PLANNING COMMISSIONERS

JEFFREY BARNES
Chair

PATRICIA KORZEC
Vice-Chair

RAY L. BAKER
Commissioner

CITY OF MORENO VALLEY
DECEMBER 3, 1984

JEFFREY SIMS
Commissioner

ALVIN DEJOHNETTE
Commissioner

JOANN STEPHAN
Commissioner

ROBERT HARRIS
Commissioner

PLANNING COMMISSION
Regular Meeting

Agenda

Thursday, December 13, 2018 at 7:00 PM
City Hall Council Chamber – 14177 Frederick Street

CALL TO ORDER

ROLL CALL

PLEDGE OF ALLEGIANCE

APPROVAL OF AGENDA

APPROVAL OF AGENDA

CONSENT CALENDAR

All matters listed under Consent Calendar are considered to be routine and all will be enacted by one roll call vote. There will be no discussion of these items unless Members of the Planning Commission request specific items be removed from the Consent Calendar for separate action.

1. APPROVAL OF MINUTES

Planning Commission – Regular Meeting – October 25, 2018 7:00 PM

PUBLIC COMMENTS PROCEDURE

Any person wishing to address the Commission on any matter, either under the Public Comments section of the Agenda or scheduled items or public hearings, must fill out a "Request to Speak" form available at the door. The completed form must be submitted to the Secretary prior to the Agenda item being called by the Chairperson. In speaking to the Commission, member of the public may be limited to three minutes per person, except for the applicant for entitlement. The Commission may establish an overall time limit for comments on a particular Agenda item. Members of the public must direct their questions to the Chairperson of the Commission and not to other members of the Commission, the applicant, the Staff, or the audience.

NON-PUBLIC HEARING ITEMS

PUBLIC HEARING ITEMS

1. Case: PEN18-0082 – Conditional Use Permit

Applicant: T&C International Health, Inc.

Owner: T&C International Health, Inc.

Representative: Steve L’Hommedieu

Location: North side of Alessandro Boulevard, approximately 300 feet east of Kitching Street

Case Planner: Jeff Bradshaw

Council District: 3

Proposal REQUEST FOR CONTINUANCE TO THE JANUARY 10, 2019 PLANNING COMMISSION MEETING FOR PROPOSED CONDITIONAL USE PERMIT FOR A 116 BED MORENO VALLEY SKILLED NURSING FACILITY LOCATED ON THE NORTH SIDE OF ALESSANDRO BOULEVARD AND EASTERLY OF KITCHING STREET.

2. Case: PEN18-0016 Conditional Use Permit

Applicant: Sater Oil International, LLC

Owner: Sater Oil International, LLC

Representative: Ed Hale of Barghausen

Location: Northwest corner of Iris Avenue and Oliver Street

Case Planner: Gabriel Diaz

Council District: 4

Proposal PROPOSED CONDITIONAL USE PERMIT FOR A GAS STATION WITH 8 FUEL STATIONS, CAR WASH AND CONVENIENCE STORE INCLUDING TYPE-20 ALCOHOL SALES FOR BEER AND WINE.

OTHER COMMISSION BUSINESS

STAFF COMMENTS

PLANNING COMMISSIONER COMMENTS

ADJOURNMENT

Planning Commission Regular Meeting, January 10, 2019 at 7:00 P.M., City of Moreno Valley, City Hall Council Chamber, 14177 Frederick Street, Moreno Valley, CA 92553.

OFFICIAL MINUTES OF THE PLANNING COMMISSION OF THE CITY OF MORENO VALLEY

REGULAR MEETING – 7:00 PM
October 25, 2018

CALL TO ORDER

This Regular Meeting of the Planning Commission of the City of Moreno Valley was called to order at 7:02 p.m. by Chair Jeffrey Barnes in the Council Chamber located at 14177 Frederick Street.

ROLL CALL

Planning Commission:	Jeffrey Barnes	Chairman	Present
	Patricia Korzec	Vice Chairman	Present
	Robert Harris	Commissioner	Present
	JoAnn Stephan	Commissioner	Present
	Jeffrey Sims	Commissioner	Excused Absence
	Ray L. Baker	Commissioner	Present
	Alvin Dejohnette	Commissioner	Present

PLEDGE OF ALLEGIANCE

The Pledge of Allegiance was led by Commissioner JoAnn Stephan.

APPROVAL OF AGENDA

APPROVAL OF AGENDA

Motion made by Commissioner Baker and seconded by Commissioner DeJohnette to approve the agenda.

Vote: 6-0
Ayes: Commissioners Baker, DeJohnette, Stephan, Harris, Vice Chair Korzec and Chair Barnes.
Action: **Approved**

STAFF PRESENT

Paul Early	City Attorney
Patty Nevins	Planning Official
Chris Ormsby	Senior Planner
Seda Yaghoubian	Contract Planner
Eric Lewis	City Traffic Engineer
Michael Lloyd	Assistant City Engineer
Hoang Nguyen	Associate Engineer
Doug Bloom	Assistant Fire Marshal
Ashley Aparicio	Planning Commission Secretary

CONSENT CALENDAR

APPROVAL OF MINUTES

Planning Commission - Special Meeting - October 11, 2018 6:30 PM

Motion made by Commissioner Baker and seconded by Commissioner Harris.

Vote:	6-0
Ayes:	Commissioners Baker, Harris, Stephan, DeJohnette, Vice Chair Korzec and Chair Barnes.
Action:	**Approved**

PUBLIC COMMENTS PROCEDURE

Rafael Brugueras

1. Thanked the residents for their patience while the City works on our roads, buildings and general construction around the city.

2. Thanked all the past and present staff and commissioners for their hard work on these projects. We get things done, and no one in our city can say that nothing has been done. We get things done for our elders and our young people who will grow up and stay a little longer than the past.

3. Thanked the past and present commissioners for their votes because this city looks great. We have sidewalks and sewers and we need to keep it up.

NON-PUBLIC HEARING ITEMS

No Items for Discussion

PUBLIC HEARING ITEMS

1. Plot Plan to develop a campus of seven warehouse/light industrial buildings totaling 280,800 square feet and a Tentative Parcel Map to subdivide the site into seven parcels. (Report of: Planning Commission)

A. Staff recommends that the Planning Commission APPROVE Resolution Numbers 2018-51, 2018-52, and 2018-53.

Resolution No 2018-51

1. CERTIFY that the Initial Study/Mitigation Negative Declaration PEN18-0029 for the PAMA Business Center project on file with the Community Development Department, incorporated herein by this reference, has been completed in compliance with the California Environmental Quality Act, that the Planning Commission reviewed

and considered the information contained in the Initial Study/Mitigated Negative Declaration and that the Initial Study/Mitigated Negative Declaration reflects the City's independent judgment and analysis, attached hereto as Exhibit A; and

2. ADOPT the Mitigation Monitoring and Reporting Program for the Initial Study/Mitigated Negative Declaration for the proposed project, attached hereto as Exhibit B; and

Resolution 2018-52

3. APPROVE PEN18-0027, Tentative Parcel Map 37478 as shown on the attachment included as Exhibit A; and

Resolution 2018-53

4. APPROVE PEN18-0028, Plot Plan subject to the attached Conditions of Approval included as Exhibit A.

Public Hearing Opened: 7:20 p.m.

Public Comments

Rafael Brugueras supports the item.

Public Hearing Closed: 7:24 p.m.

Motion made by Chair Barnes and seconded by Commissioner Harris to approve as recommended.

Vote: 6-0
Ayes: Chair Barnes, Commissioners Harris, Stephan, DeJohnette, Baker and Vice Chair Korzec.
Action: **Approved**

2. Tentative Tract Map, General Plan Amendment and Change of Zone for 45 single-family residential lots on 8.85 acres (Report of: Planning Commission)

A. Staff recommends that the Planning Commission APPROVE Resolution Numbers 2018-47, 2018-48, 2018-49 and 2018-50, and thereby RECOMMEND that the City Council:

Resolution 2018-47

1. CERTIFY that the Initial Study/Mitigated Negative Declaration PEN18-0055 for the Brodiaea Residential project on file with the Community Development Department, incorporated herein by this

reference, has been completed in compliance with the California Environmental Quality Act, that the Planning Commission reviewed and considered the information contained in the Initial Study/Mitigated Negative Declaration, and that the Initial Study/Mitigated Negative Declaration reflects the City's independent judgment and analysis attached herto as Exhibit A: and

2. ADOPT the Mitigation Monitoring and Reporting Program for the Initial Study/Mitigated Negative Declaration for the proposed project, attached hereto as Exhibit B; and

Resolution 2018-48

3. APPROVE PEN18-0053, the General Plan Amendment as shown on the attachment included as Exhibit A; and

Resolution 2018-49

4. APPROVE PEN18-0054, the Change of Zone as shown on the attachment included as Exhibit A; and

Resolution 2018-50

5. APPROVE PEN18-0092, Tentative Tract Map subject to the attached Conditions of Approval included as Exhibit A.

Public Hearing Opened: 7:45 p.m.

Public Comments

Rafael Brugueras supports the item.

Public Hearing Closed: 7:49 p.m.

Motion made by Commissioner Baker and seconded by Commissioner DeJohnette to approve as recommended.

Vote:	4-2
Ayes:	Commissioners Baker, DeJohnette, Harris, and Stephan
Noes:	Vice Chair Korzec and Chair Barnes
Action:	**Approved**

OTHER COMMISSION BUSINESS

No Items for Discussion

STAFF COMMENTS

No Items for Discussion

PLANNING COMMISSIONER COMMENTS

No Items for Discussion

ADJOURNMENT

There being no further business to come before the Planning Commission, Chairman Barnes adjourned the meeting at 8:02 PM.

Submitted by:	Approved by:
Ashley Aparicio Planning Commission Secretary	Jeffrey Barnes Chair

CITY OF MORENO VALLEY
DECEMBER 3, 1984

PLANNING COMMISSION

STAFF REPORT

Meeting Date: December 13, 2018

REQUEST FOR CONTINUANCE TO THE JANUARY 10, 2019 PLANNING COMMISSION MEETING FOR PROPOSED CONDITIONAL USE PERMIT FOR A 116 BED MORENO VALLEY SKILLED NURSING FACILITY LOCATED ON THE NORTH SIDE OF ALESSANDRO BOULEVARD AND EASTERLY OF KITCHING STREET

Case:	PEN18-0082 – Conditional Use Permit
Applicant:	T&C International Health, Inc.
Owner:	T&C International Health, Inc.
Representative:	Steve L'Hommedieu
Location:	North side of Alessandro Boulevard, approximately 300 feet east of Kitching Street
Case Planner:	Jeff Bradshaw
Council District:	3

SUMMARY

This item was originally scheduled for a public hearing before the Planning Commission on December 13, 2018. Planning staff is recommending continuance of this Item to the Planning Commission's January 10, 2019 agenda. The continuance will allow for time to finalize review and approval of the Preliminary Water Quality Management Plan and prepare conditions of approval for the project.

PROJECT DESCRIPTION

The applicant, T&S International Health, Inc., is seeking approval of a Conditional Use Permit to allow for the development of a skilled nursing facility on a 4.54-acre site located on the north side of Alessandro Boulevard and approximately 300 feet east of Kitching Street.

DISCUSSION

This item had been scheduled for a public hearing before the Planning Commission on December 13, 2018. Subsequent to setting this hearing date, it was determined that the Preliminary Water Quality Management Plan required revisions.

Staff and the applicant are in agreement in requesting the continuance of this Item to the Planning Commission's January 10, 2019 agenda. The continuance will allow for time to finalize review and approval of the Preliminary Water Quality Management Plan and prepare final conditions of approval for the project.

A complete staff report detailing the intent and design of the proposed project will be provided with the agenda packet for the January 10, 2019 meeting.

NOTIFICATION

The public hearing notice for the December 13, 2018 public hearing for this project was published in the local newspaper on November 23, 2018. Public notice was sent to all property owners of record within 300 feet of the project site on November 29, 2018. The public hearing notice for this project was also posted on the project site on November 29, 2018.

As of the date of report preparation, staff had received no public inquiries in response to the noticing for this project.

If the continuance request is approved by the Planning Commission, no additional noticing will be required for the January 10, 2019 public hearing since this item will have been continued to a date specific.

STAFF RECOMMENDATION

Staff recommends that the Planning Commission take the following action:

1. **APPROVE** the request for a continuance of the public hearing for this item to the next regular Planning Commission meeting date of January 10, 2019.

Prepared by: Ashley Aparicio Administrative Assistant	Approved by: Patty Nevins Planning Official

ATTACHMENTS

None

CITY OF MORENO VALLEY
DECEMBER 3, 1984

PLANNING COMMISSION

STAFF REPORT

Meeting Date: December 13, 2018

CONDITIONAL USE PERMIT FOR A GAS STATION WITH 8 FUEL STATIONS, CAR WASH AND CONVENIENCE STORE INCLUDING TYPE-20 ALCOHOL SALES FOR BEER AND WINE

Case:	PEN18-0016 Conditional Use Permit
Applicant:	Sater Oil International, LLC
Owner:	Sater Oil International, LLC
Representative:	Ed Hale of Barghausen
Location:	Northwest corner of Iris Avenue and Oliver Street
Case Planner:	Gabriel Diaz
Council District:	4

SUMMARY

The applicant, Sater Oil International, LLC, is seeking approval of a Conditional Use Permit (CUP) to allow for the development of a new 3,180 square foot ARCO AM/PM gas station, operating 24 hours per day, with eight fuel islands, carwash, and a convenience store including Type-20 alcohol sales for beer and wine. The property is a 1.31-acre parcel located at the northwest corner of Iris Avenue and Oliver Street, within the Neighborhood Commercial (NC) zone. The project as designed has been found consistent with the objectives, goals and policies outlined in the City's General Plan and Municipal Code, and would be compatible with the existing and planned land uses in the project area. The project is recommended for approval.

PROJECT DESCRIPTION

Project

The applicant, Sater Oil International, LLC, submitted a Conditional Use Permit application for a new 3,180 square foot ARCO AM/PM gas station and convenience store, including Type-20 alcohol sales for beer and wine, operating 24 hours per day, with eight fuel islands and a carwash. The carwash component includes attached equipment structure and office space. The property is a 1.31 acre parcel zoned Neighborhood Commercial (NC). Auto service stations, including accessory convenience store and car wash uses, may be approved but require a Conditional Use Permit in the NC zone when located 300 feet or less from a residential zone or use, which this project is. Additionally, the request for approval of alcohol sales in conjunction with the convenience store requires a Conditional Use Permit when located 300 feet or less from a residential zone or use. Residential land uses are located across both Oliver Street to the east and Iris Avenue to the south.

The Conditional Use Permit has been evaluated particularly against General Plan Objective 2.4, which calls for commercial areas within the City to be conveniently located, efficient, attractive, and to have safe and easy pedestrian and vehicular circulation in order to serve the retail and service commercial needs of Moreno Valley residents and businesses. Staff has confirmed the proposed project meets this goal and does not conflict with other goals, objectives, policies, or programs set forth in the General Plan.

The current project site has a downward slope from south to north requiring a retaining wall on the north and west property lines to build the proposed gas station, convenience store, and car wash. The retaining wall ranges in height from 1.2 feet to 7.3 feet on the north property line, and from 3 feet to 7.3 feet on the west property line. The maximum retaining wall height of 7.3 feet is located on the northwest corner of the property.

The proposed building is rectangular in shape, single story, and has a contemporary modern style that includes a flat roof design with a more prominent tower element as the building’s main entrance. The architectural design of the convenience store building strives to achieve an attractive and appealing structure that will be visible at a prominent street corner, Iris Avenue and Oliver Street. Exterior finishes proposed include brick veneer treatments, aluminum composite rustic wood finishes, aluminum awnings, and stucco wall finishes with a blend of pewter and white as the primary colors.

The gasoline station canopy and carwash building are complementary to the main convenience store building, using flat roofs, and incorporating the same brick veneer and stucco colors of the main building.

Staff has found the proposed project would add economic vitality and architectural character along this portion of Iris Avenue, which is highly desirable given its proximity to the existing Kaiser Permanente Hospital and medical offices. The applicant has worked closely with staff in achieving an enhanced design of the project.

Site

The project site is comprised of one rectangular parcel (Assessor's Parcel Number 486-310-038) totaling 1.31 acres, located at the northwest corner of Iris Avenue and Oliver Street. The project topography has a gentle downward slope from south to north. The site has no natural features such as rock outcroppings, water features or prior structures that might limit the developable area of the site. The site has been cleared routinely for weed abatement. Public sidewalks along both the Iris Avenue and Oliver Street frontages are in place. A bus stop and established street trees are present along Iris Avenue.

The current zoning designation for the project site is Neighborhood Commercial (NC). The General Plan land use designation for the project site is Commercial (C).

Surrounding Area

The project site is bounded to the south by Iris Avenue and to the east by Oliver Street. The properties directly adjacent to the project site on the north and west are vacant and are zoned Neighborhood Commercial (NC). To the south across Iris Avenue, and to the east across Oliver Street are existing single family homes, which are part of the Moreno Valley Ranch Specific Plan 193 (SP193) neighborhoods. The homes are built at a density consistent with the Medium/Low (ML) residential zoning designation. To the west/northwest is the existing Kaiser Permanente Moreno Valley Hospital, with a current zoning designation of Community Commercial (CC).

Access/Parking

Primary direct access to the proposed development will be from a driveway off of Iris Avenue and a driveway off of Oliver Street. Both driveways will be restricted to right-in and right-out movements only.

As proposed the project exceeds the Municipal Code requirements for parking. A total of 17 parking spaces are required for the gas station and associated convenience store. The project as designed provides 19 total spaces including 3 Vanpool/Clean Air/Fuel Efficient spaces and 1 space for electric vehicle charging. The carwash component requires 11 parking spaces per Code and design shows 14 parking spaces will be provided. The project as designed satisfies, or exceeds, all parking requirements of the City's Municipal Code including ADA accessible parking and parking considerations for fuel efficient vehicles.

The driveways and interior drive aisles within the site have been reviewed and found to be adequate for truck maneuvering and turnaround for delivery trucks and trash pick-up. In addition, the site has been found acceptable by the Fire Prevention Bureau for fire truck access.

Design/Landscaping

The project structures, parking and access infrastructure, as designed and conditioned, conform to all development standards of the NC zone and the design guidelines for a commercial use as required by the City's Municipal Code.

Furthermore, the project has been designed to meet required landscaped standards and landscaping objectives as set forth in the City's Municipal Code. The landscape elements of the project include the landscape setback areas along Iris Avenue and Oliver Street, parking lot landscape, street trees and landscape treatments around the perimeter of the site.

REVIEW PROCESS

In accordance with the Municipal Code, the project was reviewed by the Project Review Staff Committee (PRSC) in February 2018. All staff comments generated throughout the multiple plan reviews for the project have been addressed and are reflected in the final project plans, Preliminary Water Quality Management Plan, and conditions of approval included as an exhibit to the recommended Resolution for the project.

ENVIRONMENTAL

An Initial Study was prepared by LSA Associates, Inc in compliance with the California Environmental Quality Act (CEQA) Guidelines. The Initial Study examined the potential for the project to have significant impact on the environment. The Initial Study (IS/MND) supports the finding that a Mitigated Negative Declaration serves as appropriate CEQA documentation for the proposed project; the proposed project, with the implementation of mitigation measures identified, will not have a significant effect on the environment. Technical studies prepared in support of the IS/MND include the following: air quality and greenhouse gas emissions analysis and screening health risk assessment; biological resources assessment and MSHCP consistency analysis and habitat assessment; cultural resource assessment; preliminary geotechnical engineering investigation; feasibility study report of soils and foundation evaluations; phase I environmental site assessment; project specific water quality management plan; preliminary drainage report; noise and vibration impact analysis; and traffic impact study. The electronic files for the IS/MND and appendices are included with this report; due to size, hard copies will not be included with the printed packet. Anyone wishing to view the documents can do so at the Planning Division counter at City Hall.

Public notice of the availability of the Initial Study / Mitigated Negative Declaration (IS/MND) WAS published in the newspaper on November 23, 2018, which satisfies the required 20-day review period in advance of a Planning Commission Public Hearing.

Mitigation measures are recommended for the proposed project in the following areas: biological resources; cultural resources; geology and soils; hazardous materials; hydrology and water quality; and noise. The measures for cultural resources have been included to address input from the tribal agencies. The measures are intended to ensure that potential resources that might be discovered are protected. However, these measures are not required to address a known significant impact. A Mitigation

Monitoring Program has been prepared and is recommended for approval to ensure implementation of the mitigation measures.

NOTIFICATION

The public hearing notice for this project was published in the local newspaper on November 23, 2018. Public notices were sent to all property owners of record within 300 feet of the project site on November 29, 2018. The public hearing notice for this project was posted on the project site on November 30, 2018.

As of the date of report preparation, staff has received no phone calls or correspondence in response to the noticing for this project.

REVIEW AGENCY COMMENTS

The project applications materials were circulated for review by all appropriate City departments and divisions, as well as applicable outside agencies/entities. Throughout the plan review process, comments and proposed conditions of approval regarding the project were provided in writing to the applicant. Where applicable, conditions of approval have been included in the recommended Resolution to address concerns from the responding agencies.

STAFF RECOMMENDATION

Staff recommends that the Planning Commission **APPROVE** Resolution Nos. 2018-54 and 2018-55, and thereby:

Resolution No. 2018-54

1. **ADOPT** a Mitigated Negative Declaration for a Conditional Use Permit PEN18-0016 pursuant to the California Environmental Quality Act (CEQA) Guidelines, and included as Exhibit A; and

2. **ADOPT** the Mitigation Monitoring and Reporting Program prepared for a Conditional Use Permit PEN18-0016 pursuant to the California Environmental Quality Act (CEQA) Guidelines, and included as Exhibit B; and

Resolution No. 2018-55

3. **APPROVE** Conditional Use Permit PEN18-0016, a request by Sater Oil International, LLC, for a 24-hour gas station operation with 8 fuel stations, convenience store including type-20 alcohol sales for beer and wine, and a car wash, on a 1.31 acre property located at the northwest corner of Iris Avenue and Oliver Street, subject to the attached conditions of approval included as Exhibit A.

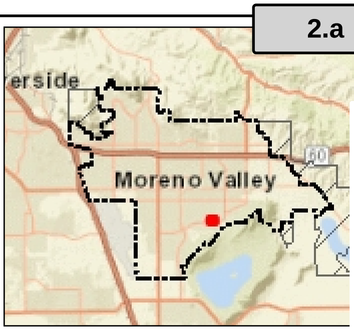
Prepared by: Gabriel Diaz Associate Planner	Approved by: Patty Nevins Planning Official

ATTACHMENTS

1. Aerial Photograph
2. Location Map
3. Zoning Map
4. Resolution 2018-54
5. Exhibit A - Initial Study / Mitigated Negative Delaration
6. Exhibit B - Mitigation Monitoring and Report Program
7. Resolution 2018-55
8. Exhibit A - Conditions of Approval
9. Site Plan
10. Preliminary Grading Plans
11. Color Elevations
12. Material Color Board
13. Floor Plan
14. Architectural Plans
15. Preliminary Landscape Plans
16. Appendix A - Air Quality and Greenhouse Gas Analysis
17. Appendix B - Biological Resources Assessment
18. Appendix C - Cultural Resource Assessment
19. Appendix D - Geotechnical Engineering Investigation
20. Appendix E - Soils Report
21. Appendix F - Phase I Environmental Site Assessment
22. Appendix G - Water Quality Management Plan
23. Appendix H - Preliminary Drainage Report
24. Appendix I - Noise and Vibration Impact Analysis Study
25. Appendix J - Traffic Impact Analysis
26. Public Hearing Notice

MORENO VALLEY
WHERE DREAMS SOAR

Aerial Photograph



Legend

Public Facilities

- ■ Public Facilities
- ★ Fire Stations

☐ Parcels

⬚ City Boundary

▨ Sphere of Influence

315.5	0	157.74	315.5 Feet

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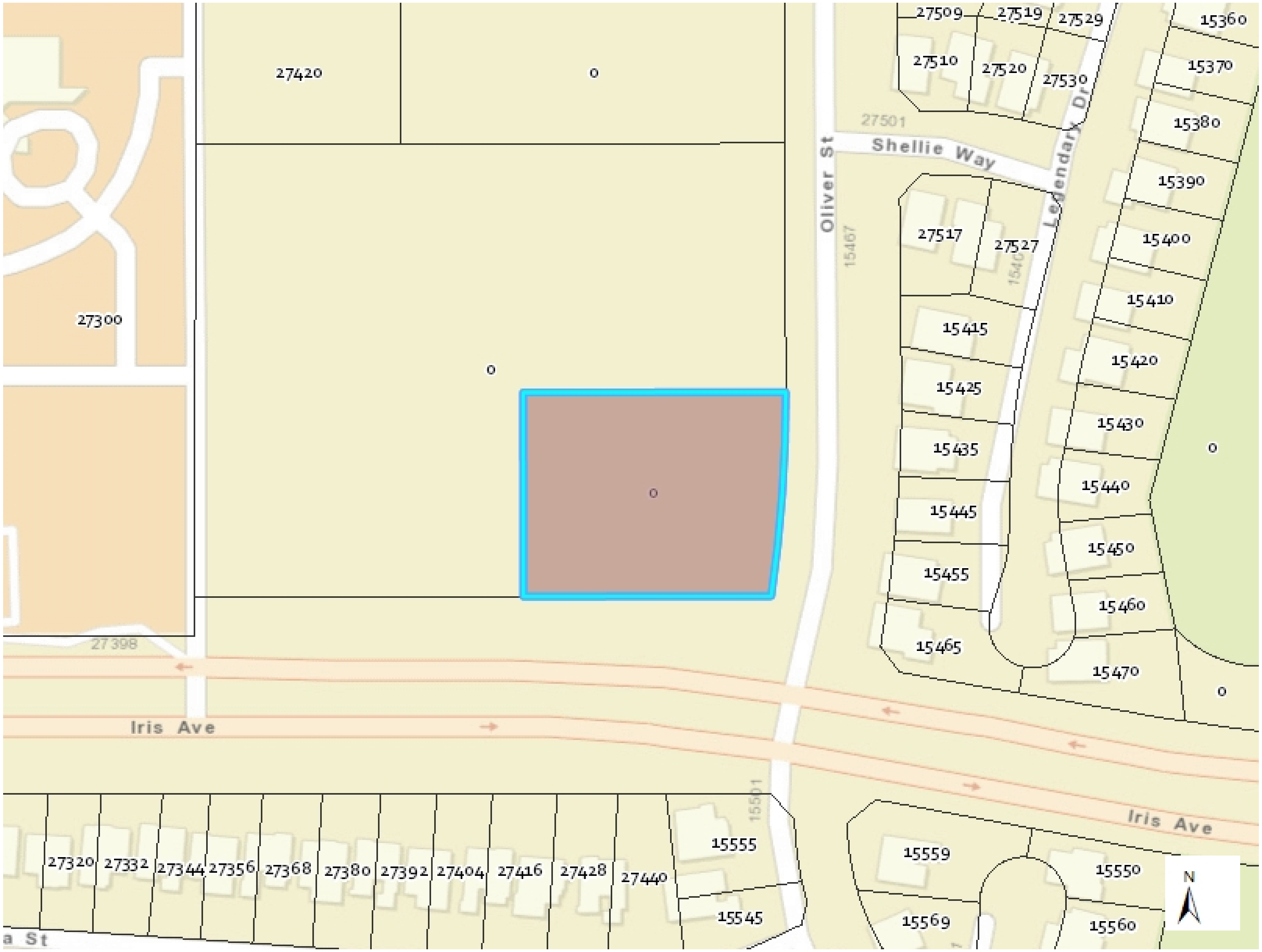
Print Date: 11/21/2018

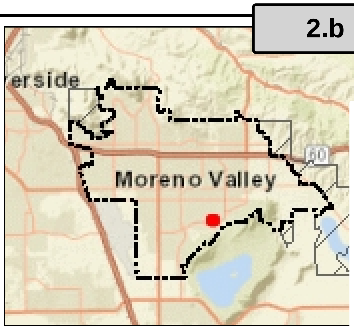
Notes

PEN18-0016

MORENO VALLEY
WHERE DREAMS SOAR

PEN18-0016
APN: 486-310-038





Legend

Public Facilities
■ Public Facilities
★ Fire Stations
☐ Parcels
⬚ City Boundary
▨ Sphere of Influence

Notes

315.5 0 157.74 315.5 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere

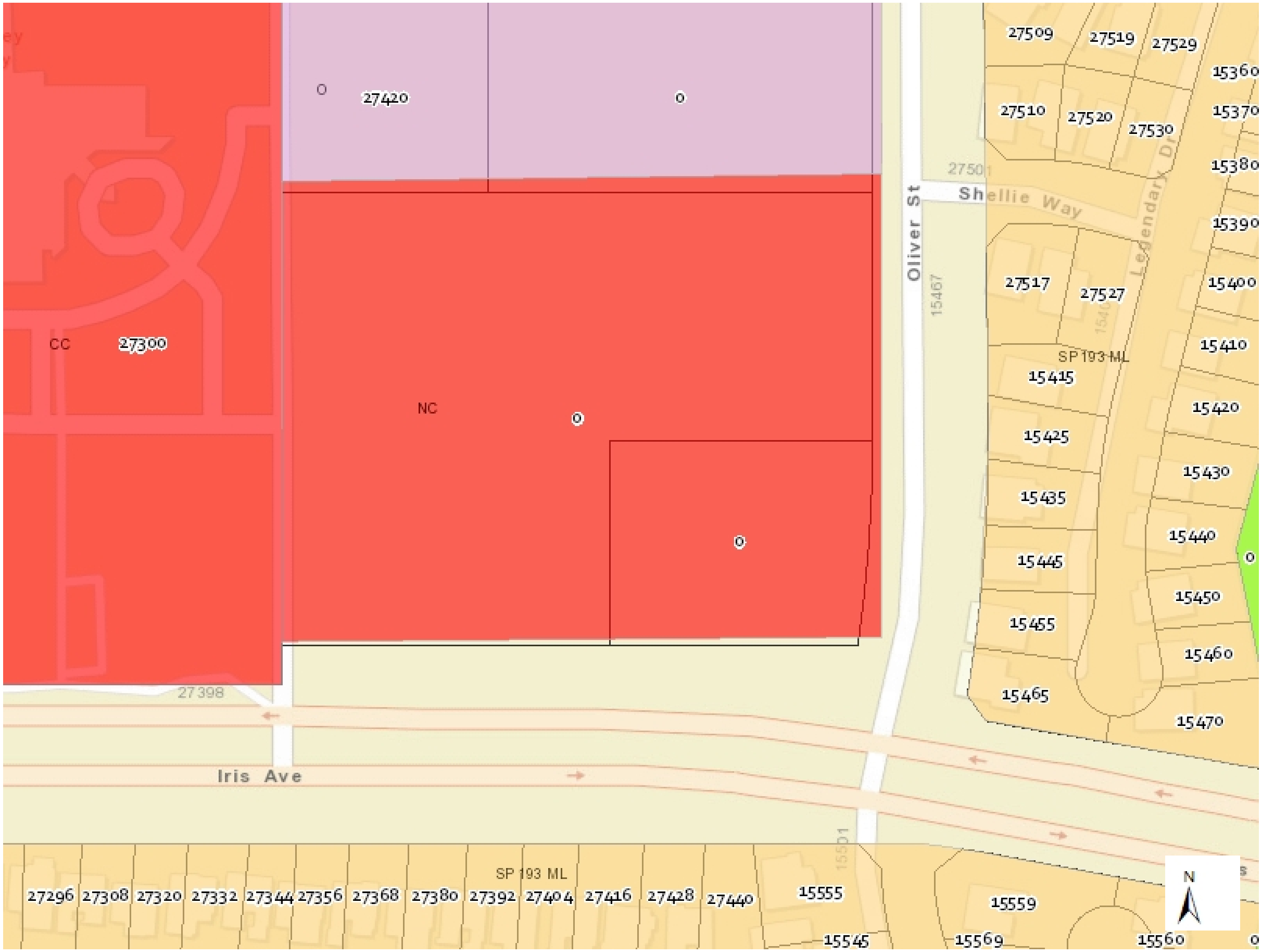
Print Date: 11/14/2018

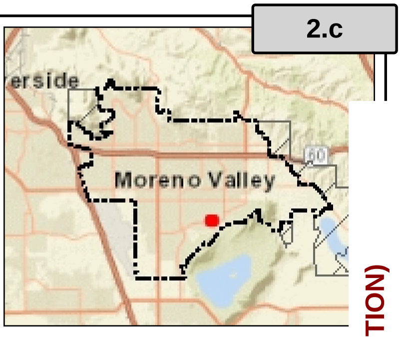
DISCLAIMER: The information shown on this map was compiled from the City of Moreno Valley GIS and Riverside County GIS. The land base and facility information on this map is for display purposes only and should not be relied upon without independent verification as to its accuracy. Riverside County and City of Moreno Valley will not be held responsible for any claims, losses or damages resulting from the use of this map.

