Peds, #/hr	4	0	0	0	0	4	5	0	0	0	0	5
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	30	-	-	70	-	60
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	99	99	99	99	99	99	99	99	99	99	99	99
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	138	10	17	10	10	42	25	431	10	54	575	169

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1204	1179	580	1267	1343	440	749	0	0	441	0	0
Stage 1	688	688	-	486	486	-	-	-	-	-	-	-
Stage 2	516	491	-	781	857	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.51	6.21	7.11	6.51	6.21	4.11	-	-	4.11	-	-
Critical Hdwy Stg 1	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.51	-	6.11	5.51	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.009	3.309	3.509	4.009	3.309	2.209	-	-	2.209	-	-
Pot Cap-1 Maneuver	162	191	516	146	153	619	864	-	-	1124	-	-
Stage 1	438	448	-	565	553	-	-	-	-	-	-	-
Stage 2	544	550	-	389	375	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 133	176	514	127	141	617	860	-	-	1124	-	-
Mov Cap-2 Maneuver	~ 133	176	-	127	141	-	-	-	-	-	-	-
Stage 1	423	424	-	549	537	-	-	-	-	-	-	-
Stage 2	481	534	-	349	355	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	176.2	21.2	0.5	0.6
HCM LOS	F	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	860	-	-	146	285	1124	-	-
HCM Lane V/C Ratio	0.029	-	-	1.135	0.22	0.048	-	-
HCM Control Delay (s)	9.3	-	-	176.2	21.2	8.4	-	-
HCM Lane LOS	A	-	-	F	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	9.2	0.8	0.1	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↰	↱		↑↱	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	10	10	16	175	10	180	14	271	271	302	265	20
Future Volume (vph)	10	10	16	175	10	180	14	271	271	302	265	20
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	11	11	17	188	11	194	15	291	291	325	285	22

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	39	393	306	291	468	165
Volume Left (vph)	11	188	15	0	325	0
Volume Right (vph)	17	194	0	291	0	22
Hadj (s)	-0.19	-0.18	0.04	-0.68	0.36	-0.08
Departure Headway (s)	8.3	6.8	7.4	6.6	7.5	7.1
Degree Utilization, x	0.09	0.74	0.63	0.54	0.98	0.32
Capacity (veh/h)	385	393	478	539	468	498
Control Delay (s)	12.1	26.4	20.8	15.8	62.4	12.2
Approach Delay (s)	12.1	26.4	18.4		49.3	
Approach LOS	B	D	C		E	

Intersection Summary				
Delay	31.9			
Level of Service	D			
Intersection Capacity Utilization	69.9%	ICU Level of Service	C	
Analysis Period (min)	15			

Intersection	
Intersection Delay, s/veh	33.1
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Vol, veh/h	10	10	16	175	10	180	0	14	271	271	302	265
Future Vol, veh/h	10	10	16	175	10	180	0	14	271	271	302	265
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.92	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	1	1	1	1	1	1	2	1	1	1	1	1
Mvmt Flow	11	11	17	188	11	194	0	15	291	291	325	285
Number of Lanes	0	1	0	0	1	0	0	0	1	1	0	2

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	1	1
HCM Control Delay	12.3	27.6	19.5	50.7
HCM LOS	B	D	C	F

Lane	NBLn1	NBLn2	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	5%	0%	28%	48%	70%	0%
Vol Thru, %	95%	0%	28%	3%	30%	87%
Vol Right, %	0%	100%	44%	49%	0%	13%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	285	271	36	365	435	153
LT Vol	14	0	10	175	302	0
Through Vol	271	0	10	10	133	133
RT Vol	0	271	16	180	0	20
Lane Flow Rate	306	291	39	392	467	164
Geometry Grp	7	7	2	2	7	7
Degree of Util (X)	0.629	0.538	0.09	0.748	0.98	0.323
Departure Headway (Hd)	7.389	6.643	8.405	6.861	7.549	7.097
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	487	542	425	526	481	507
Service Time	5.145	4.398	6.493	4.901	5.302	4.85
HCM Lane V/C Ratio	0.628	0.537	0.092	0.745	0.971	0.323
HCM Control Delay	21.9	16.9	12.3	27.6	63.9	13.2
HCM Lane LOS	C	C	B	D	F	B
HCM 95th-tile Q	4.3	3.2	0.3	6.4	12.6	1.4

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBR
Lane Configurations	
Traffic Vol, veh/h	20
Future Vol, veh/h	20
Peak Hour Factor	0.93
Heavy Vehicles, %	1
Mvmt Flow	22
Number of Lanes	0

Approach	
Opposing Approach	
Opposing Lanes	
Conflicting Approach Left	
Conflicting Lanes Left	
Conflicting Approach Right	
Conflicting Lanes Right	
HCM Control Delay	
HCM LOS	

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	331	253	150	225	210	245
Future Volume (Veh/h)	331	253	150	225	210	245
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	341	261	155	232	216	253
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		6				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	642	216	469			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	642	216	469			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	3	67	86			
cM capacity (veh/h)	351	792	1096			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3	SB 1	SB 2
Volume Total	602	155	116	116	216	253
Volume Left	341	155	0	0	0	0
Volume Right	261	0	0	0	0	253
cSH	581	1096	1700	1700	1700	1700
Volume to Capacity	1.04	0.14	0.07	0.07	0.13	0.15
Queue Length 95th (ft)	411	12	0	0	0	0
Control Delay (s)	73.9	8.8	0.0	0.0	0.0	0.0
Lane LOS	F	A				
Approach Delay (s)	73.9	3.5			0.0	
Approach LOS	F					

Intersection Summary			
Average Delay		31.5	
Intersection Capacity Utilization		47.7%	ICU Level of Service A
Analysis Period (min)		15	

Intersection	
Int Delay, s/veh	18.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	331	253	150	225	210	245
Future Vol, veh/h	331	253	150	225	210	245
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	145	105	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	341	261	155	232	216	253

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	642	216	469	0	-	0
Stage 1	216	-	-	-	-	-
Stage 2	426	-	-	-	-	-
Critical Hdwy	6.615	6.215	4.115	-	-	-
Critical Hdwy Stg 1	5.415	-	-	-	-	-
Critical Hdwy Stg 2	5.815	-	-	-	-	-
Follow-up Hdwy	3.5095	3.3095	2.2095	-	-	-
Pot Cap-1 Maneuver	424	826	1097	-	-	-
Stage 1	822	-	-	-	-	-
Stage 2	630	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	364	826	1097	-	-	-
Mov Cap-2 Maneuver	364	-	-	-	-	-
Stage 1	706	-	-	-	-	-
Stage 2	630	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	42.9	3.5	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1097	-	364	826	-	-
HCM Lane V/C Ratio	0.141	-	0.937	0.316	-	-
HCM Control Delay (s)	8.8	-	66.9	11.4	-	-
HCM Lane LOS	A	-	F	B	-	-
HCM 95th %tile Q(veh)	0.5	-	10	1.4	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	0	316	20	0	0	0	0	400	53
Future Volume (Veh/h)	0	0	0	0	316	20	0	0	0	0	400	53
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	343	22	0	0	0	0	435	58
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)						1						
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	636	464	464	464	493	0	493			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	636	464	464	464	493	0	493			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	28	98	100			100		
cM capacity (veh/h)	160	497	600	510	478	1088	1076			1630		

Direction, Lane #	WB 1	SB 1
Volume Total	365	493
Volume Left	0	0
Volume Right	22	58
cSH	499	1700
Volume to Capacity	0.73	0.29
Queue Length 95th (ft)	151	0
Control Delay (s)	29.5	0.0
Lane LOS	D	
Approach Delay (s)	29.5	0.0
Approach LOS	D	

Intersection Summary				
Average Delay	12.5			
Intersection Capacity Utilization	47.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	316	20	0	0	0	0	400	53
Future Vol, veh/h	0	0	0	0	316	20	0	0	0	0	400	53
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	-	-	-	-	-	25	-	-	-	-	-	-
Veh in Median Storage, #	-	2	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	0	0	0	0	343	22	0	0	0	0	435	58

Major/Minor	Minor1			Major2		
Conflicting Flow All	464	493	-	-	-	0
Stage 1	0	0	-	-	-	-
Stage 2	464	493	-	-	-	-
Critical Hdwy	6.41	6.51	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	5.41	5.51	-	-	-	-
Follow-up Hdwy	3.509	4.009	-	-	-	-
Pot Cap-1 Maneuver	558	478	0	0	-	-
Stage 1	-	-	0	0	-	-
Stage 2	635	549	0	0	-	-
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	558	0	-	-	-	-
Mov Cap-2 Maneuver	558	0	-	-	-	-
Stage 1	-	0	-	-	-	-
Stage 2	635	0	-	-	-	-

Approach	WB	SB
HCM Control Delay, s		0
HCM LOS	-	

Minor Lane/Major Mvmt	WBLn1	WBLn2	SBT	SBR
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	0	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	-	-	-

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	75	483	775	278	541	141	424	1199	795	461
v/c Ratio	0.27	0.88	0.73	0.49	0.53	0.70	0.82	0.91	0.91	0.46
Control Delay	58.3	75.2	50.7	45.6	8.8	81.6	73.9	34.2	67.4	41.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.3	75.2	50.7	45.6	8.8	81.6	73.9	34.2	67.4	41.2
Queue Length 50th (ft)	65	234	354	225	116	135	212	320	389	177
Queue Length 95th (ft)	118	#326	431	319	205	207	275	#442	#498	241
Internal Link Dist (ft)		521		1372			611			680
Turn Bay Length (ft)	115		515		115	165		290	305	
Base Capacity (vph)	290	577	1073	582	1043	255	575	1336	922	1033
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.84	0.72	0.48	0.52	0.55	0.74	0.90	0.86	0.45

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	73	356	113	752	270	525	137	411	1163	771	325	122
Future Volume (vph)	73	356	113	752	270	525	137	411	1163	771	325	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Lane Util. Factor	1.00	0.95		0.97	1.00	1.00	1.00	0.95	0.88	0.97	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.99	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	3433		3467	1881	1585	1787	3574	2814	3467	3428	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	3433		3467	1881	1585	1787	3574	2814	3467	3428	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	75	367	116	775	278	541	141	424	1199	795	335	126
RTOR Reduction (vph)	0	20	0	0	0	137	0	0	48	0	26	0
Lane Group Flow (vph)	75	463	0	775	278	404	141	424	1151	795	435	0
Confl. Peds. (#/hr)						2						
Confl. Bikes (#/hr)			2									
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Split	NA		Split	NA	pm+ov	Prot	NA	pm+ov	Prot	NA	
Protected Phases	4	4		8	8	1	5	2	8	1	6	
Permitted Phases						8			2			
Actuated Green, G (s)	22.3	22.3		44.1	44.1	80.7	16.2	21.1	65.2	36.6	41.5	
Effective Green, g (s)	22.3	22.3		44.1	44.1	80.7	16.2	21.1	65.2	36.6	41.5	
Actuated g/C Ratio	0.15	0.15		0.30	0.30	0.56	0.11	0.15	0.45	0.25	0.29	
Clearance Time (s)	4.6	4.6		5.4	5.4	4.7	5.8	5.8	5.4	4.7	4.7	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	275	529		1057	573	884	200	521	1268	877	983	
v/s Ratio Prot	0.04	c0.13		0.22	0.15	0.12	0.08	0.12	c0.28	c0.23	0.13	
v/s Ratio Perm						0.14			0.13			
v/c Ratio	0.27	0.87		0.73	0.49	0.46	0.70	0.81	0.91	0.91	0.44	
Uniform Delay, d1	54.0	59.8		45.0	41.0	19.0	61.9	59.8	36.9	52.3	42.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	14.9		2.7	0.6	0.4	10.7	9.4	9.5	12.8	0.3	
Delay (s)	54.5	74.7		47.6	41.6	19.3	72.6	69.3	46.4	65.2	42.4	
Level of Service	D	E		D	D	B	E	E	D	E	D	
Approach Delay (s)		72.0			37.0			54.0			56.8	
Approach LOS		E			D			D			E	

Intersection Summary

HCM 2000 Control Delay	51.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	144.6	Sum of lost time (s)	20.5
Intersection Capacity Utilization	88.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Cumulative Plus 1293 Unit Project and School PM
18: US 101 Ramps/Spring Street & 1st Street/Niblick Road — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	73	356	113	752	270	525	137	411	1163	771	325	122
Future Volume (veh/h)	73	356	113	752	270	525	137	411	1163	771	325	122
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	75	367	116	775	278	541	141	424	1199	795	335	126
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	280	417	130	996	539	852	166	590	1267	863	799	295
Arrive On Green	0.16	0.16	0.16	0.29	0.29	0.29	0.09	0.16	0.16	0.25	0.31	0.31
Sat Flow, veh/h	1795	2677	834	3483	1885	1594	1795	3582	2812	3483	2560	946
Grp Volume(v), veh/h	75	244	239	775	278	541	141	424	1199	795	233	228
Grp Sat Flow(s),veh/h/ln	1795	1791	1720	1742	1885	1594	1795	1791	1406	1742	1791	1715
Q Serve(g_s), s	5.2	18.7	19.2	28.8	17.4	33.7	10.9	15.8	23.2	31.3	14.4	14.9
Cycle Q Clear(g_c), s	5.2	18.7	19.2	28.8	17.4	33.7	10.9	15.8	23.2	31.3	14.4	14.9
Prop In Lane	1.00		0.48	1.00		1.00	1.00		1.00	1.00		0.55
Lane Grp Cap(c), veh/h	280	279	268	996	539	852	166	590	1267	863	559	535
V/C Ratio(X)	0.27	0.87	0.89	0.78	0.52	0.64	0.85	0.72	0.95	0.92	0.42	0.43
Avail Cap(c_a), veh/h	298	298	286	1104	597	901	263	590	1267	948	559	535
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.3	58.0	58.3	46.2	42.1	23.2	62.9	55.7	27.6	51.6	38.3	38.4
Incr Delay (d2), s/veh	0.5	22.7	26.7	3.3	0.8	1.4	13.8	4.2	14.3	13.3	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	10.3	10.4	12.7	8.1	12.5	5.5	7.3	23.8	15.3	6.5	6.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.8	80.7	85.0	49.4	42.9	24.5	76.7	59.9	41.9	64.9	38.8	38.9
LnGrp LOS	D	F	F	D	D	C	E	E	D	E	D	D
Approach Vol, veh/h		558			1594			1764			1256	
Approach Delay, s/veh		78.8			39.8			49.0			55.3	
Approach LOS		E			D			D			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	39.6	29.0		26.5	18.8	49.7		45.6				
Change Period (Y+Rc), s	* 4.7	5.8		4.6	5.8	* 5.8		5.4				
Max Green Setting (Gmax), s	* 38	23.2		23.4	20.6	* 41		44.6				
Max Q Clear Time (g_c+I1), s	33.3	25.2		21.2	12.9	16.9		35.7				
Green Ext Time (p_c), s	1.5	0.0		0.7	0.2	2.9		4.5				

Intersection Summary												
HCM 6th Ctrl Delay			50.9									
HCM 6th LOS			D									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Olsen-Chandler SP — Cumulative Plus 1293 Unit Project and School PM
19: S. River Road & Niblick Road — Queues

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	281	1177	684	140	1049	445	385	219	559
v/c Ratio	0.75	0.87	0.77	0.75	0.80	0.82	0.53	0.81	0.78
Control Delay	63.2	41.6	16.9	75.2	36.9	60.7	39.5	70.7	49.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.2	41.6	16.9	75.2	36.9	60.7	39.5	70.7	49.1
Queue Length 50th (ft)	107	428	151	104	360	168	124	160	198
Queue Length 95th (ft)	#170	#578	335	#208	465	#253	175	#287	263
Internal Link Dist (ft)		1510			1609		962		896
Turn Bay Length (ft)	140			80		150		110	
Base Capacity (vph)	393	1405	905	199	1374	573	850	298	853
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.84	0.76	0.70	0.76	0.78	0.45	0.73	0.66

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Cumulative Plus 1293 Unit Project and School PM
19: S. River Road & Niblick Road — HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	270	1130	657	134	844	163	427	276	93	210	407	130
Future Volume (vph)	270	1130	657	134	844	163	427	276	93	210	407	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		0.97	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.96		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	3467	3574	1599	1787	3479		3467	3439		1787	3432	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	3467	3574	1599	1787	3479		3467	3439		1787	3432	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	281	1177	684	140	879	170	445	288	97	219	424	135
RTOR Reduction (vph)	0	0	284	0	13	0	0	28	0	0	26	0
Lane Group Flow (vph)	281	1177	400	140	1036	0	445	357	0	219	533	0
Confl. Peds. (#/hr)						2						3
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	12.3	42.7	42.7	11.8	42.2		17.6	23.1		17.1	22.6	
Effective Green, g (s)	12.3	42.7	42.7	11.8	42.2		17.6	23.1		17.1	22.6	
Actuated g/C Ratio	0.11	0.38	0.38	0.10	0.37		0.16	0.20		0.15	0.20	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	378	1354	605	187	1302		541	704		271	688	
v/s Ratio Prot	c0.08	c0.33		0.08	0.30		c0.13	0.10		0.12	c0.16	
v/s Ratio Perm			0.25									
v/c Ratio	0.74	0.87	0.66	0.75	0.80		0.82	0.51		0.81	0.77	
Uniform Delay, d1	48.7	32.4	29.0	49.0	31.4		46.0	39.8		46.2	42.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.7	6.2	2.7	15.1	3.5		9.8	0.6		16.0	5.4	
Delay (s)	56.4	38.6	31.7	64.1	34.9		55.8	40.3		62.3	48.1	
Level of Service	E	D	C	E	C		E	D		E	D	
Approach Delay (s)		38.7			38.3			48.6			52.1	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM 2000 Control Delay	42.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	112.7	Sum of lost time (s)	18.0	
Intersection Capacity Utilization	82.0%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Olsen-Chandler SP — Cumulative Plus 1293 Unit Project and School PM
19: S. River Road & Niblick Road — HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	270	1130	657	134	844	163	427	276	93	210	407	130
Future Volume (veh/h)	270	1130	657	134	844	163	427	276	93	210	407	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	281	1177	684	140	879	170	445	288	97	219	424	135
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	349	1391	620	170	1145	221	520	541	178	252	524	165
Arrive On Green	0.10	0.39	0.39	0.09	0.38	0.38	0.15	0.20	0.20	0.14	0.20	0.20
Sat Flow, veh/h	3483	3582	1598	1795	2992	579	3483	2646	873	1795	2676	844
Grp Volume(v), veh/h	281	1177	684	140	526	523	445	193	192	219	282	277
Grp Sat Flow(s),veh/h/ln	1742	1791	1598	1795	1791	1780	1742	1791	1728	1795	1791	1729
Q Serve(g_s), s	8.3	31.3	25.0	8.0	26.8	26.9	13.0	10.0	10.4	12.5	15.7	16.0
Cycle Q Clear(g_c), s	8.3	31.3	25.0	8.0	26.8	26.9	13.0	10.0	10.4	12.5	15.7	16.0
Prop In Lane	1.00		1.00	1.00		0.33	1.00		0.51	1.00		0.49
Lane Grp Cap(c), veh/h	349	1391	620	170	685	681	520	366	353	252	350	338
V/C Ratio(X)	0.80	0.85	1.10	0.82	0.77	0.77	0.86	0.53	0.54	0.87	0.81	0.82
Avail Cap(c_a), veh/h	423	1507	672	215	750	745	616	459	443	321	462	446
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.0	29.1	12.1	46.5	28.2	28.2	43.4	37.1	37.2	44.0	40.2	40.3
Incr Delay (d2), s/veh	9.1	4.4	67.6	18.2	4.4	4.5	10.1	1.2	1.3	18.1	7.6	8.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	13.5	19.3	4.3	11.7	11.6	6.2	4.4	4.4	6.7	7.5	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.1	33.6	79.7	64.7	32.6	32.7	53.5	38.3	38.5	62.1	47.8	49.0
LnGrp LOS	E	C	F	E	C	C	D	D	D	E	D	D
Approach Vol, veh/h		2142			1189			830			778	
Approach Delay, s/veh		51.1			36.4			46.5			52.2	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.4	45.1	20.1	25.0	15.0	44.5	19.2	25.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	12.5	44.0	18.5	27.0	12.7	43.8	18.7	26.8
Max Q Clear Time (g_c+I1), s	10.0	33.3	15.0	18.0	10.3	28.9	14.5	12.4
Green Ext Time (p_c), s	0.1	7.3	0.6	2.1	0.2	5.7	0.2	1.8

Intersection Summary	
HCM 6th Ctrl Delay	47.0
HCM 6th LOS	D

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	943	413	23	680	402	20
v/c Ratio	0.93	0.40	0.21	0.35	0.81	0.04
Control Delay	34.4	2.5	16.3	10.0	35.8	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.4	2.5	16.3	10.0	35.8	11.6
Queue Length 50th (ft)	332	0	4	75	153	3
Queue Length 95th (ft)	#702	42	24	136	247	16
Internal Link Dist (ft)	1629			570	669	
Turn Bay Length (ft)			75			50
Base Capacity (vph)	1009	1024	107	1919	694	629
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.40	0.21	0.35	0.58	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	868	380	21	626	370	18
Future Volume (vph)	868	380	21	626	370	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1827	1518	1735	3471	1732	1553
Flt Permitted	1.00	1.00	0.11	1.00	0.95	1.00
Satd. Flow (perm)	1827	1518	195	3471	1732	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	943	413	23	680	402	20
RTOR Reduction (vph)	0	185	0	0	0	8
Lane Group Flow (vph)	943	228	23	680	402	12
Confl. Peds. (#/hr)		2	2		3	
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%
Turn Type	NA	Perm	Perm	NA	Perm	Prot
Protected Phases	2			6		8
Permitted Phases		2	6		8	
Actuated Green, G (s)	37.4	37.4	37.4	37.4	19.4	19.4
Effective Green, g (s)	37.4	37.4	37.4	37.4	19.4	19.4
Actuated g/C Ratio	0.55	0.55	0.55	0.55	0.29	0.29
Clearance Time (s)	5.4	5.4	5.4	5.4	5.4	5.4
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	1010	839	107	1920	497	445
v/s Ratio Prot	c0.52			0.20		0.01
v/s Ratio Perm		0.15	0.12		c0.23	
v/c Ratio	0.93	0.27	0.21	0.35	0.81	0.03
Uniform Delay, d1	14.0	7.9	7.7	8.4	22.4	17.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.7	0.1	0.4	0.0	8.9	0.0
Delay (s)	28.6	8.0	8.0	8.4	31.3	17.3
Level of Service	C	A	A	A	C	B
Approach Delay (s)	22.4			8.4	30.6	
Approach LOS	C			A	C	

Intersection Summary				
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	67.6	Sum of lost time (s)	10.8	
Intersection Capacity Utilization	75.2%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

Reso A - Exhibit C2 (EIR Technical Appendix)

Olsen-Chandler SP — Cumulative Plus 1293 Unit Project and School PM
20: Commerce Way & Sherwood Road — HCM 6th Signalized Intersection Summary

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	868	380	21	626	370	18
Future Volume (veh/h)	868	380	21	626	370	18
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	943	413	23	680	402	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	4	4	4	4	4	4
Cap, veh/h	1039	879	159	1974	457	406
Arrive On Green	0.56	0.56	0.56	0.56	0.26	0.26
Sat Flow, veh/h	1841	1557	395	3589	1753	1560
Grp Volume(v), veh/h	943	413	23	680	402	20
Grp Sat Flow(s),veh/h/ln	1841	1557	395	1749	1753	1560
Q Serve(g_s), s	28.2	9.7	3.4	6.5	13.6	0.6
Cycle Q Clear(g_c), s	28.2	9.7	31.6	6.5	13.6	0.6
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1039	879	159	1974	457	406
V/C Ratio(X)	0.91	0.47	0.14	0.34	0.88	0.05
Avail Cap(c_a), veh/h	1110	939	174	2109	767	683
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.0	8.0	26.1	7.3	21.9	17.1
Incr Delay (d2), s/veh	10.0	0.1	0.2	0.0	3.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.9	2.4	0.3	1.7	5.3	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	22.0	8.1	26.3	7.3	25.3	17.1
LnGrp LOS	C	A	C	A	C	B
Approach Vol, veh/h	1356			703	422	
Approach Delay, s/veh	17.7			7.9	24.9	
Approach LOS	B			A	C	

Timer - Assigned Phs	2	6	8
Phs Duration (G+Y+Rc), s	40.2	40.2	21.5
Change Period (Y+Rc), s	5.4	5.4	5.4
Max Green Setting (Gmax), s	37.2	37.2	27.0
Max Q Clear Time (g_c+I1), s	30.2	33.6	15.6
Green Ext Time (p_c), s	3.2	1.2	0.5

Intersection Summary	
HCM 6th Ctrl Delay	16.2
HCM 6th LOS	B

Olsen-Chandler SP — Cumulative Plus 1293 Unit Project and School PM
21: Fontana Road & Sherwood Road — HCM Unsignalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	811	65	19	499	10	138	0	16	0	0	10
Future Volume (Veh/h)	10	811	65	19	499	10	138	0	16	0	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	882	71	21	542	11	150	0	17	0	0	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)									4			
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		650										
pX, platoon unblocked				0.48			0.48	0.48	0.48	0.48	0.48	
vC, conflicting volume	553			953			1264	1534	918	1538	1564	276
vC1, stage 1 conf vol							940	940		590	590	
vC2, stage 2 conf vol							324	595		948	975	
vCu, unblocked vol	553			360			1007	1572	286	1578	1634	276
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			96			46	100	95	100	100	98
cM capacity (veh/h)	1013			574			280	250	341	222	225	721

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	964	292	282	167	11
Volume Left	11	21	0	150	0
Volume Right	71	0	11	17	11
cSH	1013	574	1700	311	721
Volume to Capacity	0.01	0.04	0.17	0.54	0.02
Queue Length 95th (ft)	1	3	0	74	1
Control Delay (s)	0.3	1.3	0.0	30.2	10.1
Lane LOS	A	A		D	B
Approach Delay (s)	0.3	0.7		30.2	10.1
Approach LOS				D	B

Intersection Summary					
Average Delay	3.4				
Intersection Capacity Utilization	75.7%	ICU Level of Service		D	
Analysis Period (min)	15				

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	811	65	19	499	10	138	0	16	0	0	10
Future Vol, veh/h	10	811	65	19	499	10	138	0	16	0	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	100	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	882	71	21	542	11	150	0	17	0	0	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	553	0	0	953	0	0	1253	1535	918	1538	1565	277
Stage 1	-	-	-	-	-	-	940	940	-	590	590	-
Stage 2	-	-	-	-	-	-	313	595	-	948	975	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.33	6.53	6.23	7.33	6.53	6.93
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.53	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.53	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.219	-	-	2.219	-	-	3.519	4.019	3.319	3.519	4.019	3.319
Pot Cap-1 Maneuver	1015	-	-	719	-	-	~ 138	116	328	86	111	721
Stage 1	-	-	-	-	-	-	316	341	-	462	494	-
Stage 2	-	-	-	-	-	-	673	492	-	312	329	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1015	-	-	719	-	-	~ 129	109	328	77	104	721
Mov Cap-2 Maneuver	-	-	-	-	-	-	278	274	-	228	256	-
Stage 1	-	-	-	-	-	-	309	333	-	451	473	-
Stage 2	-	-	-	-	-	-	635	471	-	289	321	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.6	30.6	10.1
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	278	328	1015	-	-	719	-	-	721
HCM Lane V/C Ratio	0.54	0.053	0.011	-	-	0.029	-	-	0.015
HCM Control Delay (s)	32.2	16.6	8.6	0	-	10.2	0.2	-	10.1
HCM Lane LOS	D	C	A	A	-	B	A	-	B
HCM 95th %tile Q(veh)	3	0.2	0	-	-	0.1	-	-	0

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized												
Traffic Volume (veh/h)	250	274	234	44	170	54	150	159	34	79	306	178
Future Volume (veh/h)	250	274	234	44	170	54	150	159	34	79	306	178
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	272	298	254	48	185	59	163	173	37	86	333	193
Approach Volume (veh/h)		824			292			373			612	
Crossing Volume (veh/h)		467			608			656			396	
High Capacity (veh/h)		958			856			824			1014	
High v/c (veh/h)		0.86			0.34			0.45			0.60	
Low Capacity (veh/h)		777			686			657			826	
Low v/c (veh/h)		1.06			0.43			0.57			0.74	

Intersection Summary					
Maximum v/c High		0.86			
Maximum v/c Low		1.06			
Intersection Capacity Utilization		112.2%	ICU Level of Service		H

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	28.5
Intersection LOS	D

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	824	292	373	612
Demand Flow Rate, veh/h	840	298	380	625
Vehicles Circulating, veh/h	477	619	669	404
Vehicles Exiting, veh/h	552	430	648	513
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	51.0	10.4	14.1	15.7
Approach LOS	F	B	B	C

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	840	298	380	625
Cap Entry Lane, veh/h	848	734	697	914
Entry HV Adj Factor	0.981	0.981	0.980	0.980
Flow Entry, veh/h	824	292	373	612
Cap Entry, veh/h	832	720	684	895
V/C Ratio	0.990	0.406	0.545	0.684
Control Delay, s/veh	51.0	10.4	14.1	15.7
LOS	F	B	B	C
95th %tile Queue, veh	17	2	3	6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	68	18	54	1	17	22	32	209	3	32	351	65
Future Volume (vph)	68	18	54	1	17	22	32	209	3	32	351	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	74	20	59	1	18	24	35	227	3	35	382	71

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total (vph)	153	43	265	488
Volume Left (vph)	74	1	35	35
Volume Right (vph)	59	24	3	71
Hadj (s)	-0.12	-0.31	0.04	-0.06
Departure Headway (s)	5.7	5.8	5.2	4.8
Degree Utilization, x	0.24	0.07	0.38	0.65
Capacity (veh/h)	551	506	662	729
Control Delay (s)	10.5	9.2	11.3	16.3
Approach Delay (s)	10.5	9.2	11.3	16.3
Approach LOS	B	A	B	C

Intersection Summary				
Delay	13.7			
Level of Service	B			
Intersection Capacity Utilization	49.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	13.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Vol, veh/h	68	18	54	1	17	22	32	209	3	32	351	65
Future Vol, veh/h	68	18	54	1	17	22	32	209	3	32	351	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	74	20	59	1	18	24	35	227	3	35	382	71
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.5	9.2	11.3	16.3
HCM LOS	B	A	B	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	13%	49%	3%	7%
Vol Thru, %	86%	13%	42%	78%
Vol Right, %	1%	39%	55%	15%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	244	140	40	448
LT Vol	32	68	1	32
Through Vol	209	18	17	351
RT Vol	3	54	22	65
Lane Flow Rate	265	152	43	487
Geometry Grp	1	1	1	1
Degree of Util (X)	0.379	0.241	0.069	0.651
Departure Headway (Hd)	5.143	5.693	5.749	4.813
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	700	630	621	755
Service Time	3.173	3.734	3.8	2.813
HCM Lane V/C Ratio	0.379	0.241	0.069	0.645
HCM Control Delay	11.3	10.5	9.2	16.3
HCM Lane LOS	B	B	A	C
HCM 95th-tile Q	1.8	0.9	0.2	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	
Traffic Volume (veh/h)	117	105	34	1	68	22	23	117	1	17	173	110
Future Volume (Veh/h)	117	105	34	1	68	22	23	117	1	17	173	110
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	127	114	37	1	74	24	25	127	1	18	188	120
Pedestrians								6				
Lane Width (ft)								12.0				
Walking Speed (ft/s)								3.5				
Percent Blockage								1				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	98			157			694	492	138	539	499	86
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	98			157			694	492	138	539	499	86
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	92			100			87	71	100	95	56	88
cM capacity (veh/h)	1501			1421			193	435	907	329	432	976

Direction, Lane #	EB 1	WB 1	NB 1	SB 1	SB 2
Volume Total	278	99	153	18	308
Volume Left	127	1	25	18	0
Volume Right	37	24	1	0	120
cSH	1501	1421	362	329	552
Volume to Capacity	0.08	0.00	0.42	0.05	0.56
Queue Length 95th (ft)	7	0	51	4	85
Control Delay (s)	3.9	0.1	22.0	16.6	19.5
Lane LOS	A	A	C	C	C
Approach Delay (s)	3.9	0.1	22.0	19.3	
Approach LOS			C	C	

Intersection Summary				
Average Delay	12.5			
Intersection Capacity Utilization	53.4%	ICU Level of Service		A
Analysis Period (min)	15			

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Int Delay, s/veh	12.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↰	↑	
Traffic Vol, veh/h	117	105	34	1	68	22	23	117	1	17	173	110
Future Vol, veh/h	117	105	34	1	68	22	23	117	1	17	173	110
Conflicting Peds, #/hr	0	0	6	6	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	127	114	37	1	74	24	25	127	1	18	188	120

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	98	0	0	157	0	0	635	493	139	539	499	86
Stage 1	-	-	-	-	-	-	393	393	-	88	88	-
Stage 2	-	-	-	-	-	-	242	100	-	451	411	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.11	6.51	6.21
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.11	5.51	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.509	4.009	3.309
Pot Cap-1 Maneuver	1501	-	-	1429	-	-	393	478	912	455	475	976
Stage 1	-	-	-	-	-	-	634	608	-	922	824	-
Stage 2	-	-	-	-	-	-	764	814	-	590	597	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1501	-	-	1421	-	-	210	431	907	327	428	976
Mov Cap-2 Maneuver	-	-	-	-	-	-	210	431	-	327	428	-
Stage 1	-	-	-	-	-	-	572	548	-	836	823	-
Stage 2	-	-	-	-	-	-	517	813	-	410	538	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.5	0.1	21.5	19.5
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	369	1501	-	-	1421	-	-	327	547
HCM Lane V/C Ratio	0.415	0.085	-	-	0.001	-	-	0.057	0.562
HCM Control Delay (s)	21.5	7.6	0	-	7.5	0	-	16.7	19.7
HCM Lane LOS	C	A	A	-	A	A	-	C	C
HCM 95th %tile Q(veh)	2	0.3	-	-	0	-	-	0.2	3.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Right Turn Channelized						
Traffic Volume (veh/h)	25	137	114	15	174	170
Future Volume (veh/h)	25	137	114	15	174	170
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	149	124	16	189	185
Approach Volume (veh/h)	176		140			374
Crossing Volume (veh/h)	124		189			27
High Capacity (veh/h)	1257		1194			1356
High v/c (veh/h)	0.14		0.12			0.28
Low Capacity (veh/h)	1045		988			1135
Low v/c (veh/h)	0.17		0.14			0.33

Intersection Summary				
Maximum v/c High	0.28			
Maximum v/c Low	0.33			
Intersection Capacity Utilization	45.3%	ICU Level of Service		A

Reso A - Exhibit C2 (EIR Technical Appendix)

Intersection	
Intersection Delay, s/veh	4.8
Intersection LOS	A

Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	176	140	374
Demand Flow Rate, veh/h	180	142	382
Vehicles Circulating, veh/h	126	193	28
Vehicles Exiting, veh/h	209	217	278
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	4.3	4.3	5.3
Approach LOS	A	A	A

Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976
Entry Flow, veh/h	180	142	382
Cap Entry Lane, veh/h	1213	1133	1341
Entry HV Adj Factor	0.978	0.983	0.980
Flow Entry, veh/h	176	140	374
Cap Entry, veh/h	1186	1114	1314
V/C Ratio	0.148	0.125	0.285
Control Delay, s/veh	4.3	4.3	5.3
LOS	A	A	A
95th %tile Queue, veh	1	0	1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	21	96	115	10	5	26
Future Volume (Veh/h)	21	96	115	10	5	26
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	23	104	125	11	5	28
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	136				280	130
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	136				280	130
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				99	97
cM capacity (veh/h)	1436				694	914

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	127	136	33
Volume Left	23	0	5
Volume Right	0	11	28
cSH	1436	1700	872
Volume to Capacity	0.02	0.08	0.04
Queue Length 95th (ft)	1	0	3
Control Delay (s)	1.5	0.0	9.3
Lane LOS	A		A
Approach Delay (s)	1.5	0.0	9.3
Approach LOS			A

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	26.2%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	21	96	115	10	5	26
Future Vol, veh/h	21	96	115	10	5	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	23	104	125	11	5	28

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	136	0	-	0	281	131
Stage 1	-	-	-	-	131	-
Stage 2	-	-	-	-	150	-
Critical Hdwy	4.14	-	-	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	2.236	-	-	-	3.536	3.336
Pot Cap-1 Maneuver	1436	-	-	-	705	913
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	873	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1436	-	-	-	693	913
Mov Cap-2 Maneuver	-	-	-	-	693	-
Stage 1	-	-	-	-	875	-
Stage 2	-	-	-	-	873	-

Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	9.3
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1436	-	-	-	869
HCM Lane V/C Ratio	0.016	-	-	-	0.039
HCM Control Delay (s)	7.5	0	-	-	9.3
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Cumulative Plus 1293-Unit and School Project (Mitigated)

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	435	1158	387	443	1176	326	474	665	255	253	304
v/c Ratio	0.88	0.97	0.50	0.90	0.99	0.45	0.92	0.88	0.74	0.82	0.49
Control Delay	84.6	69.1	5.6	86.7	72.3	8.1	88.4	71.2	81.3	82.3	23.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.6	69.1	5.6	86.7	72.3	8.1	88.4	71.2	81.3	82.3	23.0
Queue Length 50th (ft)	231	~638	0	236	~681	24	256	349	135	255	134
Queue Length 95th (ft)	#329	#839	79	#340	#860	109	#377	435	189	361	225
Internal Link Dist (ft)		1323			2509			853		451	
Turn Bay Length (ft)	225		485	125		390	160		140		
Base Capacity (vph)	527	1190	778	527	1190	717	527	843	405	385	636
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.97	0.50	0.84	0.99	0.45	0.90	0.79	0.63	0.66	0.48

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	400	1065	356	408	1082	300	436	519	93	235	233	280
Future Volume (veh/h)	400	1065	356	408	1082	300	436	519	93	235	233	280
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1737	1737	1737	1737	1737	1737	1737	1737	1737	1737	1737	1737
Adj Flow Rate, veh/h	435	1158	387	443	1176	326	474	564	101	255	253	304
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	11	11	11	11	11	11	11	11	11	11	11	11
Cap, veh/h	476	1162	518	481	1235	551	509	718	128	299	333	500
Arrive On Green	0.15	0.35	0.35	0.15	0.37	0.37	0.16	0.26	0.26	0.09	0.19	0.19
Sat Flow, veh/h	3209	3300	1472	3209	3300	1472	3209	2792	498	3209	1737	1472
Grp Volume(v), veh/h	435	1158	387	443	1176	326	474	333	332	255	253	304
Grp Sat Flow(s),veh/h/ln	1605	1650	1472	1605	1650	1472	1605	1650	1640	1605	1737	1472
Q Serve(g_s), s	21.6	56.7	24.2	22.0	56.1	28.8	23.6	30.3	30.6	12.7	22.3	27.8
Cycle Q Clear(g_c), s	21.6	56.7	24.2	22.0	56.1	28.8	23.6	30.3	30.6	12.7	22.3	27.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.30	1.00		1.00
Lane Grp Cap(c), veh/h	476	1162	518	481	1235	551	509	424	422	299	333	500
V/C Ratio(X)	0.91	1.00	0.75	0.92	0.95	0.59	0.93	0.78	0.79	0.85	0.76	0.61
Avail Cap(c_a), veh/h	516	1162	518	516	1235	551	516	424	422	397	376	537
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	67.9	52.3	19.3	67.9	49.3	40.7	67.2	55.9	56.0	72.3	61.9	44.4
Incr Delay (d2), s/veh	19.9	25.4	5.9	20.6	15.6	1.7	23.6	9.3	9.6	12.9	7.8	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.9	26.5	9.0	10.2	24.7	10.6	11.3	13.6	13.7	5.7	10.5	10.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	87.8	77.7	25.1	88.4	64.9	42.4	90.8	65.2	65.6	85.2	69.7	46.2
LnGrp LOS	F	E	C	F	E	D	F	E	E	F	E	D
Approach Vol, veh/h		1980			1945			1139			812	
Approach Delay, s/veh		69.7			66.5			76.0			65.8	
Approach LOS		E			E			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	31.5	64.3	29.7	36.3	28.0	67.8	19.1	46.9
Change Period (Y+Rc), s	7.3	* 7.3	4.0	5.3	4.0	7.3	4.0	5.3
Max Green Setting (Gmax), s	24.0	* 57	26.0	35.0	26.0	57.0	20.0	41.0
Max Q Clear Time (g_c+I1), s	24.0	58.7	25.6	29.8	23.6	58.1	14.7	32.6
Green Ext Time (p_c), s	0.2	0.0	0.1	1.2	0.4	0.0	0.4	2.5

Intersection Summary	
HCM 6th Ctrl Delay	69.3
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized			MOYes									
Traffic Volume (veh/h)	204	222	150	322	200	156	63	675	301	100	559	250
Future Volume (veh/h)	204	222	150	322	200	156	63	675	301	100	559	250
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	222	241	163	350	217	170	68	734	327	109	608	272
Approach Volume (veh/h)		463			737			1129			989	
Crossing Volume (veh/h)		1067			1024			572			635	
High Capacity (veh/h)		589			610			881			838	
High v/c (veh/h)		0.79			1.21			1.28			1.18	
Low Capacity (veh/h)		454			472			708			670	
Low v/c (veh/h)		1.02			1.56			1.59			1.48	

Intersection Summary					
Maximum v/c High	1.28				
Maximum v/c Low	1.59				
Intersection Capacity Utilization	110.9%	ICU Level of Service		H	

Intersection	
Intersection Delay, s/veh	29.6
Intersection LOS	D

Approach	EB	WB	NB	SB
Entry Lanes	2	2	2	2
Conflicting Circle Lanes	2	2	2	2
Adj Approach Flow, veh/h	626	737	1129	989
Demand Flow Rate, veh/h	645	759	1163	1018
Vehicles Circulating, veh/h	1099	1055	589	655
Vehicles Exiting, veh/h	574	697	987	1160
Ped Vol Crossing Leg, #/h	0	0	3	0
Ped Cap Adj	1.000	1.000	0.998	1.000
Approach Delay, s/veh	14.5	24.4	52.8	16.7
Approach LOS	B	C	F	C

Lane	Left	Right	Bypass	Left	Right	Left	Right	Left	Right
Designated Moves	LT	TR	R	L	TR	LT	R	LT	TR
Assumed Moves	LT	TR	R	L	TR	LT	R	LT	TR
RT Channelized			Yield						
Lane Util	0.470	0.530		0.474	0.526	0.710	0.290	0.470	0.530
Follow-Up Headway, s	2.667	2.535		2.667	2.535	2.667	2.535	2.667	2.535
Critical Headway, s	4.645	4.328	168	4.645	4.328	4.645	4.328	4.645	4.328
Entry Flow, veh/h	224	253	504	360	399	826	337	478	540
Cap Entry Lane, veh/h	491	558	0.971	511	579	785	861	739	814
Entry HV Adj Factor	0.971	0.969	163	0.972	0.971	0.971	0.970	0.972	0.970
Flow Entry, veh/h	218	245	490	350	387	802	327	465	524
Cap Entry, veh/h	477	541	0.333	497	562	761	834	718	790
V/C Ratio	0.456	0.453	12.6	0.704	0.689	1.054	0.392	0.647	0.664
Control Delay, s/veh	16.0	14.3	B	26.2	22.8	70.7	9.0	16.9	16.4
LOS	C	B	1	D	C	F	A	C	C
95th %tile Queue, veh	2	2		5	5	20	2	5	5

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	11	432	388	504	768	11	22	166	349	351	43
v/c Ratio	0.12	0.44	0.85	0.48	0.52	0.12	0.23	0.31	0.78	0.77	0.08
Control Delay	48.6	33.1	34.7	6.5	2.0	48.5	51.5	6.2	47.3	46.5	0.3
Queue Delay	0.0	0.0	1.5	0.4	0.7	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.6	33.2	36.2	6.9	2.6	48.5	51.5	6.2	47.3	46.5	0.3
Queue Length 50th (ft)	7	134	173	54	14	7	14	13	201	202	0
Queue Length 95th (ft)	25	175	#366	113	0	25	39	34	#364	#362	0
Internal Link Dist (ft)		346		307			744			674	
Turn Bay Length (ft)	65		125			140		165	150		185
Base Capacity (vph)	91	1029	492	1042	1479	92	97	566	466	473	543
Starvation Cap Reductn	0	0	27	185	361	0	0	0	0	0	0
Spillback Cap Reductn	0	32	0	0	0	0	0	1	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.43	0.83	0.59	0.69	0.12	0.23	0.29	0.75	0.74	0.08

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	365	32	357	464	707	10	20	153	553	91	40
Future Volume (veh/h)	10	365	32	357	464	707	10	20	153	553	91	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	397	35	388	504	768	11	22	166	672	0	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	23	529	46	688	998	1190	88	92	690	774	0	340
Arrive On Green	0.01	0.16	0.16	0.13	0.18	0.18	0.05	0.05	0.05	0.22	0.00	0.22
Sat Flow, veh/h	1767	3271	287	1767	1856	1572	1767	1856	1563	3534	0	1555
Grp Volume(v), veh/h	11	213	219	388	504	768	11	22	166	672	0	43
Grp Sat Flow(s),veh/h/ln	1767	1763	1795	1767	1856	1572	1767	1856	1563	1767	0	1555
Q Serve(g_s), s	0.6	11.5	11.7	20.6	24.5	25.2	0.6	1.1	0.0	18.3	0.0	2.2
Cycle Q Clear(g_c), s	0.6	11.5	11.7	20.6	24.5	25.2	0.6	1.1	0.0	18.3	0.0	2.2
Prop In Lane	1.00		0.16	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	23	285	290	688	998	1190	88	92	690	774	0	340
V/C Ratio(X)	0.47	0.75	0.75	0.56	0.50	0.65	0.12	0.24	0.24	0.87	0.00	0.13
Avail Cap(c_a), veh/h	88	405	413	688	998	1190	88	93	691	937	0	412
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.65	0.65	0.65	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	49.0	40.0	40.0	35.6	29.1	10.7	45.4	45.7	17.6	37.7	0.0	31.4
Incr Delay (d2), s/veh	14.2	16.3	16.6	0.7	0.3	0.8	0.6	1.3	0.2	7.6	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	6.3	6.5	9.9	12.2	20.3	0.3	0.6	2.3	8.5	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.1	56.3	56.6	36.3	29.4	11.5	46.1	47.0	17.7	45.2	0.0	31.5
LnGrp LOS	E	E	E	D	C	B	D	D	B	D	A	C
Approach Vol, veh/h		443			1660			199			715	
Approach Delay, s/veh		56.6			22.7			22.5			44.4	
Approach LOS		E			C			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.5	20.7		26.4	5.8	58.3		9.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	7.5	23.0		26.5	5.0	45.5		5.0				
Max Q Clear Time (g_c+I1), s	2.6	13.7		20.3	2.6	27.2		3.1				
Green Ext Time (p_c), s	0.6	1.8		1.6	0.0	6.6		0.1				

Intersection Summary	
HCM 6th Ctrl Delay	32.8
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	76	1088	57	1416	433	235	22	272	11	11
v/c Ratio	0.54	0.54	0.27	0.68	0.42	0.80	0.06	0.53	0.04	0.02
Control Delay	49.8	11.7	36.7	13.6	2.3	56.8	29.3	10.4	28.9	0.1
Queue Delay	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.8	11.8	36.7	13.6	2.3	56.8	29.3	10.4	28.9	0.1
Queue Length 50th (ft)	49	243	33	338	32	140	11	19	6	0
Queue Length 95th (ft)	m72	295	m43	m489	m32	220	30	87	20	0
Internal Link Dist (ft)		307		269			836			575
Turn Bay Length (ft)	120		220		145	130		110	95	
Base Capacity (vph)	152	2124	227	2072	1026	352	470	574	349	539
Starvation Cap Reductn	0	180	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	50	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.56	0.25	0.70	0.42	0.67	0.05	0.47	0.03	0.02

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	950	51	52	1303	398	216	20	250	10	0	10
Future Volume (veh/h)	70	950	51	52	1303	398	216	20	250	10	0	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	76	1033	55	57	1416	0	235	22	272	11	0	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	97	1236	66	534	2151		342	371	314	277	0	314
Arrive On Green	0.07	0.48	0.48	0.30	0.61	0.00	0.20	0.20	0.20	0.20	0.00	0.20
Sat Flow, veh/h	1767	3403	181	1767	3526	1572	1392	1856	1572	1077	0	1572
Grp Volume(v), veh/h	76	535	553	57	1416	0	235	22	272	11	0	11
Grp Sat Flow(s),veh/h/ln	1767	1763	1821	1767	1763	1572	1392	1856	1572	1077	0	1572
Q Serve(g_s), s	4.2	26.3	26.3	2.3	26.2	0.0	16.4	1.0	16.7	0.8	0.0	0.6
Cycle Q Clear(g_c), s	4.2	26.3	26.3	2.3	26.2	0.0	16.9	1.0	16.7	1.8	0.0	0.6
Prop In Lane	1.00		0.10	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	97	640	661	534	2151		342	371	314	277	0	314
V/C Ratio(X)	0.78	0.84	0.84	0.11	0.66		0.69	0.06	0.87	0.04	0.00	0.04
Avail Cap(c_a), veh/h	150	918	949	534	2151		419	473	401	336	0	401
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.82	0.82	0.82	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	45.8	23.3	23.3	25.2	12.7	0.0	39.1	32.4	38.7	33.1	0.0	32.2
Incr Delay (d2), s/veh	11.1	10.3	10.0	0.1	1.6	0.0	3.5	0.1	14.7	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	11.3	11.6	1.0	9.9	0.0	5.8	0.4	7.6	0.2	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.8	33.6	33.3	25.3	14.3	0.0	42.5	32.5	53.4	33.2	0.0	32.3
LnGrp LOS	E	C	C	C	B		D	C	D	C	A	C
Approach Vol, veh/h		1164			1473	A		529			22	
Approach Delay, s/veh		35.0			14.7			47.7			32.7	
Approach LOS		C			B			D			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	34.7	40.8		24.5	10.0	65.5		24.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	30.2	52.1		25.5	8.5	52.5		25.5				
Max Q Clear Time (g_c+I1), s	4.3	28.3		3.8	6.2	28.2		18.9				
Green Ext Time (p_c), s	0.0	8.0		0.0	0.0	12.3		1.1				

Intersection Summary	
HCM 6th Ctrl Delay	27.7
HCM 6th LOS	C

Notes

Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	342	972	65	1205	417	203	54	174	209	489
v/c Ratio	1.25	0.74	0.56	1.01	0.79	0.22	0.10	0.73	0.46	0.92
Control Delay	168.1	17.9	64.0	62.1	52.8	28.9	0.4	59.6	35.0	46.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	168.1	17.9	64.0	62.1	52.8	28.9	0.4	59.6	35.0	46.8
Queue Length 50th (ft)	~135	84	41	~461	132	52	0	106	110	190
Queue Length 95th (ft)	#225	#197	#98	#595	#189	82	0	#188	178	#376
Internal Link Dist (ft)		353		673		608			523	
Turn Bay Length (ft)	295		235		140		130	225		
Base Capacity (vph)	274	1316	120	1195	549	990	561	265	503	566
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.25	0.74	0.54	1.01	0.76	0.21	0.10	0.66	0.42	0.86

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	315	591	304	60	918	190	384	187	50	160	192	450
Future Volume (veh/h)	315	591	304	60	918	190	384	187	50	160	192	450
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	342	642	0	65	998	207	417	203	54	174	209	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	801	1759		84	906	188	489	576	257	207	256	
Arrive On Green	0.23	0.49	0.00	0.05	0.31	0.31	0.14	0.16	0.16	0.12	0.14	0.00
Sat Flow, veh/h	3456	3647	0	1781	2924	605	3456	3554	1585	1781	1870	1585
Grp Volume(v), veh/h	342	642	0	65	606	599	417	203	54	174	209	0
Grp Sat Flow(s),veh/h/ln	1728	1777	0	1781	1777	1752	1728	1777	1585	1781	1870	1585
Q Serve(g_s), s	8.4	11.1	0.0	3.6	31.0	31.0	11.8	5.1	3.0	9.6	10.9	0.0
Cycle Q Clear(g_c), s	8.4	11.1	0.0	3.6	31.0	31.0	11.8	5.1	3.0	9.6	10.9	0.0
Prop In Lane	1.00		0.00	1.00		0.35	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	801	1759		84	551	543	489	576	257	207	256	
V/C Ratio(X)	0.43	0.37		0.78	1.10	1.10	0.85	0.35	0.21	0.84	0.82	
Avail Cap(c_a), veh/h	801	1759		116	551	543	553	995	444	267	505	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.7	15.6	0.0	47.1	34.5	34.5	41.9	37.2	36.3	43.3	42.0	0.0
Incr Delay (d2), s/veh	0.4	0.6	0.0	19.6	68.4	70.0	11.2	0.4	0.4	16.9	6.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	4.5	0.0	2.0	23.3	23.2	5.6	2.2	1.1	5.0	5.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.1	16.2	0.0	66.8	102.9	104.5	53.1	37.6	36.7	60.2	48.3	0.0
LnGrp LOS	C	B		E	F	F	D	D	D	E	D	
Approach Vol, veh/h		984	A		1270			674			383	A
Approach Delay, s/veh		22.0			101.8			47.1			53.7	
Approach LOS		C			F			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.2	54.0	18.6	18.2	27.7	35.5	16.1	20.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.5	32.5	16.0	27.0	8.0	31.0	15.0	28.0
Max Q Clear Time (g_c+I1), s	5.6	13.1	13.8	12.9	10.4	33.0	11.6	7.1
Green Ext Time (p_c), s	0.0	4.3	0.4	0.8	0.0	0.0	0.1	1.3

Intersection Summary

HCM 6th Ctrl Delay	61.4
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.
Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	112	880	63	574
v/c Ratio	0.49	0.36	0.12	0.38
Control Delay	24.5	7.3	3.1	4.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	24.5	7.3	3.1	4.0
Queue Length 50th (ft)	25	95	5	69
Queue Length 95th (ft)	68	160	16	145
Internal Link Dist (ft)	2642	1057		1090
Turn Bay Length (ft)			60	
Base Capacity (vph)	711	2455	507	1508
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.16	0.36	0.12	0.38

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT	
Lane Configurations							
Traffic Volume (veh/h)	48	55	752	58	58	528	
Future Volume (veh/h)	48	55	752	58	58	528	
Initial Q (Qb), veh	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	
Work Zone On Approach	No		No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1870	1870	1870	1870	
Adj Flow Rate, veh/h	52	60	817	63	63	574	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	0	0	2	2	2	2	
Cap, veh/h	67	77	2288	176	541	1474	
Arrive On Green	0.09	0.09	0.68	0.68	0.05	0.79	
Sat Flow, veh/h	769	888	3437	258	1781	1870	
Grp Volume(v), veh/h	113	0	434	446	63	574	
Grp Sat Flow(s),veh/h/ln	1672	0	1777	1824	1781	1870	
Q Serve(g_s), s	5.3	0.0	8.2	8.2	0.7	7.5	
Cycle Q Clear(g_c), s	5.3	0.0	8.2	8.2	0.7	7.5	
Prop In Lane	0.46	0.53		0.14	1.00		
Lane Grp Cap(c), veh/h	146	0	1216	1249	541	1474	
V/C Ratio(X)	0.78	0.00	0.36	0.36	0.12	0.39	
Avail Cap(c_a), veh/h	669	0	1216	1249	580	1474	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	0.00	0.71	0.71	1.00	1.00	
Uniform Delay (d), s/veh	35.7	0.0	5.3	5.3	3.2	2.6	
Incr Delay (d2), s/veh	8.5	0.0	0.6	0.6	0.1	0.8	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	2.4	0.0	2.4	2.5	0.2	1.6	
Unsig. Movement Delay, s/veh							
LnGrp Delay(d),s/veh	44.3	0.0	5.9	5.8	3.3	3.4	
LnGrp LOS	D	A	A	A	A	A	
Approach Vol, veh/h	113		880			637	
Approach Delay, s/veh	44.3		5.8			3.4	
Approach LOS	D		A			A	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	8.3	59.8				68.0	12.0
Change Period (Y+Rc), s	4.5	5.0				5.0	5.0
Max Green Setting (Gmax), s	5.5	28.0				38.0	32.0
Max Q Clear Time (g_c+I1), s	2.7	10.2				9.5	7.3
Green Ext Time (p_c), s	0.0	5.2				3.9	0.3

Intersection Summary			
HCM 6th Ctrl Delay		7.5	
HCM 6th LOS		A	

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	210	146	38	570	38	442	110
v/c Ratio	0.57	0.29	0.20	0.66	0.20	0.51	0.14
Control Delay	21.2	7.5	27.7	18.4	27.7	14.4	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.2	7.5	27.7	18.4	27.7	14.4	4.4
Queue Length 50th (ft)	41	6	10	95	10	67	1
Queue Length 95th (ft)	113	44	40	#362	40	226	29
Internal Link Dist (ft)	560	1033		1337		1057	
Turn Bay Length (ft)			30		70		60
Base Capacity (vph)	781	972	189	933	189	936	822
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.15	0.20	0.61	0.20	0.47	0.13

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	141	10	42	10	20	104	35	514	10	35	407	101
Future Volume (veh/h)	141	10	42	10	20	104	35	514	10	35	407	101
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	153	11	46	11	22	113	38	559	11	38	442	110
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	365	29	66	109	63	253	77	713	14	77	730	614
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.04	0.39	0.39	0.04	0.39	0.39
Sat Flow, veh/h	1039	146	332	56	313	1263	1781	1828	36	1781	1870	1573
Grp Volume(v), veh/h	210	0	0	146	0	0	38	0	570	38	442	110
Grp Sat Flow(s),veh/h/ln	1517	0	0	1632	0	0	1781	0	1864	1781	1870	1573
Q Serve(g_s), s	1.5	0.0	0.0	0.0	0.0	0.0	0.8	0.0	10.6	0.8	7.5	1.8
Cycle Q Clear(g_c), s	4.6	0.0	0.0	3.1	0.0	0.0	0.8	0.0	10.6	0.8	7.5	1.8
Prop In Lane	0.73		0.22	0.08		0.77	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	461	0	0	424	0	0	77	0	727	77	730	614
V/C Ratio(X)	0.46	0.00	0.00	0.34	0.00	0.00	0.49	0.00	0.78	0.49	0.61	0.18
Avail Cap(c_a), veh/h	1104	0	0	1195	0	0	225	0	1107	225	1111	934
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.4	0.0	0.0	13.9	0.0	0.0	18.5	0.0	10.6	18.5	9.6	7.9
Incr Delay (d2), s/veh	0.7	0.0	0.0	0.5	0.0	0.0	4.8	0.0	2.1	4.8	0.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	0.0	1.0	0.0	0.0	0.4	0.0	3.4	0.4	2.3	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.1	0.0	0.0	14.4	0.0	0.0	23.4	0.0	12.7	23.4	10.4	8.0
LnGrp LOS	B	A	A	B	A	A	C	A	B	C	B	A
Approach Vol, veh/h		210			146			608			590	
Approach Delay, s/veh		15.1			14.4			13.4			10.8	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.7	20.4		12.4	6.7	20.4		12.4				
Change Period (Y+Rc), s	5.0	5.0		4.5	5.0	5.0		4.5				
Max Green Setting (Gmax), s	5.0	23.5		27.0	5.0	23.5		27.0				
Max Q Clear Time (g_c+I1), s	2.8	12.6		6.6	2.8	9.5		5.1				
Green Ext Time (p_c), s	0.0	2.7		1.2	0.0	2.6		0.8				

Intersection Summary

HCM 6th Ctrl Delay	12.7
HCM 6th LOS	B

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	46	322	318	16	272	165	284	227
v/c Ratio	0.30	0.68	0.51	0.12	0.65	0.34	0.69	0.13
Control Delay	39.0	35.9	6.7	46.1	38.5	6.7	39.7	13.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.0	35.9	6.7	46.1	38.5	6.7	39.7	13.8
Queue Length 50th (ft)	17	150	0	8	131	0	137	30
Queue Length 95th (ft)	58	278	65	32	241	45	256	68
Internal Link Dist (ft)	284	314			712			1337
Turn Bay Length (ft)							120	
Base Capacity (vph)	151	715	780	129	654	669	621	2210
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.45	0.41	0.12	0.42	0.25	0.46	0.10

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	10	12	286	10	293	15	250	152	261	199	10
Future Volume (veh/h)	20	10	12	286	10	293	15	250	152	261	199	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.86	1.00		0.95	1.00		0.98	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	22	11	13	311	11	318	16	272	165	284	216	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	34	17	20	500	18	437	34	381	317	339	1290	65
Arrive On Green	0.04	0.04	0.04	0.29	0.29	0.29	0.02	0.20	0.20	0.19	0.38	0.38
Sat Flow, veh/h	794	397	469	1723	61	1506	1781	1870	1558	1781	3440	174
Grp Volume(v), veh/h	46	0	0	322	0	318	16	272	165	284	111	116
Grp Sat Flow(s),veh/h/ln	1659	0	0	1784	0	1506	1781	1870	1558	1781	1777	1837
Q Serve(g_s), s	1.9	0.0	0.0	10.9	0.0	13.2	0.6	9.4	6.6	10.7	2.9	2.9
Cycle Q Clear(g_c), s	1.9	0.0	0.0	10.9	0.0	13.2	0.6	9.4	6.6	10.7	2.9	2.9
Prop In Lane	0.48		0.28	0.97		1.00	1.00		1.00	1.00		0.09
Lane Grp Cap(c), veh/h	70	0	0	518	0	437	34	381	317	339	667	689
V/C Ratio(X)	0.65	0.00	0.00	0.62	0.00	0.73	0.47	0.71	0.52	0.84	0.17	0.17
Avail Cap(c_a), veh/h	131	0	0	705	0	595	128	645	537	614	1098	1135
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.8	0.0	0.0	21.4	0.0	22.2	33.8	25.8	24.7	27.1	14.5	14.5
Incr Delay (d2), s/veh	9.9	0.0	0.0	1.2	0.0	2.9	9.7	2.5	1.3	5.5	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	4.5	0.0	4.8	0.3	4.0	2.3	4.8	1.1	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.7	0.0	0.0	22.6	0.0	25.1	43.5	28.3	26.0	32.6	14.6	14.6
LnGrp LOS	D	A	A	C	A	C	D	C	C	C	B	B
Approach Vol, veh/h		46			640			453			511	
Approach Delay, s/veh		42.7			23.8			28.0			24.6	
Approach LOS		D			C			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	18.3	19.2		7.4	6.3	31.1		24.7				
Change Period (Y+Rc), s	5.0	5.0		4.5	5.0	5.0		4.5				
Max Green Setting (Gmax), s	24.0	24.0		5.5	5.0	43.0		27.5				
Max Q Clear Time (g_c+I1), s	12.7	11.4		3.9	2.6	4.9		15.2				
Green Ext Time (p_c), s	0.6	1.6		0.0	0.0	1.3		2.7				

Intersection Summary			
HCM 6th Ctrl Delay		25.7	
HCM 6th LOS		C	

Intersection has too many lanes per leg.
HCM All-Way analysis is limited to two lanes per leg.
Channelized right turn lanes are not counted.

Intersection	
Intersection Delay, s/veh	20
Intersection LOS	C

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	197	135	221	208	122	401
Future Vol, veh/h	197	135	221	208	122	401
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	214	147	240	226	133	436
Number of Lanes	1	1	1	2	1	1

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	3
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	2	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	3	0	2
HCM Control Delay	16.3	15.4	26.1
HCM LOS	C	C	D

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	0%
Vol Thru, %	0%	100%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	221	104	104	197	135	122	401
LT Vol	221	0	0	197	0	0	0
Through Vol	0	104	104	0	0	122	0
RT Vol	0	0	0	0	135	0	401
Lane Flow Rate	240	113	113	214	147	133	436
Geometry Grp	8	8	8	8	8	8	8
Degree of Util (X)	0.532	0.234	0.178	0.492	0.287	0.268	0.795
Departure Headway (Hd)	7.978	7.466	5.675	8.271	7.052	7.282	6.566
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	452	480	631	437	509	493	554
Service Time	5.723	5.211	3.419	6.018	4.799	5.024	4.307
HCM Lane V/C Ratio	0.531	0.235	0.179	0.49	0.289	0.27	0.787
HCM Control Delay	19.5	12.5	9.7	18.8	12.6	12.7	30.2
HCM Lane LOS	C	B	A	C	B	B	D
HCM 95th-tile Q	3.1	0.9	0.6	2.6	1.2	1.1	7.6

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	0	0	3	192	10	0	0	0	0	386	20
Future Volume (vph)	0	0	0	3	192	10	0	0	0	0	386	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	3	209	11	0	0	0	0	420	22

Direction, Lane #	WB 1	WB 2	SB 1
Volume Total (vph)	212	11	442
Volume Left (vph)	3	0	0
Volume Right (vph)	0	11	22
Hadj (s)	0.04	-0.57	0.00
Departure Headway (s)	5.0	3.2	4.5
Degree Utilization, x	0.29	0.01	0.55
Capacity (veh/h)	671	1121	785
Control Delay (s)	10.1	6.2	12.8
Approach Delay (s)	9.9		12.8
Approach LOS	A		B

Intersection Summary				
Delay	11.8			
Level of Service	B			
Intersection Capacity Utilization	38.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Intersection Delay, s/veh	12.4
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	3	192	10	0	0	0	0	386	20
Future Vol, veh/h	0	0	0	3	192	10	0	0	0	0	386	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	3	209	11	0	0	0	0	420	22
Number of Lanes	0	0	0	0	1	1	0	0	0	0	1	0

Approach	WB	SB
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left		WB
Conflicting Lanes Left	0	2
Conflicting Approach Right	SB	
Conflicting Lanes Right	1	0
HCM Control Delay	10.9	13.1
HCM LOS	B	B

Lane	WBLn1	WBLn2	SBLn1
Vol Left, %	2%	0%	0%
Vol Thru, %	98%	0%	95%
Vol Right, %	0%	100%	5%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	195	10	406
LT Vol	3	0	0
Through Vol	192	0	386
RT Vol	0	10	20
Lane Flow Rate	212	11	441
Geometry Grp	7	7	2
Degree of Util (X)	0.329	0.015	0.555
Departure Headway (Hd)	5.58	4.865	4.531
Convergence, Y/N	Yes	Yes	Yes
Cap	642	731	794
Service Time	3.339	2.624	2.562
HCM Lane V/C Ratio	0.33	0.015	0.555
HCM Control Delay	11.1	7.7	13.1
HCM Lane LOS	B	A	B
HCM 95th-tile Q	1.4	0	3.5

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	25	372	1222	439	586	126	315	615	429	329
v/c Ratio	0.11	0.79	0.82	0.55	0.53	0.67	0.70	0.38	0.76	0.50
Control Delay	58.1	64.1	41.2	33.4	5.2	78.8	67.6	7.6	66.1	48.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.1	64.1	41.2	33.4	5.2	78.8	67.6	7.6	66.1	48.0
Queue Length 50th (ft)	21	155	523	308	56	117	153	71	201	129
Queue Length 95th (ft)	53	221	651	438	141	189	207	94	270	185
Internal Link Dist (ft)		521		1372			611			680
Turn Bay Length (ft)	115		515		115	165		290	305	
Base Capacity (vph)	252	524	1580	857	1140	244	577	1691	639	740
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.71	0.77	0.51	0.51	0.52	0.55	0.36	0.67	0.44

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	223	120	1124	404	539	116	290	566	395	210	93
Future Volume (veh/h)	23	223	120	1124	404	539	116	290	566	395	210	93
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	25	242	130	1222	439	586	126	315	615	429	228	101
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	231	293	152	1437	778	879	152	540	1584	499	490	210
Arrive On Green	0.13	0.13	0.13	0.42	0.42	0.42	0.09	0.15	0.15	0.14	0.20	0.20
Sat Flow, veh/h	1781	2262	1174	3456	1870	1564	1781	3554	2790	3456	2420	1037
Grp Volume(v), veh/h	25	188	184	1222	439	586	126	315	615	429	165	164
Grp Sat Flow(s),veh/h/ln	1781	1777	1659	1728	1870	1564	1781	1777	1395	1728	1777	1681
Q Serve(g_s), s	1.6	13.4	14.0	41.4	23.2	34.1	9.0	10.7	15.8	15.7	10.6	11.2
Cycle Q Clear(g_c), s	1.6	13.4	14.0	41.4	23.2	34.1	9.0	10.7	15.8	15.7	10.6	11.2
Prop In Lane	1.00		0.71	1.00		1.00	1.00		1.00	1.00		0.62
Lane Grp Cap(c), veh/h	231	230	215	1437	778	879	152	540	1584	499	360	340
V/C Ratio(X)	0.11	0.82	0.85	0.85	0.56	0.67	0.83	0.58	0.39	0.86	0.46	0.48
Avail Cap(c_a), veh/h	267	266	248	1669	903	984	258	609	1638	675	393	372
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.8	54.9	55.2	34.2	28.9	20.0	58.3	51.1	15.5	54.2	45.5	45.7
Incr Delay (d2), s/veh	0.2	15.9	21.8	3.9	0.6	1.5	10.8	1.1	0.2	8.4	0.9	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	7.1	7.2	17.5	10.3	12.1	4.4	4.7	10.0	7.4	4.8	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.0	70.8	77.0	38.1	29.5	21.5	69.2	52.3	15.7	62.6	46.4	46.7
LnGrp LOS	D	E	E	D	C	C	E	D	B	E	D	D
Approach Vol, veh/h		397			2247			1056			758	
Approach Delay, s/veh		72.3			32.1			33.0			55.6	
Approach LOS		E			C			C			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	23.4	25.5		21.4	16.9	32.0		59.3				
Change Period (Y+Rc), s	* 4.7	5.8		4.6	5.8	* 5.8		5.4				
Max Green Setting (Gmax), s	* 25	22.2		19.4	18.8	* 29		62.6				
Max Q Clear Time (g_c+I1), s	17.7	17.8		16.0	11.0	13.2		43.4				
Green Ext Time (p_c), s	1.0	1.8		0.8	0.2	1.7		10.5				

Intersection Summary		
HCM 6th Ctrl Delay	39.9	
HCM 6th LOS	D	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	120	830	299	136	1223	304	683	394	310	509
v/c Ratio	0.71	0.74	0.42	0.70	0.92	0.41	0.92	0.60	0.84	0.75
Control Delay	72.1	36.9	5.5	64.9	43.1	6.8	58.9	40.6	59.1	38.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.1	36.9	5.5	64.9	43.1	6.8	58.9	40.6	59.1	38.9
Queue Length 50th (ft)	40	252	0	85	388	18	223	122	187	134
Queue Length 95th (ft)	#92	362	63	#182	#598	86	#362	172	#342	192
Internal Link Dist (ft)		1510			1609			962		896
Turn Bay Length (ft)	140			80			150		110	
Base Capacity (vph)	168	1119	705	207	1331	742	742	859	416	952
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.74	0.42	0.66	0.92	0.41	0.92	0.46	0.75	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	764	275	125	1125	280	628	308	54	285	269	200
Future Volume (veh/h)	110	764	275	125	1125	280	628	308	54	285	269	200
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	120	830	299	136	1223	304	683	335	59	310	292	217
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	170	1155	515	166	1312	580	738	639	111	345	377	272
Arrive On Green	0.05	0.33	0.33	0.09	0.37	0.37	0.21	0.21	0.21	0.19	0.19	0.19
Sat Flow, veh/h	3456	3554	1585	1781	3554	1572	3456	3022	526	1781	1969	1422
Grp Volume(v), veh/h	120	830	299	136	1223	304	683	195	199	310	263	246
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1781	1777	1572	1728	1777	1771	1781	1777	1614
Q Serve(g_s), s	3.5	21.0	8.8	7.6	33.7	15.4	19.7	9.9	10.1	17.3	14.3	14.8
Cycle Q Clear(g_c), s	3.5	21.0	8.8	7.6	33.7	15.4	19.7	9.9	10.1	17.3	14.3	14.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.30	1.00		0.88
Lane Grp Cap(c), veh/h	170	1155	515	166	1312	580	738	376	375	345	340	309
V/C Ratio(X)	0.71	0.72	0.58	0.82	0.93	0.52	0.93	0.52	0.53	0.90	0.77	0.80
Avail Cap(c_a), veh/h	170	1155	515	208	1333	590	739	434	433	418	471	428
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.7	30.3	8.7	45.3	30.9	25.1	39.3	35.6	35.7	40.1	39.1	39.3
Incr Delay (d2), s/veh	12.7	2.2	1.6	18.3	11.8	0.8	17.5	1.1	1.2	19.5	5.2	7.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	8.9	0.2	4.1	15.7	5.6	9.9	4.3	4.4	9.2	6.5	6.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.4	32.5	10.4	63.7	42.7	25.9	56.8	36.7	36.8	59.6	44.3	46.4
LnGrp LOS	E	C	B	E	D	C	E	D	D	E	D	D
Approach Vol, veh/h		1249			1663			1077			819	
Approach Delay, s/veh		29.9			41.4			49.4			50.7	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	37.6	26.3	24.0	9.5	42.1	24.2	26.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.5	31.3	21.8	27.0	5.0	38.2	23.9	24.9
Max Q Clear Time (g_c+I1), s	9.5	23.0	21.7	16.8	5.5	35.7	19.3	12.1
Green Ext Time (p_c), s	0.1	4.0	0.0	2.1	0.0	1.9	0.4	1.7

Intersection Summary	
HCM 6th Ctrl Delay	41.8
HCM 6th LOS	D

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	392	1075	375	406	1134	216	380	507	272	357	320
v/c Ratio	0.91	0.93	0.50	0.80	0.92	0.32	0.80	0.61	0.74	0.92	0.48
Control Delay	91.4	62.9	6.5	76.6	58.8	5.4	77.3	52.7	79.5	87.8	24.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.4	62.9	6.5	76.6	58.8	5.4	77.3	52.7	79.5	87.8	24.3
Queue Length 50th (ft)	214	563	8	216	583	2	201	239	144	372	151
Queue Length 95th (ft)	#335	#716	91	283	697	58	264	311	200	#587	258
Internal Link Dist (ft)		1323			2509			853		451	
Turn Bay Length (ft)	225		485	125		390	160		140		
Base Capacity (vph)	432	1269	786	561	1403	743	561	895	432	410	663
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.91	0.85	0.48	0.72	0.81	0.29	0.68	0.57	0.63	0.87	0.48

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	380	1043	364	394	1100	210	369	376	115	264	346	310
Future Volume (veh/h)	380	1043	364	394	1100	210	369	376	115	264	346	310
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	392	1075	375	406	1134	216	380	388	119	272	357	320
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	435	1201	535	454	1298	578	436	648	196	323	390	530
Arrive On Green	0.13	0.35	0.35	0.14	0.38	0.38	0.13	0.25	0.25	0.10	0.22	0.22
Sat Flow, veh/h	3319	3413	1521	3319	3413	1521	3319	2579	781	3319	1796	1522
Grp Volume(v), veh/h	392	1075	375	406	1134	216	380	255	252	272	357	320
Grp Sat Flow(s),veh/h/ln	1659	1706	1521	1659	1706	1521	1659	1706	1653	1659	1796	1522
Q Serve(g_s), s	17.1	43.8	21.2	17.7	45.3	15.1	16.5	19.4	19.8	11.8	28.5	25.5
Cycle Q Clear(g_c), s	17.1	43.8	21.2	17.7	45.3	15.1	16.5	19.4	19.8	11.8	28.5	25.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.47	1.00		1.00
Lane Grp Cap(c), veh/h	435	1201	535	454	1298	578	436	429	415	323	390	530
V/C Ratio(X)	0.90	0.90	0.70	0.89	0.87	0.37	0.87	0.60	0.61	0.84	0.92	0.60
Avail Cap(c_a), veh/h	452	1323	590	587	1463	652	587	476	461	452	428	562
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	62.9	45.1	18.9	62.4	42.3	32.9	62.6	48.5	48.6	65.2	56.2	39.6
Incr Delay (d2), s/veh	20.6	7.8	3.3	11.6	5.7	0.4	10.5	1.7	1.9	9.8	23.0	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.2	18.9	7.8	8.0	19.1	5.6	7.5	8.4	8.3	5.4	15.2	9.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	83.5	52.8	22.2	74.0	47.9	33.3	73.1	50.1	50.5	75.0	79.3	41.2
LnGrp LOS	F	D	C	E	D	C	E	D	D	E	E	D
Approach Vol, veh/h		1842			1756			887			949	
Approach Delay, s/veh		53.1			52.2			60.1			65.2	
Approach LOS		D			D			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	27.4	59.0	23.3	37.2	23.3	63.2	18.3	42.2
Change Period (Y+Rc), s	7.3	* 7.3	4.0	5.3	4.0	7.3	4.0	5.3
Max Green Setting (Gmax), s	20.0	* 57	26.0	35.0	20.0	63.0	20.0	41.0
Max Q Clear Time (g_c+I1), s	19.7	45.8	18.5	30.5	19.1	47.3	13.8	21.8
Green Ext Time (p_c), s	0.4	5.9	0.8	1.4	0.1	7.1	0.5	2.8

Intersection Summary	
HCM 6th Ctrl Delay	56.1
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Right Turn Channelized			MOYes									
Traffic Volume (veh/h)	300	350	150	326	280	180	62	453	358	100	630	300
Future Volume (veh/h)	300	350	150	326	280	180	62	453	358	100	630	300
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	323	376	161	351	301	194	67	487	385	108	677	323
Approach Volume (veh/h)		699			846			939			1108	
Crossing Volume (veh/h)		1136			877			807			719	
High Capacity (veh/h)		557			688			729			783	
High v/c (veh/h)		1.26			1.23			1.29			1.42	
Low Capacity (veh/h)		426			539			575			622	
Low v/c (veh/h)		1.64			1.57			1.63			1.78	

Intersection Summary					
Maximum v/c High	1.42				
Maximum v/c Low	1.78				
Intersection Capacity Utilization	114.7%	ICU Level of Service		H	

Intersection	
Intersection Delay, s/veh	24.0
Intersection LOS	C

Approach	EB	WB	NB	SB
Entry Lanes	2	2	2	2
Conflicting Circle Lanes	2	2	2	2
Adj Approach Flow, veh/h	860	846	939	1108
Demand Flow Rate, veh/h	869	855	949	1119
Vehicles Circulating, veh/h	1148	886	815	727
Vehicles Exiting, veh/h	698	878	1039	1014
Ped Vol Crossing Leg, #/h	1	1	1	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	23.7	21.0	27.8	23.3
Approach LOS	C	C	D	C

Lane	Left	Right	Bypass	Left	Right	Left	Right	Left	Right
Designated Moves	LT	TR	R	L	TR	LT	R	LT	TR
Assumed Moves	LT	TR	R	L	TR	LT	R	LT	TR
RT Channelized			Yield						
Lane Util	0.470	0.530		0.415	0.585	0.590	0.410	0.470	0.530
Follow-Up Headway, s	2.667	2.535		2.667	2.535	2.667	2.535	2.667	2.535
Critical Headway, s	4.645	4.328	163	4.645	4.328	4.645	4.328	4.645	4.328
Entry Flow, veh/h	332	374	478	355	500	560	389	526	593
Cap Entry Lane, veh/h	470	535	0.990	597	669	638	710	692	765
Entry HV Adj Factor	0.990	0.991	161	0.989	0.990	0.990	0.990	0.990	0.990
Flow Entry, veh/h	329	371	473	351	495	554	385	521	587
Cap Entry, veh/h	465	530	0.340	591	662	631	703	685	758
V/C Ratio	0.707	0.699	13.2	0.594	0.748	0.878	0.548	0.761	0.775
Control Delay, s/veh	27.9	24.5	B	17.6	23.5	37.5	13.9	23.8	22.9
LOS	D	C	1	C	C	E	B	C	C
95th %tile Queue, veh	5	5		4	7	10	3	7	8

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	21	552	309	511	764	7	54	319	388	396	117
v/c Ratio	0.18	0.55	0.84	0.56	0.58	0.07	0.49	0.70	0.79	0.79	0.21
Control Delay	48.0	34.4	45.4	13.2	4.3	46.4	61.6	28.0	45.0	45.2	2.4
Queue Delay	0.0	0.0	0.0	0.9	0.2	0.0	0.0	2.8	1.7	1.8	0.0
Total Delay	48.0	34.4	45.4	14.0	4.5	46.4	61.6	30.8	46.8	47.0	2.4
Queue Length 50th (ft)	13	171	192	198	174	4	34	80	226	231	0
Queue Length 95th (ft)	38	222	#323	310	222	19	#83	177	#384	#391	18
Internal Link Dist (ft)		346		307			744			674	
Turn Bay Length (ft)	65		125			140		165	150		185
Base Capacity (vph)	116	1033	404	935	1338	104	110	484	515	523	587
Starvation Cap Reductn	0	0	0	189	95	0	0	0	0	0	0
Spillback Cap Reductn	0	6	0	0	0	0	0	82	41	42	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.54	0.76	0.68	0.61	0.07	0.49	0.79	0.82	0.82	0.20