Attachment: Location Map (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

MORENO VALLEY
WHERE DREAMS SOAR

Zone: Neighborhood Commercial (NC)





Legend

Zoning

- 🟥 Commercial
- 🟦 Industrial/Business Park
- 🟦 Public Facilities
- 🟪 Office
- ⬜ Planned Development
- 🟫 Large Lot Residential
- ⬜ Residential Agriculture 2 DU/AC
- 🟨 Residential 2 DU/AC
- 🟧 Suburban Residential
- 🟧 Multi-family
- 🟩 Open Space/Park

Master Plan of Trails

- — Bridge
- — Improved
- — Multiuse
- — Proposed
- — Regional
- — State

- ☐ Parcels
- ⬚ City Boundary
- ▨ Sphere of Influence

Notes

PEN18-0016

315.5 0 157.74 315.5 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere

Print Date: 11/21/2018

PLANNING COMMISSION RESOLUTION NO. 2018-54

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF MORENO VALLEY, CALIFORNIA, CERTIFYING THE MITIGATED NEGATIVE DECLARATION AND APPROVING THE MITIGATION MONITORING AND REPORTING PROGRAM FOR THE DEVELOPMENT OF A 24 HOUR 3,180 SQUARE FOOT GAS STATION WITH CONVENIENCE STORE AND CARWASH PROJECT, CONDITIONAL USE PERMIT APPLICATION (PEN18-0016)

WHEREAS, the applicant, Sater Oil International, LLC, has filed an application for the approval of Conditional Use Permit (PEN18-0016) for development of a new 3,180 square foot ARCO AM/PM gas station, operating 24 hours, with 8 fuel islands, carwash, and a Type-20 alcohol sales license for beer and wine, located on the northwest corner of Iris Avenue and Oliver Street as described in the title above. The Conditional Use Permit application shall not be approved unless the Final Mitigated Negative Declaration is certified and approved; and

WHEREAS, the applications for the Project have been evaluated in accordance with established City of Moreno Valley (City) procedures, and with consideration of the General Plan and other applicable regulations; and

WHEREAS, an Initial Study, supporting technical studies, and Mitigated Negative Declaration for the Project were prepared, consistent with the California Environmental Quality Act (CEQA); and

WHEREAS, the City, in conducting its own independent analysis of the Initial Study and other environmental reports and data determined that a Mitigated Negative Declaration is an appropriate environmental determination for the Project as there is substantial evidence that demonstrates the Project with mitigation would not result in any significant environmental impacts; and

WHEREAS, a Mitigation Monitoring and Reporting Program (MMRP) has been prepared in accordance with CEQA Guidelines, and is designed to ensure compliance with the identified mitigation measures outlined in the Final Mitigated Negative Declaration through Project implementation; and

WHEREAS, a 20-day public review period of the Initial Study and Mitigated Negative Declaration commenced on November 23, 2018 and concluded on December 13, 2018; and

WHEREAS, a public hearing notice for this project and consideration by the Planning Commission on December 13, 2018 was published in the local newspaper on November 23, 2018, and public notice was sent to all property owners of record within 300 feet of the project site on November 29, 2018, and a public hearing notice was posted on the project site on November 30, 2018; and

WHEREAS, the City of Moreno Valley, Community Development Department, located at 14177 Frederick Street, Moreno Valley, California 92552 is the custodian of documents and other materials that constitute the record of proceedings upon which the decision to adopt the Mitigated Negative Declaration is based; and

WHEREAS, the Planning Commission of the City of Moreno Valley considered the Project, including all environmental documentation, at a public hearing held on December 13, 2018; and

WHEREAS, the Planning Commission considered the Initial Study prepared for the Project for the purpose of compliance with the California Environmental Quality Act (CEQA), and based on the Initial Study including all supporting technical evidence, it was determined that the project impacts are expected to be less than significant with mitigation, and approval of a Mitigated Negative Declaration is an appropriate environmental determination for the Project; and

WHEREAS, all legal prerequisites to the adoption of this Resolution have occurred.

THE PLANNING COMMISSION OF THE CITY OF MORENO VALLEY, CALIFORNIA, DOES HEREBY RESOLVE AS FOLLOWS:

A. This Planning Commission specifically finds that all of the facts set forth above in this Resolution are true and correct.

B. Based upon substantial evidence presented to this Planning Commission during the above-referenced meeting on December 13, 2018, including written and oral staff reports, and the record from the public hearing, this Planning Commission finds as follows:

1. Independent Judgment and Analysis – An Initial Study/Mitigated Negative Declaration dated November 20, 2018 was prepared by the environmental consultant, LSA Associates, Inc. The documents were properly circulated for public review in accordance with the California Environmental Quality Act Guidelines. The Mitigated Negative Declaration/Initial Study has been completed along with the Mitigation Monitoring and Reporting Program (MMRP) to ensure compliance with all mitigation through project implementation. All environmental documents that comprise the Mitigated Negative Declaration, including all technical studies were independently reviewed by the City. On the basis of the whole record, there is no substantial evidence that the Project as designed, conditioned, and mitigated, will have a significant effect on the environment. The Mitigated Negative Declaration prepared and completed, in accordance with the CEQA Guidelines, reflects the independent judgment and analysis of the City.

NOW, THEREFORE, THE PLANNING COMMISSION OF THE CITY OF MORENO VALLEY, CALIFORNIA, DOES HEREBY:

1. **CERTIFY** that the Mitigated Negative Declaration prepared for a Conditional Use Permit (PEN18-0016) on file with the Community Development Department, incorporated herein by this reference, has been completed in compliance with the California Environmental Quality Act, that the Planning Commission reviewed and considered the information contained in the Mitigated Negative Declaration and the document reflects the City's independent judgment and analysis; attached hereto as Exhibit A and

2. **ADOPT** the Mitigation Monitoring and Reporting Program, attached hereto as Exhibit B.

APPROVED AND ADOPTED this 13th day of December, 2018.

AYES:
NOES:
ABSTAIN:

Jeffrey Barnes
Chair, Planning Commission

ATTEST:

Patty Nevins, Planning Official
Secretary to the Planning Commission

APPROVED AS TO FORM:

City Attorney

ATTACHMENTS:

Exhibit A: Mitigated Negative Declaration
Exhibit B: Mitigation Monitoring and Reporting Program

DECEMBER 3, 1984

INITIAL STUDY/
ENVIRONMENTAL CHECKLIST FORM
CITY OF MORENO VALLEY

November 20, 2018

1. Project Title: Sater ARCO AM/PM Gas Station
City Case No. PEN18-0016

2. Lead Agency Name and Address: City of Moreno Valley
14177 Frederick Street
Moreno Valley, CA 92552

3. Contact Person and Phone Number: Gabriel Diaz, Planning Division, 951-413-3206

4. Project Location: The project site is located on the northwest corner of Iris Avenue and Oliver Street in the City of Moreno Valley (City), Riverside County. The proposed project site is currently vacant. The project site consists of one parcel, Assessor's Parcel Number (APN) 486-310-038. The site is approximately 3 miles south of State Route 60 (SR-60) and Interstate 215 (I-215) is approximately 5.2 miles west of the project site (Figure 1 depicts the regional and project location). The March Air Reserve Base is located approximately 3.5 miles west of the project site, and the Upland Game Hunting Area is located approximately 0.4 mile south of the project site.

5. Project Sponsor's Name and Address: Sater Oil International
683 Cliffside Drive
San Dimas, CA 91773

6. General Plan Designation: Commercial

7. Zoning: Neighborhood Commercial (NC)

8. Description of the Project: (Describe the whole action involved, including but not limited to later phases of the project, and any secondary, support, or off-site features necessary for its implementation. Attach additional sheets if necessary)

   The Project proposes the construction of an ARCO AM/PM gas station comprising a 3,180 square-foot convenience store, a 42-foot by 116-foot canopy with 8 multiple product dispensers (MPD) for fueling 16 vehicles, two underground storage tanks located east of the canopy, and a 20-foot by 100-foot car wash facility plus an attached ancillary equipment building and office on a 1.58 acre site. Additionally, the proposed project includes 32 auto parking stalls two of which are handicap, a trash enclosure facility located on the south side of the convenience store, and thirteen (13) car vacuum stations located on the west side of the site (see Figure 4, site plan). The 3,180 square-foot convenience store will be located to the north of the site with the main entrance is facing south towards the canopy and 16 fueling stations. The car wash facility will be located to the north of the store with the entrance facing south. The project proposes permanent retaining walls with metal fences on the northern and western boundaries of the site, approximately 150 feet in length along each boundary, ranging from 3 to 6 feet in height. The existing ground gradually slopes down in the northwest direction. The project site ranges from an elevation of 1,570 feet above mean sea level (AMSL) to the southeast and an elevation of 1,556 feet AMSL to the northwest.

Attachment: Exhibit A - Initial Study / Mitigated Negative Delaration (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

The City's General Plan Land Use Map designates the project site as Commercial (C) and the Zoning as Neighborhood Commercial (NC). Ornamental trees are located south of the project site along with an electrical power station located on the southeast corner of the site. Refer to Figure 3. Perris Reservoir is located approximately 2 miles south of the project site, just beyond the Upland Game Hunting Area. Grading activities include 200 cubic yards of cut and 2,800 cubic yards of fill.

Ingress/egress to the project site is provided from one (1) driveway on Oliver Street in the center of site and one (1) driveway from Iris Avenue at the southwest corner of site which will also be used for emergency access vehicles. The two entrances/exits will be right-turn-in and right-turn-out only access.

9. Surrounding Land Uses and Setting: (Briefly describe the project's surroundings)

Surrounding land uses include: one and two-story single-family residential housing to the east across Oliver Street, two-story single-family residential housing to the south across Iris Avenue, vacant land to the north and west. Just beyond the vacant land to the west is the Kaiser Permanente Hospital. Refer to Figure 1 and 2.

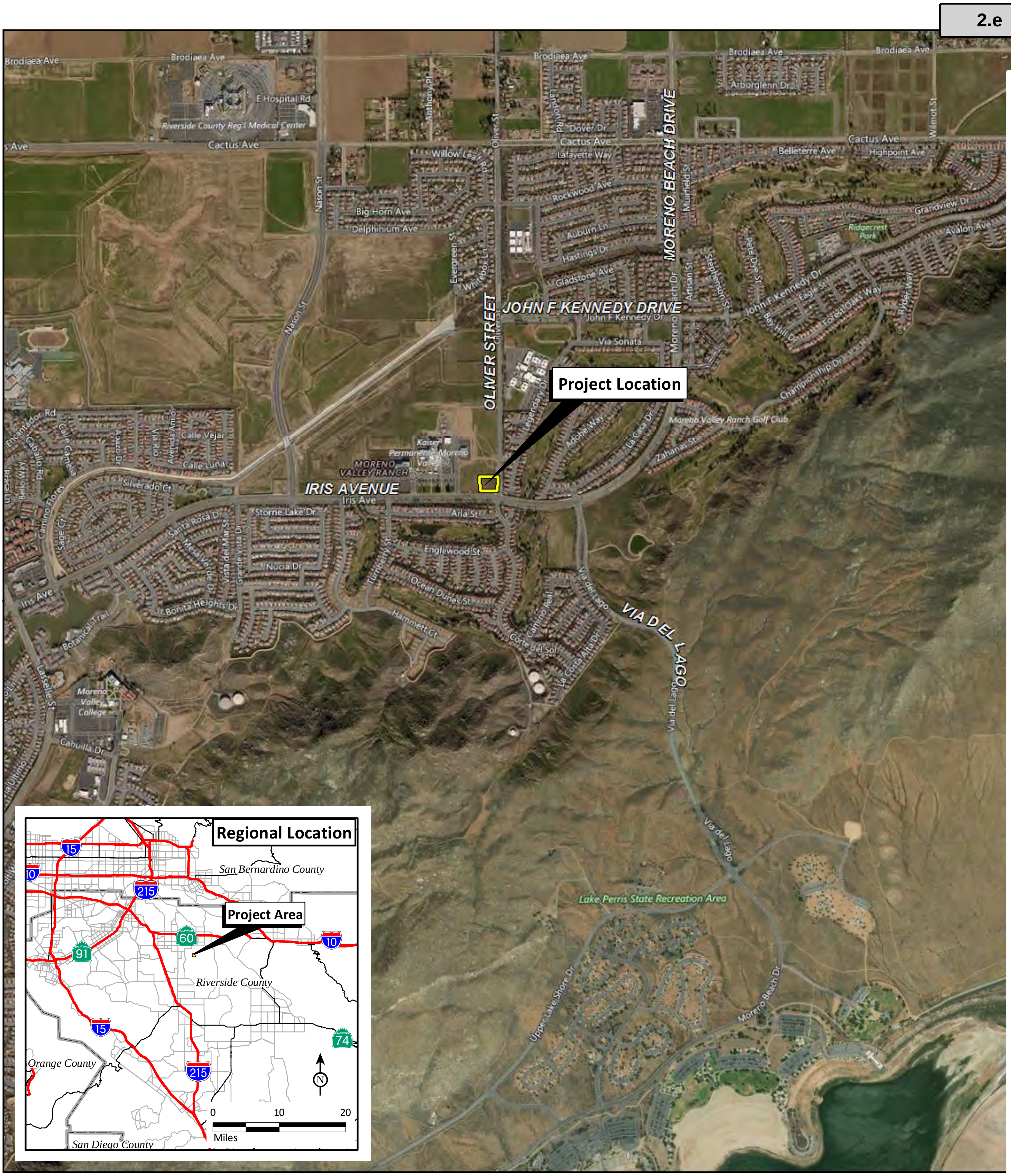
10. Other public agencies whose approval is required (e.g. permits, financing approval, or participation agreement).

11. Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so, has consultation begun?

The City sent the required AB 52 notices to the relevant tribes as required. All of the notices were delivered appropriately with receipts returned to the City. Following delivery of the notices, three tribes responded. These tribes and the status of coordination with them are:

- Pechanga Band of Luiseno Indians. This Tribe did not identify any specific tribal cultural resources within the area affected by the project.
- Rincon Band of Luiseno Indians. This Tribe did not identify any specific tribal cultural resources within the area affected by the project.
- Soboba Band of Luiseno Indians. This Tribe did not identify any specific tribal cultural resources within the area affected by the project.

NOTE: Conducting consultation early in the CEQA process allows tribal governments, lead agencies, and project proponents to discuss the level of environmental review, identify and address potential adverse impacts to tribal cultural resources, and reduce the potential for delay and conflict in the environmental review process. (See Public Resources Code section 21083.2.) Information may also be available from the California Native American Heritage Commission's Sacred Lands File per Public Resources Code section 5097.96 and the California Historical Resources Information System administered by the California Office of Historic Preservation. Please also note that Public Resources Code section 21082.3 (c) contains provisions specific to confidentiality.



LSA

FIGURE 1

LEGEND

▭ Project Boundary

N

0 1000 2000

FEET

SOURCE: Bing Aerial, 2015; Riverside County, 2015.

ARCO Iris and Olive
Moreno Valley

Regional and Project Location

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LSA

LEGEND

▭ Project Location

Photo Location

N

0 100 200
FEET

SOURCE: Google Earth, 2016.

FIGURE

ARCO Iris and Olive
Moreno Valle

Project Site

I:\SAT1701\Reports\IS\fig2_ProjectSite.mxd (12/14/2017)

Photograph 1: *View looking northwest from the southeast corner of the project site.*

Photograph 2: *View looking west toward Kaiser Hospital.*

LSA

FIGURE 3

ARCO Iris and Olive
Moreno Valle

Site Photographs

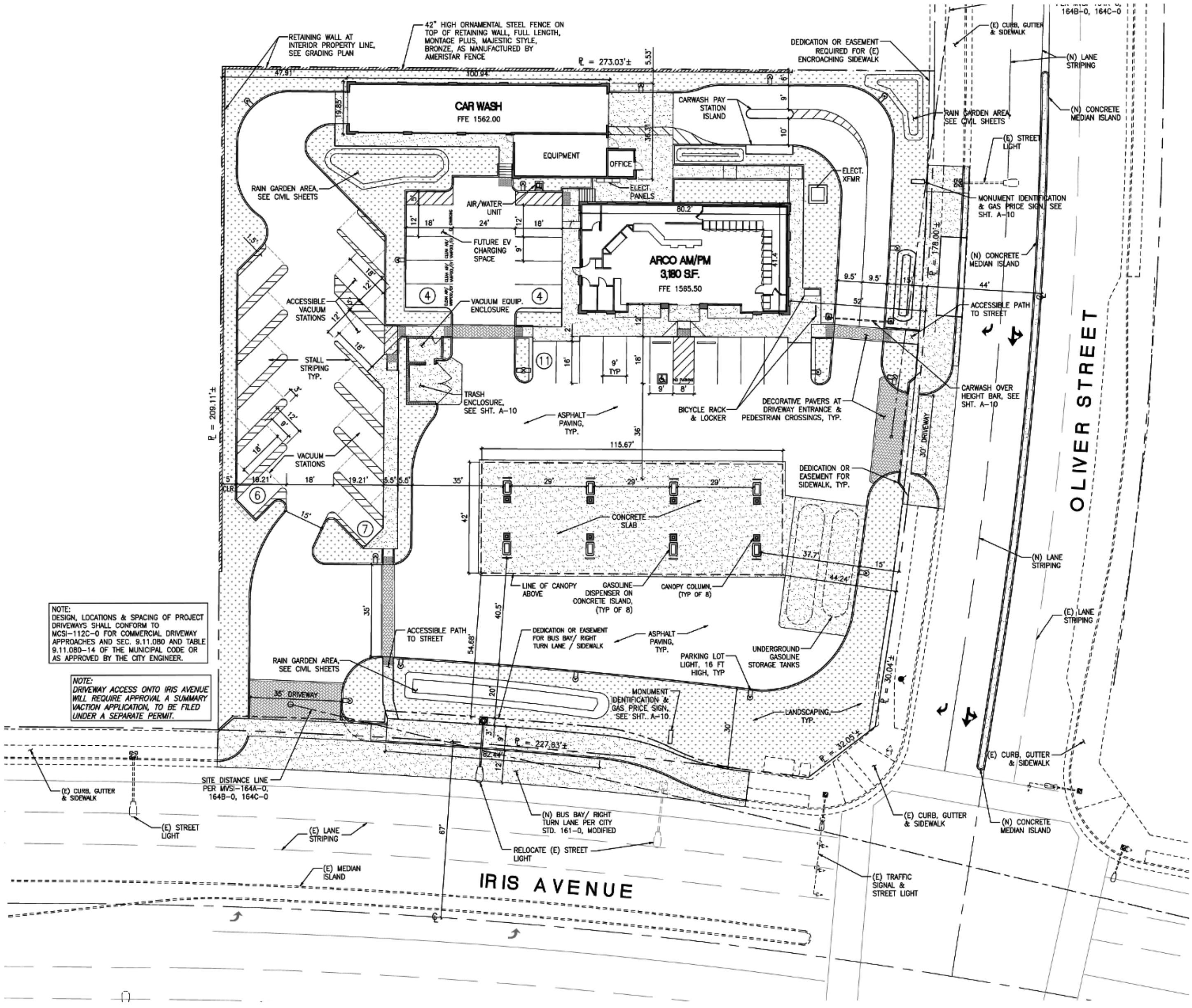
Photograph 1: *View looking east along the southern boundary.*

Photograph 2: *View looking south along the eastern boundary.*

FIGURE 3

ARCO Iris and Oliv
Moreno Vall

Site Photographs



NOTE:
DESIGN, LOCATIONS & SPACING OF PROJECT DRIVEWAYS SHALL CONFORM TO MCSI-112C-0 FOR COMMERCIAL DRIVEWAY APPROACHES AND SEC. 9.11.080 AND TABLE 9.11.080-14 OF THE MUNICIPAL CODE OR AS APPROVED BY THE CITY ENGINEER.

NOTE:
DRIVEWAY ACCESS ONTO IRIS AVENUE WILL REQUIRE APPROVAL A SUMMARY VACTION APPLICATION, TO BE FILED UNDER A SEPARATE PERMIT.

FIGURE

N

0 30 60
FEET

SOURCE: Bing (2015)

ARCO Iris and Olive
Moreno Valle

Conceptual Site Plan

I:\SAT1701\GIS\MXD\ConceptualSitePlan.mxd (11/16/2018)

LSA

LEGEND

▭ Project Location

State Farmland Designations

🟨 D, Urban and Built-up Land

🟩 L, Farmland of Local Importance

FIGURE

ARCO Iris and Olive
Moreno Valle

State Farmland Designations

SOURCE: Google Earth, 2016; Farmland Mapping & Monitoring Program, 2014

I:\SAT1701\Reports\IS\fig5_Farmland.mxd (12/12/2017)

Attachment: Exhibit A - Initial Study / Mitigated Negative Delaration (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

LSA

LEGEND

☐ Project Location

▨ Small Mammal Survey Area

▨ Burrowing Owl Survey Area

N

0 250 500
FEET

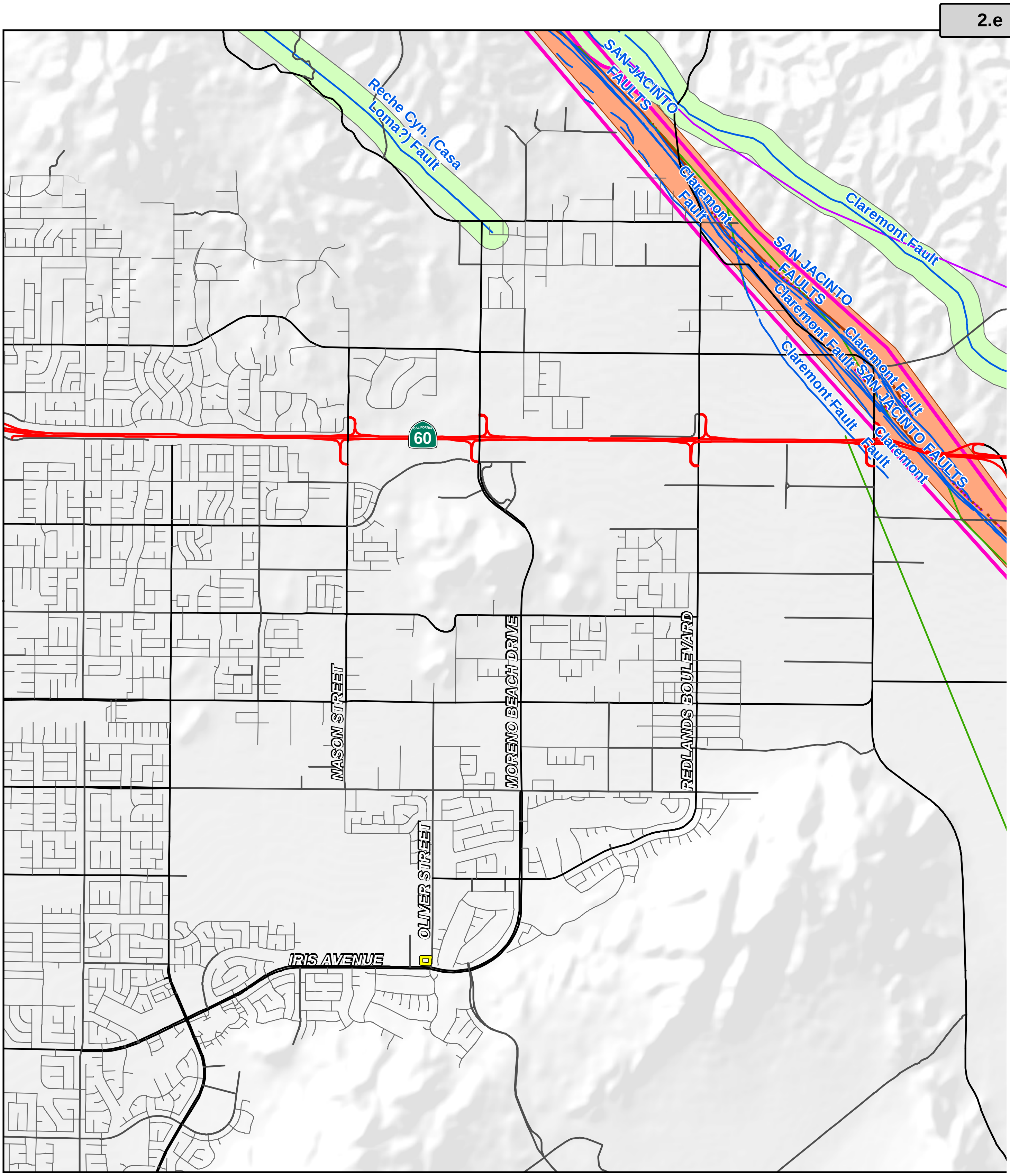
SOURCE: Google Earth, 2016; MHCP, 2005

FIGURE (

ARCO Iris and Olive
Moreno Valle

MSHCP Survey Areas

I:\SAT1701\Reports\IS\fig6_MSHCPsurvey.mxd (12/12/2017)



LSA

LEGEND

☐	Project Location	**County Fault Zones**		**Alquist-Priolo Zone**	
—	CGS Faults, 2005	☐	Alquist-Priolo	🟧	Alquist-Priolo Zone
—	USGS Faults, 2010	🟩	Riverside County	—	Fault, Certain
		—	County Faults, 2003	– –	Fault, Approximate
				······	Fault, Concealed

N

0 2000 4000

FEET

FIGURE

ARCO Iris and Olive

Moreno Valle

Alquist-Priolo Fault Zone

and Earthquake Faults

SOURCE: Google Earth, 2016; USGS, 2010; CGS, 2005; Riverside County, 2003

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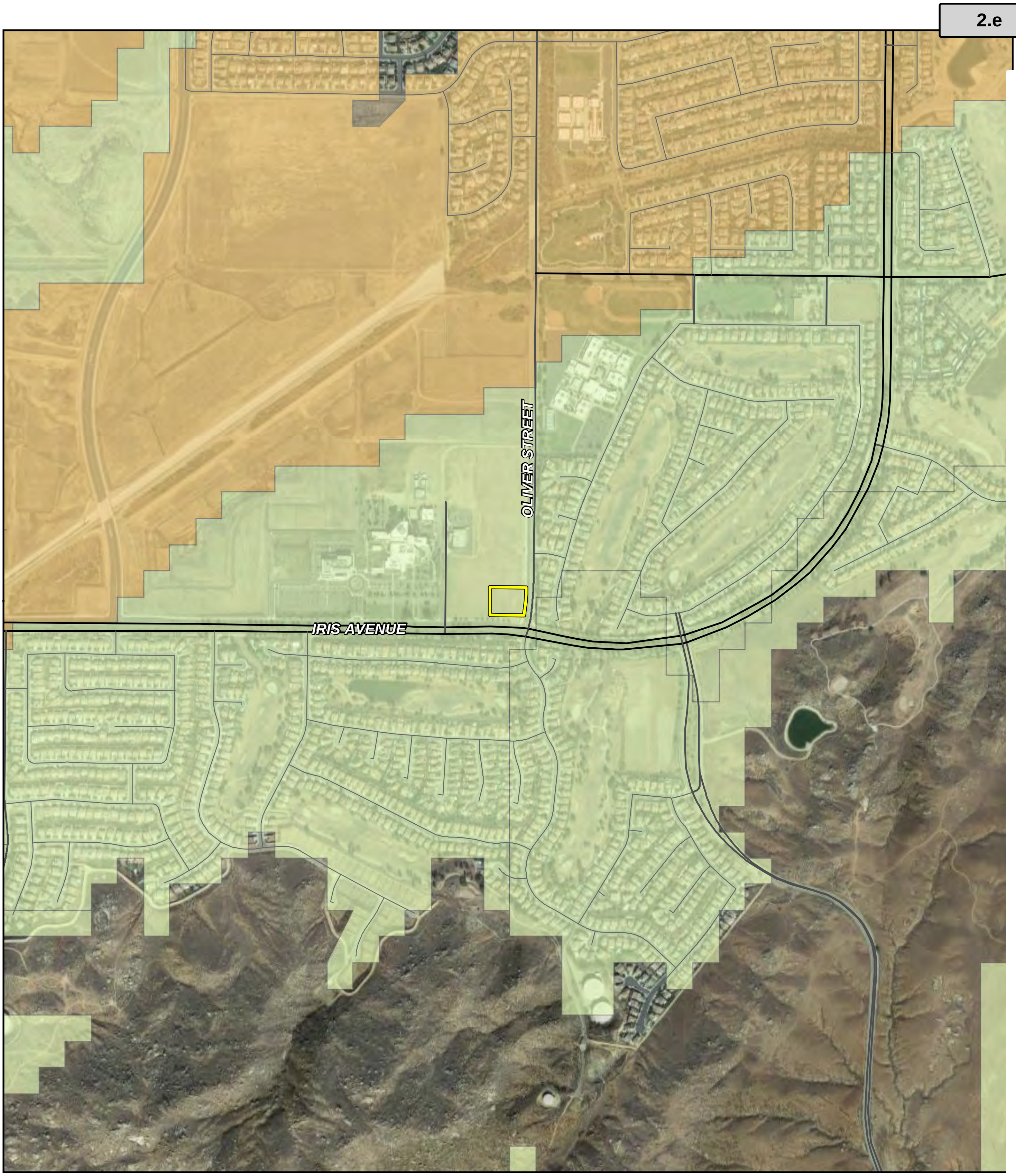


LSA

LEGEND

▭ Project Location

Liquefaction Susceptibilty

🟧 Moderate

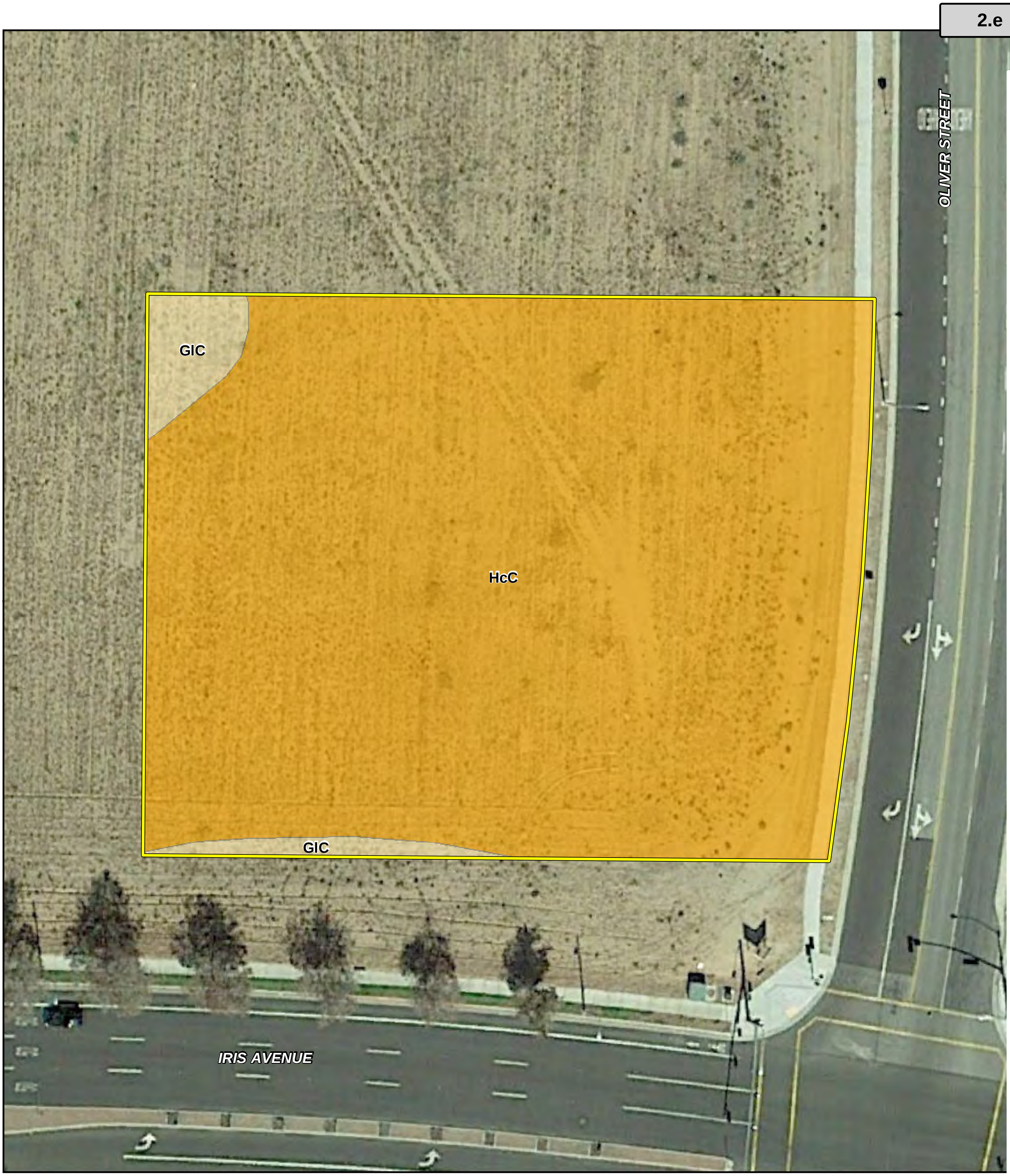
🟩 Low

SOURCE: Google Earth, 2016; Riverside County, 2003

FIGURE

ARCO Iris and Olive
Moreno Valle

Liquefaction Susceptibility



LSA

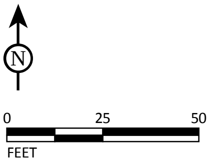
LEGEND

☐ Project Location

Soils

🟨 GlC: Gorgonio loamy sand, deep, 2 to 8 percent slopes

🟧 HcC: Hanford coarse sandy loam, 2 to 8 percent slopes



FIGURE

ARCO Iris and Olive
Moreno Valle

Soils

SOURCE: Google Earth, 2016; Soil Data Mart, 2015

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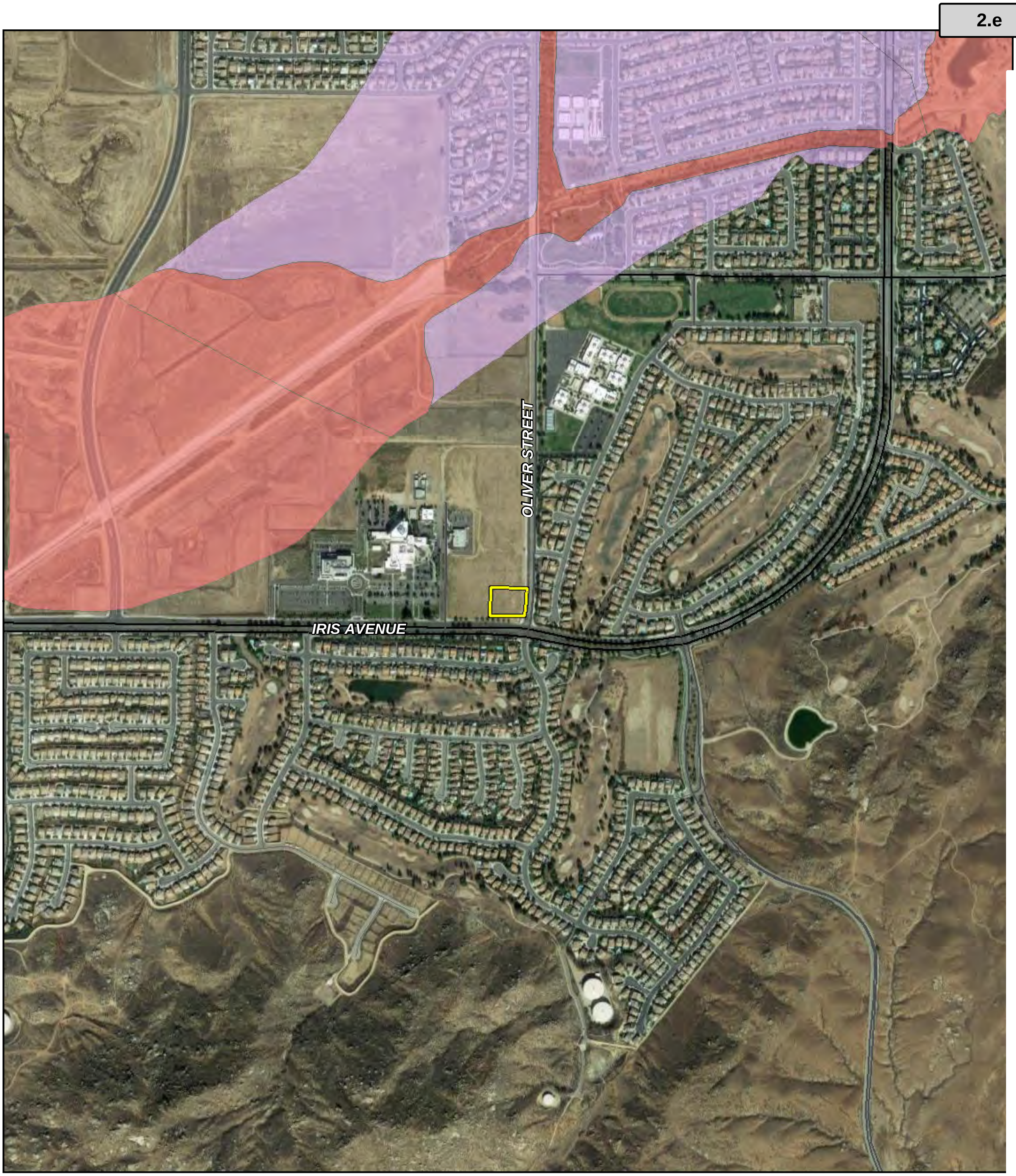

LSA

LEGEND

☐ Project Location

FEMA DFIRM Flood Zones

🟪 500-Year Floodplain

🟥 100-Year Floodplain

N

0 500 1000
FEET

FIGURE 1

ARCO Iris and Olive
Moreno Valle

FEMA Flood Zones

SOURCE: Google Earth, 2016; Riverside County, 2003; FEMA DFIRM Data, 2008.