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	487	32	290	480	718	7	51	300	639	98	110
Future Volume (veh/h)	20	487	32	290	480	718	7	51	300	639	98	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	21	518	34	309	511	764	7	54	319	754	0	117
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	234	647	42	606	749	1007	90	94	619	871	0	386
Arrive On Green	0.13	0.19	0.19	0.34	0.40	0.40	0.05	0.05	0.05	0.24	0.00	0.24
Sat Flow, veh/h	1795	3410	223	1795	1885	1559	1795	1885	1598	3591	0	1591
Grp Volume(v), veh/h	21	272	280	309	511	764	7	54	319	754	0	117
Grp Sat Flow(s),veh/h/ln	1795	1791	1842	1795	1885	1559	1795	1885	1598	1795	0	1591
Q Serve(g_s), s	1.0	14.5	14.6	13.8	22.4	34.6	0.4	2.8	0.0	20.1	0.0	6.0
Cycle Q Clear(g_c), s	1.0	14.5	14.6	13.8	22.4	34.6	0.4	2.8	0.0	20.1	0.0	6.0
Prop In Lane	1.00		0.12	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	234	340	350	606	749	1007	90	94	619	871	0	386
V/C Ratio(X)	0.09	0.80	0.80	0.51	0.68	0.76	0.08	0.57	0.52	0.87	0.00	0.30
Avail Cap(c_a), veh/h	234	439	451	606	792	1042	99	104	627	1059	0	469
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.74	0.74	0.74	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	38.3	38.7	38.7	26.5	24.9	12.7	45.3	46.5	23.4	36.3	0.0	31.0
Incr Delay (d2), s/veh	0.2	17.6	17.5	0.5	1.7	2.4	0.4	6.2	0.7	6.6	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	8.0	8.3	5.9	10.1	19.7	0.2	1.5	5.7	9.4	0.0	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.4	56.3	56.2	27.0	26.6	15.1	45.7	52.6	24.1	42.9	0.0	31.4
LnGrp LOS	D	E	E	C	C	B	D	D	C	D	A	C
Approach Vol, veh/h		573			1584			380			871	
Approach Delay, s/veh		55.6			21.1			28.6			41.3	
Approach LOS		E			C			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.3	23.5		28.8	17.5	44.2		9.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	2.5	24.5		29.5	5.0	42.0		5.5				
Max Q Clear Time (g_c+I1), s	1.5	16.6		22.1	3.0	36.6		4.8				
Green Ext Time (p_c), s	0.5	2.2		2.1	0.0	3.1		0.1				

Intersection Summary	
HCM 6th Ctrl Delay	32.9
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	94	1439	30	1289	374	154	158	508	9	32
v/c Ratio	0.38	0.82	0.08	0.61	0.36	0.75	0.76	0.75	0.06	0.07
Control Delay	49.7	22.0	32.8	6.3	0.9	62.1	62.5	31.6	35.1	0.3
Queue Delay	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.7	23.6	32.8	6.3	0.9	62.1	62.5	31.6	35.1	0.3
Queue Length 50th (ft)	61	337	19	116	4	97	101	255	5	0
Queue Length 95th (ft)	m94	413	m23	m141	m10	#172	#183	375	19	0
Internal Link Dist (ft)		307		269			836			575
Turn Bay Length (ft)	120		220		145	130		110	95	
Base Capacity (vph)	265	1759	382	2185	1076	243	247	675	167	494
Starvation Cap Reductn	0	167	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	51	0	0	0	0	0	3
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.90	0.08	0.60	0.35	0.63	0.64	0.75	0.05	0.07

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	87	1298	40	28	1199	348	260	30	472	8	0	30
Future Volume (veh/h)	87	1298	40	28	1199	348	260	30	472	8	0	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	94	1396	43	30	1289	0	303	0	508	9	0	32
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	482	1567	48	478	1576		530	0	675	212	0	250
Arrive On Green	0.27	0.44	0.44	0.27	0.44	0.00	0.16	0.00	0.16	0.16	0.00	0.16
Sat Flow, veh/h	1795	3544	109	1795	3582	1598	2776	0	1598	899	0	1598
Grp Volume(v), veh/h	94	704	735	30	1289	0	303	0	508	9	0	32
Grp Sat Flow(s),veh/h/ln	1795	1791	1862	1795	1791	1598	1388	0	1598	899	0	1598
Q Serve(g_s), s	4.0	36.2	36.3	1.2	31.5	0.0	10.5	0.0	0.3	0.9	0.0	1.7
Cycle Q Clear(g_c), s	4.0	36.2	36.3	1.2	31.5	0.0	12.3	0.0	0.3	0.9	0.0	1.7
Prop In Lane	1.00		0.06	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	482	792	824	478	1576		530	0	675	212	0	250
V/C Ratio(X)	0.19	0.89	0.89	0.06	0.82		0.57	0.00	0.75	0.04	0.00	0.13
Avail Cap(c_a), veh/h	482	844	877	478	2013		610	0	721	238	0	296
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.70	0.70	0.70	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.2	25.6	25.7	27.4	24.5	0.0	41.6	0.0	24.4	36.0	0.0	36.3
Incr Delay (d2), s/veh	0.1	10.6	10.4	0.1	4.8	0.0	1.0	0.0	4.2	0.1	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	17.0	17.7	0.5	13.8	0.0	3.6	0.0	10.4	0.2	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.4	36.2	36.1	27.4	29.3	0.0	42.6	0.0	28.6	36.0	0.0	36.6
LnGrp LOS	C	D	D	C	C		D	A	C	D	A	D
Approach Vol, veh/h		1533			1319	A		811			41	
Approach Delay, s/veh		35.7			29.3			33.8			36.4	
Approach LOS		D			C			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	31.1	48.7		20.1	31.4	48.5		20.1				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	20.9	47.1		18.5	11.8	56.2		18.5				
Max Q Clear Time (g_c+I1), s	3.2	38.3		3.7	6.0	33.5		14.3				
Green Ext Time (p_c), s	0.0	5.9		0.1	0.1	10.5		1.4				

Intersection Summary	
HCM 6th Ctrl Delay	33.0
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.
Unsignalized Delay for [WBR] is excluded from calculations of the approach delay and intersection delay.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	508	1364	105	982	311	255	74	148	301	526
v/c Ratio	0.96	0.95	0.73	0.83	0.74	0.33	0.15	0.74	0.76	0.92
Control Delay	58.0	30.2	74.3	37.5	54.2	33.5	0.7	65.0	49.7	39.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.0	30.2	74.3	37.5	54.2	33.5	0.7	65.0	49.7	39.9
Queue Length 50th (ft)	~182	~181	67	298	100	70	0	92	175	147
Queue Length 95th (ft)	m#269	#584	#157	#390	#148	106	0	#180	269	#345
Internal Link Dist (ft)		353		673		608			523	
Turn Bay Length (ft)	295		235		140		130	225		
Base Capacity (vph)	530	1432	144	1182	431	857	508	212	442	600
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.95	0.73	0.83	0.72	0.30	0.15	0.70	0.68	0.88

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	483	880	416	100	779	154	295	242	70	141	286	500
Future Volume (veh/h)	483	880	416	100	779	154	295	242	70	141	286	500
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	508	926	0	105	820	162	311	255	74	148	301	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	769	1627		132	912	180	380	690	308	179	345	
Arrive On Green	0.22	0.45	0.00	0.07	0.31	0.31	0.11	0.19	0.19	0.10	0.18	0.00
Sat Flow, veh/h	3483	3676	0	1795	2973	587	3483	3582	1598	1795	1885	1598
Grp Volume(v), veh/h	508	926	0	105	494	488	311	255	74	148	301	0
Grp Sat Flow(s),veh/h/ln	1742	1791	0	1795	1791	1770	1742	1791	1598	1795	1885	1598
Q Serve(g_s), s	13.3	19.0	0.0	5.8	26.4	26.4	8.7	6.2	3.9	8.1	15.5	0.0
Cycle Q Clear(g_c), s	13.3	19.0	0.0	5.8	26.4	26.4	8.7	6.2	3.9	8.1	15.5	0.0
Prop In Lane	1.00		0.00	1.00		0.33	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	769	1627		132	549	543	380	690	308	179	345	
V/C Ratio(X)	0.66	0.57		0.80	0.90	0.90	0.82	0.37	0.24	0.83	0.87	
Avail Cap(c_a), veh/h	769	1627		135	584	577	432	860	383	214	443	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	35.5	20.1	0.0	45.6	33.2	33.2	43.6	35.1	34.2	44.2	39.7	0.0
Incr Delay (d2), s/veh	2.1	1.5	0.0	27.1	20.2	20.4	10.5	0.3	0.4	19.7	14.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.8	8.0	0.0	3.5	14.1	14.0	4.2	2.7	1.5	4.4	8.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.6	21.5	0.0	72.7	53.4	53.6	54.1	35.4	34.6	63.9	53.8	0.0
LnGrp LOS	D	C		E	D	D	D	D	C	E	D	
Approach Vol, veh/h		1434	A		1087			640			449	A
Approach Delay, s/veh		27.2			55.3			44.4			57.1	
Approach LOS		C			E			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.8	49.9	15.4	22.8	26.6	35.2	14.5	23.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.5	38.6	12.4	23.5	13.5	32.6	11.9	24.0
Max Q Clear Time (g_c+I1), s	7.8	21.0	10.7	17.5	15.3	28.4	10.1	8.2
Green Ext Time (p_c), s	0.0	6.3	0.2	0.8	0.0	2.3	0.1	1.5

Intersection Summary

HCM 6th Ctrl Delay	42.5
HCM 6th LOS	D

Notes

Unsignalized Delay for [EBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	133	741	100	897
v/c Ratio	0.53	0.32	0.18	0.63
Control Delay	25.5	7.7	3.5	7.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	25.5	7.7	3.5	7.3
Queue Length 50th (ft)	32	79	9	150
Queue Length 95th (ft)	79	138	25	325
Internal Link Dist (ft)	2642	1037		1110
Turn Bay Length (ft)			60	
Base Capacity (vph)	724	2291	565	1434
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.18	0.32	0.18	0.63

Intersection Summary

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	62	61	637	52	93	834
Future Volume (veh/h)	62	61	637	52	93	834
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1885	1885	1885	1885
Adj Flow Rate, veh/h	67	66	685	56	100	897
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	1	1	1	1
Cap, veh/h	86	84	2219	181	606	1459
Arrive On Green	0.10	0.10	0.66	0.66	0.06	0.77
Sat Flow, veh/h	846	834	3447	274	1795	1885
Grp Volume(v), veh/h	134	0	366	375	100	897
Grp Sat Flow(s),veh/h/ln	1693	0	1791	1835	1795	1885
Q Serve(g_s), s	6.2	0.0	6.9	7.0	1.2	16.4
Cycle Q Clear(g_c), s	6.2	0.0	6.9	7.0	1.2	16.4
Prop In Lane	0.50	0.49		0.15	1.00	
Lane Grp Cap(c), veh/h	171	0	1185	1215	606	1459
V/C Ratio(X)	0.78	0.00	0.31	0.31	0.17	0.61
Avail Cap(c_a), veh/h	677	0	1185	1215	652	1459
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.76	0.76	1.00	1.00
Uniform Delay (d), s/veh	35.1	0.0	5.8	5.8	3.4	3.9
Incr Delay (d2), s/veh	7.5	0.0	0.5	0.5	0.1	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.0	2.2	2.2	0.3	4.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	42.6	0.0	6.3	6.3	3.5	5.9
LnGrp LOS	D	A	A	A	A	A
Approach Vol, veh/h	134		741			997
Approach Delay, s/veh	42.6		6.3			5.6
Approach LOS	D		A			A

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	9.0	57.9				66.9	13.1
Change Period (Y+Rc), s	4.5	5.0				5.0	5.0
Max Green Setting (Gmax), s	6.5	27.0				38.0	32.0
Max Q Clear Time (g_c+I1), s	3.2	9.0				18.4	8.2
Green Ext Time (p_c), s	0.1	4.3				6.7	0.4

Intersection Summary			
HCM 6th Ctrl Delay		8.5	
HCM 6th LOS		A	

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	165	62	25	441	54	575	169
v/c Ratio	0.53	0.31	0.19	0.61	0.27	0.58	0.20
Control Delay	36.5	22.1	42.6	24.0	38.4	18.2	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.5	22.1	42.6	24.0	38.4	18.2	6.9
Queue Length 50th (ft)	66	9	11	162	23	158	14
Queue Length 95th (ft)	149	49	41	311	67	389	62
Internal Link Dist (ft)	560	1033		1337		1037	
Turn Bay Length (ft)			30		70		60
Base Capacity (vph)	713	683	129	840	467	1149	983
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.09	0.19	0.53	0.12	0.50	0.17

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	137	10	17	10	10	42	25	427	10	53	569	167
Future Volume (veh/h)	137	10	17	10	10	42	25	427	10	53	569	167
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	138	10	17	10	10	42	25	431	10	54	575	169
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	209	15	26	19	19	79	52	599	14	173	742	625
Arrive On Green	0.14	0.14	0.14	0.07	0.07	0.07	0.03	0.33	0.33	0.10	0.39	0.39
Sat Flow, veh/h	1483	107	183	267	267	1120	1795	1835	43	1795	1885	1587
Grp Volume(v), veh/h	165	0	0	62	0	0	25	0	441	54	575	169
Grp Sat Flow(s),veh/h/ln	1773	0	0	1654	0	0	1795	0	1877	1795	1885	1587
Q Serve(g_s), s	4.6	0.0	0.0	1.9	0.0	0.0	0.7	0.0	10.7	1.5	13.8	3.8
Cycle Q Clear(g_c), s	4.6	0.0	0.0	1.9	0.0	0.0	0.7	0.0	10.7	1.5	13.8	3.8
Prop In Lane	0.84		0.10	0.16		0.68	1.00		0.02	1.00		1.00
Lane Grp Cap(c), veh/h	250	0	0	116	0	0	52	0	613	173	742	625
V/C Ratio(X)	0.66	0.00	0.00	0.53	0.00	0.00	0.48	0.00	0.72	0.31	0.77	0.27
Avail Cap(c_a), veh/h	939	0	0	859	0	0	173	0	1030	622	1524	1283
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.1	0.0	0.0	23.3	0.0	0.0	24.8	0.0	15.4	21.9	13.7	10.7
Incr Delay (d2), s/veh	2.9	0.0	0.0	3.8	0.0	0.0	6.6	0.0	1.6	1.0	1.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	0.0	0.8	0.0	0.0	0.4	0.0	4.1	0.6	5.0	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.1	0.0	0.0	27.1	0.0	0.0	31.4	0.0	17.0	22.9	15.5	10.9
LnGrp LOS	C	A	A	C	A	A	C	A	B	C	B	B
Approach Vol, veh/h		165			62			466			798	
Approach Delay, s/veh		24.1			27.1			17.8			15.0	
Approach LOS		C			C			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.0	22.0		11.8	6.5	25.5		8.2				
Change Period (Y+Rc), s	5.0	5.0		4.5	5.0	5.0		4.5				
Max Green Setting (Gmax), s	5.0	28.5		27.5	5.0	42.0		27.0				
Max Q Clear Time (g_c+I1), s	3.5	12.7		6.6	2.7	15.8		3.9				
Green Ext Time (p_c), s	0.1	2.4		0.9	0.0	4.5		0.3				

Intersection Summary		
HCM 6th Ctrl Delay		17.4
HCM 6th LOS		B

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBT	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	39	199	194	15	291	291	325	307
v/c Ratio	0.29	0.59	0.43	0.12	0.51	0.42	0.78	0.15
Control Delay	30.7	35.1	7.1	38.7	26.9	5.4	43.9	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.7	35.1	7.1	38.7	26.9	5.4	43.9	9.6
Queue Length 50th (ft)	10	89	0	7	116	0	148	31
Queue Length 95th (ft)	42	152	47	27	216	58	#320	80
Internal Link Dist (ft)	284	314			712			1337
Turn Bay Length (ft)							120	
Base Capacity (vph)	135	674	709	123	574	690	421	2067
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.30	0.27	0.12	0.51	0.42	0.77	0.15

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	10	16	175	10	180	14	271	271	302	265	20
Future Volume (veh/h)	10	10	16	175	10	180	14	271	271	302	265	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	11	11	17	188	11	194	15	291	291	325	285	22
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	18	18	28	297	17	276	32	587	495	372	1684	129
Arrive On Green	0.04	0.04	0.04	0.17	0.17	0.17	0.02	0.31	0.31	0.21	0.50	0.50
Sat Flow, veh/h	484	484	748	1701	100	1584	1795	1885	1590	1795	3364	258
Grp Volume(v), veh/h	39	0	0	199	0	194	15	291	291	325	151	156
Grp Sat Flow(s),veh/h/ln	1715	0	0	1800	0	1584	1795	1885	1590	1795	1791	1831
Q Serve(g_s), s	1.6	0.0	0.0	7.2	0.0	8.1	0.6	8.9	10.9	12.4	3.2	3.3
Cycle Q Clear(g_c), s	1.6	0.0	0.0	7.2	0.0	8.1	0.6	8.9	10.9	12.4	3.2	3.3
Prop In Lane	0.28		0.44	0.94		1.00	1.00		1.00	1.00		0.14
Lane Grp Cap(c), veh/h	65	0	0	314	0	276	32	587	495	372	897	917
V/C Ratio(X)	0.60	0.00	0.00	0.63	0.00	0.70	0.46	0.50	0.59	0.87	0.17	0.17
Avail Cap(c_a), veh/h	121	0	0	688	0	606	127	587	495	432	897	917
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.4	0.0	0.0	27.1	0.0	27.4	34.3	19.8	20.5	27.1	9.6	9.6
Incr Delay (d2), s/veh	8.6	0.0	0.0	2.1	0.0	3.2	9.9	3.0	5.0	16.0	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	3.2	0.0	3.2	0.3	3.9	4.2	6.6	1.2	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.0	0.0	0.0	29.2	0.0	30.7	44.3	22.8	25.5	43.1	10.0	10.0
LnGrp LOS	D	A	A	C	A	C	D	C	C	D	B	B
Approach Vol, veh/h		39			393			597			632	
Approach Delay, s/veh		42.0			29.9			24.6			27.0	
Approach LOS		D			C			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	19.6	27.0		7.2	6.3	40.3		16.8				
Change Period (Y+Rc), s	5.0	5.0		4.5	5.0	5.0		4.5				
Max Green Setting (Gmax), s	17.0	22.0		5.0	5.0	34.0		27.0				
Max Q Clear Time (g_c+I1), s	14.4	12.9		3.6	2.6	5.3		10.1				
Green Ext Time (p_c), s	0.3	1.8		0.0	0.0	1.7		1.7				

Intersection Summary

HCM 6th Ctrl Delay	27.2
HCM 6th LOS	C

Intersection has too many lanes per leg.
HCM All-Way analysis is limited to two lanes per leg.
Channelized right turn lanes are not counted.

Intersection	
Intersection Delay, s/veh	18.8
Intersection LOS	C

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	331	253	150	225	210	245
Future Vol, veh/h	331	253	150	225	210	245
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	341	261	155	232	216	253
Number of Lanes	1	1	1	2	1	1

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	3
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	2	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	3	0	2
HCM Control Delay	23.8	13.5	16.8
HCM LOS	C	B	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	0%
Vol Thru, %	0%	100%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	150	113	113	331	253	210	245
LT Vol	150	0	0	331	0	0	0
Through Vol	0	113	113	0	0	210	0
RT Vol	0	0	0	0	253	0	245
Lane Flow Rate	155	116	116	341	261	216	253
Geometry Grp	8	8	8	8	8	8	8
Degree of Util (X)	0.362	0.255	0.198	0.744	0.481	0.466	0.493
Departure Headway (Hd)	8.42	7.906	6.141	7.854	6.64	7.751	7.03
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	427	455	583	461	543	465	513
Service Time	6.167	5.653	3.888	5.598	4.384	5.498	4.776
HCM Lane V/C Ratio	0.363	0.255	0.199	0.74	0.481	0.465	0.493
HCM Control Delay	15.9	13.4	10.4	30.2	15.4	17.1	16.5
HCM Lane LOS	C	B	B	D	C	C	C
HCM 95th-tile Q	1.6	1	0.7	6.1	2.6	2.4	2.7

Reso A - Exhibit C2 (EIR Technical Appendix)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	0	0	0	316	20	0	0	0	0	400	53
Future Volume (vph)	0	0	0	0	316	20	0	0	0	0	400	53
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	343	22	0	0	0	0	435	58

Direction, Lane #	WB 1	WB 2	SB 1
Volume Total (vph)	343	22	493
Volume Left (vph)	0	0	0
Volume Right (vph)	0	22	58
Hadj (s)	0.02	-0.58	-0.05
Departure Headway (s)	5.2	3.2	4.8
Degree Utilization, x	0.49	0.02	0.66
Capacity (veh/h)	658	1121	722
Control Delay (s)	13.1	6.3	16.5
Approach Delay (s)	12.7		16.5
Approach LOS	B		C

Intersection Summary				
Delay		14.9		
Level of Service		B		
Intersection Capacity Utilization		47.6%	ICU Level of Service	A
Analysis Period (min)		15		

Intersection	
Intersection Delay, s/veh	16.4
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	316	20	0	0	0	0	400	53
Future Vol, veh/h	0	0	0	0	316	20	0	0	0	0	400	53
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	0	0	0	0	343	22	0	0	0	0	435	58
Number of Lanes	0	0	0	0	1	1	0	0	0	0	1	0

Approach	WB	SB
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left		WB
Conflicting Lanes Left	0	2
Conflicting Approach Right	SB	
Conflicting Lanes Right	1	0
HCM Control Delay	15.1	17.3
HCM LOS	C	C

Lane	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	0%	0%
Vol Thru, %	100%	0%	88%
Vol Right, %	0%	100%	12%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	316	20	453
LT Vol	0	0	0
Through Vol	316	0	400
RT Vol	0	20	53
Lane Flow Rate	343	22	492
Geometry Grp	7	7	2
Degree of Util (X)	0.557	0.031	0.666
Departure Headway (Hd)	5.833	5.125	4.87
Convergence, Y/N	Yes	Yes	Yes
Cap	622	703	734
Service Time	3.533	2.825	2.954
HCM Lane V/C Ratio	0.551	0.031	0.67
HCM Control Delay	15.6	8	17.3
HCM Lane LOS	C	A	C
HCM 95th-tile Q	3.4	0.1	5.1

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	75	483	775	278	541	141	424	1199	795	461
v/c Ratio	0.27	0.88	0.73	0.49	0.53	0.70	0.82	0.91	0.91	0.46
Control Delay	58.3	75.2	50.7	45.6	8.8	81.6	73.9	34.2	67.4	41.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.3	75.2	50.7	45.6	8.8	81.6	73.9	34.2	67.4	41.2
Queue Length 50th (ft)	65	234	354	225	116	135	212	320	389	177
Queue Length 95th (ft)	118	#326	431	319	205	207	275	#442	#498	241
Internal Link Dist (ft)		521		1372			611			680
Turn Bay Length (ft)	115		515		115	165		290	305	
Base Capacity (vph)	290	577	1073	582	1043	255	575	1336	922	1033
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.84	0.72	0.48	0.52	0.55	0.74	0.90	0.86	0.45

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	73	356	113	752	270	525	137	411	1163	771	325	122
Future Volume (veh/h)	73	356	113	752	270	525	137	411	1163	771	325	122
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	75	367	116	775	278	541	141	424	1199	795	335	126
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	280	417	130	996	539	852	166	590	1267	863	799	295
Arrive On Green	0.16	0.16	0.16	0.29	0.29	0.29	0.09	0.16	0.16	0.25	0.31	0.31
Sat Flow, veh/h	1795	2677	834	3483	1885	1594	1795	3582	2812	3483	2560	946
Grp Volume(v), veh/h	75	244	239	775	278	541	141	424	1199	795	233	228
Grp Sat Flow(s),veh/h/ln	1795	1791	1720	1742	1885	1594	1795	1791	1406	1742	1791	1715
Q Serve(g_s), s	5.2	18.7	19.2	28.8	17.4	33.7	10.9	15.8	23.2	31.3	14.4	14.9
Cycle Q Clear(g_c), s	5.2	18.7	19.2	28.8	17.4	33.7	10.9	15.8	23.2	31.3	14.4	14.9
Prop In Lane	1.00		0.48	1.00		1.00	1.00		1.00	1.00		0.55
Lane Grp Cap(c), veh/h	280	279	268	996	539	852	166	590	1267	863	559	535
V/C Ratio(X)	0.27	0.87	0.89	0.78	0.52	0.64	0.85	0.72	0.95	0.92	0.42	0.43
Avail Cap(c_a), veh/h	298	298	286	1104	597	901	263	590	1267	948	559	535
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.3	58.0	58.3	46.2	42.1	23.2	62.9	55.7	27.6	51.6	38.3	38.4
Incr Delay (d2), s/veh	0.5	22.7	26.7	3.3	0.8	1.4	13.8	4.2	14.3	13.3	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	10.3	10.4	12.7	8.1	12.5	5.5	7.3	23.8	15.3	6.5	6.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.8	80.7	85.0	49.4	42.9	24.5	76.7	59.9	41.9	64.9	38.8	38.9
LnGrp LOS	D	F	F	D	D	C	E	E	D	E	D	D
Approach Vol, veh/h		558			1594			1764			1256	
Approach Delay, s/veh		78.8			39.8			49.0			55.3	
Approach LOS		E			D			D			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	39.6	29.0		26.5	18.8	49.7		45.6				
Change Period (Y+Rc), s	* 4.7	5.8		4.6	5.8	* 5.8		5.4				
Max Green Setting (Gmax), s	* 38	23.2		23.4	20.6	* 41		44.6				
Max Q Clear Time (g_c+I1), s	33.3	25.2		21.2	12.9	16.9		35.7				
Green Ext Time (p_c), s	1.5	0.0		0.7	0.2	2.9		4.5				

Intersection Summary		
HCM 6th Ctrl Delay	50.9	
HCM 6th LOS	D	

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Reso A - Exhibit C2 (EIR Technical Appendix)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	281	1177	684	140	879	170	445	385	219	559
v/c Ratio	0.72	0.93	0.79	0.88	0.74	0.27	0.87	0.49	0.86	0.73
Control Delay	52.3	43.1	19.4	89.7	32.8	5.2	58.5	29.9	70.5	37.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.3	43.1	19.4	89.7	32.8	5.2	58.5	29.9	70.5	37.4
Queue Length 50th (ft)	83	346	146	83	240	0	134	92	128	150
Queue Length 95th (ft)	#148	#543	#356	#209	346	47	#241	135	#280	206
Internal Link Dist (ft)		1510			1609			962		896
Turn Bay Length (ft)	140			80			150		110	
Base Capacity (vph)	399	1271	869	160	1189	638	511	1047	256	1029
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.93	0.79	0.88	0.74	0.27	0.87	0.37	0.86	0.54

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	270	1130	657	134	844	163	427	276	93	210	407	130
Future Volume (veh/h)	270	1130	657	134	844	163	427	276	93	210	407	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	281	1177	684	140	879	170	445	288	97	219	424	135
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	357	1284	809	164	1245	554	514	558	184	253	546	172
Arrive On Green	0.10	0.36	0.36	0.09	0.35	0.35	0.15	0.21	0.21	0.14	0.20	0.20
Sat Flow, veh/h	3483	3582	1598	1795	3582	1595	3483	2646	873	1795	2676	844
Grp Volume(v), veh/h	281	1177	684	140	879	170	445	193	192	219	282	277
Grp Sat Flow(s),veh/h/ln	1742	1791	1598	1795	1791	1595	1742	1791	1728	1795	1791	1729
Q Serve(g_s), s	7.2	28.5	13.4	7.0	19.3	7.1	11.3	8.7	9.0	10.8	13.5	13.8
Cycle Q Clear(g_c), s	7.2	28.5	13.4	7.0	19.3	7.1	11.3	8.7	9.0	10.8	13.5	13.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.51	1.00		0.49
Lane Grp Cap(c), veh/h	357	1284	809	164	1245	554	514	377	364	253	366	353
V/C Ratio(X)	0.79	0.92	0.85	0.85	0.71	0.31	0.87	0.51	0.53	0.86	0.77	0.78
Avail Cap(c_a), veh/h	410	1302	817	164	1245	554	526	540	521	263	533	514
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.8	27.8	8.0	40.6	25.6	21.6	37.8	31.7	31.8	38.1	34.1	34.2
Incr Delay (d2), s/veh	8.7	10.3	8.1	32.8	1.8	0.3	13.9	1.1	1.2	24.0	4.2	4.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	13.1	5.5	4.5	8.0	2.5	5.6	3.7	3.7	6.3	6.0	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.5	38.1	16.1	73.4	27.5	21.9	51.7	32.8	33.0	62.1	38.4	39.1
LnGrp LOS	D	D	B	E	C	C	D	C	C	E	D	D
Approach Vol, veh/h		2142			1189			830			778	
Approach Delay, s/veh		32.4			32.1			43.0			45.3	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.8	37.1	17.9	23.0	13.8	36.1	17.3	23.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	8.3	33.0	13.7	27.0	10.7	30.6	13.3	27.4
Max Q Clear Time (g_c+I1), s	9.0	30.5	13.3	15.8	9.2	21.3	12.8	11.0
Green Ext Time (p_c), s	0.0	2.0	0.1	2.4	0.2	4.2	0.0	1.9

Intersection Summary

HCM 6th Ctrl Delay	36.1
HCM 6th LOS	D

Appendix C: Freeway LOS Calculation Sheets

Existing AM

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	AM
Project Description	EX AM US 101 Off Ramp @ SR 46W - NB (#1)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	235
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1940	146
Peak Hour Factor (PHF)	0.90	0.83
Total Trucks, %	8.00	6.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943
Flow Rate (v_i), pc/h	2328	187
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.53	0.10

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	22.2
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.468
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	55.0
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2328	Ramp Junction Speed (S), mi/h	55.0
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	21.2
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	AM
Project Description	EX AM US 101 On Ramp @ SR 46W - NB (#2)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	345
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1794	427
Peak Hour Factor (PHF)	0.90	0.91
Total Trucks, %	8.00	6.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943
Flow Rate (v_i), pc/h	2153	498
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.60	0.27

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	23.8
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.353
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	57.9
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2153	Ramp Junction Speed (S), mi/h	57.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2651	Average Density (D), pc/mi/ln	22.9
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	AM
Project Description	EX AM US 101 Mainline north of SR 46W - NB (#3)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	2221	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.90	Flow Rate (v_P), pc/h/ln	1332
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.60
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.1
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	19.9
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	AM
Project Description	EX AM US 101 Off Ramp @ Spring - NB (#4)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	195
Terrain Type	Rolling	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2221	756
Peak Hour Factor (PHF)	0.90	0.84
Total Trucks, %	8.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.862	0.980
Flow Rate (v_i), pc/h	2863	918
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.65	0.49

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	27.1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.534
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	53.4
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2863	Ramp Junction Speed (S), mi/h	53.4
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	26.8
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	AM
Project Description	EX AM US 101 Off Ramp @ Paso Robles - NB (#5)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	270
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1465	323
Peak Hour Factor (PHF)	0.90	0.94
Total Trucks, %	8.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.990
Flow Rate (v_i), pc/h	1758	347
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.40	0.18

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	16.9
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.483
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1758	Ramp Junction Speed (S), mi/h	54.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	16.1
Level of Service (LOS)	B		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	AM
Project Description	EX AM US 101 On Ramp @ Paso Robles - NB (#6)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	400
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1142	394
Peak Hour Factor (PHF)	0.90	0.73
Total Trucks, %	8.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.990
Flow Rate (v_i), pc/h	1370	545
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.43	0.29

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	17.7
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.321
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.6
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1370	Ramp Junction Speed (S), mi/h	58.6
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1915	Average Density (D), pc/mi/ln	16.3
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	AM
Project Description	EX AM US 101 Mainline south of SR 46E - NB (#7)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1536	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.90	Flow Rate (v_P), pc/h/ln	922
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.41
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	13.6
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	AM
Project Description	EX AM US 101 Off Ramp @ SR 46E - NB (#8)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	225
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1536	890
Peak Hour Factor (PHF)	0.90	0.85
Total Trucks, %	8.00	5.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.952
Flow Rate (v_i), pc/h	1843	1100
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.42	0.59

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	18.1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.550
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	53.0
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1843	Ramp Junction Speed (S), mi/h	53.0
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	17.4
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Merge Report

Project Information

Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	AM
Project Description	EX AM US 101 On Ramp @ SR 46E - NB (#9)		

Geometric Data

	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	405
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

	Balanced Mix	Balanced Mix
Driver Population		
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i), veh/h	646	260	
Peak Hour Factor (PHF)	0.78	0.78	
Total Trucks, %	18.00	18.00	
Single-Unit Trucks (SUT), %	-	-	
Tractor-Trailers (TT), %	-	-	
Heavy Vehicle Adjustment Factor (f_{HV})	0.847	0.847	
Flow Rate (v_i), pc/h	978	394	
Capacity (c), pc/h	4413	1878	
Volume-to-Capacity Ratio (v/c)	0.31	0.21	

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	13.5
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.309
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.9
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	978	Ramp Junction Speed (S), mi/h	58.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1372	Average Density (D), pc/mi/ln	11.6
Level of Service (LOS)	B		

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HCS7 Basic Freeway Report

Project Information

Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	AM
Project Description	EX AM US 101 Mainline north of SR 46E - NB (#10)		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	906	Heavy Vehicle Adjustment Factor (f_{HV})	0.847
Peak Hour Factor (PHF)	0.78	Flow Rate (v_P), pc/h/ln	686
Total Trucks, %	18.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.31
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	10.1
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	AM
Project Description	EX AM US 101 Mainline north of SR 46E - SB (#11)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	850	Heavy Vehicle Adjustment Factor (f_{HV})	0.840
Peak Hour Factor (PHF)	0.93	Flow Rate (v_P), pc/h/ln	544
Total Trucks, %	19.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.24
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	8.1
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	AM
Project Description	EX AM US 101 Off Ramp @ SR 46E - SB (#12)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	155
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	850	248
Peak Hour Factor (PHF)	0.93	0.95
Total Trucks, %	19.00	19.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.840	0.840
Flow Rate (v_i), pc/h	1088	311
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.25	0.17

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	12.2
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.479
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.8
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1088	Ramp Junction Speed (S), mi/h	54.8
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	9.9
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

On-ramp to Mainline (W1)

Volume (vph)	892 vph
Truck %	7%
PCE for Trucks	2
Volume (pcph)	954 pcph

Mainline to Off-Ramp (W2)

Volume (vph)	218 vph
Truck %	0%
PCE for Trucks	2
Volume (pcph)	218 pcph

Mainline to Mainline

Volume (vph)	384 vph
Truck %	19%
PCE for Trucks	2
Volume (pcph)	457 pcph

457 pcph

W2 = 218 pcph

W1 = 954 pcph

0 pcph

V = 1629 pcph

V_w = 1172 pcph

R = 0.19

W1 = 954 pcph

W2 = 218 pcph

L = 1475 feet

N = 3 lanes

N_b = 2 lanes

Lane Imbalanced

Existing AM (US 101 Weave)

On Ramp: SR 46E (#13)

Off Ramp: Riverside Ave-17th St (#14)

Direction: South

Peak Hour: AM

Project: Olsen-Chandler SP

Results

Weave LOS = C

Total Volume LOS = A

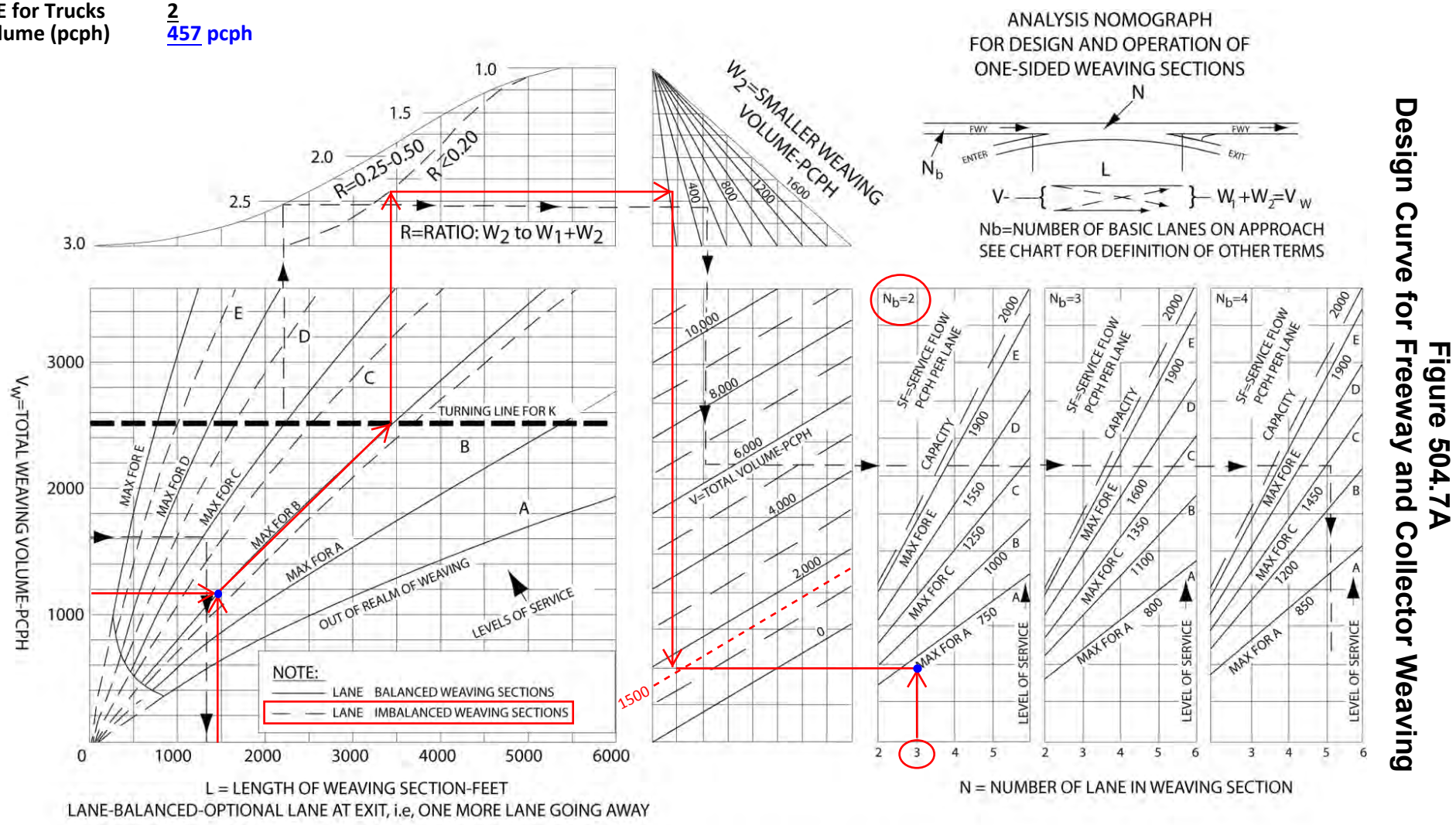

Figure 504.7A
Design Curve for Freeway and Collector Weaving

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	AM
Project Description	EX AM US 101 Mainline south of SR 46E - SB (#15)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1276	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.93	Flow Rate (v_P), pc/h/ln	741
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.33
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	11.1
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	AM
Project Description	EX AM US 101 On Ramp @ Riverside-17th - SB (#16)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	300
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1276	298
Peak Hour Factor (PHF)	0.93	0.94
Total Trucks, %	8.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.980
Flow Rate (v_i), pc/h	1482	323
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.41	0.17

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	17.6
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.325
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.5
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1482	Ramp Junction Speed (S), mi/h	58.5
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1805	Average Density (D), pc/mi/ln	15.4
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	AM
Project Description	EX AM US 101 Off Ramp @ Riverside/Pine - SB (#17)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	190
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1574	93
Peak Hour Factor (PHF)	0.93	0.82
Total Trucks, %	8.00	5.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.952
Flow Rate (v_i), pc/h	1828	119
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.41	0.06

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	18.3
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.462
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	55.2
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1828	Ramp Junction Speed (S), mi/h	55.2
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	16.6
Level of Service (LOS)	B		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	AM
Project Description	EX AM US 101 On Ramp @ Spring - SB (#18)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	1330
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1830	1190
Peak Hour Factor (PHF)	0.93	0.91
Total Trucks, %	8.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.980
Flow Rate (v_i), pc/h	2125	1334
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.78	0.71

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	23.6
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.357
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	57.8
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2125	Ramp Junction Speed (S), mi/h	57.8
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3459	Average Density (D), pc/mi/ln	29.9
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	AM
Project Description	EX AM US 101 Mainline north of SR 46W - SB (#19)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	3020	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.93	Flow Rate (v_P), pc/h/ln	1754
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.79
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	61.5
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	28.5
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	AM
Project Description	EX AM US 101 Off Ramp @ SR 46W - SB (#20)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	210
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3020	510
Peak Hour Factor (PHF)	0.93	0.89
Total Trucks, %	8.00	6.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943
Flow Rate (v_i), pc/h	3507	608
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.79	0.32

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	32.5
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.506
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.1
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3507	Ramp Junction Speed (S), mi/h	54.1
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	32.4
Level of Service (LOS)	D		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Merge Report

Project Information

Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	AM
Project Description	EX AM US 101 On Ramp @ SR 46W - SB (#21)		

Geometric Data

	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	315
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i), veh/h	2510	92
Peak Hour Factor (PHF)	0.93	0.88
Total Trucks, %	8.00	6.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943
Flow Rate (v_i), pc/h	2915	111
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.69	0.06

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	27.1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.380
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	57.2
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2915	Ramp Junction Speed (S), mi/h	57.2
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3026	Average Density (D), pc/mi/ln	26.5
Level of Service (LOS)	C		

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Existing PM

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	PM
Project Description	EX PM US 101 Off Ramp @ SR 46W - NB (#1)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	235
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2640	114
Peak Hour Factor (PHF)	0.98	0.73
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	2800	158
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.63	0.08

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	26.2
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.466
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	55.1
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2800	Ramp Junction Speed (S), mi/h	55.1
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	25.4
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	PM
Project Description	EX PM US 101 On Ramp @ SR 46W - NB (#2)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	345
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2526	755
Peak Hour Factor (PHF)	0.98	0.92
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	2679	829
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.79	0.44

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	30.4
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.428
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	56.0
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2679	Ramp Junction Speed (S), mi/h	56.0
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3508	Average Density (D), pc/mi/ln	31.3
Level of Service (LOS)	D		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	6/14/2018
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	PM
Project Description	EX PM US 101 Mainline north of SR 46W - NB (#3)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	3281	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor (PHF)	0.98	Flow Rate (v_P), pc/h/ln	1740
Total Trucks, %	4.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.78
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	62.2
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	28.0
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	PM
Project Description	EX PM US 101 Off Ramp @ Spring - NB (#4)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	195
Terrain Type	Rolling	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3281	1337
Peak Hour Factor (PHF)	0.98	0.98
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.990
Flow Rate (v_i), pc/h	3616	1378
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.82	0.73

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	33.6
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.575
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	52.4
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3616	Ramp Junction Speed (S), mi/h	52.4
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	34.5
Level of Service (LOS)	D		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	PM
Project Description	EX PM US 101 Off Ramp @ Paso Robles - NB (#5)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	270
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1944	561
Peak Hour Factor (PHF)	0.98	0.95
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	2062	596
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.47	0.32

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	19.6
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.505
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.1
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2062	Ramp Junction Speed (S), mi/h	54.1
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	19.1
Level of Service (LOS)	B		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	PM
Project Description	EX PM US 101 On Ramp @ Paso Robles - NB (#6)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	400
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1383	326
Peak Hour Factor (PHF)	0.98	0.96
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	1467	343
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.41	0.18

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	17.0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.318
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1467	Ramp Junction Speed (S), mi/h	58.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1810	Average Density (D), pc/mi/ln	15.4
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	PM
Project Description	EX PM US 101 Mainline south of SR 46E - NB (#7)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1709	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor (PHF)	0.98	Flow Rate (v_P), pc/h/ln	906
Total Trucks, %	4.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.41
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	13.4
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	PM
Project Description	EX PM US 101 Off Ramp @ SR 46E - NB (#8)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	225
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1709	947
Peak Hour Factor (PHF)	0.98	0.96
Total Trucks, %	4.00	3.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.971
Flow Rate (v_i), pc/h	1813	1016
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.41	0.54

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	17.8
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.543
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	53.2
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1813	Ramp Junction Speed (S), mi/h	53.2
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	17.0
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Merge Report

Project Information

Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	PM
Project Description	EX PM US 101 On Ramp @ SR 46E - NB (#9)		

Geometric Data

	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	405
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i), veh/h	762	249
Peak Hour Factor (PHF)	0.86	0.86
Total Trucks, %	12.00	12.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.893	0.893
Flow Rate (v_i), pc/h	992	324
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.30	0.17

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	13.1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.309
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.9
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	992	Ramp Junction Speed (S), mi/h	58.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1316	Average Density (D), pc/mi/ln	11.2
Level of Service (LOS)	B		

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HCS7 Basic Freeway Report

Project Information

Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	PM
Project Description	EX PM US 101 Mainline north of SR 46E - NB (#10)		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	1011	Heavy Vehicle Adjustment Factor (f_{HV})	0.893
Peak Hour Factor (PHF)	0.86	Flow Rate (v_P), pc/h/ln	658
Total Trucks, %	12.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.29
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	9.7
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	PM
Project Description	EX PM US 101 Mainline north of SR 46E - SB (#11)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1361	Heavy Vehicle Adjustment Factor (f_{HV})	0.826
Peak Hour Factor (PHF)	0.92	Flow Rate (v_P), pc/h/ln	896
Total Trucks, %	21.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.40
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	13.4
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	PM
Project Description	EX PM US 101 Off Ramp @ SR 46E - SB (#12)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	155
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1361	327
Peak Hour Factor (PHF)	0.92	0.94
Total Trucks, %	21.00	21.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.826	0.826
Flow Rate (v_i), pc/h	1791	421
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.41	0.22

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	18.3
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.489
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.5
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1791	Ramp Junction Speed (S), mi/h	54.5
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	16.4
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

On-ramp to Mainline (W1)

Volume (vph)	992 vph
Truck %	4%
PCE for Trucks	2
Volume (pcph)	1032 pcph

Mainline to Off-Ramp (W2)

Volume (vph)	303 vph
Truck %	1%
PCE for Trucks	2
Volume (pcph)	306 pcph

Mainline to Mainline

Volume (vph)	731 vph
Truck %	21%
PCE for Trucks	2
Volume (pcph)	885 pcph

885 pcph

W2 = 306 pcph

W1 = 1032 pcph

0 pcph

V = 2223 pcph

V_w = 1338 pcph

R = 0.23

W1 = 1032 pcph

W2 = 306 pcph

L = 1475 feet

N = 3 lanes

N_b = 2 lanes

Lane Imbalanced

Existing PM (US 101 Weave)

On Ramp: SR 46E (#13)

Off Ramp: Riverside Ave-17th St (#14)

Direction: South

Peak Hour: PM

Project: Olsen-Chandler SP

Results

Weave LOS = C

Total Volume LOS = B

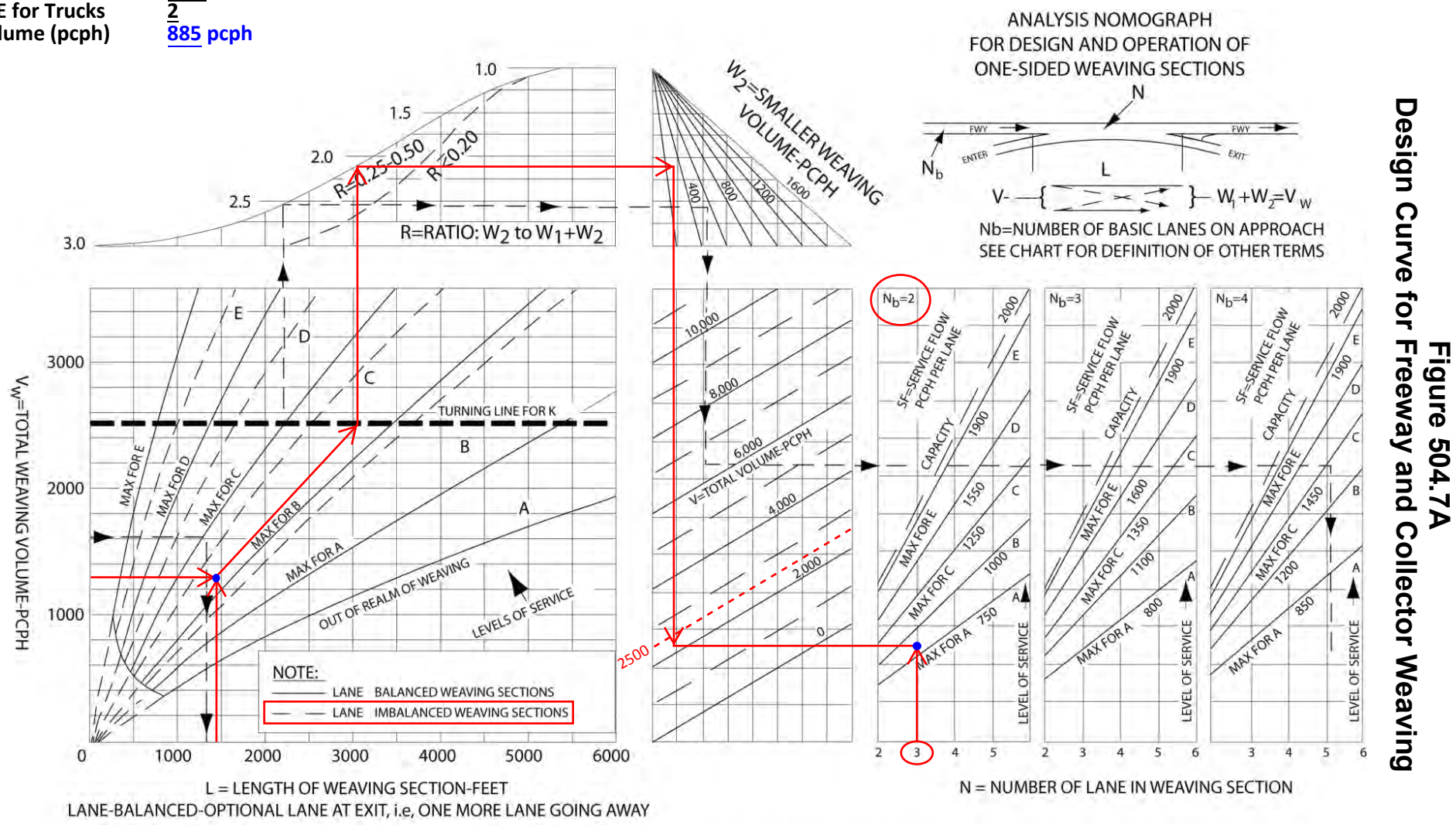

Figure 504.7A
Design Curve for Freeway and Collector Weaving

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	PM
Project Description	EX PM US 101 Mainline south of SR 46E - SB (#15)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1723	Heavy Vehicle Adjustment Factor (f_{HV})	0.943
Peak Hour Factor (PHF)	0.92	Flow Rate (v_P), pc/h/ln	993
Total Trucks, %	6.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.45
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	14.8
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	PM
Project Description	EX PM US 101 On Ramp @ Riverside-17th - SB (#16)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	300
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1723	205
Peak Hour Factor (PHF)	0.92	0.85
Total Trucks, %	6.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.990
Flow Rate (v_i), pc/h	1986	244
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.51	0.13

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	20.9
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.337
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.2
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1986	Ramp Junction Speed (S), mi/h	58.2
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2230	Average Density (D), pc/mi/ln	19.2
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	PM
Project Description	EX PM US 101 Off Ramp @ Riverside/Pine - SB (#17)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	190
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1928	126
Peak Hour Factor (PHF)	0.92	0.77
Total Trucks, %	6.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.990
Flow Rate (v_i), pc/h	2222	165
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.50	0.09

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	21.7
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.466
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	55.1
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2222	Ramp Junction Speed (S), mi/h	55.1
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	20.2
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	PM
Project Description	EX PM US 101 On Ramp @ Spring - SB (#18)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	1330
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2152	894
Peak Hour Factor (PHF)	0.92	0.90
Total Trucks, %	6.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.990
Flow Rate (v_i), pc/h	2481	1003
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.79	0.53

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	23.9
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.360
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	57.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2481	Ramp Junction Speed (S), mi/h	57.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3484	Average Density (D), pc/mi/ln	30.2
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	PM
Project Description	EX PM US 101 Mainline north of SR 46W - SB (#19)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	3046	Heavy Vehicle Adjustment Factor (f_{HV})	0.943
Peak Hour Factor (PHF)	0.92	Flow Rate (v_P), pc/h/ln	1756
Total Trucks, %	6.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.79
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	61.5
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	28.6
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	PM
Project Description	EX PM US 101 Off Ramp @ SR 46W - SB (#20)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	210
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3046	523
Peak Hour Factor (PHF)	0.92	0.90
Total Trucks, %	6.00	3.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.971
Flow Rate (v_i), pc/h	3511	598
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.80	0.32

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	32.6
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.505
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.1
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3511	Ramp Junction Speed (S), mi/h	54.1
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	32.4
Level of Service (LOS)	D		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2018
Jurisdiction		Time Period Analyzed	PM
Project Description	EX PM US 101 On Ramp @ SR 46W - SB (#21)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	315
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2523	146
Peak Hour Factor (PHF)	0.92	0.83
Total Trucks, %	6.00	3.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.971
Flow Rate (v_i), pc/h	2908	181
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.70	0.10

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	27.6
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.386
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	57.0
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2908	Ramp Junction Speed (S), mi/h	57.0
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3089	Average Density (D), pc/mi/ln	27.1
Level of Service (LOS)	C		

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Existing Plus 1293-Unit Project AM

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293 AM US 101 Off Ramp @ SR 46W - NB (#1)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	235
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1974	146
Peak Hour Factor (PHF)	0.90	0.83
Total Trucks, %	8.00	6.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943
Flow Rate (v_i), pc/h	2369	187
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.54	0.10

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	22.5
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.468
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	55.0
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2369	Ramp Junction Speed (S), mi/h	55.0
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	21.5
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293 AM US 101 On Ramp @ SR 46W - NB (#2)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	345
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1828	436
Peak Hour Factor (PHF)	0.90	0.91
Total Trucks, %	8.00	6.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943
Flow Rate (v_i), pc/h	2193	508
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.61	0.27

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	24.2
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.356
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	57.8
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2193	Ramp Junction Speed (S), mi/h	57.8
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2701	Average Density (D), pc/mi/ln	23.4
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information

Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293 AM US 101 Mainline north of SR 46W - NB (#3)		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	2264	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.90	Flow Rate (v_P), pc/h/ln	1358
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.61
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.0
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	20.3
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information

Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293 AM US 101 Off Ramp @ Spring - NB (#4)		

Geometric Data

	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	195
Terrain Type	Rolling	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i), veh/h	2264	799
Peak Hour Factor (PHF)	0.90	0.84
Total Trucks, %	8.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.862	0.980
Flow Rate (v_i), pc/h	2918	971
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.66	0.52

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	27.6
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.539
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	53.3
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2918	Ramp Junction Speed (S), mi/h	53.3
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	27.4
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293 AM US 101 Off Ramp @ Paso Robles - NB (#5)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	270
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity			
Demand Volume (V_i), veh/h	1465	323	
Peak Hour Factor (PHF)	0.90	0.94	
Total Trucks, %	8.00	1.00	
Single-Unit Trucks (SUT), %	-	-	
Tractor-Trailers (TT), %	-	-	
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.990	
Flow Rate (v_i), pc/h	1758	347	
Capacity (c), pc/h	4413	1878	
Volume-to-Capacity Ratio (v/c)	0.40	0.18	

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	16.9
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.483
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1758	Ramp Junction Speed (S), mi/h	54.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	16.1
Level of Service (LOS)	B		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293 AM US 101 On Ramp @ Paso Robles - NB (#6)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	400
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity			
Demand Volume (V_i), veh/h	1142	407	
Peak Hour Factor (PHF)	0.90	0.73	
Total Trucks, %	8.00	1.00	
Single-Unit Trucks (SUT), %	-	-	
Tractor-Trailers (TT), %	-	-	
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.990	
Flow Rate (v_i), pc/h	1370	563	
Capacity (c), pc/h	4413	1878	
Volume-to-Capacity Ratio (v/c)	0.44	0.30	

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	17.9
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.321
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.6
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1370	Ramp Junction Speed (S), mi/h	58.6
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1933	Average Density (D), pc/mi/ln	16.5
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293 AM US 101 Mainline south of SR 46E - NB (#7)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1549	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.90	Flow Rate (v_P), pc/h/ln	930
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.42
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	13.7
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293 AM US 101 Off Ramp @ SR 46E - NB (#8)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	225
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1549	890
Peak Hour Factor (PHF)	0.90	0.85
Total Trucks, %	8.00	5.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.952
Flow Rate (v_i), pc/h	1859	1100
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.42	0.59

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	18.2
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.550
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	53.0
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1859	Ramp Junction Speed (S), mi/h	53.0
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	17.5
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Merge Report

Project Information

Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293 AM US 101 On Ramp @ SR 46E - NB (#9)		

Geometric Data

	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	405
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

	Balanced Mix	Balanced Mix
Driver Population		
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i), veh/h	659	280	
Peak Hour Factor (PHF)	0.78	0.78	
Total Trucks, %	18.00	18.00	
Single-Unit Trucks (SUT), %	-	-	
Tractor-Trailers (TT), %	-	-	
Heavy Vehicle Adjustment Factor (f_{HV})	0.847	0.847	
Flow Rate (v_i), pc/h	997	424	
Capacity (c), pc/h	4413	1878	
Volume-to-Capacity Ratio (v/c)	0.32	0.23	

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	13.9
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.310
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.9
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	997	Ramp Junction Speed (S), mi/h	58.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1421	Average Density (D), pc/mi/ln	12.1
Level of Service (LOS)	B		

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HCS7 Basic Freeway Report

Project Information

Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293 AM US 101 Mainline north of SR 46E - NB (#10)		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	939	Heavy Vehicle Adjustment Factor (f_{HV})	0.847
Peak Hour Factor (PHF)	0.78	Flow Rate (v_P), pc/h/ln	710
Total Trucks, %	18.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.32
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	10.5
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293 AM US 101 Mainline north of SR 46E - SB (#11)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	865	Heavy Vehicle Adjustment Factor (f_{HV})	0.840
Peak Hour Factor (PHF)	0.93	Flow Rate (v_P), pc/h/ln	554
Total Trucks, %	19.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.25
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	8.3
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293 AM US 101 Off Ramp @ SR 46E - SB (#12)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	155
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	865	259
Peak Hour Factor (PHF)	0.93	0.95
Total Trucks, %	19.00	19.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.840	0.840
Flow Rate (v_i), pc/h	1107	325
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.25	0.17

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	12.4
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.481
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1107	Ramp Junction Speed (S), mi/h	54.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	10.1
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

On-ramp to Mainline (W1)

Volume (vph)	892 vph
Truck %	7%
PCE for Trucks	2
Volume (pcph)	954 pcph

Mainline to Off-Ramp (W2)

Volume (vph)	218 vph
Truck %	0%
PCE for Trucks	2
Volume (pcph)	218 pcph

Mainline to Mainline

Volume (vph)	388 vph
Truck %	19%
PCE for Trucks	2
Volume (pcph)	462 pcph

462 pcph

W2 = 218 pcph

W1 = 954 pcph

0 pcph

V_f = 1634 pcph

V_w = 1172 pcph

R = 0.19

W1 = 954 pcph

W2 = 218 pcph

L = 1475 feet

N = 3 lanes

N_b = 2 lanes

Lane Imbalanced

Existing Plus 1293 Unit Project AM (US 101 Weave)

On Ramp: SR 46E (#13)

Off Ramp: Riverside Ave-17th St (#14)

Direction: South

Peak Hour: AM

Project: Olsen-Chandler SP

Results

Weave LOS = C

Total Volume LOS = A

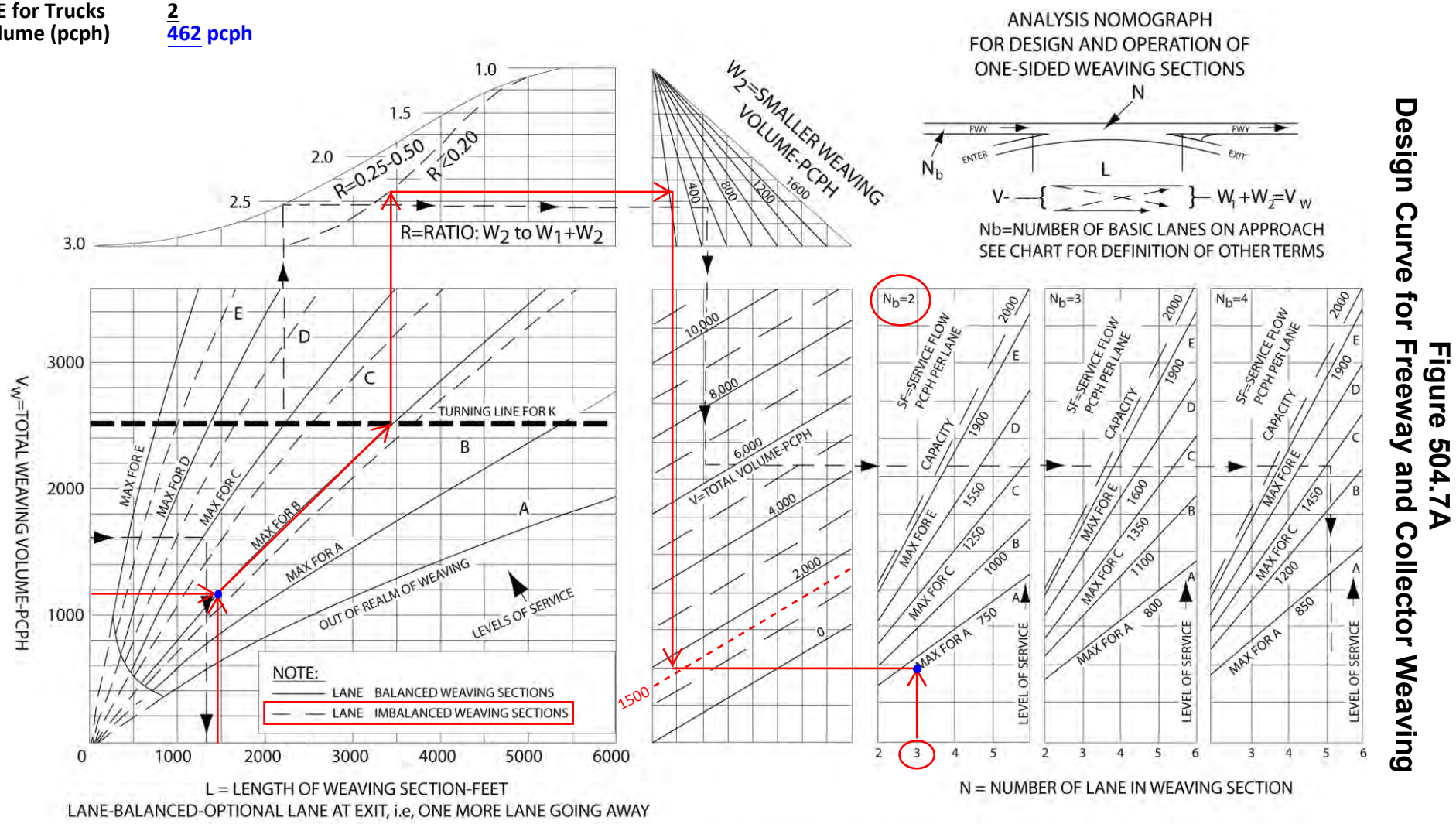

Figure 504.7A
Design Curve for Freeway and Collector Weaving

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293 AM US 101 Mainline south of SR 46E - SB (#15)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1280	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.93	Flow Rate (v_P), pc/h/ln	743
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.33
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	11.1
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293 AM US 101 On Ramp @ Riverside-17th - SB (#16)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	300
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1280	298
Peak Hour Factor (PHF)	0.93	0.94
Total Trucks, %	8.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.980
Flow Rate (v_i), pc/h	1486	323
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.41	0.17

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	17.6
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.325
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.5
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1486	Ramp Junction Speed (S), mi/h	58.5
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1809	Average Density (D), pc/mi/ln	15.5
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293 AM US 101 Off Ramp @ Riverside/Pine - SB (#17)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	190
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1578	97
Peak Hour Factor (PHF)	0.93	0.82
Total Trucks, %	8.00	5.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.952
Flow Rate (v_i), pc/h	1832	124
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.42	0.07

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	18.3
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.463
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	55.2
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1832	Ramp Junction Speed (S), mi/h	55.2
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	16.6
Level of Service (LOS)	B		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293 AM US 101 On Ramp @ Spring - SB (#18)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	1330
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1830	1315
Peak Hour Factor (PHF)	0.93	0.91
Total Trucks, %	8.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.980
Flow Rate (v_i), pc/h	2125	1475
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.82	0.79

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	24.6
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.375
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	57.3
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2125	Ramp Junction Speed (S), mi/h	57.3
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3600	Average Density (D), pc/mi/ln	31.4
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293 AM US 101 Mainline north of SR 46W - SB (#19)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	3145	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.93	Flow Rate (v_P), pc/h/ln	1826
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.82
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	60.1
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	30.4
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293 AM US 101 Off Ramp @ SR 46W - SB (#20)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	210
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3145	536
Peak Hour Factor (PHF)	0.93	0.89
Total Trucks, %	8.00	6.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943
Flow Rate (v_i), pc/h	3652	639
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.83	0.34

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	33.8
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.509
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.0
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3652	Ramp Junction Speed (S), mi/h	54.0
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	33.8
Level of Service (LOS)	D		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293 AM US 101 On Ramp @ SR 46W - SB (#21)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	315
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2609	92
Peak Hour Factor (PHF)	0.93	0.88
Total Trucks, %	8.00	6.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943
Flow Rate (v_i), pc/h	3030	111
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.71	0.06

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	28.0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.390
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	56.9
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3030	Ramp Junction Speed (S), mi/h	56.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3141	Average Density (D), pc/mi/ln	27.6
Level of Service (LOS)	C		

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Existing Plus 1293-Unit Project PM

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293 PM US 101 Off Ramp @ SR 46W - NB (#1)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	235
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2749	114
Peak Hour Factor (PHF)	0.98	0.73
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	2916	158
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.66	0.08

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	27.2
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.466
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	55.1
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2916	Ramp Junction Speed (S), mi/h	55.1
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	26.5
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293 PM US 101 On Ramp @ SR 46W - NB (#2)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	345
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2635	785
Peak Hour Factor (PHF)	0.98	0.92
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	2795	862
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.83	0.46

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	31.5
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.449
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	55.5
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2795	Ramp Junction Speed (S), mi/h	55.5
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3657	Average Density (D), pc/mi/ln	32.9
Level of Service (LOS)	D		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293 PM US 101 Mainline north of SR 46W - NB (#3)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	3420	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor (PHF)	0.98	Flow Rate (v_P), pc/h/ln	1814
Total Trucks, %	4.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.81
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	60.8
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	29.8
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293 PM US 101 Off Ramp @ Spring - NB (#4)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	195
Terrain Type	Rolling	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3420	1476
Peak Hour Factor (PHF)	0.98	0.98
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.990
Flow Rate (v_i), pc/h	3769	1521
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.85	0.81

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	34.9
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.588
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	52.1
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3769	Ramp Junction Speed (S), mi/h	52.1
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	36.2
Level of Service (LOS)	D		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293 PM US 101 Off Ramp @ Paso Robles - NB (#5)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	270
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1944	561
Peak Hour Factor (PHF)	0.98	0.95
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	2062	596
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.47	0.32

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	19.6
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.505
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.1
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2062	Ramp Junction Speed (S), mi/h	54.1
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	19.1
Level of Service (LOS)	B		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293 PM US 101 On Ramp @ Paso Robles - NB (#6)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	400
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1383	335
Peak Hour Factor (PHF)	0.98	0.96
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	1467	352
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.41	0.19

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	17.1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.318
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1467	Ramp Junction Speed (S), mi/h	58.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1819	Average Density (D), pc/mi/ln	15.5
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293 PM US 101 Mainline south of SR 46E - NB (#7)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1718	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor (PHF)	0.98	Flow Rate (v_P), pc/h/ln	911
Total Trucks, %	4.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.41
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	13.5
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293 PM US 101 Off Ramp @ SR 46E - NB (#8)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	225
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1718	947
Peak Hour Factor (PHF)	0.98	0.96
Total Trucks, %	4.00	3.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.971
Flow Rate (v_i), pc/h	1822	1016
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.41	0.54

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	17.9
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.543
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	53.2
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1822	Ramp Junction Speed (S), mi/h	53.2
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	17.1
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293 PM US 101 On Ramp @ SR 46E - NB (#9)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	405
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	771	262
Peak Hour Factor (PHF)	0.86	0.86
Total Trucks, %	12.00	12.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.893	0.893
Flow Rate (v_i), pc/h	1004	341
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.30	0.18

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	13.3
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.309
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.9
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1004	Ramp Junction Speed (S), mi/h	58.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1345	Average Density (D), pc/mi/ln	11.4
Level of Service (LOS)	B		

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HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293 PM US 101 Mainline north of SR 46E - NB (#10)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1033	Heavy Vehicle Adjustment Factor (f_{HV})	0.893
Peak Hour Factor (PHF)	0.86	Flow Rate (v_P), pc/h/ln	672
Total Trucks, %	12.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.30
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	9.9
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293 PM US 101 Mainline north of SR 46E - SB (#11)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1411	Heavy Vehicle Adjustment Factor (f_{HV})	0.826
Peak Hour Factor (PHF)	0.92	Flow Rate (v_P), pc/h/ln	928
Total Trucks, %	21.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.42
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	13.9
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293 PM US 101 Off Ramp @ SR 46E - SB (#12)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	155
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1411	363
Peak Hour Factor (PHF)	0.92	0.94
Total Trucks, %	21.00	21.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.826	0.826
Flow Rate (v_i), pc/h	1857	468
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.42	0.25

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	18.8
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.494
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.4
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1857	Ramp Junction Speed (S), mi/h	54.4
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	17.1
Level of Service (LOS)	B		

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On-ramp to Mainline (W1)

Volume (vph)	992 vph
Truck %	4%
PCE for Trucks	2
Volume (pcph)	1032 pcph

Mainline to Off-Ramp (W2)

Volume (vph)	303 vph
Truck %	1%
PCE for Trucks	2
Volume (pcph)	306 pcph

Mainline to Mainline

Volume (vph)	745 vph
Truck %	21%
PCE for Trucks	2
Volume (pcph)	901 pcph

901 pcph

W2 = 306 pcph

W1 = 1032 pcph

0 pcph

L = 1475 feet

N = 3 lanes

N_b = 2 lanes

Lane Imbalanced

V = 2239 pcph

V_w = 1338 pcph

R = 0.23

W1 = 1032 pcph

W2 = 306 pcph

Existing Plus 1293 Unit Project PM (US 101 Weave)

On Ramp: SR 46E (#13)

Off Ramp: Riverside Ave-17th St (#14)

Direction: South

Peak Hour: PM

Project: Olsen-Chandler SP

Results

Weave LOS = C

Total Volume LOS = B

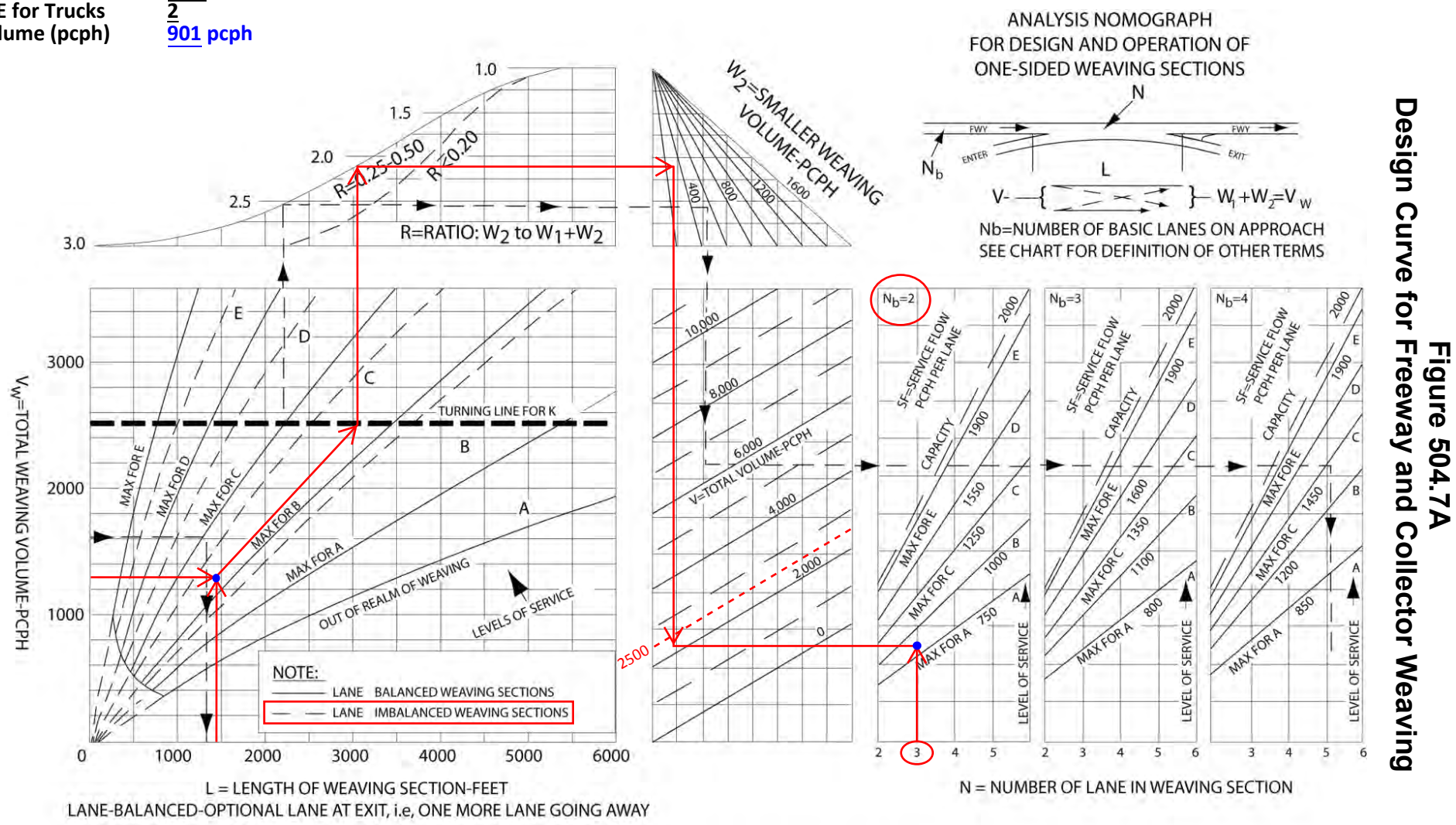

Figure 504.7A
Design Curve for Freeway and Collector Weaving

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293 PM US 101 Mainline south of SR 46E - SB (#15)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1737	Heavy Vehicle Adjustment Factor (f_{HV})	0.943
Peak Hour Factor (PHF)	0.92	Flow Rate (v_P), pc/h/ln	1001
Total Trucks, %	6.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.45
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	15.0
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293 PM US 101 On Ramp @ Riverside-17th - SB (#16)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	300
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1737	205
Peak Hour Factor (PHF)	0.92	0.85
Total Trucks, %	6.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.990
Flow Rate (v_i), pc/h	2002	244
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.51	0.13

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	21.1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.338
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.2
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2002	Ramp Junction Speed (S), mi/h	58.2
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2246	Average Density (D), pc/mi/ln	19.3
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293 PM US 101 Off Ramp @ Riverside/Pine - SB (#17)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	190
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1942	140
Peak Hour Factor (PHF)	0.92	0.77
Total Trucks, %	6.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.990
Flow Rate (v_i), pc/h	2238	184
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.51	0.10

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	21.8
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.468
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	55.0
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2238	Ramp Junction Speed (S), mi/h	55.0
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	20.3
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293 PM US 101 On Ramp @ Spring - SB (#18)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	1330
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2152	979
Peak Hour Factor (PHF)	0.92	0.90
Total Trucks, %	6.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.990
Flow Rate (v_i), pc/h	2481	1099
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.81	0.59

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	24.6
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.373
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	57.4
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2481	Ramp Junction Speed (S), mi/h	57.4
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3580	Average Density (D), pc/mi/ln	31.2
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293 PM US 101 Mainline north of SR 46W - SB (#19)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	3131	Heavy Vehicle Adjustment Factor (f_{HV})	0.943
Peak Hour Factor (PHF)	0.92	Flow Rate (v_P), pc/h/ln	1804
Total Trucks, %	6.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.81
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	60.6
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	29.8
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293 PM US 101 Off Ramp @ SR 46W - SB (#20)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	210
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3131	541
Peak Hour Factor (PHF)	0.92	0.90
Total Trucks, %	6.00	3.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.971
Flow Rate (v_i), pc/h	3609	619
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.82	0.33

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	33.4
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.507
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.1
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3609	Ramp Junction Speed (S), mi/h	54.1
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	33.4
Level of Service (LOS)	D		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293 PM US 101 On Ramp @ SR 46W - SB (#21)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	315
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2590	146
Peak Hour Factor (PHF)	0.92	0.83
Total Trucks, %	6.00	3.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.971
Flow Rate (v_i), pc/h	2985	181
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.72	0.10

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	28.2
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.393
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	56.9
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2985	Ramp Junction Speed (S), mi/h	56.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3166	Average Density (D), pc/mi/ln	27.8
Level of Service (LOS)	D		

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Existing Plus 1293-Unit and School Project AM

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293+School AM US 101 Off Ramp @ SR 46W - NB (#1)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	235
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2001	146
Peak Hour Factor (PHF)	0.90	0.83
Total Trucks, %	8.00	6.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943
Flow Rate (v_i), pc/h	2401	187
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.54	0.10

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	22.8
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.468
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	55.0
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2401	Ramp Junction Speed (S), mi/h	55.0
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	21.8
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293+School AM US 101 On Ramp @ SR 46W - NB (#2)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	345
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1855	443
Peak Hour Factor (PHF)	0.90	0.91
Total Trucks, %	8.00	6.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943
Flow Rate (v_i), pc/h	2226	516
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.62	0.27

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	24.5
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.359
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	57.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2226	Ramp Junction Speed (S), mi/h	57.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2742	Average Density (D), pc/mi/ln	23.8
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293+School AM US 101 Mainline north of SR 46W - NB (#3)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	2298	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.90	Flow Rate (v_P), pc/h/ln	1378
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.62
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.8
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	20.6
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293+School AM US 101 Off Ramp @ Spring - NB (#4)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	195
Terrain Type	Rolling	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2298	833
Peak Hour Factor (PHF)	0.90	0.84
Total Trucks, %	8.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.862	0.980
Flow Rate (v_i), pc/h	2962	1012
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.67	0.54

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	28.0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.542
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	53.2
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2962	Ramp Junction Speed (S), mi/h	53.2
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	27.8
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293+School AM US 101 Off Ramp @ Paso Robles - NB (#5)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	270
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity			
Demand Volume (V_i), veh/h	1465	323	
Peak Hour Factor (PHF)	0.90	0.94	
Total Trucks, %	8.00	1.00	
Single-Unit Trucks (SUT), %	-	-	
Tractor-Trailers (TT), %	-	-	
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.990	
Flow Rate (v_i), pc/h	1758	347	
Capacity (c), pc/h	4413	1878	
Volume-to-Capacity Ratio (v/c)	0.40	0.18	

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	16.9
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.483
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1758	Ramp Junction Speed (S), mi/h	54.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	16.1
Level of Service (LOS)	B		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293+School AM US 101 On Ramp @ Paso Robles - NB (#6)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	400
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity			
Demand Volume (V_i), veh/h	1142	410	
Peak Hour Factor (PHF)	0.90	0.73	
Total Trucks, %	8.00	1.00	
Single-Unit Trucks (SUT), %	-	-	
Tractor-Trailers (TT), %	-	-	
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.990	
Flow Rate (v_i), pc/h	1370	567	
Capacity (c), pc/h	4413	1878	
Volume-to-Capacity Ratio (v/c)	0.44	0.30	