I:\SAT1701\Reports\IS\fig10_Flood.mxd (12/12/2017)

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below(■) would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

	Aesthetics		Greenhouse Gas Emissions		Public Services
	Agricultural Resources		Hazards & Hazardous Materials		Recreation
	Air Quality		Hydrology/Water Quality		Transportation/Traffic
	Biological Resources		Land Use/Planning		Utilities/Service Systems
	Cultural Resources		Mineral Resources		Mandatory Findings of Significance
	Geology/Soils		Noise		Tribal Cultural Resources
	Tribal Cultural Resources		Population/Housing		

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation:

I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.	
I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.	X
I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.	
I find that the proposed project MAY have a "potential significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.	
I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.	

Gabriel Diaz
Signature

11/20/18
Date

Gabriel Diaz
Printed Name

For

EVALUATION OF ENVIRONMENTAL IMPACTS

1) A brief explanation is required for all answers except “No Impact” answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A “No Impact” answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g. the project falls outside a fault rupture zone). A “No Impact” answer should be explained where it is based on project-specific factors as well as general standards (e.g. the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. “Potentially Significant Impact” is appropriate if there is substantial evidence that an effect may be significant. If there are one or more “Potentially Significant Impact” entries when the determination is made, an EIR is required.

4) “Negative Declaration: Potentially Significant Unless Mitigation Incorporated” applies where the incorporation of mitigation measures has reduced an effect from “Potentially Significant Impact” to a “Less Significant Impact.” The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from “Earlier Analysis,” as described in (5) below, may be cross-referenced).

5) Earlier analysis may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063 (c) (3) (d). In this case, a brief discussion should identify the following:

   (a) Earlier Analysis Used. Identify and state where they are available for review.

   (b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.

   (c) Mitigation Measures. For effects that are “Less than Significant with Mitigation Measures Incorporated,” describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g. general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project’s environmental effects in whatever format is selected.

9) The analysis of each issue should identify: (a) the significance criteria or threshold used to evaluate each question; and (b) the mitigation measure identified, if any, to reduce the impact to less than significance.

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

I. AESTHETICS. Would the project:

a) Have a substantial adverse effect on a scenic vista?			X	

Less than Significant Impact. Scenic vistas are publicly accessible viewpoints that provide views of areas from the project site and only the project site that exemplify a community's environment. Scenic vistas within the City include Box Springs Mountains and Reche Canyon area to the north, the "Badlands" to the east, and the Mount Russel area to the south.[1]

The project site is located on the northwest corner of Oliver Street and Iris Avenue. Surrounding land uses include: one and two-story single-family residential units to the east, two-story single-family residential units to the south; vacant land to the west and north. Just beyond the vacant land to the west is the Kaiser Permanente Hospital. Permanent walls exist between the single-family residential homes located to the east and south of the project site, blocking scenic vistas on the first floor of the single-family residential homes. The single-family residential units to the south are approximately 10 feet higher in elevation compared to the project site. Ornamental trees are located along Iris Avenue to the north and south, partially blocking scenic views of the Box Springs Mountains, and are also located east of Oliver Street, partially blocking views of the Box Spring Mountains from the single-family residential units to the east of Oliver Street.

The proposed ARCO gas station/convenience store is 24.5 feet in height at its tallest point and the 42-foot by 116-foot canopy is 18.5 feet in height. Views of the Box Spring Mountains to the north of the project site would be intermittently blocked while traveling east on Iris Avenue due to ornamental trees located north of the street. While traveling west on Iris Avenue, views of the Box Spring Mountains will be partially and temporarily blocked by the new gas station building and canopy, while some views will continue to be blocked by the existing ornamental trees located north of Iris Avenue. The development of the Arco gas station will block some views of Box Spring Mountains to the north of the site, but is not considered a substantial adverse effect. The Upland Game Hunting Area can be seen traveling south on Oliver Street and views will be partially be blocked by the proposed Arco gas station. Overall, the development of the proposed project would have a **less than significant** impact on scenic vistas due to its limited size and height, and no mitigation is required.

b) Substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway?			X	

Less than Significant Impact. The proposed project site is currently vacant. Surrounding land uses include single-family residential to the east and south, and vacant land to the north and west. Two scenic highways are located within the City which includes State Route 60 (SR-60) and Moreno Beach Drive.[1] State Route 60 is located approximately 3 miles north of the project site while Moreno Beach Drive is located approximately 0.3 mile east of the project site. However, single-family residential units are currently blocking views of the project site from Moreno Beach Drive. Therefore, the development of the Project will have a **less than significant** impact related to scenic resources and no mitigation is required.

c) Substantially degrade the existing visual character or quality of the site and its surroundings?			X	

Less than Significant Impact. The construction phase of the project would introduce the use of machinery such as excavators and bull dozer. The presence of the construction equipment, as well as the construction activities would temporarily alter the visual character of portion of the proposed project. Construction staging areas, including earth stockpiling, storage of equipment and supplies, and related activities would contribute to a disturbed site, which would be a short-term visual impact. However, these construction activities would be temporary, so this would not create a permanent significant visual impact. Once the project is completed, the overall visual character of the area would return to its present condition.

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[1] Chapter 7 – Conservation, City of Moreno Valley General Plan, July 11, 2006.

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

Regarding long-term views, the project site is currently vacant and undeveloped. Single-family residential units are located to the south and east of the project site, with vacant undeveloped land located to the north and west. Just west of the vacant land is Kaiser Permanente Hospital (refer to Figures 2 and 3). The proposed project would comply with the City of Moreno Valley General Plan policies and regulations regarding the appearance of the proposed building and canopy. In addition, the height of the gas station building and fueling canopy is equal or less than a single-family home. Therefore, the minor changes in visual character that would result from implementation of the project would be **less than significant**. No mitigation is required.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?			X	

Less than Significant Impact. The project site presently does not contain any source of light. Sources of light in the area include street lighting along Iris Avenue and Oliver Street, as well as the fully improved roadways, and single-family residential lighting south and east of the site. Glare is daytime occurrence resulting from light reflecting off polished surfaces and affecting viewers in nearby moving vehicles. The development of the Arco AM/PM gas station would create new sources of light and glare. At night, the project's interior and exterior building lights and landscape lighting would be visible from the adjacent single-family residential uses, and to a lesser extent, from the surrounding public streets. However, these light sources would not have a significant impact on the night sky, as they would not exceed existing background light levels already present within the surrounding area. In addition, new construction shall comply with the City of Moreno Valley's General Plan and Municipal Code requirements. Therefore, lighting impacts would be **less than significant**. No mitigation is required.

Sources of glare as a result of project implementation include reflective building materials and vehicles parked within and traveling to and from the property. The amount of glare would depend on the location of the reflective surfaces and the direction of the sun. Any glare produced by the reflective surfaces would be temporary, as the location of the sun would be changing throughout the day. The project site is consistent with the City's General Plan and Zoning. Therefore, impacts from glare would be **less than significant.** No mitigation is required.

II. AGRICULTURAL RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project?

a) Convert Prime Farmland, Unique Farmland or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				X

No Impact. The California Department of Conservation, Farmland Mapping and Monitoring Program (FMMP) compile important farmland maps pursuant to the provisions of Section 65570 of the California Government Code. The maps are updated every two years using computer mapping system, aerial imagery, public review and field reconnaissance. According to the FMMP, the project site lies within "farmland of local importance (refer to Figure 5)."[2] The project site is surrounded by farmland of local importance and urban and built-up land, however, much of this land has already been developed or is planned to be developed into various urban uses. The closest Prime Farmland to the project site is located approximately 2.8 miles north of the proposed project site. Therefore, no Prime, Unique, or Statewide Importance Farmland is located within the project limits and **no impact** to state designated farmland would result from the development of the proposed project. No mitigation is required.

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				X

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[2] Department of Conservation, Farmland Mapping and Monitoring Program, http://maps.conservation.ca.gov/ciff/ciff.html (Accessed September 19, 2017).

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

No Impact. The California Land Conservation Act of 1965 – or commonly known as the Williamson Act, enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space uses. In return, landowners are given a lower property tax assessment. The project site does not contain land that is enrolled in a Williamson Act contract.[3] Additionally, according to the City of Moreno Valley's Zoning Map, the project site is currently zoned for "Neighborhood Commercial (NC)." In addition, the surrounding area contained existing or planned suburban development, and the City has no agricultural land use designations in its General Plan or zoning. Due to the project site not part of a Williamson Act contract, nor is zoned for agricultural uses, **no impact** associated with this issue would occur. No mitigation is required.

c) Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?				X

No Impact. The proposed project site is currently vacant and undeveloped. The site does not contain any forest land, Timberland Production, nor is it zoned for such uses. Therefore, the project will have **no impact** on forest land, timberland, or timberland zoned Timberland Production. No mitigation is warranted.

d) Would the project result in loss of forest land or conversion of forest land to non-forest use?				X

No Impact. Please refer to Checklist Response IIC.

e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?				X

No Impact. As noted above, the project site is currently vacant and is not utilized for agricultural production or timberland. Neither the project site nor adjacent facilities are being used for, or zoned for farmland or forest land. Please refer to Checklist Responses IIa and IIc. Therefore, the development of the proposed project will not result in the conversion of farmland to non-agricultural use or forest land to non-forest uses. **No impact** to the conversion of agricultural lands or forest lands would occur. No mitigation is required.

III. AIR QUALITY: Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

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

Less than Significant Impact. The project site is located in the South Coast Air Basin (Basin), which is under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). The Basin includes all of Orange County and portions of Los Angeles, Riverside, and San Bernardino Counties. The SCAQMD adopted an Air Quality Management Plan (AQMP), the main purpose of which is to describe air pollution control strategies to be taken by a city, county, or region classified as a nonattainment area in order to bring the area into compliance with federal and state air quality standards. A nonattainment area is considered to have air quality worse than the National Ambient Air Quality Standards (NAAQS) as defined in the Federal Clean Air Act. The Basin is in nonattainment for the federal and state standards for ozone (O3) and particulate matter less than 2.5 microns in diameter (PM2.5) and in nonattainment for the state standards for particulate matter less than 10 microns in diameter (PM10) and nitrogen dioxide (NO2). The Basin is

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[3] California Department of Conservation, Division of Land Resource Protection, Riverside County Williamson Act FY 2015/2016, Sheet 1 of 3, website: ftp://ftp.consrv.ca.gov/pub/dlrp/wa/Riverside_w_15_16_WA.pdf (Accessed September 19, 2017).

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

in attainment/maintenance/unclassified status for all other federal and state criteria pollutant standards.

Consistency with the draft 2016 AQMP (i.e., an update to the adopted 2012 AQMP) for the Basin means that a project will be consistent with the goals, objectives, and assumptions in the respective plan to achieve the federal and state air quality standards. Pursuant to the methodology provided in Chapter 12 of the 1993 SCAQMD CEQA Air Quality Handbook, consistency with the Basin 2016 AQMP is affirmed when a project (1) does not increase the frequency or severity of an air quality standards violation or cause a new violation; and (2) is consistent with the growth assumptions in the AQMP. For the proposed project to be consistent with the AQMP adopted by the SCAQMD, the pollutants emitted from the project should not exceed the SCAQMD daily threshold or cause a significant impact on air quality, or the project must already have been included in the AQMP projections. Additionally, if feasible mitigation measures are implemented and shown to reduce the impact level from significant to less than significant, a project may be deemed consistent with the AQMP.

According to the CEQA Air Quality Handbook, consistency with AQMP growth assumptions must be analyzed for new or amended General Plan elements, Specific Plans, and significant projects. The proposed project does not propose or require any change in land use designation, nor any increase in development intensity beyond that currently anticipated for the subject site. Because the land uses and development intensities proposed by the proposed project are consistent with the current adopted City General Plan and applicable zoning standards, the proposed project would not result in air quality violations. The proposed project would not generate operational-source criteria pollutant emissions not already reflected in the current AQMP regional emissions inventory. Based on the preceding, the proposed project is considered to be consistent with the AQMP. In addition, the proposed project is not considered a significant project (e.g., large-scale projects such as airports, electrical generating facilities, petroleum and gas refineries, designation of oil drilling districts, water ports, solid waste disposal sites, and offshore drilling facilities). As discussed in checklist response 3b, below, the proposed project's short-term construction and long-term pollutant emissions will not exceed the emissions thresholds established in the SCAQMD's CEQA Air Quality Handbook; therefore, the project would not result in an increase in the frequency or severity of any air quality standards violation and will not cause a new air quality standard violation. For these reasons, the proposed project is consistent with the City's General Plan and the regional AQMP. Therefore, impacts related to implementation of the AQMP would be **less than significant**, and no mitigation is required.

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation.			X	

Less than Significant Impact. The following analysis analyzes both short-term impacts caused by construction activities and long-term impacts caused by occupancy and operation of the project as proposed.[4]

Short-Term Impacts

Grading and other construction activities would result in combustion emissions from heavy-duty construction vehicles, haul trucks, and vehicles transporting construction crews. Exhaust emissions during these construction activities will vary daily as construction activity levels change. The grading phase of construction represent the most intense construction period during which daily emissions would be at their greatest level, based on the potential amount of equipment and duration of use. Construction equipment estimates are based on default values in CalEEMod (Version 2016.3.1). The project would balance grading activity onsite, which means that no soil would be transported offsite for disposal nor would soil be transported onsite for use in construction activities. Table A below provides a "worst-case" estimate of the short-term construction emissions during each calendar year. Table A indicates that the construction pollutant emissions from the proposed project would not exceed the corresponding SCAQMD daily emissions threshold criteria pollutants.

Currently, the Basin is designated as a nonattainment area for ozone, PM_{10}, and $PM_{2.5}$. Project construction will be required to comply with regional fugitive dust reduction practices (SCAQMD Rule 403) that assist in reducing short-term air pollutant emissions. The purpose of SCAQMD Rule 403 is to reduce the amount of particulate matter in the atmosphere resulting from man-made fugitive dust sources. Among the requirements under this rule, fugitive dust must

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[4] Air Quality and Greenhouse Gas Emissions Analysis and Screening Health Risk Assessment Technical Memorandum, October 27, 2017.

be controlled so that the presence of such dust does not remain visible in the atmosphere beyond the property line of the emission source. This is achieved by requiring actions to prevent, reduce, or mitigate dust emissions. Adherence to Rule 403 is a standard requirement for any construction activity occurring within the Basin. As depicted in Table A, construction emissions would not exceed daily SCAQMD thresholds, so impacts are **less than significant** and no mitigation is required (see Appendix A).

Table A: Estimated Construction Emissions

Construction Phase	Peak Daily Pollutant Emissions (lbs/day)					
	VOC	**NOx**	**CO**	**SOx**	**PM_{10}**	**$PM_{2.5}$**
Max. Daily Emissions During Year 1	2.60	20.78	13.93	0.02	6.84	3.85
Max. Daily Emissions during Year 2	3.34	15.98	13.53	0.02	0.93	0.89
SCAQMD Thresholds	**75**	**100**	**550**	**150**	**150**	**55**
Significant Emissions?	**No**	**No**	**No**	**No**	**No**	**No**

Source: Table D, LSA, November 2017 (Appendix A).

CO = carbon monoxide
lbs/day = pounds per day
NOx = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size
SCAQMD = South Coast Air Quality Management District
SOx = sulfur oxides
VOC = volatile organic compounds

Long-Term Impacts

Operational emissions from area sources include the combustion of natural gas for heating and hot water, engine emissions from landscape maintenance equipment, and the use of appliances. Mobile source emissions are associated with project-related vehicle trip generation. Based on the CalEEMod (Version 2016.3.1) default mode at full buildout, the project would generate approximately 1,111 average daily trips (ADT). The long-term operational emissions associated with the proposed project, calculated using the CalEEMod 2016.3.1 model are shown in Table B and demonstrates operational activities associated with the project would be below the SCAQMD threshold (Appendix A). Therefore, project-related long-term air quality impacts would be **less than significant**, and no mitigation is required.

Table B: Operational Emissions

Source	Pollutant Emissions (lbs/day)					
	VOC	**NOx**	**CO**	**SOx**	**PM_{10}**	**$PM_{2.5}$**
Area Sources	0.05	<0.01	<0.01	0.00	<0.01	0.02
Energy Sources	<0.01	0.02	0.02	<0.01	<0.01	<0.01
Mobile Sources	5.55	24.40	26.14	0.08	3.73	1.03
Total Project Emissions	**5.60**	**24.42**	**26.16**	**0.08**	**3.73**	**1.03**
SCAQMD Thresholds	55	55	550	150	150	55
Significant Emissions?	No	No	No	No	No	No

Source: Table F, LSA Associates, November 2017 (Appendix A).

CO = carbon monoxide
lbs/day = pounds per day
NOx = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size
SCAQMD = South Coast Air Quality Management District
SOx = sulfur oxides
VOC = volatile organic compounds

c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?			X	

The majority of the project-related operational emissions would be due to natural gas for heating and hot water and customer and employee vehicle trips to and from the project. Tables A and B indicate that all emissions of criteria pollutants from the proposed project would be less than the applicable SCAQMD thresholds over both the short and long term, therefore, no significant cumulative impacts would occur and no mitigation is required.

d) Expose sensitive receptors to substantial pollutant concentrations?			X	

Localized Significance Thresholds (LSTs) represent the maximum emissions from a project that would not result in an exceedance of the national or state ambient air quality standards. LSTs are based on the ambient concentrations of that pollutant within the project source receptor area (SRA) and the distance to the nearest sensitive receptor. For this project, the appropriate SRA is the Perris Valley Area (SRA 24) according to the project air quality analysis included in Appendix A of this report.

Short-Term LST Impacts

As previously described, it is expected that construction would occur in one phase, and the site is only 1.58 acres, so much less than 5 acres would be actively worked on during any given day. The closest sensitive receptors to the site are several existing residences surrounding the project site, the closest of which is approximately 100 feet. Table C shows that emissions are well below LST thresholds and thus would be less than significant and not require mitigation.

Table C: Construction Localized Impacts Analysis

Emissions Sources	NOx	CO	PM_{10}	$PM_{2.5}$
Onsite Emissions (lbs/day)	21.0	14.0	3.2	2.0
Local Significance Thresholds (lbs/day)	**125.0**	**670.0**	**5.9**	**3.2**
Significant Emissions?	**No**	**No**	**No**	**No**

Source: Table E, LSA Associates, November 2017 (Appendix A).

Note: Source Receptor Area 24 – Perris Valley, 1 acre, 31 meter distance

CO = carbon monoxide
lbs/day = pounds per day
NOx = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size

Long-Term LST Analysis

The potential long-term daily air pollutant emissions from the proposed gas station operational activities were calculated and compared with the appropriate LSTs from the SCAQMD based on CalEEMod 2016.3.1 model data from the project air quality assessment (Appendix A). As shown in Table D, the calculations determined that the operational emission rates would not exceed the LST thresholds for the closest sensitive receptors. Therefore, the proposed operational activity would not result in a localized significant air quality impact and no mitigation is required.

Table D: Long-Term Operational Localized Impacts Analysis

Emissions Sources	NOx	CO	PM_{10}	$PM_{2.5}$
Onsite Emissions (lbs/day)[1]	0.3	1.4	0.07	0.04
Local Significance Thresholds (lbs/day)	**125.0**	**670.0**	**1.50**	**1.00**
Significant Emissions?	**No**	**No**	**No**	**No**

Source: Table G, LSA Associates, November 2017 (Appendix A).

Note: Source Receptor Area 24 – Perris Valley, 1 acre, 31 meter distance.

[1] CalEEMod clearly delineates the onsite and offsite emissions and mobile source trips within the project area (i.e., driveways and parking lots).

CO = carbon monoxide
NOx = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size

Health Risk Assessment

The California Air Resources Board (ARB) has developed an Air Quality and Land Use Handbook (Handbook) intended to serve as a general reference guide for evaluating and reducing air pollution impacts associated with new projects that go through the land use decision-making process. According to the Handbook, recent air pollution studies have shown an association between respiratory and other non-cancer health effects and proximity to high-traffic roadways. The

Handbook recommends that planning agencies strongly consider proximity to these sources when finding new locations for “sensitive” land uses such as residential homes. Key recommendations in the Handbook include taking steps to avoid siting new, sensitive land uses within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater). Please note that this ARB buffer recommendation in the 2005 Handbook does not consider the ARB required enhanced vapor recovery systems for gasoline dispensing facilities. The Handbook specifically states that its recommendations are advisory and acknowledges land use agencies have to balance other considerations, including housing and transportation needs, economic development priorities, and other quality of life issues.

Table E: SCAQMD Toxic Air Contaminant Incremental Risk Thresholds

Maximum Individual Cancer Risk	≥ 10 in 1 million
Cancer Burden	> 0.5 excess cancer cases
Hazard Index	≥ 1.0

Source: Table C, LSA Associates, November 2017 (Appendix A).

e) Create objectionable odors affecting a substantial number of people?			X	

The SCAQMD Air Quality CEQA Guidelines establish risk thresholds for projects under CEQA that have the potential to expose sensitive receptors (including residential areas) or the general public to substantial levels of toxic air contaminants (TACs). Table E lists the air district’s TAC incremental risk thresholds for operation of a project.[5] As indicated in Table B, project operational emissions of criteria pollutants would be below SCAQMD significance thresholds; thus, they are not likely to have a significant impact on these residences given the distance and the dispersion that would occur. Exposure by individuals pumping gasoline would be limited in time, so the dose level for customers would be low. In addition, SCAQMD Rule 461 - Gasoline Transfer and Dispensing, require the installation of enhanced vapor recovery systems that would reduce the amount of vapor that would be emitted into the atmosphere by 95 to 98 percent from levels without such systems. This would further limit TAC doses and exposures, reducing potential health risk related to gasoline vapors to a level that is not significant. Overall, project impacts related to exposure of sensitive receptors to emissions are considered less than significant. The project health risk screening determined the project would not result in significant cancer or non-cancer risks from fuel dispensing activities (Appendix A)

Less Than Significant Impact. Project construction will generate limited odors over the short term, mainly fumes from gasoline- and diesel-powered construction equipment. These odors would be temporary and not likely to be noticeable beyond the project limits. The painting of buildings or the installation of concrete paving may also create temporary odors. SCAQMD Rule 1113 outlines standards for paint applications, while Rule 1108 identifies standards regarding the application of asphalt. Adherence to the standards identified in these SCAQMD Rules would reduce temporary odor impacts to a less than significant level, and no mitigation is required.

Land uses generally associated with long-term objectionable odors include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting operations, refineries, landfills, dairies, and fiberglass molding facilities. The site plan currently shows the trash enclosure will be in the west portion of the site, on the south side of the convenience store. The proposed project is a gas station and convenience store and waste odors are not expected to result in significant odor impacts because waste storage is required to adhere to City waste storage requirements (i.e., covered outdoor storage containers that are regularly emptied). Through the adherence of these existing requirements, the proposed project is not expected to generate long-term objectionable odors. Because the project would not involve any substantial short-term or long-term sources of strong negative odors, impacts are considered **less than significant** and no mitigation is required.

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[5] Air Quality and Greenhouse Gas Emissions Analysis and Screening Health Risk Assessment Technical Memorandum, October 27, 2017.

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

IV. BIOLOGICAL RESOURCES. Would the project:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U. S. Fish and Wildlife Service?		X		

Less Than Significant With Mitigation Incorporated. A Biological Resource Assessment and Multiple Species Habitat Conservation Plan Consistency Analysis and Habitat Assessment were prepared in September 2017 by LSA.[6] No special-status species were found or observed during the field reconnaissance. However, a literature review indicates that some special-interest species, including federal/State listed species, are known to occur in the region. These species include coastal California gnatcatcher (*Polioptila californica californica*), least Bell's vireo (*Vireo bellii pusillua*), western yellow-billed cuckoo (*Coccyzus americanus accidentalis*), San Bernardino kangaroo rat (*Dipodomya merriami parvus*), and Stephen's kangaroo rat (*Dipodomys stephensi*). Because the site is highly disturbed and lacking vegetation, the site is not suitable for the species listed above (see Appendix B).

The proposed Project site lies within the MSHCP survey area for burrowing owl. The project site has been recently plowed for weed abatement and is un-vegetated. Because the project site lies within the MSHCP survey area for burrowing owl (see Figure 6), a burrowing owl habitat assessment was conducted on August 30, 2017 and found no evidence of owls or owl sign, and no evidence of usable burrows. Because burrowing owls are mobile and seasonally migratory birds, **Mitigation Measure BIO-1** will reduce impacts to a **less than significant with mitigation incorporated**.

BIO-1 Prior to the issuance of grading permit, a pre-construction survey for burrowing owl shall be conducted by a qualified biologist no more than 30 days before the commencement of vegetation removal or ground disturbing activities to confirm the absence of burrowing owl onsite. If burrowing owl(s) are detected during the focused surveys, a Burrowing Owl Mitigation and Monitoring Plan ("Plan") shall be prepared by a qualified biologist and submitted to the California Department of Fish and Wildlife for review and approval prior to commencement of project activities. The Plan shall describe appropriate avoidance, minimization, and mitigation measures to reduce impacts to burrowing owls and ensure the implementation of appropriate and commensurate compensatory mitigation for the loss of burrowing owl nesting and foraging habitat. No further action is required if the 30-day pre-construction survey does not result in burrowing owl sign or observations.

b) Have a substantially adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U. S. Wildlife Service?			X	

Less Than Significant Impact. No riparian or riverine habitats were identified within or adjacent to the project site.[7] The project site has been recently plowed for weed abatement and is unvegetated. Emergent plant and plant debris includes Saharan mustard (*Brassica tounefortii*), Russian thistle (*salsola tragus*), doveweed (*Croton setigerus*), puncture vine (*Tribulus terrestris*), red brome (*Bromus madritensis ssp. rubens*), flax-leaved horseweed (*Erigeron bonariensis*), morning glory (*Calystegia macrostegia*), jimsonweed (*Datura wrightii*), and Fremont's goosefoot (*Chenopodium fremontii*). No MSHCP Narrow Endemic Plant species are known to occur within the project area. As a result, focused surveys are not required. A **less than significant** impact related to this issue would occur, and no mitigation is required.

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or				X

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[6] Biological Resources Assessment and MSHCP Consistency Analysis and Habitat Assessment, AM-PM Gasoline Service Station Project, City of Moreno Valley, LSA Associated Inc., September 2017.

[7] IBID.

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
other means?				

No Impact. The project site is currently vacant and is currently surrounded by residential and commercial uses. No federal jurisdictional waters, wetlands, and/or streambeds regulated by CDFW were identified within the project area. Therefore, **no impact** related to this issue would occur. No mitigation is required.

d) Interfere substantially with the movement of any resident or migratory fish or wildlife species or with established native resident migratory wildlife corridors, or impede the use of native wildlife nursery sites?			X	

Less Than Significant Impact. The project is currently vacant and is surrounded by residential and commercial uses. The project will not affect wildlife movement since the parcel is surrounded by urban development and species associated with urban environments are able to navigate these areas. A **less than significant** impact related to this issue would occur, and no mitigation is required.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?			X	
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan?			X	

Less Than Significant Impact. The site contains no native vegetation, drainages, or other biological resources and is not subject to the City's tree protection ordinance 9.16.210. The project site is located within the Multiple Species Habitat Conservation Plan (MSHCP) City of Moreno Valley Area Plan. The proposed project site is not located in a Criteria Cell and is not adjacent to Public-Quasi-Public or Conservation Land. Therefore, it is not subject to possible land conservation requirement under the MSHCP. However, the project will be required to pay the established MSHCP impact fee. For these reasons, the project will have **less than significant** impacts related to local biological ordinances and policies, and any Habitat Conservation Plans. No mitigation is required (see Appendix B).

V. CULTURAL RESOURCES. Would the project:

a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?		X		

Less than Significant with Mitigation Incorporated. There are no sites within Moreno Valley study area listed as a state landmark, nor are there any sites on the National Register of Historic Places. The old Moreno Schoolhouse was designated a City landmark[8] In 1988 but it is 2 miles northeast of the project site. According to the Cultural Resource Assessment,[9] eight (8) previous cultural resources studies have been conducted within a 1-mile radius of the Project, none of which included any portion of the Project area. Although no cultural resources have been documented in the Project area, 21 prehistoric sites have been recorded within 1-mile: 1 rock shelter with an associated milling feature, 4 bedrock milling complexes (milling surfaces on three or more outcrops), 1 bedrock milling feature with associated rock circle, and 15 bedrock milling feature sites (milling surfaces on 1 or 2 outcrops).[7] The nearest resource (bedrock milling feature) is approximate 0.4 mile south of the Project area. None of the resources documented within the study area were in any of the inventories, directories, or registers[7] (see Appendix C).

During the field reconnaissance on September 1, 2017, an isolated fragment of riveted steel irrigation pipe was identified on the project site. Isolated artifacts with no specific association are generally considered not significant and therefore are not "historical resources" under CEQA.[7] Although no other cultural resources were identified within the Project area, a subsurface concrete cistern was noted approximately 100 feet from the western edge of the property and an additional

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[8] Chapter 7 – Conservation, City of Moreno Valley General Plan, July 11, 2006.

[9] Cultural Resource Assessment, Sater Arco Project, City of Moreno Valley, LSA Associates Inc., October 2018.

fragment of riveted steel pipe was noted approximately 80 feet north of the site. Although no cultural resources were previously documented within or near the Project area by the records search, a water tank was once located on the parcel, a fragment of historic period irrigation pipe was identified during the survey and a concrete cistern remains to the west. Also, numerous prehistoric resources lie to the south and the sensitivity of the area between these resources and the Project is unknown. Therefore, **Mitigation Measures CUL-1 through CUL-5** shall be implemented to reduce impacts related to historical resources to **less than significant with mitigation incorporated**.

CUL-1 Prior to the issuance of a grading permit, the Developer shall retain a professional archaeologist to conduct monitoring of all mass grading and trenching activities. The Project Archaeologist shall have the authority to temporarily redirect earthmoving activities in the event that suspected archaeological resources are unearthed during Project construction. The Project Archaeologist, in consultation with the Consulting Tribe(s), the contractor, and the City, shall develop a Cultural Resources Management Plan (CRMP) in consultation pursuant to the definition in AB52 to address the details, timing and responsibility of all archaeological and cultural activities that will occur on the project site. A consulting tribe is defined as a tribe that initiated the AB 52 tribal consultation process for the Project, has not opted out of the AB52 consultation process, and has completed AB 52 consultation with the City as provided for in Cal Pub Res Code Section 21080.3.2(b)(1) of AB52. Details in the Plan shall include:

a. Project grading and development scheduling;

b. The Project archeologist and the Consulting Tribes(s) as defined in CR-1 shall attend the pre-grading meeting with the City, the construction manager and any contractors and will conduct a mandatory Cultural Resources Worker Sensitivity Training to those in attendance. The Training will include a brief review of the cultural sensitivity of the Project and the surrounding area; what resources could potentially be identified during earthmoving activities; the requirements of the monitoring program; the protocols that apply in the event inadvertent discoveries of cultural resources are identified, including who to contact and appropriate avoidance measures until the find(s) can be properly evaluated; and any other appropriate protocols. All new construction personnel that will conduct earthwork or grading activities that begin work on the Project following the initial Training must take the Cultural Sensitivity Training prior to beginning work and the Project archaeologist and Consulting Tribe(s) shall make themselves available to provide the training on an as-needed basis;

c. The protocols and stipulations that the contractor, City, Consulting Tribe(s) and Project archaeologist will follow in the event of inadvertent cultural resources discoveries, including any newly discovered cultural resource deposits that shall be subject to a cultural resources evaluation.

CUL-2 Prior to the issuance of a grading permit, the Developer shall secure agreements with the Pechanga Band of Luiseño Indians and Soboba Band of Luiseño Indians for tribal monitoring. The Developer is also required to provide a minimum of 30 days advance notice to the tribes of all mass grading and trenching activities. The Native American Tribal Representatives shall have the authority to temporarily halt and redirect earth moving activities in the affected area in the event that suspected archaeological resources are unearthed. If the Native American Tribal Representatives suspect that an archaeological resource may have been unearthed, the Project Archaeologist or the Tribal Representatives shall immediately redirect grading operations in a 100-foot radius around the find to allow identification and evaluation of the suspected resource. In consultation with the Native American Tribal Representatives, the Project Archaeologist shall evaluate the suspected resource and make a determination of significance pursuant to California Public Resources Code Section 21083.2.

CUL-3 In the event that Native American cultural resources are discovered during the course of grading (inadvertent discoveries), the following procedures shall be carried out for final disposition of the discoveries:

a. One or more of the following treatments, in order of preference, shall be employed with the tribes. Evidence of such shall be provided to the City of Moreno Valley Planning Department:

i. Preservation-In-Place of the cultural resources, if feasible. Preservation in place means avoiding the resources, leaving them in the place they were found with no development affecting the integrity of the resources.

ii. Onsite reburial of the discovered items as detailed in the treatment plan required pursuant to Mitigation Measure CUl-1. This shall include measures and provisions to protect the future reburial area from any future impacts in perpetuity. Reburial shall not occur until all legally required cataloging and basic recordation have been completed. No recordation of sacred items is permitted without the written consent of all Consulting Native American Tribal Governments as defined in CUL-1.

CUL-4 The City shall verify that the following note is included on the Grading Plan:

> "If any suspected archaeological resources are discovered during ground-disturbing activities and the Project Archaeologist or Native American Tribal Representatives are not present, the construction supervisor is obligated to halt work in a 100-foot radius around the find and call the Project Archaeologist and the Tribal Representatives to the site to assess the significance of the find."

CUL-5 If potential historic or cultural resources are uncovered during excavation or construction activities at the project site, work in the affected area must cease immediately and a qualified person meeting the Secretary of the Interior's standards (36 CFR 61), Tribal Representatives, and all site monitors per the Mitigation Measures, shall be consulted by the City to evaluate the find, and as appropriate recommend alternative measures to avoid, minimize or mitigate negative effects on the historic, or prehistoric resource. Determinations and recommendations by the consultant shall be immediately submitted to the Planning Division for consideration, and implemented as deemed appropriate by the Community Development Director, in consultation with the State Historic Preservation Officer (SHPO) and any and all Consulting Native American Tribes as defined in CR-1 before any further work commences in the affected area.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?		X		

Less than Significant with Mitigation Incorporated. According to the South Central Coastal Information Center, there have been thirty (30) reported cultural resource areas within 1-mile of the project, one prehistoric site within the project's boundary. With **Mitigation Measures CUL-1 through CUL-5** noted in CEQA Checklist V(a) discussion above would reduce the impact to **less than significant with mitigation incorporated** (see Appendix C).

c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?		X		

Less than Significant with Mitigation Incorporated. The project site contains Alluvial Fan Deposits which consist of unconsolidated gravel, sand, and silt. Cobble- and boulder-size clasts are also present and become more abundant closer to the hills and mountains. These sediments were eroded from higher elevations, carried by flooding streams and debris flows, and deposited in a fan or lobe shape at the base of the hills. Based on the geology of the site, construction of the project would not impact, either directly or indirectly, any known unique paleontological resource or site of unique geologic features. Given the site's history of disturbance, the potential for undiscovered paleontological or geological resources is considered low. However, ground-disturbing activities at the project site still have the potential to disturb previously unknown resources. With implementation of **Mitigation Measure CUL-6,** a **less than significant with mitigation incorporated** impact to paleontological resources would occur.

CUL-6 If paleontological resources (fossils) are discovered during project grading, work will be halted in that area until a qualified paleontologist can be retained to assess the significance of the find. The project paleontologist shall monitor remaining earthmoving activities at the project site and shall be equipped to record and salvage fossil resources that may be unearthed during grading activities. The paleontologist shall be empowered to temporarily halt or divert grading equipment to allow recording and removal of the unearthed resources. Any fossils found shall be evaluated in accordance with the CEQA Guidelines and offered for curation at an accredited facility approved by the City of Moreno Valley. Once grading activities have ceased or the paleontologist determines that monitoring is no longer necessary, monitoring activities shall be discontinued. This measure shall be implemented to the satisfaction of the City Planning Division.

d) Disturb any human remains, including those interred outside of formal cemeteries?		X		

Less than Significant with Mitigation Incorporated. California Health and Safety Code §7050.5, Public Resources Code § 5097.98, and § 15064.5 of the California Code of Regulations (CEQA Guidelines) mandate procedures to be followed, including that, if human remains are encountered during excavation, all work must halt, and the County Coroner must be notified (Section 7050.5 of the California Health and Safety Code). The coroner will determine whether the remains are of forensic interest. If the coroner, with the aid of the supervising archaeologist, determines that the remains are prehistoric, the coroner will contact the Native American Heritage Commission (NAHC).

The NAHC will be responsible for designating the most likely descendant (MLD) responsible for the ultimate disposition of the remains, as required by Section 5097.98 of the Public Resources Code. The MLD should make his/her recommendations within 48 hours of their notification by the NAHC. This recommendation may include A) the non-destructive removal and analysis of human remains and items associated with Native American human remains; (B) preservation of Native American human remains and associated items in place; (C) relinquishment of Native American human remains and associated items to the descendants for treatment; or (D) other culturally appropriate treatment. Section 7052 of the Health & Safety Code also states that disturbance of Native American cemeteries is a felony. With adherence to these existing regulation and **Mitigation Measure CUL-7** impacts would be **less than significant with mitigation incorporated.**

CUL-7 If human remains are discovered, no further disturbance shall occur in the affected area until the County Coroner has made necessary findings as to origin. If the County Coroner determines that the remains are potentially Native American, the California Native American Heritage Commission shall be notified within 24 hours of the published finding to be given a reasonable opportunity to identify the "most likely descendant". The "most likely descendant" shall then make recommendations, and engage in consultations concerning the treatment of the remains (California Public Resources Code 5097.98). (GP Objective 23.3, CEQA).

VI. GEOLOGY AND SOILS. Would the project:

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving:

(i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.			X	

Less Than Significant Impact. The project site is located within the Peninsular Range Geomorphic Province, an area characterized by active northeast trending strike slip faults, including the San Jacinto Fault and the Elsinore Fault (see Figure 7).[10] The project site is not located within the boundaries of an Earthquake Fault Zone as defined by the Alquist-Priolo Earthquake Fault Zoning Act of 1972 (California Geological Survey 2005).[10] There are no known active or potentially active faults that traverse the project site and the risk of ground rupture due to a fault displacement beneath the site is low. The closest known fault is the San Jacinto-San Jacinto Valley (San Bernardino) Fault zone approximately 4.1 miles northeast of the project site.[10,11] Therefore, impacts related to earthquake faults would be **less than significant.** No mitigation is required (see Appendix D).

(ii) Strong seismic ground shaking?			X	

Less than Significant. Like all of Southern California, the project site will continue to be subject to ground shaking generated from activity on local and regional faults. In addition, the site lies in relative close proximity to an active fault;[9] therefore, during the life of the proposed improvements, the property will probably experience similar moderate to occasionally high ground shaking from these fault zones, as well as some background shaking from other seismically active areas of the Southern California region. However, the design and construction in accordance with the current California Building Code (CBC) requirements is anticipated to address the issues related to potential ground shaking. With the implementation of California Building Code (CBC) requirement, seismic-related impacts would be **less than significant.** No mitigation is required.

(iii) Seismic-related ground failure, including liquefaction?			X	

Less than Significant. Liquefaction describes the phenomenon where ground shaking works cohesion less soil particles into a tighter packing, which induces excess pore pressure. There are three basic factors that must exist concurrently in order for liquefaction to occur. These factors include:

- A source of ground shaking, such as an earthquake, capable of generating soil mass distortions;
- A relatively loose silty and/or sandy soil; and
- A relatively shallow groundwater table (within approximately 50 feet below ground surface) or completely saturated soil conditions that will allow positive pore pressure generation.

The site is not located within a liquefaction zone (see Figure 8).[8,12] Considering the granular nature of the existing subsoils, along with the absence of groundwater table within 50-feet, potential susceptibility for liquefaction due to an earthquake is considered unlikely.[13] Therefore, a **less than significant** impact related to this issue would occur. No mitigation is required.

(iv) Landslides?			X	

Less than Significant. The geologic and topographic characteristics of an area, often determine its potential for landslides. Steep slopes, the extent of erosion, and the rock composition of a hillside all contribute to the potential for slope failure and landslide events. In order to fail, unstable slopes typically need to be disturbed; the common triggering mechanisms of slope failure include undercutting of slopes by erosion or grading, saturation of marginally stable slopes by rainfall or irrigation, and shaking of marginally stable slopes during earthquakes. The project is not located in an area that is susceptible to landslides.[14,15] The Upland Game Hunting Area is located approximately 0.4 mile south of the site, which has the potential for landslides. However, the proposed project would be required to adhere to applicable regulations regarding the City's Building Ordinance. With the use of these safety regulations, the potential for landslides to occur within the project site is considered to be low. The impacts related to landslides would be **less than significant.** No

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[10] Preliminary Geotechnical Engineering Investigation, Salem Engineering Group, Inc., November 30, 2017.

[11] Figure 6-3: Geologic Faults and Liquefaction, City of Moreno Valley General Plan, July 11, 2006.

[12] 7.4 – Liquefaction, Preliminary Geotechnical Engineering Investigation, Salem Engineering Group, Inc., November 30, 2017.

[13] Feasibility Study Report of Soils and Foundation Evaluations, Soils Southwest, Inc., November 12, 2003.

[14] Section 4.12 "Geology and Soils," County of Riverside Environmental Impact Report No. 521, March 2014.

[15] 7.6 – Landslides, Preliminary Geotechnical Engineering Investigation, Salem Engineering Group, Inc., November 30, 2017.

mitigation is required.

(b) Result in substantial soil erosion or the loss of topsoil?		X		

Less than Significant ***With Mitigation Incorporated***. The project site is underlain by a mix of Gorgonio loamy sand and Hanford coarse sandy loam (see Figure 9).[16] Prior to the issuance of grading permits, the project proponent would be required to prepare and submit detailed grading plans for the project site. These plans must be prepared in conformance with applicable standards of the City's Grading Ordinance.

Construction activities associated with the development of the proposed Project would expose underlying soils, thus increasing their susceptibility to erosion until the Project is fully developed. Development of the site would involve more than one acre of ground disturbance; therefore, the proposed project is required to obtain a National Pollutant Discharge Elimination System (NPDES) permit. A Storm Water Pollution Prevention Plan (SWPPP) would also be required to address erosion and discharge impacts associated with the proposed onsite grading by implementing appropriate best management practices (BMPs). Adherence to the BMPs contained in the SWPPP and **Mitigation Measures HYD-1** through **HYD-3** would ensure that the potential for soil erosion impacts would be reduced to **less than significant *with mitigation incorporated*** levels by implementation of existing water quality regulations. No mitigation is required.

(c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?			X	

Less than Significant With Mitigation Incorporated. Subsidence is the sudden sinking or gradual downward settling of the earth's surface with little or no horizontal movement. Subsidence is caused by a variety of activities, which include, but are not limited to, withdrawal of groundwater, pumping of oil and gas from underground, the collapse of underground mines, liquefaction, and hydrocompaction. The Project site is generally flat and gently slopes down to the northwest. On-site soils primarily consist of upper 3 to 4 feet of dry, loose and compressible silty fine sand, overlying gravelly fine to medium coarse sand of moderate consistency with scattered rock fragments and rocks.[17] Due to the absence of groundwater within 50-feet and the relatively flat site topography, the potential susceptibility for onsite soil liquefaction and lateral spreading due to an earthquake is considered low.[12,18]

No structural fills and/or load bearing foundations and concrete slabs should be constructed bearing directly on the surface soils currently existing on the Project site.[12] Therefore, with implementation of **Mitigation Measure GEO-1** will ensure a less than significant impact with development of the proposed Project. The project site is not located within an area that is susceptible to landslides.[10] The proposed project would be required to adhere to applicable regulations ensuring building safety; a **less than significant impact with mitigation incorporated** would result from the construction and operation of the proposed onsite uses with implementation of all applicable regulations and **Mitigation Measure GEO-1**. (see Appendix E).

GEO-1 Prior to issuance of building permits, the project applicant or its designee shall demonstrate all recommendations contained in project-specific geotechnical and/or soils and foundation evaluation report by Salem Engineering Group Inc. dated November 30, 2017 are implemented. This measure shall be implemented to the satisfaction of the City Engineer.

(d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?		X		

Less Than Significant with Mitigation Incorporated. Expansive soils are fine-grained silts and clays which are subject to

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[16] Web Soil Survey, United States Department of Agriculture, Natural Resources Conservation Service, August 10, 2017. https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm (Accessed October 2, 2017).

[17] Feasibility Study Report of Soils and Foundation Evaluations, Soils Southwest, Inc., November 12, 2003.

[18] 7.5 – Lateral Spreading, Preliminary Geotechnical Engineering Investigation, Salem Engineering Group, Inc., November 30, 2017.

swelling and contracting. The swelling and contracting is due to the amount of fine-grained clay materials present in the soils and the amount of moisture either introduced or extracted from the soils. According to the Soils Feasibility Study,[13] onsite soils are considered non-expansive. However, **Mitigation Measure GEO-2** will ensure impacts related to expansive soils are reduced to **less than significant with mitigation incorporated** (see Appendix E).

GEO-2 Prior to the issuance of a grading permit, the project applicant shall provide proof to the City of Moreno Valley that supplemental laboratory testing has been conducted for expansive soils and that any identified conditions in this regard will be eliminated or reduced to safe levels by proposed grading activities and/or foundation design. This measure shall be implemented to the satisfaction of the City Engineer.

(e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?				X

No Impact. The proposed project is expected to connect to existing sewer main lines and service lines. The project would not use septic tanks or other alternative wastewater disposal system. Therefore, the development of the project would have **no impact** related to this issue. No mitigation measures are required.

VII. GREENHOUSE GAS EMISSIONS. Would this project?

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			X	

This section provides an analysis of greenhouse gas (GHG) emissions associated with the proposed project. This analysis examines the short-term construction and long-term operational impacts of the proposed project as it relates to greenhouse gases. A detailed assessment of project-related GHG emissions is included in Appendix A.

Calculation of Greenhouse Gas Emissions

The project's GHG emissions during construction and mobile sources during project operation were estimated by using the CalEEMod 2016.3.1 computer model developed and maintained by the South Coast Air Quality Management District (SCAQMD). The project's GHG emissions from onsite equipment were estimated using the emission factors found on the SCAQMD website.

The proposed project would generate a total of 198 metric tons (MT) of CO2e GHGs during construction plus 6.6 metric tons of CO2e each year amortized over a 30-year period consistent with SCAQMD methodologies. The long-term GHG emissions of the project are estimated to be 1,235 metric tons of CO2e per year (Appendix A).

For comparison, the existing emissions from the entire SCAG region are estimated to be approximately 176.79 MMT/yr of CO2e, and the existing emissions for the entire State are estimated at approximately 496.95 MMT/yr of CO2e. The carbon dioxide, methane, and nitrous oxide emissions that would be associated with the proposed project is less than a thousandth of one percent of California's total emissions for carbon dioxide, methane, and nitrous oxide.

According to the Air Quality Analysis, the project's short- and long-term GHG emissions would be lower than the SCAQMD's interim Tier 3 GHG emissions "efficiency" threshold for commercial projects of 1,400 MT/yr of CO2e even assuming worst-case conditions (i.e., not accounting for the elimination of the ongoing GHG emissions from the existing service station). Since projected short- and long-term GHG emissions are well below the SCAQMD's efficiency threshold, cumulative GHG impacts are **less than significant** and no mitigation measures are required.

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?			X	

Less Than Significant Impact. The City of Moreno Valley has adopted the following goals and policies under the City's General Plan to reduce greenhouse gas emissions relative to the proposed project:

Policy 2.10.4 Landscaping and open spaces should be provided as an integral part of project design to enhance building design, public views, and interior spaces; provide buffers and transitions as needed; and facilitate energy and resource conservation.

Policy 6.7.6 Require building construction to comply with the energy conservation requirements of Title 24 of the California Administrative Code.

Policy 7.5.1 Encourage building, site design, and landscaping techniques that provide passive heating and cooling to reduce energy demand.

Policy 7.5.4 Encourage the use of solar power and other renewable energy systems.

The project is required to meet Title 24 energy conservation requirements and all applicable Green Building Code requirements regarding energy and water conservation. With implementation of these regulatory requirements, project-related GHG emissions will be **less than significant** so the project will not conflict with any applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases, and no mitigation is required.

VIII. HAZARDS AND HAZARDOUS MATERIALS. Would the project?

a) Create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials?			X	

Less than Significant Impact. Potentially hazardous materials such as fuels, lubricants, and solvents would be used during project construction. The proposed ARCO AM/PM gas station would utilize hazardous materials on a daily basis including gasoline, oil, solvents, and cleaning products. Two underground storage tanks (USTs) (22,000 and 25,000 gallons) are proposed on the east side of the proposed canopy along with 8 MPDs (16 total fueling stations). The transport, use, and storage of hazardous materials during construction of the project would be conducted in accordance with all applicable State and federal laws, such as the Hazardous Materials Transportation Act, Resource Conservation and Recovery Act, the California Hazardous Material Management Act, and the California Code of Regulations, Title 22. Compliance with all applicable laws and regulations during project construction would reduce the potential impact associated with the routine transport, use, storage, or disposal of hazardous materials to a **less than significant** level. No mitigation is required.

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			X	

Less Than Significant Impact. A Phase I Environmental Site Assessment (ESA)[19] was completed for an 18.81-acre parcel which encompasses the 1.58-acre project site (see Appendix F). There is no indication if the proposed project site was once used for agricultural purposes. Dating back to 1967, the project site has been vacant and undeveloped with the exception of a structure that once stood on the southeast corner of the property (probably a water tank), but was removed sometime between 1978 and 1996.[20] According to the EnviroStor website[21] and the Phase I ESA, no hazardous material sites on or adjacent to the proposed project site were identified. The closest site is the La Jolla Elementary School located approximately 1-mile north of the project site.[15] The site type was a school investigation with no action required as of

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[19] Phase I ESA, Registered Environmental Assessor, September 26, 2003.

[20] Cultural Resource Assessment, Sater Arco Project, City of Moreno Valley, LSA Associates Inc., September 2017.

[21] EnviroStor, Department of Toxic Substances Control, 2007.

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

September 8, 2003. The gas station use will be required to comply with all applicable federal, state, and local laws and regulations regarding hazardous materials. The underground fuel storage tanks will also require permitting and monitoring by the City Fire Department and the County Department of Environmental Health as the Certified Unified Program Agency (CUPA) for Riverside County. With this compliance, the project would have a **less than significant** impact on the release of hazardous materials and no mitigation is required.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?			X	

Less Than Significant Impact. The nearest school is the Landmark Middle School located at 15261 Legendary Drive approximately 0.2 mile north of the project site. The City does not have jurisdiction with respect to the location, design, or construction of school facilities. However, the City works with the Moreno Valley Unified School District concerning the design of roads and other public improvements in and around school sites, and is responsible for fire, police, and public safety concerns involving all facilities within the City, including schools. The handling of hazardous materials or emission of hazardous substances, if present, will be in accordance with a Hazardous Materials Business Emergency Plan administered by the City Fire Prevention Bureau, as applicable, in accordance with California Health and Safety Code Section 25507 and other local, state, and federal standards, ordinances, and regulations.

Compliance with Health and Safety Code Section 25507 will ensure that impacts associated with environmental and health hazards related to an accidental release of hazardous materials or emissions of hazardous substance near existing or proposed schools are **less than significant.** No mitigation is required.

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result would it create a significant hazard to the public or the environment?				X

No Impact. According to the Phase I ESA,[14] the proposed project site is not located on a list of hazardous material sites pursuant to Government Code Section 65962.5. Additionally, the project site is not located on the EnviroStor website.[16] Therefore, **no impact** related to this issue will occur and no mitigation is required.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?			X	

Less Than Significant Impact. The closest airport is the March Air Reserve Base located approximately 3.5 miles west of the project site. The project site is not located within a Compatibility Zone of the March Air Reserve Base.[22] Because the project site lies outside the Compatibility Zones, no impact would occur related to the safety of people within an airport land use plan. No mitigation is required.

f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?				X

No Impact. The project does not lie within the vicinity of a private airstrip. Therefore, the project will have **no impact** related to the safety of people near a private airstrip. No mitigation is required.

g) Impair implementation of, or physically interfere with an adopted emergency response plan or emergency evacuation plan?		X		

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[22] Map MA-1: Compatibility Map, March Air Reserve Base/Inland Port Airport Land Use Compatibility Plan, Riverside County Airport Land Use Commission, November 13, 2017.

Less Than Significant with Mitigation Incorporated. The Project site is currently vacant and unoccupied. Police, fire, and paramedic services are currently provided by the City to the entire area, including the project site. The project site will be accessible via two limited-access driveways, one on Iris Avenue and one on Oliver Street (right-in, right-out only). A detailed traffic study and site circulation study were prepared for this project to determine the appropriate vehicle stacking distances to provide onsite emergency access (see Appendix J). Due to the existing center divider on Iris Avenue and the proposed center divider on Oliver Street, **Mitigation Measure HAZ-1** will ensure a **less than significant impact with mitigation incorporated** related to emergency plans and access.

HAZ-1 Prior to issuance of construction permit, the project applicant shall provide proof to the City of Moreno Valley that City police and fire services, as applicable, have reviewed and approved the emergency response plan.

h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?			X	

No Impact. The project in and of itself is not located within a wildfire susceptibility area, respectively. However, the Upland Game Hunting Area is located approximately 0.4 mile south of the project site and is identified as a high wildfire susceptibility area.[23] In the event of a fire emergency within the proposed project, the Moreno Valley Fire Department, more specifically Fire Station 91 located at 16110 Lasselle Street approximately 1.3 miles west-southwest of the project site, would provide initial fire protection services. Because of the close proximity of the Moreno Valley Fire Department and the distance from the Upland Game Hunting Area, a **less than significant** impact would occur related to wildland fire. No mitigation is required.

IX. HYDROLOGY AND WATER QUALITY. Would the project:

a) Violate any water quality standards or waste discharge requirements?		X		

Less Than Significant Impact with mitigation incorporated. The proposed Project is located within the Santa Ana River Watershed. The project site is currently undeveloped. The Project site is currently 100 percent pervious and has been routinely disked. Construction of the project will involve site clearing, rough grading and compaction, pouring of concrete and asphalt, and construction of the structures. The project site clearing and grading phases will disturb vegetation and surface soils, potentially resulting in erosion and sedimentation. If left exposed and with no vegetative cover, the project site's bare soil could be subject to additional wind and water erosion. Since the proposed project involves over one acre of ground disturbance, it is subject to National Pollution Discharge Elimination System (NPDES) requirements and must implement a Storm Water Pollution Prevention Plan (SWPPP). Implementation of site-specific best management practices (BMPs), as established by the SWPPP, will ensure all impacts related to erosion and sedimentation from ground disturbance are less than significant (see Appendices G and H).

Under existing conditions, the project site drains in a northwesterly direction toward the Kaiser Permanente Hospital. The proposed project includes three bio-filtration systems located throughout the site. To address potential water contaminants, the project is required to comply with applicable federal, state, and local water quality regulations in accordance with the project-specific NPDES and SWPPP. Given compliance with all applicable federal, state, and local laws regulating surface water quality, and with implementation of **Mitigation measures HYD-1** through **HYD-3**, the proposed project as designed will result in a **less than significant impact with mitigation incorporated** to any water quality standards or waste discharge. No mitigation is required.

HYD-1 Prior to the issuance of a grading permit, the project applicant shall file and obtain a Notice of Intent (NOI) with the Regional Water Quality Control Board (RWQCB) in order to be in compliance with the State NPDES General Construction Storm Water Permit for discharge of surface runoff associated with

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[23] Figure S-11 "Wildfire Susceptibility," Riverside County General Plan, December 15, 2015.

construction activities. Evidence that this has been obtained (i.e., a copy of the Waste Discharger's Identification Number) shall be submitted to the City for coverage under the NPDES General Construction Permit. The NOI shall address the potential for an extended and discontinuous construction period based on funding availability.

HYD-2 Prior to the issuance of a grading permit, the project applicant shall prepare a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP shall include a surface water control plan and erosion control plan citing specific measures to control on-site and off-site erosion during the entire grading and construction period. In addition, the SWPPP shall emphasize structural and nonstructural Best Management Practices (BMPs) to control sediment and non-visible discharges from the site. The SWPPP will include inspection forms for routine monitoring of the site during construction phase to ensure NPDES compliance and additional BMPs and erosion control measures will be documented in the SWPPP and utilized if necessary. The SWPPP shall address the potential for an extended and discontinuous construction period based on funding availability. The SWPPP will be kept on site for the entire duration of project construction and will be available to the local RWQCB for inspection at any time. BMPs included in the SWPPP may include the following:

- Sediment discharges from the site may be controlled by the following: sandbags, silt fences, straw wattles and temporary basins (if deemed necessary), and other discharge control devices. The construction and condition of the BMPs will be periodically inspected during construction and repairs will be made when necessary as required by the SWPPP.

- Materials that have the potential to contribute to non-visible pollutants to storm water must not be placed in drainage ways and must be contained, elevated, and placed in temporary storage containment areas.

- All loose piles of soil, silt, clay, sand, debris, and other earthen material shall be protected in a reasonable manner to eliminate any discharge from the site. Stockpiles will be surrounded by silt fences and covered with plastic tarps.

- In addition, the construction contractor shall be responsible for performing and documenting the application of BMPs identified in the SWPPP. Weekly inspections shall be performed on sandbag barriers and other sediment control measures called for in the SWPPP. Monthly reports and inspection logs shall be maintained by the Contractor and reviewed by the City and the representatives of the State Water Resources Control Board. In the event that it is not feasible to implement specific BMPs, the City can make a determination that other BMPs will provide equivalent or superior treatment either on or off site.

HYD-3 Prior to the issuance of a grading permit, the applicant shall submit a Water Quality Management Plan (WQMP) to the City, for review and approval. The project shall implement project design features identified in the Water Quality Management Plan. This measure shall be implemented to the satisfaction of the City Public Works Department.

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?			X	

Less Than Significant Impact. Groundwater in the project area is managed and distributed by the Eastern Municipal Water District (EMWD). The EMWD is required by state law (Urban Water Planning Management Act or AB 797 in

Attachment: Exhibit A - Initial Study / Mitigated Negative Delaration (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

1983) to prepare an Urban Water Management Plan (UWMP) to identify its sources/supplies of potable water, its historical and projected consumption by its customers, and evaluate various mandated scenarios for water shortages (e.g., single dry year, and multiple dry years) to assure its customers and the state that it will have adequate water supplies now and in the future, even under expected drought conditions.

The 2015 UWMP concluded the City could supply water to its customers until at least 2040 under single dry and multiple drought year scenarios. The project does not involve a General Plan Amendment or Zone Change, so the City in its UWMP has accounted for future water consumption of existing and planned land uses, including residential and commercial uses such as the proposed project.

The project is also subject to NPDES requirements and will be designed and constructed to ensure compliance with the water quality standards and waste discharge requirements. Compliance with these regulations, along with all City water supply requirements, will ensure there will be no significant impacts related to groundwater supply or recharge resulting from the proposed project. A **less than significant** impact would occur related to this issue and no mitigation is required.

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?			X	

Less Than Significant Impact. Development of the proposed project (buildings and pavement) will alter the amount of existing impervious surface area and the amount of generated runoff. Currently, runoff generally drains from the southeast to the northwest. No streams, rivers, or other drainage features are located on site. The proposed project would implement structures and impervious surfaces that could potentially alter the current drainage pattern. Pursuant to the requirements of the NPDES permit, as discussed previously, excess flows and sediment would be captured by BMPs identified in the SWPPP and WQMP. With implementation of required BMPs, the proposed project is not expected to result in substantial erosion or siltation. Impacts would be **less than significant** and no mitigation is required.

d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or surface runoff in a manner which would result in flooding on- or off site?				X

No Impact. No streams, rivers, or other drainage features are located on site. Pursuant to the requirements of the NPDES permit, as discussed previously, excess flows and sediment would be captured by BMPs identified in the SWPPP and WQMP. Since the proposed project not increase storm water flows, **no impact** related to flooding would occur. No mitigation is warranted.

e) Create or contribute runoff which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?			X	

Less Than Significant Impact. The existing site slopes down from the southeast to the northwest toward the Moreno Valley Hospital. The project proposes three bio-filtration systems located throughout the project site and offsite discharge will be routed to Oliver Street. The nature of the proposed development would not generate flows previously unaccounted for in drainage plans. The project will incorporate BMPs that will moderate flows into existing storm drain systems. As the project would maintain drainage patterns and flow rates comparable to the existing condition. A **less than significant** impact would occur with the development of the proposed project, and no mitigation is warranted.

f) Otherwise substantially degrade water quality?		X		

Less Than Significant Impact with Mitigation Incorporated. The proposed project is in a developed urban setting and through adherence to City water quality regulations and **Mitigation Measures HYD-1** through **HYD-3** would not

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

substantially degrade water quality. A **less than significant** impact would occur with implementation of the recommended mitigation measures. No additional mitigation measures are required.

g) Place housing within a 100-year floodplain, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				X

No Impact. The Project does not include the construction of housing. There will be **no impact** caused by this project, as it will not place housing within a 100-year flood hazard area (see Figure 10). No mitigation is required.

h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?				X

No Impact. The project site is not located within a 100-year flood hazard area and does not include the development of housing (see Figure 10).[24] Therefore, the project will not place a structure within a 100-year flood hazard area that would impede or redirect flood flows. **No impact** would occur and no mitigation is required.

i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?				X

No Impact. Two locations of concern exist within the City of Moreno Valley: Poorman Reservoir (Pigeon Pass Reservoir) and Lake Perris. Dam failure at Portman's Reservoir could result in extensive flooding along the downstream watercourse. Dam failure at Lake Perris would only affect a very small area south of Nandina Avenue along the Perris Valley Storm Drain and the Mystic Lake area in the southeast corner of the City.[25] According to the City's General Plan,[20] the project site will not expose people or structures to a risk of loss, injury or death involving the failure of a levee or dam. **No impact** would occur and no mitigation is required.

j) Inundation by seiche, tsunami, or mudflow?				X

No Impact. The Project site is located approximately 2-miles north of Lake Perris. At this distance, the Project site is not considered susceptible to seiche-related hazards originating at Lake Parris. Additionally, the Upland Game Hunting Area is located between the Project site and Lake Perris, initially creating a buffer from the Project site and the waterbody. The Project site and Lake Perris have an elevation of approximately 1560 feet above mean sea level (amsl) while the Upland Game Hunting Area hills are approximately 1813 feet amsl which approximately 253 feet above the Project site. The Project site is located approximately 42-miles northeast of the Pacific Ocean and is approximately 1,560 feet amsl. As such, the project is not subject to tsunami hazards and **no impact** would occur.

X. LAND USE AND PLANNING. Would the project:

a) Physically divide an established community?				X

No Impact. The Project proposes the development of an ARCO gas station on land designated as commercial. To the north and west is vacant land while residential communities are located to the south and east. The project would not introduce features such as highways or transit lines that would divide an established community. **No impact** regarding dividing an established neighborhood would occur. No mitigation is required.

b) Conflict with an applicable land use plan, policy or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?				X

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[24] Figure 6-4 "Flood Hazards," Chapter 6-Safety, City of Moreno Valley General Plan, July 11, 2006.

[25] Chapter 6-Safety, City of Moreno Valley General Plan, July 11, 2006.

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

No Impact. The Project proposed the development of an ARCO gas station. The General Plan designates the site as Commercial (C) and the City's Zoning Map designate the project as Neighborhood Commercial (NC). Therefore, the proposed Project is consistent with the general plan land use and the City's zoning map. Therefore, the development of the proposed project would have **no impact** on any applicable land use plan, policy, or regulation. No mitigation is required.

c) Conflict with any applicable habitat conservation plan or natural community conservation plan?			X	

Less Than Significant Impact. The proposed Project is located within the Multiple Species Habitat Conservation Plan (MSHCP) City of Moreno Valley Area Plan; however, the Project is not located in a criteria cell and is not adjacent to Public/Quasi-Public or Conservation Land. The Project is located within the MSHCP survey area for burrowing owl. Because the project is not located within a Criteria Cell, it is not subject to possible land conservation requirement under the MSHCP. Therefore, development of the Project would have a **less than significant** impact related to a habitat conservation plan and no mitigation is required.

XI. MINERAL RESOURCES. Would the project:

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				X
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?				X

No Impact. The Project site is vacant and undeveloped. The mineral resources known to occur within the City of Moreno Valley include sand, gravel and rock which is used to make concrete and as road base.[26] According to the City's General Plan, one recently active sand and gravel quarry is known to occur within the City's sphere of influence: the Jack Rabbit Canyon Quarry.[22] The Jack Rabbit Canyon Quarry was inactive as of 2001 and is located in a drainage course at the northeast corner of Jack Rabbit Trail and Gilman Springs Road approximately 6.5 miles west of the Project site. No regionally or statewide significant mineral resources are located within the planning area.[27] Due to the absence of mineral resources, **no impact** would occur related to the project and no mitigation measures are required.