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	17.9
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.321
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.6
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1370	Ramp Junction Speed (S), mi/h	58.6
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1937	Average Density (D), pc/mi/ln	16.5
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293+School AM US 101 Mainline south of SR 46E - NB (#7)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1552	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.90	Flow Rate (v_P), pc/h/ln	931
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.42
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	13.8
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293+School AM US 101 Off Ramp @ SR 46E - NB (#8)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	225
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1552	890
Peak Hour Factor (PHF)	0.90	0.85
Total Trucks, %	8.00	5.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.952
Flow Rate (v_i), pc/h	1862	1100
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.42	0.59

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	18.2
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.550
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	53.0
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1862	Ramp Junction Speed (S), mi/h	53.0
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	17.6
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293+School AM US 101 On Ramp @ SR 46E - NB (#9)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	405
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	662	284
Peak Hour Factor (PHF)	0.78	0.78
Total Trucks, %	18.00	18.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.847	0.847
Flow Rate (v_i), pc/h	1002	430
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.32	0.23

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	14.0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.310
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.9
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1002	Ramp Junction Speed (S), mi/h	58.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1432	Average Density (D), pc/mi/ln	12.2
Level of Service (LOS)	B		

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HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293+School AM US 101 Mainline north of SR 46E - NB (#10)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	946	Heavy Vehicle Adjustment Factor (f_{HV})	0.847
Peak Hour Factor (PHF)	0.78	Flow Rate (v_P), pc/h/ln	716
Total Trucks, %	18.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.32
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	10.6
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293+School AM US 101 Mainline north of SR 46E - SB (#11)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	878	Heavy Vehicle Adjustment Factor (f_{HV})	0.840
Peak Hour Factor (PHF)	0.93	Flow Rate (v_P), pc/h/ln	562
Total Trucks, %	19.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.25
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	8.4
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293+School AM US 101 Off Ramp @ SR 46E - SB (#12)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	155
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	878	268
Peak Hour Factor (PHF)	0.93	0.95
Total Trucks, %	19.00	19.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.840	0.840
Flow Rate (v_i), pc/h	1124	336
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.25	0.18

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	12.5
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.482
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1124	Ramp Junction Speed (S), mi/h	54.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	10.3
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

On-ramp to Mainline (W1)

Volume (vph)	892 vph
Truck %	7%
PCE for Trucks	2
Volume (pcph)	954 pcph

Mainline to Off-Ramp (W2)

Volume (vph)	218 vph
Truck %	0%
PCE for Trucks	2
Volume (pcph)	218 pcph

Mainline to Mainline

Volume (vph)	392 vph
Truck %	19%
PCE for Trucks	2
Volume (pcph)	466 pcph

466 pcph

W2 = 218 pcph

W1 = 954 pcph

0 pcph

V_f = 1639 pcph

V_w = 1172 pcph

R = 0.19

W1 = 954 pcph

W2 = 218 pcph

L = 1475 feet

N = 3 lanes

N_b = 2 lanes

Lane Imbalanced

Existing Plus 1293 Unit and School Project AM (US 101 Weave)

On Ramp: SR 46E (#13)

Off Ramp: Riverside Ave-17th St (#14)

Direction: South

Peak Hour: AM

Project: Olsen-Chandler SP

Results

Weave LOS = C

Total Volume LOS = A

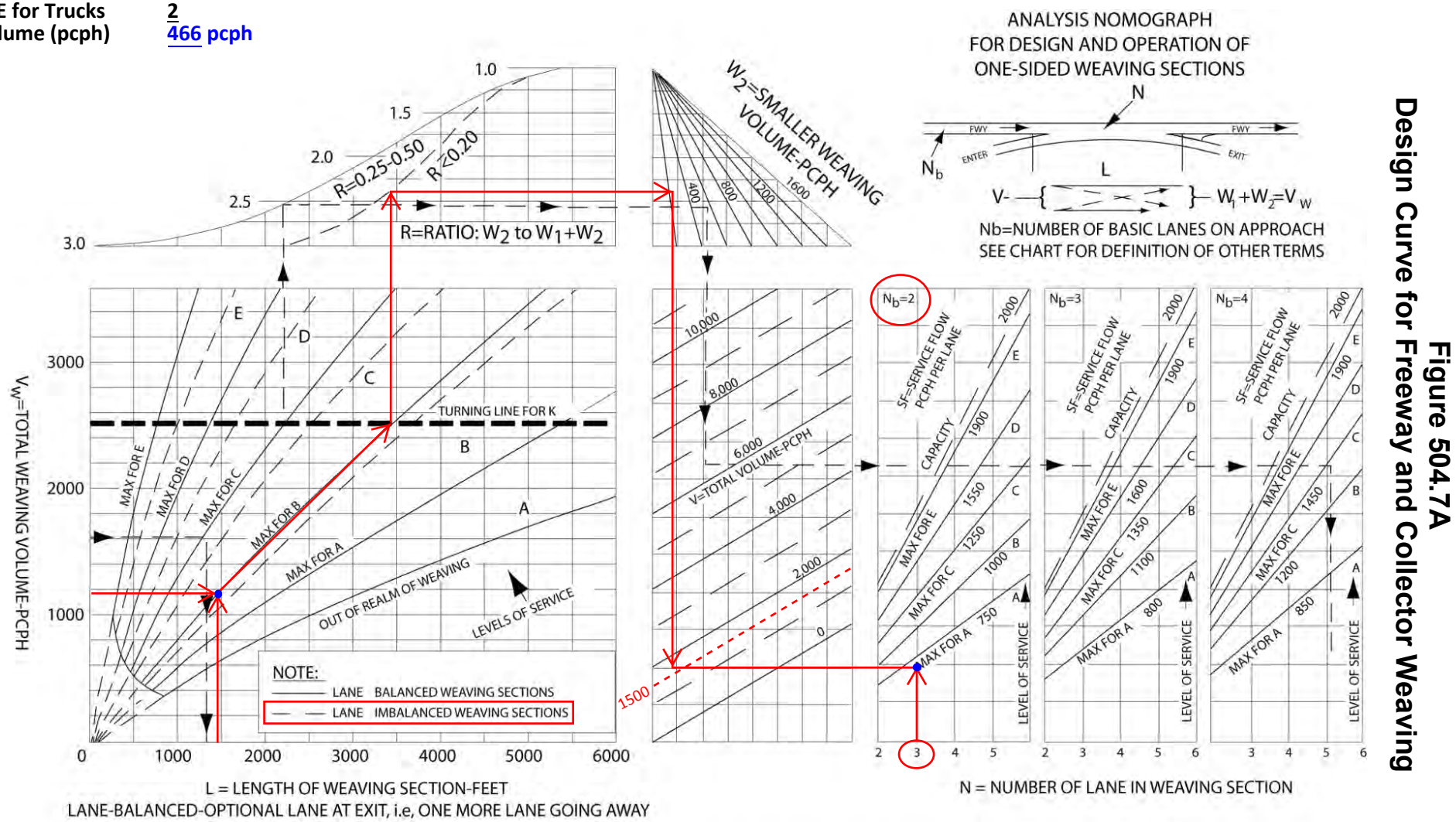

Figure 504.7A
Design Curve for Freeway and Collector Weaving

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293+School AM US 101 Mainline south of SR 46E - SB (#15)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1284	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.93	Flow Rate (v_P), pc/h/ln	746
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.34
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	11.2
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293+School AM US 101 On Ramp @ Riverside-17th - SB (#16)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	300
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1284	298
Peak Hour Factor (PHF)	0.93	0.94
Total Trucks, %	8.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.980
Flow Rate (v_i), pc/h	1491	323
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.41	0.17

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	17.7
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.325
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.5
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1491	Ramp Junction Speed (S), mi/h	58.5
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1814	Average Density (D), pc/mi/ln	15.5
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293+School AM US 101 Off Ramp @ Riverside/Pine - SB (#17)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	190
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1582	101
Peak Hour Factor (PHF)	0.93	0.82
Total Trucks, %	8.00	5.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.952
Flow Rate (v_i), pc/h	1837	129
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.42	0.07

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	18.3
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.463
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	55.2
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1837	Ramp Junction Speed (S), mi/h	55.2
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	16.6
Level of Service (LOS)	B		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293+School AM US 101 On Ramp @ Spring - SB (#18)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	1330
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1830	1345
Peak Hour Factor (PHF)	0.93	0.91
Total Trucks, %	8.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.980
Flow Rate (v_i), pc/h	2125	1508
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.82	0.80

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	24.9
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.380
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	57.2
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2125	Ramp Junction Speed (S), mi/h	57.2
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3633	Average Density (D), pc/mi/ln	31.8
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293+School AM US 101 Mainline north of SR 46W - SB (#19)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	3175	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.93	Flow Rate (v_P), pc/h/ln	1844
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.83
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	59.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	30.9
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293+School AM US 101 Off Ramp @ SR 46W - SB (#20)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	210
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3175	542
Peak Hour Factor (PHF)	0.93	0.89
Total Trucks, %	8.00	6.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943
Flow Rate (v_i), pc/h	3687	646
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.84	0.34

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	34.1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.510
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.0
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3687	Ramp Junction Speed (S), mi/h	54.0
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	34.1
Level of Service (LOS)	D		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	AM
Project Description	EX+1293+School AM US 101 On Ramp @ SR 46W - SB (#21)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	315
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2633	92
Peak Hour Factor (PHF)	0.93	0.88
Total Trucks, %	8.00	6.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943
Flow Rate (v_i), pc/h	3057	111
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.72	0.06

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	28.2
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.393
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	56.9
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3057	Ramp Junction Speed (S), mi/h	56.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3168	Average Density (D), pc/mi/ln	27.8
Level of Service (LOS)	D		

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Existing Plus 1293-Unit and School Project PM

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293+School PM US 101 Off Ramp @ SR 46W - NB (#1)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	235
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2756	114
Peak Hour Factor (PHF)	0.98	0.73
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	2923	158
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.66	0.08

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	27.3
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.466
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	55.1
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2923	Ramp Junction Speed (S), mi/h	55.1
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	26.5
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293+School PM US 101 On Ramp @ SR 46W - NB (#2)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	345
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2642	786
Peak Hour Factor (PHF)	0.98	0.92
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	2802	863
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.83	0.46

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	31.6
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.450
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	55.5
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2802	Ramp Junction Speed (S), mi/h	55.5
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3665	Average Density (D), pc/mi/ln	33.0
Level of Service (LOS)	D		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293+School PM US 101 Mainline north of SR 46W - NB (#3)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	3428	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor (PHF)	0.98	Flow Rate (v_P), pc/h/ln	1818
Total Trucks, %	4.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.81
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	60.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	30.0
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293+School PM US 101 Off Ramp @ Spring - NB (#4)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	195
Terrain Type	Rolling	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3428	1484
Peak Hour Factor (PHF)	0.98	0.98
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.990
Flow Rate (v_i), pc/h	3777	1530
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.86	0.81

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	35.0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.589
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	52.1
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3777	Ramp Junction Speed (S), mi/h	52.1
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	36.2
Level of Service (LOS)	D		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293+School PM US 101 Off Ramp @ Paso Robles - NB (#5)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	270
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1944	561
Peak Hour Factor (PHF)	0.98	0.95
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	2062	596
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.47	0.32

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	19.6
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.505
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.1
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2062	Ramp Junction Speed (S), mi/h	54.1
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	19.1
Level of Service (LOS)	B		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293+School PM US 101 On Ramp @ Paso Robles - NB (#6)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	400
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1383	336
Peak Hour Factor (PHF)	0.98	0.96
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	1467	354
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.41	0.19

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	17.1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.319
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1467	Ramp Junction Speed (S), mi/h	58.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1821	Average Density (D), pc/mi/ln	15.5
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information

Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293+School PM US 101 Mainline south of SR 46E - NB (#7)		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	1719	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor (PHF)	0.98	Flow Rate (v_P), pc/h/ln	912
Total Trucks, %	4.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.41
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	13.5
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information

Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293+School PM US 101 Off Ramp @ SR 46E - NB (#8)		

Geometric Data

	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	225
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i), veh/h	1719	947
Peak Hour Factor (PHF)	0.98	0.96
Total Trucks, %	4.00	3.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.971
Flow Rate (v_i), pc/h	1823	1016
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.41	0.54

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	17.9
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.543
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	53.2
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1823	Ramp Junction Speed (S), mi/h	53.2
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	17.1
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293+School PM US 101 On Ramp @ SR 46E - NB (#9)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	405
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	772	263
Peak Hour Factor (PHF)	0.86	0.86
Total Trucks, %	12.00	12.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.893	0.893
Flow Rate (v_i), pc/h	1005	342
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.31	0.18

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	13.4
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.309
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.9
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1005	Ramp Junction Speed (S), mi/h	58.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1347	Average Density (D), pc/mi/ln	11.4
Level of Service (LOS)	B		

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HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293+School PM US 101 Mainline north of SR 46E - NB (#10)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1035	Heavy Vehicle Adjustment Factor (f_{HV})	0.893
Peak Hour Factor (PHF)	0.86	Flow Rate (v_P), pc/h/ln	674
Total Trucks, %	12.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.30
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	10.0
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293+School PM US 101 Mainline north of SR 46E - SB (#11)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1414	Heavy Vehicle Adjustment Factor (f_{HV})	0.826
Peak Hour Factor (PHF)	0.92	Flow Rate (v_P), pc/h/ln	930
Total Trucks, %	21.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.42
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	13.9
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293+School PM US 101 Off Ramp @ SR 46E - SB (#12)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	155
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1414	365
Peak Hour Factor (PHF)	0.92	0.94
Total Trucks, %	21.00	21.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.826	0.826
Flow Rate (v_i), pc/h	1861	470
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.42	0.25

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	18.9
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.494
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.4
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1861	Ramp Junction Speed (S), mi/h	54.4
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	17.1
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

On-ramp to Mainline (W1)

Volume (vph)	992 vph
Truck %	4%
PCE for Trucks	2
Volume (pcph)	1032 pcph

Mainline to Off-Ramp (W2)

Volume (vph)	303 vph
Truck %	1%
PCE for Trucks	2
Volume (pcph)	306 pcph

Mainline to Mainline

Volume (vph)	746 vph
Truck %	21%
PCE for Trucks	2
Volume (pcph)	903 pcph

903 pcph

W2 = 306 pcph

W1 = 1032 pcph

0 pcph

L = 1475 feet

N = 3 lanes

N_b = 2 lanes

Lane Imbalanced

V_w = 2240 pcph

V_w = 1338 pcph

R = 0.23

W1 = 1032 pcph

W2 = 306 pcph

Existing Plus 1293 Unit and School Project PM (US 101 Weave)

On Ramp: SR 46E (#13)

Off Ramp: Riverside Ave-17th St (#14)

Direction: South

Peak Hour: PM

Project: Olsen-Chandler SP

Results

Weave LOS = C

Total Volume LOS = B

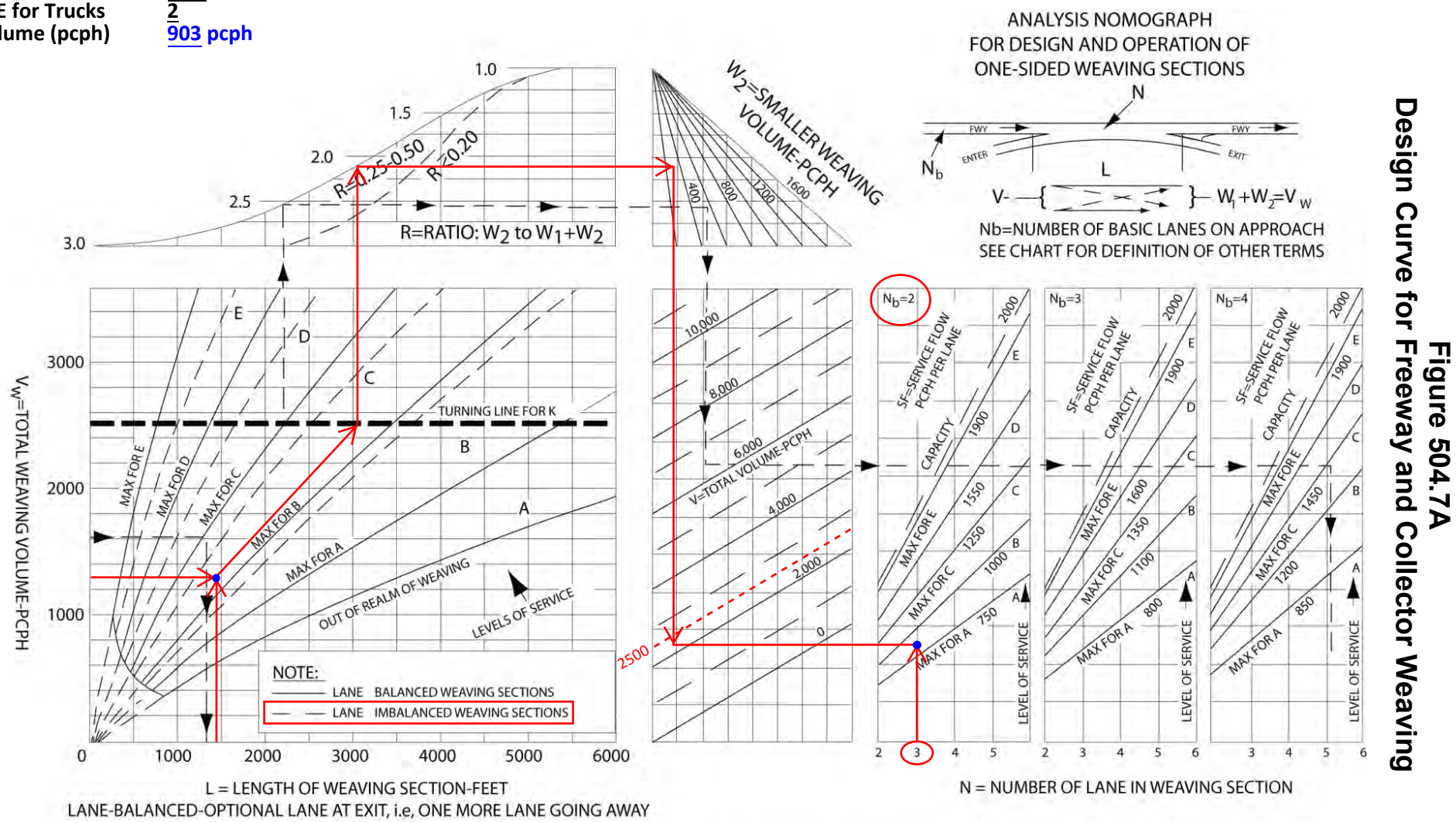

Figure 504.7A
Design Curve for Freeway and Collector Weaving

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293+School PM US 101 Mainline south of SR 46E - SB (#15)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1738	Heavy Vehicle Adjustment Factor (f_{HV})	0.943
Peak Hour Factor (PHF)	0.92	Flow Rate (v_P), pc/h/ln	1002
Total Trucks, %	6.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.45
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	15.0
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293+School PM US 101 On Ramp @ Riverside-17th - SB (#16)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	300
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1738	205
Peak Hour Factor (PHF)	0.92	0.85
Total Trucks, %	6.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.990
Flow Rate (v_i), pc/h	2003	244
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.51	0.13

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	21.1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.338
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.2
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2003	Ramp Junction Speed (S), mi/h	58.2
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2247	Average Density (D), pc/mi/ln	19.3
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293+School PM US 101 Off Ramp @ Riverside/Pine - SB (#17)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	190
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1943	141
Peak Hour Factor (PHF)	0.92	0.77
Total Trucks, %	6.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.990
Flow Rate (v_i), pc/h	2240	185
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.51	0.10

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	21.8
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.468
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	55.0
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2240	Ramp Junction Speed (S), mi/h	55.0
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	20.4
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293+School PM US 101 On Ramp @ Spring - SB (#18)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	1330
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2152	987
Peak Hour Factor (PHF)	0.92	0.90
Total Trucks, %	6.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.990
Flow Rate (v_i), pc/h	2481	1108
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.81	0.59

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	24.7
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.374
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	57.3
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2481	Ramp Junction Speed (S), mi/h	57.3
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3589	Average Density (D), pc/mi/ln	31.3
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293+School PM US 101 Mainline north of SR 46W - SB (#19)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	3139	Heavy Vehicle Adjustment Factor (f_{HV})	0.943
Peak Hour Factor (PHF)	0.92	Flow Rate (v_P), pc/h/ln	1809
Total Trucks, %	6.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.81
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	60.5
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	29.9
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293+School PM US 101 Off Ramp @ SR 46W - SB (#20)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	210
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3139	543
Peak Hour Factor (PHF)	0.92	0.90
Total Trucks, %	6.00	3.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.971
Flow Rate (v_i), pc/h	3618	621
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.82	0.33

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	33.5
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.507
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.1
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3618	Ramp Junction Speed (S), mi/h	54.1
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	33.4
Level of Service (LOS)	D		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	2019
Jurisdiction		Time Period Analyzed	PM
Project Description	EX+1293+School PM US 101 On Ramp @ SR 46W - SB (#21)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	315
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2596	146
Peak Hour Factor (PHF)	0.92	0.83
Total Trucks, %	6.00	3.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.971
Flow Rate (v_i), pc/h	2992	181
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.72	0.10

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	28.2
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.393
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	56.9
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2992	Ramp Junction Speed (S), mi/h	56.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3173	Average Density (D), pc/mi/ln	27.9
Level of Service (LOS)	D		

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Near Term AM

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT AM US 101 Off Ramp @ SR 46W - NB (#1)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	235
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors	Balanced Mix	Balanced Mix
Driver Population		
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity			
Demand Volume (V_i), veh/h	2284	250	
Peak Hour Factor (PHF)	0.94	0.94	
Total Trucks, %	8.00	6.00	
Single-Unit Trucks (SUT), %	-	-	
Tractor-Trailers (TT), %	-	-	
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943	
Flow Rate (v_i), pc/h	2624	282	
Capacity (c), pc/h	4413	1878	
Volume-to-Capacity Ratio (v/c)	0.59	0.15	

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	24.7
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.477
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.8
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2624	Ramp Junction Speed (S), mi/h	54.8
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	23.9
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT AM US 101 On Ramp @ SR 46W - NB (#2)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	345
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors	Balanced Mix	Balanced Mix
Driver Population		
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity			
Demand Volume (V_i), veh/h	2034	461	
Peak Hour Factor (PHF)	0.94	0.94	
Total Trucks, %	8.00	6.00	
Single-Unit Trucks (SUT), %	-	-	
Tractor-Trailers (TT), %	-	-	
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943	
Flow Rate (v_i), pc/h	2337	520	
Capacity (c), pc/h	4413	1878	
Volume-to-Capacity Ratio (v/c)	0.65	0.28	

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	25.4
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.366
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	57.5
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2337	Ramp Junction Speed (S), mi/h	57.5
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2857	Average Density (D), pc/mi/ln	24.8
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT AM US 101 Mainline north of SR 46W - NB (#3)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	2495	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	1433
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.64
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.4
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	21.6
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT AM US 101 Off Ramp @ Spring - NB (#4)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	195
Terrain Type	Rolling	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2495	849
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.862	0.980
Flow Rate (v_i), pc/h	3079	922
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.70	0.49

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	29.0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.534
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	53.4
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3079	Ramp Junction Speed (S), mi/h	53.4
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	28.8
Level of Service (LOS)	D		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT AM US 101 Off Ramp @ Paso Robles - NB (#5)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	270
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1646	342
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.990
Flow Rate (v_i), pc/h	1891	368
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.43	0.20

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	18.1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.485
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.6
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1891	Ramp Junction Speed (S), mi/h	54.6
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	17.3
Level of Service (LOS)	B		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT AM US 101 On Ramp @ Paso Robles - NB (#6)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	400
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1304	405
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.990
Flow Rate (v_i), pc/h	1498	435
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.44	0.23

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	17.9
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.321
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.6
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1498	Ramp Junction Speed (S), mi/h	58.6
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1933	Average Density (D), pc/mi/ln	16.5
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT AM US 101 Mainline south of SR 46E - NB (#7)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1709	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	982
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.44
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	14.5
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT AM US 101 Off Ramp @ SR 46E - NB (#8)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	225
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1709	1017
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	5.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.952
Flow Rate (v_i), pc/h	1963	1136
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.44	0.60

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	19.1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.554
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	52.9
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1963	Ramp Junction Speed (S), mi/h	52.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	18.6
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT AM US 101 On Ramp @ SR 46E - NB (#9)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	405
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	692	287
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	18.00	18.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.847	0.847
Flow Rate (v_i), pc/h	869	360
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.28	0.19

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	12.4
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.307
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	59.0
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	869	Ramp Junction Speed (S), mi/h	59.0
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1229	Average Density (D), pc/mi/ln	10.4
Level of Service (LOS)	B		

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HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT AM US 101 Mainline north of SR 46E - NB (#10)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	979	Heavy Vehicle Adjustment Factor (f_{HV})	0.847
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	615
Total Trucks, %	18.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.28
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	9.1
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT AM US 101 Mainline north of SR 46E - SB (#11)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	908	Heavy Vehicle Adjustment Factor (f_{HV})	0.840
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	575
Total Trucks, %	19.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.26
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	8.6
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT AM US 101 Off Ramp @ SR 46E - SB (#12)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	155
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	908	264
Peak Hour Factor (PHF)	0.94	0.95
Total Trucks, %	19.00	19.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.840	0.840
Flow Rate (v_i), pc/h	1150	331
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.26	0.18

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	12.7
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.481
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1150	Ramp Junction Speed (S), mi/h	54.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	10.5
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

On-ramp to Mainline (W1)

Volume (vph)	1104 vph
Truck %	7%
PCE for Trucks	2
Volume (pcph)	1181 pcph

Mainline to Off-Ramp (W2)

Volume (vph)	218 vph
Truck %	0%
PCE for Trucks	2
Volume (pcph)	218 pcph

Mainline to Mainline

Volume (vph)	426 vph
Truck %	19%
PCE for Trucks	2
Volume (pcph)	507 pcph

507 pcph

W2 = 218 pcph

W1 = 1181 pcph

0 pcph

V_w = 1906 pcph

V_w = 1399 pcph

R = 0.16

W1 = 1181 pcph

W2 = 218 pcph

L = 1475 feet

N = 3 lanes

N_b = 2 lanes

Lane Imbalanced

Near Term AM (US 101 Weave)

On Ramp: SR 46E (#13)

Off Ramp: Riverside Ave-17th St (#14)

Direction: South

Peak Hour: AM

Project: Olsen-Chandler SP

Results

Weave LOS = C

Total Volume LOS = A

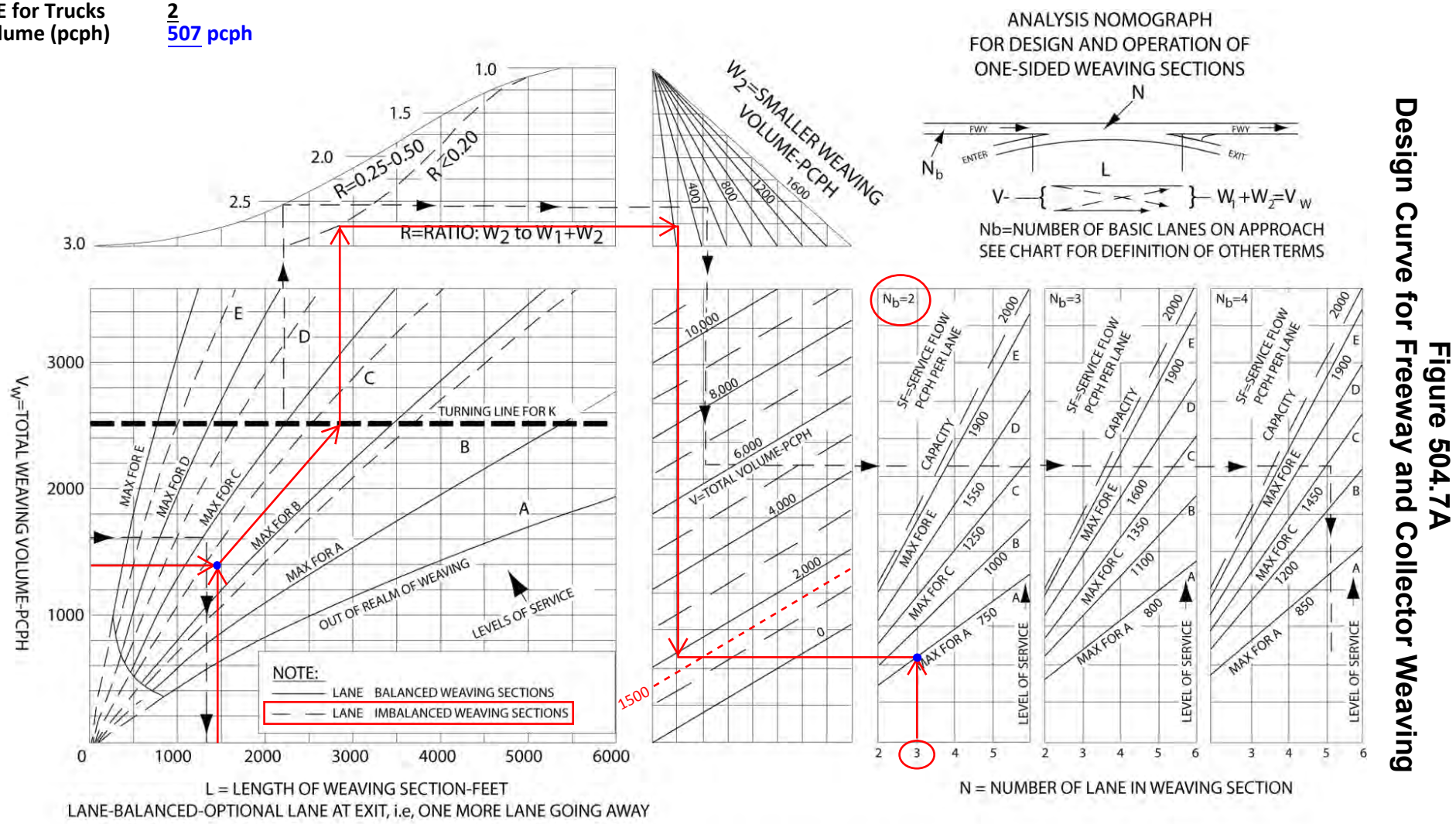

Figure 504.7A
Design Curve for Freeway and Collector Weaving

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT AM US 101 Mainline south of SR 46E - SB (#15)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1530	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	879
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.40
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	13.1
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT AM US 101 On Ramp @ Riverside-17th - SB (#16)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	300
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1530	298
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.980
Flow Rate (v_i), pc/h	1758	323
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.47	0.17

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	19.7
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.332
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.4
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1758	Ramp Junction Speed (S), mi/h	58.4
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2081	Average Density (D), pc/mi/ln	17.8
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT AM US 101 Off Ramp @ Riverside/Pine - SB (#17)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	190
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1828	119
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	5.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.952
Flow Rate (v_i), pc/h	2100	133
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.48	0.07

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	20.6
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.463
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	55.2
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2100	Ramp Junction Speed (S), mi/h	55.2
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	19.0
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT AM US 101 On Ramp @ Spring - SB (#18)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	1330
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2089	1285
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.980
Flow Rate (v_i), pc/h	2400	1395
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.86	0.74

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	26.2
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.406
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	56.6
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2400	Ramp Junction Speed (S), mi/h	56.6
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3795	Average Density (D), pc/mi/ln	33.5
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT AM US 101 Mainline north of SR 46W - SB (#19)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	3374	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	1938
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.87
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	57.6
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	33.6
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT AM US 101 Off Ramp @ SR 46W - SB (#20)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	210
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3374	640
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	6.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943
Flow Rate (v_i), pc/h	3876	722
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.88	0.38

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	35.7
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.516
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	53.9
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3876	Ramp Junction Speed (S), mi/h	53.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	36.0
Level of Service (LOS)	E		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT AM US 101 On Ramp @ SR 46W - SB (#21)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	315
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2734	139
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	6.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943
Flow Rate (v_i), pc/h	3141	157
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.75	0.08

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	29.2
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.406
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	56.6
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3141	Ramp Junction Speed (S), mi/h	56.6
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3298	Average Density (D), pc/mi/ln	29.1
Level of Service (LOS)	D		

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Near Term PM

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT PM US 101 Off Ramp @ SR 46W - NB (#1)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	235
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3036	232
Peak Hour Factor (PHF)	0.98	0.94
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	3220	249
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.73	0.13

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	29.8
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.474
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.9
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3220	Ramp Junction Speed (S), mi/h	54.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	29.3
Level of Service (LOS)	D		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT PM US 101 On Ramp @ SR 46W - NB (#2)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	345
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2804	858
Peak Hour Factor (PHF)	0.98	0.94
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	2974	922
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.88	0.49

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	33.3
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.490
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	54.5
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2974	Ramp Junction Speed (S), mi/h	54.5
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3896	Average Density (D), pc/mi/ln	35.7
Level of Service (LOS)	D		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT PM US 101 Mainline north of SR 46W - NB (#3)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	3662	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor (PHF)	0.98	Flow Rate (v_P), pc/h/ln	1942
Total Trucks, %	4.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.87
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	57.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	33.5
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT PM US 101 Off Ramp @ Spring - NB (#4)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	195
Terrain Type	Rolling	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3662	1474
Peak Hour Factor (PHF)	0.98	0.98
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.990
Flow Rate (v_i), pc/h	4035	1519
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.91	0.81

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	37.2
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.588
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	52.1
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	4035	Ramp Junction Speed (S), mi/h	52.1
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	38.7
Level of Service (LOS)	E		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT PM US 101 Off Ramp @ Paso Robles - NB (#5)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	270
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2188	578
Peak Hour Factor (PHF)	0.98	0.95
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	2321	615
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.53	0.33

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	21.8
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.507
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.1
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2321	Ramp Junction Speed (S), mi/h	54.1
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	21.5
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT PM US 101 On Ramp @ Paso Robles - NB (#6)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	400
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1610	350
Peak Hour Factor (PHF)	0.98	0.96
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	1708	368
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.47	0.20

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	19.1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.326
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.5
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1708	Ramp Junction Speed (S), mi/h	58.5
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2076	Average Density (D), pc/mi/ln	17.7
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT PM US 101 Mainline south of SR 46E - NB (#7)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1960	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor (PHF)	0.98	Flow Rate (v_P), pc/h/ln	1040
Total Trucks, %	4.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.47
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	15.4
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT PM US 101 Off Ramp @ SR 46E - NB (#8)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	225
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1960	1140
Peak Hour Factor (PHF)	0.98	0.96
Total Trucks, %	4.00	3.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.971
Flow Rate (v_i), pc/h	2079	1223
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.47	0.65

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	20.1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.561
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	52.8
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2079	Ramp Junction Speed (S), mi/h	52.8
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	19.7
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT PM US 101 On Ramp @ SR 46E - NB (#9)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	405
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	820	273
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	12.00	12.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.893	0.893
Flow Rate (v_i), pc/h	977	325
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.30	0.17

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	13.0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.308
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	59.0
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	977	Ramp Junction Speed (S), mi/h	59.0
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1302	Average Density (D), pc/mi/ln	11.0
Level of Service (LOS)	B		

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HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT PM US 101 Mainline north of SR 46E - NB (#10)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1093	Heavy Vehicle Adjustment Factor (f_{HV})	0.893
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	651
Total Trucks, %	12.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.29
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	9.6
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT PM US 101 Mainline north of SR 46E - SB (#11)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1457	Heavy Vehicle Adjustment Factor (f_{HV})	0.826
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	938
Total Trucks, %	21.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.42
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	14.0
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT PM US 101 Off Ramp @ SR 46E - SB (#12)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	155
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1457	346
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	21.00	21.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.826	0.826
Flow Rate (v_i), pc/h	1877	446
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.43	0.24

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	19.0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.492
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.4
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1877	Ramp Junction Speed (S), mi/h	54.4
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	17.3
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

On-ramp to Mainline (W1)

Volume (vph)	1150 vph
Truck %	4%
PCE for Trucks	2
Volume (pcph)	1196 pcph

Mainline to Off-Ramp (W2)

Volume (vph)	303 vph
Truck %	1%
PCE for Trucks	2
Volume (pcph)	306 pcph

Mainline to Mainline

Volume (vph)	808 vph
Truck %	21%
PCE for Trucks	2
Volume (pcph)	978 pcph

978 pcph

W2 = 306 pcph

W1 = 1196 pcph

0 pcph

V = 2480 pcph

V_w = 1502 pcph

R = 0.20

W1 = 1196 pcph

W2 = 306 pcph

L = 1475 feet

N = 3 lanes

N_b = 2 lanes

Lane Imbalanced

Near Term PM (US 101 Weave)

On Ramp: SR 46E (#13)

Off Ramp: Riverside Ave-17th St (#14)

Direction: South

Peak Hour: PM

Project: Olsen-Chandler SP

Results

Weave LOS = C

Total Volume LOS = B

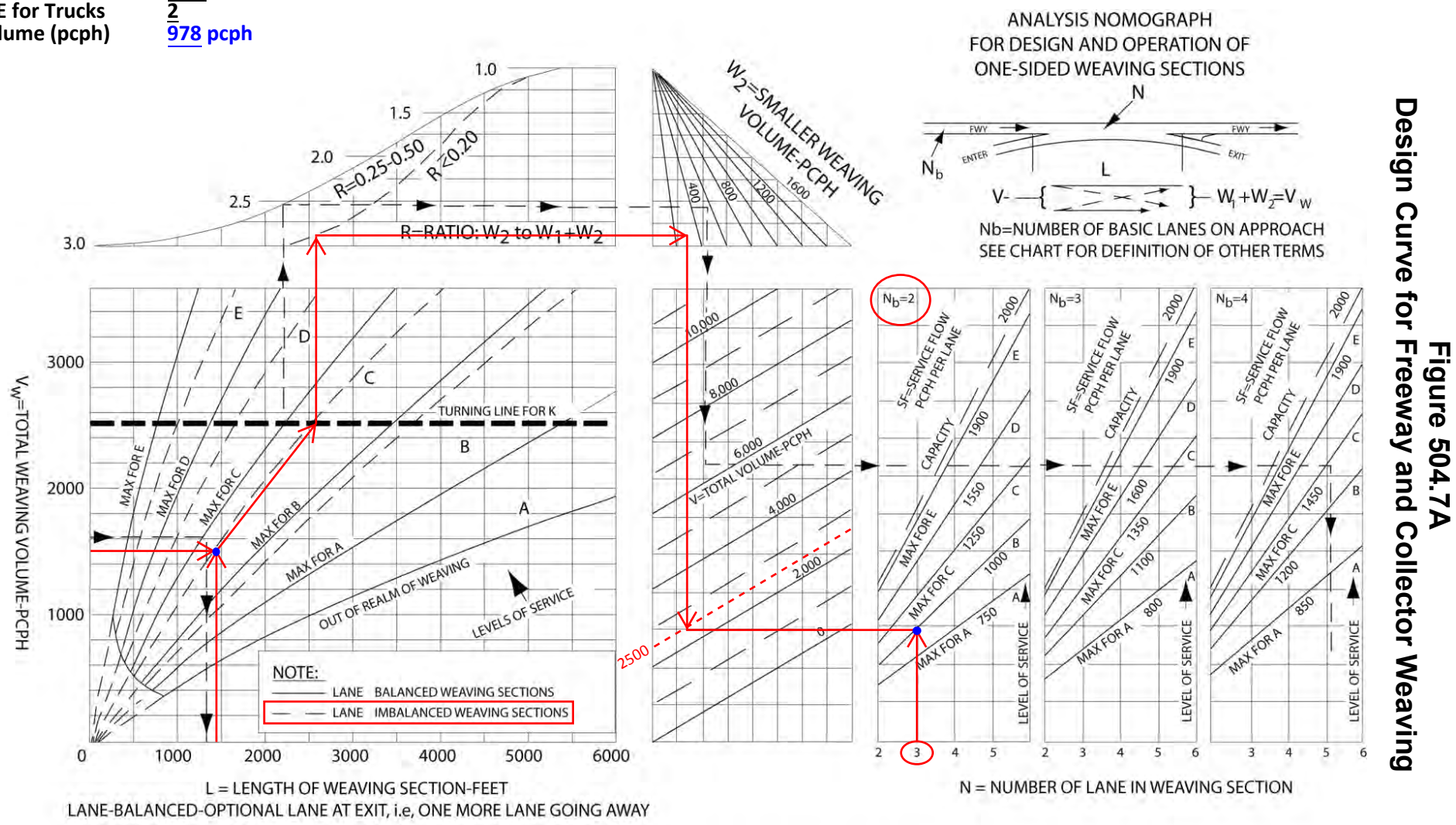

Figure 504.7A
Design Curve for Freeway and Collector Weaving

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT PM US 101 Mainline south of SR 46E - SB (#15)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1958	Heavy Vehicle Adjustment Factor (f_{HV})	0.943
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	1104
Total Trucks, %	6.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.50
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	16.5
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT PM US 101 On Ramp @ Riverside-17th - SB (#16)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	300
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1958	205
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	6.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.990
Flow Rate (v_i), pc/h	2209	220
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.55	0.12

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	22.5
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.345
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.0
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2209	Ramp Junction Speed (S), mi/h	58.0
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2429	Average Density (D), pc/mi/ln	20.9
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT PM US 101 Off Ramp @ Riverside/Pine - SB (#17)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	190
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2163	182
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	6.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.990
Flow Rate (v_i), pc/h	2440	196
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.55	0.10

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	23.5
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.469
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	55.0
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2440	Ramp Junction Speed (S), mi/h	55.0
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	22.2
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT PM US 101 On Ramp @ Spring - SB (#18)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	1330
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2373	1011
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	6.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.990
Flow Rate (v_i), pc/h	2677	1086
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.85	0.58

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	26.1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.401
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	56.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2677	Ramp Junction Speed (S), mi/h	56.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3763	Average Density (D), pc/mi/ln	33.2
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT PM US 101 Mainline north of SR 46W - SB (#19)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	3384	Heavy Vehicle Adjustment Factor (f_{HV})	0.943
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	1909
Total Trucks, %	6.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.86
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	58.3
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	32.7
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT PM US 101 Off Ramp @ SR 46W - SB (#20)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	210
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3384	643
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	6.00	3.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.971
Flow Rate (v_i), pc/h	3818	704
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.87	0.37

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	35.2
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.515
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	53.9
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3818	Ramp Junction Speed (S), mi/h	53.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	35.4
Level of Service (LOS)	E		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Merge Report

Project Information

Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT PM US 101 On Ramp @ SR 46W - SB (#21)		

Geometric Data

	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	315
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i), veh/h	2741	211
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	6.00	3.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.971
Flow Rate (v_i), pc/h	3092	231
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.75	0.12

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	29.4
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.408
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	56.5
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3092	Ramp Junction Speed (S), mi/h	56.5
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3323	Average Density (D), pc/mi/ln	29.4
Level of Service (LOS)	D		

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Reso A - Exhibit C2 (EIR Technical Appendix)

Near Term Plus 1293-Unit Project AM

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293 AM US 101 Off Ramp @ SR 46W - NB (#1)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	235
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2318	250
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	6.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943
Flow Rate (v_i), pc/h	2663	282
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.60	0.15

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	25.0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.477
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.8
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2663	Ramp Junction Speed (S), mi/h	54.8
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	24.3
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293 AM US 101 On Ramp @ SR 46W - NB (#2)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	345
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2068	470
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	6.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943
Flow Rate (v_i), pc/h	2376	530
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.66	0.28

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	25.8
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.369
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	57.5
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2376	Ramp Junction Speed (S), mi/h	57.5
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2906	Average Density (D), pc/mi/ln	25.3
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293 AM US 101 Mainline north of SR 46W - NB (#3)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	2538	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	1458
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.65
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.2
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	22.0
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293 AM US 101 Off Ramp @ Spring - NB (#4)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	195
Terrain Type	Rolling	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2538	892
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.862	0.980
Flow Rate (v_i), pc/h	3132	968
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.71	0.52

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	29.4
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.539
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	53.3
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3132	Ramp Junction Speed (S), mi/h	53.3
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	29.4
Level of Service (LOS)	D		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293 AM US 101 Off Ramp @ Paso Robles - NB (#5)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	270
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1646	342
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.990
Flow Rate (v_i), pc/h	1891	368
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.43	0.20

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	18.1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.485
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.6
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1891	Ramp Junction Speed (S), mi/h	54.6
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	17.3
Level of Service (LOS)	B		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293 AM US 101 On Ramp @ Paso Robles - NB (#6)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	400
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1304	418
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.990
Flow Rate (v_i), pc/h	1498	449
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.44	0.24

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	18.0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.322
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.6
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1498	Ramp Junction Speed (S), mi/h	58.6
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1947	Average Density (D), pc/mi/ln	16.6
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293 AM US 101 Mainline south of SR 46E - NB (#7)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1722	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	989
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.44
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	14.6
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293 AM US 101 Off Ramp @ SR 46E - NB (#8)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	225
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1722	1017
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	5.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.952
Flow Rate (v_i), pc/h	1978	1136
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.45	0.60

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	19.2
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.554
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	52.9
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1978	Ramp Junction Speed (S), mi/h	52.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	18.7
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293 AM US 101 On Ramp @ SR 46E - NB (#9)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	405
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	705	307
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	18.00	18.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.847	0.847
Flow Rate (v_i), pc/h	885	386
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.29	0.21

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	12.7
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.308
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	59.0
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	885	Ramp Junction Speed (S), mi/h	59.0
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1271	Average Density (D), pc/mi/ln	10.8
Level of Service (LOS)	B		

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HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293 AM US 101 Mainline north of SR 46E - NB (#10)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1012	Heavy Vehicle Adjustment Factor (f_{HV})	0.847
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	636
Total Trucks, %	18.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.28
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	9.4
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293 AM US 101 Mainline north of SR 46E - SB (#11)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	923	Heavy Vehicle Adjustment Factor (f_{HV})	0.840
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	584
Total Trucks, %	19.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.26
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	8.7
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293 AM US 101 Off Ramp @ SR 46E - SB (#12)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	155
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	923	275
Peak Hour Factor (PHF)	0.94	0.95
Total Trucks, %	19.00	19.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.840	0.840
Flow Rate (v_i), pc/h	1169	345
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.26	0.18

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	12.9
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.482
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1169	Ramp Junction Speed (S), mi/h	54.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	10.7
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

On-ramp to Mainline (W1)

Volume (vph)	1104 vph
Truck %	7%
PCE for Trucks	2
Volume (pcph)	1181 pcph

Mainline to Off-Ramp (W2)

Volume (vph)	218 vph
Truck %	0%
PCE for Trucks	2
Volume (pcph)	218 pcph

Mainline to Mainline

Volume (vph)	430 vph
Truck %	19%
PCE for Trucks	2
Volume (pcph)	512 pcph

512 pcph

W2 = 218 pcph

W1 = 1181 pcph

0 pcph

V_1 = 1911 pcph

V_w = 1399 pcph

R = 0.16

W1 = 1181 pcph

W2 = 218 pcph

L = 1475 feet

N = 3 lanes

N_b = 2 lanes

Lane Imbalanced

Near Term Plus 1293 Unit Project AM (US 101 Weave)

On Ramp: SR 46E (#13)

Off Ramp: Riverside Ave-17th St (#14)

Direction: South

Peak Hour: AM

Project: Olsen-Chandler SP

Results

Weave LOS = C

Total Volume LOS = A

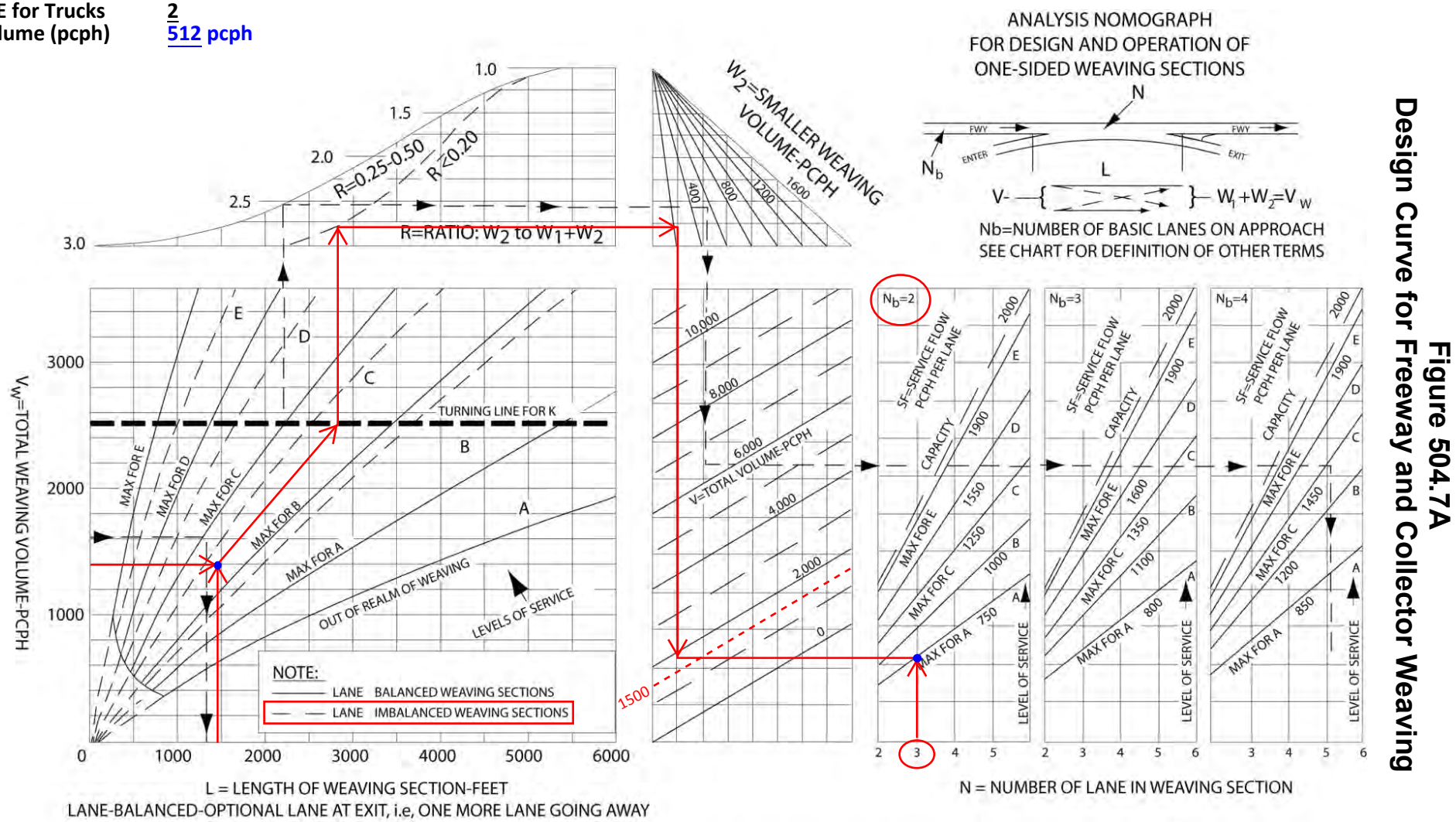

Figure 504.7A
Design Curve for Freeway and Collector Weaving

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293 AM US 101 Mainline south of SR 46E - SB (#15)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1534	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	881
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.40
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	13.2
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293 AM US 101 On Ramp @ Riverside-17th - SB (#16)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	300
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1534	298
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.980
Flow Rate (v_i), pc/h	1762	323
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.47	0.17

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	19.8
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.332
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.4
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1762	Ramp Junction Speed (S), mi/h	58.4
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2085	Average Density (D), pc/mi/ln	17.9
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293 AM US 101 Off Ramp @ Riverside/Pine - SB (#17)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	190
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1832	123
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	5.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.952
Flow Rate (v_i), pc/h	2105	137
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.48	0.07

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	20.6
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.464
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	55.1
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2105	Ramp Junction Speed (S), mi/h	55.1
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	19.1
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293 AM US 101 On Ramp @ Spring - SB (#18)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	1330
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2089	1410
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.980
Flow Rate (v_i), pc/h	2400	1531
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.89	0.82

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	27.2
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.431
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	55.9
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2400	Ramp Junction Speed (S), mi/h	55.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3931	Average Density (D), pc/mi/ln	35.2
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293 AM US 101 Mainline north of SR 46W - SB (#19)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	3499	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	2010
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.90
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	55.8
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	36.0
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293 AM US 101 Off Ramp @ SR 46W - SB (#20)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	210
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3499	666
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	6.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943
Flow Rate (v_i), pc/h	4020	751
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.91	0.40

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	36.9
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.519
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	53.8
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	4020	Ramp Junction Speed (S), mi/h	53.8
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	37.4
Level of Service (LOS)	E		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293 AM US 101 On Ramp @ SR 46W - SB (#21)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	315
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2833	139
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	6.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943
Flow Rate (v_i), pc/h	3255	157
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.77	0.08

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	30.1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.418
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	56.3
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3255	Ramp Junction Speed (S), mi/h	56.3
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3412	Average Density (D), pc/mi/ln	30.3
Level of Service (LOS)	D		

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Reso A - Exhibit C2 (EIR Technical Appendix)

Near Term Plus 1293-Unit Project PM

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293 PM US 101 Off Ramp @ SR 46W - NB (#1)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	235
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3145	232
Peak Hour Factor (PHF)	0.98	0.94
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	3336	249
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.76	0.13

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	30.8
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.474
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.9
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3336	Ramp Junction Speed (S), mi/h	54.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	30.4
Level of Service (LOS)	D		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293 PM US 101 On Ramp @ SR 46W - NB (#2)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	345
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2913	888
Peak Hour Factor (PHF)	0.98	0.94
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	3090	954
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.92	0.51

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	34.5
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.521
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	53.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3090	Ramp Junction Speed (S), mi/h	53.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	4044	Average Density (D), pc/mi/ln	37.7
Level of Service (LOS)	D		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293 PM US 101 Mainline north of SR 46W - NB (#3)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	3801	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor (PHF)	0.98	Flow Rate (v_P), pc/h/ln	2016
Total Trucks, %	4.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.90
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	56.0
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	36.0
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293 PM US 101 Off Ramp @ Spring - NB (#4)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	195
Terrain Type	Rolling	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3801	1613
Peak Hour Factor (PHF)	0.98	0.98
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.990
Flow Rate (v_i), pc/h	4189	1663
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.95	0.89

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	38.5
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.601
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	51.8
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	4189	Ramp Junction Speed (S), mi/h	51.8
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	40.4
Level of Service (LOS)	E		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293 PM US 101 Off Ramp @ Paso Robles - NB (#5)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	270
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2188	578
Peak Hour Factor (PHF)	0.98	0.95
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	2321	615
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.53	0.33

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	21.8
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.507
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.1
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2321	Ramp Junction Speed (S), mi/h	54.1
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	21.5
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293 PM US 101 On Ramp @ Paso Robles - NB (#6)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	400
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1610	359
Peak Hour Factor (PHF)	0.98	0.96
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	1708	378
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.47	0.20

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	19.1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.326
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.5
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1708	Ramp Junction Speed (S), mi/h	58.5
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2086	Average Density (D), pc/mi/ln	17.8
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293 PM US 101 Mainline south of SR 46E - NB (#7)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1969	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor (PHF)	0.98	Flow Rate (v_P), pc/h/ln	1044
Total Trucks, %	4.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.47
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	15.4
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293 PM US 101 Off Ramp @ SR 46E - NB (#8)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	225
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1969	1140
Peak Hour Factor (PHF)	0.98	0.96
Total Trucks, %	4.00	3.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.971
Flow Rate (v_i), pc/h	2089	1223
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.47	0.65

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	20.2
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.561
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	52.8
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2089	Ramp Junction Speed (S), mi/h	52.8
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	19.8
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293 PM US 101 On Ramp @ SR 46E - NB (#9)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	405
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	829	286
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	12.00	12.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.893	0.893
Flow Rate (v_i), pc/h	988	341
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.30	0.18

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	13.2
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.309
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.9
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	988	Ramp Junction Speed (S), mi/h	58.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1329	Average Density (D), pc/mi/ln	11.3
Level of Service (LOS)	B		

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HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293 PM US 101 Mainline north of SR 46E - NB (#10)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1115	Heavy Vehicle Adjustment Factor (f_{HV})	0.893
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	664
Total Trucks, %	12.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.30
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	9.8
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293 PM US 101 Mainline north of SR 46E - SB (#11)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1507	Heavy Vehicle Adjustment Factor (f_{HV})	0.826
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	970
Total Trucks, %	21.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.44
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	14.5
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293 PM US 101 Off Ramp @ SR 46E - SB (#12)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	155
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1507	382
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	21.00	21.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.826	0.826
Flow Rate (v_i), pc/h	1941	492
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.44	0.26

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	19.5
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.496
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.3
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1941	Ramp Junction Speed (S), mi/h	54.3
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	17.9
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

On-ramp to Mainline (W1)

Volume (vph)	1150 vph
Truck %	4%
PCE for Trucks	2
Volume (pcph)	1196 pcph

Mainline to Off-Ramp (W2)

Volume (vph)	303 vph
Truck %	1%
PCE for Trucks	2
Volume (pcph)	306 pcph

Mainline to Mainline

Volume (vph)	822 vph
Truck %	21%
PCE for Trucks	2
Volume (pcph)	995 pcph

995 pcph

W2 = 306 pcph

W1 = 1196 pcph

0 pcph

L = 1475 feet

N = 3 lanes

N_b = 2 lanes

Lane Imbalanced

V_w = 2497 pcph

V_w = 1502 pcph

R = 0.20

W1 = 1196 pcph

W2 = 306 pcph

Near Term Plus 1293 Unit Project PM (US 101 Weave)

On Ramp: SR 46E (#13)

Off Ramp: Riverside Ave-17th St (#14)

Direction: South

Peak Hour: PM

Project: Olsen-Chandler SP

Results

Weave LOS = C

Total Volume LOS = B

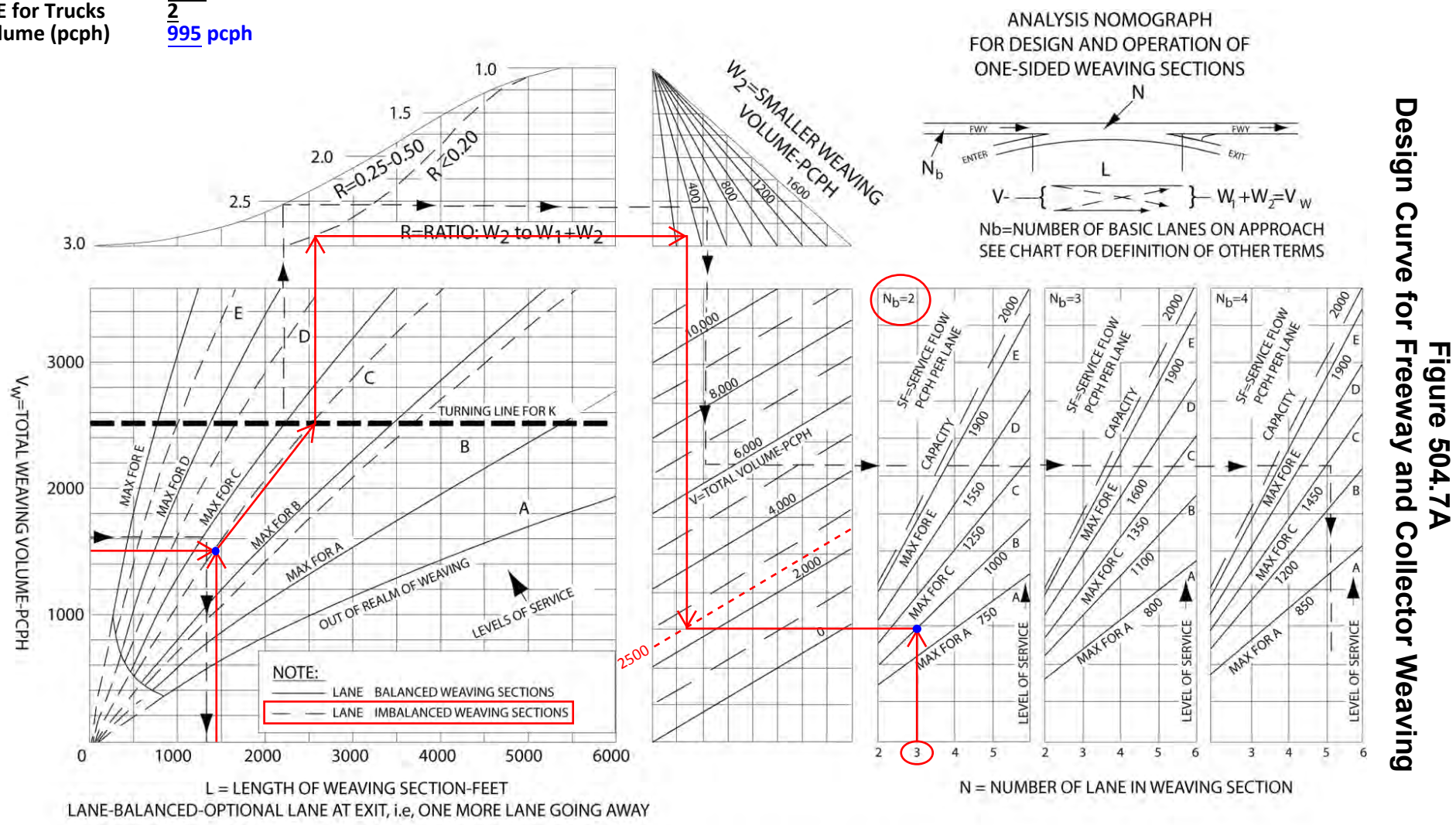

Figure 504.7A
Design Curve for Freeway and Collector Weaving

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293 PM US 101 Mainline south of SR 46E - SB (#15)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1972	Heavy Vehicle Adjustment Factor (f_{HV})	0.943
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	1112
Total Trucks, %	6.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.50
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	16.6
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293 PM US 101 On Ramp @ Riverside-17th - SB (#16)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	300
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1972	205
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	6.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.990
Flow Rate (v_i), pc/h	2225	220
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.55	0.12

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	22.6
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.346
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.0
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2225	Ramp Junction Speed (S), mi/h	58.0
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2445	Average Density (D), pc/mi/ln	21.1
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293 PM US 101 Off Ramp @ Riverside/Pine - SB (#17)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	190
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2177	196
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	6.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.990
Flow Rate (v_i), pc/h	2456	211
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.56	0.11

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	23.7
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.470
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	55.0
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2456	Ramp Junction Speed (S), mi/h	55.0
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	22.3
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293 PM US 101 On Ramp @ Spring - SB (#18)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	1330
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2373	1096
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	6.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.990
Flow Rate (v_i), pc/h	2677	1178
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.87	0.63

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	26.7
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.417
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	56.3
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2677	Ramp Junction Speed (S), mi/h	56.3
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3855	Average Density (D), pc/mi/ln	34.2
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293 PM US 101 Mainline north of SR 46W - SB (#19)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	3469	Heavy Vehicle Adjustment Factor (f_{HV})	0.943
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	1956
Total Trucks, %	6.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.88
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	57.2
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	34.2
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293 PM US 101 Off Ramp @ SR 46W - SB (#20)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	210
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3469	661
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	6.00	3.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.971
Flow Rate (v_i), pc/h	3913	724
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.89	0.39

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	36.0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.517
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	53.8
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3913	Ramp Junction Speed (S), mi/h	53.8
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	36.4
Level of Service (LOS)	E		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293 PM US 101 On Ramp @ SR 46W - SB (#21)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	315
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2808	211
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	6.00	3.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.971
Flow Rate (v_i), pc/h	3168	231
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.77	0.12

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	30.0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.417
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	56.3
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3168	Ramp Junction Speed (S), mi/h	56.3
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3399	Average Density (D), pc/mi/ln	30.2
Level of Service (LOS)	D		

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Near Term Plus 1293-Unit and School Project AM

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293+School AM US 101 Off Ramp @ SR 46W - NB (#1)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	235
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2345	250
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	6.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943
Flow Rate (v_i), pc/h	2694	282
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.61	0.15

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	25.3
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.477
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.8
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2694	Ramp Junction Speed (S), mi/h	54.8
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	24.6
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293+School AM US 101 On Ramp @ SR 46W - NB (#2)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	345
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2095	477
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	6.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943
Flow Rate (v_i), pc/h	2407	538
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.67	0.29

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	26.1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.372
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	57.4
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2407	Ramp Junction Speed (S), mi/h	57.4
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2945	Average Density (D), pc/mi/ln	25.7
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293+School AM US 101 Mainline north of SR 46W - NB (#3)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	2572	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	1478
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.66
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.0
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	22.4
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293+School AM US 101 Off Ramp @ Spring - NB (#4)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	195
Terrain Type	Rolling	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2572	926
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.862	0.980
Flow Rate (v_i), pc/h	3174	1005
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.72	0.54

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	29.8
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.542
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	53.2
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3174	Ramp Junction Speed (S), mi/h	53.2
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	29.8
Level of Service (LOS)	D		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293+School AM US 101 Off Ramp @ Paso Robles - NB (#5)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	270
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1646	342
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.990
Flow Rate (v_i), pc/h	1891	368
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.43	0.20

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	18.1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.485
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.6
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1891	Ramp Junction Speed (S), mi/h	54.6
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	17.3
Level of Service (LOS)	B		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293+School AM US 101 On Ramp @ Paso Robles - NB (#6)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	400
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1304	421
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.990
Flow Rate (v_i), pc/h	1498	452
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.44	0.24

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	18.0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.322
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.6
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1498	Ramp Junction Speed (S), mi/h	58.6
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1950	Average Density (D), pc/mi/ln	16.6
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293+School AM US 101 Mainline south of SR 46E - NB (#7)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1725	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	991
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.44
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	14.6
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293+School AM US 101 Off Ramp @ SR 46E - NB (#8)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	225
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1725	1017
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	5.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.952
Flow Rate (v_i), pc/h	1982	1136
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.45	0.60

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	19.3
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.554
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	52.9
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1982	Ramp Junction Speed (S), mi/h	52.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	18.7
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Merge Report

Project Information

Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293+School AM US 101 On Ramp @ SR 46E - NB (#9)		

Geometric Data

	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	405
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

	Balanced Mix	Balanced Mix
Driver Population		
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i), veh/h	708	311	
Peak Hour Factor (PHF)	0.94	0.94	
Total Trucks, %	18.00	18.00	
Single-Unit Trucks (SUT), %	-	-	
Tractor-Trailers (TT), %	-	-	
Heavy Vehicle Adjustment Factor (f_{HV})	0.847	0.847	
Flow Rate (v_i), pc/h	889	391	
Capacity (c), pc/h	4413	1878	
Volume-to-Capacity Ratio (v/c)	0.29	0.21	

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	12.8
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.308
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	59.0
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	889	Ramp Junction Speed (S), mi/h	59.0
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1280	Average Density (D), pc/mi/ln	10.8
Level of Service (LOS)	B		

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HCS7 Basic Freeway Report

Project Information

Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293+School AM US 101 Mainline north of SR 46E - NB (#10)		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	1019	Heavy Vehicle Adjustment Factor (f_{HV})	0.847
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	640
Total Trucks, %	18.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.29
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	9.5
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293+School AM US 101 Mainline north of SR 46E - SB (#11)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	936	Heavy Vehicle Adjustment Factor (f_{HV})	0.840
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	592
Total Trucks, %	19.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.27
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	8.8
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293+School AM US 101 Off Ramp @ SR 46E - SB (#12)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	155
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	936	284
Peak Hour Factor (PHF)	0.94	0.95
Total Trucks, %	19.00	19.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.840	0.840
Flow Rate (v_i), pc/h	1185	356
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.27	0.19

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	13.0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.483
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1185	Ramp Junction Speed (S), mi/h	54.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	10.8
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

On-ramp to Mainline (W1)

Volume (vph)	1104 vph
Truck %	7%
PCE for Trucks	2
Volume (pcph)	1181 pcph

Mainline to Off-Ramp (W2)

Volume (vph)	218 vph
Truck %	0%
PCE for Trucks	2
Volume (pcph)	218 pcph

Mainline to Mainline

Volume (vph)	434 vph
Truck %	19%
PCE for Trucks	2
Volume (pcph)	516 pcph

516 pcph

W2 = 218 pcph

W1 = 1181 pcph

0 pcph

V_o = 1916 pcph

V_w = 1399 pcph

R = 0.16

W1 = 1181 pcph

W2 = 218 pcph

L = 1475 feet

N = 3 lanes

N_b = 2 lanes

Lane Imbalanced

Near Term Plus 1293 Unit and School Project AM (US 101 Weave)

On Ramp: SR 46E (#13)

Off Ramp: Riverside Ave-17th St (#14)

Direction: South

Peak Hour: AM

Project: Olsen-Chandler SP

Results

Weave LOS = C

Total Volume LOS = B

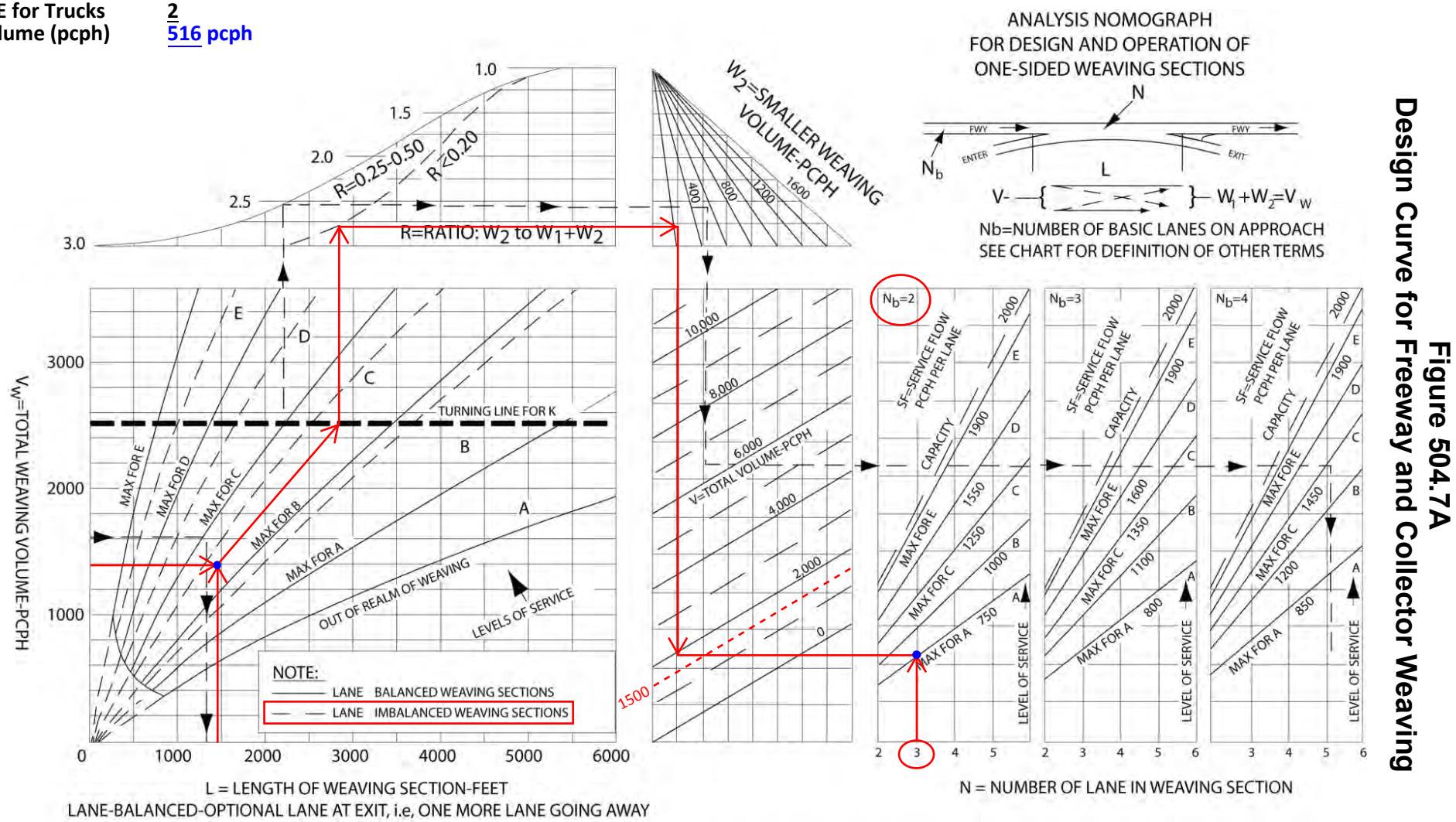

Figure 504.7A
Design Curve for Freeway and Collector Weaving

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293+School AM US 101 Mainline south of SR 46E - SB (#15)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1538	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	884
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.40
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	13.2
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293+School AM US 101 On Ramp @ Riverside-17th - SB (#16)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	300
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1538	298
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.980
Flow Rate (v_i), pc/h	1767	323
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.47	0.17

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	19.8
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.333
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.3
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1767	Ramp Junction Speed (S), mi/h	58.3
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2090	Average Density (D), pc/mi/ln	17.9
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293+School AM US 101 Off Ramp @ Riverside/Pine - SB (#17)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	190
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1836	127
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	5.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.952
Flow Rate (v_i), pc/h	2109	142
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.48	0.08

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	20.7
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.464
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	55.1
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2109	Ramp Junction Speed (S), mi/h	55.1
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	19.1
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293+School AM US 101 On Ramp @ Spring - SB (#18)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	1330
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2089	1440
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.980
Flow Rate (v_i), pc/h	2400	1563
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.90	0.83

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	27.4
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.438
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	55.8
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2400	Ramp Junction Speed (S), mi/h	55.8
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3963	Average Density (D), pc/mi/ln	35.5
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293+School AM US 101 Mainline north of SR 46W - SB (#19)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	3529	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	2027
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.91
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	55.3
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	36.7
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293+School AM US 101 Off Ramp @ SR 46W - SB (#20)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	210
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3529	672
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	6.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943
Flow Rate (v_i), pc/h	4054	758
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.92	0.40

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	37.2
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.520
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	53.8
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	4054	Ramp Junction Speed (S), mi/h	53.8
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	37.7
Level of Service (LOS)	E		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	NT+1293+School AM US 101 On Ramp @ SR 46W - SB (#21)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	315
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2857	139
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	6.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943
Flow Rate (v_i), pc/h	3282	157
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.78	0.08

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	30.3
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.422
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	56.2
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3282	Ramp Junction Speed (S), mi/h	56.2
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3439	Average Density (D), pc/mi/ln	30.6
Level of Service (LOS)	D		

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Reso A - Exhibit C2 (EIR Technical Appendix)

Near Term Plus 1293-Unit and School Project PM

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293+School PM US 101 Off Ramp @ SR 46W - NB (#1)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	235
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3152	232
Peak Hour Factor (PHF)	0.98	0.94
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	3343	249
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.76	0.13

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	30.9
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.474
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.9
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3343	Ramp Junction Speed (S), mi/h	54.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	30.4
Level of Service (LOS)	D		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293+School PM US 101 On Ramp @ SR 46W - NB (#2)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	345
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2920	889
Peak Hour Factor (PHF)	0.98	0.94
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	3097	955
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.92	0.51

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	34.6
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.522
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	53.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3097	Ramp Junction Speed (S), mi/h	53.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	4052	Average Density (D), pc/mi/ln	37.7
Level of Service (LOS)	D		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293+School PM US 101 Mainline north of SR 46W - NB (#3)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	3809	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor (PHF)	0.98	Flow Rate (v_P), pc/h/ln	2020
Total Trucks, %	4.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.91
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	55.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	36.1
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293+School PM US 101 Off Ramp @ Spring - NB (#4)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	195
Terrain Type	Rolling	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3809	1621
Peak Hour Factor (PHF)	0.98	0.98
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.990
Flow Rate (v_i), pc/h	4197	1671
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.95	0.89

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	38.6
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.602
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	51.8
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	4197	Ramp Junction Speed (S), mi/h	51.8
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	40.5
Level of Service (LOS)	E		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293+School PM US 101 Off Ramp @ Paso Robles - NB (#5)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	270
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2188	578
Peak Hour Factor (PHF)	0.98	0.95
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	2321	615
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.53	0.33

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	21.8
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.507
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.1
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2321	Ramp Junction Speed (S), mi/h	54.1
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	21.5
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293+School PM US 101 On Ramp @ Paso Robles - NB (#6)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	400
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1610	360
Peak Hour Factor (PHF)	0.98	0.96
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	1708	379
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.47	0.20

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	19.1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.326
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.5
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1708	Ramp Junction Speed (S), mi/h	58.5
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2087	Average Density (D), pc/mi/ln	17.8
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information

Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293+School PM US 101 Mainline south of SR 46E - NB (#7)		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	1970	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor (PHF)	0.98	Flow Rate (v_P), pc/h/ln	1045
Total Trucks, %	4.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.47
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	15.4
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information

Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293+School PM US 101 Off Ramp @ SR 46E - NB (#8)		

Geometric Data

	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	225
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i), veh/h	1970	1140
Peak Hour Factor (PHF)	0.98	0.96
Total Trucks, %	4.00	3.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.971
Flow Rate (v_i), pc/h	2090	1223
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.47	0.65

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	20.2
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.561
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	52.8
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2090	Ramp Junction Speed (S), mi/h	52.8
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	19.8
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293+School PM US 101 On Ramp @ SR 46E - NB (#9)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	405
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	830	287
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	12.00	12.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.893	0.893
Flow Rate (v_i), pc/h	989	342
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.30	0.18

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	13.2
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.309
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.9
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	989	Ramp Junction Speed (S), mi/h	58.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1331	Average Density (D), pc/mi/ln	11.3
Level of Service (LOS)	B		

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HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293+School PM US 101 Mainline north of SR 46E - NB (#10)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1117	Heavy Vehicle Adjustment Factor (f_{HV})	0.893
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	666
Total Trucks, %	12.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.30
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	9.8
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293+School PM US 101 Mainline north of SR 46E - SB (#11)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1510	Heavy Vehicle Adjustment Factor (f_{HV})	0.826
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	972
Total Trucks, %	21.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.44
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	14.5
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293+School PM US 101 Off Ramp @ SR 46E - SB (#12)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	155
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1510	384
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	21.00	21.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.826	0.826
Flow Rate (v_i), pc/h	1945	495
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.44	0.26

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	19.6
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.496
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.3
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1945	Ramp Junction Speed (S), mi/h	54.3
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	17.9
Level of Service (LOS)	B		

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On-ramp to Mainline (W1)

Volume (vph)	1150 vph
Truck %	4%
PCE for Trucks	2
Volume (pcph)	1196 pcph

Mainline to Off-Ramp (W2)

Volume (vph)	303 vph
Truck %	1%
PCE for Trucks	2
Volume (pcph)	306 pcph

Mainline to Mainline

Volume (vph)	823 vph
Truck %	21%
PCE for Trucks	2
Volume (pcph)	996 pcph

~~Reso A - Exhibit C2~~ (EIR Technical Appendix)

996 pcph

W2 = 306 pcph

W1 = 1196 pcph

0 pcph

L = 1475 feet

N = 3 lanes

N_b = 2 lanes

Lane Imbalanced

V = 2498 pcph

V_w = 1502 pcph

R = 0.20

W1 = 1196 pcph

W2 = 306 pcph

Near Term Plus 1293 Unit and School Project PM (US 101 Weave)

On Ramp: SR 46E (#13)

Off Ramp: Riverside Ave-17th St (#14)

Direction: South

Peak Hour: PM

Project: Olsen-Chandler SP

Results

Weave LOS = C

Total Volume LOS = B

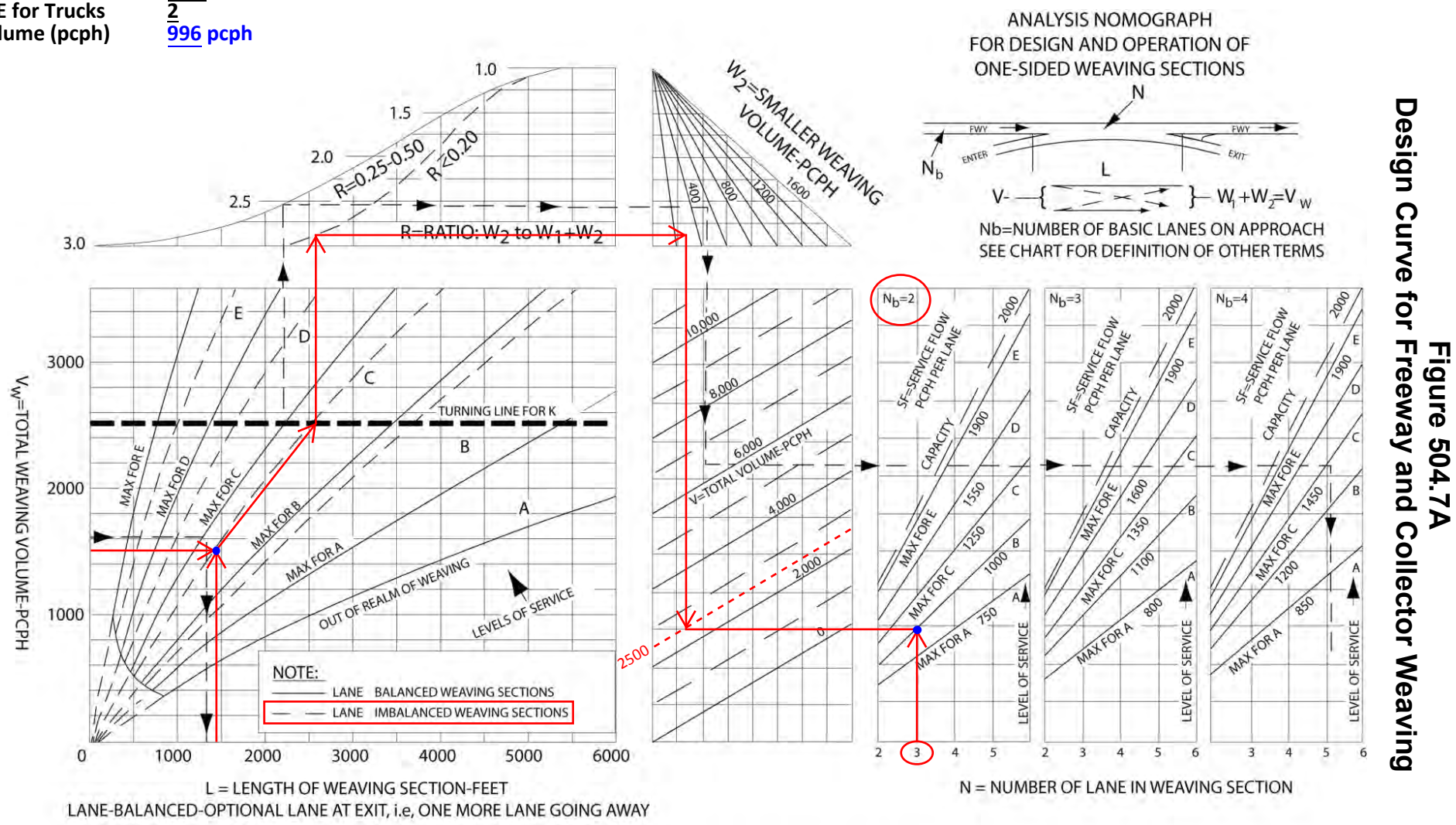

Figure 504.7A
Design Curve for Freeway and Collector Weaving

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293+School PM US 101 Mainline south of SR 46E - SB (#15)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1973	Heavy Vehicle Adjustment Factor (f_{HV})	0.943
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	1113
Total Trucks, %	6.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.50
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	16.6
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293+School PM US 101 On Ramp @ Riverside-17th - SB (#16)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	300
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1973	205
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	6.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.990
Flow Rate (v_i), pc/h	2226	220
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.55	0.12

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	22.6
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.346
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.0
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2226	Ramp Junction Speed (S), mi/h	58.0
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2446	Average Density (D), pc/mi/ln	21.1
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293+School PM US 101 Off Ramp @ Riverside/Pine - SB (#17)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	190
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2178	197
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	6.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.990
Flow Rate (v_i), pc/h	2457	212
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.56	0.11

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	23.7
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.470
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	55.0
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2457	Ramp Junction Speed (S), mi/h	55.0
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	22.3
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293+School PM US 101 On Ramp @ Spring - SB (#18)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	1330
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2373	1104
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	6.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.990
Flow Rate (v_i), pc/h	2677	1186
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.88	0.63

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	26.8
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.418
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	56.3
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2677	Ramp Junction Speed (S), mi/h	56.3
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3863	Average Density (D), pc/mi/ln	34.3
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293+School PM US 101 Mainline north of SR 46W - SB (#19)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	3477	Heavy Vehicle Adjustment Factor (f_{HV})	0.943
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	1962
Total Trucks, %	6.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.88
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	57.0
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	34.4
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293+School PM US 101 Off Ramp @ SR 46W - SB (#20)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	210
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3477	663
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	6.00	3.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.971
Flow Rate (v_i), pc/h	3923	726
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.89	0.39

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	36.1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.517
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	53.8
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3923	Ramp Junction Speed (S), mi/h	53.8
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	36.5
Level of Service (LOS)	E		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	NT+1293+School PM US 101 On Ramp @ SR 46W - SB (#21)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	315
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2814	211
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	6.00	3.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.971
Flow Rate (v_i), pc/h	3175	231
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.77	0.12

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	30.0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.418
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	56.3
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3175	Ramp Junction Speed (S), mi/h	56.3
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3406	Average Density (D), pc/mi/ln	30.2
Level of Service (LOS)	D		

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Cumulative AM

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM AM US 101 Off Ramp @ SR 46W - NB (#1)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	235
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors	Balanced Mix	Balanced Mix
Driver Population		
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity			
Demand Volume (V_i), veh/h	2586	300	
Peak Hour Factor (PHF)	0.94	0.94	
Total Trucks, %	8.00	6.00	
Single-Unit Trucks (SUT), %	-	-	
Tractor-Trailers (TT), %	-	-	
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943	
Flow Rate (v_i), pc/h	2971	338	
Capacity (c), pc/h	4413	1878	
Volume-to-Capacity Ratio (v/c)	0.67	0.18	

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	27.7
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.482
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2971	Ramp Junction Speed (S), mi/h	54.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	27.2
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM AM US 101 On Ramp @ SR 46W - NB (#2)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	345
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors	Balanced Mix	Balanced Mix
Driver Population		
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity			
Demand Volume (V_i), veh/h	2286	571	
Peak Hour Factor (PHF)	0.94	0.94	
Total Trucks, %	8.00	6.00	
Single-Unit Trucks (SUT), %	-	-	
Tractor-Trailers (TT), %	-	-	
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943	
Flow Rate (v_i), pc/h	2626	644	
Capacity (c), pc/h	4413	1878	
Volume-to-Capacity Ratio (v/c)	0.74	0.34	

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	28.6
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.401
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	56.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2626	Ramp Junction Speed (S), mi/h	56.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3270	Average Density (D), pc/mi/ln	28.8
Level of Service (LOS)	D		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM AM US 101 Mainline north of SR 46W - NB (#3)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	2857	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	1641
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.74
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	63.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	25.7
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM AM US 101 Off Ramp @ Spring - NB (#4)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	195
Terrain Type	Rolling	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2857	903
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.862	0.980
Flow Rate (v_i), pc/h	3526	980
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.80	0.52

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	32.8
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.540
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	53.3
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3526	Ramp Junction Speed (S), mi/h	53.3
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	33.1
Level of Service (LOS)	D		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM AM US 101 Off Ramp @ Paso Robles - NB (#5)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	270
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors	Freeway	Ramp
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity	Freeway	Ramp
Demand Volume (V_i), veh/h	1954	423
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.990
Flow Rate (v_i), pc/h	2245	455
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.51	0.24

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	21.1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.492
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.4
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2245	Ramp Junction Speed (S), mi/h	54.4
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	20.6
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM AM US 101 On Ramp @ Paso Robles - NB (#6)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	400
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors	Freeway	Ramp
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity	Freeway	Ramp
Demand Volume (V_i), veh/h	1531	480
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.990
Flow Rate (v_i), pc/h	1759	516
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.52	0.27

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	20.5
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.332
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.4
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1759	Ramp Junction Speed (S), mi/h	58.4
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2275	Average Density (D), pc/mi/ln	19.5
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM AM US 101 Mainline south of SR 46E - NB (#7)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	2011	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	1155
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.52
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	17.1
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM AM US 101 Off Ramp @ SR 46E - NB (#8)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	225
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2011	1164
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	5.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.952
Flow Rate (v_i), pc/h	2310	1301
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.52	0.69

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	22.1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.568
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	52.6
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2310	Ramp Junction Speed (S), mi/h	52.6
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	22.0
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM AM US 101 On Ramp @ SR 46E - NB (#9)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	405
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	847	345
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	18.00	18.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.847	0.847
Flow Rate (v_i), pc/h	1064	433
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.34	0.23

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	14.5
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.312
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.9
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1064	Ramp Junction Speed (S), mi/h	58.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1497	Average Density (D), pc/mi/ln	12.7
Level of Service (LOS)	B		

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HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM AM US 101 Mainline north of SR 46E - NB (#10)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1192	Heavy Vehicle Adjustment Factor (f_{HV})	0.847
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	748
Total Trucks, %	18.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.34
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	11.0
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM AM US 101 Mainline north of SR 46E - SB (#11)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1115	Heavy Vehicle Adjustment Factor (f_{HV})	0.840
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	706
Total Trucks, %	19.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.32
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	10.6
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM AM US 101 Off Ramp @ SR 46E - SB (#12)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	155
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1115	326
Peak Hour Factor (PHF)	0.94	0.95
Total Trucks, %	19.00	19.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.840	0.840
Flow Rate (v_i), pc/h	1412	409
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.32	0.22

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	15.0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.488
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.5
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1412	Ramp Junction Speed (S), mi/h	54.5
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	13.0
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

On-ramp to Mainline (W1)

Volume (vph)	1167 vph
Truck %	7%
PCE for Trucks	2
Volume (pcph)	1249 pcph

Mainline to Off-Ramp (W2)

Volume (vph)	285 vph
Truck %	0%
PCE for Trucks	2
Volume (pcph)	285 pcph

Mainline to Mainline

Volume (vph)	504 vph
Truck %	19%
PCE for Trucks	2
Volume (pcph)	600 pcph

600 pcph

W2 = 285 pcph

W1 = 1249 pcph

0 pcph

V_w = 1534 pcph

R = 0.19

W1 = 1249 pcph

W2 = 285 pcph

L = 1475 feet

N = 3 lanes

N_b = 2 lanes

Lane Imbalanced

Cumulative AM (US 101 Weave)

On Ramp: SR 46E (#13)

Off Ramp: Riverside Ave-17th St (#14)

Direction: South

Peak Hour: AM

Project: Olsen-Chandler SP

Results

Weave LOS = C

Total Volume LOS = B

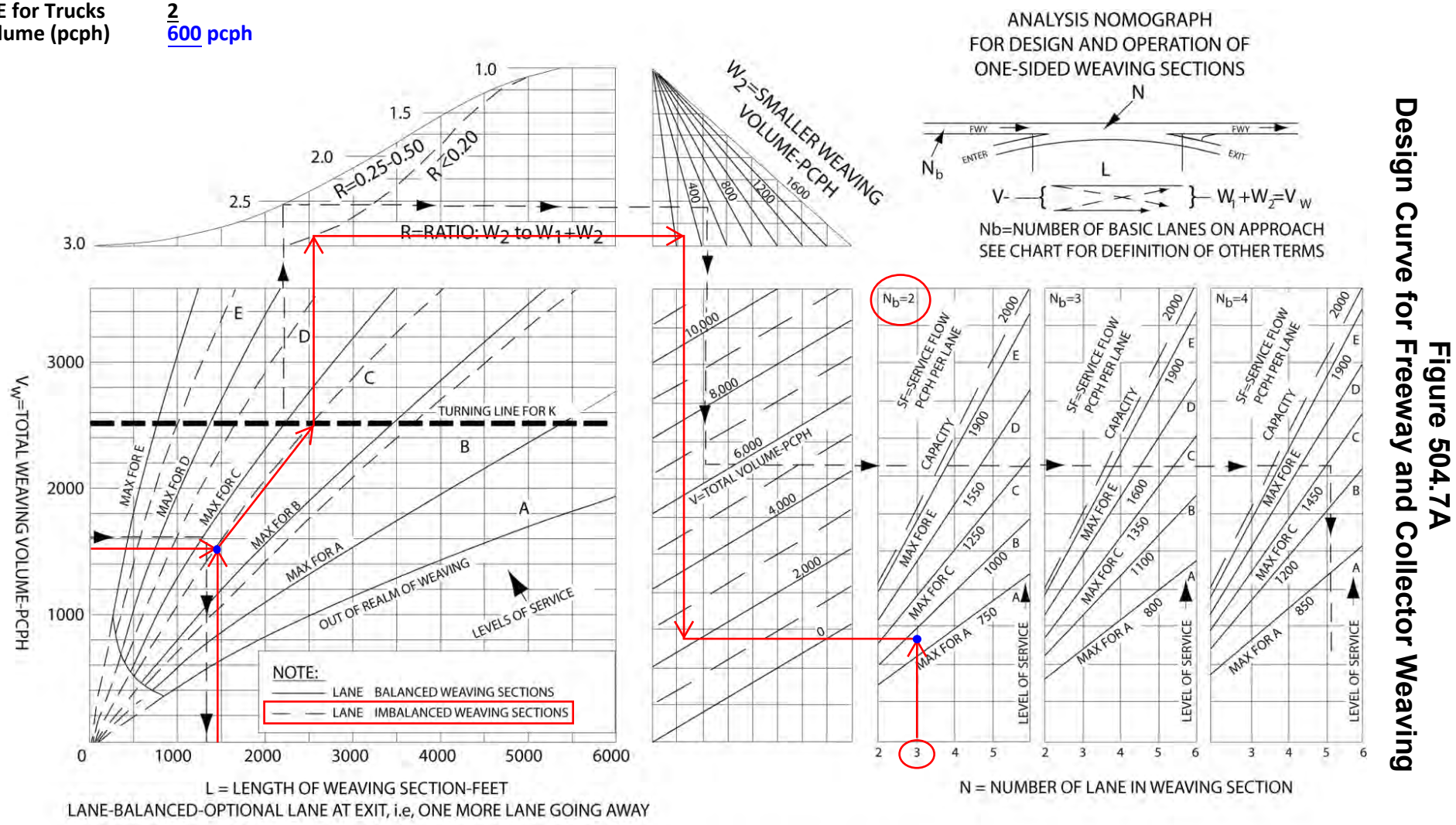

Figure 504.7A
Design Curve for Freeway and Collector Weaving

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM AM US 101 Mainline south of SR 46E - SB (#15)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1671	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	960
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.43
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	14.3
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM AM US 101 On Ramp @ Riverside-17th - SB (#16)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	300
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1671	390
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.980
Flow Rate (v_i), pc/h	1920	423
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.53	0.23

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	21.7
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.342
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.1
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1920	Ramp Junction Speed (S), mi/h	58.1
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2343	Average Density (D), pc/mi/ln	20.2
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM AM US 101 Off Ramp @ Riverside/Pine - SB (#17)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	190
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2061	201
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	5.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.952
Flow Rate (v_i), pc/h	2368	225
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.54	0.12

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	22.9
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.472
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.9
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2368	Ramp Junction Speed (S), mi/h	54.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	21.6
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM AM US 101 On Ramp @ Spring - SB (#18)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	1330
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2249	1316
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.980
Flow Rate (v_i), pc/h	2584	1429
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.91	0.76

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	27.9
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.448
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	55.5
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2584	Ramp Junction Speed (S), mi/h	55.5
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	4013	Average Density (D), pc/mi/ln	36.2
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM AM US 101 Mainline north of SR 46W - SB (#19)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	3565	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	2048
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.92
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	54.8
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	37.4
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM AM US 101 Off Ramp @ SR 46W - SB (#20)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	210
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3565	692
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	6.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943
Flow Rate (v_i), pc/h	4096	781
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.93	0.42

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	37.6
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.522
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	53.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	4096	Ramp Junction Speed (S), mi/h	53.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	38.1
Level of Service (LOS)	E		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM AM US 101 On Ramp @ SR 46W - SB (#21)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	315
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2873	200
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	6.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943
Flow Rate (v_i), pc/h	3301	226
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.80	0.12

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	31.0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.433
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	55.9
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3301	Ramp Junction Speed (S), mi/h	55.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3527	Average Density (D), pc/mi/ln	31.5
Level of Service (LOS)	D		

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Cumulative PM

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM PM US 101 Off Ramp @ SR 46W - NB (#1)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	235
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity			
Demand Volume (V_i), veh/h	3375	300	
Peak Hour Factor (PHF)	0.98	0.94	
Total Trucks, %	4.00	1.00	
Single-Unit Trucks (SUT), %	-	-	
Tractor-Trailers (TT), %	-	-	
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990	
Flow Rate (v_i), pc/h	3580	322	
Capacity (c), pc/h	4413	1878	
Volume-to-Capacity Ratio (v/c)	0.81	0.17	

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	32.9
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.480
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3580	Ramp Junction Speed (S), mi/h	54.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	32.7
Level of Service (LOS)	D		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM PM US 101 On Ramp @ SR 46W - NB (#2)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	345
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity			
Demand Volume (V_i), veh/h	3075	1017	
Peak Hour Factor (PHF)	0.98	0.94	
Total Trucks, %	4.00	1.00	
Single-Unit Trucks (SUT), %	-	-	
Tractor-Trailers (TT), %	-	-	
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990	
Flow Rate (v_i), pc/h	3262	1093	
Capacity (c), pc/h	4413	1878	
Volume-to-Capacity Ratio (v/c)	0.99	0.58	

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	36.9
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.602
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	51.8
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3262	Ramp Junction Speed (S), mi/h	51.8
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	4355	Average Density (D), pc/mi/ln	42.0
Level of Service (LOS)	E		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM PM US 101 Mainline north of SR 46W - NB (#3)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	4092	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor (PHF)	0.98	Flow Rate (v_P), pc/h/ln	2170
Total Trucks, %	4.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.97
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	51.6
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	42.1
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM PM US 101 Off Ramp @ Spring - NB (#4)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	195
Terrain Type	Rolling	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	4092	1579
Peak Hour Factor (PHF)	0.98	0.98
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.990
Flow Rate (v_i), pc/h	4509	1627
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	1.02	0.87

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	-
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	-
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	-
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	4509	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM PM US 101 Off Ramp @ Paso Robles - NB (#5)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	270
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2513	734
Peak Hour Factor (PHF)	0.98	0.95
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	2666	780
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.60	0.42

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	24.7
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.522
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	53.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2666	Ramp Junction Speed (S), mi/h	53.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	24.8
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM PM US 101 On Ramp @ Paso Robles - NB (#6)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	400
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1779	460
Peak Hour Factor (PHF)	0.98	0.96
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	1887	484
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.54	0.26

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	21.3
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.336
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.3
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1887	Ramp Junction Speed (S), mi/h	58.3
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2371	Average Density (D), pc/mi/ln	20.3
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM PM US 101 Mainline south of SR 46E - NB (#7)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	2239	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor (PHF)	0.98	Flow Rate (v_P), pc/h/ln	1188
Total Trucks, %	4.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.53
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	17.5
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM PM US 101 Off Ramp @ SR 46E - NB (#8)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	225
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2239	1239
Peak Hour Factor (PHF)	0.98	0.96
Total Trucks, %	4.00	3.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.971
Flow Rate (v_i), pc/h	2375	1329
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.54	0.71

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	22.7
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.571
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	52.5
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2375	Ramp Junction Speed (S), mi/h	52.5
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	22.6
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM PM US 101 On Ramp @ SR 46E - NB (#9)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	405
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1000	330
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	12.00	12.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.893	0.893
Flow Rate (v_i), pc/h	1191	393
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.36	0.21

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	15.2
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.313
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.8
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1191	Ramp Junction Speed (S), mi/h	58.8
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1584	Average Density (D), pc/mi/ln	13.5
Level of Service (LOS)	B		

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HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM PM US 101 Mainline north of SR 46E - NB (#10)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1330	Heavy Vehicle Adjustment Factor (f_{HV})	0.893
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	792
Total Trucks, %	12.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.35
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	11.7
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM PM US 101 Mainline north of SR 46E - SB (#11)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1791	Heavy Vehicle Adjustment Factor (f_{HV})	0.826
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	1154
Total Trucks, %	21.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.52
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	17.2
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM PM US 101 Off Ramp @ SR 46E - SB (#12)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	155
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1791	434
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	21.00	21.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.826	0.826
Flow Rate (v_i), pc/h	2307	559
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.52	0.30

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	22.7
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.502
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.2
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2307	Ramp Junction Speed (S), mi/h	54.2
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	21.3
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

On-ramp to Mainline (W1)

Volume (vph)	1298 vph
Truck %	4%
PCE for Trucks	2
Volume (pcph)	1350 pcph

Mainline to Off-Ramp (W2)

Volume (vph)	396 vph
Truck %	1%
PCE for Trucks	2
Volume (pcph)	400 pcph

Mainline to Mainline

Volume (vph)	961 vph
Truck %	21%
PCE for Trucks	2
Volume (pcph)	1163 pcph

1163 pcph

W2 = 400 pcph

W1 = 1350 pcph

0 pcph

V = 2913 pcph

V_w = 1750 pcph

R = 0.23

W1 = 1350 pcph

W2 = 400 pcph

L = 1475 feet

N = 3 lanes

N_b = 2 lanes

Lane Imbalanced

Cumulative PM (US 101 Weave)

On Ramp: SR 46E (#13)

Off Ramp: Riverside Ave-17th St (#14)

Direction: South

Peak Hour: PM

Project: Olsen-Chandler SP

Results

Weave LOS = D

Total Volume LOS = C

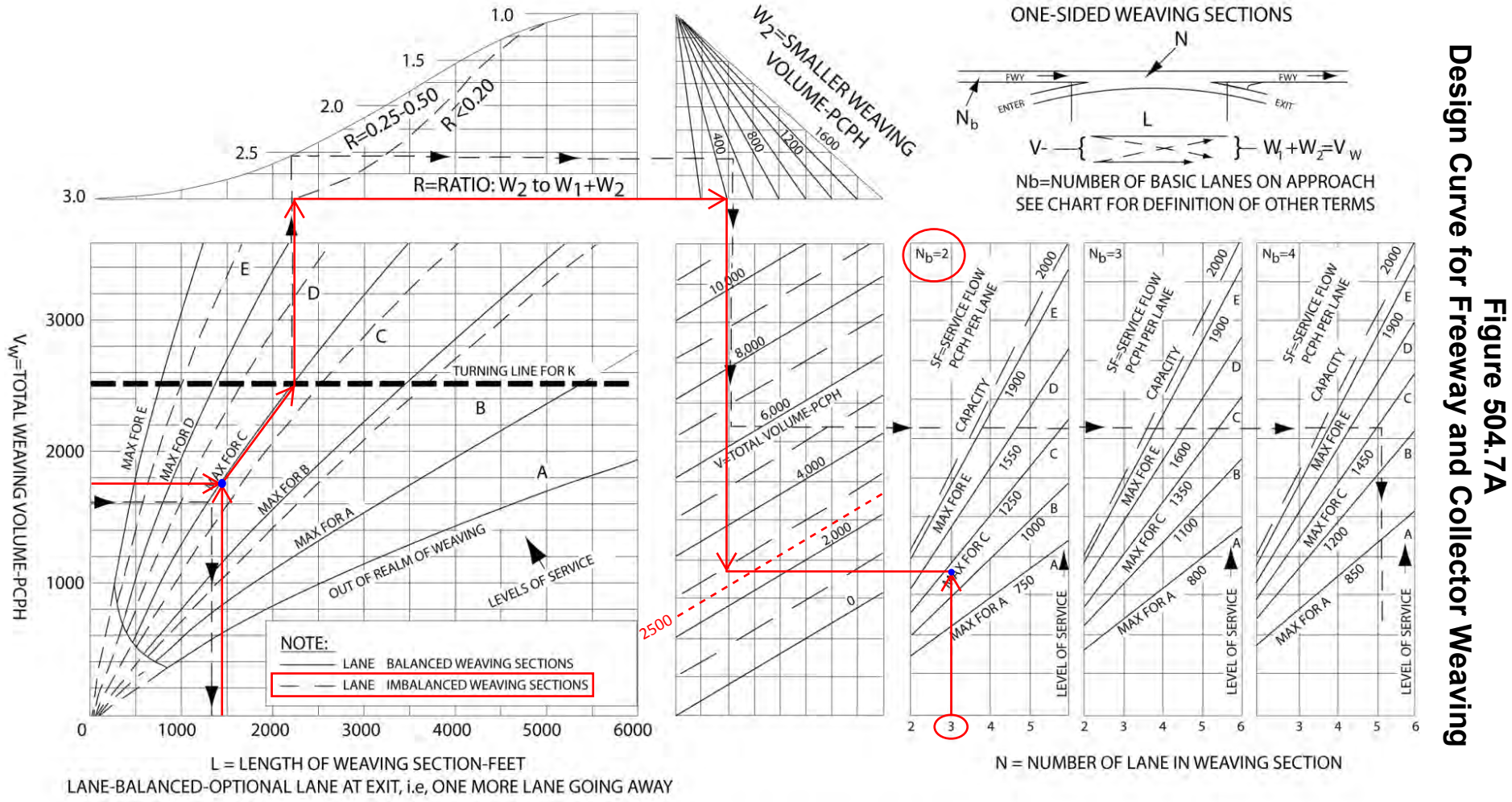

Figure 504.7A
Design Curve for Freeway and Collector Weaving

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM PM US 101 Mainline south of SR 46E - SB (#15)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	2259	Heavy Vehicle Adjustment Factor (f_{HV})	0.943
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	1274
Total Trucks, %	6.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.57
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	19.1
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM PM US 101 On Ramp @ Riverside-17th - SB (#16)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	300
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2259	268
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	6.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.990
Flow Rate (v_i), pc/h	2548	288
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.64	0.15

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	25.7
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.368
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	57.5
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2548	Ramp Junction Speed (S), mi/h	57.5
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2836	Average Density (D), pc/mi/ln	24.7
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM PM US 101 Off Ramp @ Riverside/Pine - SB (#17)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	190
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2527	328
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	6.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.990
Flow Rate (v_i), pc/h	2851	352
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.65	0.19

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	27.1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.483
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2851	Ramp Junction Speed (S), mi/h	54.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	26.1
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM PM US 101 On Ramp @ Spring - SB (#18)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	1330
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2599	1106
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	6.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.990
Flow Rate (v_i), pc/h	2932	1188
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.93	0.63

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	28.8
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.473
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	54.9
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2932	Ramp Junction Speed (S), mi/h	54.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	4120	Average Density (D), pc/mi/ln	37.5
Level of Service (LOS)	D		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM PM US 101 Mainline north of SR 46W - SB (#19)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	3705	Heavy Vehicle Adjustment Factor (f_{HV})	0.943
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	2090
Total Trucks, %	6.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.94
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	53.6
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	39.0
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM PM US 101 Off Ramp @ SR 46W - SB (#20)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	210
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3705	703
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	6.00	3.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.971
Flow Rate (v_i), pc/h	4180	770
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.95	0.41

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	38.3
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.521
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	53.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	4180	Ramp Junction Speed (S), mi/h	53.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	38.9
Level of Service (LOS)	E		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM PM US 101 On Ramp @ SR 46W - SB (#21)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	315
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3002	300
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	6.00	3.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.971
Flow Rate (v_i), pc/h	3387	329
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.84	0.18

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	32.4
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.460
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	55.2
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3387	Ramp Junction Speed (S), mi/h	55.2
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3716	Average Density (D), pc/mi/ln	33.7
Level of Service (LOS)	D		

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Cumulative Plus 1293-Unit Project AM

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293 AM US 101 Off Ramp @ SR 46W - NB (#1)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	235
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity			
Demand Volume (V_i), veh/h	2613	300	
Peak Hour Factor (PHF)	0.94	0.94	
Total Trucks, %	8.00	6.00	
Single-Unit Trucks (SUT), %	-	-	
Tractor-Trailers (TT), %	-	-	
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943	
Flow Rate (v_i), pc/h	3002	338	
Capacity (c), pc/h	4413	1878	
Volume-to-Capacity Ratio (v/c)	0.68	0.18	

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	28.0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.482
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3002	Ramp Junction Speed (S), mi/h	54.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	27.4
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293 AM US 101 On Ramp @ SR 46W - NB (#2)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	345
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity			
Demand Volume (V_i), veh/h	2313	582	
Peak Hour Factor (PHF)	0.94	0.94	
Total Trucks, %	8.00	6.00	
Single-Unit Trucks (SUT), %	-	-	
Tractor-Trailers (TT), %	-	-	
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943	
Flow Rate (v_i), pc/h	2657	657	
Capacity (c), pc/h	4413	1878	
Volume-to-Capacity Ratio (v/c)	0.75	0.35	

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	28.9
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.405
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	56.6
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2657	Ramp Junction Speed (S), mi/h	56.6
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3314	Average Density (D), pc/mi/ln	29.3
Level of Service (LOS)	D		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293 AM US 101 Mainline north of SR 46W - NB (#3)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	2895	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	1663
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.75
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	63.5
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	26.2
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293 AM US 101 Off Ramp @ Spring - NB (#4)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	195
Terrain Type	Rolling	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2895	941
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.862	0.980
Flow Rate (v_i), pc/h	3573	1021
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.81	0.54

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	33.2
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.543
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	53.2
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3573	Ramp Junction Speed (S), mi/h	53.2
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	33.6
Level of Service (LOS)	D		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293 AM US 101 Off Ramp @ Paso Robles - NB (#5)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	270
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1954	423
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.990
Flow Rate (v_i), pc/h	2245	455
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.51	0.24

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	21.1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.492
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.4
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2245	Ramp Junction Speed (S), mi/h	54.4
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	20.6
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293 AM US 101 On Ramp @ Paso Robles - NB (#6)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	400
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1531	487
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.990
Flow Rate (v_i), pc/h	1759	523
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.52	0.28

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	20.6
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.333
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.3
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1759	Ramp Junction Speed (S), mi/h	58.3
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2282	Average Density (D), pc/mi/ln	19.6
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293 AM US 101 Mainline south of SR 46E - NB (#7)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	2018	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	1159
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.52
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	17.1
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293 AM US 101 Off Ramp @ SR 46E - NB (#8)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	225
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2018	1164
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	5.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.952
Flow Rate (v_i), pc/h	2318	1301
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.53	0.69

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	22.2
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.568
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	52.6
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2318	Ramp Junction Speed (S), mi/h	52.6
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	22.0
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293 AM US 101 On Ramp @ SR 46E - NB (#9)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	405
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	854	358
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	18.00	18.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.847	0.847
Flow Rate (v_i), pc/h	1073	450
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.35	0.24

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	14.7
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.312
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.9
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1073	Ramp Junction Speed (S), mi/h	58.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1523	Average Density (D), pc/mi/ln	12.9
Level of Service (LOS)	B		

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HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293 AM US 101 Mainline north of SR 46E - NB (#10)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1212	Heavy Vehicle Adjustment Factor (f_{HV})	0.847
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	761
Total Trucks, %	18.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.34
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	11.2
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293 AM US 101 Mainline north of SR 46E - SB (#11)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1121	Heavy Vehicle Adjustment Factor (f_{HV})	0.840
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	710
Total Trucks, %	19.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.32
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	10.6
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293 AM US 101 Off Ramp @ SR 46E - SB (#12)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	155
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1121	330
Peak Hour Factor (PHF)	0.94	0.95
Total Trucks, %	19.00	19.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.840	0.840
Flow Rate (v_i), pc/h	1420	414
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.32	0.22

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	15.1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.489
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.5
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1420	Ramp Junction Speed (S), mi/h	54.5
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	13.0
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

On-ramp to Mainline (W1)

Volume (vph)	1167 vph
Truck %	7%
PCE for Trucks	2
Volume (pcph)	1249 pcph

Mainline to Off-Ramp (W2)

Volume (vph)	285 vph
Truck %	0%
PCE for Trucks	2
Volume (pcph)	285 pcph

Mainline to Mainline

Volume (vph)	506 vph
Truck %	19%
PCE for Trucks	2
Volume (pcph)	602 pcph

602 pcph

W2 = 285 pcph

W1 = 1249 pcph

0 pcph

V_t = 2136 pcph

V_w = 1534 pcph

R = 0.19

W1 = 1249 pcph

W2 = 285 pcph

L = 1475 feet

N = 3 lanes

N_b = 2 lanes

Lane Imbalanced

Cumulative Plus 1293 Unit Project AM (US 101 Weave)

On Ramp: SR 46E (#13)

Off Ramp: Riverside Ave-17th St (#14)

Direction: South

Peak Hour: AM

Project: Olsen-Chandler SP

Results

Weave LOS = C

Total Volume LOS = B

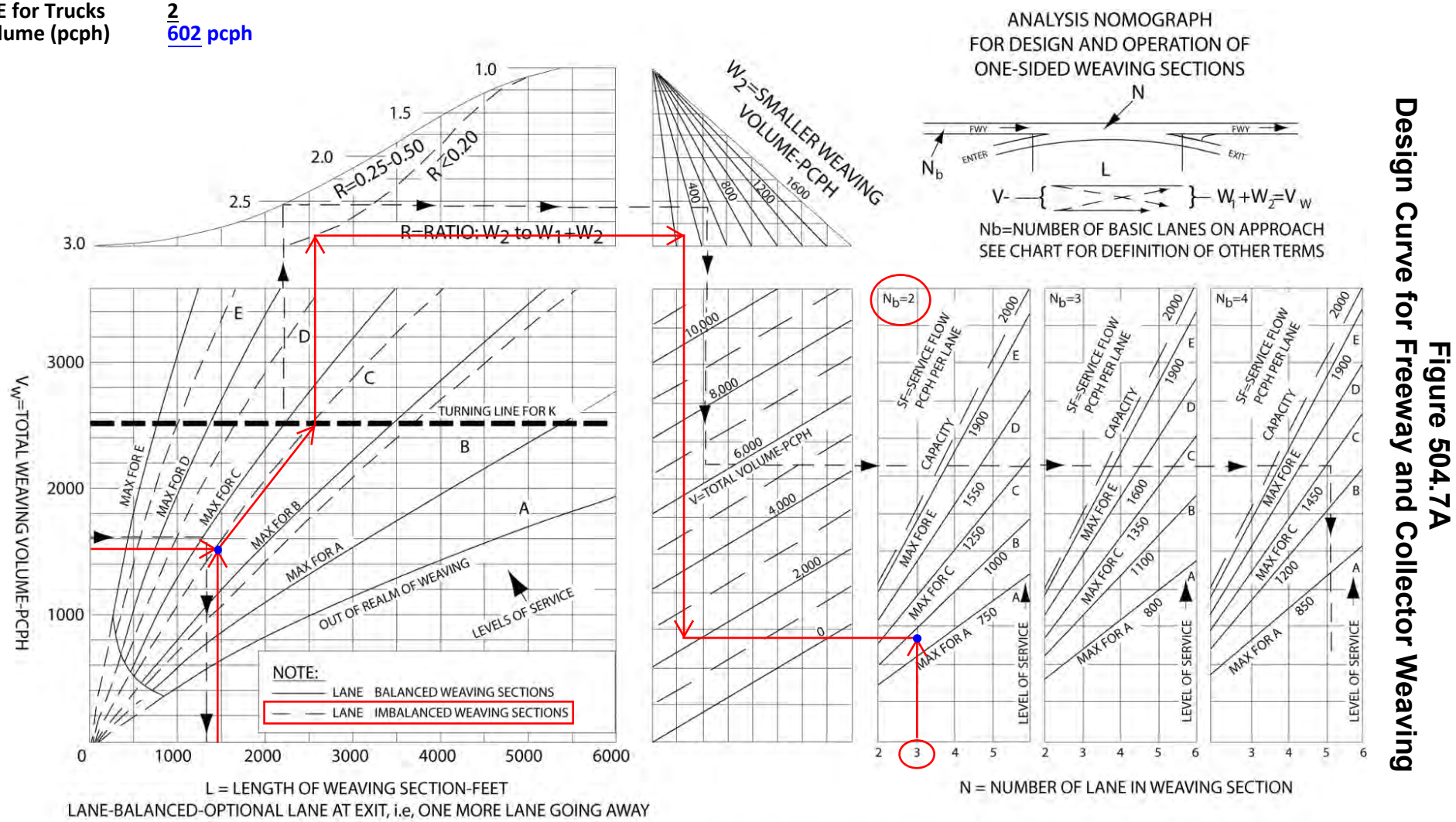

Figure 504.7A
Design Curve for Freeway and Collector Weaving

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293 AM US 101 Mainline south of SR 46E - SB (#15)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1673	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	961
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.43
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	14.4
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293 AM US 101 On Ramp @ Riverside-17th - SB (#16)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	300
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1673	390
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.980
Flow Rate (v_i), pc/h	1922	423
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.53	0.23

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	21.8
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.342
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.1
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1922	Ramp Junction Speed (S), mi/h	58.1
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2345	Average Density (D), pc/mi/ln	20.2
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293 AM US 101 Off Ramp @ Riverside/Pine - SB (#17)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	190
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2063	203
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	5.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.952
Flow Rate (v_i), pc/h	2370	227
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.54	0.12

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	22.9
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.472
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.9
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2370	Ramp Junction Speed (S), mi/h	54.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	21.6
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293 AM US 101 On Ramp @ Spring - SB (#18)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	1330
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2249	1428
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.980
Flow Rate (v_i), pc/h	2584	1550
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.94	0.83

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	28.7
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.476
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	54.8
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2584	Ramp Junction Speed (S), mi/h	54.8
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	4134	Average Density (D), pc/mi/ln	37.7
Level of Service (LOS)	D		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293 AM US 101 Mainline north of SR 46W - SB (#19)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	3677	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	2112
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.95
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	53.0
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	39.8
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293 AM US 101 Off Ramp @ SR 46W - SB (#20)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	210
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3677	725
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	6.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943
Flow Rate (v_i), pc/h	4224	818
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.96	0.44

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	38.7
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.525
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	53.6
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	4224	Ramp Junction Speed (S), mi/h	53.6
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	39.4
Level of Service (LOS)	E		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293 AM US 101 On Ramp @ SR 46W - SB (#21)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	315
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2949	200
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	6.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943
Flow Rate (v_i), pc/h	3388	226
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.82	0.12

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	31.7
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.445
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	55.6
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3388	Ramp Junction Speed (S), mi/h	55.6
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3614	Average Density (D), pc/mi/ln	32.5
Level of Service (LOS)	D		

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Cumulative Plus 1293-Unit Project PM

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293 PM US 101 Off Ramp @ SR 46W - NB (#1)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	235
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3463	300
Peak Hour Factor (PHF)	0.98	0.94
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	3673	322
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.83	0.17

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	33.7
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.480
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3673	Ramp Junction Speed (S), mi/h	54.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	33.6
Level of Service (LOS)	D		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293 PM US 101 On Ramp @ SR 46W - NB (#2)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	345
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3163	1054
Peak Hour Factor (PHF)	0.98	0.94
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	3355	1133
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	1.02	0.60

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	-
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	-
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	-
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3355	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	4488	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293 PM US 101 Mainline north of SR 46W - NB (#3)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	4217	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor (PHF)	0.98	Flow Rate (v_P), pc/h/ln	2236
Total Trucks, %	4.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	1.00
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	-
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	-
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	F
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293 PM US 101 Off Ramp @ Spring - NB (#4)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	195
Terrain Type	Rolling	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	4217	1704
Peak Hour Factor (PHF)	0.98	0.98
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.990
Flow Rate (v_i), pc/h	4647	1756
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	1.05	0.94

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	-
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	-
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	-
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	4647	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293 PM US 101 Off Ramp @ Paso Robles - NB (#5)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	270
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2513	734
Peak Hour Factor (PHF)	0.98	0.95
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	2666	780
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.60	0.42

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	24.7
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.522
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	53.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2666	Ramp Junction Speed (S), mi/h	53.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	24.8
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293 PM US 101 On Ramp @ Paso Robles - NB (#6)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	400
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1779	464
Peak Hour Factor (PHF)	0.98	0.96
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	1887	488
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.54	0.26

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	21.3
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.336
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.3
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1887	Ramp Junction Speed (S), mi/h	58.3
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2375	Average Density (D), pc/mi/ln	20.4
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293 PM US 101 Mainline south of SR 46E - NB (#7)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	2243	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor (PHF)	0.98	Flow Rate (v_P), pc/h/ln	1190
Total Trucks, %	4.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.53
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	17.6
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293 PM US 101 Off Ramp @ SR 46E - NB (#8)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	225
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2243	1239
Peak Hour Factor (PHF)	0.98	0.96
Total Trucks, %	4.00	3.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.971
Flow Rate (v_i), pc/h	2379	1329
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.54	0.71

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	22.7
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.571
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	52.5
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2379	Ramp Junction Speed (S), mi/h	52.5
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	22.7
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293 PM US 101 On Ramp @ SR 46E - NB (#9)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	405
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1004	339
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	12.00	12.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.893	0.893
Flow Rate (v_i), pc/h	1196	404
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.36	0.22

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	15.3
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.313
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.8
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1196	Ramp Junction Speed (S), mi/h	58.8
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1600	Average Density (D), pc/mi/ln	13.6
Level of Service (LOS)	B		

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HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293 PM US 101 Mainline north of SR 46E - NB (#10)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1343	Heavy Vehicle Adjustment Factor (f_{HV})	0.893
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	800
Total Trucks, %	12.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.36
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	11.8
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293 PM US 101 Mainline north of SR 46E - SB (#11)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1812	Heavy Vehicle Adjustment Factor (f_{HV})	0.826
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	1167
Total Trucks, %	21.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.52
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	17.4
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293 PM US 101 Off Ramp @ SR 46E - SB (#12)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	155
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1812	448
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	21.00	21.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.826	0.826
Flow Rate (v_i), pc/h	2334	577
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.53	0.31

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	22.9
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.503
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.2
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2334	Ramp Junction Speed (S), mi/h	54.2
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	21.5
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

On-ramp to Mainline (W1)

Volume (vph)	1298 vph
Truck %	4%
PCE for Trucks	2
Volume (pcph)	1350 pcph

Mainline to Off-Ramp (W2)

Volume (vph)	396 vph
Truck %	1%
PCE for Trucks	2
Volume (pcph)	400 pcph

Mainline to Mainline

Volume (vph)	968 vph
Truck %	21%
PCE for Trucks	2
Volume (pcph)	1171 pcph

1171 pcph

W2 = 400 pcph

W1 = 1350 pcph

0 pcph

V = 2921 pcph

V_w = 1750 pcph

R = 0.23

W1 = 1350 pcph

W2 = 400 pcph

L = 1475 feet

N = 3 lanes

N_b = 2 lanes

Lane Imbalanced

Cumulative Plus 1293 Unit Project PM (US 101 Weave)

On Ramp: SR 46E (#13)

Off Ramp: Riverside Ave-17th St (#14)

Direction: South

Peak Hour: PM

Project: Olsen-Chandler SP

Results

Weave LOS = D

Total Volume LOS = C

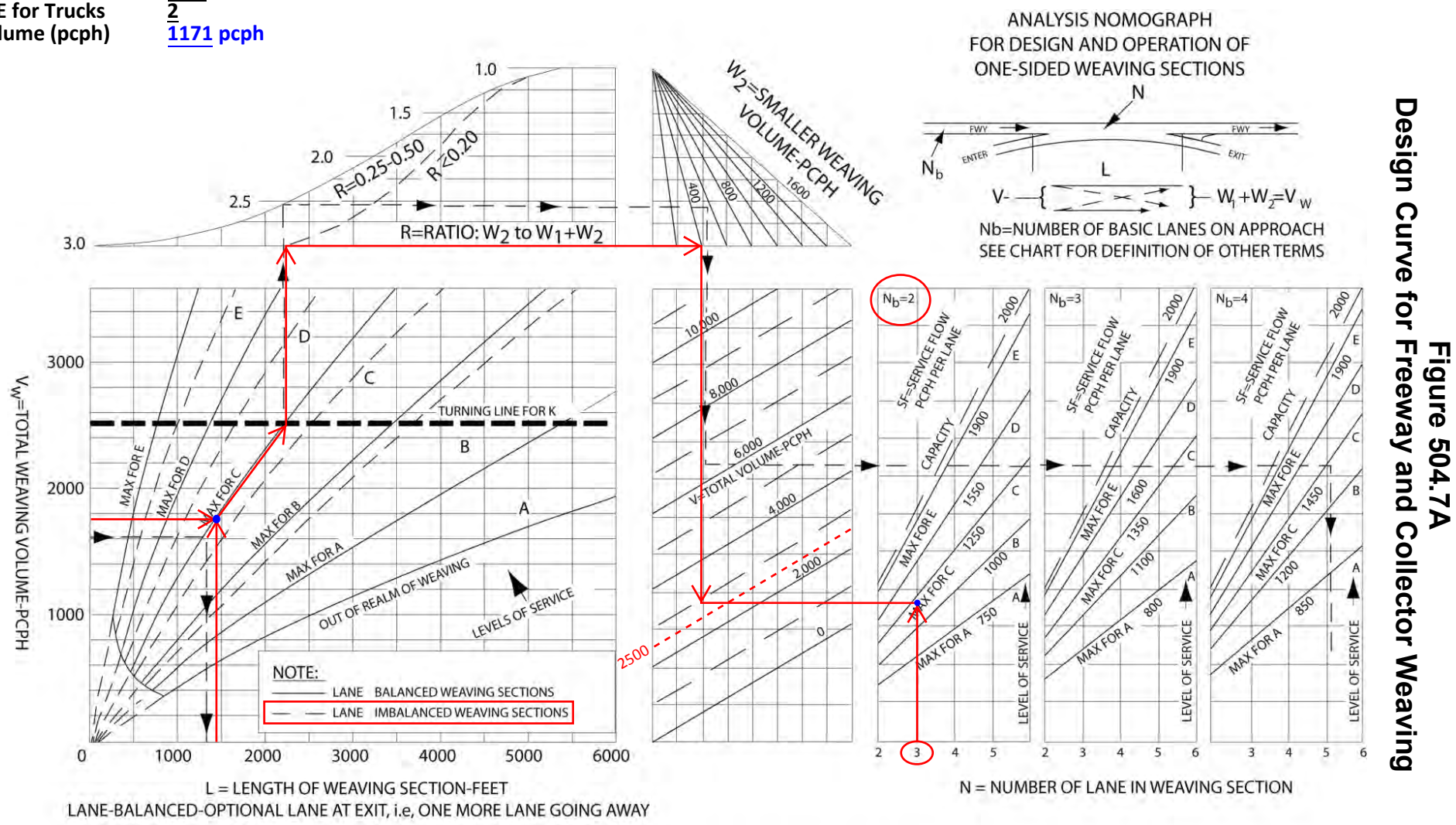

Figure 504.7A
Design Curve for Freeway and Collector Weaving

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information

Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293 PM US 101 Mainline south of SR 46E - SB (#15)		

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume (V), veh/h	2266	Heavy Vehicle Adjustment Factor (f_{HV})	0.943
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	1278
Total Trucks, %	6.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.57
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	19.2
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Merge Report

Project Information

Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293 PM US 101 On Ramp @ Riverside-17th - SB (#16)		

Geometric Data

	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	300
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors

Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i), veh/h	2266	268
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	6.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.990
Flow Rate (v_i), pc/h	2556	288
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.64	0.15

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	25.7
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.368
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	57.5
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2556	Ramp Junction Speed (S), mi/h	57.5
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2844	Average Density (D), pc/mi/ln	24.7
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293 PM US 101 Off Ramp @ Riverside/Pine - SB (#17)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	190
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2534	335
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	6.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.990
Flow Rate (v_i), pc/h	2859	360
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.65	0.19

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	27.1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.484
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.6
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2859	Ramp Junction Speed (S), mi/h	54.6
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	26.2
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293 PM US 101 On Ramp @ Spring - SB (#18)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	1330
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2599	1182
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	6.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.990
Flow Rate (v_i), pc/h	2932	1270
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.95	0.68

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	29.4
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.493
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	54.4
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2932	Ramp Junction Speed (S), mi/h	54.4
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	4202	Average Density (D), pc/mi/ln	38.6
Level of Service (LOS)	D		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293 PM US 101 Mainline north of SR 46W - SB (#19)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	3781	Heavy Vehicle Adjustment Factor (f_{HV})	0.943
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	2132
Total Trucks, %	6.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.96
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	52.4
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	40.7
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293 PM US 101 Off Ramp @ SR 46W - SB (#20)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	210
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3781	726
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	6.00	3.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.971
Flow Rate (v_i), pc/h	4265	795
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.97	0.42

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	39.0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.523
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	53.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	4265	Ramp Junction Speed (S), mi/h	53.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	39.7
Level of Service (LOS)	E		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293 PM US 101 On Ramp @ SR 46W - SB (#21)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	315
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3055	300
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	6.00	3.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.971
Flow Rate (v_i), pc/h	3446	329
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.86	0.18

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	32.9
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.470
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	55.0
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3446	Ramp Junction Speed (S), mi/h	55.0
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3775	Average Density (D), pc/mi/ln	34.3
Level of Service (LOS)	D		

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Cumulative Plus 1293-Unit and School Project AM

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293+School AM US 101 Off Ramp @ SR 46W - NB (#1)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	235
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2635	300
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	6.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943
Flow Rate (v_i), pc/h	3027	338
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.69	0.18

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	28.2
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.482
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3027	Ramp Junction Speed (S), mi/h	54.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	27.7
Level of Service (LOS)	D		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293+School AM US 101 On Ramp @ SR 46W - NB (#2)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	345
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2335	591
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	6.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943
Flow Rate (v_i), pc/h	2683	667
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.76	0.36

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	29.2
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.409
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	56.5
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2683	Ramp Junction Speed (S), mi/h	56.5
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3350	Average Density (D), pc/mi/ln	29.6
Level of Service (LOS)	D		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293+School AM US 101 Mainline north of SR 46W - NB (#3)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	2926	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	1681
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.75
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	63.2
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	26.6
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	D
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293+School AM US 101 Off Ramp @ Spring - NB (#4)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	195
Terrain Type	Rolling	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2926	972
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.862	0.980
Flow Rate (v_i), pc/h	3611	1055
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.82	0.56

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	33.6
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.546
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	53.1
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3611	Ramp Junction Speed (S), mi/h	53.1
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	34.0
Level of Service (LOS)	D		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293+School AM US 101 Off Ramp @ Paso Robles - NB (#5)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	270
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1954	423
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.990
Flow Rate (v_i), pc/h	2245	455
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.51	0.24

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	21.1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.492
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.4
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2245	Ramp Junction Speed (S), mi/h	54.4
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	20.6
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293+School AM US 101 On Ramp @ Paso Robles - NB (#6)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	400
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1531	488
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.990
Flow Rate (v_i), pc/h	1759	524
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.52	0.28

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	20.6
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.333
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.3
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1759	Ramp Junction Speed (S), mi/h	58.3
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2283	Average Density (D), pc/mi/ln	19.6
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293+School AM US 101 Mainline south of SR 46E - NB (#7)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	2019	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	1160
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.52
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	17.1
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293+School AM US 101 Off Ramp @ SR 46E - NB (#8)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	225
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2019	1164
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	5.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.952
Flow Rate (v_i), pc/h	2320	1301
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.53	0.69

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	22.2
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.568
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	52.6
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2320	Ramp Junction Speed (S), mi/h	52.6
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	22.1
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293+School AM US 101 On Ramp @ SR 46E - NB (#9)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	405
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	855	361
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	18.00	18.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.847	0.847
Flow Rate (v_i), pc/h	1074	453
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.35	0.24

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	14.7
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.312
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.9
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1074	Ramp Junction Speed (S), mi/h	58.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1527	Average Density (D), pc/mi/ln	13.0
Level of Service (LOS)	B		

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HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293+School AM US 101 Mainline north of SR 46E - NB (#10)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1216	Heavy Vehicle Adjustment Factor (f_{HV})	0.847
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	764
Total Trucks, %	18.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.34
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	11.3
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293+School AM US 101 Mainline north of SR 46E - SB (#11)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1127	Heavy Vehicle Adjustment Factor (f_{HV})	0.840
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	714
Total Trucks, %	19.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.32
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	10.7
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293+School AM US 101 Off Ramp @ SR 46E - SB (#12)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	155
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1127	334
Peak Hour Factor (PHF)	0.94	0.95
Total Trucks, %	19.00	19.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.840	0.840
Flow Rate (v_i), pc/h	1427	419
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.32	0.22

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	15.1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.489
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.5
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1427	Ramp Junction Speed (S), mi/h	54.5
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	13.1
Level of Service (LOS)	B		

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Reso A - Exhibit C2 (EIR Technical Appendix)

Cumulative Plus 1293 Unit and School Project AM (US 101 Weave)

On-ramp to Mainline (W1)

Volume (vph)	1167 vph
Truck %	7%
PCE for Trucks	2
Volume (pcph)	1249 pcph

Mainline to Off-Ramp (W2)

Volume (vph)	285 vph
Truck %	0%
PCE for Trucks	2
Volume (pcph)	285 pcph

Mainline to Mainline

Volume (vph)	508 vph
Truck %	19%
PCE for Trucks	2
Volume (pcph)	605 pcph

605 pcph

W2 = 285 pcph

W1 = 1249 pcph

0 pcph

V_w = 2138 pcph

V_w = 1534 pcph

R = 0.19

W1 = 1249 pcph

W2 = 285 pcph

L = 1475 feet

N = 3 lanes

N_b = 2 lanes

Lane Imbalanced

On Ramp: SR 46E (#13)

Off Ramp: Riverside Ave-17th St (#14)

Direction: South

Peak Hour: AM

Project: Olsen-Chandler SP

Results

Weave LOS = C

Total Volume LOS = B

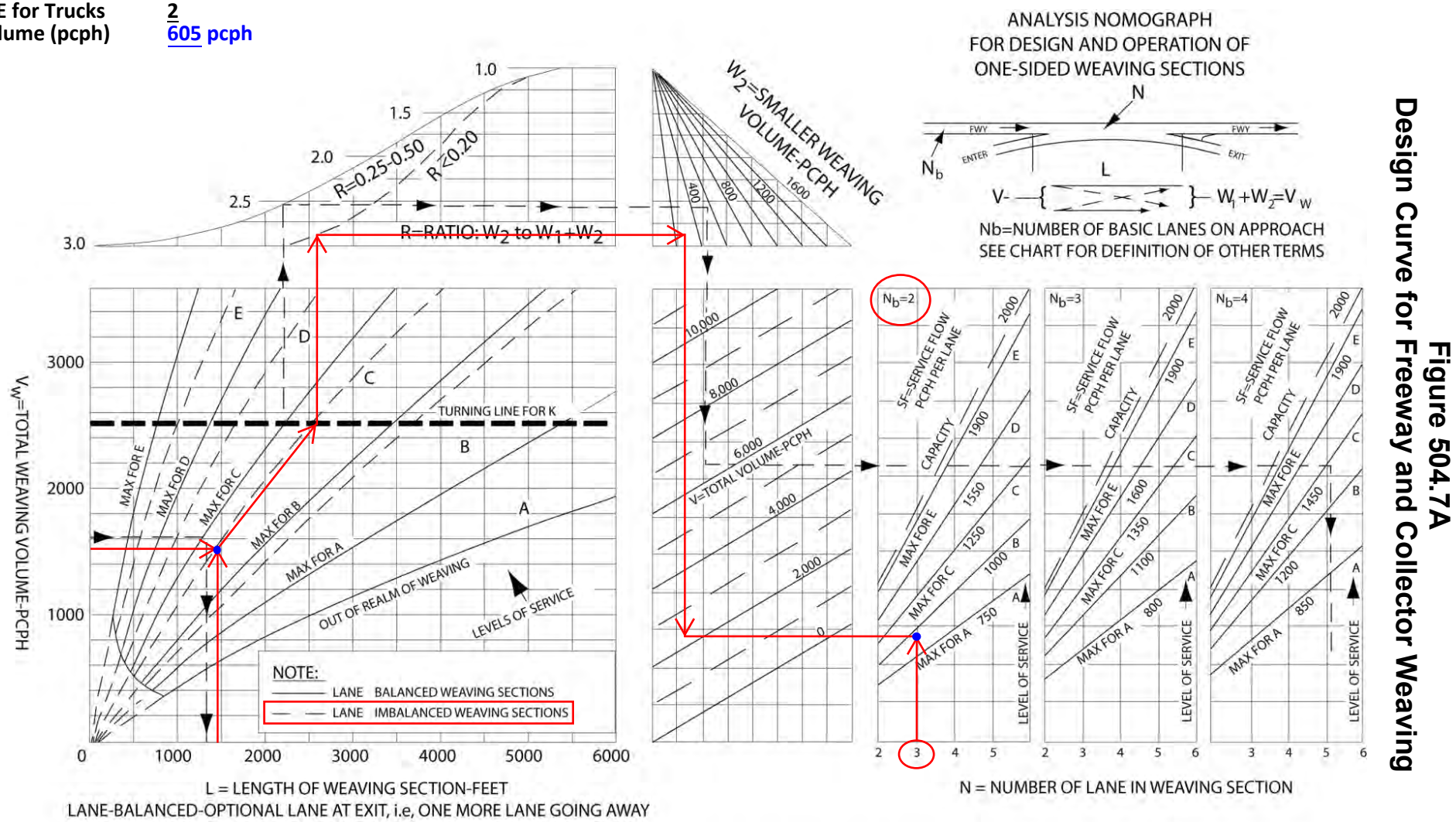

Figure 504.7A
Design Curve for Freeway and Collector Weaving

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293+School AM US 101 Mainline south of SR 46E - SB (#15)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1675	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	962
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.43
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	14.4
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293+School AM US 101 On Ramp @ Riverside-17th - SB (#16)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	300
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1675	390
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.980
Flow Rate (v_i), pc/h	1924	423
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.53	0.23

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	21.8
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.342
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.1
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1924	Ramp Junction Speed (S), mi/h	58.1
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2347	Average Density (D), pc/mi/ln	20.2
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293+School AM US 101 Off Ramp @ Riverside/Pine - SB (#17)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	190
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2065	205
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	5.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.952
Flow Rate (v_i), pc/h	2372	229
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.54	0.12

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	22.9
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.472
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.9
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2372	Ramp Junction Speed (S), mi/h	54.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	21.6
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293+School AM US 101 On Ramp @ Spring - SB (#18)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	1330
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2249	1454
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	2.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.980
Flow Rate (v_i), pc/h	2584	1578
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.94	0.84

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	28.9
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.483
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	54.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2584	Ramp Junction Speed (S), mi/h	54.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	4162	Average Density (D), pc/mi/ln	38.0
Level of Service (LOS)	D		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293+School AM US 101 Mainline north of SR 46W - SB (#19)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	3703	Heavy Vehicle Adjustment Factor (f_{HV})	0.926
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	2127
Total Trucks, %	8.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.96
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	52.5
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	40.5
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293+School AM US 101 Off Ramp @ SR 46W - SB (#20)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	210
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3703	732
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	6.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943
Flow Rate (v_i), pc/h	4254	826
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.96	0.44

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	38.9
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.526
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	53.6
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	4254	Ramp Junction Speed (S), mi/h	53.6
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	39.7
Level of Service (LOS)	E		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	AM
Project Description	CM+1293+School AM US 101 On Ramp @ SR 46W - SB (#21)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	315
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2971	200
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	8.00	6.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.943
Flow Rate (v_i), pc/h	3413	226
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.82	0.12

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	31.9
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.448
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	55.5
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3413	Ramp Junction Speed (S), mi/h	55.5
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3639	Average Density (D), pc/mi/ln	32.8
Level of Service (LOS)	D		

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Cumulative Plus 1293-Unit and School Project PM

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293+School PM US 101 Off Ramp @ SR 46W - NB (#1)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	235
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3468	300
Peak Hour Factor (PHF)	0.98	0.94
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	3679	322
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.83	0.17

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	33.8
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.480
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3679	Ramp Junction Speed (S), mi/h	54.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	33.6
Level of Service (LOS)	D		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293+School PM US 101 On Ramp @ SR 46W - NB (#2)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	345
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3168	1056
Peak Hour Factor (PHF)	0.98	0.94
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	3360	1135
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	1.02	0.60

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	-
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	-
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	-
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3360	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	4495	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293+School PM US 101 Mainline north of SR 46W - NB (#3)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	4224	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor (PHF)	0.98	Flow Rate (v_P), pc/h/ln	2240
Total Trucks, %	4.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	1.00
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	-
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	-
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	F
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293+School PM US 101 Off Ramp @ Spring - NB (#4)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	195
Terrain Type	Rolling	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	4224	1711
Peak Hour Factor (PHF)	0.98	0.98
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.926	0.990
Flow Rate (v_i), pc/h	4655	1764
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	1.05	0.94

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	-
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	-
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	-
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	4655	Ramp Junction Speed (S), mi/h	-
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	-
Level of Service (LOS)	F		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293+School PM US 101 Off Ramp @ Paso Robles - NB (#5)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	270
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2513	734
Peak Hour Factor (PHF)	0.98	0.95
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	2666	780
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.60	0.42

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	24.7
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.522
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	53.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2666	Ramp Junction Speed (S), mi/h	53.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	24.8
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293+School PM US 101 On Ramp @ Paso Robles - NB (#6)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	400
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1779	465
Peak Hour Factor (PHF)	0.98	0.96
Total Trucks, %	4.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.990
Flow Rate (v_i), pc/h	1887	489
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.54	0.26

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	21.3
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.336
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.3
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1887	Ramp Junction Speed (S), mi/h	58.3
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2376	Average Density (D), pc/mi/ln	20.4
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293+School PM US 101 Mainline south of SR 46E - NB (#7)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	2244	Heavy Vehicle Adjustment Factor (f_{HV})	0.962
Peak Hour Factor (PHF)	0.98	Flow Rate (v_P), pc/h/ln	1190
Total Trucks, %	4.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.53
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	17.6
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293+School PM US 101 Off Ramp @ SR 46E - NB (#8)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	225
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2244	1239
Peak Hour Factor (PHF)	0.98	0.96
Total Trucks, %	4.00	3.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.962	0.971
Flow Rate (v_i), pc/h	2380	1329
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.54	0.71

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	22.7
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.571
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	52.5
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2380	Ramp Junction Speed (S), mi/h	52.5
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	22.7
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293+School PM US 101 On Ramp @ SR 46E - NB (#9)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	405
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1005	340
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	12.00	12.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.893	0.893
Flow Rate (v_i), pc/h	1197	405
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.36	0.22

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	15.3
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.313
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	58.8
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	1197	Ramp Junction Speed (S), mi/h	58.8
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1602	Average Density (D), pc/mi/ln	13.6
Level of Service (LOS)	B		

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HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293+School PM US 101 Mainline north of SR 46E - NB (#10)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.33
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	71.3
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1345	Heavy Vehicle Adjustment Factor (f_{HV})	0.893
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	801
Total Trucks, %	12.00	Capacity (c), pc/h/ln	2377
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2232
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.36
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	67.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	11.8
Total Ramp Density Adjustment	4.1	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	67.7		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293+School PM US 101 Mainline north of SR 46E - SB (#11)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	1814	Heavy Vehicle Adjustment Factor (f_{HV})	0.826
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	1168
Total Trucks, %	21.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.53
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	17.5
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293+School PM US 101 Off Ramp @ SR 46E - SB (#12)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	155
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	1814	449
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	21.00	21.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.826	0.826
Flow Rate (v_i), pc/h	2336	578
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.53	0.31

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	22.9
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.503
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.2
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2336	Ramp Junction Speed (S), mi/h	54.2
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	21.5
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

On-ramp to Mainline (W1)

Volume (vph)	1298 vph
Truck %	4%
PCE for Trucks	2
Volume (pcph)	1350 pcph

Mainline to Off-Ramp (W2)

Volume (vph)	396 vph
Truck %	1%
PCE for Trucks	2
Volume (pcph)	400 pcph

Mainline to Mainline

Volume (vph)	969 vph
Truck %	21%
PCE for Trucks	2
Volume (pcph)	1172 pcph

1171 pcph

W2 = 400 pcph

W1 = 1350 pcph

0 pcph

V_w = 2922 pcph

V_w = 1750 pcph

R = 0.23

W1 = 1350 pcph

W2 = 400 pcph

L = 1475 feet

N = 3 lanes

N_b = 2 lanes

Lane Imbalanced

Cumulative Plus 1293 Unit and School Project PM (US 101 Weave)

On Ramp: SR 46E (#13)

Off Ramp: Riverside Ave-17th St (#14)

Direction: South

Peak Hour: PM

Project: Olsen-Chandler SP

Results

Weave LOS = D

Total Volume LOS = C

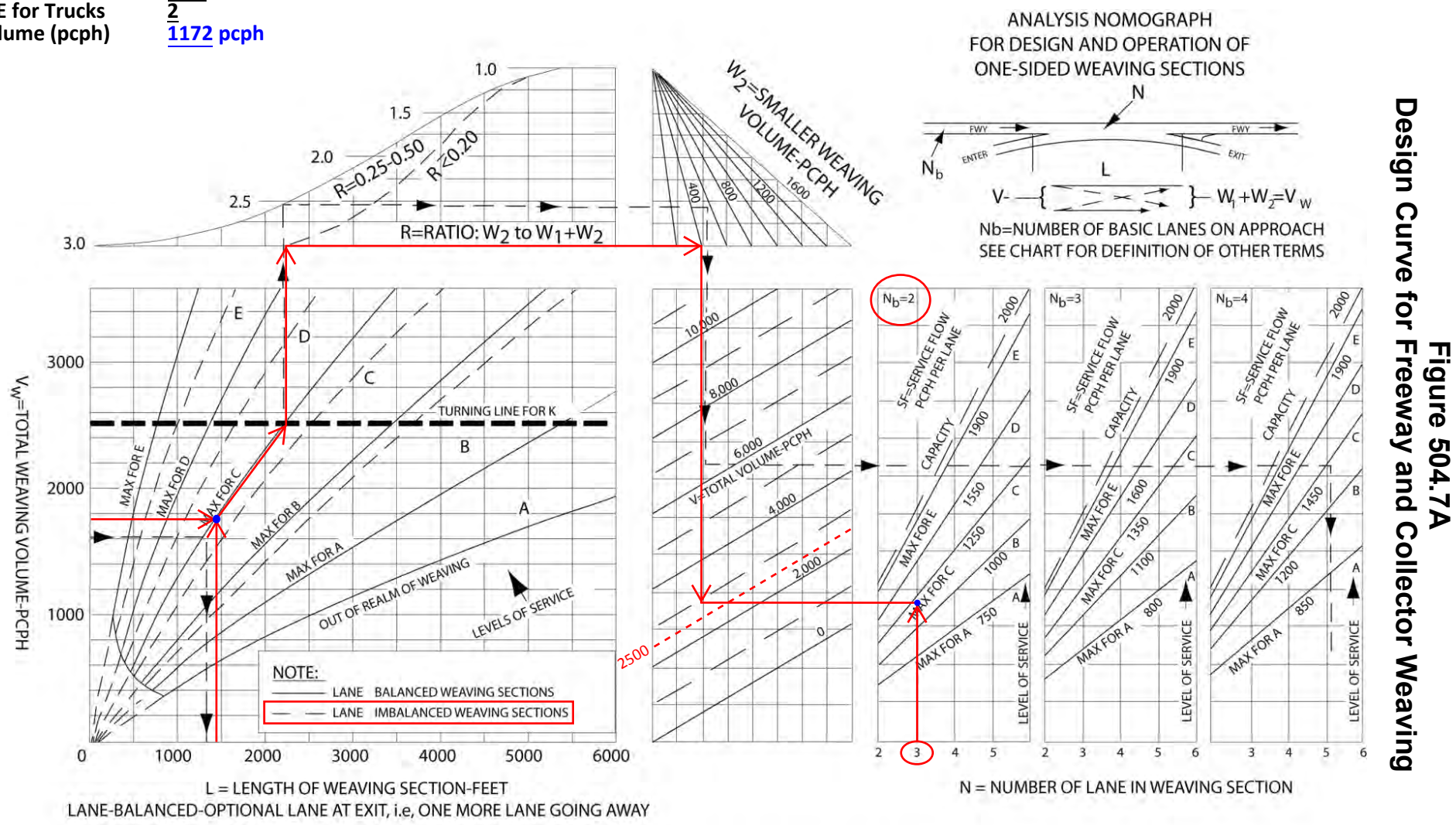

Figure 504.7A
Design Curve for Freeway and Collector Weaving

Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293+School PM US 101 Mainline south of SR 46E - SB (#15)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	2267	Heavy Vehicle Adjustment Factor (f_{HV})	0.943
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	1278
Total Trucks, %	6.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.57
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	66.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	19.2
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293+School PM US 101 On Ramp @ Riverside-17th - SB (#16)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	300
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2267	268
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	6.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.990
Flow Rate (v_i), pc/h	2557	288
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.64	0.15

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	25.7
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.368
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	57.5
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2557	Ramp Junction Speed (S), mi/h	57.5
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2845	Average Density (D), pc/mi/ln	24.7
Level of Service (LOS)	C		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293+School PM US 101 Off Ramp @ Riverside/Pine - SB (#17)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	190
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2535	336
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	6.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.990
Flow Rate (v_i), pc/h	2860	361
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.65	0.19

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	27.1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.484
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	54.6
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2860	Ramp Junction Speed (S), mi/h	54.6
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	26.2
Level of Service (LOS)	C		

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HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293+School PM US 101 On Ramp @ Spring - SB (#18)		

Geometric Data	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	1330
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	2599	1190
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	6.00	1.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.990
Flow Rate (v_i), pc/h	2932	1279
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.95	0.68

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	29.5
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.496
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	54.3
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	2932	Ramp Junction Speed (S), mi/h	54.3
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	4211	Average Density (D), pc/mi/ln	38.8
Level of Service (LOS)	D		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Basic Freeway Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293+S PM US 101 Mainline north of SR 46W - SB (#19)		

Geometric Data			
Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	1.67
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	70.4
Right-Side Lateral Clearance, ft	10		

Adjustment Factors			
Driver Population	Balanced Mix	Final Speed Adjustment Factor (SAF)	0.950
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.939
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity			
Demand Volume (V), veh/h	3789	Heavy Vehicle Adjustment Factor (f_{HV})	0.943
Peak Hour Factor (PHF)	0.94	Flow Rate (v_P), pc/h/ln	2137
Total Trucks, %	6.00	Capacity (c), pc/h/ln	2369
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2224
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.96
Passenger Car Equivalent (E_T)	2.000		

Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	52.2
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	40.9
Total Ramp Density Adjustment	5.0	Level of Service (LOS)	E
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	66.9		

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HCS7 Freeway Diverge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293+School PM US 101 Off Ramp @ SR 46W - SB (#20)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Deceleration Length (L_D), ft	1500	210
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3789	728
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	6.00	3.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.971
Flow Rate (v_i), pc/h	4274	798
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.97	0.42

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	39.1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.523
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	53.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	4274	Ramp Junction Speed (S), mi/h	53.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	39.8
Level of Service (LOS)	E		

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Reso A - Exhibit C2 (EIR Technical Appendix)

HCS7 Freeway Merge Report

Project Information			
Analyst	CCTC	Date	
Agency		Analysis Year	
Jurisdiction		Time Period Analyzed	PM
Project Description	CM+1293+School PM US 101 On Ramp @ SR 46W - SB (#21)		

Geometric Data		
	Freeway	Ramp
Number of Lanes (N)	2	1
Free-Flow Speed (FFS), mi/h	70.0	35.0
Segment Length (L) / Acceleration Length (L_A), ft	1500	315
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Side	Freeway	Right

Adjustment Factors		
Driver Population	Balanced Mix	Balanced Mix
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	0.950	0.950
Final Capacity Adjustment Factor (CAF)	0.939	0.939
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity		
Demand Volume (V_i), veh/h	3061	300
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	6.00	3.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.943	0.971
Flow Rate (v_i), pc/h	3453	329
Capacity (c), pc/h	4413	1878
Volume-to-Capacity Ratio (v/c)	0.86	0.18

Speed and Density			
Upstream Equilibrium Distance (L_{EQ}), ft	-	Density in Ramp Influence Area (D_R), pc/mi/ln	32.9
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.471
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	55.0
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	-
Flow in Lanes 1 and 2 (v_{12}), pc/h	3453	Ramp Junction Speed (S), mi/h	55.0
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3782	Average Density (D), pc/mi/ln	34.4
Level of Service (LOS)	D		

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Appendix D: Warrant Analysis Sheets

Existing

Central Coast Transportation Consulting
Traffic Engineering & Transportation Planning

Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Olsen-Chandler SP
Project/File #	2019_131
Scenario	Existing AM

Intersection Information			
Major Street (N/S Road)	Golden Hill Rd	Minor Street (E/W Road)	Union Rd
Analyzed with	2 or more approach lanes	Analyzed with	2 or more approach lanes
Total Approach Volume	859 vehicles	Total Approach Volume	700 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	100 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

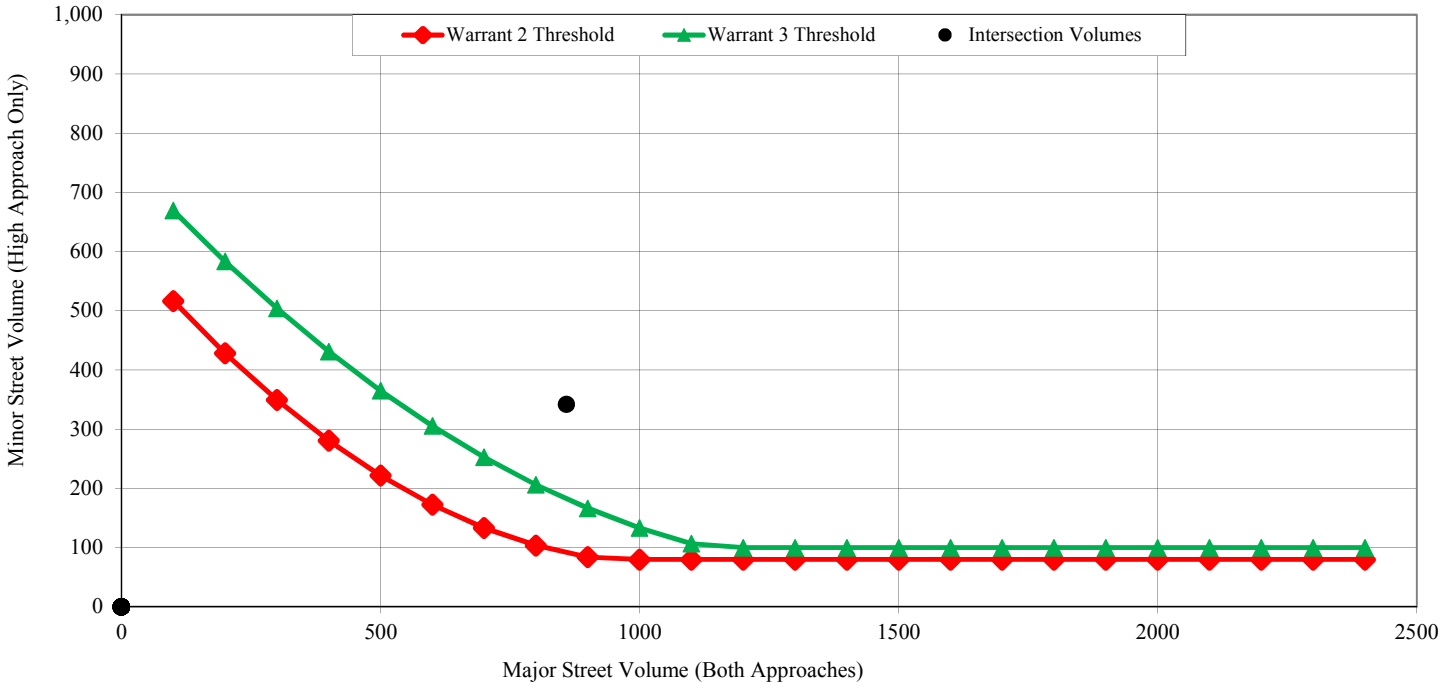
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	**Condition B**	**Condition A+B***
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**	**Not Satisfied**
Required values reached for	1 hour	1 hour	1 (Cond. A) & 1 (Cond. B)
Criteria - Major Street (veh/hr)	420	630	336 (Cond. A) & 504 (Cond. B)
Criteria - Minor Street (veh/hr)	140	70	112 (Cond. A) & 56 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	**Not Satisfied**
Required values reached for	1 hour
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	**Condition B**
Condition Satisfied?	**Satisfied**	**Satisfied**
Required values reached for	1559 total, 408 minor, 6.2 delay	1 hour
Criteria - Total Approach Volume (veh in one hour)	800	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	150	
Criteria - Minor Street High Side Delay (veh-hrs)	5	

Figure 4C-2 (Warrant 2 - 70% Factor) & Figure 4C-4 (Warrant 3 - 70% Factor)



Central Coast Transportation Consulting
Traffic Engineering & Transportation Planning

Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Olsen-Chandler SP
Project/File #	2019_131
Scenario	Existing PM

Intersection Information			
Major Street (N/S Road)	Golden Hill Rd	Minor Street (E/W Road)	Union Rd
Analyzed with	2 or more approach lanes	Analyzed with	2 or more approach lanes
Total Approach Volume	960 vehicles	Total Approach Volume	860 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	100 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

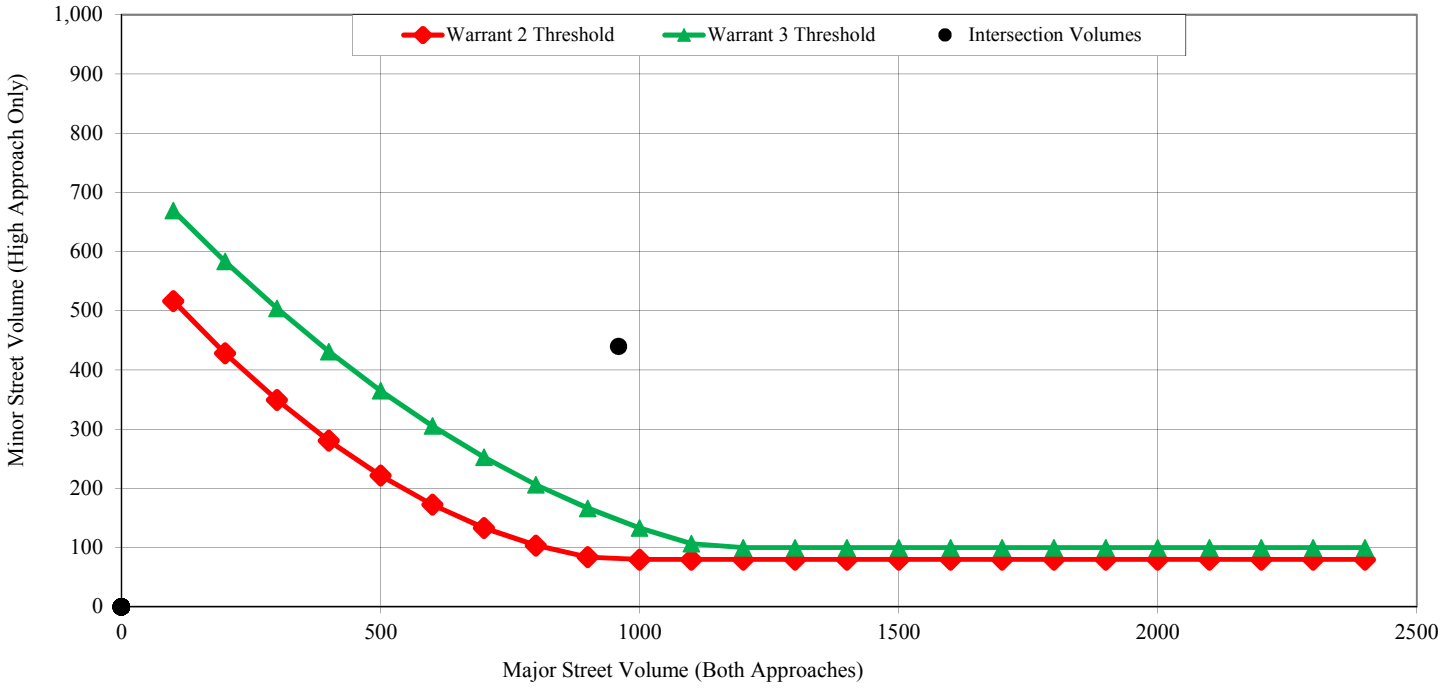
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	**Condition B**	**Condition A+B***
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**	**Not Satisfied**
Required values reached for	1 hour	1 hour	1 (Cond. A) & 1 (Cond. B)
Criteria - Major Street (veh/hr)	420	630	336 (Cond. A) & 504 (Cond. B)
Criteria - Minor Street (veh/hr)	140	70	112 (Cond. A) & 56 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	**Not Satisfied**
Required values reached for	1 hour
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	**Condition B**
Condition Satisfied?	**Satisfied**	**Satisfied**
Required values reached for	1820 total, 537 minor, 9.3 delay	1 hour
Criteria - Total Approach Volume (veh in one hour)	800	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	150	
Criteria - Minor Street High Side Delay (veh-hrs)	5	

Figure 4C-2 (Warrant 2 - 70% Factor) & Figure 4C-4 (Warrant 3 - 70% Factor)



Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Olsen-Chandler SP
Project/File #	2019_131
Scenario	Existing AM

Intersection Information			
Major Street (N/S Road)	Creston Rd	Minor Street (E/W Road)	Stoney Creek Rd
Analyzed with	1 approach lane	Analyzed with	1 Approach Lane
Total Approach Volume	1399 vehicles	Total Approach Volume	406 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