XII. NOISE. Would the project result in:

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?		X		

Less than Significant with Mitigation Incorporated

Short-Term Noise

LSA Associates Inc. (LSA) prepared a detailed assessment of noise impacts for the proposed project based on the project development characteristics (LSA 2017) (Appendix I).[28] The assessment indicates that short-term noise impacts would be associated with grading and erecting of building on-site during construction of the proposed project. Noise associated with the use of construction equipment is estimated to be between 55 and 85 dBA L_{max} at a distance of 50 feet from the active construction area for the site preparation phase. The maximum noise level generated by each scraper and dozer is assumed to be approximately 85 dBA L_{max} at 50 feet from heavy equipment. Each doubling of the sound sources with equal strength increases the noise level by 3dBA. Assuming that each piece of construction equipment operates at same

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[26] Chapter 7 – Conservation, 7.8 Mineral Resources, City of Moreno Valley General Plan, July 11, 2006.

[27] Chapter 5.14 – Mineral Resources, City of Moreno Valley General Plan Final Program EIR, July 2006.

[28] Noise and Vibration Impact Analysis Memorandum, AM/PM Gasoline Service Station, LSA Associates, Inc., November, 2017.

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

distance from the other equipment, the worst-case combined noise level during construction would be 84 dBA L_{max} at 50 feet from active construction area. The existing traffic noise levels without the project is based on a usage factor of 40 percent, the worst-case combined noise level during construction would be 84 dBA L_{eq} at a distance of 50 feet from the active construction area. It should be noted the construction hours will be limited to those set forth in the City's Municipal Code Section 8.14.040E. The Municipal Code limits hours of construction to 7 a.m. to 7 p.m. Monday through Friday, excluding holidays and from 8 a.m. to 4 p.m. on Saturday, unless written approval is obtained from the city building official or city engineer.

According to the Noise Impact Analysis, the nearest sensitive receptors are single-family residences located approximately 85 feet east of the project site across Oliver Street and single-family residences located approximately 150 feet south of the project site across Iris Avenue. The residences to the east are bordered by a concrete wall, reducing potential noise exposure. In addition, Kaiser Permanente, a medical center, is located approximately 700 feet to the northwest, and Landmark Middle School is approximately a quarter mile to the north on Oliver Street.

The nearest sensitive receptors that may be subject to construction noise include the single-family residences located approximately 85 feet east of the project site across Oliver Street. At 85 feet, noise levels would attenuate approximately 5 dBA from the increased distance compared to the noise level measured at 50 feet from the active construction area. In addition to distance damping, for a conservative analysis, the current concrete fence bordering the residents to the east may reduce noise exposure by 5 to 10 dBA. Therefore, the closest sensitive receptors may be subject to short-term construction noise reaching 76 dBA L_{max} when construction occurs at the project site boundary. However, when LSA conducted ambient noise monitoring for the project on-site at the residencies to the east, LSA measured an L_{max} of 76.9 dBA. Therefore, the closest sensitive receptor would not be exposed to a temporary increase in noise levels. In addition, construction noise is permitted by the City between the hours of 7 a.m. and 7 p.m. Monday through Friday, excluding holidays and from 8 a.m. to 4 p.m. on Saturday, unless written approval is obtained from the city building official or city engineer. However mitigation measures should be implemented to reduce impacts to the extent feasible.

Construction noise would result in a temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. With the implementation of **Mitigation Measure NOI-1**, short-term construction noise impacts would be reduced to **less than significant** levels. No additional mitigation is warranted.

NOI-1 Prior to the issuance of a grading permit, the project applicant shall incorporate the following standards as notes on the grading plan cover sheet to minimize construction noise to the greatest extend practical:

- Equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers consistent with manufacturers' standards.
- Place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the active project site.
- Locate equipment staging in areas that would create the greatest possible distance between construction-related noise sources and noise-sensitive receptors nearest the active project site during all project construction.
- Prohibit extended idling time of internal combustion engines.
- All noise producing construction activities shall be limited to the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday, excluding holidays and from 8 a.m. to 4 p.m. on Saturday, unless written approval is obtained from the city building official or city engineer.
- Designate a "disturbance coordinator" who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaint (e.g., starting too early, bad muffler) and would determine and implement reasonable measures warranted to correct the problem.

Less than Significant Impact

Long-Term Noise

Traffic Noise. The proposed project would include a convenience store, fueling stations, and a car wash in a developed area of the City. Operational noise can be categorized as mobile source noise and stationary source noise. Mobile source noise would be attributable to the additional trips that would be a result of the proposed project. Stationary source noise includes noise generated by the proposed project, such as parking lot activities and the car wash.

Tables F and G show a minor change in the traffic noise levels associated with the implementation of the proposed project. The largest increase in traffic-related noise as a result of the project would occur on the east side of the project site on Oliver Street between Driveway 2 and Iris Avenue. This increase in traffic would occur due to the addition of an AM/PM convenience store, eight fueling stations, and a drive through car wash adjacent to residences. Oliver Street could result in an up to 1.2 dBA increase over existing conditions. This noise level would not exceed the 3 dBA increase considered to be perceptible by the human ear in an outdoor environment. The resulting noise level along Oliver Street would be approximately 58.6 dBA CNEL, which would be lower than existing noise associated with other surrounding roadways (i.e. Iris Avenue) and would be in the normally acceptable range for residential and commercial land uses. Noise along the southern border of the project site adjacent to Iris Avenue would result in an increase of 0.2 dBA from baseline conditions. This noise level increase is less than the 3 dBA increase considered to be perceptible by the human ear in an outdoor environment and the resulting noise level would be 68.3 dBA CNEL, which would remain conditionally acceptable for residential land uses and normally acceptable for commercial land uses. Therefore, no significant traffic noise impacts would occur for off-site land uses. As a result, no mitigation is required.

Parking Lot Activity. Parking lot noise, including engine sounds, car doors slamming, car alarms, loud music, and people conversing, would occur as a result of the proposed project at the project site and on nearby streets. Typical parking lot activities, such as people conversing or doors slamming, generates approximately 60 dBA to 70 dBA L_{max} at 50 feet.

The nearest sensitive receptors that may be affected by parking lot activity are the single-family residences located approximately 85 feet east of the project boundary. Based on current project plans, the nearest proposed parking and fueling station would be located approximately 120 feet from the existing sensitive receptors. Therefore, adjusted for a distance of 120 feet, the nearest sensitive receptors would be exposed to a noise level of 52 to 62 dBA L_{max} generated by parking lot activities. This noise level could exceed the City's maximum sound level at residential land uses of 60 dBA during the daytime (8:00 a.m. to 10:00 p.m.) and 55 dBA during the nighttime (10:00 p.m. to 8:00 a.m.). However, LSA conducted ambient noise monitoring for the project at location ST-3, located adjacent to the residences east of the project site, an L_{max} of 76.9 dBA was measured. Therefore, the closest sensitive receptor would not be exposed to a maximum level in excess of the existing noise environment. In addition, due to the intermittent nature of parking activity, when averaged over a 24-hour period, this noise level would not cause an increase in noise levels of more than 3 dBA. Also, the nearest residential receptors would be surrounded by a solid concrete fence, acting also as a noise barrier. Based on LSA's previous experience and calculations, this concrete fence may reduce noise levels by approximately 5 to 10 dBA. Therefore, parking lot noise associated with the proposed project would not be expected to substantially increase noise levels, and therefore, the proposed project would not result in significant parking lot noise.

Table F: Existing Traffic Noise Levels Without and With Project (2017)

Roadway Segment	Existing Traffic Volumes (2017)											
	Without Project					With Project						
	ADT	Centerline to 70 CNEL (feet)	Centerline to 65 CNEL (feet)	Centerline to 60 CNEL (feet)	CNEL (dBA) 50 feet from Centerline of Outermost Lane	ADT	Increase in ADT	Centerline to 70 CNEL (feet)	Centerline to 65 CNEL (feet)	Centerline to 60 CNEL (feet)	CNEL (dBA) 50 feet from Centerline of Outermost Lane	Increase from Baseline Conditions
Oliver Street - John F. Kennedy Drive to Project Driveway 2	2,700	< 50	< 50	< 50	57.4	2,900	200	< 50	< 50	< 50	57.7	0.3
Oliver Street - Driveway 2 to Iris Avenue	2,700	< 50	< 50	< 50	57.4	3,500	800	< 50	< 50	56	58.6	1.2
Iris Avenue - Nason Street to Kaiser Hospital Entrance	20,300	75	146	307	68.9	21,100	800	77	150	315	69.1	0.2
Iris Avenue - Kaiser Hospital Entrance to Project Driveway 1	17,000	69	131	274	68.1	17,800	800	70	135	282	68.3	0.2
Iris Avenue - Project Driveway 1 to Oliver Street	17,000	69	131	274	68.1	17,800	800	70	135	282	68.3	0.2
Iris Avenue - Oliver Street to Via Del Lago	14,200	63	117	243	67.3	14,900	700	65	121	251	67.5	0.2

Source: LSA, November 2017.
Notes: Traffic noise within 50 feet of the roadway centerline should be evaluated with site-specific information.
Shaded cells indicate road segments directly adjacent to the project.
ADT rounded to nearest hundred.
ADT = average daily traffic
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels

Table G: Future Traffic Noise Levels Without and With Project (2022)

Roadway Segment	Opening Year Traffic Volumes (2022)											
	Without Project					With Project						
	ADT	Centerline to 70 CNEL (feet)	Centerline to 65 CNEL (feet)	Centerline to 60 CNEL (feet)	CNEL (dBA) 50 feet from Centerline of Outermost Lane	ADT	Increase in ADT	Centerline to 70 CNEL (feet)	Centerline to 65 CNEL (feet)	Centerline to 60 CNEL (feet)	CNEL (dBA) 50 feet from Centerline of Outermost Lane	Increase from Baseline Conditions
Oliver Street - John F. Kennedy Drive to Project Driveway 2	3,000	< 50	< 50	< 50	57.9	3,200	200	< 50	< 50	< 50	58.2	0.3
Oliver Street - Driveway 2 to Iris Avenue	3,000	< 50	< 50	< 50	57.9	3,800	800	< 50	< 50	58	58.9	1.0
Iris Avenue - Nason Street to Kaiser Hospital Entrance	22,400	79	156	328	69.3	23,200	800	80	159	336	69.5	0.2
Iris Avenue - Kaiser Hospital Entrance to Project Driveway 1	18,800	72	139	292	68.6	19,600	800	74	143	300	68.7	0.1
Iris Avenue - Project Driveway 1 to Oliver Street	18,800	72	139	292	68.6	19,600	800	74	143	300	68.7	0.1
Iris Avenue - Oliver Street to Via Del Lago	15,600	66	124	259	67.7	16,400	800	67	128	267	68.0	0.3

Source: LSA, November 2017.
Note: Traffic noise within 50 feet of the roadway centerline should be evaluated with site-specific information.
Shaded cells indicate road segments directly adjacent to the project.
ADT rounded to nearest hundred.
ADT = average daily traffic
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

Car Wash Noise

The proposed car wash is located near the northern border of the project site. Typical car wash noises include the sprayers and blowers within the washing building and the vacuum stations located outside. Car wash noise levels near the exit of the blower area could reach up to 101 dBA L_{max}. Shop vacuum cleaners can produce noise levels approximately 65 dBA L_{max}. The car wash equipment is enclosed providing additional noise attenuation barriers. The car wash exit would be located approximately 350 feet from the property line of the closest sensitive receptors located to the south across Iris Avenue and to the east across Oliver Street. At this distance, the combined car wash noise, including both the car wash and the vacuum noise, would be approximately 64 dBA L_{max} at the nearest receiving sensitive receptor. This noise exposure would exceed the City's maximum sound level at residential land uses of 60 dBA during the daytime (8:00 a.m. to 10:00 p.m.). However, the closest sensitive receptors to the car wash have either a bordering concrete wall and/or the property is raised in elevation when compared to the car wash exit. The existing noise barrier in place would reduce noise by approximately 5-10 dBA, resulting in a 54-59 dBA noise exposure from the car wash which is less than the City's 60 dBA daytime standard. In addition, LSA's traffic study models existing noise conditions to be 68.1 dBA along Iris Avenue between the car wash exit and the adjacent receptors. The resulting noise level from the car wash would be lower than the existing noise associated with traffic on Iris Avenue. The addition of a noise level of up to 59 dBA to the 68.1 dBA CNEL conditions would not result in a substantial increase in noise. The resulting noise level would not exceed the 3 dBA increase considered to be perceptible by the human ear in an outdoor environment. The car wash would not operate during nighttime hours and therefore would not exceed the nighttime standard of 55 dBA (10:00 p.m. to 8:00 a.m.). In addition, because the drying cycle is a small part of the overall wash, the dryers along with the vacuums would be anticipated to operate no more than 30 minutes in any hour. The calculated hourly L_{eq} from the car wash given a usage factor of 0.5 would be approximately 63 dBA during operating hours before any noise reduction, and range from 53-58 dBA with sound attenuation from the noise barrier. Therefore, the car wash would be operating within existing noise conditions. Therefore, impacts associated with noise from the car wash are **less than significant** and no mitigation is required.

Conclusions

Overall, with implementation of **Mitigation Measure NOI-1,** short-term construction noise impacts would be rendered **less than significant with mitigation incorporated**. No additional mitigation measures are warranted for short term, long term, or cumulative impacts. Long-term noise impacts would not exceed existing ambient noise standards at nearby sensitive receptors; therefore, long term impacts would be considered **less than significant** with no mitigation required.

b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?			X	

Less Than Significant Impact. Vibration refers to groundborne noise and perceptible motion. Groundborne vibration is almost exclusively a concern inside buildings and is rarely perceived as a problem outdoors, where the motion may be discernible, but without the effects associated with the shaking of a building, there is a less adverse reaction. According to Federal Transit Administration (FTA) guidelines, vibration levels up to 102 VdB will not result in structural damage to buildings. Table H shows the vibration level for equipment that could potentially be used during construction. Table I shows the human response to different levels of groundborne noise and vibration.

Table H: Vibration Source Amplitudes for Construction Equipment

Equipment	Reference PPV/L_V at 25 ft	
	PPV (in/sec)	L_V (VdB)
Large Bulldozer	0.089	87
Loaded Trucks	0.076	86
Jackhammer	0.035	79

Sources: Transit Noise and Vibration Impact Assessment (FTA 2006).

ft = feet
L_V = velocity in decibels
VdB = vibration velocity decibels
in/sec = inches per second
PPV = peak particle velocity

Table I: Human Response to Groundborne Noise and Vibration

Vibration Velocity Level	Noise Level		Human Response
	Low Frequency[1]	Mid Frequency[2]	
65 VdB	25 dBA	40 dBA	Approximate threshold of perception for many humans. Low-frequency sound usually inaudible; mid-frequency sound excessive for quiet sleeping areas.
75 VdB	35 dBA	50 dBA	Approximate dividing line between barely perceptible and distinctly perceptible. Many people find transit vibration at this level unacceptable. Low-frequency noise acceptable for sleeping areas; mid-frequency noise annoying in most quiet occupied areas.
85 VdB	45 dBA	60 dBA	Vibration acceptable only if there are an infrequent number of events per day. Low-frequency noise unacceptable for sleeping areas; mid-frequency noise unacceptable even for infrequent events with institutional land uses such as schools and churches.

Source: *Transit Noise and Vibration Impact Assessment* (FTA 2006).

[1] Approximate noise level when vibration spectrum peak is near 30 Hz.
[2] Approximate noise level when vibration spectrum peak is near 60 Hz.

dBA = A-weighted decibels
Hz = Hertz
VdB = vibration velocity decibels

Short-Term Vibration

During site grading, vibration may be felt at the residences to the east of the project across Oliver Street. Table J lists the projected vibration level from various construction equipment expected to be used on the project site to the nearest buildings in the project vicinity. For typical construction activity, the equipment with the highest vibration generation potential is the large bulldozer, which would generate 87 VdB at 25-feet. The nearest sensitive receptors to the project would be approximately 85 feet from the project boundary to the east. Based on the distance attenuation, the closest residences would experience vibration levels of up to 71 Vdb (0.014 PPV [in/sec]) This vibration level at the closest residential structures from construction equipment would not exceed FTA threshold of 94 VdB (0.2 in/sec PPV) for building damage. This level is also below the FTA's "barely perceptible" human response criteria of 0.04 PPV for transient sources of vibration events. Therefore, ground-borne vibration impacts from project-related construction activities would be considered **less than significant.** No mitigation is warranted.

Table J: Summary of Construction Equipment and Activity Vibration

Land Use	Direction	Equipment/ Activity	Reference Vibration Level (VdB) at 25 feet	Reference Vibration Level (PPV) at 25 feet	Distance (feet)	Maximum Vibration Level (VdB)	Maximum Vibration Level (PPV)
Residential	North/ West	Large Bulldozers	87	0.089	10	99	0.352
		Loaded Trucks	86	0.076	10	98	0.300
Church	North	Large Bulldozers	87	0.089	25	94	0.191
		Loaded Trucks	86	0.076	25	93	0.164
Office	West	Large Bulldozers	87	0.089	65	75	0.021
		Loaded Trucks	86	0.076	65	73	0.018

Source: Compiled by LSA (2017).
Note: The FTA-recommended building damage threshold is 0.2 PPV (in/sec) or approximately 94 VdB at the receiving residential/church structure and 0.3 PPV (in/sec) or approximately 98 VdB at the receiving commercial structure.

ft = foot/feet
in/sec = inch/inches per second
FTA = Federal Transit Administration
PPV = peak particle velocity
VdB = vibration velocity decibels

Long-Term Vibration

The streets surrounding the project area are paved, smooth, and unlikely to cause significant ground-borne vibration. In addition, the rubber tires and suspension systems of buses and other on-road vehicles make it unusual for on-road vehicles to cause ground-borne noise or vibration problems. It is, therefore, assumed that no such vehicular vibration impacts would occur and, therefore, no vibration impact analysis of on-road vehicles is necessary. Additionally, once constructed, the proposed project would not contain uses that would generate ground-borne vibration. Therefore, a less than significant impact would occur regarding long-term vibration, and no mitigation is required.

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?			X	

Less Than Significant Impact. Please refer to Checklist Response XII.a. A **less than significant** impact related to increase in ambient noise levels would occur. No mitigation is required.

d) A substantially temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?			X	

Less Than Significant Impact. Please refer to Checklist Response XII.a. A **less than significant** impact related to increase in ambient noise levels would occur. No mitigation is required.

e) For a project located within an airport land use plan, or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				X

No Impact. The closest airport to the proposed project site is March Air Reserve Base (RIV) located approximately 3.5 miles west of the project site. Aircraft noise is rarely audible at the project site; and no portion of the site lies within the 55 dBA CNEL noise contours of the airport. Therefore, **no impact** would occur with the exposure of people residing or working within the project boundaries. No mitigation is required.

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?				X

No Impact. Please refer to Checklist Response XII.e. **No impact** would occur and no mitigation is required.

XIII. POPULATION AND HOUSING. Would the project: a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?			X	

Less than Significant Impact. During the construction process, the Project would create short-term construction jobs and are anticipated to be filled primarily by workers who reside in the project vicinity. The proposed Project would generate a maximum of 12 employees.[29] New employment opportunities are projected to be filled by local residents who reside in the City of Moreno Valley, so a large influx of new residents to the City due to the proposed project is not expected.

Due to the construction of an ARCO AM/PM gas station opposed to residential units, the proposed project will not have a direct effect on population growth within the City. The proposed project would generate employment opportunities, but are not expected to induce substantial growth in the City or region beyond the growth forecasts detailed in the City's General Plan or SCAG's regional growth forecasts since the proposed project is consistent with the existing land use and zoning designations (i.e., Commercial). Therefore, a **less than significant** impact related to this issue. No mitigation is required.

b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				X

No Impact. The proposed project is currently vacant and does not contain any residences that would be removed as a result of the proposed Project. Therefore, the Project would not displace a substantial number of existing housing or residences so as to necessitate the construction of replacement of housing. **No impact** would occur with respect to the displacement of existing housing. No mitigation is required.

c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				X

No Impact. Please refer to Response Question XIII.b. **No impact** related to this issue would occur as a result of the Project and no mitigation is required.

XIV. PUBLIC SERVICES. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered government facilities, need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

a) Fire protection?			X	

Less Than Significant Impact. The proposed Project would place an ARCO AM/PM gas station on undeveloped land. The City of Moreno Valley Fire Service contracts with the Riverside County Fire Department Services. Fire Station 91 (College Park) is the closest station to the site located at 16110 Lasselle Street approximately 1.4 miles southwest. Fire Station 91 houses one 75-foot ladder truck, one second line engine and a breathing support. Because the Project proposes a gas station, fire services may be needed at a quick response time. According to the City's General Plan, a five-minute response time is considered to be the maximum time standard for serving urban and suburban uses.[30] However, the need for fire services to the Project site is considered unlikely. Considering this, the project will have a **less than significant** impact on fire protection. No mitigation is required.

b) Police protection?			X	

Less Than Significant Impact. The Project includes the development of an ARCO AM/PM gasoline station on the northwest corner of Iris Avenue and Oliver Street. Police services are provided by the Moreno Valley Police Department (MVPD) which has 162 sworn officers and a current officer to population ration of 0.9 officers per 1,000 populations. The nearest police station is located at 22850 Calle San Juan De Los Lagos approximately 4.8 miles west northwest of

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[29] Personal email with Leslie Burnside.

[30] Chapter 6 "Safety," City of Moreno Valley General Plan, July 11, 2006.

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

the project site. The Project could introduce a maximum of 12 new employees to the City, which would incrementally increase the need for police. Therefore, development of the project would have a **less than significant** impact on police protection. No mitigation is required.

c) Schools?				X

No Impact. The Project proposed the development of an ARCO AM/PM gas station as it would not generate school aged children. Therefore, **no impact** would occur related to this issue and no mitigation is required.

d) Parks?				X

No Impact. As mentioned above, the proposed Project would not generate additional residences into the City of Moreno Valley. Because the project does not include housing and would not generate additional residences into the City, **no impact** would occur in relation to the development of the project. No mitigation is warranted.

e) Other public facilities?			X	

Less Than Significant Impact. The proposed Project would not induce population growth within the City of Moreno Valley. The project could introduce a maximum of 12 new employees into the City. Because the Project would not introduce a substantial amount of population into the City of Moreno Valley, development of the Project would have a **less than significant** impact. No mitigation is required.

XV. RECREATION.

a) Would the project increase the use of existing neighborhood or regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?			X	

Less than Significant Impact. The proposed project includes the construction of an ARCO AM/PM gas station on the northwest corner of Iris Avenue and Oliver Street. The project would generate a maximum of 12 employees and may contribute to residents working and living in the City of Moreno Valley. The closest parks to the proposed project are the Fairway Park and Celebration Park approximately 0.4 mile north of the Project site. The Project would be required to pay development fees to offset the impact to parks and recreation. Therefore, with the development of the proposed Project, it will not create a significant increase in the use of existing neighborhood, regional parks, or other recreational facilities, with a **less than significant** impact related to this issue. No mitigation is required.

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?				X

No Impact. The proposed project does not include any recreational facilities or parkland. Furthermore, the project does not include any residential development and will not directly increase population associated with the proposed Project. The Project will also be required to pay applicable development fees to offset the impact to parks and recreation. Therefore, the construction or expansion of recreational facilities in the absence of a population increase is not necessary. **No impact** would occur regarding this issue. No mitigation is required.

XVI. TRANSPORTATION/TRAFFIC. Would the project:

a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and			X	

relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?				

Access to the gas station on the project site would be provided via two street accesses, one on Iris Avenue and the other on Oliver Street. As detailed in Table K, the proposed project is expected to generate 1,111 daily trips with 88 trips occurring during the a.m. peak hour and 101 trips occurring during the p.m. peak hour (see Appendix J).

Table K: Project Trip Generation

Land Use	Units	A.M. Peak Hour In	A.M. Peak Hour Out	A.M. Peak Hour Total	P.M. Peak Hour In	P.M. Peak Hour Out	P.M. Peak Hour Total	Daily Trips
Gasoline Station with Convenience Market and Car Wash	16 Fueling Stations							
Trip Generation		45	43	88	52	49	101	1,111

Source: Table 5-A – Traffic Impact Analysis, LSA, July 2018 (Appendix J).

The study intersections were identified via the Scoping Agreement process and, where with the addition of peak hour project trips to a Collector Street or higher classification, project traffic has the potential to cause a significant impact. The study intersections are listed as follows:[31]

- Nason Street/Iris Avenue;
- Kaiser Hospital Entrance/Iris Avenue;
- Project Driveway 1/Iris Avenue;
- Oliver Street/John F. Kennedy Drive;
- Oliver Street/Project Driveway 2;
- Oliver Street/Iris Avenue; and
- Via Del Lago/Iris Avenue.

The roadway segments are listed as follows:

- Oliver Street, from John F. Kennedy Drive to Project Driveway 2;
- Oliver Street, from Project Driveway 2 to Iris Avenue;
- Iris Avenue, from Nason Street to Kaiser Hospital Entrance;
- Iris Avenue, from Kaiser Hospital Entrance to Project Driveway 1;
- Iris Avenue, from Project Driveway 1 to Oliver Street; and
- Iris Avenue, from Oliver Street to Via Del Lago.

Study intersections analyzed are under the jurisdiction of the City of Moreno Valley. The City uses both LOS C and LOS D as its minimum level of service criteria for intersections and roadway segments. As stated in the City's General Plan and TIA Guidelines, LOS D is applicable to intersections and roadway segments adjacent to employment generated land uses while LOS C is applicable to all other areas. As detailed in Tables L and M, all intersections are anticipated to operate at an LOS D or better. Additionally, all roadway intersections are anticipated to operate at a satisfactory level. Therefore, a less than significant impact related to this issue would occur, and no mitigation is required.

Table L: Existing (2017) Intersection Levels of Service

Intersection	Without Project A.M Peak Hour	Without Project P.M Peak Hour	With Project A.M Peak Hour	With Project P.M Peak Hour	Significant Impact?
1. Nason Street/Iris Avenue	C	C	C	C	No

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[31] *Traffic Impact Analysis, AM/PM Gasoline Service Station*, LSA, July 2018. (Appendix J)

2. Kaiser Hospital Entrance/Iris Avenue	A	A	A	A	No
3. Project Driveway 1/Iris Avenue	N/A	N/A	A	A	No
4. Oliver Street/John F. Kennedy Drive	B	A	B	A	No
5. Oliver Street/Project Driveway 2	N/A	N/A	A	A	No
6. Oliver Street/Iris Avenue	C	B	D	C	No
7. Via Del Lago/Iris Avenue – Moreno Beach Drive	C	C	C	C	No

Source: Table 7-A, Traffic Impact Analysis, LSA, July 2018 (AppendixJI).

Table M: Opening Year (2022) Intersection Levels of Service

Intersection	Without Project		With Project		Significant Impact?
	A.M Peak Hour	P.M Peak Hour	A.M Peak Hour	P.M Peak Hour	
1. Nason Street/Iris Avenue	C	C	C	C	No
2. Kaiser Hospital Entrance/Iris Avenue	A	A	A	A	No
3. Project Driveway 1/Iris Avenue	N/A	N/A	A	A	No
4. Oliver Street/John F. Kennedy Drive	B	A	B	A	No
5. Oliver Street/Project Driveway 2	N/A	N/A	A	A	No
6. Oliver Street/Iris Avenue	C	B	D	C	No
7. Via Del Lago/Iris Avenue – Moreno Beach Drive	C	C	C	C	No

Source: Table 7-A, Traffic Impact Analysis, LSA, July 2018 (Appendix J).

b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?			X	

Less Than Significant Impact. The 2010 Highway Capacity Manual (HCM 2010) establishes levels of service A through F for intersections. The project trip generation analysis (LSA, Appendix J) indicated the project would generate approximately 1,111 daily trips. The cumulative projects are expected to generate 62,227 net daily trips, with 4,066 net trips in the a.m. peak hour, and 4,934 net trips in the p.m. peak hour. Tables H and I summarize the existing and Opening Year (2022) intersection levels of service and with improvements and show that all study area intersections are projected to operate at satisfactory level of service. Because all intersections and roadway segments are to operate at LOS D or better, a **less than significant** impact related to this issue would occur. No mitigation is required.

c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks?				X

No Impact. The nearest airport is the March Air Reserve Base located approximately 3.5 miles west of the project site. The proposed gas station is consistent with the City's General Plan Land Use designation and the Specific Plan. The proposed project is outside the Airport Influence Area. The project does not include uses or components that would affect air traffic, so no substantial safety risks would result from project implementation. Because of these reasons, **no impact**

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

would occur with the development of the project. No mitigation required.

d) Substantially increase hazards to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)?			X	

Less Than Significant Impact. The project is on a small infill site (under 5 acres) located on one corner of a major intersection with no long roadway segments within the property. The design of roadways must provide adequate sight distance and traffic control measures. This provision is normally realized through roadway design to facilitate roadway traffic flows. Roadway improvements in and around the project site would be designed and constructed to satisfy all City requirements for street widths, corner radii, intersection control as well as incorporate design standards tailored specifically to site access requirements. Adherence to applicable City requirements would ensure the proposed development would not include any sharp curves or dangerous intersections. Therefore, no substantial increase in hazards due to a design feature would occur, resulting in a **less than significant** impact. No mitigation is required.

e) Result in inadequate emergency access?				X

No Impact. The Moreno Valley Police Service (located at 22850 Calle San Juan De Los Lagos) is approximately 4.8 miles northwest of the project site, and the Moreno Valley Fire Department Station 74 (located at 16110 Lasselle Street) is approximately 1.4 miles southwest of the project site. Traffic associated with project construction may have a temporary effect on existing traffic circulation patterns. The proposed project is in an urban setting and direct access to the site will be available via Iris Avenue and Oliver Street which would also accommodate emergency services. Due to the proximity of emergency services, the urban setting, and availability of access to the site, impacts to emergency access will be less than significant. The proposed project will also comply with all of the City's requirements for emergency access. Therefore, there will be **no significant impacts** and no mitigation is required.

f) Conflict with adopted policies or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?				X

No Impact. Iris Avenue is currently improved with on-street bike lanes. The Riverside Transit Agency currently provides bus service to the project site in the form of Route 20 that runs east-west along Iris Avenue adjacent to the project site and connects to other routes in the City and surrounding communities. The proposed project would not impede the implementation of City programs supporting walking, bicycling, and use of buses. The proposed project will not conflict with any adopted transportation policies. **No impact** associated with this issue would occur. No mitigation is required.

XVII. TRIBAL CULTURAL RESOURCES

a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:		X		
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or		X		

Less Than Significant with Mitigation Incorporated.

Chapter 532, Statutes of 2014 (i.e., AB 52), requires Lead Agencies evaluate a project's potential to impact "tribal cultural resources." Such resources include "[s]ites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American Tribe that are eligible for inclusion in the California Register of Historical Resources or included in a local register of historical resources." AB 52 also gives Lead Agencies the discretion to determine, supported by substantial evidence, whether a resource qualifies as a "tribal cultural resource."

Per AB 52 (specifically PRC 21080.3.1), Native American consultation is required upon request by a California Native American tribe that has previously requested that the City provide it with notice of such projects. In February 2018, the City of Moreno Valley sent the required AB 52 notices to the relevant tribes as required through certified mail. All of the notices were delivered appropriately with receipts returned to the City. Following delivery of the notices, three tribes responded. These tribes and there comments are:

- Pechanga Band of Luiseno Indians, Letter dated March 1, 2018. Requested to begin formal consultation. Letter dated June 29, 2018, containing minor suggestions to the Cultural report and request for full-time construction monitoring instead of part-time.
- Rincon Band of Luiseno Indians, Email dated March 6, 2018. Did not request to begin formal consultation.
- Soboba Band of Luiseno Indians, Letter dated March 20, 2018.

Although the project-specific cultural resources assessment, which included an archaeological and historical records search, communication with Native American tribal representatives, and an intensive pedestrian survey of the project site (Appendix J), did not identify Native American resources on the surface of the project site, there remains some potential for the proposed project to unearth previously undocumented tribal cultural resources during construction. Therefore, previously referenced **Mitigation Measures CUL-1** through **CUL-5** and **CUL-7** are proposed. Adherence to **Mitigation Measures CUL-1** through **CUL-5** and **CUL-7** would ensure impacts to listed or eligible for listing tribal cultural resources would be reduced to **less than significant with mitigation incorporated** levels.

ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resource Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5025.1, the lead agency shall consider the significance of the resource to a California Native American tribe.		X		

Less Than Significant with Mitigation Incorporated.

See response to checklist question XVII above. Implementation of **Mitigation Measures CUL-1** through **CUL-5** and **CUL-7** would reduce impacts to Tribal Cultural Resources to less than significant levels.