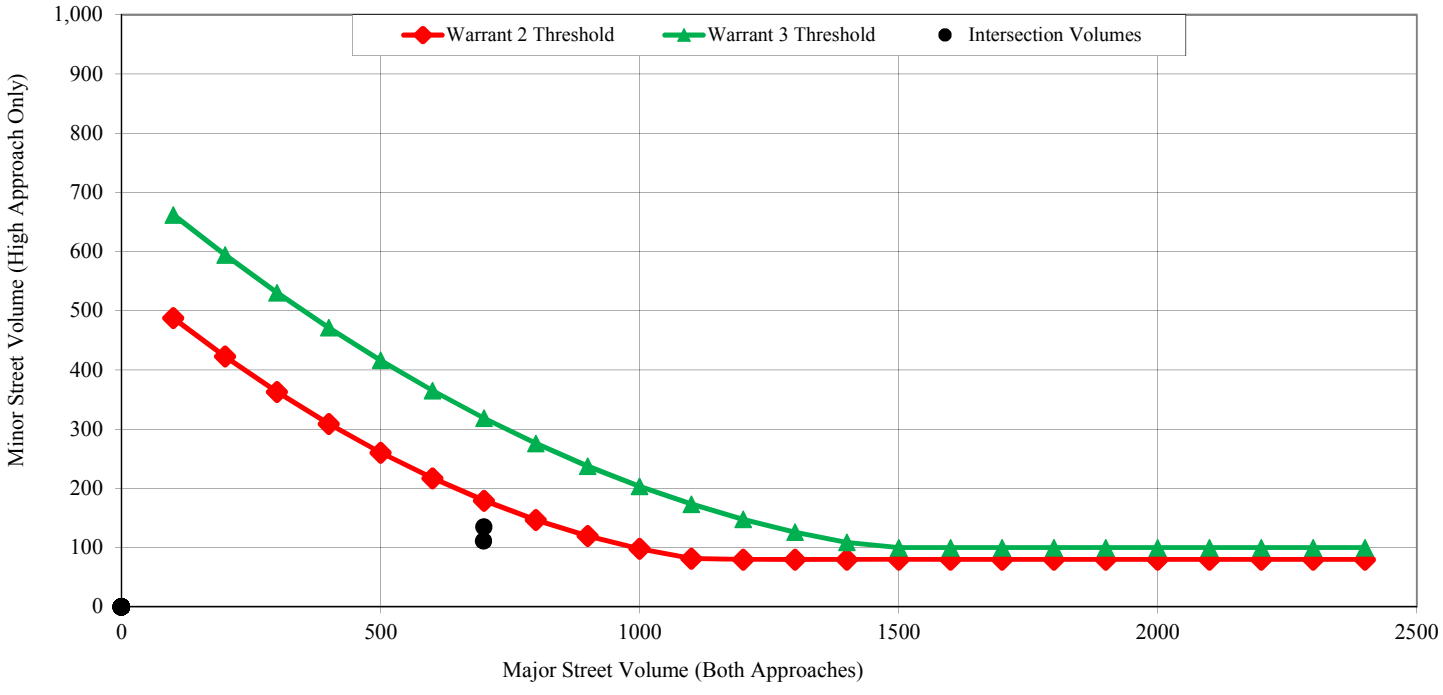
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	**Condition B**	**Condition A+B***
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**	**Not Satisfied**
Required values reached for	0 hours	0 hours	1 (Cond. A) & 2 (Cond. B)
Criteria - Major Street (veh/hr)	500	750	400 (Cond. A) & 600 (Cond. B)
Criteria - Minor Street (veh/hr)	150	75	120 (Cond. A) & 60 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	**Not Satisfied**
Required values reached for	0 hours
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	**Condition B**
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**
Required values reached for	952 total, 135 minor, 1.5 delay	0 hours
Criteria - Total Approach Volume (veh in one hour)	800	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	100	
Criteria - Minor Street High Side Delay (veh-hrs)	4	

Figure 4C-1 (Warrant 2) & Figure 4C-3 (Warrant 3)



Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Olsen-Chandler SP
Project/File #	2019_131
Scenario	Existing Plus 1293 Unit Project AM

Intersection Information			
Major Street (N/S Road)	Creston Rd	Minor Street (E/W Road)	Stoney Creek Rd
Analyzed with	1 approach lane	Analyzed with	1 Approach Lane
Total Approach Volume	777 vehicles	Total Approach Volume	254 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

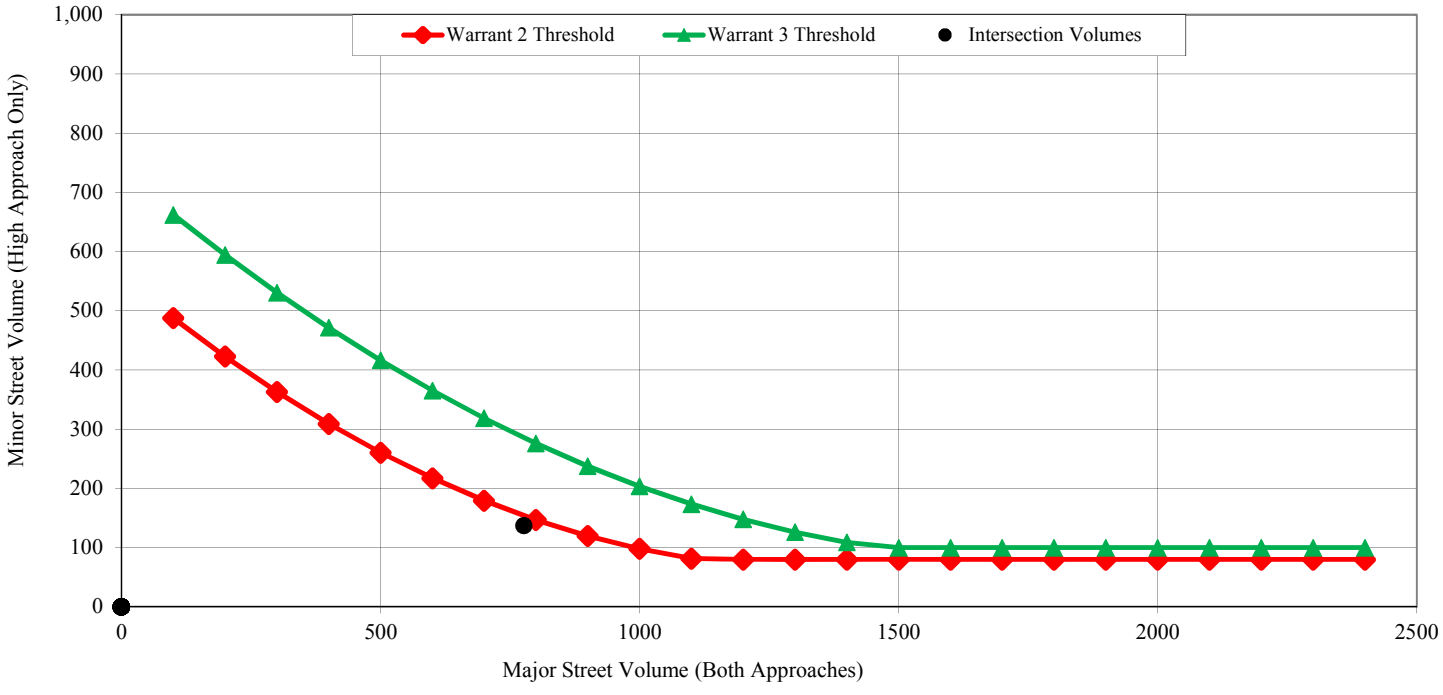
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	**Condition B**	**Condition A+B***
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**	**Not Satisfied**
Required values reached for	0 hours	1 hour	1 (Cond. A) & 1 (Cond. B)
Criteria - Major Street (veh/hr)	500	750	400 (Cond. A) & 600 (Cond. B)
Criteria - Minor Street (veh/hr)	150	75	120 (Cond. A) & 60 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	**Not Satisfied**
Required values reached for	0 hours
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	**Condition B**
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**
Required values reached for	1031 total, 137 minor, 2.2 delay	0 hours
Criteria - Total Approach Volume (veh in one hour)	800	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	100	
Criteria - Minor Street High Side Delay (veh-hrs)	4	

Figure 4C-1 (Warrant 2) & Figure 4C-3 (Warrant 3)



Central Coast Transportation Consulting
Traffic Engineering & Transportation Planning

Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Olsen-Chandler SP
Project/File #	2019_131
Scenario	Existing Plus 1293 Unit Project and School AM

Intersection Information			
Major Street (N/S Road)	Creston Rd	Minor Street (E/W Road)	Stoney Creek Rd
Analyzed with	1 approach lane	Analyzed with	1 Approach Lane
Total Approach Volume	805 vehicles	Total Approach Volume	256 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

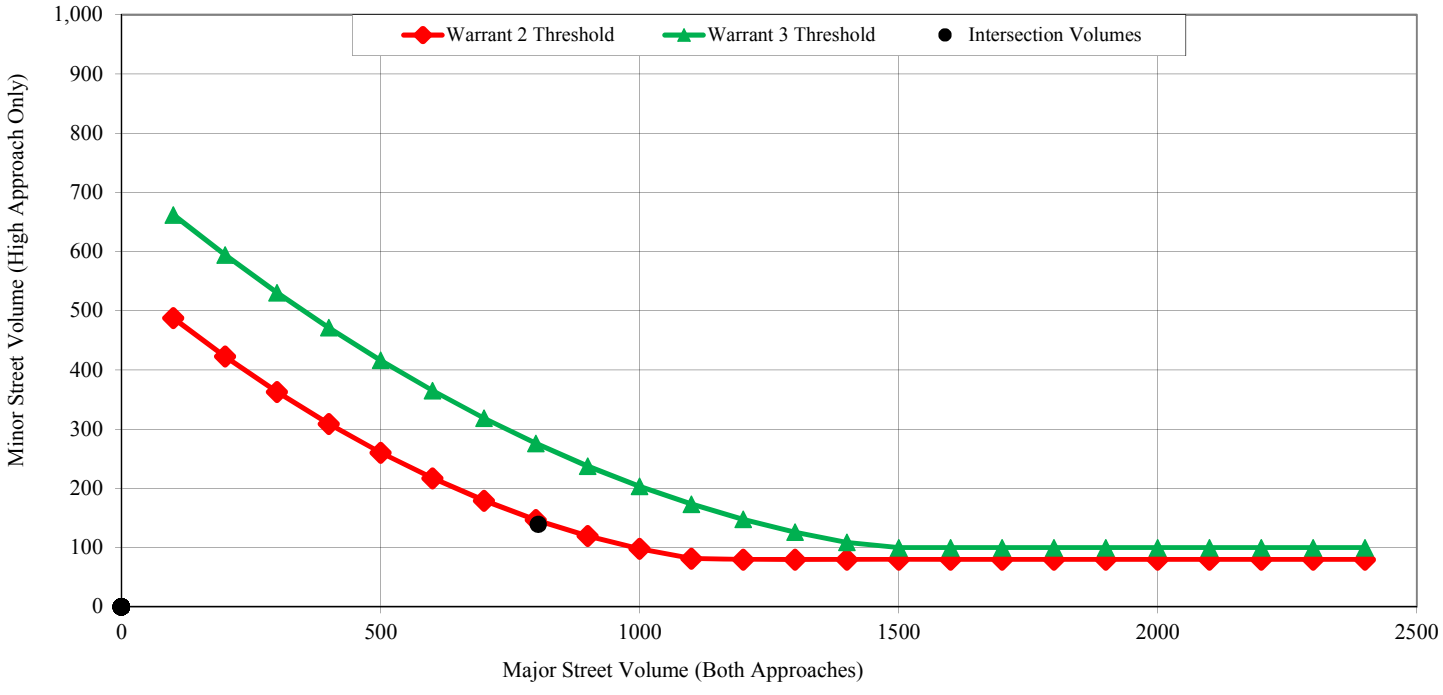
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	**Condition B**	**Condition A+B***
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**	**Not Satisfied**
Required values reached for	0 hours	1 hour	1 (Cond. A) & 1 (Cond. B)
Criteria - Major Street (veh/hr)	500	750	400 (Cond. A) & 600 (Cond. B)
Criteria - Minor Street (veh/hr)	150	75	120 (Cond. A) & 60 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	**Not Satisfied**
Required values reached for	0 hours
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	**Condition B**
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**
Required values reached for	1061 total, 139 minor, 2.7 delay	0 hours
Criteria - Total Approach Volume (veh in one hour)	800	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	100	
Criteria - Minor Street High Side Delay (veh-hrs)	4	

Figure 4C-1 (Warrant 2) & Figure 4C-3 (Warrant 3)



Near Term

Central Coast Transportation Consulting
Traffic Engineering & Transportation Planning

Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Olsen-Chandler SP
Project/File #	2019_131
Scenario	Near Term PM

Intersection Information			
Major Street (N/S Road)	Creston Rd	Minor Street (E/W Road)	Scott St
Analyzed with	1 approach lane	Analyzed with	1 Approach Lane
Total Approach Volume	2693 vehicles	Total Approach Volume	189 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

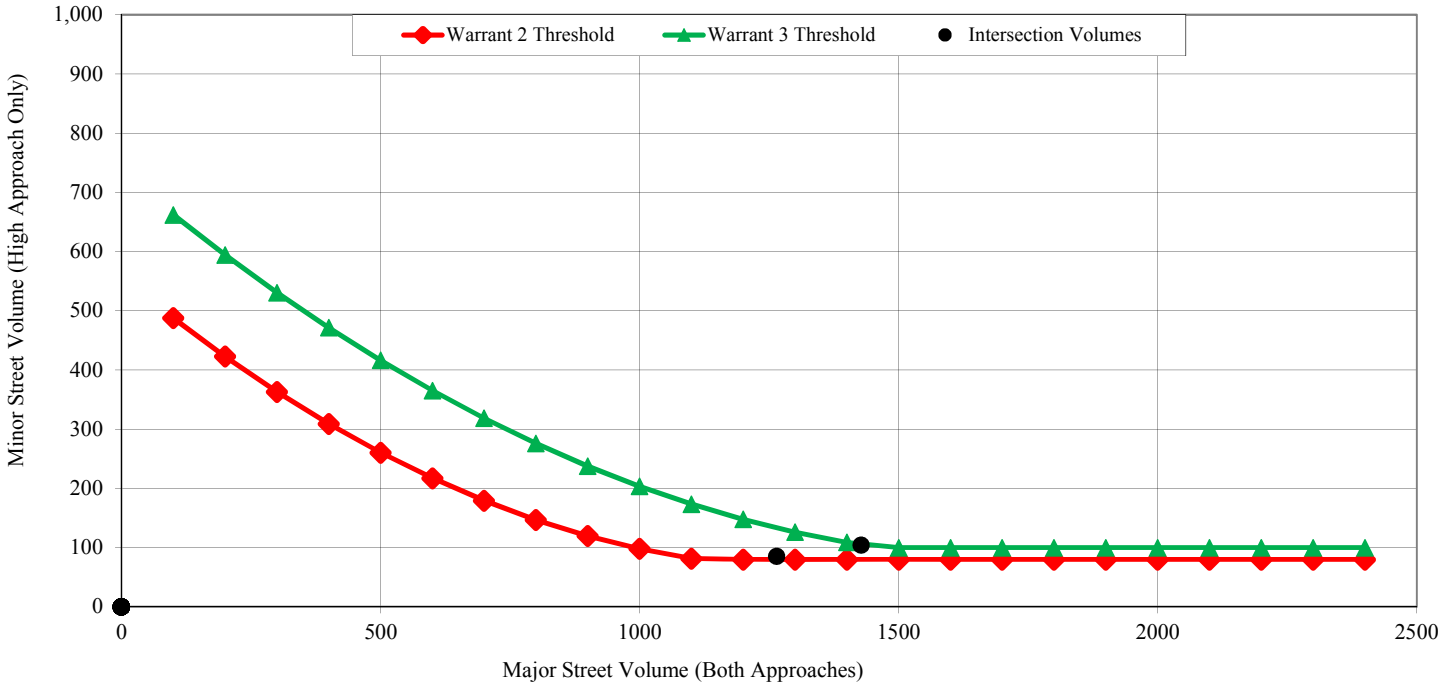
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	**Condition B**	**Condition A+B***
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**	**Not Satisfied**
Required values reached for	0 hours	2 hours	0 (Cond. A) & 2 (Cond. B)
Criteria - Major Street (veh/hr)	500	750	400 (Cond. A) & 600 (Cond. B)
Criteria - Minor Street (veh/hr)	150	75	120 (Cond. A) & 60 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	**Not Satisfied**
Required values reached for	2 hours
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	**Condition B**
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**
Required values reached for	1532 total, 104 minor, 1.5 delay	0 hours
Criteria - Total Approach Volume (veh in one hour)	650	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	100	
Criteria - Minor Street High Side Delay (veh-hrs)	4	

Figure 4C-1 (Warrant 2) & Figure 4C-3 (Warrant 3)



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Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Olsen-Chandler SP
Project/File #	2019_131
Scenario	Near Term Plus 1293 Unit Project AM

Intersection Information			
Major Street (N/S Road)	Creston Rd	Minor Street (E/W Road)	Scott St
Analyzed with	1 approach lane	Analyzed with	1 Approach Lane
Total Approach Volume	1358 vehicles	Total Approach Volume	105 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

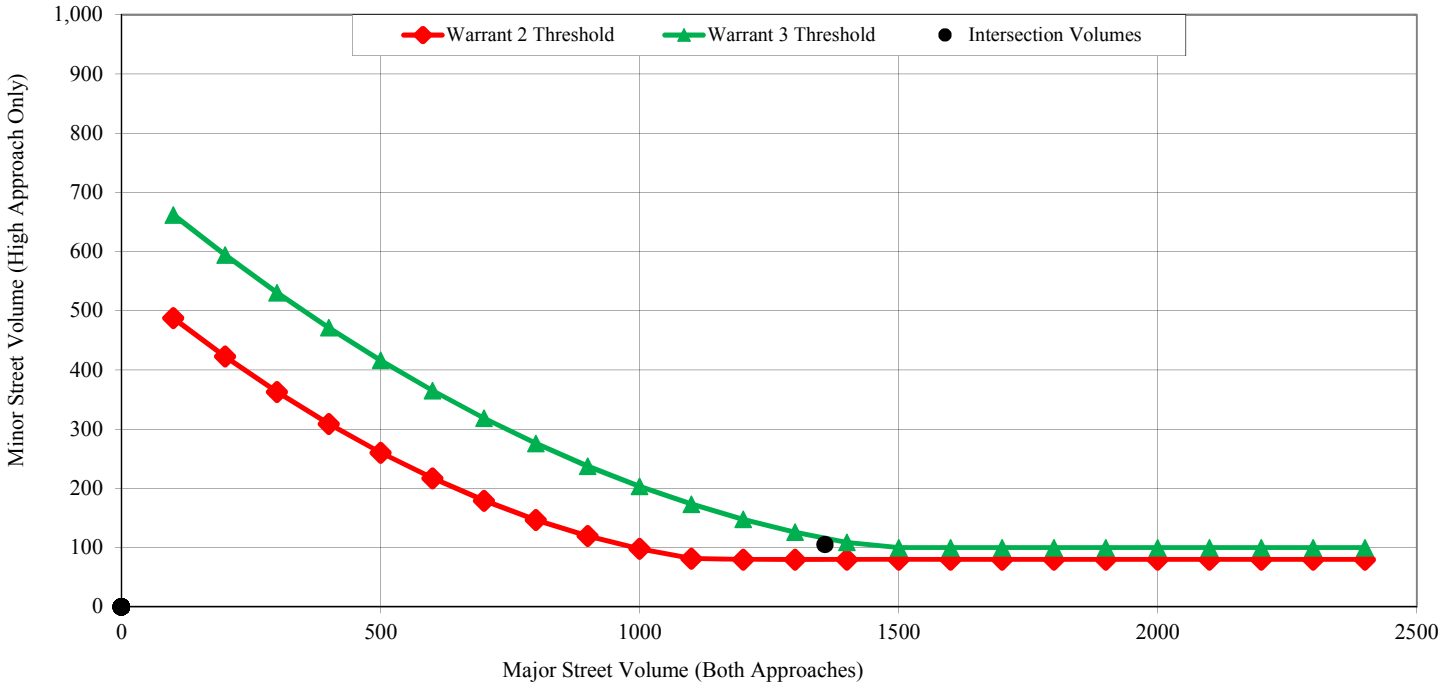
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	**Condition B**	**Condition A+B***
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**	**Not Satisfied**
Required values reached for	0 hours	1 hour	0 (Cond. A) & 1 (Cond. B)
Criteria - Major Street (veh/hr)	500	750	400 (Cond. A) & 600 (Cond. B)
Criteria - Minor Street (veh/hr)	150	75	120 (Cond. A) & 60 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	**Not Satisfied**
Required values reached for	1 hour
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	**Condition B**
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**
Required values reached for	1463 total, 105 minor, 1.3 delay	0 hours
Criteria - Total Approach Volume (veh in one hour)	650	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	100	
Criteria - Minor Street High Side Delay (veh-hrs)	4	

Figure 4C-1 (Warrant 2) & Figure 4C-3 (Warrant 3)



Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Olsen-Chandler SP
Project/File #	2019_131
Scenario	Near Term Plus 1293 Unit Project PM

Intersection Information			
Major Street (N/S Road)	Creston Rd	Minor Street (E/W Road)	Scott St
Analyzed with	1 approach lane	Analyzed with	1 Approach Lane
Total Approach Volume	1565 vehicles	Total Approach Volume	118 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

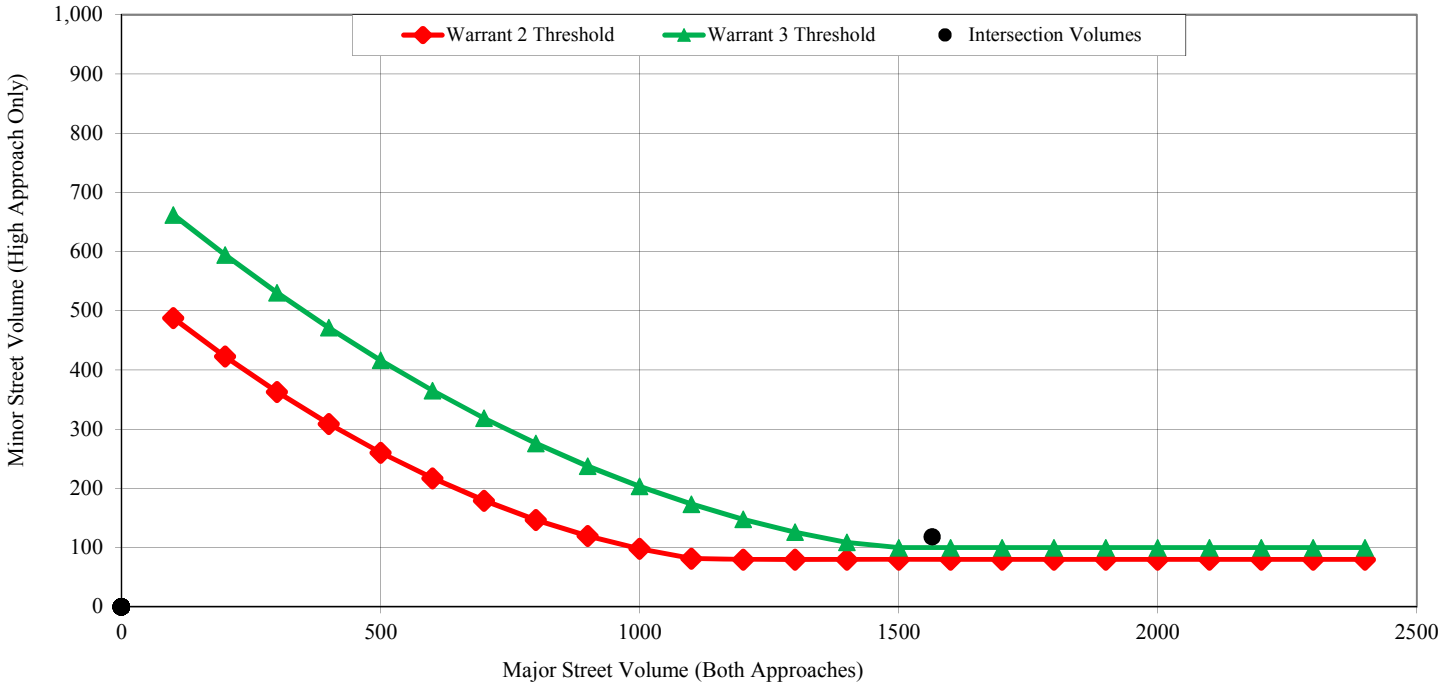
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	**Condition B**	**Condition A+B***
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**	**Not Satisfied**
Required values reached for	0 hours	1 hour	0 (Cond. A) & 1 (Cond. B)
Criteria - Major Street (veh/hr)	500	750	400 (Cond. A) & 600 (Cond. B)
Criteria - Minor Street (veh/hr)	150	75	120 (Cond. A) & 60 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	**Not Satisfied**
Required values reached for	1 hour
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	**Condition B**
Condition Satisfied?	**Not Satisfied**	**Satisfied**
Required values reached for	1683 total, 118 minor, 3.2 delay	1 hour
Criteria - Total Approach Volume (veh in one hour)	650	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	100	
Criteria - Minor Street High Side Delay (veh-hrs)	4	

Figure 4C-1 (Warrant 2) & Figure 4C-3 (Warrant 3)



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Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Olsen-Chandler SP
Project/File #	2019_131
Scenario	Near Term Plus 901 Unit Project PM (Phase 1)

Intersection Information			
Major Street (N/S Road)	Creston Rd	Minor Street (E/W Road)	Scott St
Analyzed with	1 approach lane	Analyzed with	1 Approach Lane
Total Approach Volume	1524 vehicles	Total Approach Volume	114 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

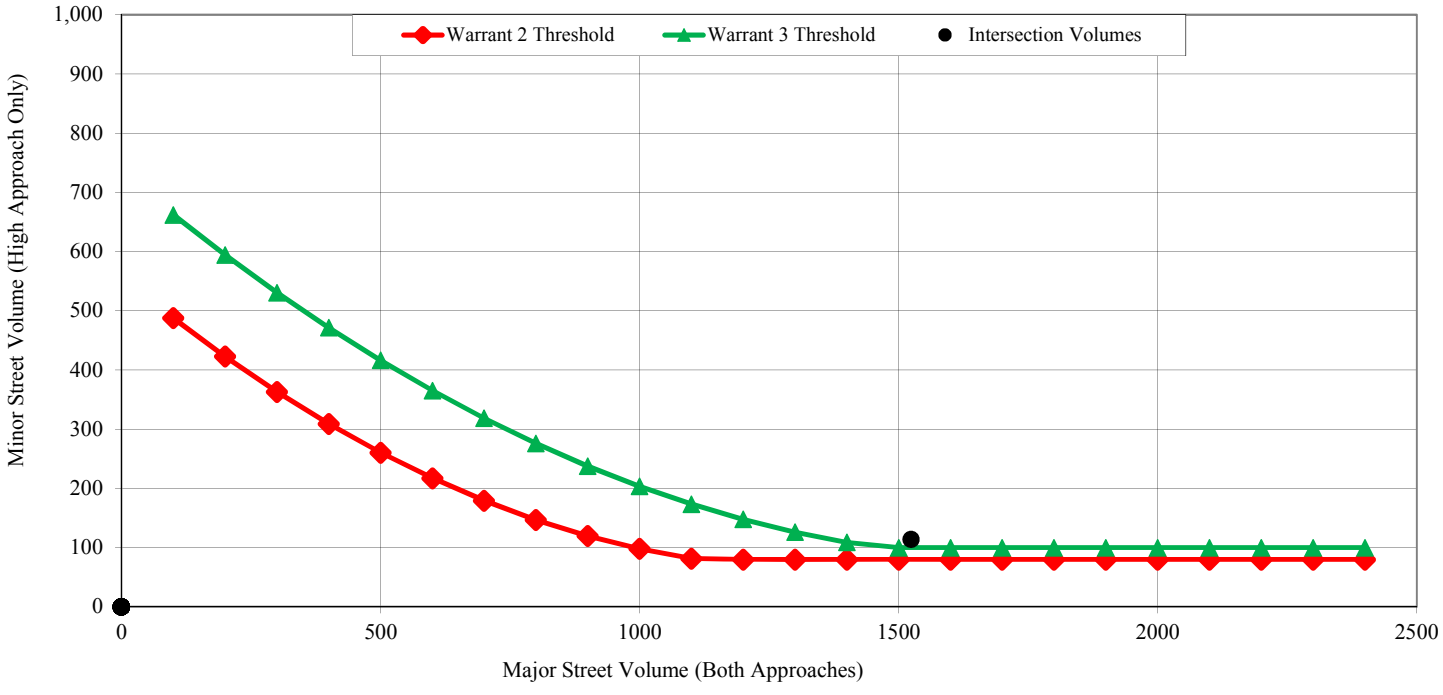
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	**Condition B**	**Condition A+B***
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**	**Not Satisfied**
Required values reached for	0 hours	1 hour	0 (Cond. A) & 1 (Cond. B)
Criteria - Major Street (veh/hr)	500	750	400 (Cond. A) & 600 (Cond. B)
Criteria - Minor Street (veh/hr)	150	75	120 (Cond. A) & 60 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	**Not Satisfied**
Required values reached for	1 hour
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	**Condition B**
Condition Satisfied?	**Not Satisfied**	**Satisfied**
Required values reached for	1638 total, 114 minor, 2.6 delay	1 hour
Criteria - Total Approach Volume (veh in one hour)	650	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	100	
Criteria - Minor Street High Side Delay (veh-hrs)	4	

Figure 4C-1 (Warrant 2) & Figure 4C-3 (Warrant 3)



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Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Olsen-Chandler SP
Project/File #	2019_131
Scenario	Near Term Plus 1293 Unit Project and School AM

Intersection Information			
Major Street (N/S Road)	Creston Rd	Minor Street (E/W Road)	Scott St
Analyzed with	1 approach lane	Analyzed with	1 Approach Lane
Total Approach Volume	1398 vehicles	Total Approach Volume	109 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

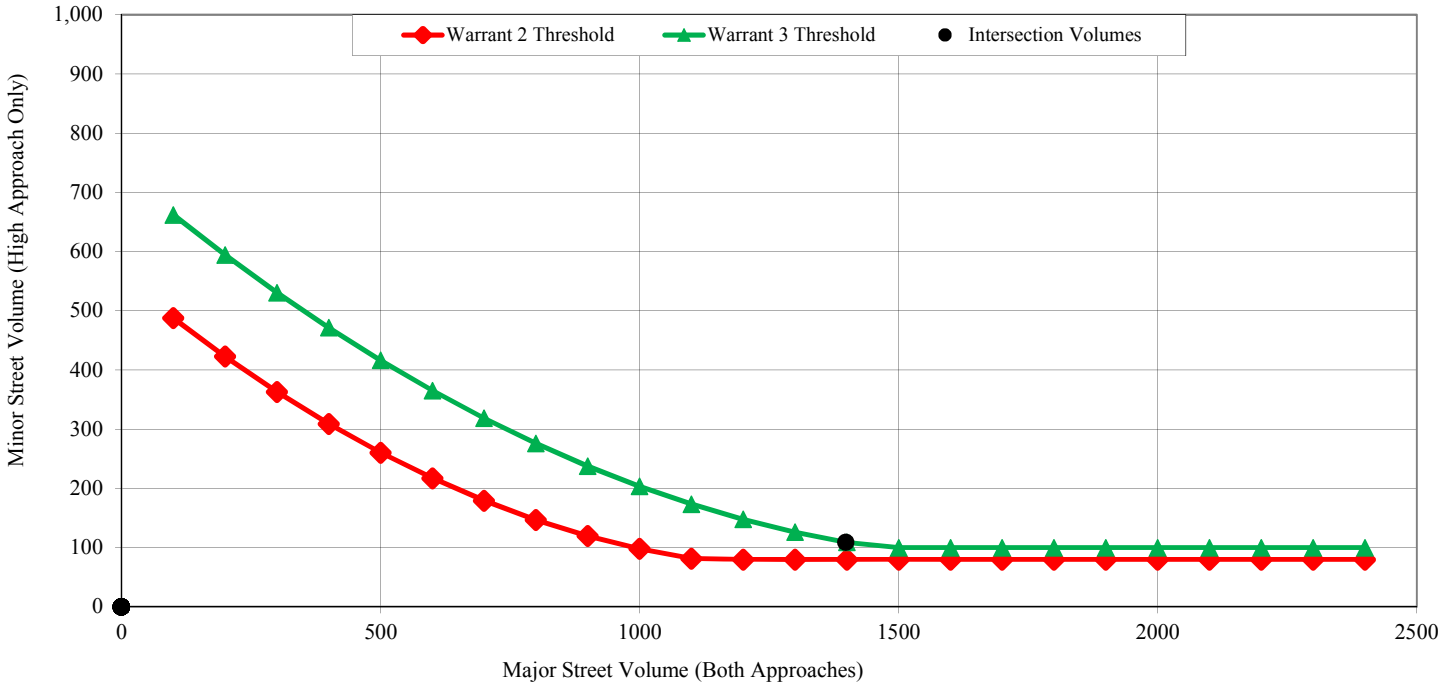
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	**Condition B**	**Condition A+B***
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**	**Not Satisfied**
Required values reached for	0 hours	1 hour	0 (Cond. A) & 1 (Cond. B)
Criteria - Major Street (veh/hr)	500	750	400 (Cond. A) & 600 (Cond. B)
Criteria - Minor Street (veh/hr)	150	75	120 (Cond. A) & 60 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	**Not Satisfied**
Required values reached for	1 hour
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	**Condition B**
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**
Required values reached for	1507 total, 109 minor, 1.6 delay	0 hours
Criteria - Total Approach Volume (veh in one hour)	650	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	100	
Criteria - Minor Street High Side Delay (veh-hrs)	4	

Figure 4C-1 (Warrant 2) & Figure 4C-3 (Warrant 3)



Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Olsen-Chandler SP
Project/File #	2019_131
Scenario	Near Term AM

Intersection Information			
Major Street (N/S Road)	Creston Rd	Minor Street (E/W Road)	Stoney Creek Rd
Analyzed with	1 approach lane	Analyzed with	1 Approach Lane
Total Approach Volume	2125 vehicles	Total Approach Volume	426 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

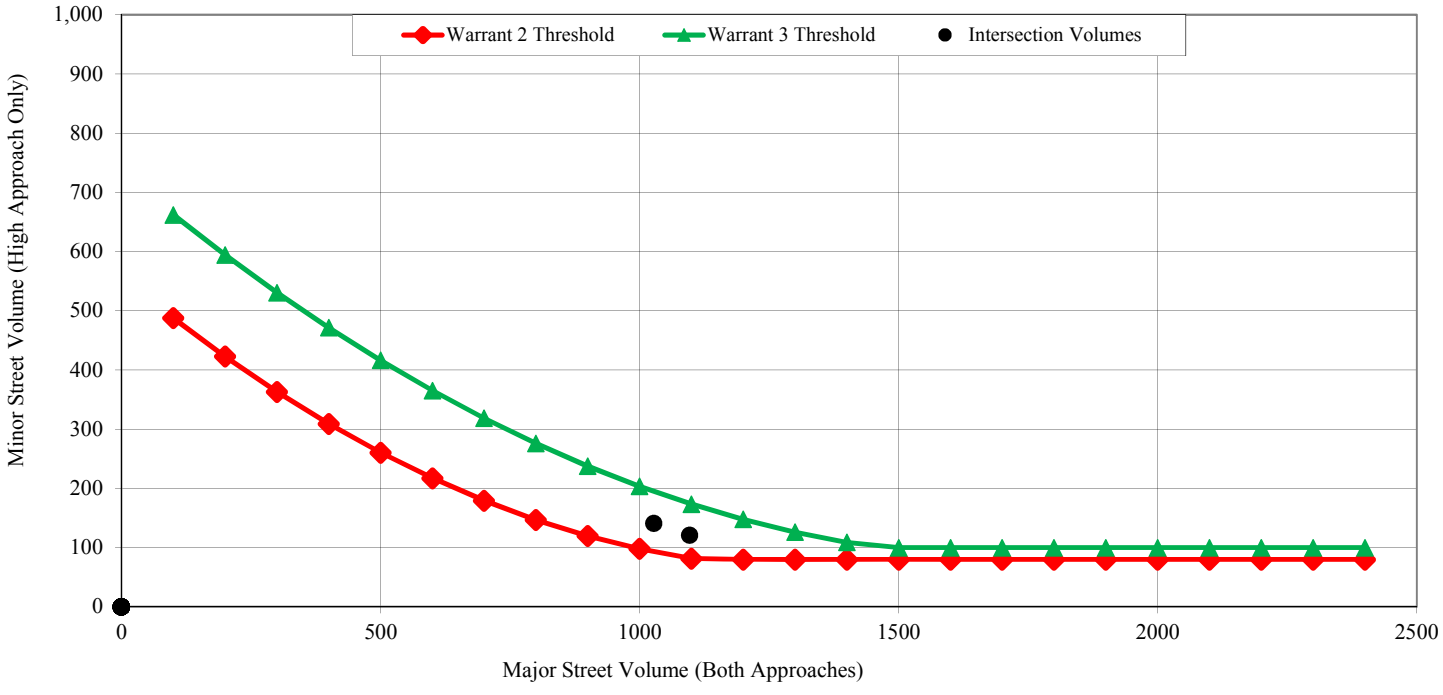
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	**Condition B**	**Condition A+B***
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**	**Not Satisfied**
Required values reached for	0 hours	2 hours	2 (Cond. A) & 2 (Cond. B)
Criteria - Major Street (veh/hr)	500	750	400 (Cond. A) & 600 (Cond. B)
Criteria - Minor Street (veh/hr)	150	75	120 (Cond. A) & 60 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	**Not Satisfied**
Required values reached for	2 hours
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	**Condition B**
Condition Satisfied?	**Satisfied**	**Not Satisfied**
Required values reached for	1290 total, 141 minor, 4.8 delay	0 hours
Criteria - Total Approach Volume (veh in one hour)	800	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	100	
Criteria - Minor Street High Side Delay (veh-hrs)	4	

Figure 4C-1 (Warrant 2) & Figure 4C-3 (Warrant 3)



Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Olsen-Chandler SP
Project/File #	2019_131
Scenario	Near Term PM

Intersection Information			
Major Street (N/S Road)	Creston Rd	Minor Street (E/W Road)	Stoney Creek Rd
Analyzed with	1 approach lane	Analyzed with	1 Approach Lane
Total Approach Volume	2125 vehicles	Total Approach Volume	426 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

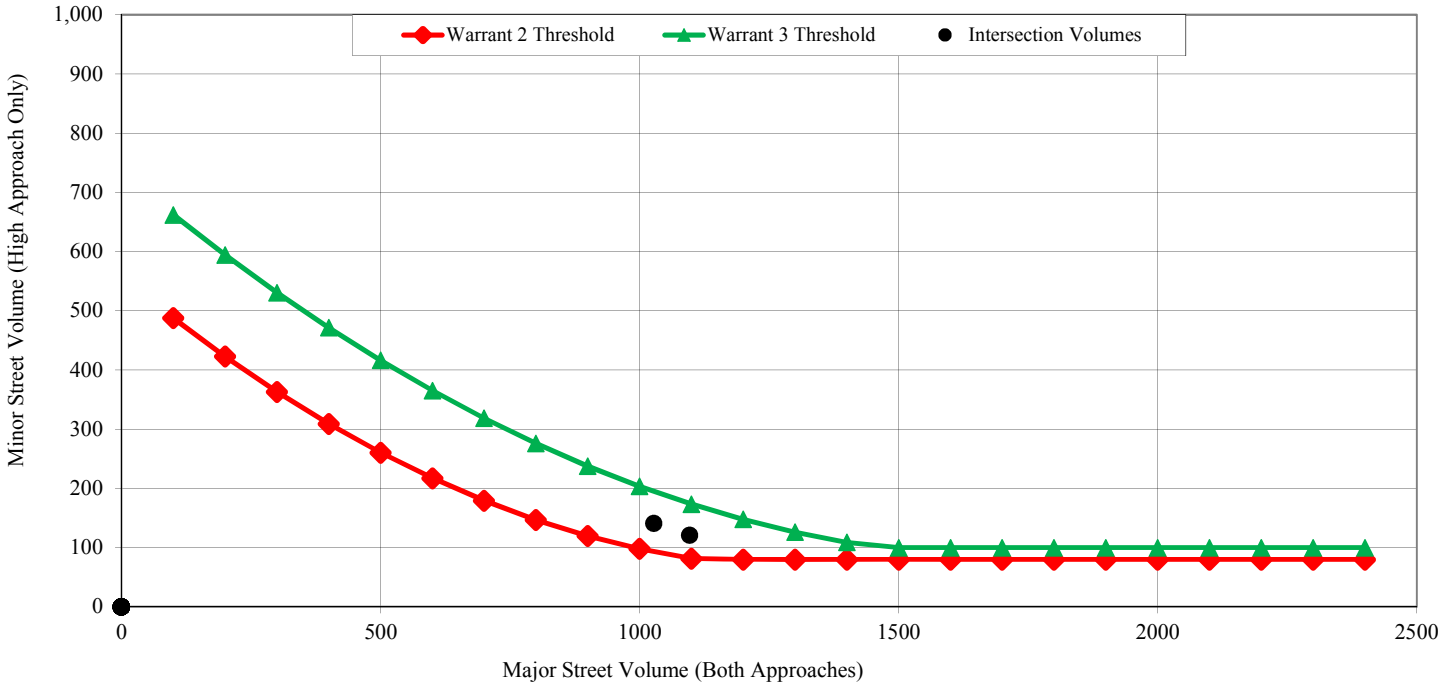
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	**Condition B**	**Condition A+B***
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**	**Not Satisfied**
Required values reached for	0 hours	2 hours	2 (Cond. A) & 2 (Cond. B)
Criteria - Major Street (veh/hr)	500	750	400 (Cond. A) & 600 (Cond. B)
Criteria - Minor Street (veh/hr)	150	75	120 (Cond. A) & 60 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	**Not Satisfied**
Required values reached for	2 hours
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	**Condition B**
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**
Required values reached for	1261 total, 121 minor, 1.8 delay	0 hours
Criteria - Total Approach Volume (veh in one hour)	800	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	100	
Criteria - Minor Street High Side Delay (veh-hrs)	4	

Figure 4C-1 (Warrant 2) & Figure 4C-3 (Warrant 3)



Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Olsen-Chandler SP
Project/File #	2019_131
Scenario	Near Term Plus 1293 Unit Project PM

Intersection Information			
Major Street (N/S Road)	Creston Rd	Minor Street (E/W Road)	Stoney Creek Rd
Analyzed with	1 approach lane	Analyzed with	1 Approach Lane
Total Approach Volume	1194 vehicles	Total Approach Volume	173 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

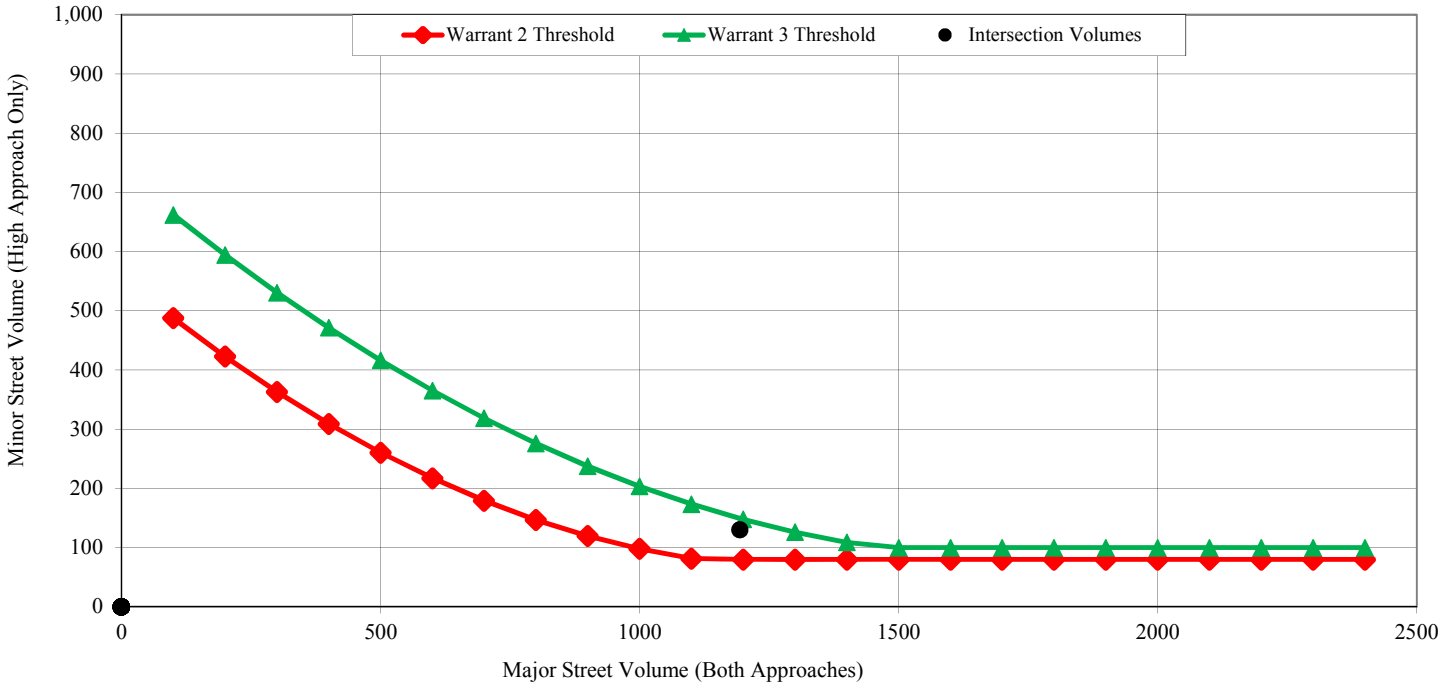
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	**Condition B**	**Condition A+B***
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**	**Not Satisfied**
Required values reached for	0 hours	1 hour	1 (Cond. A) & 1 (Cond. B)
Criteria - Major Street (veh/hr)	500	750	400 (Cond. A) & 600 (Cond. B)
Criteria - Minor Street (veh/hr)	150	75	120 (Cond. A) & 60 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	**Not Satisfied**
Required values reached for	1 hour
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	**Condition B**
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**
Required values reached for	1367 total, 130 minor, 2.9 delay	0 hours
Criteria - Total Approach Volume (veh in one hour)	800	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	100	
Criteria - Minor Street High Side Delay (veh-hrs)	4	

Figure 4C-1 (Warrant 2) & Figure 4C-3 (Warrant 3)



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Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Olsen-Chandler SP
Project/File #	2019_131
Scenario	Near Term Plus 1293 Unit Project and School PM

Intersection Information			
Major Street (N/S Road)	Creston Rd	Minor Street (E/W Road)	Stoney Creek Rd
Analyzed with	1 approach lane	Analyzed with	1 Approach Lane
Total Approach Volume	1203 vehicles	Total Approach Volume	174 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

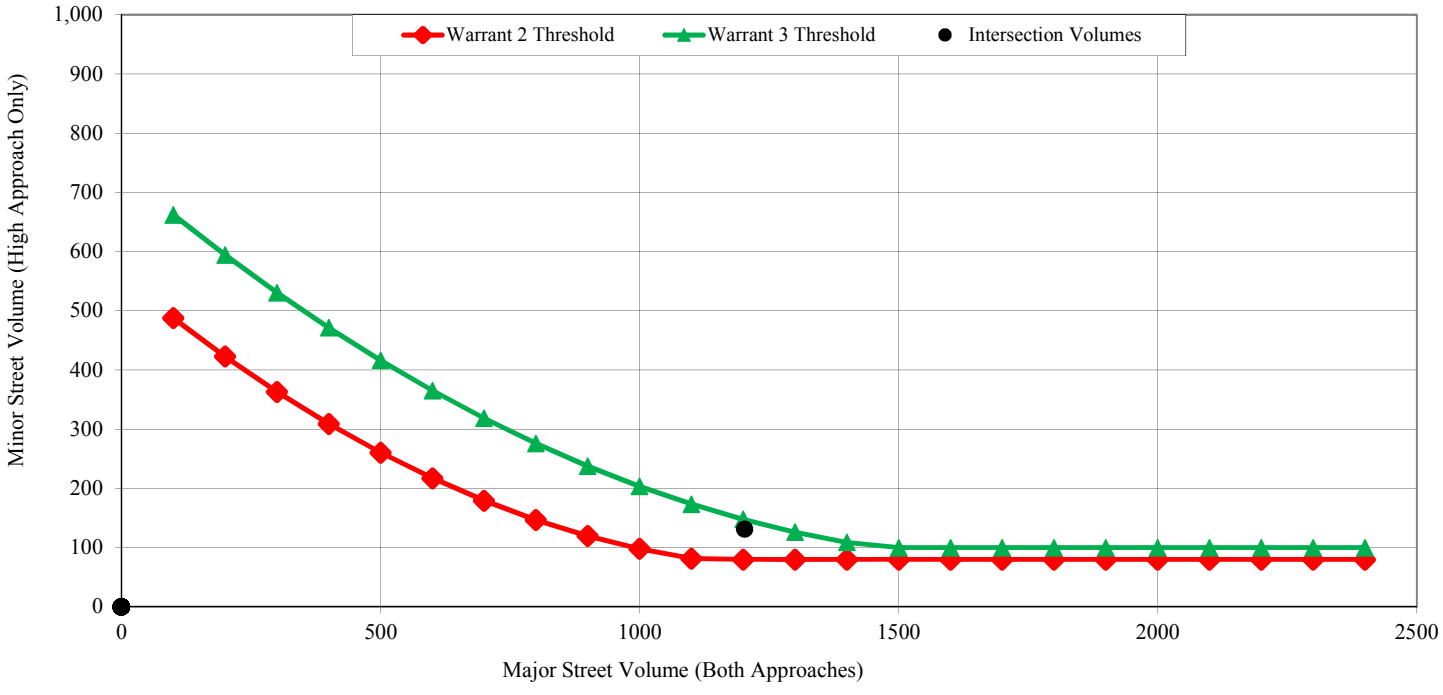
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	**Condition B**	**Condition A+B***
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**	**Not Satisfied**
Required values reached for	0 hours	1 hour	1 (Cond. A) & 1 (Cond. B)
Criteria - Major Street (veh/hr)	500	750	400 (Cond. A) & 600 (Cond. B)
Criteria - Minor Street (veh/hr)	150	75	120 (Cond. A) & 60 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	**Not Satisfied**
Required values reached for	1 hour
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	**Condition B**
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**
Required values reached for	1377 total, 131 minor, 3.1 delay	0 hours
Criteria - Total Approach Volume (veh in one hour)	800	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	100	
Criteria - Minor Street High Side Delay (veh-hrs)	4	

Figure 4C-1 (Warrant 2) & Figure 4C-3 (Warrant 3)



Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Olsen-Chandler SP
Project/File #	2019_131
Scenario	Near Term Plus 1293 Unit Project AM

Intersection Information			
Major Street (N/S Road)	Creston Rd	Minor Street (E/W Road)	Meadowlark Rd
Analyzed with	1 approach lane	Analyzed with	1 Approach Lane
Total Approach Volume	840 vehicles	Total Approach Volume	633 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

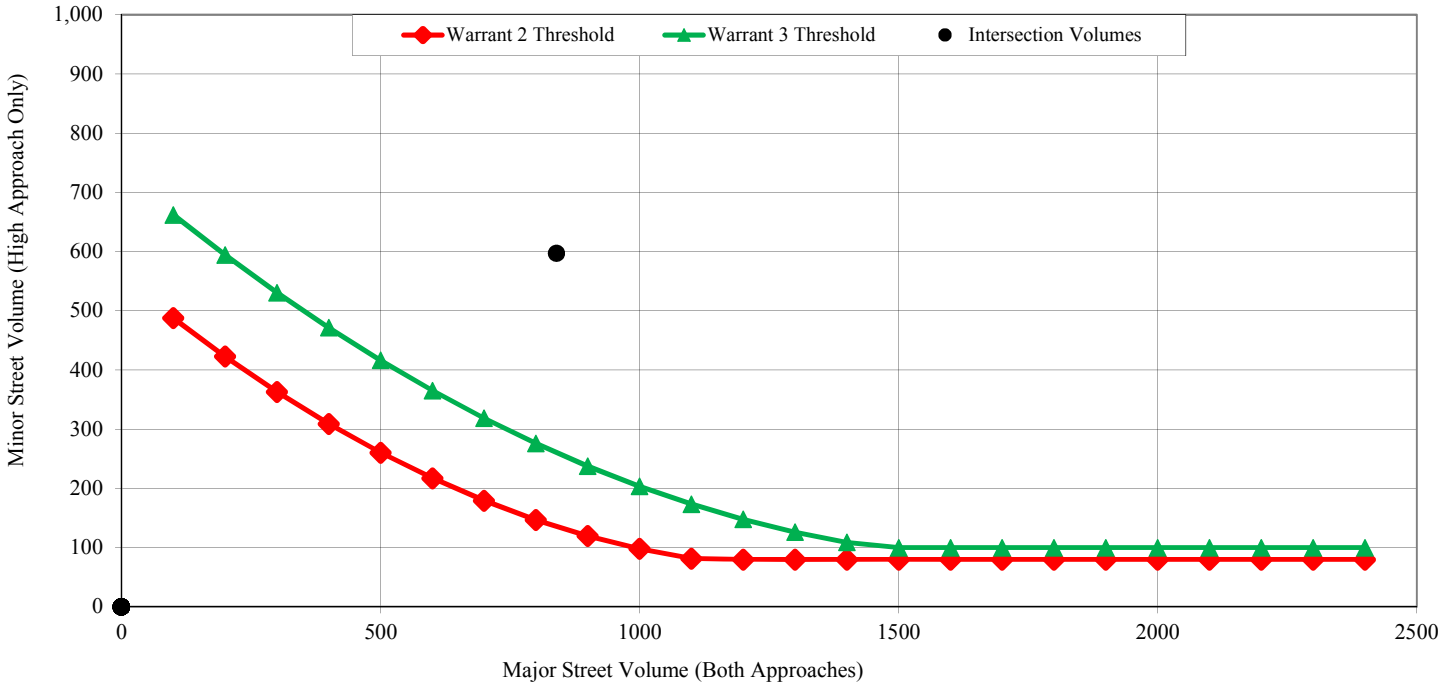
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	**Condition B**	**Condition A+B***
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**	**Not Satisfied**
Required values reached for	1 hour	1 hour	1 (Cond. A) & 1 (Cond. B)
Criteria - Major Street (veh/hr)	500	750	400 (Cond. A) & 600 (Cond. B)
Criteria - Minor Street (veh/hr)	150	75	120 (Cond. A) & 60 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	**Not Satisfied**
Required values reached for	1 hour
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	**Condition B**
Condition Satisfied?	**Satisfied**	**Satisfied**
Required values reached for	1473 total, 597 minor, 19 delay	1 hour
Criteria - Total Approach Volume (veh in one hour)	800	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	100	
Criteria - Minor Street High Side Delay (veh-hrs)	4	

Figure 4C-1 (Warrant 2) & Figure 4C-3 (Warrant 3)



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Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Olsen-Chandler SP
Project/File #	2019_131
Scenario	Near Term Plus 901 Unit Project AM (Phase 1)

Intersection Information			
Major Street (N/S Road)	Creston Rd	Minor Street (E/W Road)	Meadowlark Rd
Analyzed with	1 approach lane	Analyzed with	1 Approach Lane
Total Approach Volume	827 vehicles	Total Approach Volume	596 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

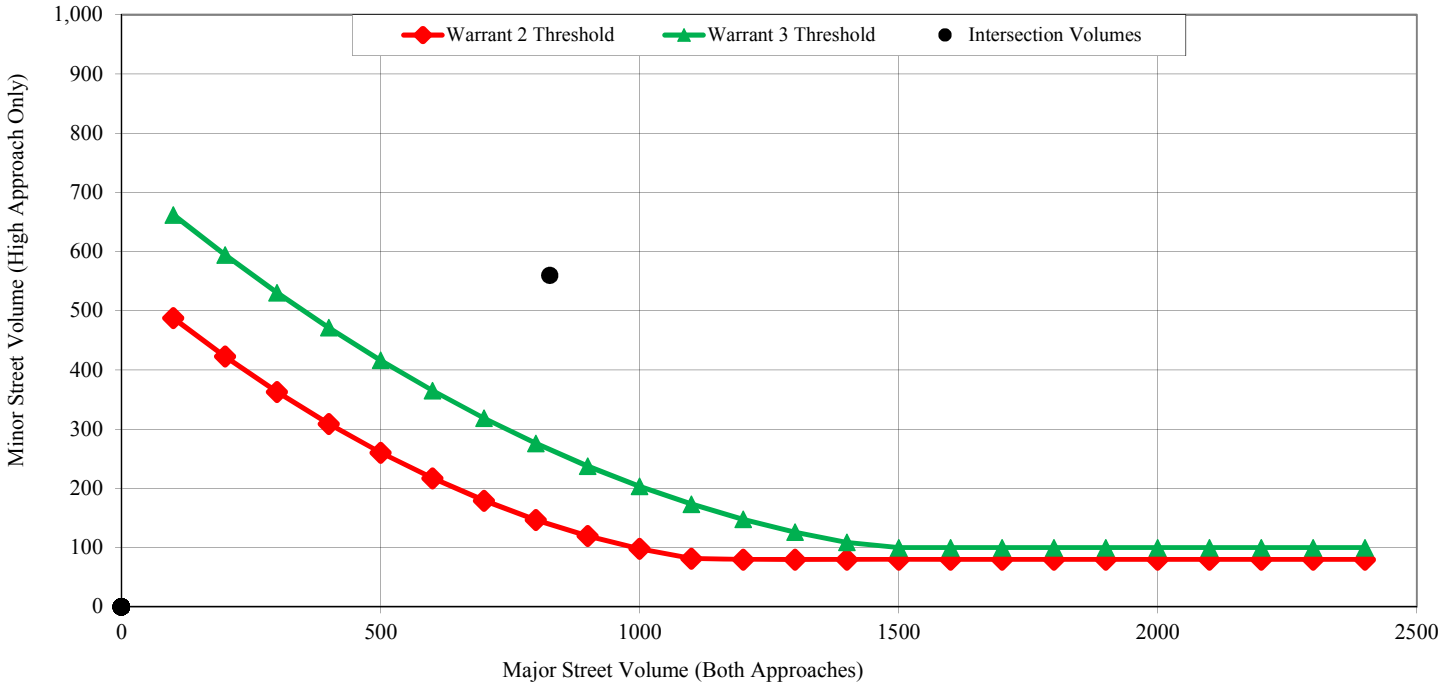
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	**Condition B**	**Condition A+B***
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**	**Not Satisfied**
Required values reached for	1 hour	1 hour	1 (Cond. A) & 1 (Cond. B)
Criteria - Major Street (veh/hr)	500	750	400 (Cond. A) & 600 (Cond. B)
Criteria - Minor Street (veh/hr)	150	75	120 (Cond. A) & 60 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	**Not Satisfied**
Required values reached for	1 hour
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	**Condition B**
Condition Satisfied?	**Satisfied**	**Satisfied**
Required values reached for	1423 total, 560 minor, 13.3 delay	1 hour
Criteria - Total Approach Volume (veh in one hour)	800	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	100	
Criteria - Minor Street High Side Delay (veh-hrs)	4	

Figure 4C-1 (Warrant 2) & Figure 4C-3 (Warrant 3)



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Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Olsen-Chandler SP
Project/File #	2019_131
Scenario	Near Term Plus 1293 Unit Project + S AM

Intersection Information			
Major Street (N/S Road)	Creston Rd	Minor Street (E/W Road)	Meadowlark Rd
Analyzed with	1 approach lane	Analyzed with	1 Approach Lane
Total Approach Volume	1123 vehicles	Total Approach Volume	410 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

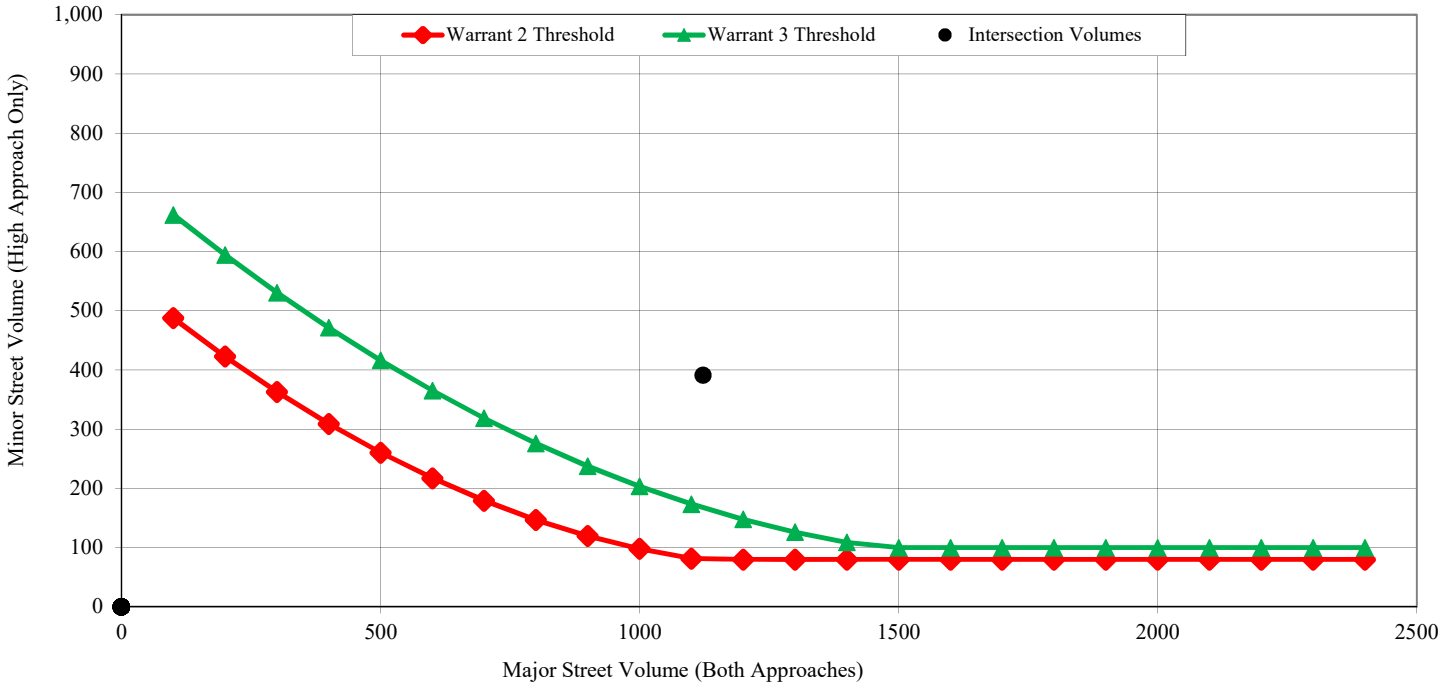
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	**Condition B**	**Condition A+B***
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**	**Not Satisfied**
Required values reached for	1 hour	1 hour	1 (Cond. A) & 1 (Cond. B)
Criteria - Major Street (veh/hr)	500	750	400 (Cond. A) & 600 (Cond. B)
Criteria - Minor Street (veh/hr)	150	75	120 (Cond. A) & 60 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	**Not Satisfied**
Required values reached for	1 hour
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	**Condition B**
Condition Satisfied?	**Not Satisfied**	**Satisfied**
Required values reached for	1533 total, 391 minor, 3.9 delay	1 hour
Criteria - Total Approach Volume (veh in one hour)	800	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	100	
Criteria - Minor Street High Side Delay (veh-hrs)	4	

Figure 4C-1 (Warrant 2) & Figure 4C-3 (Warrant 3)



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Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Olsen-Chandler SP
Project/File #	2019_131
Scenario	Near Term Plus 1293 Unit Project PM

Intersection Information			
Major Street (N/S Road)	Creston Rd	Minor Street (E/W Road)	Charolais Rd
Analyzed with	2 or more approach lanes	Analyzed with	2 or more approach lanes
Total Approach Volume	782 vehicles	Total Approach Volume	588 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

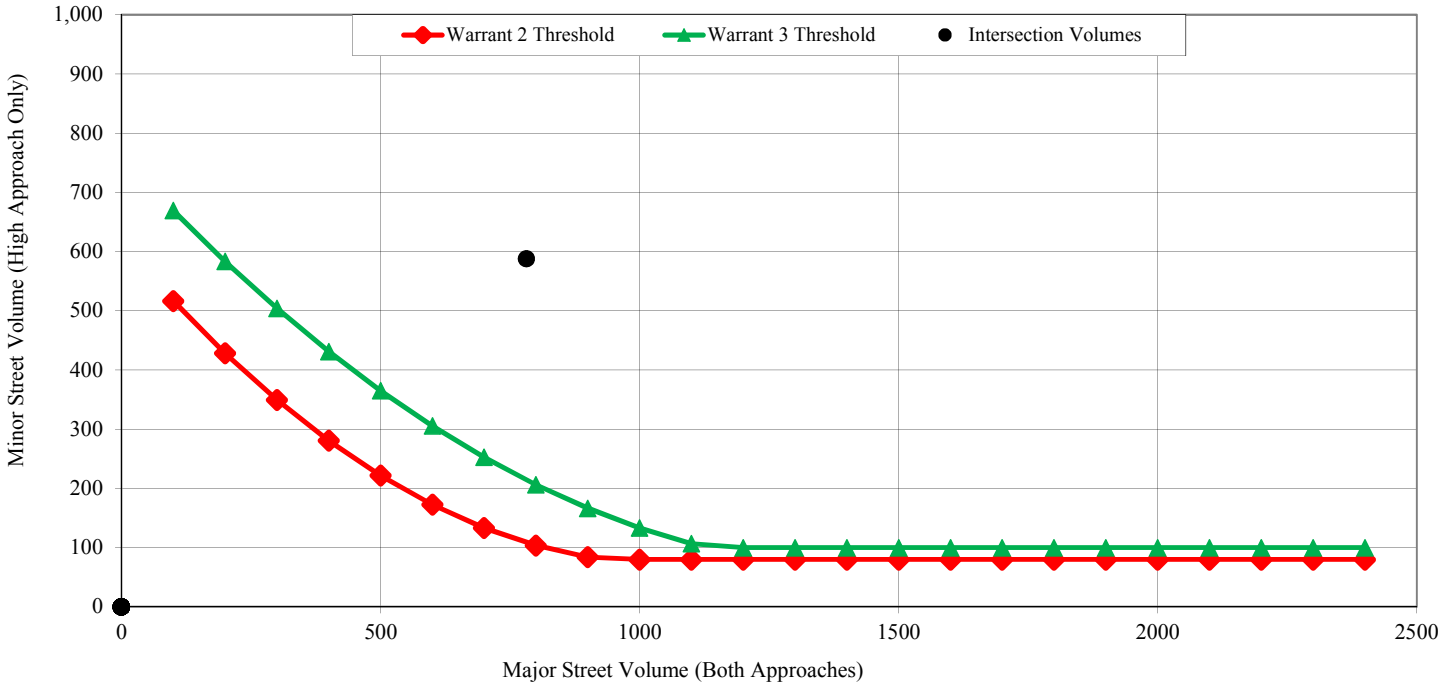
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	**Condition B**	**Condition A+B***
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**	**Not Satisfied**
Required values reached for	1 hour	1 hour	1 (Cond. A) & 1 (Cond. B)
Criteria - Major Street (veh/hr)	420	630	336 (Cond. A) & 504 (Cond. B)
Criteria - Minor Street (veh/hr)	140	70	112 (Cond. A) & 56 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	**Not Satisfied**
Required values reached for	1 hour
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	**Condition B**
Condition Satisfied?	**Satisfied**	**Satisfied**
Required values reached for	1370 total, 588 minor, 6.6 delay	1 hour
Criteria - Total Approach Volume (veh in one hour)	650	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	150	
Criteria - Minor Street High Side Delay (veh-hrs)	5	

Figure 4C-2 (Warrant 2 - 70% Factor) & Figure 4C-4 (Warrant 3 - 70% Factor)



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Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Olsen-Chandler SP
Project/File #	2019_131
Scenario	Near Term Plus 901 Unit Project PM (Phase 1)

Intersection Information			
Major Street (N/S Road)	Creston Rd	Minor Street (E/W Road)	Charolais Rd
Analyzed with	2 or more approach lanes	Analyzed with	2 or more approach lanes
Total Approach Volume	769 vehicles	Total Approach Volume	566 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

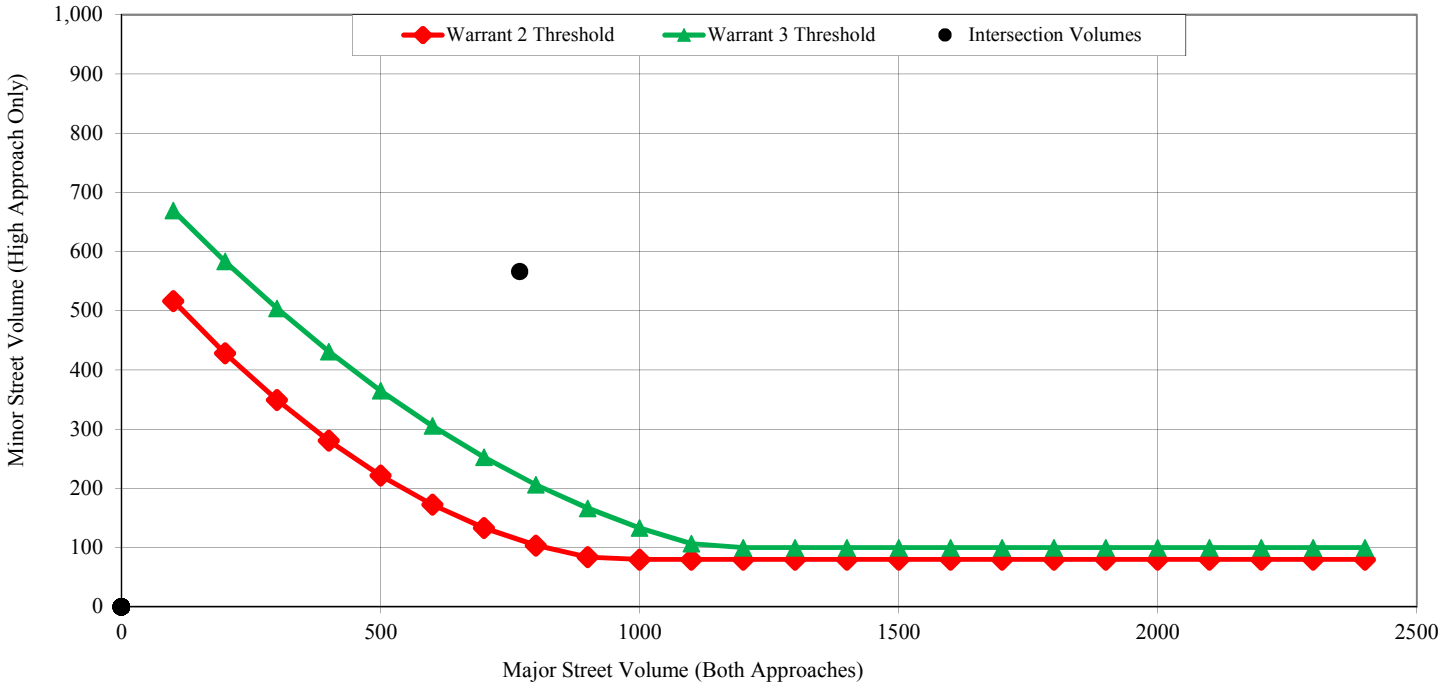
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	**Condition B**	**Condition A+B***
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**	**Not Satisfied**
Required values reached for	1 hour	1 hour	1 (Cond. A) & 1 (Cond. B)
Criteria - Major Street (veh/hr)	420	630	336 (Cond. A) & 504 (Cond. B)
Criteria - Minor Street (veh/hr)	140	70	112 (Cond. A) & 56 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	**Not Satisfied**
Required values reached for	1 hour
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	**Condition B**
Condition Satisfied?	**Satisfied**	**Satisfied**
Required values reached for	1335 total, 566 minor, 5.3 delay	1 hour
Criteria - Total Approach Volume (veh in one hour)	650	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	150	
Criteria - Minor Street High Side Delay (veh-hrs)	5	

Figure 4C-2 (Warrant 2 - 70% Factor) & Figure 4C-4 (Warrant 3 - 70% Factor)



Cumulative

Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Olsen-Chandler SP
Project/File #	2019_131
Scenario	Cumulative AM

Intersection Information			
Major Street (N/S Road)	Creston Rd	Minor Street (E/W Road)	Scott St
Analyzed with	1 approach lane	Analyzed with	1 Approach Lane
Total Approach Volume	1328 vehicles	Total Approach Volume	87 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

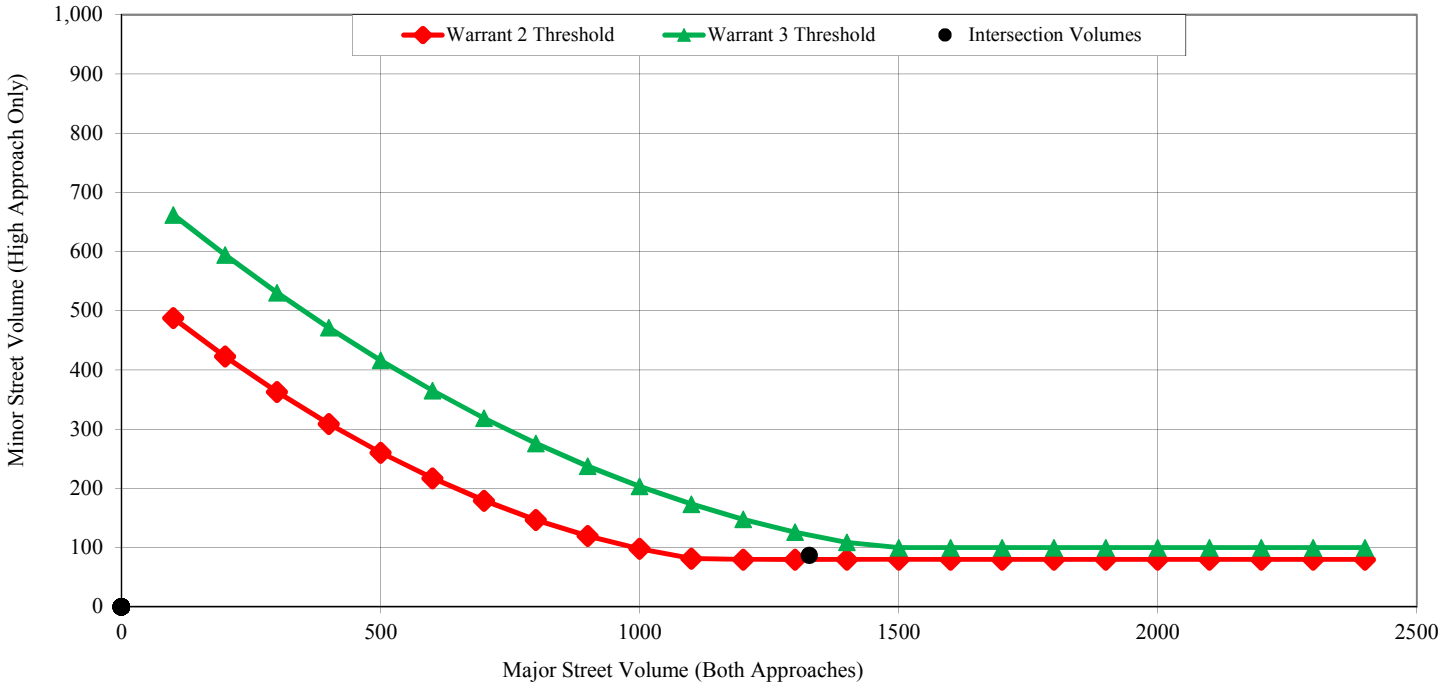
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	**Condition B**	**Condition A+B***
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**	**Not Satisfied**
Required values reached for	0 hours	1 hour	0 (Cond. A) & 1 (Cond. B)
Criteria - Major Street (veh/hr)	500	750	400 (Cond. A) & 600 (Cond. B)
Criteria - Minor Street (veh/hr)	150	75	120 (Cond. A) & 60 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	**Not Satisfied**
Required values reached for	1 hour
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	**Condition B**
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**
Required values reached for	1415 total, 87 minor, 0.9 delay	0 hours
Criteria - Total Approach Volume (veh in one hour)	650	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	100	
Criteria - Minor Street High Side Delay (veh-hrs)	4	

Figure 4C-1 (Warrant 2) & Figure 4C-3 (Warrant 3)



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Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Olsen-Chandler SP
Project/File #	2019_131
Scenario	Cumulative PM

Intersection Information			
Major Street (N/S Road)	Creston Rd	Minor Street (E/W Road)	Scott St
Analyzed with	1 approach lane	Analyzed with	1 Approach Lane
Total Approach Volume	1538 vehicles	Total Approach Volume	112 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

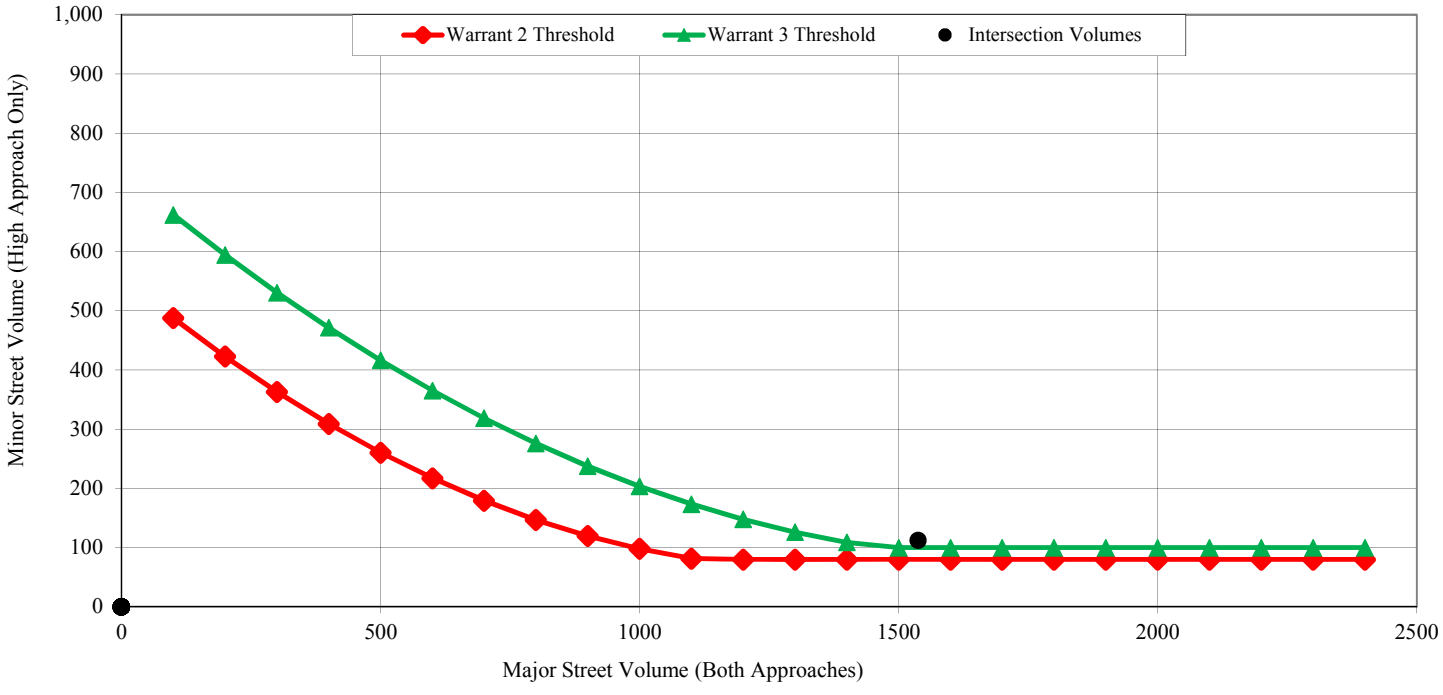
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	**Condition B**	**Condition A+B***
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**	**Not Satisfied**
Required values reached for	0 hours	1 hour	0 (Cond. A) & 1 (Cond. B)
Criteria - Major Street (veh/hr)	500	750	400 (Cond. A) & 600 (Cond. B)
Criteria - Minor Street (veh/hr)	150	75	120 (Cond. A) & 60 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	**Not Satisfied**
Required values reached for	1 hour
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	**Condition B**
Condition Satisfied?	**Not Satisfied**	**Satisfied**
Required values reached for	1650 total, 112 minor, 2.8 delay	1 hour
Criteria - Total Approach Volume (veh in one hour)	650	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	100	
Criteria - Minor Street High Side Delay (veh-hrs)	4	

Figure 4C-1 (Warrant 2) & Figure 4C-3 (Warrant 3)



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Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Olsen-Chandler SP
Project/File #	2019_131
Scenario	Cumulative Plus 1293 Unit Project AM