XVIII. UTILITIES AND SERVICE SYSTEMS. Would the project:

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?			X	

Less Than Significant Impact. Wastewater services in the City of Moreno Valley are provided by the Eastern Municipal

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

Water District (EMWD), serving most of the City and surrounding areas, and the Edgemont Community Services District.[32] The EMWD provides wastewater services to approximately 239,000 customers within its service area and currently treats approximately 43 million gallons per day of wastewater at its five active regional water reclamation facilities through 1,813 miles of sewer pipelines.[33] These reclamation plants include: San Jacinto Regional Water Reclamation Facility; Moreno Valley Regional Water Reclamation Facility; Perris Valley Regional Water Reclamation Facility; Sun City Regional Water Reclamation Facility; and Temecula Valley Regional Water Reclamation Facility. Generated wastewater from the Project site would be treated at the Moreno Valley Regional Water Reclamation Facility. The proposed Project is expected to generate a maximum of 12 employees. The proposed project is expected to generate 900 gallons of wastewater per day or 328,500 gallons per year of wastewater.[34] The typical daily flow at the MVRWRF is 10.6 million gallons per day with a current capacity of 16 million gallons per day, having a current excess capacity of approximately 5.4 million gallons per day. The proposed project would be required to comply with the applicable waste discharge prohibitions and water quality objectives established by the Santa Ana RWQCB. The project proponent would also be required to satisfy City requirements related to the payment of fees and/or the provision of wastewater conveyance features, and installation and maintenance prior to the issuance of building permits. Adherence to requirements included in the NPDES permit, SWPPP, WQMP, and City wastewater conveyance standards would reduce potential wastewater quality impacts to a **less than significant** level and no mitigation is required.

b) Require or result in construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?			X	

Less Than Significant Impact. Wastewater flows from the proposed project site would be handled by the Eastern Municipal Water District (EMWD) and would be conveyed to the Moreno Valley Regional Water Reclamation Facility (MVRWRF) located in the southwestern portion of the City. Current capacity at this facility is 16 million gallons per day (mgd) with an existing average inflow of approximately 10.6 mgd per day. Under current conditions, the average daily surplus treatment capacity is approximately 5.4 mgd. Generally, water use and wastewater flows are related in that wastewater is generated from indoor water uses. The Project is expected to generate up to 900 gallons of wastewater per day or 328,500 gallons per year. Because the amount of wastewater generated would be within the existing surplus treatment capacity, the proposed project would not require the construction of a new water or wastewater treatment facilities or expansion of existing facilities, which could cause significant environmental effects; and impacts related to this issue would be considered **less than significant.** No mitigation is required.

c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				

Less Than Significant Impact. There is no existing stormwater infrastructure located within Iris Ave and Oliver St, as such the project will collect surface runoff in three separate bioretention planters prior to collecting in a stormwater sump with a pump. The stormwater will be pumped to the surface adjacent to Oliver St where it will gravity flow to the street curb and gutter. The stormwater will ultimately discharge to the north as it does in the existing condition. The proposed project will also pay the City's established Development Impact Fee (DIF) for drainage to help offset costs for new storm water drainage facilities. Therefore the proposed project will have a **less than significant** impact on these facilities, and no mitigation is required.

d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?			X	

Less Than Significant Impact. Due to the size of the project, a water supply assessment report to determine water supply availability was not prepared for this project. The project is consistent with the City of Moreno Valley General Plan Land

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[32] Sewer Services, Public Services and Utilities, City of Moreno Valley General Plan Final Program EIR, July 2006.

[33] Wastewater Service, Eastern Municipal Water District (EMWD), 2017. https://www.emwd.org/services/wastewater-service (Accessed December 5, 2017).

[34] Personal email from Leslie Burnside, Senior Project Manager, November 7, 2017.

Use designation and the City's zoning of Neighborhood Commercial (NC). The City of Moreno Valley is served by two water purveyors: Eastern Municipal Water District (EMWD) and the Box Springs Mutual Water Company.[35] However, the EMWD is the primary water purveyor from the City and would provide water to the project site. Water demands of the project are consistent with, and are anticipated under the EMWD 2015 Urban Water Management Plan (UWMP). This is because water demands reflected in the UWMP takes into account anticipated development growth in the City pursuant to the City's General Plan. Therefore, the UWMP reflects and anticipates General Commercial (I-G) development proposed by the project. As identified in the 2015 UWMP, EMWD has the ability to meet current and project water demands through 2040 during normal, historic single-dry and historic multiple-dry year periods using imported water from Metropolitan Water District (MWD) with existing supply resources.[36] Therefore, a **less than** significant impact would occur related to this issue, and no mitigation required.

e) Result in a determination by the wastewater treatment provider which serves or may serve the project determined that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?			X	

Less Than Significant Impact. Please refer to response to Checklist Question 16(b).

f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?			X	

Less Than Significant Impact. Solid waste collection is a "demand-responsive" service and current service levels can be expanded and funded through user fees without difficulty. Solid waste generated within the proposed Project will be generated in the Riverside County Waste Management Department's (RCWMD) Badlands Landfill located at 31125 Ironwood Avenue approximately 5-miles northeast of the Project site. The Badlands Sanitary Landfill has a maximum daily permitted throughput of 4,800 tons per day, a remaining capacity of 15,748,799 cubic yards, and an estimated closure of 2022.[37] During the year 2002, the landfill received 469,705 tons of solid waste for disposal, an average of 1,520 tons per day, a surplus capacity of 2,480 tons per day.[38] Based on a solid waste generation of 0.006 pound per square foot per day, the proposed project is anticipated to generate approximately 6.73 tons of solid waste per day (2,456 tons/year). The volume of solid waste generated by the proposed project per day represents 0.0017 percent of the current permitted throughput and 0.0032 percent of the current surplus capacity at the Badlands Sanitary Landfill. As adequate daily surplus capacity exists at the receiving landfill, development of the proposed project would not significantly impact current operations or the expected lifetime of the landfill serving the project area. A **less than significant** impact would occur and no mitigation is required.

g) Comply with federal, state, and local statues and regulations related to solid waste?			X	

Less Than Significant Impact. The proposed project would be required to comply with applicable elements of AB 1327, Chapter 18 (California Solid Waste Reuse and Recycling Access Act of 1991) and other applicable local, state, and federal solid waste disposal standards, thereby ensuring that the solid waste stream to the Badlands Sanitary Landfill is reduced in accordance with existing regulations. A **less than significant** impact related to this issue would occur. No mitigation is required.

XIX. MANDATORY FINDINGS OF SIGNIFICANCE.

a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to		X		

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[35] City of Moreno Valley General Plan Final Program EIR, City of Moreno Valley, July 2006.

[36] Tables 7-4 through 7-9, Eastern Municipal Water District, 2015 Urban Water Management Plan, June 2016.

[37] Facility/Site Summary Details: Badlands Sanitary Landfill, CalRecycle, 2017.

[38] 5.13 Public Services and Utilities, Solid Waste, City of Moreno Valley General Plan Final Program EIR, July 2006.

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?				

Less Than Significant with Mitigation Incorporated. The Project proposes an ARCO AM/PM gas station on 1.58-acres of vacant land. Surrounding land uses include commercial and residential development. No federal jurisdictional waters, wetlands, and/or streambeds regulated by CDFW were identified within the project area. As mentioned before, the project site is located within the Multiple Species Habitat Conservation Plan (MSHCP) City of Moreno Valley Area Plan. No special-status species were found or observed during the field reconnaissance. However, based on a literature review and the field survey, some special-interest species, including federal/State listed species, are known to occur in the region. Because the project site is currently un-vegetated, a burrowing owl habitat assessment and burrow survey was conducted and concluding negative results for owls and owl sign, and no evidence of usable burrows. Because the burrowing owl is mobile and seasonally migratory bird, **Mitigation Measure BIO-1** will reduce impacts to a **less than significant with mitigation incorporated** levels. The project site is currently vacant and is currently surrounded by residential and commercial uses.

There are no sites within the City of Moreno Valley listed as a state landmark, nor are there any sites on the National Register of Historic Places. Eight (8) cultural resource studies have been previously conducted within a 1-mile radius of the Project, none of which included any portion of the Project.[39] Although no cultural resources were identified on the Project site, 21 prehistoric sites have been recorded within 1-mile (see Checklist Question V.a). According to the cultural resource assessment, a water tank was once located on the parcel, a fragment of historic period irrigation pipe was identified during the survey and a concrete cistern remains to the west. Also, numerous prehistoric resources lie to the south and the sensitivity of the area between these resources and the Project is unknown. With implementation of **Mitigation measure CUL-1** through **Mitigation Measure CUL-7**, impacts to cultural resources would be **less than significant.** No mitigation is required.

b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?		X		

Less Than Significant with Mitigation Incorporated. The City's General Plan identifies the site as Commercial (C) and the zoning as Neighborhood Commercial (NC). The project proposes the development of a 3,180 ARCO gas station with a car wash facility within an area of the City where such uses have been anticipated in local and regional planning documents. The potential environmental effects associated with the proposed project and cumulative projects in the City are addressed within the scope of impacts identified in the City's General Plan.

The project traffic study evaluated cumulative projects and the associated analysis (see Checklist Question XVI.a) determined the project would not generate significant amounts of cumulative traffic. The Air Quality/Greenhouse Gas and Noise studies prepared for the proposed project are based on the traffic volumes developed in the traffic study, and these two studies determined air pollution and GHG emissions and roadway noise levels would be correspondingly less than significant. In addition, there are no other projects whose impacts would comingle with the proposed project and create a cumulatively significant impact over and above those previously identified in this Initial Study. Consequently, the construction and operation of the proposed uses would result in a **less than significant with mitigation incorporated** cumulative impact with implementation of the identified mitigation measures, and no additional mitigation is warranted.

c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?		X		

Less Than Significant with Mitigation Incorporated. The proposed project would result in impacts to human beings by

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[39] Cultural Resource Assessment, Sater ARCO Project, City of Moreno Valley, LSA Associates Inc., September 2017.

Issues and Supporting Information	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact

degrading water quality. While potential water quality impacts could result from the proposed project, implementation of NPDES permits ensures that the State's mandatory standards for the maintenance of clean water and the Federal minimums are met. Adherence to **Mitigation Measures HYD-1** through **HYD-3** would ensure impacts to water quality would be reduced to **less than significant with mitigation incorporated**. Therefore, the proposed project would not have a significant water quality impact.

The South Coast Air Basin is currently designated as a non-attainment area for ozone, PM10, and PM2.5. Development of the project would contribute to air pollutant emissions on a short-term basis. The project would be required to comply with regional rules that assist in reducing short-term air pollutant emissions. The purpose of SCAQMD Rule 403 is to reduce the amount of particulate matter in the atmosphere resulting from man-made fugitive dust sources. Adherence to these measures would reduce short-term construction air quality impacts to a less than significant level.

Like all of Southern California, the project site could be subject to strong ground shaking resulting from large earthquakes. Additionally, the proposed project could experience adverse effects from unstable soils. Adherence to existing Uniform Building Code and California Building Code standards as well as recommendations detailed in the project-specific geotechnical studies would ensure potential impacts related to geologic and soil conditions are **less than significant.**

As detailed in the preceding responses, development of the proposed project would not result, either directly or indirectly, in adverse impacts to human beings.

Appendices

Appendix A: Air Quality and Greenhouse Gas Emissions Analysis and Screening Health Risk Assessment, AM-PM Gasoline Service Station Project, City of Moreno Valley, LSA, November 8, 2017.

Appendix B: Biological Resources Assessment and MSHCP Consistency Analysis and Habitat Assessment, AM-PM Gasoline Service Station Project, City of Moreno Valley, LSA, September 2017.

Appendix C: Cultural Resource Assessment, Sater Arco Project, City of Moreno Valley, LSA, September 2017.

Appendix D: Preliminary Geotechnical Engineering Investigation, ARCO Gas Station, Salem Engineering Group, Inc., November 30, 2017.

Appendix E: Feasibility Study Report of Soils and Foundation Evaluations, Soils Southwest, Inc., November 12, 2003.

Appendix F: Phase I Environmental Site Assessment Report, 18.81 Acres of Vacant Land, Oliver Street and Iris Avenue, Orswell & Kasman, Inc., September 26, 2003.

Appendix G: Project Specific Water Quality Management Plan, Moreno Valley ARCO, Barghausen Consulting Engineers, Inc., October 12, 2018.

Appendix H: Preliminary Drainage Report, Moreno Valley ARCO Fuel Station, Barghausen Consulting Engineers, Inc., September 25, 2018

Appendix I: Noise and Vibration Impact Analysis, AM/PM Gasoline Service Station, LSA Associates Inc., November 2017.

Appendix J: Traffic Impact Analysis, AM/PM Gasoline Service Station, LSA Associates Inc., July 2018.

References

California Department of Conservation, Division of Land Resource Protection, Riverside County Williamson Act FY 2015/2016, Sheet 1 of 3, website: ftp://ftp.consrv.ca.gov/pub/dlrp/wa/Riverside_w_15_16_WA.pdf (Accessed September 19, 2017).

City of Moreno Valley General Plan, July 11, 2006.

City of Moreno Valley General Plan Environmental Impact Report, July 2006.

Department of Conservation, Farmland Mapping and Monitoring Program, http://maps.conservation.ca.gov/ciff/ciff.html (Accessed September 19, 2017).

2015 Final Urban Water Management Plan, Eastern Municipal Water District, RMC Water and Environment, June 2016.

March Air Reserve Base/Inland Port Airport Land Use Compatibility Plan, Riverside County Airport Land Use Commission, Mead & Hunt, November 13, 2017.

Appendix A:

Air Quality and Greenhouse Gas Emissions Analysis and Screening Health Risk Assessment Technical Memorandum

Proposed ARCO AM/PM Gas Service Station with Convenience Store and Car Wash Project

Appendix B:

Biological Resources Assessment and MSHCP Consistency Analysis and Habitat Assessment

AM/PM Gasoline Service Station Project

Appendix C:

Cultural Resources Assessment

Sater Arco Project

Appendix D:

Preliminary Geotechnical Engineering Investigation

ARCO Gas Station

Appendix E:

Feasibility Study Report of Soils and Foundation Evaluations

Proposed Commercial Center NWC Iris Ave & Oliver St

Appendix F:

Phase I Environmental Site Assessment Report

18.81 Acres of Vacant Land, Oliver Street and Iris Avenue

Appendix G:

Project Specific Water Quality Management Plan

Moreno Valley ARCO

Appendix H:

Preliminary Drainage Report

Moreno Valley ARCO Fuel Station

Appendix I:

Noise and Vibration Impact Analysis Memorandum

AM/PM Gasoline Service Station

Appendix J:

Traffic Impact Analysis

AM/PM Gasoline Service Station

MITIGATION MONITORING AND REPORTING PROGRAM
SATER ARCO AM/PM GAS STATION PROJECT (PEN 18 - 0016)

This Mitigation Monitoring and Reporting Program has been prepared for use in implementing mitigation for the:

Sater ARCO AM/PM Gas Station Project (PEN 18 - 0016)

The program has been prepared in compliance with State law and the Mitigated Negative Declaration (MND) prepared for the project by the City of Moreno Valley (City).

The California Environmental Quality Act (CEQA) requires adoption of a reporting or monitoring program for those measures placed on a project to mitigate or avoid adverse effects on the environment (Public Resource Code Section 21081.6). The law states the reporting or monitoring program shall be designed to ensure compliance during project implementation.

The monitoring program contains the following elements:

1) The mitigation measures are recorded with the action and procedure necessary to ensure compliance. In some instances, one action may be used to verify implementation of several mitigation measures.
2) A procedure for compliance and verification has been outlined for each action necessary. This procedure designates who will take action, what action will be taken and when, and to whom and when compliance will be reported.
3) The program has been designed to be flexible. As monitoring progresses, changes to compliance procedures may be necessary based upon recommendations by those responsible for the program. As changes are made, new monitoring compliance procedures and records will be developed and incorporated into the program.

This Mitigation Monitoring and Reporting Program includes mitigation identified in the MND.

MITIGATION MONITORING AND RESPONSIBILITIES

As the Lead Agency, the City is responsible for ensuring full compliance with the mitigation measures adopted for the proposed project. The City will monitor and report on all mitigation activities. Mitigation measures will be implemented at different stages of development throughout the project site. In this regard, the responsibilities for implementation have been assigned to the Applicant, Contractor, or a combination thereof. If during the course of project implementation, any of the mitigation measures identified herein cannot be successfully implemented, the City shall be immediately informed, and the City will then inform any affected responsible agencies. The City, in conjunction with any affected responsible agencies, will then determine if modification to the project is required and/or whether alternative mitigation is appropriate.

STANDARD CONDITIONS

Standard Conditions are presented in instances where the proposed project would not create a significant impact but would be required to adhere to regulatory requirements in order to ensure impacts do not become significant. Standard Conditions outline compliance with various federal, State, and/or local acts, laws, rules, regulations, municipal codes, etc.

Attachment: Exhibit B - Mitigation Monitoring and Report Program (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

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MITIGATION MONITORING AND REPORTING PROGRAM
SATER ARCO AM/PM GAS STATION PROJECT (PEN 18 - 0016)

MITIGATION MONITORING AND REPORTING PROGRAM CHECKLIST

Project Name: Sater ARCO AM/PM Gas Station Project (PEN 18 - 0016) **Applicant:** **Sater Oil International, LLC**

Date: **November 2018**

Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Timing of Verification	Method of Verification	Verified Date/ Initials	Sanctions for Non-Compliance
BIOLOGICAL RESOURCES					
BIO-1: Prior to the issuance of grading permit, a pre-construction survey for burrowing owl shall be conducted by a qualified biologist no more than 30 days before the commencement of vegetation removal or ground disturbing activities to confirm the absence of burrowing owl onsite. If burrowing owl(s) are detected during the focused surveys, a Burrowing Owl Mitigation and Monitoring Plan (“Plan”) shall be prepared by a qualified biologist and submitted to the California Department of Fish and Wildlife for review and approval prior to commencement of project activities. The Plan shall describe appropriate avoidance, minimization, and mitigation measures to reduce impacts to burrowing owls and ensure the implementation of appropriate and commensurate compensatory mitigation for the loss of burrowing owl nesting and foraging habitat. No further action is required if the 30-day pre-construction survey does not result in burrowing owl sign or observations.	City Planner or designee	Prior to the issuance of grading permits and/or during grading activities	Evidence the required pre-construction survey has been completed, and (as applicable), the establishment and maintenance of appropriate buffers.		Withhold grading permit and/or issuance of a stop work order
CULTURAL RESOURCES					
CUL-1: Prior to the issuance of a grading permit, the Developer shall retain a professional archaeologist to conduct monitoring of all mass grading and trenching activities. The Project Archaeologist shall	City Planner or designee	Prior to the issuance of grading permit and during	Evidence the construction documents include instructions in the event such a resource is detected,		Withhold grading permit and/or issuance of a

Project Name: Sater ARCO AM/PM Gas Station Project (PEN 18 - 0016) **Applicant:** **Sater Oil International, LLC**
Date: **November 2018**

Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Timing of Verification	Method of Verification	Verified Date/ Initials	Sanctions for Non-Compliance
have the authority to temporarily redirect earthmoving activities in the event that suspected archaeological resources are unearthed during Project construction. The Project Archaeologist, in consultation with the Consulting Tribe(s), the contractor, and the City, shall develop a Cultural Resources Management Plan (CRMP) in consultation pursuant to the definition in AB52 to address the details, timing and responsibility of all archaeological and cultural activities that will occur on the project site. A consulting tribe is defined as a tribe that initiated the AB 52 tribal consultation process for the Project, has not opted out of the AB52 consultation process, and has completed AB 52 consultation with the City as provided for in Cal Pub Res Code Section 21080.3.2(b)(1) of AB52. Details in the Plan shall include: a) Project grading and development scheduling; b) The Project archeologist and the Consulting Tribes(s) as defined in CR-1 shall attend the pre-grading meeting with the City, the construction manager and any contractors and will conduct a mandatory Cultural Resources Worker Sensitivity Training to those in attendance. The Training will include a brief review of the cultural sensitivity of the Project and the surrounding area; what resources could		grading	and as applicable, 1) Evidence appropriate buffer areas have been established; 2) Evidence qualified archaeologist has been retained to inspect the find; and 3) Completion of required evaluation and report by a qualified archeologist.		stop work order

Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Timing of Verification	Method of Verification	Verified Date/ Initials	Sanctions for Non-Compliance
potentially be identified during earthmoving activities; the requirements of the monitoring program; the protocols that apply in the event inadvertent discoveries of cultural resources are identified, including who to contact and appropriate avoidance measures until the find(s) can be properly evaluated; and any other appropriate protocols. All new construction personnel that will conduct earthwork or grading activities that begin work on the Project following the initial Training must take the Cultural Sensitivity Training prior to beginning work and the Project archaeologist and Consulting Tribe(s) shall make themselves available to provide the training on an as-needed basis; c) The protocols and stipulations that the contractor, City, Consulting Tribe(s) and Project archaeologist will follow in the event of inadvertent cultural resources discoveries, including any newly discovered cultural resource deposits that shall be subject to a cultural resources evaluation.					
CUL 2: Prior to the issuance of a grading permit, the Developer shall secure agreements with the Pechanga Band of Luiseño Indians and Soboba Band of Luiseño Indians for tribal monitoring. The Developer is also required to provide a minimum of	City Planner or designee	Prior to the issuance of grading permits and during grading	Evidence the construction documents include instructions in the event such a resource is detected, and as applicable,		Withhold grading permit and/or issuance of a stop work

Project Name: Sater ARCO AM/PM Gas Station Project (PEN 18 - 0016) **Applicant:** **Sater Oil International, LLC**
Date: **November 2018**

Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Timing of Verification	Method of Verification	Verified Date/ Initials	Sanctions for Non-Compliance
30 days advance notice to the tribes of all mass grading and trenching activities. The Native American Tribal Representatives shall have the authority to temporarily halt and redirect earth moving activities in the affected area in the event that suspected archaeological resources are unearthed. If the Native American Tribal Representatives suspect that an archaeological resource may have been unearthed, the Project Archaeologist or the Tribal Representatives shall immediately redirect grading operations in a 100-foot radius around the find to allow identification and evaluation of the suspected resource. In consultation with the Native American Tribal Representatives, the Project Archaeologist shall evaluate the suspected resource and make a determination of significance pursuant to California Public Resources Code Section 21083.2.			1) Evidence appropriate buffer areas have been established; 2) Evidence qualified archaeologist has been retained to inspect the find; 3) Completion of required evaluation and report by a qualified archeologist; and 4) Secure agreements with the Pechanga Band of Luiseño Indians and Soboba Band of Luiseño Indians for tribal monitoring.		order
CUL 3: In the event that Native American cultural resources are discovered during the course of grading (inadvertent discoveries), the following procedures shall be carried out for final disposition of the discoveries. a) One or more of the following treatments, in order of preference, shall be employed with the tribes. Evidence of such shall be provided to the City of Moreno Valley Planning Department:	City Planner or designee	During shovel testing, construction, or any other ground-disturbing activities	Provide evidence to the City that a qualified archaeological monitor has been retained and that the monitor will be present during all grading and other significant ground-disturbing, and as applicable, 1) Evidence appropriate		Withhold grading permit and/or issuance of a stop work order

Project Name: Sater ARCO AM/PM Gas Station Project (PEN 18 - 0016) **Applicant:** **Sater Oil International, LLC**
Date: **November 2018**

Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Timing of Verification	Method of Verification	Verified Date/ Initials	Sanctions for Non-Compliance
i. Preservation-In-Place of the cultural resources, if feasible. Preservation in place means avoiding the resources, leaving them in the place they were found with no development affecting the integrity of the resources. ii. Onsite reburial of the discovered items as detailed in the treatment plan required pursuant to Mitigation Measure CUl-1. This shall include measures and provisions to protect the future reburial area from any future impacts in perpetuity. Reburial shall not occur until all legally required cataloging and basic recordation have been completed. No recordation of sacred items is permitted without the written consent of all Consulting Native American Tribal Governments as defined in CUL-1.			buffer areas have been established; 2) Evidence of preparation of Cultural Resources Discovery, Monitoring, and Treatment Plan; 3) Evidence appropriate Native American Parties have been engaged; and 4) Completion of required evaluation and report by a qualified archeologist.		
CUL 4: The City shall verify that the following note is included on the Grading Plan: "If any suspected archaeological resources are discovered during ground-disturbing activities and the Project Archaeologist or Native American Tribal Representatives are not present, the construction	City Planner or designee	During shovel testing, construction, or any other ground-disturbing activities	Provide evidence to the City that a qualified archaeological monitor has been retained and that the monitor will be present during all grading and other significant ground-		Withhold grading permit and/or issuance of a stop work order

MITIGATION MONITORING AND REPORTING PROGRAM
SATER ARCO AM/PM GAS STATION PROJECT (PEN 18 - 0016)

Project Name: Sater ARCO AM/PM Gas Station Project (PEN 18 - 0016) **Applicant:** **Sater Oil International, LLC**

Date: **November 2018**

Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Timing of Verification	Method of Verification	Verified Date/ Initials	Sanctions for Non-Compliance
supervisor is obligated to halt work in a 100-foot radius around the find and call the Project Archaeologist and the Tribal Representatives to the site to assess the significance of the find."			disturbing, and as applicable, 1) Evidence appropriate buffer areas have been established; 2) Evidence of preparation of Cultural Resources Discovery, Monitoring, and Treatment Plan; 3) Evidence appropriate Native American Parties have been engaged; and 4) Completion of required evaluation and report by a qualified archeologist.		
CUL 5: If potential historic or cultural resources are uncovered during excavation or construction activities at the project site, work in the affected area must cease immediately and a qualified person meeting the Secretary of the Interior's standards (36 CFR 61), Tribal Representatives, and all site monitors per the Mitigation Measures, shall be consulted by the City to evaluate the find, and as appropriate recommend alternative measures to avoid, minimize or mitigate negative effects on the historic, or prehistoric resource. Determinations and	City Planner or designee	During shovel testing, construction, or any other ground-disturbing activities	Provide evidence to the City that a qualified archaeological monitor has been retained and that the monitor will be present during all grading and other significant ground-disturbing, and as applicable, 1) Evidence appropriate buffer areas have been		Withhold grading permit and/or issuance of a stop work order

Project Name: Sater ARCO AM/PM Gas Station Project (PEN 18 - 0016) **Applicant:** **Sater Oil International, LLC**

Date: **November 2018**

Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Timing of Verification	Method of Verification	Verified Date/ Initials	Sanctions for Non-Compliance
recommendations by the consultant shall be immediately submitted to the Planning Division for consideration, and implemented as deemed appropriate by the Community Development Director, in consultation with the State Historic Preservation Officer (SHPO) and any and all Consulting Native American Tribes as defined in CR-1 before any further work commences in the affected area.			established; 2) Evidence of preparation of Cultural Resources Discovery, Monitoring, and Treatment Plan; 3) Evidence appropriate Native American Parties have been engaged; and 4) Completion of required evaluation and report by a qualified archeologist.		
CUL 6: If paleontological resources (fossils) are discovered during project grading, work will be halted in that area until a qualified paleontologist can be retained to assess the significance of the find. The project paleontologist shall monitor remaining earthmoving activities at the project site and shall be equipped to record and salvage fossil resources that may be unearthed during grading activities. The paleontologist shall be empowered to temporarily halt or divert grading equipment to allow recording and removal of the unearthed resources. Any fossils found shall be evaluated in accordance with the CEQA Guidelines and offered for curation at an accredited facility approved by the City of Moreno Valley. Once grading activities have ceased or the paleontologist determines that	City Planner or designee	During shovel testing, construction, or any other ground-disturbing activities	Provide evidence to the City that a qualified archaeological monitor has been retained and that the monitor will be present during all grading and other significant ground-disturbing, and as applicable, 1) Evidence appropriate buffer areas have been established; 2) Evidence of preparation of Cultural Resources		Withhold grading permit and/or issuance of a stop work order

MITIGATION MONITORING AND REPORTING PROGRAM
SATER ARCO AM/PM GAS STATION PROJECT (PEN 18 - 0016)

Project Name: Sater ARCO AM/PM Gas Station Project (PEN 18 - 0016) **Applicant:** **Sater Oil International, LLC**
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Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Timing of Verification	Method of Verification	Verified Date/ Initials	Sanctions for Non-Compliance
monitoring is no longer necessary, monitoring activities shall be discontinued. This measure shall be implemented to the satisfaction of the City Planning Division.			Discovery, Monitoring, and Treatment Plan; 3) Evidence appropriate Native American Parties have been engaged; and 4) Completion of required evaluation and report by a qualified archeologist.		
CUL 7: If human remains are discovered, no further disturbance shall occur in the affected area until the County Coroner has made necessary findings as to origin. If the County Coroner determines that the remains are potentially Native American, the California Native American Heritage Commission shall be notified within 24 hours of the published finding to be given a reasonable opportunity to identify the "most likely descendant". The "most likely descendant" shall then make recommendations, and engage in consultations concerning the treatment of the remains (California Public Resources Code 5097.98). (GP Objective 23.3, CEQA).	City Planner or designee	During shovel testing, construction, or any other ground-disturbing activities	Provide evidence to the City that a qualified archaeological monitor has been retained and that the monitor will be present during all grading and other significant ground-disturbing, and as applicable, 1) Evidence appropriate buffer areas have been established; 2) Evidence of preparation of Cultural Resources Discovery, Monitoring, and Treatment Plan; 3) Evidence appropriate		Withhold grading permit and/or issuance of a stop work order

Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Timing of Verification	Method of Verification	Verified Date/ Initials	Sanctions for Non-Compliance
			Native American Parties have been engaged; and 4) Completion of required evaluation and report by a qualified archeologist.		
GEOLOGY AND SOILS					
GEO 1: Prior to issuance of building permits, the project applicant or its designee shall demonstrate all recommendations contained in project-specific geotechnical and/or soils and foundation evaluation report by Salem Engineering Group Inc. dated November 30, 2017 are implemented. This measure shall be implemented to the satisfaction of the City Engineer.	City building official or designee	Prior to the issuance of grading or building permits	Evidence of construction of the improvements.		Withhold building permit.
GEO 2: Prior to the issuance of a grading permit, the project applicant shall provide proof to the City of Moreno Valley that supplemental laboratory testing has been conducted for expansive soils and that any identified conditions in this regard will be eliminated or reduced to safe levels by proposed grading activities and/or foundation design. This measure shall be implemented to the satisfaction of the City Engineer.	City building official or designee	Prior to the issuance of grading or building permits	Evidence of construction of the improvements.		Withhold building permit.
HAZARDOUS MATERIALS					
HAZ-1: Prior to issuance of construction permit, the project applicant shall provide proof to the City	City Development	Prior to the issuance of	Evidence of City police and fire services have		Withhold building

Project Name: Sater ARCO AM/PM Gas Station Project (PEN 18 - 0016) **Applicant:** **Sater Oil International, LLC**
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Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Timing of Verification	Method of Verification	Verified Date/ Initials	Sanctions for Non-Compliance
of Moreno Valley that City police and fire services, as applicable, have reviewed and approved the emergency response plan.	Services Department, Building and Safety Division, or designee	grading and building permits	conducted their review provided approval		permit.
HYDROLOGY AND WATER QUALITY					
HYD-1: Prior to the issuance of a grading permit, the project applicant shall file and obtain a Notice of Intent (NOI) with the Regional Water Quality Control Board (RWQCB) in order to be in compliance with the State NPDES General Construction Storm Water Permit for discharge of surface runoff associated with construction activities. Evidence that this has been obtained (i.e., a copy of the Waste Discharger's Identification Number) shall be submitted to the City for coverage under the NPDES General Construction Permit. The NOI shall address the potential for an extended and discontinuous construction period based on funding availability.	City Municipal Utilities & Public Works Department and Development Services Department, as appropriate	Prior to the issuance of grading permits.	Submittal of NOI to the City.		Withhold building permit.
HYD-2: Prior to the issuance of a grading permit, the project applicant shall prepare a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP shall include a surface water control plan and erosion control plan citing specific measures to control on-site and off-site erosion during the entire grading and construction period. In addition, the SWPPP shall emphasize structural and nonstructural Best Management Practices (BMPs) to control sediment	City Municipal Utilities & Public Works Department and Development Services Department, as appropriate	Prior to the issuance of grading permits.	Evidence of construction of the improvements.		Withhold building permit.

Attachment: Exhibit B - Mitigation Monitoring and Report Program (3309 : CONDITIONAL USE PERMIT

MITIGATION MONITORING AND REPORTING PROGRAM
SATER ARCO AM/PM GAS STATION PROJECT (PEN 18 - 0016)

Project Name: Sater ARCO AM/PM Gas Station Project (PEN 18 - 0016)	**Applicant:**	**Sater Oil International, LLC**
	Date:	**November 2018**

Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Timing of Verification	Method of Verification	Verified Date/ Initials	Sanctions for Non-Compliance
and non-visible discharges from the site. The SWPPP will include inspection forms for routine monitoring of the site during construction phase to ensure NPDES compliance and additional BMPs and erosion control measures will be documented in the SWPPP and utilized if necessary. The SWPPP shall address the potential for an extended and discontinuous construction period based on funding availability. The SWPPP will be kept on site for the entire duration of project construction and will be available to the local RWQCB for inspection at any time. BMPs included in the SWPPP may include the following: • Sediment discharges from the site may be controlled by the following: sandbags, silt fences, straw wattles and temporary basins (if deemed necessary), and other discharge control devices. The construction and condition of the BMPs will be periodically inspected during construction and repairs will be made when necessary as required by the SWPPP. • Materials that have the potential to contribute to non-visible pollutants to storm water must not be placed in drainage ways and must be contained, elevated, and placed in temporary storage containment areas. • All loose piles of soil, silt, clay, sand,					

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Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Timing of Verification	Method of Verification	Verified Date/ Initials	Sanctions for Non-Compliance
debris, and other earthen material shall be protected in a reasonable manner to eliminate any discharge from the site. Stockpiles will be surrounded by silt fences and covered with plastic tarps. • In addition, the construction contractor shall be responsible for performing and documenting the application of BMPs identified in the SWPPP. Weekly inspections shall be performed on sandbag barriers and other sediment control measures called for in the SWPPP. Monthly reports and inspection logs shall be maintained by the Contractor and reviewed by the City and the representatives of the State Water Resources Control Board. In the event that it is not feasible to implement specific BMPs, the City can make a determination that other BMPs will provide equivalent or superior treatment either on or off site.					
HYD-3: Prior to the issuance of a grading permit, the applicant shall submit a Water Quality Management Plan (WQMP) to the City, for review and approval. The project shall implement project design features identified in the Water Quality Management Plan. This measure shall be implemented to the satisfaction of the City Public	City Municipal Utilities & Public Works Department and Development Services	Prior to the issuance of demolition and grading permits.	Evidence of construction of the improvements.		Withhold building permit.

MITIGATION MONITORING AND REPORTING PROGRAM
SATER ARCO AM/PM GAS STATION PROJECT (PEN 18 - 0016)

Project Name: Sater ARCO AM/PM Gas Station Project (PEN 18 - 0016) **Applicant:** **Sater Oil International, LLC**
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Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Timing of Verification	Method of Verification	Verified Date/ Initials	Sanctions for Non-Compliance
Works Department.	Department, as appropriate				
NOISE					
NOI-1: Prior to the issuance of a grading permit, the project applicant shall incorporate the following standards as notes on the grading plan cover sheet to minimize construction noise to the greatest extend practical: • Equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers consistent with manufacturers' standards. • Place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the active project site. • Locate equipment staging in areas that would create the greatest possible distance between construction-related noise sources and noise-sensitive receptors nearest the active project site during all project construction. • Prohibit extended idling time of internal combustion engines. • All noise producing construction activities shall be limited to the hours of 7:00 a.m. and 7:00 p.m. Monday through Friday, excluding holidays and from 8 a.m. to 4 p.m. on Saturday, unless written approval	City Planner or designee	Prior to approval of development plan.	Implement measures to maintain City noise standards.		Withhold building permit.

MITIGATION MONITORING AND REPORTING PROGRAM
SATER ARCO AM/PM GAS STATION PROJECT (PEN 18 - 0016)

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Mitigation Measure No. / Implementing Action	Responsible for Monitoring	Timing of Verification	Method of Verification	Verified Date/ Initials	Sanctions for Non-Compliance
is obtained from the city building official or city engineer. - Designate a "disturbance coordinator" who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaint (e.g., starting too early, bad muffler) and would determine and implement reasonable measures warranted to correct the problem.					

PLANNING COMMISSION RESOLUTION NO. 2018-55

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF MORENO VALLEY APPROVING CONDITIONAL USE PERMIT APPLICATION PEN18-0016 FOR DEVELOPMENT OF A 3,180 SQUARE FOOT GAS STATION WITH CONVENIENCE STORE, INCLUDING SALE OF ALCOHOL, AND CARWASH ON A 1.31 ACRE SITE LOCATED ON THE NORTHWEST CORNER OF IRIS AVENUE AND OLIVER STREET (ASSESSOR'S PARCEL NUMBER 486-310-038)

WHEREAS, Sater Oil International, LLC, has filed an application for the approval of Conditional Use Permit (CUP) PEN18-0016 for development of a new 3,180 square foot ARCO AM/PM gas station, with 8 fuel islands, a convenience store including Type-20 alcohol sales for beer and wine, and carwash, to operate up to 24 hours per day and as described in the title above; and

WHEREAS, the application has been evaluated in accordance with established City of Moreno Valley (City) procedures, and with consideration of the Municipal Code, General Plan and other applicable regulations; and

WHEREAS, upon completion of a thorough development review process the project was appropriately agendized and noticed for a public hearing before the Planning Commission of the City of Moreno Valley (Planning Commission); and

WHEREAS, the public hearing notice for this project was published in the local newspaper on November 23, 2018, and was sent to all property owners of record within 300 feet of the project site on November 29, 2018, and which public hearing notice was also posted on the project site on November 30, 2018; and

WHEREAS, on December 13, 2018, the Planning Commission held a public hearing to consider the application; and

WHEREAS, an environmental assessment, including an Initial Study, has been prepared to address the environmental impacts associated with the application PEN18-0016 as described above and a Mitigated Negative Declaration and Mitigation Monitoring and Reporting Program have been adopted pursuant to the California Environmental Quality Act (CEQA) as there is no evidence that the proposed Conditional Use Permit will have a significant impact on the environment with the incorporation of mitigation measures; and

WHEREAS, all legal prerequisites to the adoption of this Resolution have occurred; and

WHEREAS, pursuant to Government Code Section 66020(d)(1), **NOTICE IS HEREBY GIVEN** that this project is subject to certain fees, dedications, reservations and other exactions as provided herein.

NOW, THEREFORE, BE IT RESOLVED, it is hereby found, determined and resolved by the Planning Commission as follows:

A. This Planning Commission hereby specifically finds that all of the facts set forth above in this Resolution are true and correct.

B. Based upon substantial evidence presented to this Planning Commission during the above-referenced meeting on December 13, 2018, including written and oral staff reports, public testimony and the record from the public hearing, this Planning Commission hereby specifically finds as follows:

1. **Conformance with General Plan Policies –** The proposed use is consistent with the General Plan, and its goals, objectives, policies and programs.

   FACT: State Planning Law required cities and counties to set forth goals, policies, and implementation programs for the long term physical development of the community. Section 65302 (a) of the Government Code requires preparation of a land use element which designates the proposed general distribution and general location of the uses of land for housing, business, industry, public buildings, and open space. The proposed development is located within the Commercial (C) land use designation of the Moreno Valley General Plan.

   The CUP has been evaluated against General Plan Objective 2.4, which states "provide commercial areas within the City that are conveniently located, efficient, attractive, and have safe and easy pedestrian and vehicular circulation in order to serve the retail and service commercial needs of Moreno Valley residents and businesses" and staff has confirmed that the proposed project does not conflict with any of the goals, objectives, policies, and programs of the General Plan. The addition of a new 24 hour 3,180 square foot ARCO AM/PM gas station, with 8 fuel islands and convenience store, carwash, and a Type-20 alcohol sales license for beer and wine, provides a convenience to the surrounding neighborhood.

2. **Conformance with Zoning Regulations –** The proposed use complies with all applicable zoning and other regulations.

   FACT: General Plan Policy 2.4.1 states the primary purpose of areas designated Commercial is to provide property for business purposes, including, but not limited to, retail stores, restaurants, banks, hotels, professional offices, personal services and repair services. The zoning regulations shall identify the particular uses permitted on each parcel of land. The proposed project is within the Neighborhood Commercial (NC) zoning district. Municipal Code Section 9.02.020 (Permitted Uses) requires a conditional use permit for auto service stations and accessory uses including convenience store and carwash, and convenience store with alcohol sales, when located within 300 feet of residential uses. The project is located within 300 feet of residential developments and a Medium/Low (ML) residential zone.

The project is designed in accordance with the provisions of Section 9.04 Commercial Districts, Section 9.16 Design Guidelines of the City's Municipal Code. The project as designed and conditioned would comply with all applicable zoning and other regulations.

3. **Health, Safety and Welfare –** The proposed use will not be detrimental to the public health, safety or welfare or materially injurious to properties or improvements in the vicinity.

FACT: The proposed 24 hour 3,180 square foot ARCO AM/PM gas station, with 8 fuel islands and convenience store, carwash, and a Type-20 alcohol sales license for beer and wine project as designed and conditioned will provide acceptable levels of protection from natural and man-made hazards to life, health, and property consistent with General Goal 9.6.1. The project site is located within approximately one and three quarter miles from Fire Station No. 91. Therefore, adequate emergency services can be provided to the site consistent with General Plan Goal 9.6.2.

Planning staff has reviewed the request in accordance with the latest edition of the California Environmental Quality Act (CEQA) Guidelines and has determined that the project is not exempt under CEQA. An Initial Study was prepared by LSA Associates, Inc. in compliance with the California Environmental Quality Act (CEQA) Guidelines. The Initial Study examined the potential of the proposed project to have any significant impact on the environment. The Initial Study provides information in support of the finding that a Mitigated Negative Declaration is an appropriate CEQA document for the project, in that the proposed project, with the implementation of mitigation measures identified, will not have a significant effect on the environment. Therefore, the gas station with a convenience store, carwash, and a Type-20 alcohol sales license for beer and wine project will not cause substantial environmental damage or substantially and avoidably injure fish or wildlife or their habitat.

The proposed project as designed and conditioned will result in a development that will minimize the potential for loss of life and protect residents and visitors to the City from physical injury and property damage due to seismic ground shaking and flooding as provided for in General Plan Objective 6.1 and General Plan Objective 6.2. The project as designed and conditioned will be consistent with the Neighborhood Commercial (NC) zoning.

4. **Location, Design and Operation –** The location, design and operation of the proposed project will be compatible with existing and planned land uses in the vicinity.

FACT: The project site is consistent with the Commercial (C) General Plan and Neighborhood Commercial (NC) zoning designations. Based on the project location at the intersection of Iris Avenue and Oliver Street, the gas station with a convenience store, carwash, and a Type-20 alcohol sales license for beer and wine will provide ease of access and convenience to motorists and residents.

Overall, the proposed project has been found to be consistent with the objectives, goals and policies outlined in the City's General Plan, as well as being compatible with the existing and planned land uses in the project area.

This project, as designed conforms to all development standards of the Neighborhood Commercial (NC) zone and the design guidelines for commercial developments prescribed in the City's Municipal Code and City Landscape Standards. The architectural design of the building strives to achieve an attractive and appealing structure that will be located at a prominent street corner, Iris Avenue and Oliver Street. The building is rectangular in shape, single story and has a contemporary modern style, that includes a flat roof design, with a more prominent tower element as the building's main entrance. Exterior finishes proposed include brick veneer treatments, aluminum composite rustic wood finishes, aluminum awnings and stucco wall finishes with a blend of pewter and white as the primary colors. The gasoline station canopy and carwash building are complementary to the main building, using flat roofs, and incorporating the same brick veneer and stucco colors of the main building.

The proposed project will add economic vitality and architectural character along this portion of Iris Avenue, which is highly desirable given its proximity to Kaiser Permanente Hospital, medical offices and single family homes. As designed and conditioned the proposed project is compatible with existing and proposed land uses in the vicinity.

FEES, DEDICATIONS, RESERVATIONS, AND OTHER EXACTIONS

1. **FEES**

Impact, mitigation and other fees are due and payable under currently applicable ordinances and resolutions. These fees may include but are not limited to: Development Impact Fee, Transportation Uniform Mitigation Fee (TUMF), Multi-species Habitat Conservation Plan (MSHCP) Mitigation Fee, Stephens Kangaroo Habitat Conservation fee, Underground Utilities in lieu Fee, Area Drainage Plan fee, Bridge and Thoroughfare Mitigation fee (Future) and Traffic Signal Mitigation fee. The final amount of fees payable is dependent upon information provided by the applicant and will be determined at the time the fees become due and payable.

Unless otherwise provided for by this Resolution, all impact fees shall be calculated and collected at the time and in the manner provided in Chapter 3.32 of the City of Moreno Valley Municipal Code or as so provided in the applicable ordinances and resolutions. The City expressly reserves the right to amend the fees and the fee calculations consistent with applicable law.

2. DEDICATIONS, RESERVATIONS, AND OTHER EXACTIONS

The adopted Conditions of Approval for PEN18-0016, incorporated herein by reference, may include dedications, reservations, and exactions pursuant to Government Code Section 66020 (d) (1).

3. CITY RIGHT TO MODIFY/ADJUST; PROTEST LIMITATIONS

The City expressly reserves the right to establish, modify or adjust any fee, dedication, reservation or other exaction to the extent permitted and as authorized by law.

Pursuant to Government Code Section 66020(d)(1), NOTICE IS FURTHER GIVEN that the 90 day period to protest the imposition of any impact fee, dedication, reservation, or other exaction described in this Resolution begins on the effective date of this Resolution and any such protest must be in a manner that complies with Section 66020(a) and failure to timely follow this procedure will bar any subsequent legal action to attack, review, set aside, void or annul imposition.

The right to protest the fees, dedications, reservations, or other exactions does not apply to planning, zoning, grading, or other similar application processing fees or service fees in connection with this project and it does not apply to any fees, dedication, reservations, or other exactions of which a notice has been given similar to this, nor does it revive challenges to any fees for which the applicable statute of limitations has previously expired.

BE IT FURTHER RESOLVED that the Planning Commission **HEREBY APPROVES** Resolution No. 2018-55, and thereby:

1. **APPROVE** Conditional Use Permit PEN18-0016 based on the findings contained in this resolution, and subject to the attached conditions of approval included as Exhibit A.

APPROVED this 13th day of December, 2018.

Jeffrey Barnes
Chair, Planning Commission

ATTEST:

APPROVED AS TO FORM:

Patty Nevins, Planning Official
Secretary to the Planning Commission

City Attorney

ATTACHMENTS:

Exhibit A: Conditions of Approval

CITY OF MORENO VALLEY
CONDITIONS OF APPROVAL
Conditional Use Permit (PEN18-0016)

EFFECTIVE DATE:
EXPIRATION DATE:

COMMUNITY DEVELOPMENT DEPARTMENT

Planning Division

1. A change or modification to the land use or the approved site plans may require a separate approval. Prior to any change or modification, the property owner shall contact the City of Moreno Valley Community Development Department to determine if a separate approval is required.

2. Any expansion to this use or exterior alterations will require the submittal of a separate application(s) and shall be reviewed and approved under separate permit(s). (MC 9.02.080)

3. The developer, or the developer's successor-in-interest, shall be responsible for maintaining any undeveloped portion of the site in a manner that provides for the control of weeds, erosion and dust. (MC 9.02.030)

4. This approval shall expire three years after the approval date of this project unless used or extended as provided for by the City of Moreno Valley Municipal Code; otherwise it shall become null and void and of no effect whatsoever. Use means the beginning of substantial construction contemplated by this approval within the three-year period, which is thereafter pursued to completion, or the beginning of substantial utilization contemplated by this approval. (MC 9.02.230)

5. In the event the use hereby permitted ceases operation for a period of one (1) year or more, or as defined in the current Municipal Code, this permit may be revoked in accordance with provisions of the Municipal Code.

6. All landscaped areas shall be maintained in a healthy and thriving condition, free from weeds, trash and debris. (MC 9.02.030)

7. The site shall be developed in accordance with the approved plans on file in the Community Development Department - Planning Division, the Municipal Code regulations, General Plan, and the conditions contained herein. Prior to any use of the project site or business activity being commenced thereon, all Conditions of

Approval shall be completed to the satisfaction of the Planning Official. (MC 9.14.020)

8. All site plans, grading plans, landscape and irrigation plans, fence/wall plans, lighting plans and street improvement plans shall be coordinated for consistency with this approval.

Special Conditions

9. Drive-up or drive-through speaker system shall not be detectable above daytime ambient noise levels beyond the property line boundaries, and shall not exceed fifty-five (55) dBA at any one time beyond the boundaries of the property line . (MC9.09.080 C.6 and 9.10.140)

10. The following Mitigation Measures apply to this project:

Prior to the issuance of a grading permit, the Developer shall retain a professional archaeologist to conduct monitoring of all mass grading and trenching activities . The Project Archaeologist shall have the authority to temporarily redirect earthmoving activities in the event that suspected archaeological resources are unearthed during Project construction. The Project Archaeologist, in consultation with the Consulting Tribe(s), the contractor, and the City, shall develop a Cultural Resources Management Plan (CRMP) in consultation pursuant to the definition in AB52 to address the details, timing and responsibility of all archaeological and cultural activities that will occur on the project site. A consulting tribe is defined as a tribe that initiated the AB 52 tribal consultation process for the Project, has not opted out of the AB52 consultation process, and has completed AB 52 consultation with the City as provided for in Cal Pub Res Code Section 21080.3.2(b)(1) of AB52. Details in the Plan shall include:

a) Project grading and development scheduling:

b) The Project archeologist and the Consulting Tribes(s) as defined in CR-1 shall attend the pre-grading meeting with the City, the construction manager and any contractors and will conduct a mandatory Cultural Resources Worker Sensitivity Training to those in attendance. The Training will include a brief review of the cultural sensitivity of the Project and the surrounding area; what resources could potentially be identified during earthmoving activities; the requirements of the monitoring program; the protocols that apply in the event inadvertent discoveries of cultural resources are identified, including who to contact and appropriate avoidance measures until the find(s) can be properly evaluated; and any other appropriate protocols. All new construction personnel that will conduct earthwork or grading activities that begin work on the Prior to the issuance of a grading permit, the City of Moreno Valley shall secure agreements with the Soboba Band of Luiseño Indians and Pechanga Band of Luiseño Indians for tribal monitoring. The City is also required to provide a minimum of 30 days advance notice to the tribes of all mass grading and trenching activities. The Native American Tribal Representatives shall have the authority to temporarily halt and redirect earth moving activities in the affected area in the event that suspected archaeological resources are unearthed. If the Native American Tribal Representatives suspect that an archaeological resource may have been unearthed, the Project Archaeologist or the Tribal Representatives shall immediately redirect grading operations in a 100-foot radius around the find to allow identification and evaluation of the suspected resource. In consultation with the Native American Tribal Representatives, the Project Archaeologist shall evaluate the suspected resource and make a determination of significance pursuant to California Public Resources Code Section 21083.2. (only applicable if tribes require monitoring)

11. In the event that Native American cultural resources are discovered during the course of grading (inadvertent discoveries), the following procedures shall be carried out for final disposition of the discoveries:

    a) One or more of the following treatments, in order of preference, shall be employed with the tribes. Evidence of such shall be provided to the City of Moreno Valley Planning Department:

        i. Preservation-In-Place of the cultural resources, if feasible. Preservation in place means avoiding the resources, leaving them in the place they were found with no development affecting the integrity of the resources.

        ii. Onsite reburial of the discovered items as detailed in the treatment plan required pursuant to Mitigation Measure CR-1. This shall include measures and provisions to protect the future reburial area from any future impacts in perpetuity . Reburial shall not occur until all legally required cataloging and basic recordation have been completed. No recordation of sacred items is permitted without the written consent of all Consulting Native American Tribal Governments as defined in CR-1. The location for the future reburial area shall be identified on a confidential exhibit on file with the City, and concurred to by the Consulting Native American Tribal Governments prior to certification of the environmental document.

12. The City shall verify that the following note is included on the Grading Plan:

"If any suspected archaeological resources are discovered during ground -disturbing activities and the Project Archaeologist or Native American Tribal Representatives are not present, the construction supervisor is obligated to halt work in a 100-foot radius around the find and call the Project Archaeologist and the Tribal Representatives to the site to assess the significance of the find."

13. If potential historic or cultural resources are uncovered during excavation or construction activities at the project site, work in the affected area must cease immediately and a qualified person meeting the Secretary of the Interior's standards (36 CFR 61), Tribal Representatives, and all site monitors per the Mitigation Measures, shall be consulted by the City to evaluate the find, and as appropriate recommend alternative measures to avoid, minimize or mitigate negative effects on the historic, or prehistoric resource. Determinations and recommendations by the consultant shall be immediately submitted to the Planning Division for consideration, and implemented as deemed appropriate by the Community Development Director, in consultation with the State Historic Preservation Officer (SHPO) and any and all Consulting Native American Tribes as defined in CR-1 before any further work commences in the affected area.

14. If human remains are discovered, no further disturbance shall occur in the affected area until the County Coroner has made necessary findings as to origin . If the County Coroner determines that the remains are potentially Native American, the California Native American Heritage Commission shall be notified within 24 hours of the published finding to be given a reasonable opportunity to identify the "most likely descendant". The "most likely descendant" shall then make recommendations, and engage in consultations concerning the treatment of the remains (California Public Resources Code 5097.98). (GP Objective 23.3, CEQA).

15. The Police Chief may require the business owner to provide future security within buildings and parking lot to address issues that arise from the operation of the business.

16. All licenses and approval from the California Department of Alcohol Beverage Control (ABC) must be secured prior to the sale of alcohol.

17. The alcoholic beverage license issued at this location shall be a Type -20 Off-Sale General Alcohol License (Package Store) authorizing the sale of beer and wine for the consumption off the premises where sold.

18. The coolers storing beer and wine which can be accessed by the public shall be locked between the hours of 2:00 a.m. and 6:00 a.m., or as provided for in Section 25631 of the Business and Professions Code which limits hours for sale of

Attachment: Exhibit A - Conditions of Approval [Revision 1] (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION) alcoholic beverages.

19. No trespassing/loitering signs as well as signs prohibiting the consumption of alcoholic beverages on-site shall be posted at the entrance to the convenience store.

20. Address numbers should be placed at multiple locations on the building and be illuminated.

21. Prior to the start of any construction, temporary security fencing shall be erected . The fencing shall be a minimum of six (6) feet high with locking, gated access and shall remain through the duration of construction. Security shall remain in place until the project is completed or the above conditions no longer exist. (Security fencing is required if there is: construction, unsecured structures, unenclosed storage of materials and/or equipment, and/or the condition of the site constitutes a public hazard).

22. The site has been approved for a new 3,180 square foot gas station, operating 24 hours, with 8 fuel islands, a carwash, and convenience store with a Type -20 alcohol sales license for beer and wine. A change or modification shall require separate approval. For a Conditional Use Permit, violation may result in revocation of the Conditional Use Permit.

23. One outdoor trash receptacle shall be provided shall be provided for every ten (10) required parking spaces, with a minimum of one receptacle provided to be located front portion of the site for use by patrons. (MC 9.09.080 C 5.)

24. The use of the carwash and vacuum stations shall be limited to the operating hours of 8:00 a.m. and 10:00 p.m. The use of the carwash and vacuum stations shall be prohibited between 10:00 p.m. and 8:00 a.m.

Prior to Grading Permit

25. Prior to the issuance of any grading permit, all Conditions of Approval, and Mitigation Measures shall be printed on the grading plans.

26. Prior to the issuance of grading permits, decorative (e.g. colored/scored concrete or as approve by the Planning Official) pedestrian pathways across circulation aisles/paths shall be provided throughout the development to connect the commercial buildings with open space and/or the public right-of-way. The pathways shall be shown on the precise grading plan. (GP Objective 46.8, DG)

27. Prior to issuance of any grading permits, mitigation measures contained in the

Mitigation Monitoring Program approved with this project shall be implemented as provided therein. A mitigation monitoring fee, as provided by City ordinance, shall be paid by the applicant within 30 days of project approval. No City permit or approval shall be issued until such fee is paid. (CEQA)

28. Prior to issuance of grading permits, the developer shall pay the applicable Stephens' Kangaroo Rat (SKR) Habitat Conservation Plan mitigation fee. (Ord)

29. Within thirty (30) days prior to any grading or other land disturbance, a pre-construction survey for Burrowing Owls shall be conducted pursuant to the established guidelines of Multiple Species Habitat Conservation Plan. The pre-construction survey shall be submitted to the Planning Division prior to any disturbance of the site and/or grading permit issuance.

30. Prior to the issuance of grading permits, the site plan and grading plans shall show decorative hardscape (e.g. colored concrete, stamped concrete, pavers or as approved by the Planning Official) consistent and compatible with the design, color and materials of the proposed development for all driveway ingress /egress locations of the project.

31. Prior to issuance of grading permits, the developer shall submit wall /fence plans to the Planning Division for review and approval as follows:

    a) 3-foot high decorative wall, solid hedge or berm shall be placed in any setback areas between a public right of way and a parking lot for screening.

    b) Any proposed retaining walls shall also be decorative in nature, while the combination of retaining and other walls on top shall not exceed the height requirement.

32. Prior to the issuance of grading permits, a temporary project identification sign shall be erected on the site in a secure and visible manner. The sign shall be conspicuously posted at the site and remain in place until occupancy of the project . The sign shall include the following:

    a) The name (if applicable) and address of the development.

    b) The developer's name, address, and a 24-hour emergency telephone number.

33. Prior to issuance of grading permits, the location of the trash enclosure shall be included on the plans.

Prior to Building Permit

34. Prior to issuance of any grading permit, all Conditions of Approval and Mitigation Measures shall be printed on the building plans.

35. Prior to the issuance of building permits, the developer shall provide documentation that contact was made to the U.S. Postal Service to determine the appropriate type and location of mailboxes.

36. Prior to the issuance of building permits, proposed covered trash enclosures shall be included in the Planning review of the Fence and Wall plan or separate Planning submittal. The trash enclosure(s), including the roof materials, shall be compatible with the architecture, color and materials of the building (s) design. Trash enclosure areas shall include landscaping on three sides. Approved design plans shall be included in a Building submittal (Fence and Wall or building design plans). (GP Objective 43.6, DG)

37. Prior to issuance of any building permits, final landscaping and irrigation plans shall be submitted with a plan check fee for review and approval by the Planning Division . After the third plan check review for landscape plans, an additional plan check fee shall apply. The plans shall be prepared in accordance with the City's Landscape Requirements and shall include:

    a) A three (3) foot high decorative wall, solid hedge or berm shall be placed in any setback areas between a public right of way and a parking lot for screening.

    b) End planters with required step outs and curbing shall be provided adjacent to end parking stalls as well as at the terminus of each aisle.

    c) Drought tolerant landscape shall be used. Sod shall be limited to gathering areas.

    d) Street trees shall be provided every 40 feet on center in the right of way.

    e) On-site trees shall be planted at an equivalent of one (1) tree per thirty (30) linear feet of the perimeter of a parking lot and per thirty linear feet of a building dimension for the portions of the building visible from a parking lot or right of way. Trees may be massed for pleasing aesthetic effects.

    f) Enhanced landscaping shall be provided at all driveway entries and street corner locations The review of all utility boxes, transformers etc. shall be coordinated to provide adequate screening from public view.

g) Landscaping on three sides of any trash enclosure.

h) All site perimeter and parking lot landscape and irrigation shall be installed prior to the release of certificate of occupancy permit for the site.

38. Prior to issuance of building permits, the Planning Division shall review and approve the location and method of enclosure or screening of transformer cabinets, commercial gas meters and back flow preventers as shown on the final working drawings. Location and screening shall comply with the following criteria : transformer cabinets and commercial gas meters shall not be located within required setbacks and shall be screened from public view either by architectural treatment or landscaping; multiple electrical meters shall be fully enclosed and incorporated into the overall architectural design of the building(s); back-flow preventers shall be screened by landscaping. (GP Objective 43.30)

39. Prior to issuance of a building permit, the developer/property owner or developer's successor-in-interest shall pay all applicable impact fees due at permit issuance, including but not limited to Multi-species Habitat Conservation Plan (MSHCP) mitigation fees. (Ord)

40. Prior to building final, the developer/owner or developer's/owner’ s successor-in-interest shall pay all applicable impact fees, including but not limited to Transportation Uniform Mitigation fees (TUMF), and the City’s adopted Development Impact Fees. (Ord)

41. Prior to or at building plan check submittal, the elevation plans shall include decorative lighting sconces on all sides of the buildings of the complex facing a parking lot, courtyard or plaza, or public right of way or open space to provide up-lighting and shadowing on the structures. Include drawings of the sconce details for each building within the elevation plans, approved by the Planning Division prior to building permit issuance.

42. Prior to or at building plan check submittal, two copies of a detailed, on -site, computer generated, point-by-point comparison lighting plan, including exterior building, parking lot, and landscaping lighting, with a plan check fee shall be submitted to the Planning Division for review and approval prior to the issuance of a building permit. The lighting plan shall be generated on the plot plan and shall be integrated with the final landscape plan. The plan shall indicate the manufacturer's specifications for light fixtures used, shall include style, illumination, location, height and method of shielding per the City’s Municipal Code requirements. After the third plan check review for lighting plans, an additional plan check fee will apply. (MC 9.08.100, 9.16.280)

43. Prior to issuance of building permits, screening details shall be addressed on the building plans for roof top equipment submitted for Planning Division review and approval through the building plan check process. All equipment shall be completely screened so as not to be visible from public view, and the screening shall be an integral part of the building.

44. Prior to issuance of building permits, proposed covered trash enclosure (s) shall be included in the Planning review of the Fence and Wall plans. The trash enclosure (s), including the roof materials, shall be compatible with the architecture, color and materials of the building(s) design. Trash enclosure areas shall include landscaping on three sides unless located within the truck loading area. Approved design plans shall be included in a Building submittal (Fence and walls or building design plans). (GP Objective 43.6, DG)

Prior to Building Final

45. Prior to building final, all required landscaping and irrigation shall be installed per plan, certified by the Landscape Architect and inspected by the Planning Division . (MC 9.03.040, MC 9.17).

46. Prior to building final, Planning approved/stamped landscape plans shall be provided to the Community Development Department – Planning Division on a CD disk.

47. Prior to building final, all required and proposed fences and walls shall be constructed according to the approved plans on file in the Planning Division. (MC 9.080.070).

48. Prior to building final or Certificate of Occupancy, the owner or owner 's representative shall provide documentation to the Planning Division that they have contacted the Moreno Valley Police Department to establish and maintain a relationship with the City of Moreno Valley Police Department and cooperate with the Problem Oriented Policing (POP) program, or its successors. [multi-family, night clubs, liquor stores]

Building Division

49. The proposed non-residential project shall comply with the latest Federal Law, Americans with Disabilities Act, and State Law, California Code of Regulations, Title 24, Chapter 11B for accessibility standards for the disabled including access to the site, exits, bathrooms, work spaces, etc.

50. Prior to submittal, all new development, including residential second units, are required

to obtain a valid property address prior to permit application. Addresses can be obtained by contacting the Building Safety Division at 951.413.3350.

51. Contact the Building Safety Division for permit application submittal requirements. Any construction within the city shall only be completed between the hours of seven am. to seven p.m. Monday through Friday, excluding holidays and from eight a.m. to four p.m. on Saturday, unless written approval is obtained from the city building official or city engineer (Municipal Code Section 8.14.040.E).

52. Building plans submitted shall be signed and sealed by a California licensed design professional as required by the State Business and Professions Code.

53. The proposed development is subject to the payment of applicable processing fees as required by the City's current Fee Ordinance at the time a building permit application is submitted or prior to the issuance of permits as determined by the City.

54. The proposed project will be subject to approval by the Eastern Municipal Water District and all applicable fees and charges shall be paid prior to permit issuance . Contact the water district at 951.928.3777 for specific details.

55. All new structures shall be designed in conformance to the latest design standards adopted by the State of California in the California Building Code, (CBC) Part 2, Title 24, California Code of Regulations including requirements for allowable area, occupancy separations, fire suppression systems, accessibility, etc. The current code edition is the 2016 CBC.

56. The proposed non-residential project shall comply with 2016 California Green Building Standards Code, Section 5.106.5.3, mandatory requirements for Electric Vehicle Charging Station (EVCS).

57. The proposed project's occupancy shall be classified by the Building Official and must comply with exiting, occupancy separation(s) and minimum plumbing fixture requirements. Minimum plumbing fixtures shall be provided per the 2016 California Plumbing Code, Table 422.1. The occupant load and occupancy classification shall be determined in accordance with the California Building Code.

56. Prior to permit issuance, every applicant shall submit a properly completed Waste Management Plan (WMP), as a portion of the building or demolition permit process. (MC 8.80.030)

57. Prior to building final, all required landscaping and irrigation shall be installed per

plan, certified by the Landscape Architect and inspected by the Planning Division . (MC 9.03.040, MC 9.17).

58. Prior to building final, Planning approved/stamped landscape plans shall be provided to the Community Development Department – Planning Division on a CD disk.

59. Prior to building final, all required and proposed fences and walls shall be constructed according to the approved plans on file in the Planning Division. (MC 9.080.070).

60. Prior to building final or Certificate of Occupancy, the owner or owner 's representative shall provide documentation to the Planning Division that they have contacted the Moreno Valley Police Department to establish and maintain a relationship with the City of Moreno Valley Police Department and cooperate with the Problem Oriented Policing (POP) program, or its successors. [multi-family, night clubs, liquor stores]

ECONOMIC DEVELOPMENT DEPARTMENT

61. New Moreno Valley businesses may work with the Economic Development Department to coordinate job recruitment fairs.

62. New Moreno Valley businesses may adopt a “First Source” approach to employee recruitment that gives notice of job openings to Moreno Valley residents for one week in advance of the public recruitment.

63. New Moreno Valley businesses are encouraged to hire local residents.

64. New Moreno Valley businesses are encouraged to provide a job fair flyer and /or web announcement to the City in advance of job recruitments, so that the City can assist in publicizing these events.

65. New Moreno Valley businesses may utilize the workforce recruitment services provided by the Moreno Valley Employment Resource Center (“ERC”).

The ERC offers no cost assistance to businesses recruiting and training potential employees. Complimentary services include

- Job Announcements
- Applicant testing / pre-screening
- Interviewing
- Job Fair support
- Training space

FIRE DEPARTMENT

Fire Prevention Bureau

66. Prior to issuance of Certificate of Occupancy or Building Final, all commercial buildings shall display street numbers in a prominent location on the street side and rear access locations. The numerals shall be a minimum of twelve inches in height . (CFC 505.1, MVMC 8.36.060[I])

67. Prior to issuance of Certificate of Occupancy, approval shall be required from the County of Riverside Community Health Agency (Department of Environmental Health) and Moreno Valley Fire Prevention Bureau to maintain, store, use, handle materials, or conduct processes which produce conditions hazardous to life or property, and to install equipment used in connection with such activities. (CFC 105)

68. Prior to issuance of Building Permits, the applicant/developer shall participate in the Fire Impact Mitigation Program. (Fee Resolution as adopted by City Council)

69. Final fire and life safety conditions will be addressed when the Fire Prevention Bureau reviews building plans. These conditions will be based on occupancy, use, California Building Code (CBC), California Fire Code (CFC), and related codes, which are in effect at the time of building plan submittal.

70. The Fire Code Official is authorized to enforce the fire safety during construction requirements of Chapter 33. (CFC Chapter 33 & CBC Chapter 33)

71. Fire lanes and fire apparatus access roads shall have an unobstructed width of not less than twenty–four (24) feet and an unobstructed vertical clearance of not less the thirteen (13) feet six (6) inches. (CFC 503.2.1 and MVMC 8.36.060[E])

72. Prior to issuance of a Certificate of Occupancy or Building Final, a “Knox Box Rapid Entry System” shall be provided. The Knox-Box shall be installed in an accessible location approved by the Fire Code Official. All exterior security emergency access gates shall be electronically operated and be provided with Knox key switches for access by emergency personnel. (CFC 506.1)

73. The minimum number of fire hydrants required, as well as the location and spacing of fire hydrants, shall comply with the C.F.C., MVMC, and NFPA 24. Fire hydrants shall be located no closer than 40 feet to a building. A fire hydrant shall be located within 50 feet of the fire department connection for buildings protected with a fire sprinkler system. The size and number of outlets required for the approved fire hydrants are (6” x 4” x 2 ½” x 2 ½”) (CFC 507.5.1, 507.5.7, Appendix C, NFPA 24-

7.2.3, MVMC 912.2.1)

74. During phased construction, dead end roadways and streets which have not been completed shall have a turn-around capable of accommodating fire apparatus. (CFC 503.1 and 503.2.5)

75. The Fire Prevention Bureau is required to set a minimum fire flow for the remodel or construction of all commercial buildings per CFC Appendix B and Table B 105.1. The applicant/developer shall provide documentation to show there exists a water system capable of delivering said waterflow for 2 hour(s) duration at 20-PSI residual operating pressure. The required fire flow may be adjusted during the approval process to reflect changes in design, construction type, or automatic fire protection measures as approved by the Fire Prevention Bureau. Specific requirements for the project will be determined at time of submittal. (CFC 507.3, Appendix B)

FINANCIAL & MANAGEMENT SERVICES DEPARTMENT

Moreno Valley Utility

76. This project requires the installation of electric distribution facilities . A non-exclusive easement shall be provided to Moreno Valley Utility and shall include the rights of ingress and egress for the purpose of operation, maintenance, facility repair, and meter reading.