Intersection Information			
Major Street (N/S Road)	Creston Rd	Minor Street (E/W Road)	Scott St
Analyzed with	1 approach lane	Analyzed with	1 Approach Lane
Total Approach Volume	1376 vehicles	Total Approach Volume	101 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

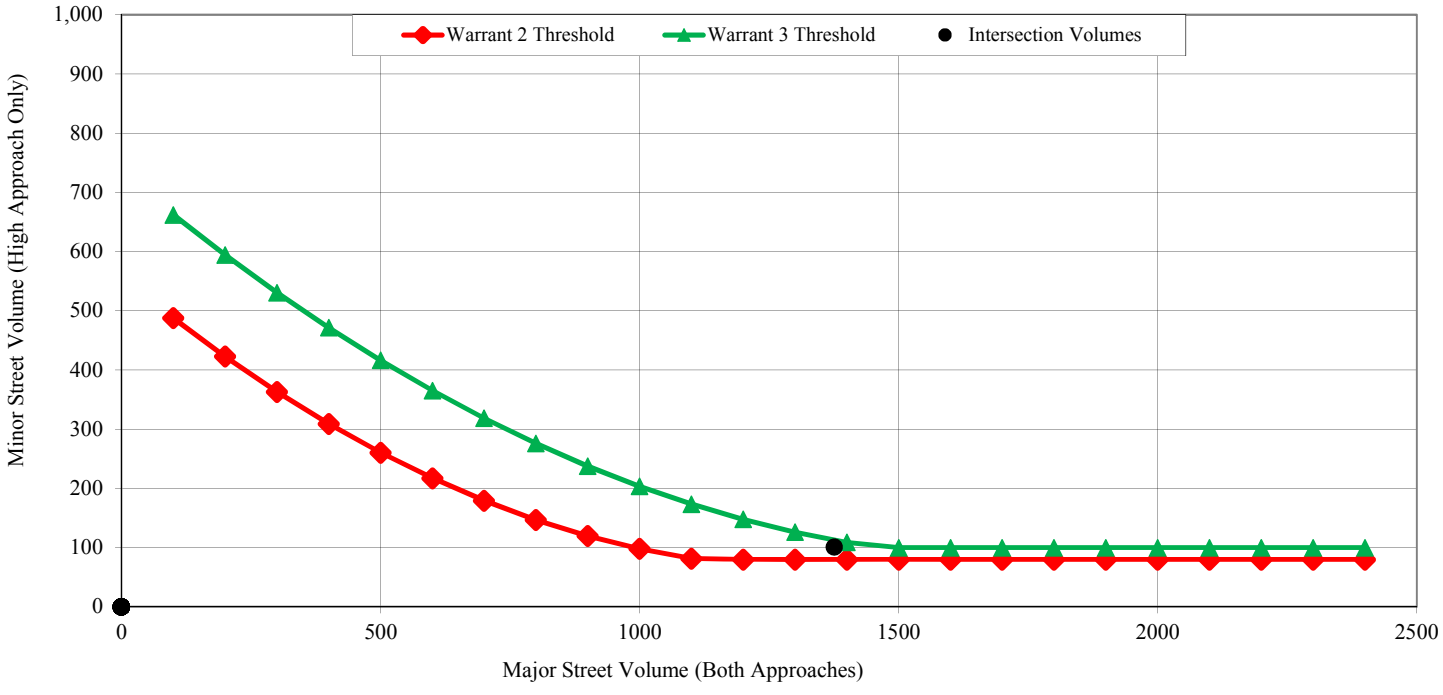
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	**Condition B**	**Condition A+B***
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**	**Not Satisfied**
Required values reached for	0 hours	1 hour	0 (Cond. A) & 1 (Cond. B)
Criteria - Major Street (veh/hr)	500	750	400 (Cond. A) & 600 (Cond. B)
Criteria - Minor Street (veh/hr)	150	75	120 (Cond. A) & 60 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	**Not Satisfied**
Required values reached for	1 hour
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	**Condition B**
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**
Required values reached for	1477 total, 101 minor, 1.4 delay	0 hours
Criteria - Total Approach Volume (veh in one hour)	650	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	100	
Criteria - Minor Street High Side Delay (veh-hrs)	4	

Figure 4C-1 (Warrant 2) & Figure 4C-3 (Warrant 3)



Central Coast Transportation Consulting
Traffic Engineering & Transportation Planning

Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Olsen-Chandler SP
Project/File #	2019_131
Scenario	Cumulative Plus 1293 Unit Project and School AM

Intersection Information			
Major Street (N/S Road)	Creston Rd	Minor Street (E/W Road)	Scott St
Analyzed with	1 approach lane	Analyzed with	1 Approach Lane
Total Approach Volume	1396 vehicles	Total Approach Volume	103 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

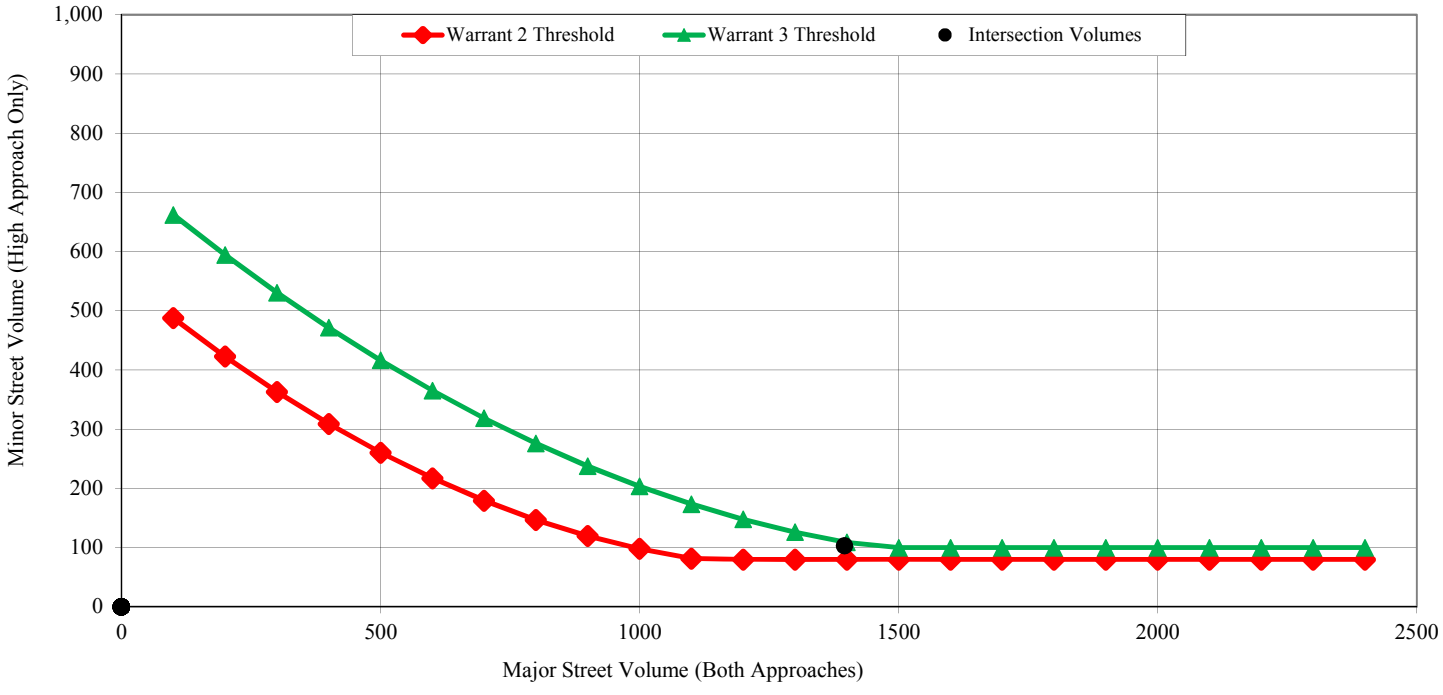
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	**Condition B**	**Condition A+B***
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**	**Not Satisfied**
Required values reached for	0 hours	1 hour	0 (Cond. A) & 1 (Cond. B)
Criteria - Major Street (veh/hr)	500	750	400 (Cond. A) & 600 (Cond. B)
Criteria - Minor Street (veh/hr)	150	75	120 (Cond. A) & 60 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	**Not Satisfied**
Required values reached for	1 hour
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	**Condition B**
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**
Required values reached for	1499 total, 103 minor, 1.5 delay	0 hours
Criteria - Total Approach Volume (veh in one hour)	650	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	100	
Criteria - Minor Street High Side Delay (veh-hrs)	4	

Figure 4C-1 (Warrant 2) & Figure 4C-3 (Warrant 3)



Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Olsen-Chandler SP
Project/File #	2019_131
Scenario	Cumulative AM

Intersection Information			
Major Street (N/S Road)	Creston Rd	Minor Street (E/W Road)	Stoney Creek Rd
Analyzed with	1 approach lane	Analyzed with	1 Approach Lane
Total Approach Volume	1046 vehicles	Total Approach Volume	323 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

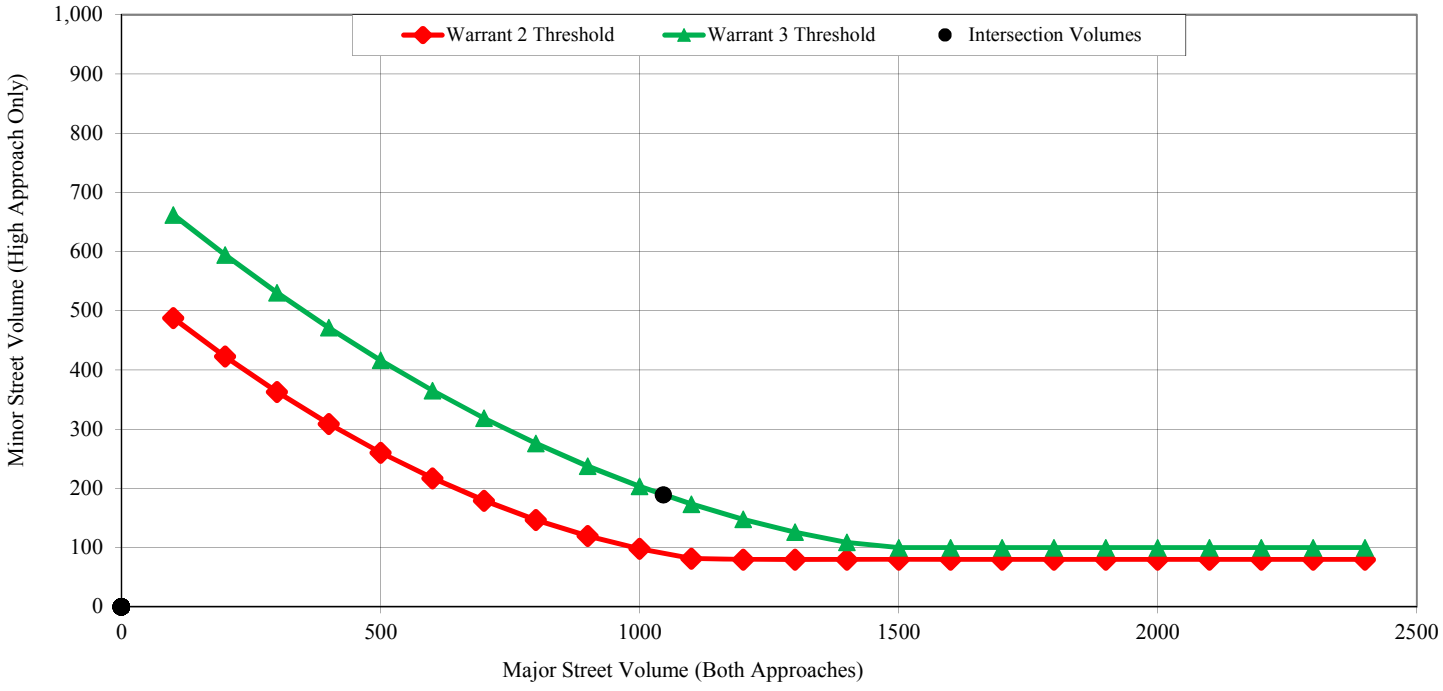
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	**Condition B**	**Condition A+B***
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**	**Not Satisfied**
Required values reached for	1 hour	1 hour	1 (Cond. A) & 1 (Cond. B)
Criteria - Major Street (veh/hr)	500	750	400 (Cond. A) & 600 (Cond. B)
Criteria - Minor Street (veh/hr)	150	75	120 (Cond. A) & 60 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	**Not Satisfied**
Required values reached for	1 hour
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	**Condition B**
Condition Satisfied?	**Satisfied**	**Not Satisfied**
Required values reached for	1369 total, 189 minor, 15.7 delay	0 hours
Criteria - Total Approach Volume (veh in one hour)	800	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	100	
Criteria - Minor Street High Side Delay (veh-hrs)	4	

Figure 4C-1 (Warrant 2) & Figure 4C-3 (Warrant 3)



Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Olsen-Chandler SP
Project/File #	2019_131
Scenario	Cumulative PM

Intersection Information			
Major Street (N/S Road)	Creston Rd	Minor Street (E/W Road)	Stoney Creek Rd
Analyzed with	1 approach lane	Analyzed with	1 Approach Lane
Total Approach Volume	1195 vehicles	Total Approach Volume	216 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

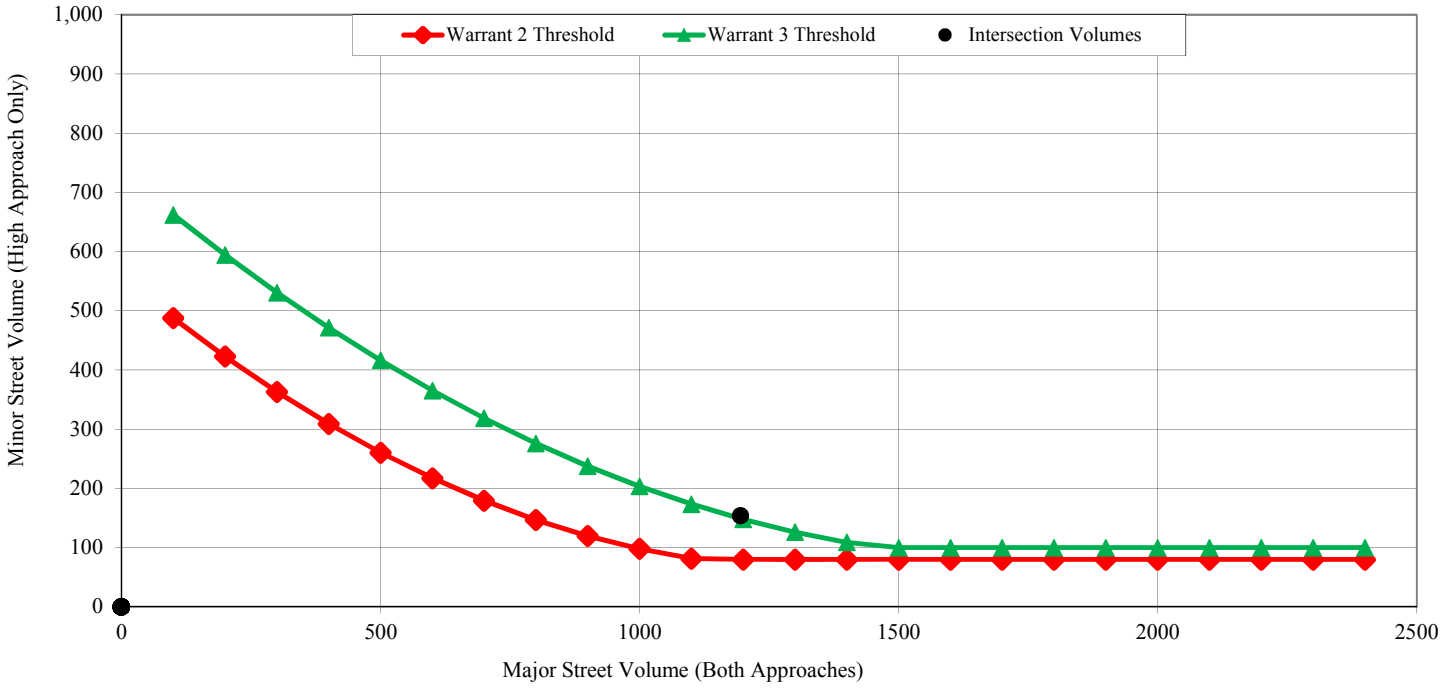
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	**Condition B**	**Condition A+B***
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**	**Not Satisfied**
Required values reached for	1 hour	1 hour	1 (Cond. A) & 1 (Cond. B)
Criteria - Major Street (veh/hr)	500	750	400 (Cond. A) & 600 (Cond. B)
Criteria - Minor Street (veh/hr)	150	75	120 (Cond. A) & 60 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	**Not Satisfied**
Required values reached for	1 hour
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	**Condition B**
Condition Satisfied?	**Satisfied**	**Satisfied**
Required values reached for	1411 total, 154 minor, 5.2 delay	1 hour
Criteria - Total Approach Volume (veh in one hour)	800	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	100	
Criteria - Minor Street High Side Delay (veh-hrs)	4	

Figure 4C-1 (Warrant 2) & Figure 4C-3 (Warrant 3)



Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Olsen-Chandler SP
Project/File #	2019_131
Scenario	Cumulative AM

Intersection Information			
Major Street (N/S Road)	Creston Rd	Minor Street (E/W Road)	Meadowlark Rd
Analyzed with	1 approach lane	Analyzed with	1 Approach Lane
Total Approach Volume	839 vehicles	Total Approach Volume	534 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

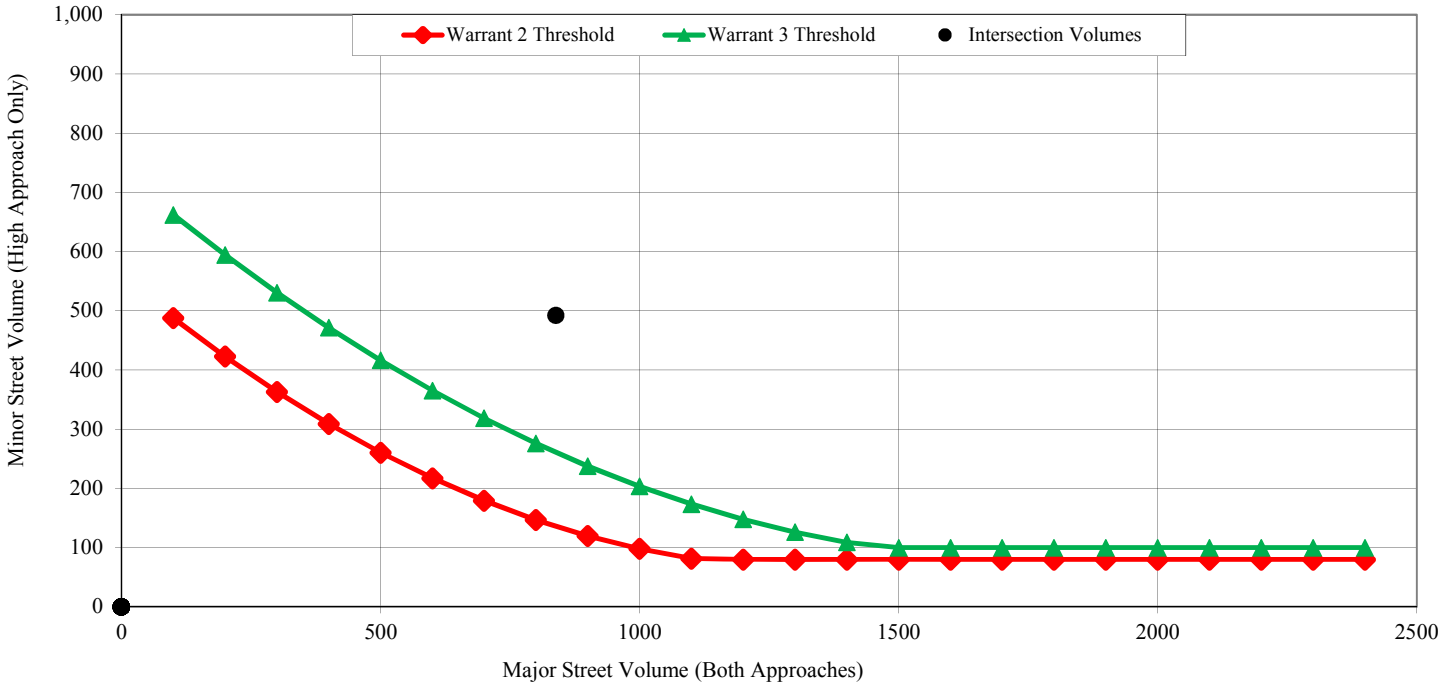
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	**Condition B**	**Condition A+B***
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**	**Not Satisfied**
Required values reached for	1 hour	1 hour	1 (Cond. A) & 1 (Cond. B)
Criteria - Major Street (veh/hr)	500	750	400 (Cond. A) & 600 (Cond. B)
Criteria - Minor Street (veh/hr)	150	75	120 (Cond. A) & 60 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	**Not Satisfied**
Required values reached for	1 hour
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	**Condition B**
Condition Satisfied?	**Satisfied**	**Satisfied**
Required values reached for	1373 total, 492 minor, 7.7 delay	1 hour
Criteria - Total Approach Volume (veh in one hour)	800	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	100	
Criteria - Minor Street High Side Delay (veh-hrs)	4	

Figure 4C-1 (Warrant 2) & Figure 4C-3 (Warrant 3)



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Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Olsen-Chandler SP
Project/File #	2019_131
Scenario	Cumulative Plus 1293 Unit Project PM

Intersection Information			
Major Street (N/S Road)	Creston Rd	Minor Street (E/W Road)	Charolais Rd
Analyzed with	2 or more approach lanes	Analyzed with	2 or more approach lanes
Total Approach Volume	826 vehicles	Total Approach Volume	580 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

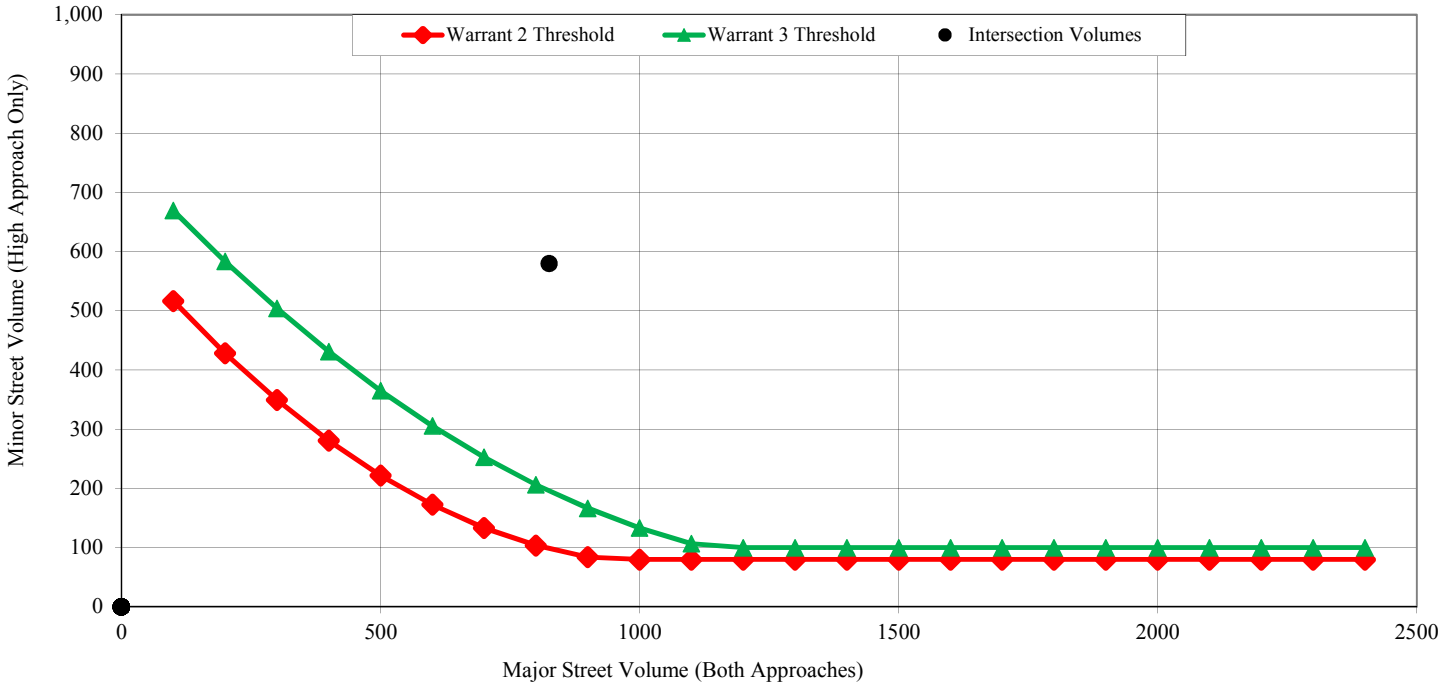
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	**Condition B**	**Condition A+B***
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**	**Not Satisfied**
Required values reached for	1 hour	1 hour	1 (Cond. A) & 1 (Cond. B)
Criteria - Major Street (veh/hr)	420	630	336 (Cond. A) & 504 (Cond. B)
Criteria - Minor Street (veh/hr)	140	70	112 (Cond. A) & 56 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	**Not Satisfied**
Required values reached for	1 hour
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	**Condition B**
Condition Satisfied?	**Satisfied**	**Satisfied**
Required values reached for	1406 total, 580 minor, 6.7 delay	1 hour
Criteria - Total Approach Volume (veh in one hour)	650	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	150	
Criteria - Minor Street High Side Delay (veh-hrs)	5	

Figure 4C-2 (Warrant 2 - 70% Factor) & Figure 4C-4 (Warrant 3 - 70% Factor)



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Traffic Signal Warrant Analysis

Warrants 1 - 3 (Volume Warrants)

Project Name	Olsen-Chandler SP
Project/File #	2019_131
Scenario	Cumulative Plus 901 Unit Project PM (Phase 1)

Intersection Information			
Major Street (N/S Road)	Creston Rd	Minor Street (E/W Road)	Charolais Rd
Analyzed with	2 or more approach lanes	Analyzed with	2 or more approach lanes
Total Approach Volume	816 vehicles	Total Approach Volume	563 vehicles
Total Ped/Bike Volume	0 crossings	Total Ped/Bike Volume	0 crossings
Right turn reduction of	0 percent applied	Right turn reduction of	0 percent applied

No high speed or isolated community reduction applied to the Volume Warrant thresholds.

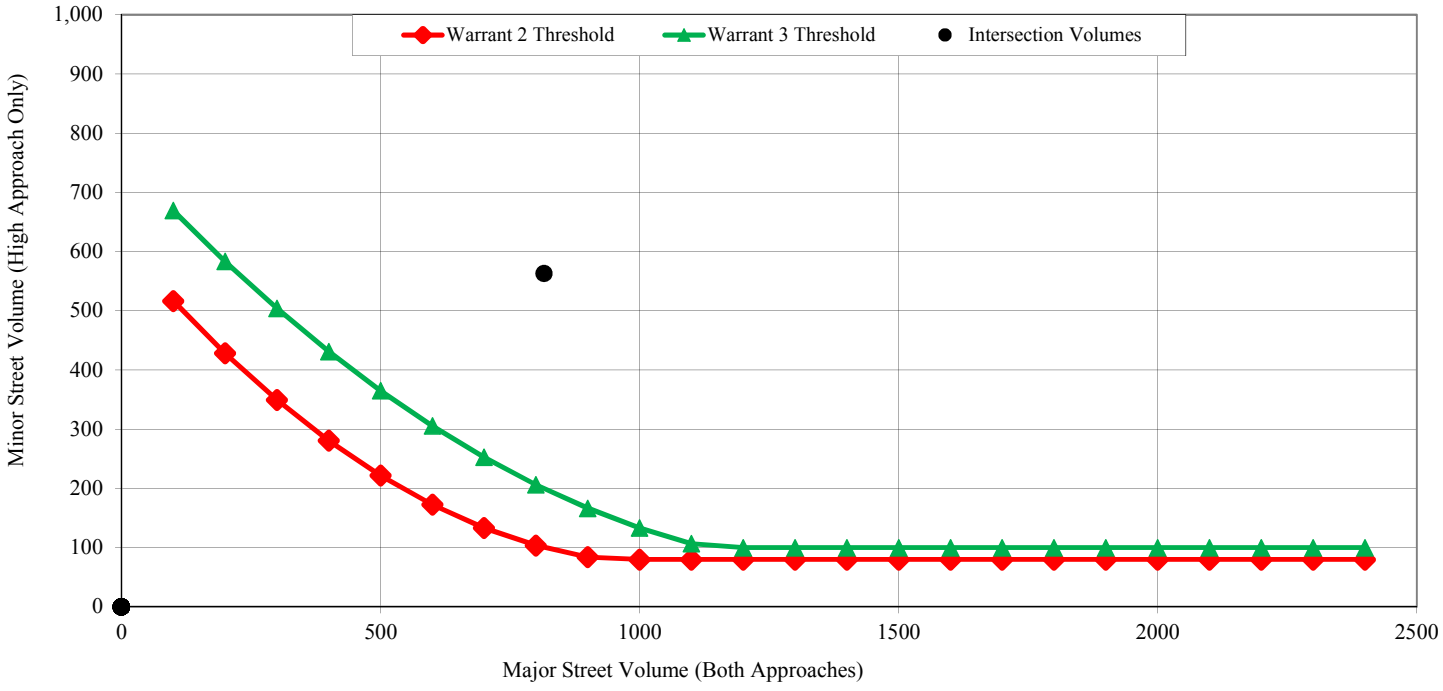
Warrant 1, Eight Hour Vehicular Volume			
	Condition A	**Condition B**	**Condition A+B***
Condition Satisfied?	**Not Satisfied**	**Not Satisfied**	**Not Satisfied**
Required values reached for	1 hour	1 hour	1 (Cond. A) & 1 (Cond. B)
Criteria - Major Street (veh/hr)	420	630	336 (Cond. A) & 504 (Cond. B)
Criteria - Minor Street (veh/hr)	140	70	112 (Cond. A) & 56 (Cond. B)

* Should be applied only after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

Warrant 2, Four Hour Vehicular Volume	
Condition Satisfied?	**Not Satisfied**
Required values reached for	1 hour
Criteria	See Figure Below

Warrant 3, Peak Hour Vehicular Volume		
	Condition A	**Condition B**
Condition Satisfied?	**Satisfied**	**Satisfied**
Required values reached for	1379 total, 563 minor, 5.6 delay	1 hour
Criteria - Total Approach Volume (veh in one hour)	650	See Figure Below
Criteria - Minor Street High Side Volume (veh in one hour)	150	
Criteria - Minor Street High Side Delay (veh-hrs)	5	

Figure 4C-2 (Warrant 2 - 70% Factor) & Figure 4C-4 (Warrant 3 - 70% Factor)



Appendix J

Water Supply Analysis

DRAFT

WATER SUPPLY ASSESSMENT

OLSEN/SOUTH CHANDLER RANCH SPECIFIC PLAN

PASO ROBLES

August 28, 2019

TODD GROUNDWATER

2490 Mariner Square Loop, Suite 215
Alameda, CA 94501
510.747.6920
www.toddgroundwater.com

Reso A - Exhibit C2 (EIR Technical Appendix)

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1. INTRODUCTION

This Water Supply Assessment (WSA) was prepared for the Olsen/South Chandler Ranch Specific Plan (Project) in the City of Paso Robles. The Project includes 1,293 dwelling units with 1,125 single family homes and 168 townhomes and multifamily units and a small amount of neighborhood commercial development. The area encompasses about 357 acres in the southeast portion of the City (**Figure 1**). About 163 acres are designated residential; 102 acres are for parks, recreational areas, open space and water quality basins; and 92 acres are roadways (Rincon, 2019). The Project will also include trails, bike lanes, and vineyards. The City of Paso Robles will supply water and sewer to the Specific Plan area.

Currently, the Project site contains 16 residences; 3 on the southern portion of the site (Olsen property) and 13 in an area called Our Town, a 1960 subdivision tract. These residences are supplied water from private wells. In the past, an agricultural well on the Olsen property was used to irrigate crops such as beets, barley, oats, alfalfa and grasses. This well has not been used in some time although the actual date it became inactive is unknown. The wells on the site will be properly abandoned when development occurs (Wallace, April 2019). Light industrial uses lie to the west of the South Chandler property and a residential area lies to the west of the Olsen property. Agricultural lands lie to the north, east and south. The proposed Beechwood Specific Plan area lies to the southwest.

The Project will be built in phases. Water supply will be potable water from the City of Paso Robles, which operates and owns a public water system. The City will also provide recycled water and wastewater collection.

This WSA was prepared in accordance with the City's Rules and Regulations for implementing projects subject to the California Environmental Quality Act (CEQA). The primary purpose of this WSA is to provide an independent evaluation of the Project's water needs and impacts on City water supplies. It documents Project water demand and provides information to verify that the City has sufficient water supply to meet future water demands within the Project area and within the City's water supply service area under normal and dry hydrologic conditions for the next 20 years.

1.1. PROPOSED PROJECT

The proposed Project encompasses about 357 acres with residential uses on about 163 acres and parks, recreational areas, open space, water quality basins and roadways consisting of about 194.2 acres (**Table 1**). The Project will include 1,293 dwelling units:

- 1,125 single family homes
- 108 townhomes, and
- 60 apartments.

The proposed development has been divided into 23 Planning Areas (PAs). **Figure 2** is a land use plan for the Project and includes the Planning Areas. Most of the Planning Areas will contain residential development (PAs 1-5, 8-13, 15, 17-20, and 23). PAs 6, 7 and 16 are designated for recreation and PAs 14, 21 and 22 are community parks.

The Project will include the following community amenities:

- The Farmstand (information and sales center; later a farmstand and community supported agriculture farm with one-acre planting area)
- The Poolhouse (recreational facility with a pool, spa and kiddy pool or splash pad)
- Olsen Creek Park
- The Overlook (recreational facility with clubhouse, fitness club, pool(s), kitchen, event space, outdoor bar and terrace, deli and coffee shop)
- Oak Knoll Park
- Meadowlark Park, and
- The Vines (PG&E easement for trails, vineyards, and open spaces).

Figure 3 shows the location of these amenities and housing types.

The Project is proposed to be constructed in three phases. The actual phasing will depend upon market conditions and the need for housing at the time of development. Phase 1 would be the development of PAs 1-7, 11, 12, and 14-16. Phase 2 would be the development of PAs 13, 17-19, 20, and 22. Phase 3 would be development of PAs 21 and 23. **Figure 2** shows the locations of these PAs. These phases would likely occur between 2021 and 2025 (Wallace, July 2019). PAs 8 (Neighborhood Commercial Overlay District), 9 (School Overlay District), 10A (Medium Density Residential) and 10B (existing Our Town subdivision) were not included in the phasing plan described in the Vinedo Specific Plan (Olsen Ranch 212, LLC, 2019). It was assumed that development of these areas would coincide with Project development.

Table 1. Land Use, Olsen/South Chandler Ranch Specific Plan Area, Paso Robles

Development Component	Area (acres)	Number of Dwelling Units
Residential		
Low Density Residential	105.9	586
Medium Density Residential	47.6	539
High Density Residential	9.4	168
Other		
Community Parks	45.3	-
Neighborhood Open Space	33.8	-
Private Recreation	17.1	-
Water Quality Basins	5.7	-
Framework Roadways	40.8	-
In-Tract Roadways	51.5	-
Total	**357.1**	**1,293**

Information from Vinedo Specific Plan Table 2.0.1 (Olsen Ranch 212, 2019) and Rincon (2019)

1.2. BACKGROUND

The City of Paso Robles requires that certain CEQA documents (e.g., an Environmental Impact Report or Mitigated Negative Declaration) be informed by an independent evaluation of the project's water supply needs and impacts on the City's water supply. This requirement applies to all general plan amendments that propose an increase in residential, commercial, and/or industrial intensity and all annexations that have not been approved by the City Council as of January 1, 2014. Each independent evaluation is to be prepared by a consultant of the City's choice based on demonstrated competence in water supply assessment and evaluation and familiarity with the UWMP. The applicants are requesting a general plan amendment to combine the Olsen Ranch and the southern portion of the Chandler Ranch property into one planning area, re-designate business park land use to residential on the South Chandler Ranch property, reallocate 60 units from the Uptown/Town Center Specific Plan to the Olsen/South Chandler Specific Plan, and to relocate the commercial component of the land use designation on the Chandler Ranch (Paso Robles, RFP, 2018 and Rincon, 2019).

The California Water Code Section 10910 (also termed Senate Bill 610 or SB610) requires that a Water Supply Assessment (WSA) be prepared for a project that is subject to CEQA and subject to SB610 as defined in Water Code Section 10912. The Olsen/South Chandler Ranch Specific Plan is subject to CEQA and SB610 because it is a residential development of more than 500 dwelling units. Under SB610, documentation of water supply sources, quantification of water demands, evaluation of drought impacts, and provision of a comparison of water supply and demand are required to assess water supply sufficiency. This WSA follows the guidelines set out in the Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 (DWR, 2003).

A foundational document for preparation of a WSA is an UWMP; the City has prepared and adopted a 2015 UWMP (Todd, 2016) in compliance with the Water Code. The 2015 UWMP details City water supplies and demands to buildout (2045 or later) and includes projected increases in water demand of both residential and non-residential land uses located within the City limits. The Olsen/South Chandler Ranch Specific Plan area is designated in the City's General Plan Land Use Element to allow up to 1,233 dwelling units (673 on the Olsen Ranch Specific Plan area and 560 on the South Chandler Ranch Specific Plan area). The Project includes a General Plan amendment to reallocate 60 units from the Uptown/ Town Centre Specific Plan to the Olsen/South Chandler Specific Plan area. If the proposed General Plan amendment is approved, the water demand associated with the 1,293 residential dwelling units and 10 acres of non-residential development that are included in the UWMP projections for the South Chandler area would be allocated to the Olsen/South Chandler Project (Gonzalez, 2019 and Bersbach, 2019).

1.3. WSA PURPOSE AND ORGANIZATION

The purpose of this WSA is to document the City's existing and future water supplies for its service area and to compare them to the area's future water demand, including that of the proposed Project. This comparison, conducted for both normal and drought conditions in five-year increments over the next 20 years, is the basis for assessing water supply sufficiency in accordance with SB610.

The WSA incorporates current and future water supply and demand information from the City's 2015 UWMP, available City and County documents regarding water supplies (groundwater, Nacimiento supply, recycled water), current water use, and estimated water use of the Project and other approved

and proposed projects. The analysis extends to 2045 (assumed to be City buildout), addresses water demands in five-year increments, and provides information consistent with SB610 WSA requirements.

While fulfilling SB610 information requirements, this WSA is organized to be easily read and understood, as follows:

- Section 1 introduces the Project and provides background.
- Section 2 focuses on the current and proposed water demands of the Project that is the subject of this WSA.
- Section 3 documents the City's existing and future supplies and demands in normal and drought years. The City currently relies on groundwater, surface water, and Lake Nacimiento water. Recycled water will be available in the future. Section 3 also includes a summary of the status of the development of a Sustainable Groundwater Management Plan for the Paso Robles Groundwater Basin and provides a discussion of the degree of certainty associated with available water supplies.
- Section 4 provides the comparison of water supply and demand (in normal and drought years) that fulfills the intent of SB610.
- Section 5 summarizes the report's conclusions.

2. PROJECT WATER DEMAND

This section addresses water demands for the existing property and presents water demand estimates for the proposed development.

2.1. CURRENT WATER USE

The Olsen/South Chandler Ranch Specific Plan area currently relies on groundwater for its water supply. Current water use is shown in **Table 2**. Current groundwater use at the Project site was estimated at approximately 6.4 acre-feet per year (AFY). The three existing residences on the Olsen property[1] are supplied water from one private domestic well. This well and two other inactive wells on the Olsen property will be properly abandoned when development occurs. In the past, crops such as beets, barley, oats, alfalfa and grasses have been grown on the site but no information on acreages, dates or irrigation rates is available (Wallace, April 2019). There are 13 existing homes on the Our Town property (PA 10B on **Figure 2**). These homes are also supplied water through a private well or wells. These wells will also be properly abandoned when development occurs.

Table 2. Current Water Use, Olsen/South Chandler Ranch Specific Plan Area, Paso Robles

Water Use Category on Project Site	Current Number of Units	Current Total Water Use (Private Wells) AFY	Water Use Rate
Single Family Homes (on Olsen Property)	3	1.20	0.40 AF/unit; typical usage in Paso Robles for older rural residential
Single Family Homes (on Our Town Property)	13	5.20	0.40 AF/unit; typical usage in Paso Robles for older rural residential
Total Current Water Use		**6.40**	**-**

AFY=acre-feet per year
Number of units from Wallace Group email communication (April 22, 2019) and Athey (2019)

The three homes on the Olsen property will be demolished for the development and some of the homes on the Our Town property will likely be retained and others demolished and rebuilt.

[1] The Olsen property is the southeastern portion of the Olsen/South Chandler Ranch Specific Plan area.

2.2. ESTIMATED FUTURE WATER DEMAND

The Project is proposed to be constructed in three phases. These phases would likely occur between 2021 and 2025 (Wallace, July 2019). **Table 3** shows the buildout water demands of the Project. It includes the type and number of dwelling units, commercial building area, or irrigated areas in the column next to the development component. The next two columns list the amounts of potable or recycled water each component will use at buildout. The last column (right-hand side) shows the water rates used to determine these buildout water demands.

Residential demands are shown in the top portion of the table and are based on water use rate projections used for future development in the City's 2015 UMWP (0.2 AFY for single family homes and 0.18 AFY for multifamily units) (Gonzalez, 2018). Non-residential demands are shown in the bottom portion of the table. Recycled water will be used for irrigation of community parks, neighborhood open space, water quality basins, and the vineyards. Potable water will be used for irrigation on the Farmstand land and on the Private Recreational Areas. A seven percent increase was applied to these water uses to include unaccounted-for (non-revenue) water in the total water demands. Unaccounted-for water is water that represents main flushing or firefighting, meter error, and leaks. At buildout, total potable demand was estimated to be 348.1 AFY and a total recycled water demand was estimated to be 230.8 AFY.

The Project includes a school overlay district on PA 9 (Centex parcel). This property could either be developed as a school or housing. If a school is built on this site, then the total housing could potentially be less than 1,293 units. However, to be conservative, this WSA assumed that an elementary school is included on the site and still included all 1,293 residential units.

Table 3. Future Water Use, Olsen/South Chandler Ranch Specific Plan Area, Paso Robles

Development Component	Planned Number of Units or Area in Acres	Buildout Water Use Sources, AFY		Water Use Rate[1]
		City Supplied Potable Water	Recycled Water	
Residential	**dwelling units**			
Single Family Homes	1,125	225.0	0.0	0.20 AF/unit applicant and 2015 UWMP
Townhomes	108	19.4	0.0	0.20 AF/unit applicant and 2015 UWMP
Apartments	60	10.8	0.0	0.18 AF/unit applicant and 2015 UWMP
Residential Units or Use	**1,293**	**255.2**	**0.0**	-
Non-Revenue Water[2]	-	19.2	0.0	-
Total Residential Use	**-**	**274.5**	**0.0**	-
Non-Residential	**acres**			
Commercial/Retail (building area)[3]	0.23	2.5	0.0	0.232 gpd/sf=11.32 AFY/acre
The Farmstand	1.0	3.0	0.0	3 AFY/acre
Pool House	Facilities on the Private Recreation areas	3.0	0.0	applicant provided
Overlook Rec Center		3.5	0.0	applicant provided
Spa		5.0	0.0	applicant provided
Club		7.5	0.0	applicant provided
Event Barn		4.4	0.0	applicant provided
Pool Service Building		2.0	0.0	applicant provided
CSA Maintenance Shed and Dog Wash		0.1	0.0	applicant provided
Elementary School - 495 students[3]	Included in residential total areas	3.3	0.0	12 gallons/day per student, 180 days/year
Private Recreational Areas (irrigation)	17.1	34.2	0.0	2 AFY/acre
Community Parks (irrigation)	45.3	0.0	90.6	2 AFY/acre
Neighborhood Open Space (irrigation)	33.8	0.0	67.6	2 AFY/acre
Water Quality Basins (irrigation)	5.7	0.0	11.4	2 AFY/acre
Vineyards (irrigation)	30.0	0.0	45.0	1.5 AFY/acre
Non-Residential Use	-	**68.5**	**214.6**	-
Non-Revenue Water[2]	-	5.2	16.2	-
Total Non-Residential Use[4]	**-**	**73.7**	**230.8**	-
Total Project Water Use	**-**	**348.1**	**230.8**	-

Information from Wallace Group (July 31, 2019), Frace (2019), and working draft EIR Section 2 (Rincon, 2019).

1. Future demand projections in the 2015 UWMP had a rate of 0.20 AFY for single family homes and 0.18 AFY for multifamily homes.
2. Non-revenue (unaccounted-for) water was assumed to be 7% of potable and 7% of recycled demands to be consistent with the 2015 UWMP and includes water used for main flushing or firefighting, meter error, and leaks.
3. The gross area of the commercial overlay district (PA-8) is 1.1 acres and is projected to contain a 0-23-acre commercial building(s) and 7 medium density residential units (Frace, 2019). The gross area of the school overlay district is 11.8 acres (PA-9) and may contain a school and up to 119 medium residential units (Frace, 2019).
4. 16.8 AFY of potable water demand is included in the 2015 UWMP for non-residential development included in the General Plan for 10 acres of commercial development that was planned in the vicinity of South Chandler Ranch. No other non-residential development was included for the South Chandler or Olsen Ranch areas at the time of the 2015 UWMP, therefore 56.9 AFY of the proposed 73.7 AFY of non-residential water use by the Project was not accounted for in the 2015 UWMP (Gonzalez, 2019).

3. CITY OF PASO ROBLES WATER SUPPLY AND DEMAND

3.1. CITY SUPPLY AND DEMAND OVERVIEW

The City has relied on groundwater from the Paso Robles Groundwater Basin, water from the Salinas River, and more recently, Lake Nacimiento water for its water supply. The City has fulfilled water demand in years that have included both extreme dry years (such as 2013) and prolonged severe drought extending over seven years (1984-1990) (see **Figure 4** for annual rainfall data). Recycled water is planned for the future. Discussion of current and projected City water demand and supplies has recently been updated and documented in the City's 2015 UWMP and will only be summarized here. The UWMP can be found on the City's website: https://prcity.com/467/Urban-Water-Management-Plan-PDF.

Table 4 summarizes projected population and water demands to buildout and the supplies projected to be used to meet those demands.

Table 4. City of Paso Robles Supply and Demand Projections

	2020	2025	2030	2035	2040	Buildout (2045 or later)
Population	32,300	34,400	37,700	39,900	41,900	44,000
Water Demands (AFY)	7,089	7,575	8,061	8,546	9,032	9,519
Water Supply Sources to Meet Demands (AFY)						
Basin Wells	2,600	2,506	2,602	2,124	2,610	2,200
River Wells	3,100	3,500	3,800	4,558	4,558	4,558
Nacimiento Water from Water Treatment Plant	1,120	1,120	1,120	1,120	1,120	2,017
Nacimiento Water from the Recovery Well	269	269	269	269	269	269
Recycled Water for Potable Offset	0	180	270	475	475	475
Total Supply	7,089	7,575	8,061	8,546	9,032	9,519

Note: Supply amounts shown above do not reflect total supply available to the City from each source, nor do they reflect any limits on the City's groundwater rights, but instead the water planned to supply projected demand.

The water demand projections in the 2015 UWMP were developed using representative water demand factors, anticipated future conservation, and City General Plan growth assumptions and buildout conditions. Projected water conservation savings are included in these demand projections. Water demand at buildout is projected to be 9,519 AFY (Todd, 2016).

The supply amounts listed in the table above represent the water planned to supply projected demands and are not the total supply available to the City from each source. More detail on supply sources is provided below.

3.2. CITY OF PASO ROBLES SUPPLIES

3.2.1. Climate

Climate has a notable influence on water availability and demand on a seasonal and annual basis. During drought, influences include greater water demand for outdoor uses, specifically landscape irrigation, and less supply availability because of reduced precipitation and greater evaporation.

Representative climate data for the Paso Robles area are summarized in **Table 5** below, including average monthly rainfall, temperature, and evapotranspiration (ETo). The area has a Mediterranean climate, with moderate temperatures year-round, dry summers and wetter winters. Most of the rainfall occurs between November and April.

Table 5. Climate Data

Month	Average Rainfall[1] (inches)	Average ETo[2] (inches)	Average Temperature[3] (°F)
January	3.45	1.69	46.89
February	3.01	2.24	50.02
March	2.46	3.72	52.98
April	1.01	4.76	56.60
May	0.34	6.03	61.71
June	0.06	6.56	67.44
July	0.05	6.60	71.55
August	0.05	6.30	71.26
September	0.16	4.94	68.12
October	0.59	3.50	61.22
November	1.36	2.02	52.66
December	2.53	1.51	46.76
Average Calendar Year Total	**14.77**	**49.87**	**-**
Monthly Average	**1.26**	**4.16**	**59.01**

1. Precipitation at Paso Robles Station 046730 (Jan 1894-Dec 2018) (WRCC, 2019). Note that *Average Calendar Year Total* is not the sum of numbers above but rather historical annual average.
2. ETo=Average Evapotranspiration at CIMIS Station 163 Atascadero (CIMIS, 2019).
3. Temperature at Paso Robles Station 046730 (Jan 1894-Dec 2018) (WRCC, 2019).

Figure 4 shows annual rainfall for the 1931 to 2018 period with average annual rainfall at 14.63 inches for the 1931 to 2018 period. Historical average rainfall for the 1894 through 2018 period is 14.77 inches.

3.2.2. Water Supplies

The City of Paso Robles has historically relied on groundwater from the Paso Robles Groundwater Basin and Salinas River water for its municipal water supply as shown below. This has been supplemented in recent years with water from Lake Nacimiento; recycled water is planned for the future. **Table 6** presents the amount of supply used from each source for the last seven years. A description of the supplies available to the City is provided in the following sections.

Table 6. Past City of Paso Robles Supplies Used to Meet Demands

Water Source (AFY)	2011	2012	2013	2014	2015	2016	2017
Paso Robles Groundwater Basin – Basin Wells	2,327	2,880	3,257	3,497	2,045	951	842
Salinas River – River Wells	4,069	3,814	3,743	2,772	3,021	2,448	3,348
Nacimiento Water Treatment Plant*	0	0	0	0	87	1,763	1,622
Total Groundwater and Surface Water	6,396	6,694	7,000	6,269	5,153	5,162	5,812

Note: Supply amounts shown above do not reflect total supply available to the City from each source, nor do they reflect any limits on the City's groundwater rights, but instead the water used to supply projected demand.
* Nacimiento Water Treatment Plant amount shown does not include surface water augmentation with Nacimiento Project Water during periods of drought.

Groundwater

Groundwater from the Paso Robles Groundwater Basin has been and will continue to be an important component of the City's water supply. The City operates deep wells that pump percolating groundwater from California Department of Water Resources (DWR) Basin No. 3-4.06 (Paso Robles Groundwater Basin) (**Figure 1**). The Paso Robles Groundwater Basin has not been adjudicated but it has been designated as high priority and critically overdrafted by the State, requiring management under the Sustainable Groundwater Management Act. The Paso Robles Groundwater Basin is the water-bearing portion of the upper Salinas River drainage area. The Salinas River system drains the basin area and surrounding uplands and flows north along the western edge of the drainage area.

The major aquifers (or water-bearing units) in the basin include alluvial deposits and the Paso Robles Formation. The alluvial deposits are up to 100 feet in depth and include recent stream-laid sands and gravels along the floodplains of the Salinas River and its tributaries, and older finer-grained terrace deposits along the Salinas River and Estrella River. Wells in alluvium typically produce in excess of 1,000 gallons per minute (gpm) (Fugro, 2002).

The Paso Robles Formation is the most extensive aquifer and consists of sedimentary layers extending from the surface to depths of more than 2,000 feet. It is typically unconsolidated and generally poorly sorted. The water bearing sediments in the basin are 700 to 1,200 feet thick and typically extend to sea level. Paso Robles Formation sediments are relatively thin, often discontinuous sand and gravel layers interbedded with thick layers of silt and clay. Wells generally produce several hundred gpm (Fugro, 2002).

The City operates 13 deep wells that are dispersed across the City east of the Salinas River. All are screened in the Paso Robles Formation as are the many nearby rural residential and agricultural wells surrounding the City.

Groundwater Quality. A general measure of groundwater quality is total dissolved solids (TDS). For drinking water purposes, water with a TDS concentration of 500 mg/L or less is recommended, but can be usable up to 1,000 mg/L. In Paso Robles Groundwater Basin wells, TDS concentrations generally range from 300 to 1,000 mg/L (Fugro, 2002 and 2005).

A survey of local groundwater quality was conducted by the United States Geological Survey (USGS) as part of its Groundwater Ambient Monitoring and Assessment (GAMA) Program (USGS, 2007). The USGS sampled eleven randomly-selected wells located along the major river valleys, including four in or near the City. While trace amounts of pesticides, arsenic, and boron were reported, no constituents of concern were detected above regulatory thresholds.

In general, City water quality is good, but has relatively high TDS and hardness. In response to the hardness, many residents use home water softeners. However, use of water softeners results in addition of salts to the City's wastewater. Nacimiento water is lower in hardness and TDS than groundwater and its provision to City customers may reduce the use of residential water softeners. Reducing or eliminating the use of water softeners will help preserve the quality of local groundwater and advance the use of recycled water for irrigation.

Groundwater Levels and Flow. Groundwater levels in the Paso Robles Groundwater Basin range between 1,500 feet above mean sea level (msl) around the basin margins to below 600 feet msl in the Estrella subarea and along the Salinas River north of the City (Todd, 2007 and GEI, 2011). Groundwater flows generally from the margins toward the center of the basin and to the northwest, where the outlet to the lower Salinas Valley is located.

Surface Water

River Wells. The City currently pumps Salinas River water from river wells pursuant to appropriative surface water rights and a permit issued by the State Water Resources Control Board. The City has eight river wells and one Nacimiento water recovery well. Approximately half of the City's current water supply comes from its shallow Salinas River wells in the Atascadero Area. Groundwater basin boundaries

were modified by the DWR in 2016 and now define the Atascadero Area of the Salinas Valley Groundwater Basin (DWR Basin No. 3-004.11). The City's Permit allows the City to take up to eight cubic feet per second (3,590 gpm) with a maximum diversion of 4,600 AFY (January 1 to December 31). The permit designates a moveable point of diversion within a specific reach of the Salinas River.

Nacimiento Water. The City of Paso Robles holds a 6,488 AFY delivery entitlement for Lake Nacimiento water with the San Luis Obispo County Flood Control and Water Conservation District. In order to directly use its Nacimiento supply, the City constructed a 2.4 million gallon per day (mgd) surface water treatment plant which became fully operational in early 2016. The City anticipates operating the plant approximately five to nine months out of the year to serve peak summer demands, yielding about 1,120 AFY to 2,017 AFY. Treatment plant operation could be increased to provide up to 2,688 AFY.

In addition to direct deliveries, Nacimiento water also can be utilized by the City through a recovery well. This operation allows Nacimiento water to be turned into the Salinas River channel and captured through the recovery well (as distinct from River water that the City produces pursuant to its water rights permit issued by the State Board). The recovery well will be operated at a rate of 400 gpm for five months out of the year, averaging 269 AFY.

Finally, Nacimiento water can be used to augment surface water and improve water supply reliability. Similar to the operation of the recovery well, Nacimiento water can be turned into the Salinas River channel adjacent to City's river wellfield. This allows the river wells to operate when native supplies are low.

Recycled Water

Municipal recycled water is wastewater that has been treated to a specified quality to enable it to be used again. The City currently does not use recycled water but is actively pursuing such use. In 2014, the City completed a Recycled Water Master Plan update (AECOM, 2014) that identified potential recycled water customers, estimated recycled water quality and blending needs, identified recycled water distribution system possibilities, and developed preliminary cost options.

The Recycled Water Master Plan identified the potential to provide approximately 1,530 AFY of recycled water to customers within City boundaries to irrigate City parks, schools, and local government facilities; residential, commercial, and industrial landscape irrigation; and golf course irrigation. This estimate of total recycled water includes potential deliveries that offset potable water demand otherwise served by the City, and deliveries that would offset private well use. This estimate also accounts for blending recycled water with lower salinity sources to make it suitable for agricultural and golf course irrigation.

Recycled water amounts shown in **Table 4** would offset potable water demand (475 AFY by 2035). Additional recycled water that is not needed within City boundaries will be available for use outside City boundaries for such uses as agricultural and vineyard irrigation and groundwater recharge.

The City of Paso Robles is currently designing a recycled water distribution system that will serve irrigation demands in the City and will also allow regional recycled water use. Recycled water will benefit the City and regional users by providing a drought-resilient supplemental water supply that can be used to offset irrigation demands and contribute to sustainable use of groundwater. The first phase of the City's recycled water distribution system will consist of construction of a five to six-mile pipeline in 2020.

Recycled water will be piped from the treatment plant to the City's east side with a reservoir in Barney Schwartz Park. Construction may take 18 months. In the interim, the recycled water will be released into the Salinas River at the current discharge site for treated wastewater. The recycled water will be available to large centralized irrigation uses within the City like golf courses, parks, and commercial landscaping areas. The system will be expanded in the future to serve additional landscape uses in the City and agricultural irrigation.

3.3. SUSTAINABLE GROUNDWATER MANAGEMENT ACT

The Sustainable Groundwater Management Act (SGMA), which became effective on January 1, 2015, provides a framework for sustainable management of groundwater resources by local agencies, defined as a local public agency with water supply, water management, or land use responsibilities within a groundwater basin.

SGMA establishes a process and timelines for local agencies to achieve sustainable groundwater management in basins designated as medium or high priority by the DWR. The Paso Robles Groundwater Basin is on the following accelerated timeline because it is designated as critically overdrafted:

- Local agencies must form local groundwater sustainability agencies (GSAs) by 2017;
- GSAs must prepare and adopt groundwater sustainability plans (GSPs) by 2020; and
- Once GSPs are adopted, GSAs must implement them and achieve sustainability within 20 years.

In January 2015, the County of San Luis Obispo and Flood Control District Board adopted a SGMA Strategy to "establish community focused Groundwater Sustainability Agencies (GSA) based on cooperative interagency and stakeholder relationships in order to comply with SGMA requirements." Subsequently, five GSAs were formed and, in September 2017, entered into a Memorandum of Agreement to prepare the Groundwater Sustainability Plan for the Paso Robles Groundwater Basin. The five overlying GSAs, called the Cooperative Committee, are:

- City of Paso Robles
- Paso Basin - County of San Luis Obispo
- San Miguel Community Services District
- Shandon - San Juan Water District
- Heritage Ranch Community Services District

The GSP is in the process of being written and sections are available for review on the Paso Robles Groundwater Communication Portal: http://pasogcp.com. The Portal also provides meeting information and updates on other SGMA-related activities in the Paso Robles Groundwater Basin. Additional information on the Paso Robles Groundwater Sustainability Plan can be found on the County's website: https://www.slocounty.ca.gov/Departments/Public-Works/Committees-Programs/Sustainable-Groundwater-Management-Act-(SGMA)/Paso-Robles-Groundwater-Basin.aspx. Compliance with SGMA means that the GSP document will be completed by 2020 and sustainability will be achieved by 2040.

3.4. WATER SUPPLY FACTORS

The City has a diverse water supply portfolio that increases overall City water supply reliability. It has a Water Conservation and Water Shortage Contingency Plan that establishes mandatory and permanent water management requirements to conserve water, enable effective water supply planning, provide for reasonable and beneficial use of water, and prevent waste, unreasonable use, and unreasonable methods of use of water. However, various factors have the potential to affect the City's water supply, including legal, environmental, water quality, and climatic factors, or a combination thereof.

3.4.1. Legal

The City is taking steps to increase the reliability of its surface water and groundwater supplies. For example, and in addition to other efforts described herein, the City is an active party in the development of a GSP for the Paso Robles Groundwater Basin. Under SGMA, the five GSAs in the Paso Robles Groundwater Basin have the legal authority to implement the GSP throughout the entire plan area.

In addition, the City has developed policies that apply to the management of non-City wells within City limits. These policies outline permit requirements for the development and use of private wells within City boundaries, establish policies for recycled water use, and extend the City's Water Conservation and Water Shortage Contingency Plan to these private wells. The policies also require that private wells be maintained and operated in a manner to prevent cross-connection with the City water system and be properly abandoned to prevent migration of surface contaminants to groundwater.

In 2013, a quiet title water rights lawsuit was filed by a small group of North County property owners in San Luis Obispo County Superior Court who argued that their overlying groundwater rights and right to continue pumping from the basin is equal or superior to the rights of the County and other governmental entities that also pump from the basin. The case was moved to the Santa Clara County Superior Court because of the court's experience with complex water law. A jury trial in 2018 found that public water suppliers had acquired prescriptive groundwater rights to the Paso Robles Groundwater Basin during times of groundwater shortage conditions. The next phase of the case will determine how much water public water suppliers have a right to pump.

3.4.2. Environmental

Environmental factors that could affect City's water supply may arise from increased pumping by other groundwater basin users. As noted above, DWR already has designated the Paso Robles Groundwater Basin as a critically overdrafted basin. SGMA regulation will guide the Paso Robles Groundwater Basin water users in the future sustainable management of groundwater resources to prevent SGMA-defined undesirable results (e.g., chronic lowering of groundwater levels, reduction of groundwater storage, degraded water quality, land subsidence, and surface water depletions with adverse impacts on beneficial uses.)

Earthquakes (such as the 2003 San Simeon earthquake) also are an environmental event that could affect supply consistency in the short term as repairs are made to potentially damaged facilities (e.g., storage tanks, pipelines, wells). Heat waves have resulted in power outages in Paso Robles that can temporarily disrupt water supply. The City has backup generators at some but not all City wells. In the past, the City has rented additional generators during power failures.

In addition to the Water Conservation and Water Shortage Contingency Plan, the City has a Water System Emergency/Disaster Response and Notification Plan to respond to emergencies affecting water system operation. The City also has a Local Hazard Mitigation Plan that assesses risks posed by natural and human-caused hazards and includes a mitigation strategy for reducing the City's risks.

Environmental impacts associated with supplying water to the Project will be minimal. The City's main infrastructures for groundwater, surface water and Nacimiento water supplies are already established. The Environmental Impact Report for the Project will address potential environmental impacts associated with construction of the water delivery system on the Project site. Regional water supply-related impacts are being addressed through the SGMA process for the management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results. The Paso Basin GSP is in the process of finalizing a set of Sustainable Management Criteria and subsequent projects and management actions to avoid significant and unreasonable undesirable results related to chronic lowering of groundwater levels, reduction of groundwater storage, degradation of groundwater quality, land subsidence affecting land use and depletion of interconnected surface affecting beneficial use.

3.4.3. Water Quality

It is not anticipated that the current or projected quality of surface water, groundwater, Nacimiento water, or recycled water will affect the volume of water available for use by the City. Nacimiento water can improve the quality of the City's water supply with respect to lowering the total dissolved solids (TDS) content of the supply.

While all but one of the Salinas River wells are clustered in two well fields, the remaining City wells are distributed widely. Accordingly, the response to contamination of a well field or one or more wells would be cessation of pumping in the affected wells and greater temporary reliance on the remaining wells (as well as Nacimiento water and recycled water supply as applicable). Wellhead treatment is also an alternative that could be implemented in response to a specific water quality issue. Currently, the Ronconi Well Field has a microfiltration wellhead treatment system and Sherwood 9 and Sherwood 11 wells have treatment systems to remove arsenic and hydrogen sulfide.

The City's supply sources are potentially vulnerable to agricultural drainage, auto repair shops, gas stations, home manufacturing, low-density septic systems, sewer collection systems, dry cleaners, metal plating/finishing/fabricating, animal operations, agriculture and irrigation wells, and plastic and synthetics producers. Despite these potential vulnerabilities, all water supplied by the City consistently meets all applicable drinking water standards.

The potential for contamination of City wells is reduced through preparation of a Drinking Water Source Assessment and Protection Program (DWSAP), a federally-mandated program being coordinated by the California State Department of Health Services. The City has prepared DWSAs for all of its wells. For each well, the DWSAs:

- Delineate source protection areas for both surface water and groundwater;
- Identify all potential sources of significant contamination in source protection areas; and
- Determine the susceptibility of water sources to contamination within protection areas.

Additionally, the City has employed several protection measures to reduce potential for contamination which have included increased monitoring, and abatement or remediation of identified sources of potential contamination. These activities, and the regional policies and ongoing programs listed below directly or indirectly reduce the vulnerability of the City's supplies to contamination or the potential for contamination:

- City and County ordinances prohibiting discharge of contaminants and pollutants
- City and County code enforcement
- City's industrial waste, and pretreatment and source control programs
- Stormwater pollution prevention programs
- Strict adherence to DWR well abandonment procedures for public and private wells.

The City's Water Shortage Contingency Plan can be used if unforeseen water supply interruptions occur due to water quality problems. Water supply wells are dispersed throughout the City and it is unlikely that more than one cluster of wells would be impacted at the same time. As mentioned before, the City's diverse water supply portfolio greatly bolsters overall water supply reliability.

With regard to regional groundwater quality, the Salt/Nutrient Management Plan (SNMP) for the Paso Robles Groundwater Basin (RMC, 2015) has characterized groundwater basin conditions, documented salt and nutrient sources, and estimated loading with a focus on TDS, chloride and nitrate. The SNMP indicated that overall groundwater quality was generally stable and could be improved with additional use of Nacimiento supply. Reduction of salt loading has been a long-term goal of the City, which has pursued the reduction of home water softener use, strategic use of City wells with lower salt concentrations, and implementation of an industrial waste discharge ordinance.

3.4.4. Climatic

The climatic events most likely to affect water supply are droughts. Future climate change can bring additional challenges to water supply management.

While the City's surface water supplies are not dependent on snowmelt (which is most likely to be affected by climate change and global warming), effects of climate change may include increased evapotranspiration losses, including increased irrigation water demand and evaporation from Lake Nacimiento. Effects on the water system of increased irrigation demand can be minimized through water conservation measures and provision of recycled water.

4. COMPARISON OF SUPPLY AND DEMAND

To determine water supply sufficiency, water supply assessments must include a comparison of supply and demand during normal, single dry and multiple dry years during a 20-year projection. **Tables 7** and **8** compare City supply and demand projections in five-year increments between 2020 and buildout (anticipated to occur after 2045) for normal and dry climatic years. These tables are based on 2015 UWMP tables. On an annual basis, the City has been able to provide sufficient supplies to meet demand during normal, single-dry, and multiple-dry year periods. Historical annual pumping has not been greatly affected by drought. The top portions of **Tables 7** and **8** show the City's supply and demands from the 2015 UWMP. Note that the supply totals represent the supply that will be used to meet 2015 UWMP demands.

As discussed in **Section 1.2**, the water supply needed to serve the Project's residential potable water demand and a portion of its non-residential demand is included in the 2015 UWMP. The City's General Plan Land Use Element includes up to 1,233 dwelling units (673 on the Olsen Ranch Specific Plan area and 560 on the South Chandler Ranch Specific Plan area) plus 60 dwelling units from the Uptown/ Town Centre Specific Plan and 10 acres of non-residential development in the vicinity of South Chandler Ranch which will be allocated to the Project with approval of the proposed Olsen/ South Chandler Specific Plan. The UWMP planned for 16.8 AFY of water supply for these 10 acres of non-residential development. Although the additional 56.9 AFY of non-residential demand proposed by the Project was not accounted for in the 2015 UWMP (shown in red in **Tables 7** and **8**), the City has 57 AFY of supply available from its water supply portfolio of Nacimiento water, groundwater from the Paso Robles Groundwater Basin and water from the Salinas River.

Table 8 shows supply and demand for single year droughts in five-year increments between 2020 and buildout (2045 or later). Although customer water use in drought years may increase initially as a result of increased irrigation, water use in a drought year was assumed to be the same as a normal year because water use restrictions would limit additional water use, especially for landscape irritation. Supply totals are the supply that will be used to meet demands. The amount of water supply available in times of drought is deemed the same as that available during normal years, and within historical pumping volumes.

Table 7. City of Paso Robles Normal Year Supply and Demand Projections

Acre-feet/year	2020	2025	2030	2035	2040	Buildout (2045 or later)
UWMP Supply and Demand Projections[1]						
Supply totals	7,089	7,575	8,061	8,546	9,032	9,519
Demand totals	7,089	7,575	8,061	8,546	9,032	9,519
Difference	0	0	0	0	0	0
Supply and Demand Projections (including portion of Project not included in UWMP)[1]						
Supply totals	7,089	7,575	8,061	8,546	9,032	9,519
Demand totals	7,089	7,632	8,118	8,603	9,089	9,576
Difference	0	57	57	57	57	57

Note: Supply totals are from the 2015 UWMP and represent the supply that will be used to meet 2015 UWMP demands.

1. Potable water for the Olsen/South Chandler Project's proposed residential use (274.5 AFY) and for a portion of the proposed non-residential use (16.8 AFY) is included in the 2015 UWMP projections (see Table 3). The City has the additional 56.9 AFY (73.7 - 16.8) of non-residential supply available from its water supply portfolio, however the supply amounts in this table were kept at 2015 UWMP-listed supplies.

Table 8. City of Paso Robles Single and Multiple Dry Year Supply and Demand Projections

Acre-feet/year	2020	2025	2030	2035	2040	Buildout (2045 or later)
UWMP Supply and Demand Projections[1]						
Supply totals	7,089	7,575	8,061	8,546	9,032	9,519
Demand totals	7,089	7,575	8,061	8,546	9,032	9,519
Difference	0	0	0	0	0	0
Supply and Demand Projections (including portion of Project not included in UWMP)[1]						
Supply totals	7,089	7,575	8,061	8,546	9,032	9,519
Demand totals	7,089	7,632	8,118	8,603	9,089	9,576
Difference	0	57	57	57	57	57

Note: Supply totals are from the 2015 UWMP and represent the supply that will be used to meet 2015 UWMP demands.

1. Potable water for the Olsen/South Chandler Project's proposed residential use (274.5 AFY) and for a portion of the proposed non-residential use (16.8 AFY) is included in the 2015 UWMP projections (see Table 3). The City has the additional 56.9 AFY (73.7 - 16.8) of non-residential supply available from its water supply portfolio, however the supply amounts in this table were kept at 2015 UWMP-listed supplies.

Currently, about 6.4 AFY of groundwater is used on the Project site (**Table 2**). If approved, at buildout, the Project will use 348.1 AFY of City-provided potable water and 230.8 AFY of City-provided recycled water (**Table 3**). Subtracting current use from proposed Project demand results in a net water use increase of about 341.7 AFY (348.1 -6.4).

5. CONCLUSIONS

The findings of this WSA are summarized below.

- The Olsen/South Chandler Specific Plan Project will be built on a 357-acre site that currently has 16 existing residences in southeast Paso Robles. A portion of the site had also been used for agriculture in the past.
- The Project includes 1,239 dwelling units with 1,125 single family homes, 108 townhomes, and 60 apartments. The site will also include a small commercial area, several community buildings, two recreational centers with pools, community parks, water quality basins, and a vineyard.
- The Project area currently relies on groundwater from private onsite wells for water supply and uses an estimated 6.4 AFY. These wells, and any inactive agricultural wells, will be properly abandoned when development occurs.
- Once completed, the Project will use an estimated 348.1 AFY of potable water resulting in a net increase of water use of 341.7 AFY.
- The Project will also use an estimated 230.8 AFY of recycled water. It is anticipated that recycled water will be available to the Project by buildout of the Project. In the event that recycled water is not available, development of the Project areas proposed to be served with recycled water may have to be postponed or modified to reduce water use. Serving the 231 AFY of recycled water demand with potable water has not been evaluated nor is it included in the UWMP.
- Potable water supply needed to serve the Project's residential water demand (274.5 AFY) is included in the 2015 UWMP. A portion of the water supply needed to serve the potable non-residential water demand (16.8 AFY) is also included in the 2015 UWMP. The City has the additional 56.9 AFY of potable non-residential water demand from its water supply portfolio of Nacimiento water, groundwater from the Paso Robles Groundwater Basin and water from the Salinas River.

In conclusion:

The City has adequate potable supply to provide a reliable long-term water supply for the Project under normal and drought conditions.

6. REFERENCES

AECOM, 2014, City of Paso Robles Recycled Water Master Plan Update, March. http://www.prcity.com/government/departments/publicworks/wastewater/index.asp

Athey, David, 2019, series of emails between David Athey, City of Paso Robles, and Chris Bersbach, Rincon, regarding housing unit numbers, August 5.

Bersbach, Chris, Rincon Associates, 2019, email to Kate White, Todd Groundwater, conveying City responses to questions, August 2.

California Department of Water Resources (DWR), 2003, Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001, www.water.ca.gov/pubs/use/sb_610_sb_221_guidebook/guidebook.pdf

California Irrigation Management Information System (CIMIS), 2019, CIMIS Weather Station: 163 – Atascadero, https://www.cimis.water.ca.gov/WSNReportCriteria.aspx, accessed February 14.

Frace, Warren, City of Paso Robles, 2019, email to David Athey, City of Paso Robles and Joe Fernandez, Central Coast Transportation Consulting, regarding Housing Unit Number – Olsen South Chandler TIS, June 17, 2019.

Fugro and Cleath and Associates, 2002, Final Report, Paso Robles Groundwater Basin Study, Phase I, prepared for County of San Luis Obispo Public Works Department, August. http://www.slocountywater.org/site/Water%20Resources/Reports/

Fugro, ETIC Engineering, and Cleath and Associates, 2005, Final Report, Paso Robles Groundwater Basin Study, Phase II, Numerical Model Development, Calibration, and Application, prepared for County of San Luis Obispo Public Works Department, February. http://www.slocountywater.org/site/Water%20Resources/Reports/

GEI, 2011, Paso Robles Groundwater Basin Management Plan, March 2011. http://www.prcity.com/government/departments/publicworks/water/groundwater.asp or http://www.slocountywater.org/site/Water%20Resources/Reports/

Gonzalez, Kirk, City of Paso Robles, 2018, email to Kate White, Todd Groundwater, October 22.

Gonzalez, Kirk, City of Paso Robles, 2019, email to Kate White, Todd Groundwater, August 27.

Olsen Ranch 212, LLC, 2019, Vinedo Specific Plan, April.

Paso Robles, Request for Proposals (RFP), Olsen/South Chandler Ranch Specific Plan Environmental Impact Report, 2018.

Rincon, 2019, working draft of Section 2 (Project Description) of the Project EIR, August 5.

RMC, 2015, Salt/Nutrient Management Plan for the Paso Robles Groundwater Basin, May.

Todd Engineers, 2007, Update for the Paso Robles Groundwater Basin, Report to Paso Robles Groundwater Basin Committee, December.

Todd Groundwater, 2016, City of Paso Robles Final 2015 Urban Water Management Plan, July.

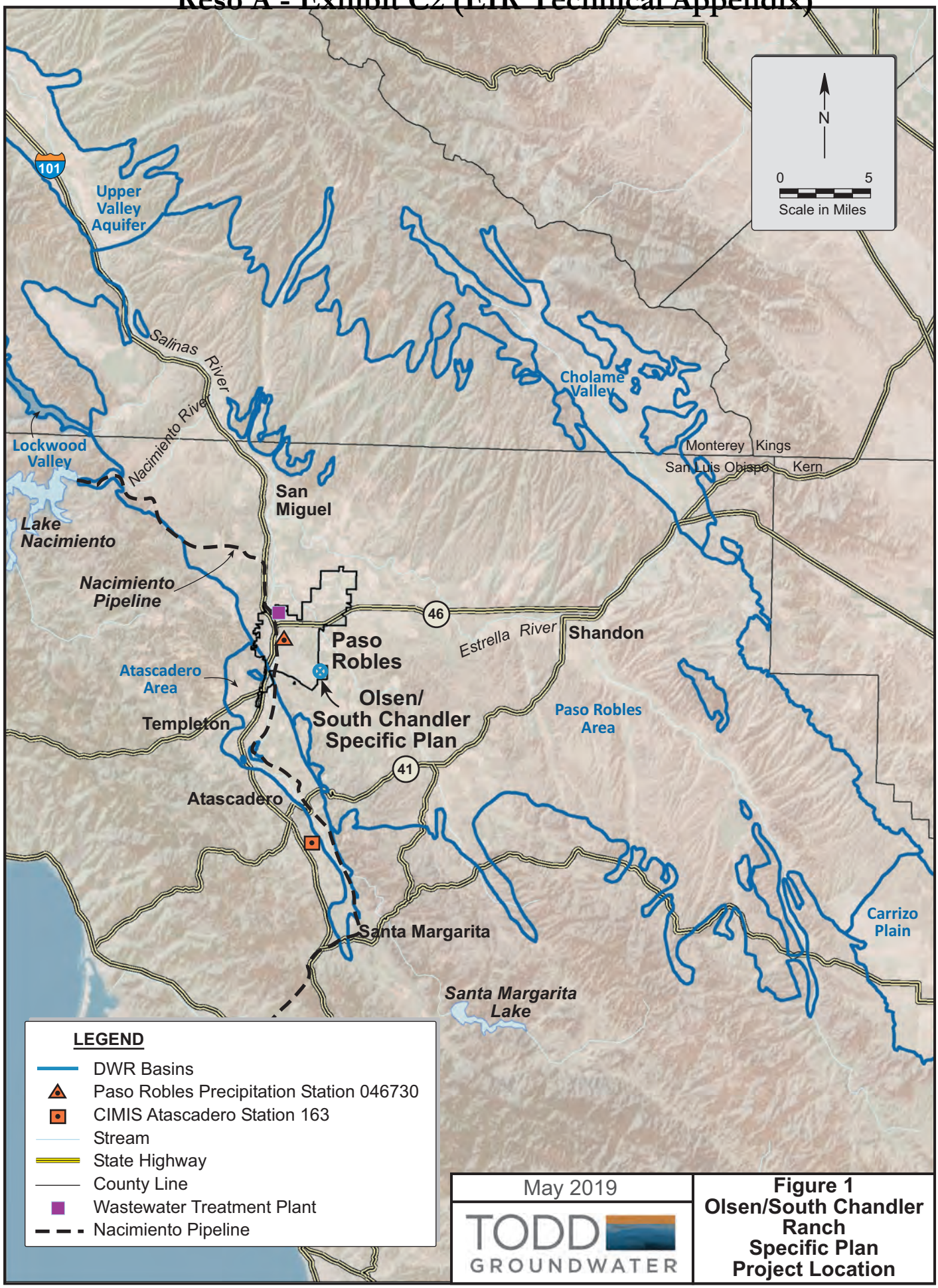
United States Geological Survey (USGS), 2007, Ground-Water Quality Data in the Monterey Bay and Salinas Valley Basins, California, 2005, Results from the California GAMA Program, Justin T. Kulongoski and Kenneth Belitz, prepared in cooperation with the California State Water Resources Control Board.

Wallace Group, April 2019, Byron Glenn email to David Athey, City of Paso Robles, April 22.

Wallace Group, July 2019, Olsen Chandler Development Water Demand Projections Memorandum, July 31.

Western Regional Climate Center (WRCC), 2019, Paso Robles Station 046730 Monthly Precipitation and Temperature Data, http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca6730, accessed February 14.

FIGURES



May 2019

TODD GROUNDWATER

Figure 1
Olsen/South Chandler Ranch Specific Plan Project Location

Reso A - Exhibit C2 (EIR Technical Appendix)

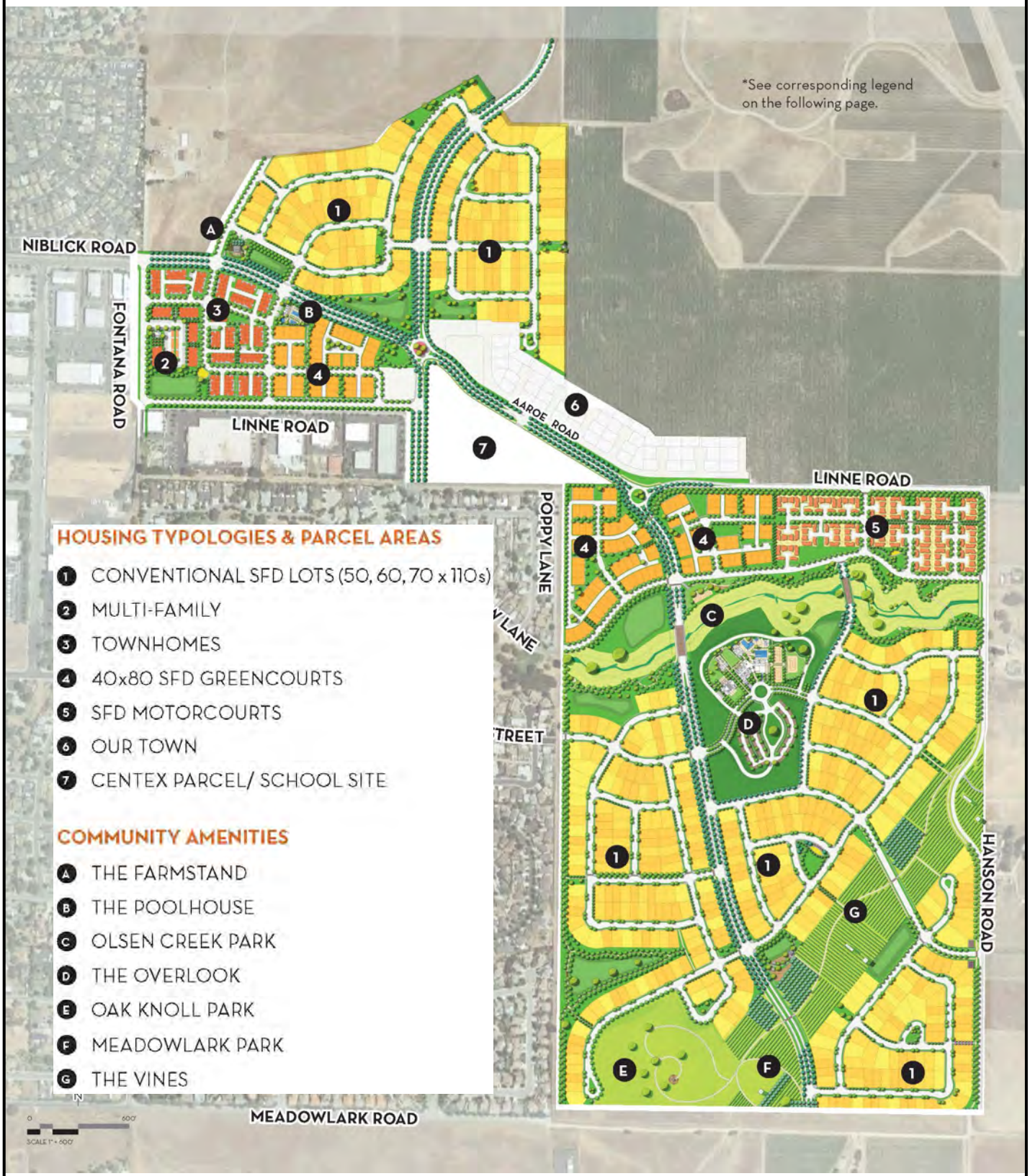
From: Vinedo Specific Plan (Olsen Ranch 212, LLC, 2019)

August 2019

TODD GROUNDWATER

Figure 2
Olsen/South Chandler Ranch Specific Plan Land Use

Reso A - Exhibit C2 (EIR Technical Appendix)



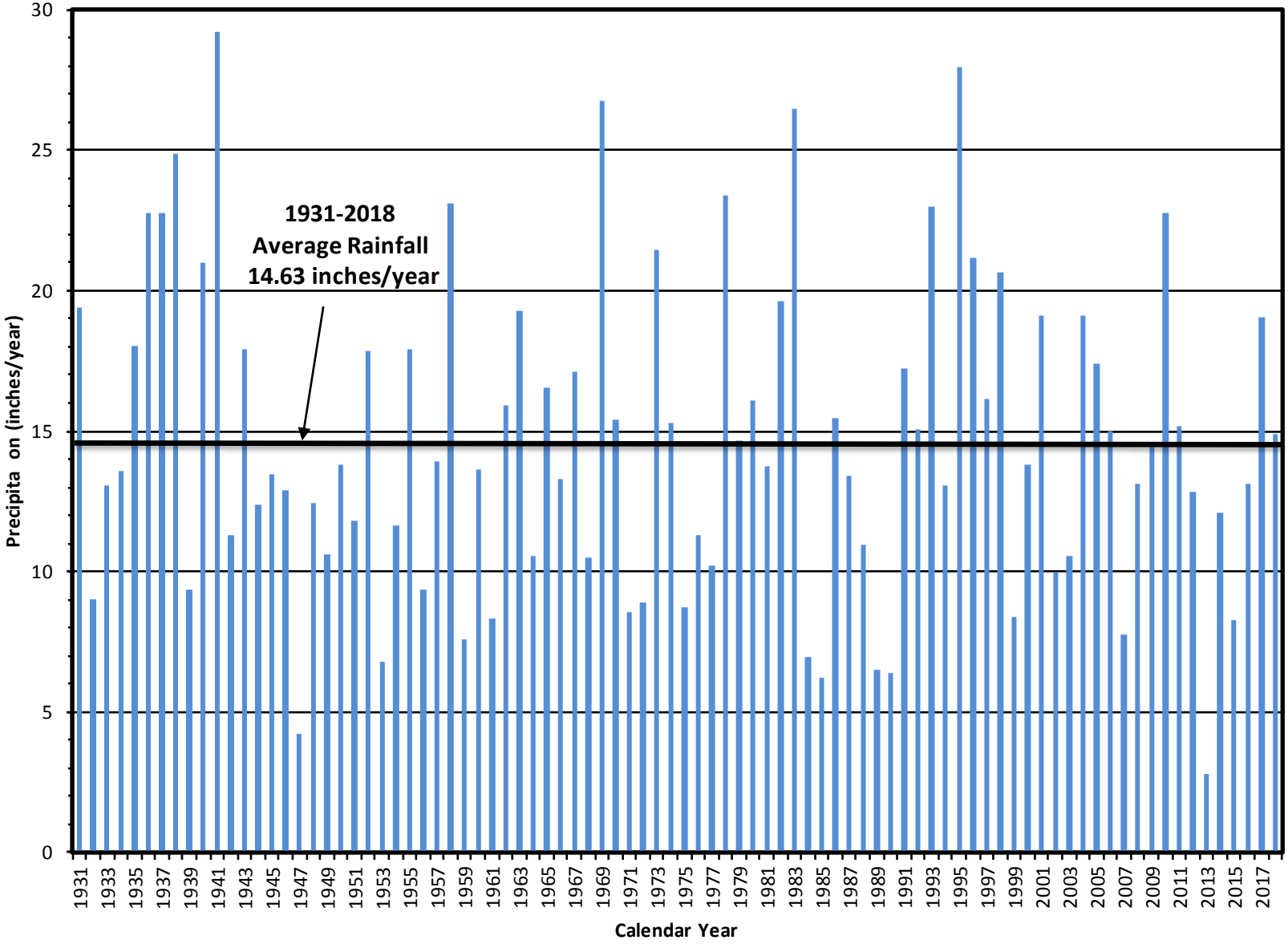
From: Vinedo Specific Plan (Olsen Ranch 212, LLC, 2019)

August 2019

TODD GROUNDWATER

Figure 3
Olsen/South Chandler Ranch Specific Plan
Conceptual Plan

Reso A - Exhibit C2 (EIR Technical Appendix)



Precipitation data from Paso Robles Station 046730 (WRCC, 2019)

May 2019

TODD GROUNDWATER

Figure 4
Paso Robles
Annual Rainfall

Appendix K

Alternatives

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Annual

OCSP Alternative 1 - 2024

San Luis Obispo County APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	750.00	1000sqft	86.00	750,000.00	0
Apartments Low Rise	222.00	Dwelling Unit	13.88	222,000.00	604
Single Family Housing	669.00	Dwelling Unit	257.82	1,204,200.00	1820

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.2	**Precipitation Freq (Days)**	44
Climate Zone	4			**Operational Year**	2024
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	447.45	**CH4 Intensity (lb/MWhr)**	0.02	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Annual

Project Characteristics - Adjusted to match Ambient AQ GHG Study.

Land Use - Adjusted to match Plan Area. Used City's household rate of 2.72 persons per household.

Construction Phase - Operational emissions only.

Vehicle Trips - SFR and MFR adjusted to match Ambient AQ GHG Study and industrial to match traffic estimates for Alt 1.

Area Coating - Adjusted to match Ambient AQ GHG study.

Energy Use -

Water And Wastewater - Adjusted to match Ambient AQ GHG Study.

Waste Mitigation - Adjusted to match Ambient's AQ GHG Study.

Water Mitigation -

Energy Mitigation -

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Annual

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	100
tblAreaCoating	Area_EF_Nonresidential_Interior	250	100
tblAreaCoating	Area_EF_Residential_Exterior	250	100
tblAreaCoating	Area_EF_Residential_Interior	250	100
tblLandUse	LotAcreage	17.22	86.00
tblLandUse	LotAcreage	217.21	257.82
tblLandUse	Population	635.00	604.00
tblLandUse	Population	1,913.00	1,820.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.02
tblProjectCharacteristics	CO2IntensityFactor	641.35	447.45
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblVehicleTrips	WD_TR	6.59	5.21
tblVehicleTrips	WD_TR	6.97	3.57
tblVehicleTrips	WD_TR	9.52	7.56
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Annual

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.1456	1.4752	0.8203	1.4700e-003	0.4849	0.0757	0.5606	0.2648	0.0698	0.3346	0.0000	129.4002	129.4002	0.0389	0.0000	130.3726
2021	4.3585	6.9065	6.3517	0.0147	1.2132	0.2693	1.4825	0.4436	0.2492	0.6928	0.0000	1,319.5549	1,319.5549	0.2393	0.0000	1,325.5378
2022	19.2251	6.5857	8.2329	0.0219	1.2226	0.2032	1.4258	0.3279	0.1902	0.5181	0.0000	1,985.3842	1,985.3842	0.2141	0.0000	1,990.7363
2023	10.6808	3.2369	4.3763	0.0119	0.6819	0.0983	0.7801	0.1829	0.0920	0.2748	0.0000	1,084.5245	1,084.5245	0.1156	0.0000	1,087.4156
Maximum	**19.2251**	**6.9065**	**8.2329**	**0.0219**	**1.2226**	**0.2693**	**1.4825**	**0.4436**	**0.2492**	**0.6928**	**0.0000**	**1,985.3842**	**1,985.3842**	**0.2393**	**0.0000**	**1,990.7363**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Annual

2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.1456	1.4752	0.8203	1.4700e-003	0.4849	0.0757	0.5606	0.2648	0.0698	0.3346	0.0000	129.4000	129.4000	0.0389	0.0000	130.3725
2021	4.3585	6.9065	6.3517	0.0147	1.2132	0.2693	1.4825	0.4436	0.2492	0.6928	0.0000	1,319.5540	1,319.5540	0.2393	0.0000	1,325.5369
2022	19.2251	6.5857	8.2329	0.0219	1.2226	0.2032	1.4258	0.3279	0.1902	0.5181	0.0000	1,985.3835	1,985.3835	0.2141	0.0000	1,990.7356
2023	10.6808	3.2369	4.3763	0.0119	0.6819	0.0983	0.7801	0.1829	0.0920	0.2748	0.0000	1,084.5241	1,084.5241	0.1156	0.0000	1,087.4152
Maximum	**19.2251**	**6.9065**	**8.2329**	**0.0219**	**1.2226**	**0.2693**	**1.4825**	**0.4436**	**0.2492**	**0.6928**	**0.0000**	**1,985.3835**	**1,985.3835**	**0.2393**	**0.0000**	**1,990.7356**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
5	**9-20-2020**	**12-19-2020**	1.4090	1.4090
6	**12-20-2020**	**3-19-2021**	1.5694	1.5694
7	**3-20-2021**	**6-19-2021**	1.9578	1.9578
8	**6-20-2021**	**9-19-2021**	2.0288	2.0288
9	**9-20-2021**	**12-19-2021**	4.9989	4.9989
10	**12-20-2021**	**3-19-2022**	6.4129	6.4129
11	**3-20-2022**	**6-19-2022**	6.5101	6.5101
12	**6-20-2022**	**9-19-2022**	6.5071	6.5071

13	**9-20-2022**	**12-19-2022**	6.4566	6.4566
14	**12-20-2022**	**3-19-2023**	6.2062	6.2062
15	**3-20-2023**	**6-19-2023**	6.2966	6.2966
16	**6-20-2023**	**9-19-2023**	2.1891	2.1891
		Highest	6.5101	6.5101

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	10.1049	0.1398	12.1364	6.4000e-004		0.0672	0.0672		0.0672	0.0672	0.0000	19.8370	19.8370	0.0191	0.0000	20.3138
Energy	0.2237	1.9702	1.2403	0.0122		0.1546	0.1546		0.1546	0.1546	0.0000	4,766.0813	4,766.0813	0.1565	0.0634	4,788.8890
Mobile	2.3141	9.5265	27.4007	0.0901	8.9559	0.0805	9.0364	2.3965	0.0753	2.4717	0.0000	8,261.4818	8,261.4818	0.2932	0.0000	8,268.8127
Waste						0.0000	0.0000		0.0000	0.0000	368.7229	0.0000	368.7229	21.7909	0.0000	913.4955
Water						0.0000	0.0000		0.0000	0.0000	81.9014	280.2236	362.1250	2.1535	0.1806	469.7865
Total	**12.6428**	**11.6365**	**40.7775**	**0.1030**	**8.9559**	**0.3024**	**9.2582**	**2.3965**	**0.2971**	**2.6936**	**450.6244**	**13,327.6236**	**13,778.2480**	**24.4133**	**0.2440**	**14,461.2976**

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2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	10.1049	0.1398	12.1364	6.4000e-004		0.0672	0.0672		0.0672	0.0672	0.0000	19.8370	19.8370	0.0191	0.0000	20.3138
Energy	0.2237	1.9702	1.2403	0.0122		0.1546	0.1546		0.1546	0.1546	0.0000	4,738.3376	4,738.3376	0.1553	0.0632	4,761.0405
Mobile	2.3141	9.5265	27.4007	0.0901	8.9559	0.0805	9.0364	2.3965	0.0753	2.4717	0.0000	8,261.4818	8,261.4818	0.2932	0.0000	8,268.8127
Waste						0.0000	0.0000		0.0000	0.0000	184.3615	0.0000	184.3615	10.8955	0.0000	456.7477
Water						0.0000	0.0000		0.0000	0.0000	65.5212	227.7926	293.3137	1.7230	0.1445	379.4566
Total	**12.6428**	**11.6365**	**40.7775**	**0.1030**	**8.9559**	**0.3024**	**9.2582**	**2.3965**	**0.2971**	**2.6936**	**249.8826**	**13,247.4490**	**13,497.3316**	**13.0860**	**0.2077**	**13,886.3713**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**44.55**	**0.60**	**2.04**	**46.40**	**14.89**	**3.98**

3.0 Construction Detail

Construction Phase

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Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	9/20/2020	10/19/2020	5	400	
2	Site Preparation	Site Preparation	10/20/2020	1/20/2021	5	240	
3	Grading	Grading	1/21/2021	7/21/2021	5	620	
4	Paving	Paving	4/24/2021	7/21/2023	5	440	
5	Building Construction	Building Construction	7/22/2021	7/21/2023	5	6200	
6	Architectural Coating	Architectural Coating	10/22/2021	7/21/2023	5	440	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 1550

Acres of Paving: 0

Residential Indoor: 2,888,055; Residential Outdoor: 962,685; Non-Residential Indoor: 1,125,000; Non-Residential Outdoor: 375,000; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

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Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

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Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	716.00	218.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	143.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0348	0.3486	0.2284	4.1000e-004		0.0174	0.0174		0.0162	0.0162	0.0000	35.6985	35.6985	0.0101	0.0000	35.9505
Total	**0.0348**	**0.3486**	**0.2284**	**4.1000e-004**		**0.0174**	**0.0174**		**0.0162**	**0.0162**	**0.0000**	**35.6985**	**35.6985**	**0.0101**	**0.0000**	**35.9505**

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3.2 Demolition - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.9000e-004	6.3000e-004	5.4200e-003	1.0000e-005	1.5200e-003	1.0000e-005	1.5300e-003	4.0000e-004	1.0000e-005	4.1000e-004	0.0000	1.2685	1.2685	4.0000e-005	0.0000	1.2696
Total	**6.9000e-004**	**6.3000e-004**	**5.4200e-003**	**1.0000e-005**	**1.5200e-003**	**1.0000e-005**	**1.5300e-003**	**4.0000e-004**	**1.0000e-005**	**4.1000e-004**	**0.0000**	**1.2685**	**1.2685**	**4.0000e-005**	**0.0000**	**1.2696**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0348	0.3486	0.2284	4.1000e-004		0.0174	0.0174		0.0162	0.0162	0.0000	35.6985	35.6985	0.0101	0.0000	35.9504
Total	**0.0348**	**0.3486**	**0.2284**	**4.1000e-004**		**0.0174**	**0.0174**		**0.0162**	**0.0162**	**0.0000**	**35.6985**	**35.6985**	**0.0101**	**0.0000**	**35.9504**

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3.2 Demolition - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.9000e-004	6.3000e-004	5.4200e-003	1.0000e-005	1.5200e-003	1.0000e-005	1.5300e-003	4.0000e-004	1.0000e-005	4.1000e-004	0.0000	1.2685	1.2685	4.0000e-005	0.0000	1.2696
Total	**6.9000e-004**	**6.3000e-004**	**5.4200e-003**	**1.0000e-005**	**1.5200e-003**	**1.0000e-005**	**1.5300e-003**	**4.0000e-004**	**1.0000e-005**	**4.1000e-004**	**0.0000**	**1.2685**	**1.2685**	**4.0000e-005**	**0.0000**	**1.2696**

3.3 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4788	0.0000	0.4788	0.2632	0.0000	0.2632	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1080	1.1241	0.5701	1.0100e-003		0.0582	0.0582		0.0536	0.0536	0.0000	88.5913	88.5913	0.0287	0.0000	89.3076
Total	**0.1080**	**1.1241**	**0.5701**	**1.0100e-003**	**0.4788**	**0.0582**	**0.5370**	**0.2632**	**0.0536**	**0.3167**	**0.0000**	**88.5913**	**88.5913**	**0.0287**	**0.0000**	**89.3076**

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3.3 Site Preparation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0900e-003	1.9000e-003	0.0164	4.0000e-005	4.5900e-003	3.0000e-005	4.6200e-003	1.2200e-003	3.0000e-005	1.2500e-003	0.0000	3.8418	3.8418	1.3000e-004	0.0000	3.8450
Total	**2.0900e-003**	**1.9000e-003**	**0.0164**	**4.0000e-005**	**4.5900e-003**	**3.0000e-005**	**4.6200e-003**	**1.2200e-003**	**3.0000e-005**	**1.2500e-003**	**0.0000**	**3.8418**	**3.8418**	**1.3000e-004**	**0.0000**	**3.8450**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4788	0.0000	0.4788	0.2632	0.0000	0.2632	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1080	1.1241	0.5701	1.0100e-003		0.0582	0.0582		0.0536	0.0536	0.0000	88.5912	88.5912	0.0287	0.0000	89.3075
Total	**0.1080**	**1.1241**	**0.5701**	**1.0100e-003**	**0.4788**	**0.0582**	**0.5370**	**0.2632**	**0.0536**	**0.3167**	**0.0000**	**88.5912**	**88.5912**	**0.0287**	**0.0000**	**89.3075**

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3.3 Site Preparation - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0900e-003	1.9000e-003	0.0164	4.0000e-005	4.5900e-003	3.0000e-005	4.6200e-003	1.2200e-003	3.0000e-005	1.2500e-003	0.0000	3.8418	3.8418	1.3000e-004	0.0000	3.8450
Total	**2.0900e-003**	**1.9000e-003**	**0.0164**	**4.0000e-005**	**4.5900e-003**	**3.0000e-005**	**4.6200e-003**	**1.2200e-003**	**3.0000e-005**	**1.2500e-003**	**0.0000**	**3.8418**	**3.8418**	**1.3000e-004**	**0.0000**	**3.8450**

3.3 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1265	0.0000	0.1265	0.0695	0.0000	0.0695	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0272	0.2835	0.1481	2.7000e-004		0.0143	0.0143		0.0132	0.0132	0.0000	23.4050	23.4050	7.5700e-003	0.0000	23.5942
Total	**0.0272**	**0.2835**	**0.1481**	**2.7000e-004**	**0.1265**	**0.0143**	**0.1408**	**0.0695**	**0.0132**	**0.0827**	**0.0000**	**23.4050**	**23.4050**	**7.5700e-003**	**0.0000**	**23.5942**

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3.3 Site Preparation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.1000e-004	4.5000e-004	3.9300e-003	1.0000e-005	1.2100e-003	1.0000e-005	1.2200e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	0.9802	0.9802	3.0000e-005	0.0000	0.9810
Total	**5.1000e-004**	**4.5000e-004**	**3.9300e-003**	**1.0000e-005**	**1.2100e-003**	**1.0000e-005**	**1.2200e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**	**0.0000**	**0.9802**	**0.9802**	**3.0000e-005**	**0.0000**	**0.9810**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1265	0.0000	0.1265	0.0695	0.0000	0.0695	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0272	0.2835	0.1481	2.7000e-004		0.0143	0.0143		0.0132	0.0132	0.0000	23.4050	23.4050	7.5700e-003	0.0000	23.5942
Total	**0.0272**	**0.2835**	**0.1481**	**2.7000e-004**	**0.1265**	**0.0143**	**0.1408**	**0.0695**	**0.0132**	**0.0827**	**0.0000**	**23.4050**	**23.4050**	**7.5700e-003**	**0.0000**	**23.5942**

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3.3 Site Preparation - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.1000e-004	4.5000e-004	3.9300e-003	1.0000e-005	1.2100e-003	1.0000e-005	1.2200e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	0.9802	0.9802	3.0000e-005	0.0000	0.9810
Total	**5.1000e-004**	**4.5000e-004**	**3.9300e-003**	**1.0000e-005**	**1.2100e-003**	**1.0000e-005**	**1.2200e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**	**0.0000**	**0.9802**	**0.9802**	**3.0000e-005**	**0.0000**	**0.9810**

3.4 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5638	0.0000	0.5638	0.2338	0.0000	0.2338	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2724	3.0160	2.0071	4.0300e-003		0.1291	0.1291		0.1187	0.1187	0.0000	354.2174	354.2174	0.1146	0.0000	357.0814
Total	**0.2724**	**3.0160**	**2.0071**	**4.0300e-003**	**0.5638**	**0.1291**	**0.6928**	**0.2338**	**0.1187**	**0.3525**	**0.0000**	**354.2174**	**354.2174**	**0.1146**	**0.0000**	**357.0814**

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3.4 Grading - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.3000e-003	4.6200e-003	0.0405	1.1000e-004	0.0125	8.0000e-005	0.0126	3.3300e-003	7.0000e-005	3.4000e-003	0.0000	10.1135	10.1135	3.1000e-004	0.0000	10.1211
Total	**5.3000e-003**	**4.6200e-003**	**0.0405**	**1.1000e-004**	**0.0125**	**8.0000e-005**	**0.0126**	**3.3300e-003**	**7.0000e-005**	**3.4000e-003**	**0.0000**	**10.1135**	**10.1135**	**3.1000e-004**	**0.0000**	**10.1211**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5638	0.0000	0.5638	0.2338	0.0000	0.2338	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2724	3.0160	2.0071	4.0300e-003		0.1291	0.1291		0.1187	0.1187	0.0000	354.2170	354.2170	0.1146	0.0000	357.0810
Total	**0.2724**	**3.0160**	**2.0071**	**4.0300e-003**	**0.5638**	**0.1291**	**0.6928**	**0.2338**	**0.1187**	**0.3525**	**0.0000**	**354.2170**	**354.2170**	**0.1146**	**0.0000**	**357.0810**

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3.4 Grading - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.3000e-003	4.6200e-003	0.0405	1.1000e-004	0.0125	8.0000e-005	0.0126	3.3300e-003	7.0000e-005	3.4000e-003	0.0000	10.1135	10.1135	3.1000e-004	0.0000	10.1211
Total	**5.3000e-003**	**4.6200e-003**	**0.0405**	**1.1000e-004**	**0.0125**	**8.0000e-005**	**0.0126**	**3.3300e-003**	**7.0000e-005**	**3.4000e-003**	**0.0000**	**10.1135**	**10.1135**	**3.1000e-004**	**0.0000**	**10.1211**

3.5 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1130	1.1627	1.3188	2.0500e-003		0.0610	0.0610		0.0561	0.0561	0.0000	180.2113	180.2113	0.0583	0.0000	181.6684
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1130**	**1.1627**	**1.3188**	**2.0500e-003**		**0.0610**	**0.0610**		**0.0561**	**0.0561**	**0.0000**	**180.2113**	**180.2113**	**0.0583**	**0.0000**	**181.6684**

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3.5 Paving - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.5000e-003	4.8000e-003	0.0421	1.2000e-004	0.0130	8.0000e-005	0.0131	3.4500e-003	8.0000e-005	3.5300e-003	0.0000	10.5024	10.5024	3.2000e-004	0.0000	10.5104
Total	**5.5000e-003**	**4.8000e-003**	**0.0421**	**1.2000e-004**	**0.0130**	**8.0000e-005**	**0.0131**	**3.4500e-003**	**8.0000e-005**	**3.5300e-003**	**0.0000**	**10.5024**	**10.5024**	**3.2000e-004**	**0.0000**	**10.5104**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1130	1.1627	1.3188	2.0500e-003		0.0610	0.0610		0.0561	0.0561	0.0000	180.2111	180.2111	0.0583	0.0000	181.6682
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1130**	**1.1627**	**1.3188**	**2.0500e-003**		**0.0610**	**0.0610**		**0.0561**	**0.0561**	**0.0000**	**180.2111**	**180.2111**	**0.0583**	**0.0000**	**181.6682**

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3.5 Paving - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.5000e-003	4.8000e-003	0.0421	1.2000e-004	0.0130	8.0000e-005	0.0131	3.4500e-003	8.0000e-005	3.5300e-003	0.0000	10.5024	10.5024	3.2000e-004	0.0000	10.5104
Total	**5.5000e-003**	**4.8000e-003**	**0.0421**	**1.2000e-004**	**0.0130**	**8.0000e-005**	**0.0131**	**3.4500e-003**	**8.0000e-005**	**3.5300e-003**	**0.0000**	**10.5024**	**10.5024**	**3.2000e-004**	**0.0000**	**10.5104**

3.5 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1434	1.4462	1.8955	2.9600e-003		0.0738	0.0738		0.0679	0.0679	0.0000	260.3583	260.3583	0.0842	0.0000	262.4634
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1434**	**1.4462**	**1.8955**	**2.9600e-003**		**0.0738**	**0.0738**		**0.0679**	**0.0679**	**0.0000**	**260.3583**	**260.3583**	**0.0842**	**0.0000**	**262.4634**

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Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.4600e-003	6.2300e-003	0.0557	1.6000e-004	0.0188	1.2000e-004	0.0189	4.9900e-003	1.1000e-004	5.1000e-003	0.0000	14.6280	14.6280	4.1000e-004	0.0000	14.6382
Total	**7.4600e-003**	**6.2300e-003**	**0.0557**	**1.6000e-004**	**0.0188**	**1.2000e-004**	**0.0189**	**4.9900e-003**	**1.1000e-004**	**5.1000e-003**	**0.0000**	**14.6280**	**14.6280**	**4.1000e-004**	**0.0000**	**14.6382**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1434	1.4462	1.8955	2.9600e-003		0.0738	0.0738		0.0679	0.0679	0.0000	260.3579	260.3579	0.0842	0.0000	262.4631
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1434**	**1.4462**	**1.8955**	**2.9600e-003**		**0.0738**	**0.0738**		**0.0679**	**0.0679**	**0.0000**	**260.3579**	**260.3579**	**0.0842**	**0.0000**	**262.4631**

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3.5 Paving - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.4600e-003	6.2300e-003	0.0557	1.6000e-004	0.0188	1.2000e-004	0.0189	4.9900e-003	1.1000e-004	5.1000e-003	0.0000	14.6280	14.6280	4.1000e-004	0.0000	14.6382
Total	**7.4600e-003**	**6.2300e-003**	**0.0557**	**1.6000e-004**	**0.0188**	**1.2000e-004**	**0.0189**	**4.9900e-003**	**1.1000e-004**	**5.1000e-003**	**0.0000**	**14.6280**	**14.6280**	**4.1000e-004**	**0.0000**	**14.6382**

3.5 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0749	0.7389	1.0574	1.6500e-003		0.0370	0.0370		0.0340	0.0340	0.0000	145.1948	145.1948	0.0470	0.0000	146.3688
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0749**	**0.7389**	**1.0574**	**1.6500e-003**		**0.0370**	**0.0370**		**0.0340**	**0.0340**	**0.0000**	**145.1948**	**145.1948**	**0.0470**	**0.0000**	**146.3688**

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Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.9100e-003	3.1200e-003	0.0284	9.0000e-005	0.0105	6.0000e-005	0.0105	2.7800e-003	6.0000e-005	2.8400e-003	0.0000	7.8519	7.8519	2.0000e-004	0.0000	7.8571
Total	**3.9100e-003**	**3.1200e-003**	**0.0284**	**9.0000e-005**	**0.0105**	**6.0000e-005**	**0.0105**	**2.7800e-003**	**6.0000e-005**	**2.8400e-003**	**0.0000**	**7.8519**	**7.8519**	**2.0000e-004**	**0.0000**	**7.8571**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0749	0.7389	1.0574	1.6500e-003		0.0370	0.0370		0.0340	0.0340	0.0000	145.1946	145.1946	0.0470	0.0000	146.3686
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0749**	**0.7389**	**1.0574**	**1.6500e-003**		**0.0370**	**0.0370**		**0.0340**	**0.0340**	**0.0000**	**145.1946**	**145.1946**	**0.0470**	**0.0000**	**146.3686**

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3.5 Paving - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.9100e-003	3.1200e-003	0.0284	9.0000e-005	0.0105	6.0000e-005	0.0105	2.7800e-003	6.0000e-005	2.8400e-003	0.0000	7.8519	7.8519	2.0000e-004	0.0000	7.8571
Total	**3.9100e-003**	**3.1200e-003**	**0.0284**	**9.0000e-005**	**0.0105**	**6.0000e-005**	**0.0105**	**2.7800e-003**	**6.0000e-005**	**2.8400e-003**	**0.0000**	**7.8519**	**7.8519**	**2.0000e-004**	**0.0000**	**7.8571**

3.6 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1112	1.0198	0.9697	1.5700e-003		0.0561	0.0561		0.0527	0.0527	0.0000	135.5078	135.5078	0.0327	0.0000	136.3251
Total	**0.1112**	**1.0198**	**0.9697**	**1.5700e-003**		**0.0561**	**0.0561**		**0.0527**	**0.0527**	**0.0000**	**135.5078**	**135.5078**	**0.0327**	**0.0000**	**136.3251**

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3.6 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0389	1.2140	0.3557	2.5200e-003	0.0579	3.4700e-003	0.0614	0.0167	3.3100e-003	0.0201	0.0000	243.8823	243.8823	0.0144	0.0000	244.2419
Worker	0.1707	0.1488	1.3058	3.6100e-003	0.4032	2.5600e-003	0.4058	0.1072	2.3700e-003	0.1095	0.0000	325.8558	325.8558	9.8700e-003	0.0000	326.1025
Total	**0.2096**	**1.3628**	**1.6615**	**6.1300e-003**	**0.4612**	**6.0300e-003**	**0.4672**	**0.1239**	**5.6800e-003**	**0.1296**	**0.0000**	**569.7381**	**569.7381**	**0.0243**	**0.0000**	**570.3444**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1112	1.0198	0.9697	1.5700e-003		0.0561	0.0561		0.0527	0.0527	0.0000	135.5077	135.5077	0.0327	0.0000	136.3250
Total	**0.1112**	**1.0198**	**0.9697**	**1.5700e-003**		**0.0561**	**0.0561**		**0.0527**	**0.0527**	**0.0000**	**135.5077**	**135.5077**	**0.0327**	**0.0000**	**136.3250**

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3.6 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0389	1.2140	0.3557	2.5200e-003	0.0579	3.4700e-003	0.0614	0.0167	3.3100e-003	0.0201	0.0000	243.8823	243.8823	0.0144	0.0000	244.2419
Worker	0.1707	0.1488	1.3058	3.6100e-003	0.4032	2.5600e-003	0.4058	0.1072	2.3700e-003	0.1095	0.0000	325.8558	325.8558	9.8700e-003	0.0000	326.1025
Total	**0.2096**	**1.3628**	**1.6615**	**6.1300e-003**	**0.4612**	**6.0300e-003**	**0.4672**	**0.1239**	**5.6800e-003**	**0.1296**	**0.0000**	**569.7381**	**569.7381**	**0.0243**	**0.0000**	**570.3444**

3.6 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2218	2.0300	2.1272	3.5000e-003		0.1052	0.1052		0.0990	0.0990	0.0000	301.2428	301.2428	0.0722	0.0000	303.0471
Total	**0.2218**	**2.0300**	**2.1272**	**3.5000e-003**		**0.1052**	**0.1052**		**0.0990**	**0.0990**	**0.0000**	**301.2428**	**301.2428**	**0.0722**	**0.0000**	**303.0471**

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Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0799	2.5633	0.7297	5.5600e-003	0.1288	6.7700e-003	0.1356	0.0372	6.4800e-003	0.0437	0.0000	538.2689	538.2689	0.0316	0.0000	539.0580
Worker	0.3562	0.2974	2.6582	7.7300e-003	0.8961	5.5400e-003	0.9016	0.2381	5.1100e-003	0.2432	0.0000	698.2408	698.2408	0.0197	0.0000	698.7321
Total	**0.4361**	**2.8607**	**3.3879**	**0.0133**	**1.0249**	**0.0123**	**1.0372**	**0.2754**	**0.0116**	**0.2869**	**0.0000**	**1,236.5097**	**1,236.5097**	**0.0512**	**0.0000**	**1,237.7901**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2218	2.0300	2.1272	3.5000e-003		0.1052	0.1052		0.0990	0.0990	0.0000	301.2425	301.2425	0.0722	0.0000	303.0467
Total	**0.2218**	**2.0300**	**2.1272**	**3.5000e-003**		**0.1052**	**0.1052**		**0.0990**	**0.0990**	**0.0000**	**301.2425**	**301.2425**	**0.0722**	**0.0000**	**303.0467**

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3.6 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0799	2.5633	0.7297	5.5600e-003	0.1288	6.7700e-003	0.1356	0.0372	6.4800e-003	0.0437	0.0000	538.2689	538.2689	0.0316	0.0000	539.0580
Worker	0.3562	0.2974	2.6582	7.7300e-003	0.8961	5.5400e-003	0.9016	0.2381	5.1100e-003	0.2432	0.0000	698.2408	698.2408	0.0197	0.0000	698.7321
Total	**0.4361**	**2.8607**	**3.3879**	**0.0133**	**1.0249**	**0.0123**	**1.0372**	**0.2754**	**0.0116**	**0.2869**	**0.0000**	**1,236.5097**	**1,236.5097**	**0.0512**	**0.0000**	**1,237.7901**

3.6 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1140	1.0429	1.1777	1.9500e-003		0.0507	0.0507		0.0477	0.0477	0.0000	168.0584	168.0584	0.0400	0.0000	169.0579
Total	**0.1140**	**1.0429**	**1.1777**	**1.9500e-003**		**0.0507**	**0.0507**		**0.0477**	**0.0477**	**0.0000**	**168.0584**	**168.0584**	**0.0400**	**0.0000**	**169.0579**

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Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0340	1.1787	0.3575	3.0500e-003	0.0718	1.7500e-003	0.0736	0.0208	1.6700e-003	0.0224	0.0000	295.2542	295.2542	0.0157	0.0000	295.6457
Worker	0.1866	0.1491	1.3537	4.1500e-003	0.4997	3.0100e-003	0.5028	0.1328	2.7700e-003	0.1356	0.0000	374.7989	374.7989	9.7800e-003	0.0000	375.0435
Total	**0.2207**	**1.3278**	**1.7113**	**7.2000e-003**	**0.5716**	**4.7600e-003**	**0.5763**	**0.1536**	**4.4400e-003**	**0.1580**	**0.0000**	**670.0532**	**670.0532**	**0.0254**	**0.0000**	**670.6892**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1140	1.0429	1.1777	1.9500e-003		0.0507	0.0507		0.0477	0.0477	0.0000	168.0582	168.0582	0.0400	0.0000	169.0577
Total	**0.1140**	**1.0429**	**1.1777**	**1.9500e-003**		**0.0507**	**0.0507**		**0.0477**	**0.0477**	**0.0000**	**168.0582**	**168.0582**	**0.0400**	**0.0000**	**169.0577**

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Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0340	1.1787	0.3575	3.0500e-003	0.0718	1.7500e-003	0.0736	0.0208	1.6700e-003	0.0224	0.0000	295.2542	295.2542	0.0157	0.0000	295.6457
Worker	0.1866	0.1491	1.3537	4.1500e-003	0.4997	3.0100e-003	0.5028	0.1328	2.7700e-003	0.1356	0.0000	374.7989	374.7989	9.7800e-003	0.0000	375.0435
Total	**0.2207**	**1.3278**	**1.7113**	**7.2000e-003**	**0.5716**	**4.7600e-003**	**0.5763**	**0.1536**	**4.4400e-003**	**0.1580**	**0.0000**	**670.0532**	**670.0532**	**0.0254**	**0.0000**	**670.6892**

3.7 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	3.5933					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.5800e-003	0.0389	0.0464	8.0000e-005		2.4000e-003	2.4000e-003		2.4000e-003	2.4000e-003	0.0000	6.5108	6.5108	4.5000e-004	0.0000	6.5220
Total	**3.5989**	**0.0389**	**0.0464**	**8.0000e-005**		**2.4000e-003**	**2.4000e-003**		**2.4000e-003**	**2.4000e-003**	**0.0000**	**6.5108**	**6.5108**	**4.5000e-004**	**0.0000**	**6.5220**

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3.7 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0149	0.0130	0.1137	3.1000e-004	0.0351	2.2000e-004	0.0353	9.3300e-003	2.1000e-004	9.5400e-003	0.0000	28.3683	28.3683	8.6000e-004	0.0000	28.3897
Total	**0.0149**	**0.0130**	**0.1137**	**3.1000e-004**	**0.0351**	**2.2000e-004**	**0.0353**	**9.3300e-003**	**2.1000e-004**	**9.5400e-003**	**0.0000**	**28.3683**	**28.3683**	**8.6000e-004**	**0.0000**	**28.3897**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	3.5933					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.5800e-003	0.0389	0.0464	8.0000e-005		2.4000e-003	2.4000e-003		2.4000e-003	2.4000e-003	0.0000	6.5108	6.5108	4.5000e-004	0.0000	6.5220
Total	**3.5989**	**0.0389**	**0.0464**	**8.0000e-005**		**2.4000e-003**	**2.4000e-003**		**2.4000e-003**	**2.4000e-003**	**0.0000**	**6.5108**	**6.5108**	**4.5000e-004**	**0.0000**	**6.5220**

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3.7 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0149	0.0130	0.1137	3.1000e-004	0.0351	2.2000e-004	0.0353	9.3300e-003	2.1000e-004	9.5400e-003	0.0000	28.3683	28.3683	8.6000e-004	0.0000	28.3897
Total	**0.0149**	**0.0130**	**0.1137**	**3.1000e-004**	**0.0351**	**2.2000e-004**	**0.0353**	**9.3300e-003**	**2.1000e-004**	**9.5400e-003**	**0.0000**	**28.3683**	**28.3683**	**8.6000e-004**	**0.0000**	**28.3897**

3.7 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	18.3187					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0266	0.1831	0.2358	3.9000e-004		0.0106	0.0106		0.0106	0.0106	0.0000	33.1923	33.1923	2.1600e-003	0.0000	33.2463
Total	**18.3453**	**0.1831**	**0.2358**	**3.9000e-004**		**0.0106**	**0.0106**		**0.0106**	**0.0106**	**0.0000**	**33.1923**	**33.1923**	**2.1600e-003**	**0.0000**	**33.2463**

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3.7 Architectural Coating - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0711	0.0594	0.5309	1.5400e-003	0.1790	1.1100e-003	0.1801	0.0476	1.0200e-003	0.0486	0.0000	139.4531	139.4531	3.9200e-003	0.0000	139.5512
Total	**0.0711**	**0.0594**	**0.5309**	**1.5400e-003**	**0.1790**	**1.1100e-003**	**0.1801**	**0.0476**	**1.0200e-003**	**0.0486**	**0.0000**	**139.4531**	**139.4531**	**3.9200e-003**	**0.0000**	**139.5512**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	18.3187					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0266	0.1831	0.2358	3.9000e-004		0.0106	0.0106		0.0106	0.0106	0.0000	33.1923	33.1923	2.1600e-003	0.0000	33.2463
Total	**18.3453**	**0.1831**	**0.2358**	**3.9000e-004**		**0.0106**	**0.0106**		**0.0106**	**0.0106**	**0.0000**	**33.1923**	**33.1923**	**2.1600e-003**	**0.0000**	**33.2463**

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3.7 Architectural Coating - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0711	0.0594	0.5309	1.5400e-003	0.1790	1.1100e-003	0.1801	0.0476	1.0200e-003	0.0486	0.0000	139.4531	139.4531	3.9200e-003	0.0000	139.5512
Total	**0.0711**	**0.0594**	**0.5309**	**1.5400e-003**	**0.1790**	**1.1100e-003**	**0.1801**	**0.0476**	**1.0200e-003**	**0.0486**	**0.0000**	**139.4531**	**139.4531**	**3.9200e-003**	**0.0000**	**139.5512**

3.7 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	10.2162					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0139	0.0945	0.1313	2.2000e-004		5.1300e-003	5.1300e-003		5.1300e-003	5.1300e-003	0.0000	18.5111	18.5111	1.1100e-003	0.0000	18.5388
Total	**10.2301**	**0.0945**	**0.1313**	**2.2000e-004**		**5.1300e-003**	**5.1300e-003**		**5.1300e-003**	**5.1300e-003**	**0.0000**	**18.5111**	**18.5111**	**1.1100e-003**	**0.0000**	**18.5388**

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3.7 Architectural Coating - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0373	0.0298	0.2704	8.3000e-004	0.0998	6.0000e-004	0.1004	0.0265	5.5000e-004	0.0271	0.0000	74.8551	74.8551	1.9500e-003	0.0000	74.9039
Total	**0.0373**	**0.0298**	**0.2704**	**8.3000e-004**	**0.0998**	**6.0000e-004**	**0.1004**	**0.0265**	**5.5000e-004**	**0.0271**	**0.0000**	**74.8551**	**74.8551**	**1.9500e-003**	**0.0000**	**74.9039**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	10.2162					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0139	0.0945	0.1313	2.2000e-004		5.1300e-003	5.1300e-003		5.1300e-003	5.1300e-003	0.0000	18.5111	18.5111	1.1100e-003	0.0000	18.5388
Total	**10.2301**	**0.0945**	**0.1313**	**2.2000e-004**		**5.1300e-003**	**5.1300e-003**		**5.1300e-003**	**5.1300e-003**	**0.0000**	**18.5111**	**18.5111**	**1.1100e-003**	**0.0000**	**18.5388**

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3.7 Architectural Coating - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0373	0.0298	0.2704	8.3000e-004	0.0998	6.0000e-004	0.1004	0.0265	5.5000e-004	0.0271	0.0000	74.8551	74.8551	1.9500e-003	0.0000	74.9039
Total	**0.0373**	**0.0298**	**0.2704**	**8.3000e-004**	**0.0998**	**6.0000e-004**	**0.1004**	**0.0265**	**5.5000e-004**	**0.0271**	**0.0000**	**74.8551**	**74.8551**	**1.9500e-003**	**0.0000**	**74.9039**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	2.3141	9.5265	27.4007	0.0901	8.9559	0.0805	9.0364	2.3965	0.0753	2.4717	0.0000	8,261.4818	8,261.4818	0.2932	0.0000	8,268.8127
Unmitigated	2.3141	9.5265	27.4007	0.0901	8.9559	0.0805	9.0364	2.3965	0.0753	2.4717	0.0000	8,261.4818	8,261.4818	0.2932	0.0000	8,268.8127

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,156.62	1,589.52	1347.54	3,166,112	3,166,112
General Light Industry	2,677.50	990.00	510.00	7,019,141	7,019,141
Single Family Housing	5,057.64	6,629.79	5766.78	13,682,571	13,682,571
Total	8,891.76	9,209.31	7,624.32	23,867,824	23,867,824

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
General Light Industry	13.00	5.00	5.00	59.00	28.00	13.00	92	5	3
Single Family Housing	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3

4.4 Fleet Mix

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Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
General Light Industry	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
Single Family Housing	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	2,524.0763	2,524.0763	0.1128	0.0226	2,533.6209
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	2,551.8200	2,551.8200	0.1141	0.0228	2,561.4695
NaturalGas Mitigated	0.2237	1.9702	1.2403	0.0122		0.1546	0.1546		0.1546	0.1546	0.0000	2,214.2613	2,214.2613	0.0424	0.0406	2,227.4196
NaturalGas Unmitigated	0.2237	1.9702	1.2403	0.0122		0.1546	0.1546		0.1546	0.1546	0.0000	2,214.2613	2,214.2613	0.0424	0.0406	2,227.4196

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5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	2.26414e+006	0.0122	0.1043	0.0444	6.7000e-004		8.4400e-003	8.4400e-003		8.4400e-003	8.4400e-003	0.0000	120.8234	120.8234	2.3200e-003	2.2200e-003	121.5414
General Light Industry	1.9785e+007	0.1067	0.9699	0.8147	5.8200e-003		0.0737	0.0737		0.0737	0.0737	0.0000	1,055.8030	1,055.8030	0.0202	0.0194	1,062.0771
Single Family Housing	1.94445e+007	0.1049	0.8960	0.3813	5.7200e-003		0.0724	0.0724		0.0724	0.0724	0.0000	1,037.6350	1,037.6350	0.0199	0.0190	1,043.8011
Total		**0.2237**	**1.9702**	**1.2403**	**0.0122**		**0.1546**	**0.1546**		**0.1546**	**0.1546**	**0.0000**	**2,214.2613**	**2,214.2613**	**0.0425**	**0.0406**	**2,227.4196**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	2.26414e+006	0.0122	0.1043	0.0444	6.7000e-004		8.4400e-003	8.4400e-003		8.4400e-003	8.4400e-003	0.0000	120.8234	120.8234	2.3200e-003	2.2200e-003	121.5414
General Light Industry	1.9785e+007	0.1067	0.9699	0.8147	5.8200e-003		0.0737	0.0737		0.0737	0.0737	0.0000	1,055.8030	1,055.8030	0.0202	0.0194	1,062.0771
Single Family Housing	1.94445e+007	0.1049	0.8960	0.3813	5.7200e-003		0.0724	0.0724		0.0724	0.0724	0.0000	1,037.6350	1,037.6350	0.0199	0.0190	1,043.8011
Total		**0.2237**	**1.9702**	**1.2403**	**0.0122**		**0.1546**	**0.1546**		**0.1546**	**0.1546**	**0.0000**	**2,214.2613**	**2,214.2613**	**0.0425**	**0.0406**	**2,227.4196**

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5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	965434	195.9443	8.7600e-003	1.7500e-003	196.6853
General Light Industry	6.195e+006	1,257.3366	0.0562	0.0112	1,262.0912
Single Family Housing	5.41259e+006	1,098.5390	0.0491	9.8200e-003	1,102.6931
Total		**2,551.8200**	**0.1141**	**0.0228**	**2,561.4695**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	941205	191.0268	8.5400e-003	1.7100e-003	191.7491
General Light Industry	6.195e+006	1,257.3366	0.0562	0.0112	1,262.0912
Single Family Housing	5.30013e+006	1,075.7129	0.0481	9.6200e-003	1,079.7806
Total		**2,524.0763**	**0.1128**	**0.0226**	**2,533.6209**

6.0 Area Detail

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6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	10.1049	0.1398	12.1364	6.4000e-004		0.0672	0.0672		0.0672	0.0672	0.0000	19.8370	19.8370	0.0191	0.0000	20.3138
Unmitigated	10.1049	0.1398	12.1364	6.4000e-004		0.0672	0.0672		0.0672	0.0672	0.0000	19.8370	19.8370	0.0191	0.0000	20.3138

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6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.2400					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	8.4992					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.3657	0.1398	12.1364	6.4000e-004		0.0672	0.0672		0.0672	0.0672	0.0000	19.8370	19.8370	0.0191	0.0000	20.3138
Total	**10.1049**	**0.1398**	**12.1364**	**6.4000e-004**		**0.0672**	**0.0672**		**0.0672**	**0.0672**	**0.0000**	**19.8370**	**19.8370**	**0.0191**	**0.0000**	**20.3138**

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6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.2400					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	8.4992					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.3657	0.1398	12.1364	6.4000e-004		0.0672	0.0672		0.0672	0.0672	0.0000	19.8370	19.8370	0.0191	0.0000	20.3138
Total	**10.1049**	**0.1398**	**12.1364**	**6.4000e-004**		**0.0672**	**0.0672**		**0.0672**	**0.0672**	**0.0000**	**19.8370**	**19.8370**	**0.0191**	**0.0000**	**20.3138**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

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	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	293.3137	1.7230	0.1445	379.4566
Unmitigated	362.1250	2.1535	0.1806	469.7865

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	14.4642 / 9.11873	27.4798	0.1348	0.0113	34.2252
General Light Industry	173.438 / 0	251.8343	1.6126	0.1352	332.4232
Single Family Housing	43.588 / 27.4794	82.8109	0.4062	0.0341	103.1382
Total		**362.1250**	**2.1535**	**0.1806**	**469.7865**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	11.5714 / 8.56249	22.8843	0.1079	9.0700e-003	28.2840
General Light Industry	138.75 / 0	201.4674	1.2901	0.1081	265.9385
Single Family Housing	34.8704 / 25.8032	68.9620	0.3250	0.0273	85.2341
Total		**293.3137**	**1.7230**	**0.1445**	**379.4566**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	184.3615	10.8955	0.0000	456.7477
Unmitigated	368.7229	21.7909	0.0000	913.4955

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	102.12	20.7294	1.2251	0.0000	51.3563
General Light Industry	930	188.7816	11.1567	0.0000	467.6984
Single Family Housing	784.33	159.2119	9.4092	0.0000	394.4408
Total		**368.7229**	**21.7909**	**0.0000**	**913.4955**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	51.06	10.3647	0.6125	0.0000	25.6782
General Light Industry	465	94.3908	5.5783	0.0000	233.8492
Single Family Housing	392.165	79.6060	4.7046	0.0000	197.2204
Total		**184.3615**	**10.8955**	**0.0000**	**456.7477**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

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11.0 Vegetation

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1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	750.00	1000sqft	86.00	750,000.00	0
Apartments Low Rise	222.00	Dwelling Unit	13.88	222,000.00	604
Single Family Housing	669.00	Dwelling Unit	257.82	1,204,200.00	1820

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.2	**Precipitation Freq (Days)**	44
Climate Zone	4			**Operational Year**	2024
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	447.45	**CH4 Intensity (lb/MWhr)**	0.02	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

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Project Characteristics - Adjusted to match Ambient AQ GHG Study.

Land Use - Adjusted to match Plan Area. Used City's household rate of 2.72 persons per household.

Construction Phase - Operational emissions only.

Vehicle Trips - SFR and MFR adjusted to match Ambient AQ GHG Study and industrial to match traffic estimates for Alt 1.

Area Coating - Adjusted to match Ambient AQ GHG study.

Energy Use -

Water And Wastewater - Adjusted to match Ambient AQ GHG Study.

Waste Mitigation - Adjusted to match Ambient's AQ GHG Study.

Water Mitigation -

Energy Mitigation -

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Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	100
tblAreaCoating	Area_EF_Nonresidential_Interior	250	100
tblAreaCoating	Area_EF_Residential_Exterior	250	100
tblAreaCoating	Area_EF_Residential_Interior	250	100
tblLandUse	LotAcreage	17.22	86.00
tblLandUse	LotAcreage	217.21	257.82
tblLandUse	Population	635.00	604.00
tblLandUse	Population	1,913.00	1,820.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.02
tblProjectCharacteristics	CO2IntensityFactor	641.35	447.45
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblVehicleTrips	WD_TR	6.59	5.21
tblVehicleTrips	WD_TR	6.97	3.57
tblVehicleTrips	WD_TR	9.52	7.56
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

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2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	4.1642	42.4902	22.2712	0.0401	18.2442	2.1986	20.4428	9.9779	2.0227	12.0006	0.0000	3,879.7990	3,879.7990	1.1971	0.0000	3,906.3569
2021	148.9529	59.4456	66.8196	0.1697	18.2442	2.6652	20.2898	9.9779	2.4520	11.8598	0.0000	16,989.0657	16,989.0657	2.6657	0.0000	17,035.4668
2022	148.3023	50.4472	63.7325	0.1667	9.6528	1.5646	11.2174	2.5832	1.4649	4.0481	0.0000	16,692.7382	16,692.7382	1.8242	0.0000	16,738.3427
2023	147.7162	44.4951	60.6627	0.1632	9.6530	1.3562	11.0092	2.5833	1.2691	3.8523	0.0000	16,349.4761	16,349.4761	1.7653	0.0000	16,393.6076
Maximum	**148.9529**	**59.4456**	**66.8196**	**0.1697**	**18.2442**	**2.6652**	**20.4428**	**9.9779**	**2.4520**	**12.0006**	**0.0000**	**16,989.0657**	**16,989.0657**	**2.6657**	**0.0000**	**17,035.4668**

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2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	4.1642	42.4902	22.2712	0.0401	18.2442	2.1986	20.4428	9.9779	2.0227	12.0006	0.0000	3,879.7990	3,879.7990	1.1971	0.0000	3,906.3569
2021	148.9529	59.4456	66.8196	0.1697	18.2442	2.6652	20.2898	9.9779	2.4520	11.8598	0.0000	16,989.0657	16,989.0657	2.6657	0.0000	17,035.4668
2022	148.3023	50.4472	63.7325	0.1667	9.6528	1.5646	11.2174	2.5832	1.4649	4.0481	0.0000	16,692.7382	16,692.7382	1.8242	0.0000	16,738.3427
2023	147.7162	44.4951	60.6627	0.1632	9.6530	1.3562	11.0092	2.5833	1.2691	3.8523	0.0000	16,349.4761	16,349.4761	1.7653	0.0000	16,393.6075
Maximum	**148.9529**	**59.4456**	**66.8196**	**0.1697**	**18.2442**	**2.6652**	**20.4428**	**9.9779**	**2.4520**	**12.0006**	**0.0000**	**16,989.0657**	**16,989.0657**	**2.6657**	**0.0000**	**17,035.4668**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

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2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	55.5818	0.8473	73.5542	3.8900e-003		0.4075	0.4075		0.4075	0.4075	0.0000	132.5242	132.5242	0.1274	0.0000	135.7099
Energy	1.2260	10.7954	6.7964	0.0669		0.8470	0.8470		0.8470	0.8470		13,374.2756	13,374.2756	0.2563	0.2452	13,453.7522
Mobile	16.1323	65.1063	190.4221	0.6123	62.9138	0.5530	63.4668	16.7988	0.5169	17.3158		61,853.0516	61,853.0516	2.2348		61,908.9220
Total	**72.9401**	**76.7490**	**270.7726**	**0.6831**	**62.9138**	**1.8076**	**64.7214**	**16.7988**	**1.7715**	**18.5703**	**0.0000**	**75,359.8514**	**75,359.8514**	**2.6186**	**0.2452**	**75,498.3841**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	55.5818	0.8473	73.5542	3.8900e-003		0.4075	0.4075		0.4075	0.4075	0.0000	132.5242	132.5242	0.1274	0.0000	135.7099
Energy	1.2260	10.7954	6.7964	0.0669		0.8470	0.8470		0.8470	0.8470		13,374.2756	13,374.2756	0.2563	0.2452	13,453.7522
Mobile	16.1323	65.1063	190.4221	0.6123	62.9138	0.5530	63.4668	16.7988	0.5169	17.3158		61,853.0516	61,853.0516	2.2348		61,908.9220
Total	**72.9401**	**76.7490**	**270.7726**	**0.6831**	**62.9138**	**1.8076**	**64.7214**	**16.7988**	**1.7715**	**18.5703**	**0.0000**	**75,359.8514**	**75,359.8514**	**2.6186**	**0.2452**	**75,498.3841**

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	9/20/2020	10/19/2020	5	400	
2	Site Preparation	Site Preparation	10/20/2020	1/20/2021	5	240	
3	Grading	Grading	1/21/2021	7/21/2021	5	620	
4	Paving	Paving	4/24/2021	7/21/2023	5	440	
5	Building Construction	Building Construction	7/22/2021	7/21/2023	5	6200	
6	Architectural Coating	Architectural Coating	10/22/2021	7/21/2023	5	440	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 1550

Acres of Paving: 0

Residential Indoor: 2,888,055; Residential Outdoor: 962,685; Non-Residential Indoor: 1,125,000; Non-Residential Outdoor: 375,000; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Winter

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Winter

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	716.00	218.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	143.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419		3,747.7049	3,747.7049	1.0580		3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**		**1.6587**	**1.6587**		**1.5419**	**1.5419**		**3,747.7049**	**3,747.7049**	**1.0580**		**3,774.1536**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Winter

3.2 Demolition - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0731	0.0607	0.5180	1.3300e-003	0.1483	9.5000e-004	0.1492	0.0393	8.8000e-004	0.0402		132.0941	132.0941	4.3700e-003		132.2033
Total	**0.0731**	**0.0607**	**0.5180**	**1.3300e-003**	**0.1483**	**9.5000e-004**	**0.1492**	**0.0393**	**8.8000e-004**	**0.0402**		**132.0941**	**132.0941**	**4.3700e-003**		**132.2033**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419	0.0000	3,747.7049	3,747.7049	1.0580		3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**		**1.6587**	**1.6587**		**1.5419**	**1.5419**	**0.0000**	**3,747.7049**	**3,747.7049**	**1.0580**		**3,774.1536**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Winter

3.2 Demolition - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0731	0.0607	0.5180	1.3300e-003	0.1483	9.5000e-004	0.1492	0.0393	8.8000e-004	0.0402		132.0941	132.0941	4.3700e-003		132.2033
Total	**0.0731**	**0.0607**	**0.5180**	**1.3300e-003**	**0.1483**	**9.5000e-004**	**0.1492**	**0.0393**	**8.8000e-004**	**0.0402**		**132.0941**	**132.0941**	**4.3700e-003**		**132.2033**

3.3 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216		3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0663**	**2.1974**	**20.2637**	**9.9307**	**2.0216**	**11.9523**		**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Winter

3.3 Site Preparation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0878	0.0729	0.6216	1.5900e-003	0.1780	1.1400e-003	0.1791	0.0472	1.0500e-003	0.0483		158.5129	158.5129	5.2400e-003		158.6439
Total	**0.0878**	**0.0729**	**0.6216**	**1.5900e-003**	**0.1780**	**1.1400e-003**	**0.1791**	**0.0472**	**1.0500e-003**	**0.0483**		**158.5129**	**158.5129**	**5.2400e-003**		**158.6439**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216	0.0000	3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0663**	**2.1974**	**20.2637**	**9.9307**	**2.0216**	**11.9523**	**0.0000**	**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Winter

3.3 Site Preparation - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0878	0.0729	0.6216	1.5900e-003	0.1780	1.1400e-003	0.1791	0.0472	1.0500e-003	0.0483		158.5129	158.5129	5.2400e-003		158.6439
Total	**0.0878**	**0.0729**	**0.6216**	**1.5900e-003**	**0.1780**	**1.1400e-003**	**0.1791**	**0.0472**	**1.0500e-003**	**0.0483**		**158.5129**	**158.5129**	**5.2400e-003**		**158.6439**

3.3 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	3.8882	40.4971	21.1543	0.0380		2.0445	2.0445		1.8809	1.8809		3,685.6569	3,685.6569	1.1920		3,715.4573
Total	**3.8882**	**40.4971**	**21.1543**	**0.0380**	**18.0663**	**2.0445**	**20.1107**	**9.9307**	**1.8809**	**11.8116**		**3,685.6569**	**3,685.6569**	**1.1920**		**3,715.4573**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Winter

3.3 Site Preparation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0819	0.0652	0.5630	1.5400e-003	0.1780	1.1000e-003	0.1791	0.0472	1.0200e-003	0.0482		153.1105	153.1105	4.6500e-003		153.2268
Total	**0.0819**	**0.0652**	**0.5630**	**1.5400e-003**	**0.1780**	**1.1000e-003**	**0.1791**	**0.0472**	**1.0200e-003**	**0.0482**		**153.1105**	**153.1105**	**4.6500e-003**		**153.2268**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	3.8882	40.4971	21.1543	0.0380		2.0445	2.0445		1.8809	1.8809	0.0000	3,685.6569	3,685.6569	1.1920		3,715.4573
Total	**3.8882**	**40.4971**	**21.1543**	**0.0380**	**18.0663**	**2.0445**	**20.1107**	**9.9307**	**1.8809**	**11.8116**	**0.0000**	**3,685.6569**	**3,685.6569**	**1.1920**		**3,715.4573**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Winter

3.3 Site Preparation - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0819	0.0652	0.5630	1.5400e-003	0.1780	1.1000e-003	0.1791	0.0472	1.0200e-003	0.0482		153.1105	153.1105	4.6500e-003		153.2268
Total	**0.0819**	**0.0652**	**0.5630**	**1.5400e-003**	**0.1780**	**1.1000e-003**	**0.1791**	**0.0472**	**1.0200e-003**	**0.0482**		**153.1105**	**153.1105**	**4.6500e-003**		**153.2268**

3.4 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.1912	46.3998	30.8785	0.0620		1.9853	1.9853		1.8265	1.8265		6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**4.1912**	**46.3998**	**30.8785**	**0.0620**	**8.6733**	**1.9853**	**10.6587**	**3.5965**	**1.8265**	**5.4230**		**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Winter

3.4 Grading - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0910	0.0724	0.6255	1.7100e-003	0.1977	1.2200e-003	0.1990	0.0524	1.1300e-003	0.0536		170.1228	170.1228	5.1700e-003		170.2520
Total	**0.0910**	**0.0724**	**0.6255**	**1.7100e-003**	**0.1977**	**1.2200e-003**	**0.1990**	**0.0524**	**1.1300e-003**	**0.0536**		**170.1228**	**170.1228**	**5.1700e-003**		**170.2520**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.1912	46.3998	30.8785	0.0620		1.9853	1.9853		1.8265	1.8265	0.0000	6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**4.1912**	**46.3998**	**30.8785**	**0.0620**	**8.6733**	**1.9853**	**10.6587**	**3.5965**	**1.8265**	**5.4230**	**0.0000**	**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Winter

3.4 Grading - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0910	0.0724	0.6255	1.7100e-003	0.1977	1.2200e-003	0.1990	0.0524	1.1300e-003	0.0536		170.1228	170.1228	5.1700e-003		170.2520
Total	**0.0910**	**0.0724**	**0.6255**	**1.7100e-003**	**0.1977**	**1.2200e-003**	**0.1990**	**0.0524**	**1.1300e-003**	**0.0536**		**170.1228**	**170.1228**	**5.1700e-003**		**170.2520**

3.5 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2556	12.9191	14.6532	0.0228		0.6777	0.6777		0.6235	0.6235		2,207.2109	2,207.2109	0.7139		2,225.0573
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2556**	**12.9191**	**14.6532**	**0.0228**		**0.6777**	**0.6777**		**0.6235**	**0.6235**		**2,207.2109**	**2,207.2109**	**0.7139**		**2,225.0573**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Winter

3.5 Paving - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0683	0.0543	0.4692	1.2800e-003	0.1483	9.2000e-004	0.1492	0.0393	8.5000e-004	0.0402		127.5921	127.5921	3.8800e-003		127.6890
Total	**0.0683**	**0.0543**	**0.4692**	**1.2800e-003**	**0.1483**	**9.2000e-004**	**0.1492**	**0.0393**	**8.5000e-004**	**0.0402**		**127.5921**	**127.5921**	**3.8800e-003**		**127.6890**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2556	12.9191	14.6532	0.0228		0.6777	0.6777		0.6235	0.6235	0.0000	2,207.2109	2,207.2109	0.7139		2,225.0573
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2556**	**12.9191**	**14.6532**	**0.0228**		**0.6777**	**0.6777**		**0.6235**	**0.6235**	**0.0000**	**2,207.2109**	**2,207.2109**	**0.7139**		**2,225.0573**

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3.5 Paving - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0683	0.0543	0.4692	1.2800e-003	0.1483	9.2000e-004	0.1492	0.0393	8.5000e-004	0.0402		127.5921	127.5921	3.8800e-003		127.6890
Total	**0.0683**	**0.0543**	**0.4692**	**1.2800e-003**	**0.1483**	**9.2000e-004**	**0.1492**	**0.0393**	**8.5000e-004**	**0.0402**		**127.5921**	**127.5921**	**3.8800e-003**		**127.6890**

3.5 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1028	11.1249	14.5805	0.0228		0.5679	0.5679		0.5225	0.5225		2,207.6603	2,207.6603	0.7140		2,225.5104
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1028**	**11.1249**	**14.5805**	**0.0228**		**0.5679**	**0.5679**		**0.5225**	**0.5225**		**2,207.6603**	**2,207.6603**	**0.7140**		**2,225.5104**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Winter

3.5 Paving - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0642	0.0488	0.4295	1.2300e-003	0.1483	8.9000e-004	0.1492	0.0393	8.2000e-004	0.0402		123.0317	123.0317	3.4700e-003		123.1185
Total	**0.0642**	**0.0488**	**0.4295**	**1.2300e-003**	**0.1483**	**8.9000e-004**	**0.1492**	**0.0393**	**8.2000e-004**	**0.0402**		**123.0317**	**123.0317**	**3.4700e-003**		**123.1185**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1028	11.1249	14.5805	0.0228		0.5679	0.5679		0.5225	0.5225	0.0000	2,207.6603	2,207.6603	0.7140		2,225.5104
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1028**	**11.1249**	**14.5805**	**0.0228**		**0.5679**	**0.5679**		**0.5225**	**0.5225**	**0.0000**	**2,207.6603**	**2,207.6603**	**0.7140**		**2,225.5104**

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3.5 Paving - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0642	0.0488	0.4295	1.2300e-003	0.1483	8.9000e-004	0.1492	0.0393	8.2000e-004	0.0402		123.0317	123.0317	3.4700e-003		123.1185
Total	**0.0642**	**0.0488**	**0.4295**	**1.2300e-003**	**0.1483**	**8.9000e-004**	**0.1492**	**0.0393**	**8.2000e-004**	**0.0402**		**123.0317**	**123.0317**	**3.4700e-003**		**123.1185**

3.5 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0327	10.1917	14.5842	0.0228		0.5102	0.5102		0.4694	0.4694		2,207.5841	2,207.5841	0.7140		2,225.4336
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0327**	**10.1917**	**14.5842**	**0.0228**		**0.5102**	**0.5102**		**0.4694**	**0.4694**		**2,207.5841**	**2,207.5841**	**0.7140**		**2,225.4336**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Winter

3.5 Paving - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0604	0.0439	0.3919	1.1900e-003	0.1483	8.7000e-004	0.1492	0.0393	8.0000e-004	0.0401		118.4177	118.4177	3.1000e-003		118.4951
Total	**0.0604**	**0.0439**	**0.3919**	**1.1900e-003**	**0.1483**	**8.7000e-004**	**0.1492**	**0.0393**	**8.0000e-004**	**0.0401**		**118.4177**	**118.4177**	**3.1000e-003**		**118.4951**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0327	10.1917	14.5842	0.0228		0.5102	0.5102		0.4694	0.4694	0.0000	2,207.5841	2,207.5841	0.7140		2,225.4336
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0327**	**10.1917**	**14.5842**	**0.0228**		**0.5102**	**0.5102**		**0.4694**	**0.4694**	**0.0000**	**2,207.5841**	**2,207.5841**	**0.7140**		**2,225.4336**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Winter

3.5 Paving - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0604	0.0439	0.3919	1.1900e-003	0.1483	8.7000e-004	0.1492	0.0393	8.0000e-004	0.0401		118.4177	118.4177	3.1000e-003		118.4951
Total	**0.0604**	**0.0439**	**0.3919**	**1.1900e-003**	**0.1483**	**8.7000e-004**	**0.1492**	**0.0393**	**8.0000e-004**	**0.0401**		**118.4177**	**118.4177**	**3.1000e-003**		**118.4951**

3.6 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013		2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**		**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Winter

3.6 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.6880	20.4709	6.4378	0.0424	1.0121	0.0612	1.0733	0.2915	0.0585	0.3501		4,512.6775	4,512.6775	0.2809		4,519.7001
Worker	3.2577	2.5925	22.3941	0.0612	7.0785	0.0438	7.1223	1.8774	0.0404	1.9178		6,090.3955	6,090.3955	0.1851		6,095.0231
Total	**3.9457**	**23.0634**	**28.8319**	**0.1035**	**8.0906**	**0.1050**	**8.1956**	**2.1689**	**0.0990**	**2.2679**		**10,603.0730**	**10,603.0730**	**0.4660**		**10,614.7232**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013	0.0000	2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**	**0.0000**	**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Winter

3.6 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.6880	20.4709	6.4378	0.0424	1.0121	0.0612	1.0733	0.2915	0.0585	0.3501		4,512.6775	4,512.6775	0.2809		4,519.7001
Worker	3.2577	2.5925	22.3941	0.0612	7.0785	0.0438	7.1223	1.8774	0.0404	1.9178		6,090.3955	6,090.3955	0.1851		6,095.0231
Total	**3.9457**	**23.0634**	**28.8319**	**0.1035**	**8.0906**	**0.1050**	**8.1956**	**2.1689**	**0.0990**	**2.2679**		**10,603.0730**	**10,603.0730**	**0.4660**		**10,614.7232**

3.6 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612		2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**		**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Winter

3.6 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.6365	19.4529	5.9513	0.0420	1.0123	0.0540	1.0663	0.2916	0.0516	0.3432		4,480.6480	4,480.6480	0.2776		4,487.5872
Worker	3.0633	2.3309	20.5000	0.0590	7.0785	0.0426	7.1211	1.8774	0.0393	1.9166		5,872.7141	5,872.7141	0.1658		5,876.8582
Total	**3.6998**	**21.7838**	**26.4513**	**0.1010**	**8.0908**	**0.0966**	**8.1873**	**2.1689**	**0.0909**	**2.2598**		**10,353.3621**	**10,353.3621**	**0.4433**		**10,364.4454**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612	0.0000	2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**	**0.0000**	**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

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3.6 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.6365	19.4529	5.9513	0.0420	1.0123	0.0540	1.0663	0.2916	0.0516	0.3432		4,480.6480	4,480.6480	0.2776		4,487.5872
Worker	3.0633	2.3309	20.5000	0.0590	7.0785	0.0426	7.1211	1.8774	0.0393	1.9166		5,872.7141	5,872.7141	0.1658		5,876.8582
Total	**3.6998**	**21.7838**	**26.4513**	**0.1010**	**8.0908**	**0.0966**	**8.1873**	**2.1689**	**0.0909**	**2.2598**		**10,353.3621**	**10,353.3621**	**0.4433**		**10,364.4454**

3.6 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584		2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**		**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

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3.6 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4864	16.0584	5.1915	0.0413	1.0125	0.0248	1.0374	0.2917	0.0238	0.3154		4,405.4287	4,405.4287	0.2462		4,411.5823
Worker	2.8834	2.0949	18.7043	0.0567	7.0785	0.0415	7.1200	1.8774	0.0383	1.9156		5,652.4721	5,652.4721	0.1478		5,656.1678
Total	**3.3698**	**18.1533**	**23.8959**	**0.0980**	**8.0910**	**0.0663**	**8.1573**	**2.1690**	**0.0620**	**2.2310**		**10,057.9008**	**10,057.9008**	**0.3940**		**10,067.7501**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584	0.0000	2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**	**0.0000**	**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

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3.6 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4864	16.0584	5.1915	0.0413	1.0125	0.0248	1.0374	0.2917	0.0238	0.3154		4,405.4287	4,405.4287	0.2462		4,411.5823
Worker	2.8834	2.0949	18.7043	0.0567	7.0785	0.0415	7.1200	1.8774	0.0383	1.9156		5,652.4721	5,652.4721	0.1478		5,656.1678
Total	**3.3698**	**18.1533**	**23.8959**	**0.0980**	**8.0910**	**0.0663**	**8.1573**	**2.1690**	**0.0620**	**2.2310**		**10,057.9008**	**10,057.9008**	**0.3940**		**10,067.7501**

3.7 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	140.9130					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941		281.4481	281.4481	0.0193		281.9309
Total	**141.1319**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**		**281.4481**	**281.4481**	**0.0193**		**281.9309**

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3.7 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.6506	0.5178	4.4726	0.0122	1.4137	8.7500e-003	1.4225	0.3750	8.0800e-003	0.3830		1,216.3779	1,216.3779	0.0370		1,217.3021
Total	**0.6506**	**0.5178**	**4.4726**	**0.0122**	**1.4137**	**8.7500e-003**	**1.4225**	**0.3750**	**8.0800e-003**	**0.3830**		**1,216.3779**	**1,216.3779**	**0.0370**		**1,217.3021**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	140.9130					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941	0.0000	281.4481	281.4481	0.0193		281.9309
Total	**141.1319**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**	**0.0000**	**281.4481**	**281.4481**	**0.0193**		**281.9309**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Winter

3.7 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.6506	0.5178	4.4726	0.0122	1.4137	8.7500e-003	1.4225	0.3750	8.0800e-003	0.3830		1,216.3779	1,216.3779	0.0370		1,217.3021
Total	**0.6506**	**0.5178**	**4.4726**	**0.0122**	**1.4137**	**8.7500e-003**	**1.4225**	**0.3750**	**8.0800e-003**	**0.3830**		**1,216.3779**	**1,216.3779**	**0.0370**		**1,217.3021**

3.7 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	140.9130					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817		281.4481	281.4481	0.0183		281.9062
Total	**141.1175**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.9062**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Winter

3.7 Architectural Coating - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.6118	0.4655	4.0943	0.0118	1.4137	8.5100e-003	1.4222	0.3750	7.8400e-003	0.3828		1,172.9024	1,172.9024	0.0331		1,173.7301
Total	**0.6118**	**0.4655**	**4.0943**	**0.0118**	**1.4137**	**8.5100e-003**	**1.4222**	**0.3750**	**7.8400e-003**	**0.3828**		**1,172.9024**	**1,172.9024**	**0.0331**		**1,173.7301**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	140.9130					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817	0.0000	281.4481	281.4481	0.0183		281.9062
Total	**141.1175**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.9062**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Winter

3.7 Architectural Coating - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.6118	0.4655	4.0943	0.0118	1.4137	8.5100e-003	1.4222	0.3750	7.8400e-003	0.3828		1,172.9024	1,172.9024	0.0331		1,173.7301
Total	**0.6118**	**0.4655**	**4.0943**	**0.0118**	**1.4137**	**8.5100e-003**	**1.4222**	**0.3750**	**7.8400e-003**	**0.3828**		**1,172.9024**	**1,172.9024**	**0.0331**		**1,173.7301**

3.7 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	140.9130					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708		281.4481	281.4481	0.0168		281.8690
Total	**141.1046**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**		**281.4481**	**281.4481**	**0.0168**		**281.8690**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Winter

3.7 Architectural Coating - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.5759	0.4184	3.7356	0.0113	1.4137	8.2900e-003	1.4220	0.3750	7.6400e-003	0.3826		1,128.9155	1,128.9155	0.0295		1,129.6536
Total	**0.5759**	**0.4184**	**3.7356**	**0.0113**	**1.4137**	**8.2900e-003**	**1.4220**	**0.3750**	**7.6400e-003**	**0.3826**		**1,128.9155**	**1,128.9155**	**0.0295**		**1,129.6536**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	140.9130					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708	0.0000	281.4481	281.4481	0.0168		281.8690
Total	**141.1046**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**	**0.0000**	**281.4481**	**281.4481**	**0.0168**		**281.8690**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Winter

3.7 Architectural Coating - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.5759	0.4184	3.7356	0.0113	1.4137	8.2900e-003	1.4220	0.3750	7.6400e-003	0.3826		1,128.9155	1,128.9155	0.0295		1,129.6536
Total	**0.5759**	**0.4184**	**3.7356**	**0.0113**	**1.4137**	**8.2900e-003**	**1.4220**	**0.3750**	**7.6400e-003**	**0.3826**		**1,128.9155**	**1,128.9155**	**0.0295**		**1,129.6536**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	16.1323	65.1063	190.4221	0.6123	62.9138	0.5530	63.4668	16.7988	0.5169	17.3158		61,853.0516	61,853.0516	2.2348		61,908.9220
Unmitigated	16.1323	65.1063	190.4221	0.6123	62.9138	0.5530	63.4668	16.7988	0.5169	17.3158		61,853.0516	61,853.0516	2.2348		61,908.9220

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,156.62	1,589.52	1347.54	3,166,112	3,166,112
General Light Industry	2,677.50	990.00	510.00	7,019,141	7,019,141
Single Family Housing	5,057.64	6,629.79	5766.78	13,682,571	13,682,571
Total	8,891.76	9,209.31	7,624.32	23,867,824	23,867,824

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
General Light Industry	13.00	5.00	5.00	59.00	28.00	13.00	92	5	3
Single Family Housing	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3

4.4 Fleet Mix

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Winter

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
General Light Industry	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
Single Family Housing	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	1.2260	10.7954	6.7964	0.0669		0.8470	0.8470		0.8470	0.8470		13,374.2756	13,374.2756	0.2563	0.2452	13,453.7522
NaturalGas Unmitigated	1.2260	10.7954	6.7964	0.0669		0.8470	0.8470		0.8470	0.8470		13,374.2756	13,374.2756	0.2563	0.2452	13,453.7522

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Winter

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	6203.14	0.0669	0.5717	0.2433	3.6500e-003		0.0462	0.0462		0.0462	0.0462		729.7807	729.7807	0.0140	0.0134	734.1175
General Light Industry	54205.5	0.5846	5.3143	4.4640	0.0319		0.4039	0.4039		0.4039	0.4039		6,377.1152	6,377.1152	0.1222	0.1169	6,415.0112
Single Family Housing	53272.7	0.5745	4.9095	2.0891	0.0313		0.3969	0.3969		0.3969	0.3969		6,267.3796	6,267.3796	0.1201	0.1149	6,304.6235
Total		**1.2260**	**10.7954**	**6.7964**	**0.0669**		**0.8470**	**0.8470**		**0.8470**	**0.8470**		**13,374.2756**	**13,374.2756**	**0.2563**	**0.2452**	**13,453.7522**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	6.20314	0.0669	0.5717	0.2433	3.6500e-003		0.0462	0.0462		0.0462	0.0462		729.7807	729.7807	0.0140	0.0134	734.1175
General Light Industry	54.2055	0.5846	5.3143	4.4640	0.0319		0.4039	0.4039		0.4039	0.4039		6,377.1152	6,377.1152	0.1222	0.1169	6,415.0112
Single Family Housing	53.2727	0.5745	4.9095	2.0891	0.0313		0.3969	0.3969		0.3969	0.3969		6,267.3796	6,267.3796	0.1201	0.1149	6,304.6235
Total		**1.2260**	**10.7954**	**6.7964**	**0.0669**		**0.8470**	**0.8470**		**0.8470**	**0.8470**		**13,374.2756**	**13,374.2756**	**0.2563**	**0.2452**	**13,453.7522**

6.0 Area Detail

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Winter

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	55.5818	0.8473	73.5542	3.8900e-003		0.4075	0.4075		0.4075	0.4075	0.0000	132.5242	132.5242	0.1274	0.0000	135.7099
Unmitigated	55.5818	0.8473	73.5542	3.8900e-003		0.4075	0.4075		0.4075	0.4075	0.0000	132.5242	132.5242	0.1274	0.0000	135.7099

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Winter

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	6.7947					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	46.5707					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.2164	0.8473	73.5542	3.8900e-003		0.4075	0.4075		0.4075	0.4075		132.5242	132.5242	0.1274		135.7099
Total	**55.5818**	**0.8473**	**73.5542**	**3.8900e-003**		**0.4075**	**0.4075**		**0.4075**	**0.4075**	**0.0000**	**132.5242**	**132.5242**	**0.1274**	**0.0000**	**135.7099**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	6.7947					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	46.5707					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.2164	0.8473	73.5542	3.8900e-003		0.4075	0.4075		0.4075	0.4075		132.5242	132.5242	0.1274		135.7099
Total	**55.5818**	**0.8473**	**73.5542**	**3.8900e-003**		**0.4075**	**0.4075**		**0.4075**	**0.4075**	**0.0000**	**132.5242**	**132.5242**	**0.1274**	**0.0000**	**135.7099**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Winter

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

OCSP Alternative 1 - 2024

San Luis Obispo County APCD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	750.00	1000sqft	86.00	750,000.00	0
Apartments Low Rise	222.00	Dwelling Unit	13.88	222,000.00	604
Single Family Housing	669.00	Dwelling Unit	257.82	1,204,200.00	1820

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.2	**Precipitation Freq (Days)**	44
Climate Zone	4			**Operational Year**	2024
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	447.45	**CH4 Intensity (lb/MWhr)**	0.02	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

Project Characteristics - Adjusted to match Ambient AQ GHG Study.

Land Use - Adjusted to match Plan Area. Used City's household rate of 2.72 persons per household.

Construction Phase - Operational emissions only.

Vehicle Trips - SFR and MFR adjusted to match Ambient AQ GHG Study and industrial to match traffic estimates for Alt 1.

Area Coating - Adjusted to match Ambient AQ GHG study.

Energy Use -

Water And Wastewater - Adjusted to match Ambient AQ GHG Study.

Waste Mitigation - Adjusted to match Ambient's AQ GHG Study.

Water Mitigation -

Energy Mitigation -

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	100
tblAreaCoating	Area_EF_Nonresidential_Interior	250	100
tblAreaCoating	Area_EF_Residential_Exterior	250	100
tblAreaCoating	Area_EF_Residential_Interior	250	100
tblLandUse	LotAcreage	17.22	86.00
tblLandUse	LotAcreage	217.21	257.82
tblLandUse	Population	635.00	604.00
tblLandUse	Population	1,913.00	1,820.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.02
tblProjectCharacteristics	CO2IntensityFactor	641.35	447.45
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblVehicleTrips	WD_TR	6.59	5.21
tblVehicleTrips	WD_TR	6.97	3.57
tblVehicleTrips	WD_TR	9.52	7.56
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	4.1535	42.4816	22.2857	0.0402	18.2442	2.1986	20.4428	9.9779	2.0227	12.0006	0.0000	3,886.2880	3,886.2880	1.1973	0.0000	3,912.8496
2021	148.4160	59.4306	66.9048	0.1747	18.2442	2.6652	20.2898	9.9779	2.4520	11.8598	0.0000	17,497.1485	17,497.1485	2.6660	0.0000	17,543.2915
2022	147.7900	50.2525	63.8536	0.1715	9.6528	1.5614	11.2142	2.5832	1.4618	4.0451	0.0000	17,188.9034	17,188.9034	1.8135	0.0000	17,234.2400
2023	147.2313	44.3171	60.9239	0.1679	9.6530	1.3550	11.0080	2.5833	1.2679	3.8512	0.0000	16,832.6708	16,832.6708	1.7575	0.0000	16,876.6085
Maximum	**148.4160**	**59.4306**	**66.9048**	**0.1747**	**18.2442**	**2.6652**	**20.4428**	**9.9779**	**2.4520**	**12.0006**	**0.0000**	**17,497.1485**	**17,497.1485**	**2.6660**	**0.0000**	**17,543.2915**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

2.1 Overall Construction (Maximum Daily Emission)

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	4.1535	42.4816	22.2857	0.0402	18.2442	2.1986	20.4428	9.9779	2.0227	12.0006	0.0000	3,886.2880	3,886.2880	1.1973	0.0000	3,912.8496
2021	148.4160	59.4306	66.9048	0.1747	18.2442	2.6652	20.2898	9.9779	2.4520	11.8598	0.0000	17,497.1485	17,497.1485	2.6660	0.0000	17,543.2915
2022	147.7900	50.2525	63.8536	0.1715	9.6528	1.5614	11.2142	2.5832	1.4618	4.0451	0.0000	17,188.9034	17,188.9034	1.8135	0.0000	17,234.2400
2023	147.2313	44.3171	60.9239	0.1679	9.6530	1.3550	11.0080	2.5833	1.2679	3.8512	0.0000	16,832.6708	16,832.6708	1.7575	0.0000	16,876.6085
Maximum	**148.4160**	**59.4306**	**66.9048**	**0.1747**	**18.2442**	**2.6652**	**20.4428**	**9.9779**	**2.4520**	**12.0006**	**0.0000**	**17,497.1485**	**17,497.1485**	**2.6660**	**0.0000**	**17,543.2915**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	55.5818	0.8473	73.5542	3.8900e-003		0.4075	0.4075		0.4075	0.4075	0.0000	132.5242	132.5242	0.1274	0.0000	135.7099
Energy	1.2260	10.7954	6.7964	0.0669		0.8470	0.8470		0.8470	0.8470		13,374.2756	13,374.2756	0.2563	0.2452	13,453.7522
Mobile	16.7698	62.7565	188.5888	0.6374	62.9138	0.5508	63.4646	16.7988	0.5148	17.3137		64,385.3897	64,385.3897	2.2162		64,440.7945
Total	**73.5776**	**74.3991**	**268.9393**	**0.7081**	**62.9138**	**1.8054**	**64.7192**	**16.7988**	**1.7694**	**18.5682**	**0.0000**	**77,892.1895**	**77,892.1895**	**2.6000**	**0.2452**	**78,030.2566**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	55.5818	0.8473	73.5542	3.8900e-003		0.4075	0.4075		0.4075	0.4075	0.0000	132.5242	132.5242	0.1274	0.0000	135.7099
Energy	1.2260	10.7954	6.7964	0.0669		0.8470	0.8470		0.8470	0.8470		13,374.2756	13,374.2756	0.2563	0.2452	13,453.7522
Mobile	16.7698	62.7565	188.5888	0.6374	62.9138	0.5508	63.4646	16.7988	0.5148	17.3137		64,385.3897	64,385.3897	2.2162		64,440.7945
Total	**73.5776**	**74.3991**	**268.9393**	**0.7081**	**62.9138**	**1.8054**	**64.7192**	**16.7988**	**1.7694**	**18.5682**	**0.0000**	**77,892.1895**	**77,892.1895**	**2.6000**	**0.2452**	**78,030.2566**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	9/20/2020	10/19/2020	5	400	
2	Site Preparation	Site Preparation	10/20/2020	1/20/2021	5	240	
3	Grading	Grading	1/21/2021	7/21/2021	5	620	
4	Paving	Paving	4/24/2021	7/21/2023	5	440	
5	Building Construction	Building Construction	7/22/2021	7/21/2023	5	6200	
6	Architectural Coating	Architectural Coating	10/22/2021	7/21/2023	5	440	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 1550

Acres of Paving: 0

Residential Indoor: 2,888,055; Residential Outdoor: 962,685; Non-Residential Indoor: 1,125,000; Non-Residential Outdoor: 375,000; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	716.00	218.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	143.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419		3,747.7049	3,747.7049	1.0580		3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**		**1.6587**	**1.6587**		**1.5419**	**1.5419**		**3,747.7049**	**3,747.7049**	**1.0580**		**3,774.1536**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

3.2 Demolition - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0642	0.0535	0.5325	1.3900e-003	0.1483	9.5000e-004	0.1492	0.0393	8.8000e-004	0.0402		138.5831	138.5831	4.5200e-003		138.6960
Total	**0.0642**	**0.0535**	**0.5325**	**1.3900e-003**	**0.1483**	**9.5000e-004**	**0.1492**	**0.0393**	**8.8000e-004**	**0.0402**		**138.5831**	**138.5831**	**4.5200e-003**		**138.6960**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	3.3121	33.2010	21.7532	0.0388		1.6587	1.6587		1.5419	1.5419	0.0000	3,747.7049	3,747.7049	1.0580		3,774.1536
Total	**3.3121**	**33.2010**	**21.7532**	**0.0388**		**1.6587**	**1.6587**		**1.5419**	**1.5419**	**0.0000**	**3,747.7049**	**3,747.7049**	**1.0580**		**3,774.1536**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

3.2 Demolition - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0642	0.0535	0.5325	1.3900e-003	0.1483	9.5000e-004	0.1492	0.0393	8.8000e-004	0.0402		138.5831	138.5831	4.5200e-003		138.6960
Total	**0.0642**	**0.0535**	**0.5325**	**1.3900e-003**	**0.1483**	**9.5000e-004**	**0.1492**	**0.0393**	**8.8000e-004**	**0.0402**		**138.5831**	**138.5831**	**4.5200e-003**		**138.6960**

3.3 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216		3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0663**	**2.1974**	**20.2637**	**9.9307**	**2.0216**	**11.9523**		**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

3.3 Site Preparation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0770	0.0642	0.6389	1.6700e-003	0.1780	1.1400e-003	0.1791	0.0472	1.0500e-003	0.0483		166.2997	166.2997	5.4200e-003		166.4352
Total	**0.0770**	**0.0642**	**0.6389**	**1.6700e-003**	**0.1780**	**1.1400e-003**	**0.1791**	**0.0472**	**1.0500e-003**	**0.0483**		**166.2997**	**166.2997**	**5.4200e-003**		**166.4352**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216	0.0000	3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0663**	**2.1974**	**20.2637**	**9.9307**	**2.0216**	**11.9523**	**0.0000**	**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

3.3 Site Preparation - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0770	0.0642	0.6389	1.6700e-003	0.1780	1.1400e-003	0.1791	0.0472	1.0500e-003	0.0483		166.2997	166.2997	5.4200e-003		166.4352
Total	**0.0770**	**0.0642**	**0.6389**	**1.6700e-003**	**0.1780**	**1.1400e-003**	**0.1791**	**0.0472**	**1.0500e-003**	**0.0483**		**166.2997**	**166.2997**	**5.4200e-003**		**166.4352**

3.3 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	3.8882	40.4971	21.1543	0.0380		2.0445	2.0445		1.8809	1.8809		3,685.6569	3,685.6569	1.1920		3,715.4573
Total	**3.8882**	**40.4971**	**21.1543**	**0.0380**	**18.0663**	**2.0445**	**20.1107**	**9.9307**	**1.8809**	**11.8116**		**3,685.6569**	**3,685.6569**	**1.1920**		**3,715.4573**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

3.3 Site Preparation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0717	0.0574	0.5802	1.6100e-003	0.1780	1.1000e-003	0.1791	0.0472	1.0200e-003	0.0482		160.6324	160.6324	4.8200e-003		160.7530
Total	**0.0717**	**0.0574**	**0.5802**	**1.6100e-003**	**0.1780**	**1.1000e-003**	**0.1791**	**0.0472**	**1.0200e-003**	**0.0482**		**160.6324**	**160.6324**	**4.8200e-003**		**160.7530**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	3.8882	40.4971	21.1543	0.0380		2.0445	2.0445		1.8809	1.8809	0.0000	3,685.6569	3,685.6569	1.1920		3,715.4573
Total	**3.8882**	**40.4971**	**21.1543**	**0.0380**	**18.0663**	**2.0445**	**20.1107**	**9.9307**	**1.8809**	**11.8116**	**0.0000**	**3,685.6569**	**3,685.6569**	**1.1920**		**3,715.4573**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

3.3 Site Preparation - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0717	0.0574	0.5802	1.6100e-003	0.1780	1.1000e-003	0.1791	0.0472	1.0200e-003	0.0482		160.6324	160.6324	4.8200e-003		160.7530
Total	**0.0717**	**0.0574**	**0.5802**	**1.6100e-003**	**0.1780**	**1.1000e-003**	**0.1791**	**0.0472**	**1.0200e-003**	**0.0482**		**160.6324**	**160.6324**	**4.8200e-003**		**160.7530**

3.4 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.1912	46.3998	30.8785	0.0620		1.9853	1.9853		1.8265	1.8265		6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**4.1912**	**46.3998**	**30.8785**	**0.0620**	**8.6733**	**1.9853**	**10.6587**	**3.5965**	**1.8265**	**5.4230**		**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

3.4 Grading - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0797	0.0638	0.6447	1.7900e-003	0.1977	1.2200e-003	0.1990	0.0524	1.1300e-003	0.0536		178.4805	178.4805	5.3600e-003		178.6144
Total	**0.0797**	**0.0638**	**0.6447**	**1.7900e-003**	**0.1977**	**1.2200e-003**	**0.1990**	**0.0524**	**1.1300e-003**	**0.0536**		**178.4805**	**178.4805**	**5.3600e-003**		**178.6144**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.1912	46.3998	30.8785	0.0620		1.9853	1.9853		1.8265	1.8265	0.0000	6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**4.1912**	**46.3998**	**30.8785**	**0.0620**	**8.6733**	**1.9853**	**10.6587**	**3.5965**	**1.8265**	**5.4230**	**0.0000**	**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

3.4 Grading - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0797	0.0638	0.6447	1.7900e-003	0.1977	1.2200e-003	0.1990	0.0524	1.1300e-003	0.0536		178.4805	178.4805	5.3600e-003		178.6144
Total	**0.0797**	**0.0638**	**0.6447**	**1.7900e-003**	**0.1977**	**1.2200e-003**	**0.1990**	**0.0524**	**1.1300e-003**	**0.0536**		**178.4805**	**178.4805**	**5.3600e-003**		**178.6144**

3.5 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2556	12.9191	14.6532	0.0228		0.6777	0.6777		0.6235	0.6235		2,207.2109	2,207.2109	0.7139		2,225.0573
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2556**	**12.9191**	**14.6532**	**0.0228**		**0.6777**	**0.6777**		**0.6235**	**0.6235**		**2,207.2109**	**2,207.2109**	**0.7139**		**2,225.0573**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

3.5 Paving - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0598	0.0479	0.4835	1.3400e-003	0.1483	9.2000e-004	0.1492	0.0393	8.5000e-004	0.0402		133.8603	133.8603	4.0200e-003		133.9608
Total	**0.0598**	**0.0479**	**0.4835**	**1.3400e-003**	**0.1483**	**9.2000e-004**	**0.1492**	**0.0393**	**8.5000e-004**	**0.0402**		**133.8603**	**133.8603**	**4.0200e-003**		**133.9608**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2556	12.9191	14.6532	0.0228		0.6777	0.6777		0.6235	0.6235	0.0000	2,207.2109	2,207.2109	0.7139		2,225.0573
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2556**	**12.9191**	**14.6532**	**0.0228**		**0.6777**	**0.6777**		**0.6235**	**0.6235**	**0.0000**	**2,207.2109**	**2,207.2109**	**0.7139**		**2,225.0573**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

3.5 Paving - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0598	0.0479	0.4835	1.3400e-003	0.1483	9.2000e-004	0.1492	0.0393	8.5000e-004	0.0402		133.8603	133.8603	4.0200e-003		133.9608
Total	**0.0598**	**0.0479**	**0.4835**	**1.3400e-003**	**0.1483**	**9.2000e-004**	**0.1492**	**0.0393**	**8.5000e-004**	**0.0402**		**133.8603**	**133.8603**	**4.0200e-003**		**133.9608**

3.5 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1028	11.1249	14.5805	0.0228		0.5679	0.5679		0.5225	0.5225		2,207.6603	2,207.6603	0.7140		2,225.5104
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1028**	**11.1249**	**14.5805**	**0.0228**		**0.5679**	**0.5679**		**0.5225**	**0.5225**		**2,207.6603**	**2,207.6603**	**0.7140**		**2,225.5104**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

3.5 Paving - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0561	0.0430	0.4437	1.3000e-003	0.1483	8.9000e-004	0.1492	0.0393	8.2000e-004	0.0402		129.0740	129.0740	3.6100e-003		129.1642
Total	**0.0561**	**0.0430**	**0.4437**	**1.3000e-003**	**0.1483**	**8.9000e-004**	**0.1492**	**0.0393**	**8.2000e-004**	**0.0402**		**129.0740**	**129.0740**	**3.6100e-003**		**129.1642**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.1028	11.1249	14.5805	0.0228		0.5679	0.5679		0.5225	0.5225	0.0000	2,207.6603	2,207.6603	0.7140		2,225.5104
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.1028**	**11.1249**	**14.5805**	**0.0228**		**0.5679**	**0.5679**		**0.5225**	**0.5225**	**0.0000**	**2,207.6603**	**2,207.6603**	**0.7140**		**2,225.5104**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

3.5 Paving - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0561	0.0430	0.4437	1.3000e-003	0.1483	8.9000e-004	0.1492	0.0393	8.2000e-004	0.0402		129.0740	129.0740	3.6100e-003		129.1642
Total	**0.0561**	**0.0430**	**0.4437**	**1.3000e-003**	**0.1483**	**8.9000e-004**	**0.1492**	**0.0393**	**8.2000e-004**	**0.0402**		**129.0740**	**129.0740**	**3.6100e-003**		**129.1642**

3.5 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0327	10.1917	14.5842	0.0228		0.5102	0.5102		0.4694	0.4694		2,207.5841	2,207.5841	0.7140		2,225.4336
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0327**	**10.1917**	**14.5842**	**0.0228**		**0.5102**	**0.5102**		**0.4694**	**0.4694**		**2,207.5841**	**2,207.5841**	**0.7140**		**2,225.4336**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

3.5 Paving - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0526	0.0387	0.4060	1.2500e-003	0.1483	8.7000e-004	0.1492	0.0393	8.0000e-004	0.0401		124.2316	124.2316	3.2200e-003		124.3122
Total	**0.0526**	**0.0387**	**0.4060**	**1.2500e-003**	**0.1483**	**8.7000e-004**	**0.1492**	**0.0393**	**8.0000e-004**	**0.0401**		**124.2316**	**124.2316**	**3.2200e-003**		**124.3122**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0327	10.1917	14.5842	0.0228		0.5102	0.5102		0.4694	0.4694	0.0000	2,207.5841	2,207.5841	0.7140		2,225.4336
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.0327**	**10.1917**	**14.5842**	**0.0228**		**0.5102**	**0.5102**		**0.4694**	**0.4694**	**0.0000**	**2,207.5841**	**2,207.5841**	**0.7140**		**2,225.4336**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

3.5 Paving - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0526	0.0387	0.4060	1.2500e-003	0.1483	8.7000e-004	0.1492	0.0393	8.0000e-004	0.0401		124.2316	124.2316	3.2200e-003		124.3122
Total	**0.0526**	**0.0387**	**0.4060**	**1.2500e-003**	**0.1483**	**8.7000e-004**	**0.1492**	**0.0393**	**8.0000e-004**	**0.0401**		**124.2316**	**124.2316**	**3.2200e-003**		**124.3122**

3.6 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013		2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**		**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

3.6 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.6461	20.6057	5.6858	0.0437	1.0121	0.0578	1.0699	0.2915	0.0553	0.3468		4,655.5300	4,655.5300	0.2623		4,662.0879
Worker	2.8522	2.2847	23.0800	0.0642	7.0785	0.0438	7.1223	1.8774	0.0404	1.9178		6,389.6001	6,389.6001	0.1919		6,394.3971
Total	**3.4983**	**22.8904**	**28.7658**	**0.1078**	**8.0906**	**0.1016**	**8.1922**	**2.1689**	**0.0957**	**2.2646**		**11,045.1301**	**11,045.1301**	**0.4542**		**11,056.4850**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013	0.0000	2,553.3639	2,553.3639	0.6160		2,568.7643
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**	**0.0000**	**2,553.3639**	**2,553.3639**	**0.6160**		**2,568.7643**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

3.6 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.6461	20.6057	5.6858	0.0437	1.0121	0.0578	1.0699	0.2915	0.0553	0.3468		4,655.5300	4,655.5300	0.2623		4,662.0879
Worker	2.8522	2.2847	23.0800	0.0642	7.0785	0.0438	7.1223	1.8774	0.0404	1.9178		6,389.6001	6,389.6001	0.1919		6,394.3971
Total	**3.4983**	**22.8904**	**28.7658**	**0.1078**	**8.0906**	**0.1016**	**8.1922**	**2.1689**	**0.0957**	**2.2646**		**11,045.1301**	**11,045.1301**	**0.4542**		**11,056.4850**

3.6 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612		2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**		**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

3.6 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5974	19.5955	5.2437	0.0434	1.0123	0.0508	1.0631	0.2916	0.0486	0.3401		4,624.7485	4,624.7485	0.2591		4,631.2247
Worker	2.6756	2.0546	21.1789	0.0618	7.0785	0.0426	7.1211	1.8774	0.0393	1.9166		6,161.1333	6,161.1333	0.1722		6,165.4371
Total	**3.2730**	**21.6501**	**26.4226**	**0.1052**	**8.0908**	**0.0934**	**8.1842**	**2.1689**	**0.0878**	**2.2568**		**10,785.8818**	**10,785.8818**	**0.4312**		**10,796.6618**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7062	15.6156	16.3634	0.0269		0.8090	0.8090		0.7612	0.7612	0.0000	2,554.3336	2,554.3336	0.6120		2,569.6322
Total	**1.7062**	**15.6156**	**16.3634**	**0.0269**		**0.8090**	**0.8090**		**0.7612**	**0.7612**	**0.0000**	**2,554.3336**	**2,554.3336**	**0.6120**		**2,569.6322**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

3.6 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5974	19.5955	5.2437	0.0434	1.0123	0.0508	1.0631	0.2916	0.0486	0.3401		4,624.7485	4,624.7485	0.2591		4,631.2247
Worker	2.6756	2.0546	21.1789	0.0618	7.0785	0.0426	7.1211	1.8774	0.0393	1.9166		6,161.1333	6,161.1333	0.1722		6,165.4371
Total	**3.2730**	**21.6501**	**26.4226**	**0.1052**	**8.0908**	**0.0934**	**8.1842**	**2.1689**	**0.0878**	**2.2568**		**10,785.8818**	**10,785.8818**	**0.4312**		**10,796.6618**

3.6 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584		2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**		**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

3.6 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4558	16.1828	4.6286	0.0426	1.0125	0.0236	1.0361	0.2917	0.0226	0.3142		4,549.8704	4,549.8704	0.2309		4,555.6438
Worker	2.5112	1.8472	19.3796	0.0595	7.0785	0.0415	7.1200	1.8774	0.0383	1.9156		5,929.9860	5,929.9860	0.1539		5,933.8345
Total	**2.9670**	**18.0300**	**24.0081**	**0.1021**	**8.0910**	**0.0651**	**8.1561**	**2.1690**	**0.0608**	**2.2298**		**10,479.8563**	**10,479.8563**	**0.3849**		**10,489.4783**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.5728	14.3849	16.2440	0.0269		0.6997	0.6997		0.6584	0.6584	0.0000	2,555.2099	2,555.2099	0.6079		2,570.4061
Total	**1.5728**	**14.3849**	**16.2440**	**0.0269**		**0.6997**	**0.6997**		**0.6584**	**0.6584**	**0.0000**	**2,555.2099**	**2,555.2099**	**0.6079**		**2,570.4061**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

3.6 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4558	16.1828	4.6286	0.0426	1.0125	0.0236	1.0361	0.2917	0.0226	0.3142		4,549.8704	4,549.8704	0.2309		4,555.6438
Worker	2.5112	1.8472	19.3796	0.0595	7.0785	0.0415	7.1200	1.8774	0.0383	1.9156		5,929.9860	5,929.9860	0.1539		5,933.8345
Total	**2.9670**	**18.0300**	**24.0081**	**0.1021**	**8.0910**	**0.0651**	**8.1561**	**2.1690**	**0.0608**	**2.2298**		**10,479.8563**	**10,479.8563**	**0.3849**		**10,489.4783**

3.7 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	140.9130					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941		281.4481	281.4481	0.0193		281.9309
Total	**141.1319**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**		**281.4481**	**281.4481**	**0.0193**		**281.9309**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

3.7 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.5697	0.4563	4.6096	0.0128	1.4137	8.7500e-003	1.4225	0.3750	8.0800e-003	0.3830		1,276.1352	1,276.1352	0.0383		1,277.0933
Total	**0.5697**	**0.4563**	**4.6096**	**0.0128**	**1.4137**	**8.7500e-003**	**1.4225**	**0.3750**	**8.0800e-003**	**0.3830**		**1,276.1352**	**1,276.1352**	**0.0383**		**1,277.0933**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	140.9130					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941	0.0000	281.4481	281.4481	0.0193		281.9309
Total	**141.1319**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**	**0.0000**	**281.4481**	**281.4481**	**0.0193**		**281.9309**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

3.7 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.5697	0.4563	4.6096	0.0128	1.4137	8.7500e-003	1.4225	0.3750	8.0800e-003	0.3830		1,276.1352	1,276.1352	0.0383		1,277.0933
Total	**0.5697**	**0.4563**	**4.6096**	**0.0128**	**1.4137**	**8.7500e-003**	**1.4225**	**0.3750**	**8.0800e-003**	**0.3830**		**1,276.1352**	**1,276.1352**	**0.0383**		**1,277.0933**

3.7 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	140.9130					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817		281.4481	281.4481	0.0183		281.9062
Total	**141.1175**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.9062**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

3.7 Architectural Coating - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.5344	0.4104	4.2299	0.0124	1.4137	8.5100e-003	1.4222	0.3750	7.8400e-003	0.3828		1,230.5057	1,230.5057	0.0344		1,231.3652
Total	**0.5344**	**0.4104**	**4.2299**	**0.0124**	**1.4137**	**8.5100e-003**	**1.4222**	**0.3750**	**7.8400e-003**	**0.3828**		**1,230.5057**	**1,230.5057**	**0.0344**		**1,231.3652**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	140.9130					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817	0.0000	281.4481	281.4481	0.0183		281.9062
Total	**141.1175**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.9062**

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3.7 Architectural Coating - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.5344	0.4104	4.2299	0.0124	1.4137	8.5100e-003	1.4222	0.3750	7.8400e-003	0.3828		1,230.5057	1,230.5057	0.0344		1,231.3652
Total	**0.5344**	**0.4104**	**4.2299**	**0.0124**	**1.4137**	**8.5100e-003**	**1.4222**	**0.3750**	**7.8400e-003**	**0.3828**		**1,230.5057**	**1,230.5057**	**0.0344**		**1,231.3652**

3.7 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	140.9130					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708		281.4481	281.4481	0.0168		281.8690
Total	**141.1046**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**		**281.4481**	**281.4481**	**0.0168**		**281.8690**

OCSP Alternative 1 - 2024 - San Luis Obispo County APCD Air District, Summer

3.7 Architectural Coating - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.5015	0.3689	3.8705	0.0119	1.4137	8.2900e-003	1.4220	0.3750	7.6400e-003	0.3826		1,184.3408	1,184.3408	0.0307		1,185.1094
Total	**0.5015**	**0.3689**	**3.8705**	**0.0119**	**1.4137**	**8.2900e-003**	**1.4220**	**0.3750**	**7.6400e-003**	**0.3826**		**1,184.3408**	**1,184.3408**	**0.0307**		**1,185.1094**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	140.9130					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.1917	1.3030	1.8111	2.9700e-003		0.0708	0.0708		0.0708	0.0708	0.0000	281.4481	281.4481	0.0168		281.8690
Total	**141.1046**	**1.3030**	**1.8111**	**2.9700e-003**		**0.0708**	**0.0708**		**0.0708**	**0.0708**	**0.0000**	**281.4481**	**281.4481**	**0.0168**		**281.8690**

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3.7 Architectural Coating - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.5015	0.3689	3.8705	0.0119	1.4137	8.2900e-003	1.4220	0.3750	7.6400e-003	0.3826		1,184.3408	1,184.3408	0.0307		1,185.1094
Total	**0.5015**	**0.3689**	**3.8705**	**0.0119**	**1.4137**	**8.2900e-003**	**1.4220**	**0.3750**	**7.6400e-003**	**0.3826**		**1,184.3408**	**1,184.3408**	**0.0307**		**1,185.1094**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	16.7698	62.7565	188.5888	0.6374	62.9138	0.5508	63.4646	16.7988	0.5148	17.3137		64,385.3897	64,385.3897	2.2162		64,440.7945
Unmitigated	16.7698	62.7565	188.5888	0.6374	62.9138	0.5508	63.4646	16.7988	0.5148	17.3137		64,385.3897	64,385.3897	2.2162		64,440.7945

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,156.62	1,589.52	1347.54	3,166,112	3,166,112
General Light Industry	2,677.50	990.00	510.00	7,019,141	7,019,141
Single Family Housing	5,057.64	6,629.79	5766.78	13,682,571	13,682,571
Total	8,891.76	9,209.31	7,624.32	23,867,824	23,867,824

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
General Light Industry	13.00	5.00	5.00	59.00	28.00	13.00	92	5	3
Single Family Housing	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3

4.4 Fleet Mix

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Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
General Light Industry	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192
Single Family Housing	0.588806	0.027737	0.198305	0.114471	0.022249	0.005748	0.012759	0.019721	0.002316	0.001163	0.004776	0.000758	0.001192

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	1.2260	10.7954	6.7964	0.0669		0.8470	0.8470		0.8470	0.8470		13,374.2756	13,374.2756	0.2563	0.2452	13,453.7522
NaturalGas Unmitigated	1.2260	10.7954	6.7964	0.0669		0.8470	0.8470		0.8470	0.8470		13,374.2756	13,374.2756	0.2563	0.2452	13,453.7522

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5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	6203.14	0.0669	0.5717	0.2433	3.6500e-003		0.0462	0.0462		0.0462	0.0462		729.7807	729.7807	0.0140	0.0134	734.1175
General Light Industry	54205.5	0.5846	5.3143	4.4640	0.0319		0.4039	0.4039		0.4039	0.4039		6,377.1152	6,377.1152	0.1222	0.1169	6,415.0112
Single Family Housing	53272.7	0.5745	4.9095	2.0891	0.0313		0.3969	0.3969		0.3969	0.3969		6,267.3796	6,267.3796	0.1201	0.1149	6,304.6235
Total		**1.2260**	**10.7954**	**6.7964**	**0.0669**		**0.8470**	**0.8470**		**0.8470**	**0.8470**		**13,374.2756**	**13,374.2756**	**0.2563**	**0.2452**	**13,453.7522**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Low Rise	6.20314	0.0669	0.5717	0.2433	3.6500e-003		0.0462	0.0462		0.0462	0.0462		729.7807	729.7807	0.0140	0.0134	734.1175
General Light Industry	54.2055	0.5846	5.3143	4.4640	0.0319		0.4039	0.4039		0.4039	0.4039		6,377.1152	6,377.1152	0.1222	0.1169	6,415.0112
Single Family Housing	53.2727	0.5745	4.9095	2.0891	0.0313		0.3969	0.3969		0.3969	0.3969		6,267.3796	6,267.3796	0.1201	0.1149	6,304.6235
Total		**1.2260**	**10.7954**	**6.7964**	**0.0669**		**0.8470**	**0.8470**		**0.8470**	**0.8470**		**13,374.2756**	**13,374.2756**	**0.2563**	**0.2452**	**13,453.7522**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	55.5818	0.8473	73.5542	3.8900e-003		0.4075	0.4075		0.4075	0.4075	0.0000	132.5242	132.5242	0.1274	0.0000	135.7099
Unmitigated	55.5818	0.8473	73.5542	3.8900e-003		0.4075	0.4075		0.4075	0.4075	0.0000	132.5242	132.5242	0.1274	0.0000	135.7099

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6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	6.7947					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	46.5707					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.2164	0.8473	73.5542	3.8900e-003		0.4075	0.4075		0.4075	0.4075		132.5242	132.5242	0.1274		135.7099
Total	**55.5818**	**0.8473**	**73.5542**	**3.8900e-003**		**0.4075**	**0.4075**		**0.4075**	**0.4075**	**0.0000**	**132.5242**	**132.5242**	**0.1274**	**0.0000**	**135.7099**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	6.7947					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	46.5707					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.2164	0.8473	73.5542	3.8900e-003		0.4075	0.4075		0.4075	0.4075		132.5242	132.5242	0.1274		135.7099
Total	**55.5818**	**0.8473**	**73.5542**	**3.8900e-003**		**0.4075**	**0.4075**		**0.4075**	**0.4075**	**0.0000**	**132.5242**	**132.5242**	**0.1274**	**0.0000**	**135.7099**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

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Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

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1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	750.00	1000sqft	86.00	750,000.00	0
Apartments Low Rise	222.00	Dwelling Unit	13.88	222,000.00	635
Single Family Housing	669.00	Dwelling Unit	257.82	1,204,200.00	1913

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	3.2	**Precipitation Freq (Days)**	44
Climate Zone	4			**Operational Year**	2030
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	298.3	**CH4 Intensity (lb/MWhr)**	0.013	**N2O Intensity (lb/MWhr)**	0.003

1.3 User Entered Comments & Non-Default Data

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Project Characteristics - Adjusted to match Ambient AQ GHG Study.

Land Use - Adjusted to match Plan Area.

Construction Phase - Operational emissions only.

Vehicle Trips - SFR and MFR adjusted to match Ambient AQ GHG Study and industrial to match traffic estimates for Alt 1.

Area Coating - Adjusted to match Ambient AQ GHG study.

Energy Use -

Water And Wastewater - Adjusted to match Ambient AQ GHG Study.

Waste Mitigation - Adjusted to match Ambient's AQ GHG Study.

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Table Name	Column Name	Default Value	New Value
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	100
tblAreaCoating	Area_EF_Nonresidential_Interior	250	100
tblAreaCoating	Area_EF_Residential_Exterior	250	100
tblAreaCoating	Area_EF_Residential_Interior	250	100
tblLandUse	LotAcreage	17.22	86.00
tblLandUse	LotAcreage	217.21	257.82
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.013
tblProjectCharacteristics	CO2IntensityFactor	641.35	298.3
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.003
tblVehicleTrips	WD_TR	6.59	5.21
tblVehicleTrips	WD_TR	6.97	3.57
tblVehicleTrips	WD_TR	9.52	7.56
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	AerobicPercent	87.46	97.79
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00
tblWater	SepticTankPercent	10.33	0.00

2.0 Emissions Summary

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2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.1456	1.4752	0.8203	1.4700e-003	0.4849	0.0757	0.5606	0.2648	0.0698	0.3346	0.0000	129.4002	129.4002	0.0389	0.0000	130.3726
2021	4.3585	6.9065	6.3517	0.0147	1.2132	0.2693	1.4825	0.4436	0.2492	0.6928	0.0000	1,319.5549	1,319.5549	0.2393	0.0000	1,325.5378
2022	19.2251	6.5857	8.2329	0.0219	1.2226	0.2032	1.4258	0.3279	0.1902	0.5181	0.0000	1,985.3842	1,985.3842	0.2141	0.0000	1,990.7363
2023	10.6808	3.2369	4.3763	0.0119	0.6819	0.0983	0.7801	0.1829	0.0920	0.2748	0.0000	1,084.5245	1,084.5245	0.1156	0.0000	1,087.4156
Maximum	**19.2251**	**6.9065**	**8.2329**	**0.0219**	**1.2226**	**0.2693**	**1.4825**	**0.4436**	**0.2492**	**0.6928**	**0.0000**	**1,985.3842**	**1,985.3842**	**0.2393**	**0.0000**	**1,990.7363**

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2.1 Overall Construction

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.1456	1.4752	0.8203	1.4700e-003	0.4849	0.0757	0.5606	0.2648	0.0698	0.3346	0.0000	129.4000	129.4000	0.0389	0.0000	130.3725
2021	4.3585	6.9065	6.3517	0.0147	1.2132	0.2693	1.4825	0.4436	0.2492	0.6928	0.0000	1,319.5540	1,319.5540	0.2393	0.0000	1,325.5369
2022	19.2251	6.5857	8.2329	0.0219	1.2226	0.2032	1.4258	0.3279	0.1902	0.5181	0.0000	1,985.3835	1,985.3835	0.2141	0.0000	1,990.7356
2023	10.6808	3.2369	4.3763	0.0119	0.6819	0.0983	0.7801	0.1829	0.0920	0.2748	0.0000	1,084.5241	1,084.5241	0.1156	0.0000	1,087.4152
Maximum	**19.2251**	**6.9065**	**8.2329**	**0.0219**	**1.2226**	**0.2693**	**1.4825**	**0.4436**	**0.2492**	**0.6928**	**0.0000**	**1,985.3835**	**1,985.3835**	**0.2393**	**0.0000**	**1,990.7356**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
5	**9-20-2020**	**12-19-2020**	1.4090	1.4090
6	**12-20-2020**	**3-19-2021**	1.5694	1.5694
7	**3-20-2021**	**6-19-2021**	1.9578	1.9578
8	**6-20-2021**	**9-19-2021**	2.0288	2.0288
9	**9-20-2021**	**12-19-2021**	4.9989	4.9989
10	**12-20-2021**	**3-19-2022**	6.4129	6.4129
11	**3-20-2022**	**6-19-2022**	6.5101	6.5101
12	**6-20-2022**	**9-19-2022**	6.5071	6.5071

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13	**9-20-2022**	**12-19-2022**	6.4566	6.4566
14	**12-20-2022**	**3-19-2023**	6.2062	6.2062
15	**3-20-2023**	**6-19-2023**	6.2966	6.2966
16	**6-20-2023**	**9-19-2023**	2.1891	2.1891
		Highest	6.5101	6.5101

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	10.1022	0.1396	12.1094	6.4000e-004		0.0673	0.0673		0.0673	0.0673	0.0000	19.8370	19.8370	0.0189	0.0000	20.3104
Energy	0.2237	1.9702	1.2403	0.0122		0.1546	0.1546		0.1546	0.1546	0.0000	3,915.4746	3,915.4746	0.1166	0.0577	3,935.5849
Mobile	1.6051	6.7800	18.7479	0.0753	8.9417	0.0542	8.9958	2.3905	0.0504	2.4409	0.0000	6,922.8328	6,922.8328	0.2187	0.0000	6,928.3001
Waste						0.0000	0.0000		0.0000	0.0000	368.7229	0.0000	368.7229	21.7909	0.0000	913.4955
Water						0.0000	0.0000		0.0000	0.0000	81.9014	186.8157	268.7172	2.1492	0.1800	376.0825
Total	**11.9310**	**8.8897**	**32.0976**	**0.0881**	**8.9417**	**0.2760**	**9.2177**	**2.3905**	**0.2723**	**2.6628**	**450.6244**	**11,044.9601**	**11,495.5845**	**24.2943**	**0.2377**	**12,173.7733**

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2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	10.1022	0.1396	12.1094	6.4000e-004		0.0673	0.0673		0.0673	0.0673	0.0000	19.8370	19.8370	0.0189	0.0000	20.3104
Energy	0.2237	1.9702	1.2403	0.0122		0.1546	0.1546		0.1546	0.1546	0.0000	3,915.4746	3,915.4746	0.1166	0.0577	3,935.5849
Mobile	1.6051	6.7800	18.7479	0.0753	8.9417	0.0542	8.9958	2.3905	0.0504	2.4409	0.0000	6,922.8328	6,922.8328	0.2187	0.0000	6,928.3001
Waste						0.0000	0.0000		0.0000	0.0000	154.8636	0.0000	154.8636	9.1522	0.0000	383.6681
Water						0.0000	0.0000		0.0000	0.0000	81.9014	186.8157	268.7172	2.1492	0.1800	376.0825
Total	**11.9310**	**8.8897**	**32.0976**	**0.0881**	**8.9417**	**0.2760**	**9.2177**	**2.3905**	**0.2723**	**2.6628**	**236.7651**	**11,044.9601**	**11,281.7252**	**11.6556**	**0.2377**	**11,643.9459**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**47.46**	**0.00**	**1.86**	**52.02**	**0.00**	**4.35**

3.0 Construction Detail

Construction Phase

OCSP Alternative 1 - 2030 - San Luis Obispo County APCD Air District, Annual

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	9/20/2020	10/19/2020	5	400	
2	Site Preparation	Site Preparation	10/20/2020	1/20/2021	5	240	
3	Grading	Grading	1/21/2021	7/21/2021	5	620	
4	Paving	Paving	4/24/2021	7/21/2023	5	440	
5	Building Construction	Building Construction	7/22/2021	7/21/2023	5	6200	
6	Architectural Coating	Architectural Coating	10/22/2021	7/21/2023	5	440	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 1550

Acres of Paving: 0

Residential Indoor: 2,888,055; Residential Outdoor: 962,685; Non-Residential Indoor: 1,125,000; Non-Residential Outdoor: 375,000; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

OCSP Alternative 1 - 2030 - San Luis Obispo County APCD Air District, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

OCSP Alternative 1 - 2030 - San Luis Obispo County APCD Air District, Annual

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	716.00	218.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	143.00	0.00	0.00	13.00	5.00	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0348	0.3486	0.2284	4.1000e-004		0.0174	0.0174		0.0162	0.0162	0.0000	35.6985	35.6985	0.0101	0.0000	35.9505
Total	**0.0348**	**0.3486**	**0.2284**	**4.1000e-004**		**0.0174**	**0.0174**		**0.0162**	**0.0162**	**0.0000**	**35.6985**	**35.6985**	**0.0101**	**0.0000**	**35.9505**

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3.2 Demolition - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.9000e-004	6.3000e-004	5.4200e-003	1.0000e-005	1.5200e-003	1.0000e-005	1.5300e-003	4.0000e-004	1.0000e-005	4.1000e-004	0.0000	1.2685	1.2685	4.0000e-005	0.0000	1.2696
Total	**6.9000e-004**	**6.3000e-004**	**5.4200e-003**	**1.0000e-005**	**1.5200e-003**	**1.0000e-005**	**1.5300e-003**	**4.0000e-004**	**1.0000e-005**	**4.1000e-004**	**0.0000**	**1.2685**	**1.2685**	**4.0000e-005**	**0.0000**	**1.2696**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0348	0.3486	0.2284	4.1000e-004		0.0174	0.0174		0.0162	0.0162	0.0000	35.6985	35.6985	0.0101	0.0000	35.9504
Total	**0.0348**	**0.3486**	**0.2284**	**4.1000e-004**		**0.0174**	**0.0174**		**0.0162**	**0.0162**	**0.0000**	**35.6985**	**35.6985**	**0.0101**	**0.0000**	**35.9504**

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3.2 Demolition - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.9000e-004	6.3000e-004	5.4200e-003	1.0000e-005	1.5200e-003	1.0000e-005	1.5300e-003	4.0000e-004	1.0000e-005	4.1000e-004	0.0000	1.2685	1.2685	4.0000e-005	0.0000	1.2696
Total	**6.9000e-004**	**6.3000e-004**	**5.4200e-003**	**1.0000e-005**	**1.5200e-003**	**1.0000e-005**	**1.5300e-003**	**4.0000e-004**	**1.0000e-005**	**4.1000e-004**	**0.0000**	**1.2685**	**1.2685**	**4.0000e-005**	**0.0000**	**1.2696**

3.3 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4788	0.0000	0.4788	0.2632	0.0000	0.2632	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1080	1.1241	0.5701	1.0100e-003		0.0582	0.0582		0.0536	0.0536	0.0000	88.5913	88.5913	0.0287	0.0000	89.3076
Total	**0.1080**	**1.1241**	**0.5701**	**1.0100e-003**	**0.4788**	**0.0582**	**0.5370**	**0.2632**	**0.0536**	**0.3167**	**0.0000**	**88.5913**	**88.5913**	**0.0287**	**0.0000**	**89.3076**

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3.3 Site Preparation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0900e-003	1.9000e-003	0.0164	4.0000e-005	4.5900e-003	3.0000e-005	4.6200e-003	1.2200e-003	3.0000e-005	1.2500e-003	0.0000	3.8418	3.8418	1.3000e-004	0.0000	3.8450
Total	**2.0900e-003**	**1.9000e-003**	**0.0164**	**4.0000e-005**	**4.5900e-003**	**3.0000e-005**	**4.6200e-003**	**1.2200e-003**	**3.0000e-005**	**1.2500e-003**	**0.0000**	**3.8418**	**3.8418**	**1.3000e-004**	**0.0000**	**3.8450**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.4788	0.0000	0.4788	0.2632	0.0000	0.2632	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1080	1.1241	0.5701	1.0100e-003		0.0582	0.0582		0.0536	0.0536	0.0000	88.5912	88.5912	0.0287	0.0000	89.3075
Total	**0.1080**	**1.1241**	**0.5701**	**1.0100e-003**	**0.4788**	**0.0582**	**0.5370**	**0.2632**	**0.0536**	**0.3167**	**0.0000**	**88.5912**	**88.5912**	**0.0287**	**0.0000**	**89.3075**

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3.3 Site Preparation - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0900e-003	1.9000e-003	0.0164	4.0000e-005	4.5900e-003	3.0000e-005	4.6200e-003	1.2200e-003	3.0000e-005	1.2500e-003	0.0000	3.8418	3.8418	1.3000e-004	0.0000	3.8450
Total	**2.0900e-003**	**1.9000e-003**	**0.0164**	**4.0000e-005**	**4.5900e-003**	**3.0000e-005**	**4.6200e-003**	**1.2200e-003**	**3.0000e-005**	**1.2500e-003**	**0.0000**	**3.8418**	**3.8418**	**1.3000e-004**	**0.0000**	**3.8450**

3.3 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1265	0.0000	0.1265	0.0695	0.0000	0.0695	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0272	0.2835	0.1481	2.7000e-004		0.0143	0.0143		0.0132	0.0132	0.0000	23.4050	23.4050	7.5700e-003	0.0000	23.5942
Total	**0.0272**	**0.2835**	**0.1481**	**2.7000e-004**	**0.1265**	**0.0143**	**0.1408**	**0.0695**	**0.0132**	**0.0827**	**0.0000**	**23.4050**	**23.4050**	**7.5700e-003**	**0.0000**	**23.5942**

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3.3 Site Preparation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.1000e-004	4.5000e-004	3.9300e-003	1.0000e-005	1.2100e-003	1.0000e-005	1.2200e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	0.9802	0.9802	3.0000e-005	0.0000	0.9810
Total	**5.1000e-004**	**4.5000e-004**	**3.9300e-003**	**1.0000e-005**	**1.2100e-003**	**1.0000e-005**	**1.2200e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**	**0.0000**	**0.9802**	**0.9802**	**3.0000e-005**	**0.0000**	**0.9810**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1265	0.0000	0.1265	0.0695	0.0000	0.0695	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0272	0.2835	0.1481	2.7000e-004		0.0143	0.0143		0.0132	0.0132	0.0000	23.4050	23.4050	7.5700e-003	0.0000	23.5942
Total	**0.0272**	**0.2835**	**0.1481**	**2.7000e-004**	**0.1265**	**0.0143**	**0.1408**	**0.0695**	**0.0132**	**0.0827**	**0.0000**	**23.4050**	**23.4050**	**7.5700e-003**	**0.0000**	**23.5942**

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3.3 Site Preparation - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.1000e-004	4.5000e-004	3.9300e-003	1.0000e-005	1.2100e-003	1.0000e-005	1.2200e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	0.9802	0.9802	3.0000e-005	0.0000	0.9810
Total	**5.1000e-004**	**4.5000e-004**	**3.9300e-003**	**1.0000e-005**	**1.2100e-003**	**1.0000e-005**	**1.2200e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**	**0.0000**	**0.9802**	**0.9802**	**3.0000e-005**	**0.0000**	**0.9810**

3.4 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5638	0.0000	0.5638	0.2338	0.0000	0.2338	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2724	3.0160	2.0071	4.0300e-003		0.1291	0.1291		0.1187	0.1187	0.0000	354.2174	354.2174	0.1146	0.0000	357.0814
Total	**0.2724**	**3.0160**	**2.0071**	**4.0300e-003**	**0.5638**	**0.1291**	**0.6928**	**0.2338**	**0.1187**	**0.3525**	**0.0000**	**354.2174**	**354.2174**	**0.1146**	**0.0000**	**357.0814**

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3.4 Grading - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.3000e-003	4.6200e-003	0.0405	1.1000e-004	0.0125	8.0000e-005	0.0126	3.3300e-003	7.0000e-005	3.4000e-003	0.0000	10.1135	10.1135	3.1000e-004	0.0000	10.1211
Total	**5.3000e-003**	**4.6200e-003**	**0.0405**	**1.1000e-004**	**0.0125**	**8.0000e-005**	**0.0126**	**3.3300e-003**	**7.0000e-005**	**3.4000e-003**	**0.0000**	**10.1135**	**10.1135**	**3.1000e-004**	**0.0000**	**10.1211**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.5638	0.0000	0.5638	0.2338	0.0000	0.2338	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2724	3.0160	2.0071	4.0300e-003		0.1291	0.1291		0.1187	0.1187	0.0000	354.2170	354.2170	0.1146	0.0000	357.0810
Total	**0.2724**	**3.0160**	**2.0071**	**4.0300e-003**	**0.5638**	**0.1291**	**0.6928**	**0.2338**	**0.1187**	**0.3525**	**0.0000**	**354.2170**	**354.2170**	**0.1146**	**0.0000**	**357.0810**

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3.4 Grading - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.3000e-003	4.6200e-003	0.0405	1.1000e-004	0.0125	8.0000e-005	0.0126	3.3300e-003	7.0000e-005	3.4000e-003	0.0000	10.1135	10.1135	3.1000e-004	0.0000	10.1211
Total	**5.3000e-003**	**4.6200e-003**	**0.0405**	**1.1000e-004**	**0.0125**	**8.0000e-005**	**0.0126**	**3.3300e-003**	**7.0000e-005**	**3.4000e-003**	**0.0000**	**10.1135**	**10.1135**	**3.1000e-004**	**0.0000**	**10.1211**

3.5 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1130	1.1627	1.3188	2.0500e-003		0.0610	0.0610		0.0561	0.0561	0.0000	180.2113	180.2113	0.0583	0.0000	181.6684
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1130**	**1.1627**	**1.3188**	**2.0500e-003**		**0.0610**	**0.0610**		**0.0561**	**0.0561**	**0.0000**	**180.2113**	**180.2113**	**0.0583**	**0.0000**	**181.6684**

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Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.5000e-003	4.8000e-003	0.0421	1.2000e-004	0.0130	8.0000e-005	0.0131	3.4500e-003	8.0000e-005	3.5300e-003	0.0000	10.5024	10.5024	3.2000e-004	0.0000	10.5104
Total	**5.5000e-003**	**4.8000e-003**	**0.0421**	**1.2000e-004**	**0.0130**	**8.0000e-005**	**0.0131**	**3.4500e-003**	**8.0000e-005**	**3.5300e-003**	**0.0000**	**10.5024**	**10.5024**	**3.2000e-004**	**0.0000**	**10.5104**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1130	1.1627	1.3188	2.0500e-003		0.0610	0.0610		0.0561	0.0561	0.0000	180.2111	180.2111	0.0583	0.0000	181.6682
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1130**	**1.1627**	**1.3188**	**2.0500e-003**		**0.0610**	**0.0610**		**0.0561**	**0.0561**	**0.0000**	**180.2111**	**180.2111**	**0.0583**	**0.0000**	**181.6682**

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Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.5000e-003	4.8000e-003	0.0421	1.2000e-004	0.0130	8.0000e-005	0.0131	3.4500e-003	8.0000e-005	3.5300e-003	0.0000	10.5024	10.5024	3.2000e-004	0.0000	10.5104
Total	**5.5000e-003**	**4.8000e-003**	**0.0421**	**1.2000e-004**	**0.0130**	**8.0000e-005**	**0.0131**	**3.4500e-003**	**8.0000e-005**	**3.5300e-003**	**0.0000**	**10.5024**	**10.5024**	**3.2000e-004**	**0.0000**	**10.5104**

3.5 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1434	1.4462	1.8955	2.9600e-003		0.0738	0.0738		0.0679	0.0679	0.0000	260.3583	260.3583	0.0842	0.0000	262.4634
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1434**	**1.4462**	**1.8955**	**2.9600e-003**		**0.0738**	**0.0738**		**0.0679**	**0.0679**	**0.0000**	**260.3583**	**260.3583**	**0.0842**	**0.0000**	**262.4634**

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Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.4600e-003	6.2300e-003	0.0557	1.6000e-004	0.0188	1.2000e-004	0.0189	4.9900e-003	1.1000e-004	5.1000e-003	0.0000	14.6280	14.6280	4.1000e-004	0.0000	14.6382
Total	**7.4600e-003**	**6.2300e-003**	**0.0557**	**1.6000e-004**	**0.0188**	**1.2000e-004**	**0.0189**	**4.9900e-003**	**1.1000e-004**	**5.1000e-003**	**0.0000**	**14.6280**	**14.6280**	**4.1000e-004**	**0.0000**	**14.6382**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1434	1.4462	1.8955	2.9600e-003		0.0738	0.0738		0.0679	0.0679	0.0000	260.3579	260.3579	0.0842	0.0000	262.4631
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.1434**	**1.4462**	**1.8955**	**2.9600e-003**		**0.0738**	**0.0738**		**0.0679**	**0.0679**	**0.0000**	**260.3579**	**260.3579**	**0.0842**	**0.0000**	**262.4631**

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Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.4600e-003	6.2300e-003	0.0557	1.6000e-004	0.0188	1.2000e-004	0.0189	4.9900e-003	1.1000e-004	5.1000e-003	0.0000	14.6280	14.6280	4.1000e-004	0.0000	14.6382
Total	**7.4600e-003**	**6.2300e-003**	**0.0557**	**1.6000e-004**	**0.0188**	**1.2000e-004**	**0.0189**	**4.9900e-003**	**1.1000e-004**	**5.1000e-003**	**0.0000**	**14.6280**	**14.6280**	**4.1000e-004**	**0.0000**	**14.6382**

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Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0749	0.7389	1.0574	1.6500e-003		0.0370	0.0370		0.0340	0.0340	0.0000	145.1948	145.1948	0.0470	0.0000	146.3688
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0749**	**0.7389**	**1.0574**	**1.6500e-003**		**0.0370**	**0.0370**		**0.0340**	**0.0340**	**0.0000**	**145.1948**	**145.1948**	**0.0470**	**0.0000**	**146.3688**

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Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.9100e-003	3.1200e-003	0.0284	9.0000e-005	0.0105	6.0000e-005	0.0105	2.7800e-003	6.0000e-005	2.8400e-003	0.0000	7.8519	7.8519	2.0000e-004	0.0000	7.8571
Total	**3.9100e-003**	**3.1200e-003**	**0.0284**	**9.0000e-005**	**0.0105**	**6.0000e-005**	**0.0105**	**2.7800e-003**	**6.0000e-005**	**2.8400e-003**	**0.0000**	**7.8519**	**7.8519**	**2.0000e-004**	**0.0000**	**7.8571**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0749	0.7389	1.0574	1.6500e-003		0.0370	0.0370		0.0340	0.0340	0.0000	145.1946	145.1946	0.0470	0.0000	146.3686
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0749**	**0.7389**	**1.0574**	**1.6500e-003**		**0.0370**	**0.0370**		**0.0340**	**0.0340**	**0.0000**	**145.1946**	**145.1946**	**0.0470**	**0.0000**	**146.3686**

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Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.9100e-003	3.1200e-003	0.0284	9.0000e-005	0.0105	6.0000e-005	0.0105	2.7800e-003	6.0000e-005	2.8400e-003	0.0000	7.8519	7.8519	2.0000e-004	0.0000	7.8571
Total	**3.9100e-003**	**3.1200e-003**	**0.0284**	**9.0000e-005**	**0.0105**	**6.0000e-005**	**0.0105**	**2.7800e-003**	**6.0000e-005**	**2.8400e-003**	**0.0000**	**7.8519**	**7.8519**	**2.0000e-004**	**0.0000**	**7.8571**

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Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1112	1.0198	0.9697	1.5700e-003		0.0561	0.0561		0.0527	0.0527	0.0000	135.5078	135.5078	0.0327	0.0000	136.3251
Total	**0.1112**	**1.0198**	**0.9697**	**1.5700e-003**		**0.0561**	**0.0561**		**0.0527**	**0.0527**	**0.0000**	**135.5078**	**135.5078**	**0.0327**	**0.0000**	**136.3251**

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Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0389	1.2140	0.3557	2.5200e-003	0.0579	3.4700e-003	0.0614	0.0167	3.3100e-003	0.0201	0.0000	243.8823	243.8823	0.0144	0.0000	244.2419
Worker	0.1707	0.1488	1.3058	3.6100e-003	0.4032	2.5600e-003	0.4058	0.1072	2.3700e-003	0.1095	0.0000	325.8558	325.8558	9.8700e-003	0.0000	326.1025
Total	**0.2096**	**1.3628**	**1.6615**	**6.1300e-003**	**0.4612**	**6.0300e-003**	**0.4672**	**0.1239**	**5.6800e-003**	**0.1296**	**0.0000**	**569.7381**	**569.7381**	**0.0243**	**0.0000**	**570.3444**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1112	1.0198	0.9697	1.5700e-003		0.0561	0.0561		0.0527	0.0527	0.0000	135.5077	135.5077	0.0327	0.0000	136.3250
Total	**0.1112**	**1.0198**	**0.9697**	**1.5700e-003**		**0.0561**	**0.0561**		**0.0527**	**0.0527**	**0.0000**	**135.5077**	**135.5077**	**0.0327**	**0.0000**	**136.3250**

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Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0389	1.2140	0.3557	2.5200e-003	0.0579	3.4700e-003	0.0614	0.0167	3.3100e-003	0.0201	0.0000	243.8823	243.8823	0.0144	0.0000	244.2419
Worker	0.1707	0.1488	1.3058	3.6100e-003	0.4032	2.5600e-003	0.4058	0.1072	2.3700e-003	0.1095	0.0000	325.8558	325.8558	9.8700e-003	0.0000	326.1025
Total	**0.2096**	**1.3628**	**1.6615**	**6.1300e-003**	**0.4612**	**6.0300e-003**	**0.4672**	**0.1239**	**5.6800e-003**	**0.1296**	**0.0000**	**569.7381**	**569.7381**	**0.0243**	**0.0000**	**570.3444**

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Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2218	2.0300	2.1272	3.5000e-003		0.1052	0.1052		0.0990	0.0990	0.0000	301.2428	301.2428	0.0722	0.0000	303.0471
Total	**0.2218**	**2.0300**	**2.1272**	**3.5000e-003**		**0.1052**	**0.1052**		**0.0990**	**0.0990**	**0.0000**	**301.2428**	**301.2428**	**0.0722**	**0.0000**	**303.0471**

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Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0799	2.5633	0.7297	5.5600e-003	0.1288	6.7700e-003	0.1356	0.0372	6.4800e-003	0.0437	0.0000	538.2689	538.2689	0.0316	0.0000	539.0580
Worker	0.3562	0.2974	2.6582	7.7300e-003	0.8961	5.5400e-003	0.9016	0.2381	5.1100e-003	0.2432	0.0000	698.2408	698.2408	0.0197	0.0000	698.7321
Total	**0.4361**	**2.8607**	**3.3879**	**0.0133**	**1.0249**	**0.0123**	**1.0372**	**0.2754**	**0.0116**	**0.2869**	**0.0000**	**1,236.5097**	**1,236.5097**	**0.0512**	**0.0000**	**1,237.7901**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2218	2.0300	2.1272	3.5000e-003		0.1052	0.1052		0.0990	0.0990	0.0000	301.2425	301.2425	0.0722	0.0000	303.0467
Total	**0.2218**	**2.0300**	**2.1272**	**3.5000e-003**		**0.1052**	**0.1052**		**0.0990**	**0.0990**	**0.0000**	**301.2425**	**301.2425**	**0.0722**	**0.0000**	**303.0467**

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Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0799	2.5633	0.7297	5.5600e-003	0.1288	6.7700e-003	0.1356	0.0372	6.4800e-003	0.0437	0.0000	538.2689	538.2689	0.0316	0.0000	539.0580
Worker	0.3562	0.2974	2.6582	7.7300e-003	0.8961	5.5400e-003	0.9016	0.2381	5.1100e-003	0.2432	0.0000	698.2408	698.2408	0.0197	0.0000	698.7321
Total	**0.4361**	**2.8607**	**3.3879**	**0.0133**	**1.0249**	**0.0123**	**1.0372**	**0.2754**	**0.0116**	**0.2869**	**0.0000**	**1,236.5097**	**1,236.5097**	**0.0512**	**0.0000**	**1,237.7901**

3.6 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1140	1.0429	1.1777	1.9500e-003		0.0507	0.0507		0.0477	0.0477	0.0000	168.0584	168.0584	0.0400	0.0000	169.0579
Total	**0.1140**	**1.0429**	**1.1777**	**1.9500e-003**		**0.0507**	**0.0507**		**0.0477**	**0.0477**	**0.0000**	**168.0584**	**168.0584**	**0.0400**	**0.0000**	**169.0579**

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3.6 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0340	1.1787	0.3575	3.0500e-003	0.0718	1.7500e-003	0.0736	0.0208	1.6700e-003	0.0224	0.0000	295.2542	295.2542	0.0157	0.0000	295.6457
Worker	0.1866	0.1491	1.3537	4.1500e-003	0.4997	3.0100e-003	0.5028	0.1328	2.7700e-003	0.1356	0.0000	374.7989	374.7989	9.7800e-003	0.0000	375.0435
Total	**0.2207**	**1.3278**	**1.7113**	**7.2000e-003**	**0.5716**	**4.7600e-003**	**0.5763**	**0.1536**	**4.4400e-003**	**0.1580**	**0.0000**	**670.0532**	**670.0532**	**0.0254**	**0.0000**	**670.6892**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1140	1.0429	1.1777	1.9500e-003		0.0507	0.0507		0.0477	0.0477	0.0000	168.0582	168.0582	0.0400	0.0000	169.0577
Total	**0.1140**	**1.0429**	**1.1777**	**1.9500e-003**		**0.0507**	**0.0507**		**0.0477**	**0.0477**	**0.0000**	**168.0582**	**168.0582**	**0.0400**	**0.0000**	**169.0577**

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3.6 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0340	1.1787	0.3575	3.0500e-003	0.0718	1.7500e-003	0.0736	0.0208	1.6700e-003	0.0224	0.0000	295.2542	295.2542	0.0157	0.0000	295.6457
Worker	0.1866	0.1491	1.3537	4.1500e-003	0.4997	3.0100e-003	0.5028	0.1328	2.7700e-003	0.1356	0.0000	374.7989	374.7989	9.7800e-003	0.0000	375.0435
Total	**0.2207**	**1.3278**	**1.7113**	**7.2000e-003**	**0.5716**	**4.7600e-003**	**0.5763**	**0.1536**	**4.4400e-003**	**0.1580**	**0.0000**	**670.0532**	**670.0532**	**0.0254**	**0.0000**	**670.6892**

3.7 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	3.5933					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.5800e-003	0.0389	0.0464	8.0000e-005		2.4000e-003	2.4000e-003		2.4000e-003	2.4000e-003	0.0000	6.5108	6.5108	4.5000e-004	0.0000	6.5220
Total	**3.5989**	**0.0389**	**0.0464**	**8.0000e-005**		**2.4000e-003**	**2.4000e-003**		**2.4000e-003**	**2.4000e-003**	**0.0000**	**6.5108**	**6.5108**	**4.5000e-004**	**0.0000**	**6.5220**

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3.7 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0149	0.0130	0.1137	3.1000e-004	0.0351	2.2000e-004	0.0353	9.3300e-003	2.1000e-004	9.5400e-003	0.0000	28.3683	28.3683	8.6000e-004	0.0000	28.3897
Total	**0.0149**	**0.0130**	**0.1137**	**3.1000e-004**	**0.0351**	**2.2000e-004**	**0.0353**	**9.3300e-003**	**2.1000e-004**	**9.5400e-003**	**0.0000**	**28.3683**	**28.3683**	**8.6000e-004**	**0.0000**	**28.3897**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	3.5933					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.5800e-003	0.0389	0.0464	8.0000e-005		2.4000e-003	2.4000e-003		2.4000e-003	2.4000e-003	0.0000	6.5108	6.5108	4.5000e-004	0.0000	6.5220
Total	**3.5989**	**0.0389**	**0.0464**	**8.0000e-005**		**2.4000e-003**	**2.4000e-003**		**2.4000e-003**	**2.4000e-003**	**0.0000**	**6.5108**	**6.5108**	**4.5000e-004**	**0.0000**	**6.5220**

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3.7 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0149	0.0130	0.1137	3.1000e-004	0.0351	2.2000e-004	0.0353	9.3300e-003	2.1000e-004	9.5400e-003	0.0000	28.3683	28.3683	8.6000e-004	0.0000	28.3897
Total	**0.0149**	**0.0130**	**0.1137**	**3.1000e-004**	**0.0351**	**2.2000e-004**	**0.0353**	**9.3300e-003**	**2.1000e-004**	**9.5400e-003**	**0.0000**	**28.3683**	**28.3683**	**8.6000e-004**	**0.0000**	**28.3897**

3.7 Architectural Coating - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	18.3187					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0266	0.1831	0.2358	3.9000e-004		0.0106	0.0106		0.0106	0.0106	0.0000	33.1923	33.1923	2.1600e-003	0.0000	33.2463
Total	**18.3453**	**0.1831**	**0.2358**	**3.9000e-004**		**0.0106**	**0.0106**		**0.0106**	**0.0106**	**0.0000**	**33.1923**	**33.1923**	**2.1600e-003**	**0.0000**	**33.2463**

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3.7 Architectural Coating - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0711	0.0594	0.5309	1.5400e-003	0.1790	1.1100e-003	0.1801	0.0476	1.0200e-003	0.0486	0.0000	139.4531	139.4531	3.9200e-003	0.0000	139.5512
Total	**0.0711**	**0.0594**	**0.5309**	**1.5400e-003**	**0.1790**	**1.1100e-003**	**0.1801**	**0.0476**	**1.0200e-003**	**0.0486**	**0.0000**	**139.4531**	**139.4531**	**3.9200e-003**	**0.0000**	**139.5512**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	18.3187					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0266	0.1831	0.2358	3.9000e-004		0.0106	0.0106		0.0106	0.0106	0.0000	33.1923	33.1923	2.1600e-003	0.0000	33.2463
Total	**18.3453**	**0.1831**	**0.2358**	**3.9000e-004**		**0.0106**	**0.0106**		**0.0106**	**0.0106**	**0.0000**	**33.1923**	**33.1923**	**2.1600e-003**	**0.0000**	**33.2463**

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3.7 Architectural Coating - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0711	0.0594	0.5309	1.5400e-003	0.1790	1.1100e-003	0.1801	0.0476	1.0200e-003	0.0486	0.0000	139.4531	139.4531	3.9200e-003	0.0000	139.5512
Total	**0.0711**	**0.0594**	**0.5309**	**1.5400e-003**	**0.1790**	**1.1100e-003**	**0.1801**	**0.0476**	**1.0200e-003**	**0.0486**	**0.0000**	**139.4531**	**139.4531**	**3.9200e-003**	**0.0000**	**139.5512**

3.7 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	10.2162					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0139	0.0945	0.1313	2.2000e-004		5.1300e-003	5.1300e-003		5.1300e-003	5.1300e-003	0.0000	18.5111	18.5111	1.1100e-003	0.0000	18.5388
Total	**10.2301**	**0.0945**	**0.1313**	**2.2000e-004**		**5.1300e-003**	**5.1300e-003**		**5.1300e-003**	**5.1300e-003**	**0.0000**	**18.5111**	**18.5111**	**1.1100e-003**	**0.0000**	**18.5388**

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3.7 Architectural Coating - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0373	0.0298	0.2704	8.3000e-004	0.0998	6.0000e-004	0.1004	0.0265	5.5000e-004	0.0271	0.0000	74.8551	74.8551	1.9500e-003	0.0000	74.9039
Total	**0.0373**	**0.0298**	**0.2704**	**8.3000e-004**	**0.0998**	**6.0000e-004**	**0.1004**	**0.0265**	**5.5000e-004**	**0.0271**	**0.0000**	**74.8551**	**74.8551**	**1.9500e-003**	**0.0000**	**74.9039**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	10.2162					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0139	0.0945	0.1313	2.2000e-004		5.1300e-003	5.1300e-003		5.1300e-003	5.1300e-003	0.0000	18.5111	18.5111	1.1100e-003	0.0000	18.5388
Total	**10.2301**	**0.0945**	**0.1313**	**2.2000e-004**		**5.1300e-003**	**5.1300e-003**		**5.1300e-003**	**5.1300e-003**	**0.0000**	**18.5111**	**18.5111**	**1.1100e-003**	**0.0000**	**18.5388**

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3.7 Architectural Coating - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0373	0.0298	0.2704	8.3000e-004	0.0998	6.0000e-004	0.1004	0.0265	5.5000e-004	0.0271	0.0000	74.8551	74.8551	1.9500e-003	0.0000	74.9039
Total	**0.0373**	**0.0298**	**0.2704**	**8.3000e-004**	**0.0998**	**6.0000e-004**	**0.1004**	**0.0265**	**5.5000e-004**	**0.0271**	**0.0000**	**74.8551**	**74.8551**	**1.9500e-003**	**0.0000**	**74.9039**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

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	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.6051	6.7800	18.7479	0.0753	8.9417	0.0542	8.9958	2.3905	0.0504	2.4409	0.0000	6,922.8328	6,922.8328	0.2187	0.0000	6,928.3001
Unmitigated	1.6051	6.7800	18.7479	0.0753	8.9417	0.0542	8.9958	2.3905	0.0504	2.4409	0.0000	6,922.8328	6,922.8328	0.2187	0.0000	6,928.3001

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	1,156.62	1,589.52	1347.54	3,166,112	3,166,112
General Light Industry	2,677.50	990.00	510.00	7,019,141	7,019,141
Single Family Housing	5,057.64	6,629.79	5766.78	13,682,571	13,682,571
Total	8,891.76	9,209.31	7,624.32	23,867,824	23,867,824

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3
General Light Industry	13.00	5.00	5.00	59.00	28.00	13.00	92	5	3
Single Family Housing	13.00	5.00	5.00	35.80	21.00	43.20	86	11	3

4.4 Fleet Mix

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Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759
General Light Industry	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759
Single Family Housing	0.610645	0.025081	0.199254	0.104456	0.014638	0.004440	0.012550	0.019914	0.002247	0.001059	0.004248	0.000708	0.000759

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	1,701.2133	1,701.2133	0.0741	0.0171	1,708.1653
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	1,701.2133	1,701.2133	0.0741	0.0171	1,708.1653
NaturalGas Mitigated	0.2237	1.9702	1.2403	0.0122		0.1546	0.1546		0.1546	0.1546	0.0000	2,214.2613	2,214.2613	0.0424	0.0406	2,227.4196
NaturalGas Unmitigated	0.2237	1.9702	1.2403	0.0122		0.1546	0.1546		0.1546	0.1546	0.0000	2,214.2613	2,214.2613	0.0424	0.0406	2,227.4196

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5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	2.26414e+006	0.0122	0.1043	0.0444	6.7000e-004		8.4400e-003	8.4400e-003		8.4400e-003	8.4400e-003	0.0000	120.8234	120.8234	2.3200e-003	2.2200e-003	121.5414
General Light Industry	1.9785e+007	0.1067	0.9699	0.8147	5.8200e-003		0.0737	0.0737		0.0737	0.0737	0.0000	1,055.8030	1,055.8030	0.0202	0.0194	1,062.0771
Single Family Housing	1.94445e+007	0.1049	0.8960	0.3813	5.7200e-003		0.0724	0.0724		0.0724	0.0724	0.0000	1,037.6350	1,037.6350	0.0199	0.0190	1,043.8011
Total		**0.2237**	**1.9702**	**1.2403**	**0.0122**		**0.1546**	**0.1546**		**0.1546**	**0.1546**	**0.0000**	**2,214.2613**	**2,214.2613**	**0.0425**	**0.0406**	**2,227.4196**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Low Rise	2.26414e+006	0.0122	0.1043	0.0444	6.7000e-004		8.4400e-003	8.4400e-003		8.4400e-003	8.4400e-003	0.0000	120.8234	120.8234	2.3200e-003	2.2200e-003	121.5414
General Light Industry	1.9785e+007	0.1067	0.9699	0.8147	5.8200e-003		0.0737	0.0737		0.0737	0.0737	0.0000	1,055.8030	1,055.8030	0.0202	0.0194	1,062.0771
Single Family Housing	1.94445e+007	0.1049	0.8960	0.3813	5.7200e-003		0.0724	0.0724		0.0724	0.0724	0.0000	1,037.6350	1,037.6350	0.0199	0.0190	1,043.8011
Total		**0.2237**	**1.9702**	**1.2403**	**0.0122**		**0.1546**	**0.1546**		**0.1546**	**0.1546**	**0.0000**	**2,214.2613**	**2,214.2613**	**0.0425**	**0.0406**	**2,227.4196**

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5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	965434	130.6295	5.6900e-003	1.3100e-003	131.1634
General Light Industry	6.195e+006	838.2244	0.0365	8.4300e-003	841.6498
Single Family Housing	5.41259e+006	732.3594	0.0319	7.3700e-003	735.3521
Total		**1,701.2133**	**0.0741**	**0.0171**	**1,708.1653**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	965434	130.6295	5.6900e-003	1.3100e-003	131.1634
General Light Industry	6.195e+006	838.2244	0.0365	8.4300e-003	841.6498
Single Family Housing	5.41259e+006	732.3594	0.0319	7.3700e-003	735.3521
Total		**1,701.2133**	**0.0741**	**0.0171**	**1,708.1653**

6.0 Area Detail

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6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	10.1022	0.1396	12.1094	6.4000e-004		0.0673	0.0673		0.0673	0.0673	0.0000	19.8370	19.8370	0.0189	0.0000	20.3104
Unmitigated	10.1022	0.1396	12.1094	6.4000e-004		0.0673	0.0673		0.0673	0.0673	0.0000	19.8370	19.8370	0.0189	0.0000	20.3104

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6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.2400					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	8.4992					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.3630	0.1396	12.1094	6.4000e-004		0.0673	0.0673		0.0673	0.0673	0.0000	19.8370	19.8370	0.0189	0.0000	20.3104
Total	**10.1022**	**0.1396**	**12.1094**	**6.4000e-004**		**0.0673**	**0.0673**		**0.0673**	**0.0673**	**0.0000**	**19.8370**	**19.8370**	**0.0189**	**0.0000**	**20.3104**

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6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.2400					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	8.4992					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.3630	0.1396	12.1094	6.4000e-004		0.0673	0.0673		0.0673	0.0673	0.0000	19.8370	19.8370	0.0189	0.0000	20.3104
Total	**10.1022**	**0.1396**	**12.1094**	**6.4000e-004**		**0.0673**	**0.0673**		**0.0673**	**0.0673**	**0.0000**	**19.8370**	**19.8370**	**0.0189**	**0.0000**	**20.3104**

7.0 Water Detail

7.1 Mitigation Measures Water

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	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	268.7172	2.1492	0.1800	376.0825
Unmitigated	268.7172	2.1492	0.1800	376.0825

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	14.4642 / 9.11873	20.0257	0.1344	0.0113	26.7475
General Light Industry	173.438 / 0	188.3437	1.6096	0.1347	268.7312
Single Family Housing	43.588 / 27.4794	60.3478	0.4051	0.0340	80.6038
Total		**268.7172**	**2.1492**	**0.1800**	**376.0825**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	14.4642 / 9.11873	20.0257	0.1344	0.0113	26.7475
General Light Industry	173.438 / 0	188.3437	1.6096	0.1347	268.7312
Single Family Housing	43.588 / 27.4794	60.3478	0.4051	0.0340	80.6038
Total		**268.7172**	**2.1492**	**0.1800**	**376.0825**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	154.8636	9.1522	0.0000	383.6681
Unmitigated	368.7229	21.7909	0.0000	913.4955

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	102.12	20.7294	1.2251	0.0000	51.3563
General Light Industry	930	188.7816	11.1567	0.0000	467.6984
Single Family Housing	784.33	159.2119	9.4092	0.0000	394.4408
Total		**368.7229**	**21.7909**	**0.0000**	**913.4955**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	42.8904	8.7064	0.5145	0.0000	21.5697
General Light Industry	390.6	79.2883	4.6858	0.0000	196.4333
Single Family Housing	329.419	66.8690	3.9518	0.0000	165.6651
Total		**154.8636**	**9.1522**	**0.0000**	**383.6681**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

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11.0 Vegetation

Reso A - Exhibit C2 (EIR Technical Appendix)

N2O Operational GHG Emission Mobile Calculations - Alternative 1 2024

Project Code & Title: 18-06612, Olsen-Chandler Specific Plan

Vehicle Population Breakdown*	
264355	Gasoline vehicles
17337	Diesel vehicles
93.8%	Gasoline vehicle %
6.2%	Diesel vehicle %

VMT per Vehicle Type	
23867824	Project VMT (CalEEMod output)
22398896	Gasoline vehicle VMT
1468928	Diesel vehicle VMT

Gasoline Vehicles	
93.8%	Gasoline vehicle %
9.5265	Tons per year mobile NOX emissions (annual output in CalEEMod)
8.94	Gasoline vehicle tons per year NOX emissions
0.2819	Tons per year N2O emissions for gasoline vehicles**
0.2558	Metric tons per year N2O emissions for gasoline vehicles

Diesel Vehicles	
1.60	grams N2O per gallon of fuel for diesel vehicles**
198381.83	Diesel average miles per gallon*
0.00001	grams per mile N2O for diesel vehicles
11.8	grams per year N2O for diesel vehicles
0.0000118	Metric tons per year N2O emissions for diesel vehicles

CO2e Emissions from N2O	
0.2558	Metric tons per year from gasoline + diesel vehicles
298	GWP of N2O***
76.2	**CO2e emissions per year from N2O emissions from gasoline + diesel vehicles**

Sources
***Vehicle population source:** EMFAC2017 (v1.0.2) Emissions Inventory Region Type: Air District Region: SAN LUIS OBISPO COUNTY APCD Calendar Year: 2024 Season: Annual Vehicle Classification: EMFAC2011 Categories ****Methodology source:** EMFAC2017 Volume III - Technical Documentation https://www.arb.ca.gov/msei/emfac2011-faq.htm *****GWP source:** Intergovernmental Panel on Climate Change (IPCC). 2007. AR4 Climate Change 2007: The Physical Science Basis. Contrbution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change.

Reso A - Exhibit C2 (EIR Technical Appendix)

N2O Operational GHG Emission Mobile Calculations - Alternative 1 2030

Project Code & Title: 18-06612, Olsen-Chandler Specific Plan

Vehicle Population Breakdown*	
281904	Gasoline vehicles
16037	Diesel vehicles
94.6%	Gasoline vehicle %
5.4%	Diesel vehicle %

VMT per Vehicle Type	
23867824	Project VMT (CalEEMod output)
22583120	Gasoline vehicle VMT
1284704	Diesel vehicle VMT

Gasoline Vehicles	
94.6%	Gasoline vehicle %
6.78	Tons per year mobile NOX emissions (annual output in CalEEMod)
6.42	Gasoline vehicle tons per year NOX emissions
0.2237	Tons per year N2O emissions for gasoline vehicles**
0.2029	Metric tons per year N2O emissions for gasoline vehicles

Diesel Vehicles	
1.60	grams N2O per gallon of fuel for diesel vehicles**
222675.12	Diesel average miles per gallon*
0.00001	grams per mile N2O for diesel vehicles
9.2	grams per year N2O for diesel vehicles
0.0000092	Metric tons per year N2O emissions for diesel vehicles

CO2e Emissions from N2O	
0.2029	Metric tons per year from gasoline + diesel vehicles
298	GWP of N2O***
60.5	**CO2e emissions per year from N2O emissions from gasoline + diesel vehicles**

Sources
***Vehicle population source:**
EMFAC2017 (v1.0.2) Emissions Inventory
Region Type: Air District
Region: SAN LUIS OBISPO COUNTY APCD
Calendar Year: 2030
Season: Annual
Vehicle Classification: EMFAC2011 Categories
****Methodology source:**
EMFAC2017 Volume III - Technical Documentation
https://www.arb.ca.gov/msei/emfac2011-faq.htm
*****GWP source:**
Intergovernmental Panel on Climate Change (IPCC). 2007.
AR4 Climate Change 2007: The Physical Science Basis.
Contrbution of Working Group I to the Fourth Assessment Report of the
Intergovernmental Panel on Climate Change.

Olsen-Chandler Specific Plan Alternative 1

Last Updated: September 24, 2019

Populate one of the following tables (Leave the other blank):

Annual VMT	OR	Daily Vehicle Trips
Annual VMT: 23,867,824		Daily Vehicle Trips:
		Average Trip Distance:

Fleet Class	Fleet Mix
Light Duty Auto (LDA)	0.588806
Light Duty Truck 1 (LDT1)	0.027737
Light Duty Truck 2 (LDT2)	0.198305
Medium Duty Vehicle (MDV)	0.114471
Light Heavy Duty 1 (LHD1)	0.022249
Light Heavy Duty 2 (LHD2)	0.005748
Medium Heavy Duty (MHD)	0.012759
Heavy Heavy Duty (HHD)	0.019721
Other Bus (OBUS)	0.002316
Urban Bus (UBUS)	0.001163
School Bus (SBUS)	0.000758
Motorhome (MH)	0.001192
Motorcycle (MCY)	0.004776

Fuel Economy (MPG)	
Passenger Vehicles	24.0
Light-Med Duty Trucks	17.4
Heavy Trucks/Other	7.4
Motorcycles	43.9

Fleet Mix

Vehicle Type	Percent	Fuel Type	Annual VMT: VMT	Vehicle Trips: VMT	Fuel Consumption (Gallons)
Passenger Vehicles	*58.88%*	*Gasoline*	14,053,518	0.00	585,563.25
Light-Medium Duty Trucks	*34.05%*	*Gasoline*	8,127,304	0.00	467,086.46
Heavy Trucks/Other	*6.59%*	*Diesel*	1,573,033	0.00	212,572.00
Motorcycle	*0.48%*	*Gasoline*	113,993	0.00	2,596.65

Total Gasoline Consumption (gallons)	**1,055,246.35**
Total Diesel Consumption (gallons)	**212,572.00**