77. This project requires the installation of electric distribution facilities. The developer shall submit a detailed engineering plan showing design, location and schematics for the utility system to be approved by the City Engineer. In accordance with Government Code Section 66462, the Developer shall execute an agreement with the City providing for the installation, construction, improvement and dedication of the utility system following recordation of final map and /or concurrent with trenching operations and other improvements so long as said agreement incorporates the approved engineering plan and provides financial security to guarantee completion and dedication of the utility system.

The Developer shall coordinate and receive approval from the City Engineer to install, construct, improve, and dedicate to the City all utility infrastructure including but not limited to, conduit, equipment, vaults, ducts, wires, switches, conductors, transformers, and “bring-up” facilities including electrical capacity to serve the identified development and other adjoining, abutting, or benefiting projects as determined by Moreno Valley Utility – collectively referred to as “utility system”, to and through the development, along with any appurtenant real property easements, as determined by the City Engineer necessary for the distribution and /or delivery of any and all “utility services” to and within the project. For purposes of this condition, “utility services” shall mean electric, cable television, telecommunication (including video, voice, and data) and other similar services designated by the City Engineer. "Utility services" shall not include sewer, water, and natural gas services, which are addressed by other conditions of approval.

The City, or the City's designee, shall utilize dedicated utility facilities to ensure safe, reliable, sustainable and cost effective delivery of utility services and maintain the integrity of streets and other public infrastructure. Developer shall, at developer's sole expense, install or cause the installation of such interconnection facilities as may be necessary to connect the electrical distribution infrastructure within the project to the Moreno Valley Utility owned and controlled electric distribution system.

78. Existing Moreno Valley Utility electrical infrastructure shall be preserved in place. The developer will be responsible, at developer's expense, for any and all costs associated with the relocation of any of Moreno Valley Utility's underground electrical distribution facilities, as determined by Moreno Valley Utility, which may be in conflict with any developer planned construction on the project site.

79. This project is subject to a Reimbursement Agreement. The Developer is responsible for a proportionate share of costs associated with electrical distribution infrastructure previously installed that directly benefits the project. Payment shall be required prior to issuance of occupancy.

PUBLIC WORKS DEPARTMENT

Land Development

80. The developer shall comply with all applicable City ordinances and resolutions including the City's Municipal Code (MC) and if subdividing land, the Government Code (GC) of the State of California, specifically Sections 66410 through 66499.58, said sections also referred to as the Subdivision Map Act (SMA). [MC 9.14.010]

81. The final approved conditions of approval (COAs) and any applicable Mitigation Measures issued by the Planning Division shall be photographically or electronically placed on mylar
sheets and included in the Grading and Street Improvement plans.

82. The developer shall monitor, supervise and control all construction related activities, so as to prevent these activities from causing a public nuisance, including but not limited to, insuring strict adherence to the following:
    a) Removal of dirt, debris, or other construction material deposited on any public street no later than the end of each working day.
    b) Observance of working hours as stipulated on permits issued by the Land Development Division.

c) The construction site shall accommodate the parking of all motor vehicles used by persons working at or providing deliveries to the site

d) All dust control measures per South Coast Air Quality Management District (SCAQMD) requirements during the grading operations.

Violation of any condition, restriction or prohibition set forth in these conditions shall subject the owner, applicant, developer or contractor (s) to remedy as noted in City Municipal Code 8.14.090. In addition, the City Engineer or Building Official may suspend all construction related activities for violation of any condition, restriction or prohibition set forth in these conditions until such time as it has been determined that all operations and activities are in conformance with these conditions.

83. Drainage facilities (e.g., catch basins, water quality basins, etc.) with sump conditions shall be designed to convey the tributary 100-year storm flows. Secondary emergency escape shall also be provided.

84. In the event right-of-way or offsite easements are required to construct offsite improvements necessary for the orderly development of the surrounding area to meet the public health and safety needs, the developer shall make a good faith effort to acquire the needed right-of-way in accordance with the Land Development Division's administrative policy. If unsuccessful, the Developer shall enter into an agreement with the City to acquire the necessary right-of-way or offsite easements and complete the improvements at such time the City acquires the right -of-way or offsite easements which will permit the improvements to be made. The developer shall be responsible for all costs associated with the right -of-way or easement acquisition. [GC 66462.5]

85. If improvements associated with this project are not initiated within two (2) years of the date of approval of the Public Improvement Agreement (PIA), the City Engineer may require that the engineer's estimate for improvements associated with the project be modified to reflect current City construction costs in effect at the time of request for an extension of time for the PIA or issuance of a permit. [MC 9.14.210(B)(C)]

86. The developer shall protect downstream properties from damage caused by alteration of drainage patterns (i.e. concentration or diversion of flow, etc). Protection shall be provided by constructing adequate drainage facilities, including, but not limited to, modifying existing facilities or by securing a drainage easement . [MC 9.14.110]

87. This project shall submit civil engineering design plans, reports and /or documents (prepared by a registered/licensed civil engineer) for review and approval by the

City Engineer per the current submittal requirements, prior to the indicated threshold or as required by the City Engineer. The submittal consists of, but is not limited to, the following:

a. Rough grading w/ erosion control plan (prior to grading permit issuance);
b. Precise grading w/ erosion control plan (prior to building permit issuance);
c. Street improvement plan (prior to encroachment permit issuance>);
d. Final drainage study (prior to grading plan approval);
e. Final WQMP (prior to grading plan approval);
f. Sidewalk easement and offer of dedication (prior to grading permit issuance);
g. As-Built revision for all plans (prior to Occupancy release);

<u>Prior to Grading Plan Approval</u>

88. Resolution of all drainage issues shall be as approved by the City Engineer.

89. A final detailed drainage study (prepared by a registered/licensed civil engineer) shall be submitted for review and approved by the City Engineer. The study shall include, but not be limited to: existing and proposed hydrologic conditions as well as hydraulic calculations for all drainage control devices and storm drain lines. The study shall analyze 1, 3, 6 and 24-hour duration events for the 2, 5, 10 and 100-year storm events [MC 9.14.110(A.1)]. A digital (pdf) copy of the approved drainage study shall be submitted to the Land Development Division.

90. Emergency overflow areas shall be shown at all applicable drainage improvement locations in the event that the drainage improvement fails or exceeds full capacity. This may include, but not be limited to spillways at proposed basins, overflow pipes, or under sidewalk parkway culverts.

91. A final project-specific Water Quality Management Plan (WQMP) shall be submitted for review and approved by the City Engineer, which:

   a. Addresses Site Design Best Management Practices (BMPs) such as minimizing impervious areas, maximizing permeability, minimizes directly connected impervious areas to the City's street and storm drain systems, and conserves natural areas;

   b. Incorporates Source Control BMPs and provides a detailed description of their implementation;

   c. Describes the long-term operation and maintenance requirements for BMPs requiring maintenance; and

   d. Describes the mechanism for funding the long-term operation and maintenance of the BMPs.

A copy of the final WQMP template can be obtained on the City's Website or by contacting the Land Development Division. A digital (pdf) copy of the approved final project-specific Water Quality Management Plan (WQMP) shall be submitted to the Land Development Division.

92. The developer shall ensure compliance with the City Grading ordinance, these Conditions of Approval and the following criteria:

    a. The project street and lot grading shall be designed in a manner that perpetuates the existing natural drainage patterns with respect to tributary drainage area and outlet points. Unless otherwise approved by the City Engineer, lot lines shall be located at the top of slopes.

    b. Any grading that creates cut or fill slopes adjacent to the street shall provide erosion control, sight distance control, and slope easements as approved by the City Engineer.

    c. All improvement plans are substantially complete and appropriate clearance letters are provided to the City.

    d. A soils/geotechnical report (addressing the soil's stability and geological conditions of the site) shall be submitted to the Land Development Division for review. A digital (pdf) copy of the soils/geotechnical report shall be submitted to the Land Development Division.

93. Grading plans (prepared by a registered/licensed civil engineer) shall be submitted for review and approved by the City Engineer per the current submittal requirements.

94. The developer shall select Low Impact Development (LID) Best Management Practices (BMPs) designed per the latest version of the Water Quality Management Plan (WQMP) - a guidance document for the Santa Ana region of Riverside County.

95. The developer shall submit recorded slope easements from adjacent property owners in all areas where grading resulting in slopes is proposed to take place outside of the project boundaries. For all other offsite grading, written permission from adjacent property owners shall be submitted.

96. The developer shall pay all remaining plan check fees.

97. For projects that will result in discharges of storm water associated with construction with a soil disturbance of one or more acres of land, the developer shall submit a Notice of Intent (NOI) and obtain a Waste Discharger's Identification number (WDID#) from the State Water Quality Control Board (SWQCB) which shall be noted on the grading plans.

98. Prior to rough grading plan approval, the Applicant shall prepare and submit for approval a final, project-specific water quality management plan (F-WQMP). The F-WQMP shall be consistent with the approved P-WQMP, as well as in full conformance with the document; "Water Quality Management Plan - A Guidance Document for the Santa Ana Region of Riverside County" dated October 22, 2012. The F-WQMP shall be submitted and approved prior to application for and issuance of grading permits. At a minimum,

the F-WQMP shall include the following: Site Design BMPs; Source Control BMPs, Treatment Control BMPs, Operation and Maintenance requirements for BMPs and sources of funding for BMP implementation.

a. The Applicant has proposed to incorporate the use of bio-retention basins. Final design and sizing details of all BMPs must be provided in the first submittal of the F-WQMP. The Applicant acknowledges that more area than currently shown on the plans may be required to treat site runoff as required by the WQMP guidance document.

b. The Applicant shall substantiate the applicable Hydrologic Condition of Concerns (HCOC) in Section F of the F-WQMP. The HCOC designates that the project will be exempt from mitigation requirements based on Exemption 3.

c. All proposed LID BMP's shall be designed in accordance with the RCFC&WCD's Design Handbook for Low Impact Development Best Management Practices, dated September 2011.

d. The proposed LID BMP's as identified in the project-specific P-WQMP shall be incorporated into the Final WQMP.

e. The NPDES notes per City Standard Drawing No. MVFE-350-0 shall be included in the grading plans.

f. Post-construction treatment control BMPs, once placed into operation for post-construction water quality control, shall not be used to treat runoff from construction sites or unstabilized areas of the site.

g. Prior to precise grading plan approval, the grading plan shall show any proposed trash enclosure to include a cover (roof) and sufficient size for dual bin; one bin for trash and one bin for recyclables. The architecture shall be approved by the Planning Division and any structural approvals shall be made by the Building and Safety Division.

<u>Prior to Grading Permit</u>

99. A receipt showing payment of the Area Drainage Plan (ADP) fee to Riverside County Flood Control and Water Conservation District shall be submitted. [MC 9.14.100(O)]

100. A digital (pdf) copy of all approved grading plans shall be submitted to the Land Development Division.

101. Security, in the form of a cash deposit (preferable), or letter of credit shall be submitted as a guarantee of the implementation and maintenance of erosion control measures. At least twenty-five (25) percent of the required security shall be in the form of a cash deposit with the City. [MC 8.21.160(H)]

102. Security, in the form of a cash deposit (preferable), or letter of credit shall be

submitted as a guarantee of the completion of the grading operations for the project. [MC 8.21.070]

103. The developer shall pay all applicable inspection fees.

Prior to Improvement Plan Approval

104. The developer is required to bring any existing access ramps adjacent to and fronting the project to current ADA (Americans with Disabilities Act) requirements. However, when work is required in an intersection that involves or impacts existing access ramps, all access ramps in that intersection shall be retrofitted to comply with current ADA requirements, unless otherwise approved by the City Engineer.

105. The developer shall submit clearances from all applicable agencies, and pay all applicable plan check fees.

106. The street improvement plans shall comply with current City policies, plans and applicable City standards (i.e. MVSI-160 series, etc.) throughout this project.

107. The hydrology study shall be designed to accept and properly convey all off -site drainage flowing onto or through the site. In the event that the City Engineer permits the use of streets for drainage purposes, the provisions of current City standards shall apply. Should the quantities exceed the street capacity or the use of streets be prohibited for drainage purposes, as in the case where one travel lane in each direction shall not be used for drainage conveyance for emergency vehicle access on streets classified as minor arterials and greater, the developer shall provide adequate facilities as approved by the City Engineer. [MC 9.14.110 A.2]

108. All public improvement plans (prepared by a licensed/registered civil engineer) shall be submitted for review and approved by the City Engineer per the current submittal requirements.

109. Any missing or deficient existing improvements along the project frontage within Iris Avenue or Oliver Street shall be constructed or secured for construction. The City Engineer may require the ultimate structural section for pavement to half -street width plus 18 feet or provide core test results confirming that existing pavement section is per current City Standards; additional signing & striping to accommodate increased traffic imposed by the development, etc.

110. For non-subdivision projects, all street dedications shall be free of encumbrances, irrevocably offered to the public and shall continue in force until the City accepts or abandons such offers, unless otherwise approved by the City Engineer.

111. The plans shall indicate any restrictions on trench repair pavement cuts to reflect the City's moratorium on disturbing newly-constructed pavement less than three (3) years old and recently slurry sealed streets less than one (1) year old. Pavement cuts for trench repairs may be allowed for emergency repairs or as specifically approved by the City Engineer.

112. All dry and wet utilities shall be shown on the plans and any crossings shall be potholed to determine actual location and elevation. Any conflicts shall be identified and addressed on the plans. The pothole survey data shall be submitted to Land Development with the public improvement plans for reference purposes only. The developer is responsible to coordinate with all affected utility companies and bear all costs of any utility relocation.

113. A 4-foot minimum pedestrian right-of-way dedication behind any driveway approach, per City Standard MVSI-112c-0, on both Iris Avenue and Oliver Street.

Prior to Encroachment Permit

114. A digital (pdf) copy of all approved improvement plans shall be submitted to the Land Development Division.

115. All applicable inspection fees shall be paid.

116. For non-subdivision projects, execution of a Public Improvement Agreement (PIA) and/or security (in the form of a cash deposit or other approved means) may be required as determined by the City Engineer. [MC 9.14.220]

117. Any work performed within public right-of-way requires an encroachment permit.

Prior to Building Permit

118. An engineered-fill certification, rough grade certification and compaction report shall be submitted for review and approved by the City Engineer. A digital (pdf) copy of the approved compaction report shall be submitted to the Land Development Division. All pads shall meet pad elevations per approved grading plans as noted by the setting of "blue-top" markers installed by a registered land surveyor or licensed civil engineer.

119. For non-subdivision projects, the developer shall guarantee the completion of all related public improvements required for this project by executing a Public Improvement Agreement (PIA) with the City and posting the required security. [MC 9.14.220]

120. For Commercial/Industrial projects, the owner may have to secure coverage under the State's General Industrial Activities Storm Water Permit as issued by the State Water Resources Control Board.

121. A walk through with a Land Development Inspector shall be scheduled to inspect existing improvements within public right of way along project frontage. Any

missing, damaged or substandard improvements including handicap access ramps that do not meet current City standards shall be required to be installed, replaced and/or repaired. The applicant shall post security to cover the cost of the repairs and complete the repairs within the time allowed in the public improvement agreement used to secure the improvements.

122. Certification to the line, grade, flow test and system invert elevations for the water quality control BMPs shall be submitted for review and approved by the City Engineer (excluding models homes).

Prior to Occupancy

123. All outstanding fees shall be paid.

124. All required as-built plans (prepared by a registered/licensed civil engineer) shall be submitted for review and approved by the City Engineer per the current submittal requirements.

125. The final/precise grade certification shall be submitted for review and approved by the City Engineer.

126. For commercial, industrial and multi-family projects, in compliance with Proposition 218, the developer shall agree to approve the City of Moreno Valley NPDES Regulatory Rate Schedule that is in place at the time of certificate of occupancy issuance. Under the current permit for storm water activities required as part of the National Pollutant Discharge Elimination System (NPDES) as mandated by the Federal Clean Water Act, this project is subject to the following requirements:

   a. Select one of the following options to meet the financial responsibility to provide storm water utilities services for the required continuous operation, maintenance, monitoring system evaluations and enhancements, remediation and/or replacement, all in accordance with Resolution No. 2002-46.

      i. Participate in the mail ballot proceeding in compliance with Proposition 218, for the Common Interest, Commercial, Industrial and Quasi-Public Use NPDES Regulatory Rate Schedule and pay all associated costs with the ballot process; or

      ii. Establish an endowment to cover future City costs as specified in the Common Interest, Commercial, Industrial and Quasi-Public Use NPDES Regulatory Rate Schedule.

   b. Notify the Special Districts Division of the intent to request building permits 90 days prior to their issuance and the financial option selected. The financial option selected shall be in place prior to the issuance of certificate of occupancy . [California Government Code & Municipal Code]

127. The developer shall complete all public improvements in conformance with current City standards including but not limited to the following:

a. Street improvements including, but not limited to: pavement, base, curb and/or gutter, cross gutters, spandrel, sidewalks, drive approaches, pedestrian ramps, street lights, signing, striping, under sidewalk drains, landscaping and irrigation, medians, pavement tapers/transitions and traffic control devices as appropriate.

b. Storm drain facilities including, but not limited to: storm drain pipe, storm drain laterals, open channels, catch basins and local depressions.

c. City-owned utilities.

d. Sewer and water systems including, but not limited to: sanitary sewer, potable water and recycled water.

e. Under grounding of all existing and proposed utilities adjacent to and on -site. [MC 9.14.130]

f. Relocation of overhead electrical utility lines including, but not limited to : electrical, cable and telephone.

128. For commercial, industrial and multi-family projects, a “Stormwater Treatment Device and Control Measure Access and Maintenance Covenant” shall be recorded to provide public notice of the maintenance requirements to be implemented per the approved final project-specific WQMP. A boilerplate copy of the “Stormwater Treatment Device and Control Measure Access and Maintenance Covenant” can be obtained by contacting the Land Development Division.

129. The applicant shall ensure the following, pursuant to Section XII. I. of the 2010 NPDES Permit:

a. Field verification that structural Site Design, Source Control and Treatment Control BMPs are designed, constructed and functional in accordance with the approved Final Water Quality Management Plan (WQMP).

b. Certification of best management practices (BMPs) from a state licensed civil engineer. An original WQMP BMP Certification shall be submitted for review and approved by the City Engineer.

130. The Developer shall comply with the following water quality related items:

a. Notify the Land Development Division prior to construction and installation of all structural BMPs so that an inspection can be performed.

b. Demonstrate that all structural BMPs described in the approved final project-specific WQMP have been constructed and installed in conformance with the approved plans and specifications;

c. Demonstrate that Developer is prepared to implement all non-structural BMPs described in the approved final project-specific WQMP; and

d. Demonstrate that an adequate number of copies of the approved final project-specific WQMP are available for future owners/occupants.

e. Clean and repair the water quality BMP's, including re-grading to approved civil drawing if necessary.

f. Obtain approval and complete installation of the irrigation and landscaping.

Special Districts Division

131. Existing turf parkway along Iris Ave. in front of the project shall become part of the on-site landscaping for this project. Any existing irrigation in this area shall be abandoned, and new irrigation installed as part of the on -site irrigation system. Special Districts shall be contacted to coordinate capping off of existing irrigation lines. Contact Dan Monto, Landscape Services Supervisor, @ (951) 413-3480.

132. The ongoing maintenance of any landscaping required to be installed behind the curb shall be the responsibility of the property owner.

133. Any damage to existing landscape areas maintained by the City of Moreno Valley due to project construction shall be repaired/replaced by the Developer, or Developer’s successors in interest, at no cost to the City of Moreno Valley.

134. The parcel(s) associated with this project have been incorporated into the Moreno Valley Community Services District Zone A (Parks & Community Services), Zone C (Arterial Street Lighting), and Landscape Maintenance District (LMD) 2014-02 Zone 04 (Moreno Valley Ranch East).All assessable parcels therein shall be subject to annual parcel taxes for Zone A and Zone C and an annual assessment for LMD 2014-02 Zone 04 for operations and capital improvements.

135. This project has been identified to potentially be included in the formation of a Map Act Area of Benefit Special District for the construction of major thoroughfares and/or freeway improvements. The property owner(s) shall participate in such District and pay any special tax, assessment, or fee levied upon the project property for such District. At the time of the public hearing to consider formation of the district, the property owner(s) will not protest the formation, but will retain the right to object any eventual assessment that is not equitable should the financial burden of the assessment not be reasonably proportionate to the benefit the affected property obtains from the improvements to be installed. The Developer must notify the Special Districts Division at 951.413.3480 or at specialdistricts@moval.org of its selected financial option when submitting an application for the first building permit to determine whether the development will be subjected to this condition. If subject to the condition, the special election requires a 90 day process in compliance with the provisions of Article 13C of the California Constitution. (Street & Highway Code, GP Objective 2.14.2, MC 9.14.100).

136. Commercial (BP) If Land Development, a Division of the Public Works Department, requires this project to supply a funding source necessary to provide for, but not limited to, stormwater utilities services for the continuous operation, remediation and/or replacement, monitoring, systems evaluations and enhancement of on -site

facilities and performing annual inspections of the affected areas to ensure compliance with state mandated stormwater regulations, a funding source needs to be established. The Developer must notify the Special Districts Division at 951.413.3480 or at specialdistricts@moval.org of its selected financial option for the National Pollution Discharge Elimination System (NPDES) program when submitting the application for the first building permit issuance (see Land Development's related condition). Participating in a special election the process requires a 90 day period prior to the City's issuance of a building permit. This allows adequate time to be in compliance with the provisions of Article 13D of the California Constitution. (California Health and Safety Code Sections 5473 through 5473.8 (Ord. 708 Section 3.1, 2006) & City of Moreno Valley Municipal Code Title 3, Section 3.50.050.)

137. This project has been identified to be included in the formation of a Community Facilities District (Mello-Roos) for Public Safety services, including but not limited to Police, Fire Protection, Paramedic Services, Park Rangers, and Animal Control services. The property owner(s) shall not protest the formation; however, they retain the right to object to the rate and method of maximum special tax. In compliance with Proposition 218, the property owner shall agree to approve the mail ballot proceeding (special election) for either formation of the CFD or annexation into an existing district. The Developer must notify the Special Districts Division at 951.413.3480 or at specialdistricts@moval.org when submitting the application for building permit issuance to determine the requirement for participation. If the first building permit is pulled prior to formation of the district, this condition will not apply . If the condition applies, the special election will require a minimum of 90 days prior to issuance of the first building permit. This allows adequate time to be in compliance with the provisions of Article 13C of the California Constitution. (California Government Code Section 53313 et. seq.)

138. This project is conditioned for a proposed district to provide a funding source for the operation and maintenance of public improvements and /or services associated with new development in that territory. The Developer shall satisfy this condition with one of the options outlined below.

a. Participate in a special election for maintenance/services and pay all associated costs of the election process and formation, if any. Financing may be structured through a Community Facilities District, Landscape and Lighting Maintenance District, or other financing structure as determined by the City; or

b. Establish an endowment fund to cover the future maintenance and /or service costs.

The Developer must notify the Special Districts Division at 951.413.3480 or at specialdistricts@moval.org when submitting the application for building permit issuance. If the first building permit is pulled prior to formation of the district, this condition will not apply. If the district has been or is in the process of being formed the Developer must inform the Special Districts Division of its selected financing option (a. or b. above). The option for participating in a special election requires 90 days to complete the special election process. This allows adequate time to be in compliance with the provisions of Article 13C of the California Constitution.

The financial option selected shall be in place prior to the issuance of the first certificate of occupancy for the project.

Transportation Engineering Division

139. Conditions of approval may be modified or added if a phasing plan is submitted for this development.

140. All proposed on-site traffic signing and striping should be accordance with the latest California Manual on Uniform Traffic Control Devices (CAMUTCD).

141. Iris Avenue is classified as a Divided Major Arterial at this location (134' RW/110'CC) per City Standard Plan No. MVSI-101A-0. Communication conduits along project frontage may be required per City Standard Plan No. MVSI-186-0. Any improvements undertaken by this project shall be consistent with the City 's standards for this facility.

142. Oliver Street is classified as a Minor Arterial (88'RW/64'CC) per City Standard Plan No. MVSI-105A-1. Any improvements undertaken by this project shall be consistent with the City's standards for this facility.

143. The driveways shall conform to City of Moreno Valley Standard No. MVSI-112C-0 for Commercial Driveway Approaches. Access at the driveways shall be allowed as follows:

    - Iris Avenue: right turn in/out only
    - Oliver Street: right turn in/out only

144. Prior to final approval of the landscape plans and construction plans for any type of fencing or monument sign, the project plans shall demonstrate that sight distance at the project driveway conforms to City Standard Plan No. MVSI-164A-0 through MVSI-164C-0. Trees, plants, shrubs, fence and monument sign shall not be located in an area that obstructs the drivers' line-of-sight.

145. Prior to the final approval of the street improvement plans, a signing and striping plan shall be prepared per City of Moreno Valley Standard Plans - Section 4 for all streets along the project frontages. Signing and striping plans shall be prepared per the latest edition of the California Manual on Uniform Traffic Control Devices (CAMUTCD) and current City of Moreno Valley Standard Plans by a qualified registered civil or traffic engineer.

146. Prior to the final approval of the street improvement plans, a median improvement plan shall be prepared by a registered civil engineer for a raised concrete median on Oliver Street along the project frontage.

147. Prior to the final approval of the street improvement plans, a bus turnout/right turn lane combination shall be designed per the latest City of Moreno Valley Standard

Plans for westbound traffic and shall be located on the north side of Iris Avenue, between the project driveway and Oliver Street.

148. Prior to issuance of an encroachment permit for work within the public right -of-way, construction traffic control plans prepared by a qualified, registered Civil or Traffic engineer shall be required for plan approval by the City Traffic Engineer.

149. Prior to final approval of any landscaping or monument sign plans, the project plans shall demonstrate that sight distance at the project driveways conforms to City Standard Plan No. MVSI-164A, B, C-0.

150. Prior to issuance of Certificate of Occupancy, raised median improvement on Oliver Street along the project frontage shall be completed and fully operational per the approved plans to the satisfaction of the City Engineer. Median construction shall include but not be limited to: paving, concrete curbs, signing and striping.

151. Prior to issuance of Certificate of Occupancy, all signing and striping shall be installed per current City Standards and the approved plans.

152. Prior to issuance of Certificate of Occupancy, a bus turnout/right turn lane combination shall be installed for westbound traffic and shall be located on the north side of Iris Avenue, between the project driveway and Oliver Street. Bus turnout construction shall include but not be limited to: paving, concrete curbs, ADA access ramps, landscaping, signing and striping.

PARKS & COMMUNITY SERVICES DEPARTMENT

153. The parcel(s) associated with this project have been incorporated into the Moreno Valley Community Services District Zone A (Parks and Community Services). All assessable parcels therein shall be subject to the annual Zone ‘A’ charge for operations and capital improvements. Proof of such shall be supplied to Parks and Community Services upon Final Map and at Building Permits.

VICINITY MAP NTS

PROJECT DATA

ASSESSOR PARCEL NUMBER

APN 486–310–038

LEGAL DESCRIPTION

PARCEL 1 AS SHOWN ON PARCEL MAP NO. 33361, RECORDED IN BOOK 239, PAGES 30–32 OF PARCEL MAPS, OFFICIAL RECORD OF RIVERSIDE COUNTY, CALIFORNIA, LYING WITHIN SECTION 22, TOWNSHIP 3 SOUTH, RANGE 3 WEST, S.B.M.,
CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

SITE AREA

1.58 ACRES, ±68,779 S.F.

BUILDINGS

CONVENIENCE STORE: 3,180 S.F.
CARWASH: 2,605 S.F.
FUELING AREA CANOPY: 4,858 S.F.

LOT COVERAGE

15.3% (INCLUDES FUELING AREA CANOPY)

LANDSCAPE COVERAGE

16,811 S.F. (24.4%)

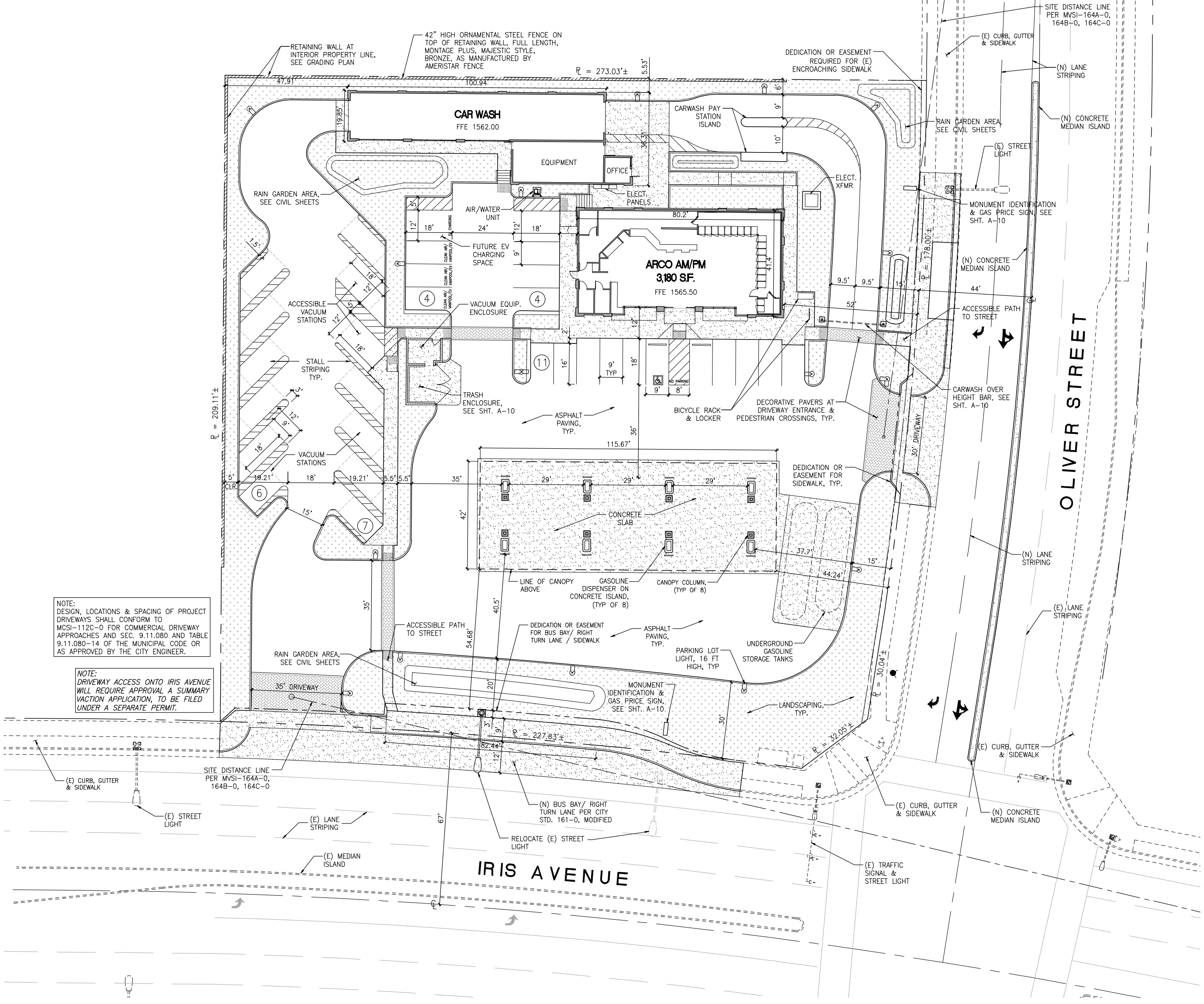
PARKING

REQUIRED:
C–STORE: 3,180 S.F. / 225 = 14.13 (15)
CARWASH: 10 + 1 PER 2 PER EMPLOYEE = 11
TOTAL: = 26

PROVIDED: 32

FOR
ARCO AM/PM
PTN OF SEC. 22,
TWP. 3 S., RGE 3 WEST, S.B.M
RIVERSIDE COUNTY STATE OF CALIFORNIA

1"=20'



NOTE:
DESIGN, LOCATIONS & SPACING OF PROJECT DRIVEWAYS SHALL CONFORM TO MCSI–112C–0 FOR COMMERCIAL DRIVEWAY APPROACHES AND SEC. 9.11.080 AND TABLE 9.11.080–14 OF THE MUNICIPAL CODE OR AS APPROVED BY THE CITY ENGINEER.

NOTE:
DRIVEWAY ACCESS ONTO IRIS AVENUE WILL REQUIRE APPROVAL A SUMMARY VACTION APPLICATION, TO BE FILED UNDER A SEPARATE PERMIT.

ARC

andea

BARGHA
CONSULTING ENGI

18215 72ND AVENU
KENT, WA 98032
(425)251–6222
(425)251–8782 FA

CIVIL ENGINEERING, LAND
SURVEYING, ENVIRONMENT

NO.	DATE	REVISION
1	3/20/18	CITY COM
2	6/01/18	CITY COM
3	8/07/18	CITY COM

SEAL:

DEVELOPMENT INFORMATION:
ARCO N
3000 am/
FUEL CAN
w/ 8 MPD
26'x100' CAR

SITE ADDRESS:
NWC IRIS AVE @ O
MORENO VALL

FACILITY #

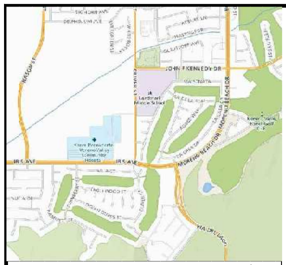
DESIGNED BY: ALLIAN
CHECKED BY: DG BP REF
DRAWN BY: SK ALLIAN
VERSION: - - PROJEC

DRAWING TITLE:
ARCHITEC
SITE PL

SHEET NO:
SP-

PEN18-0016

File:P:\18000s\18501\preliminary\18501 SP-1_CITY.dwg Date/Time:8/8/2018 12:20 PM Scale:1" = 1' SKATTNER Xref: ----

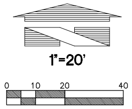


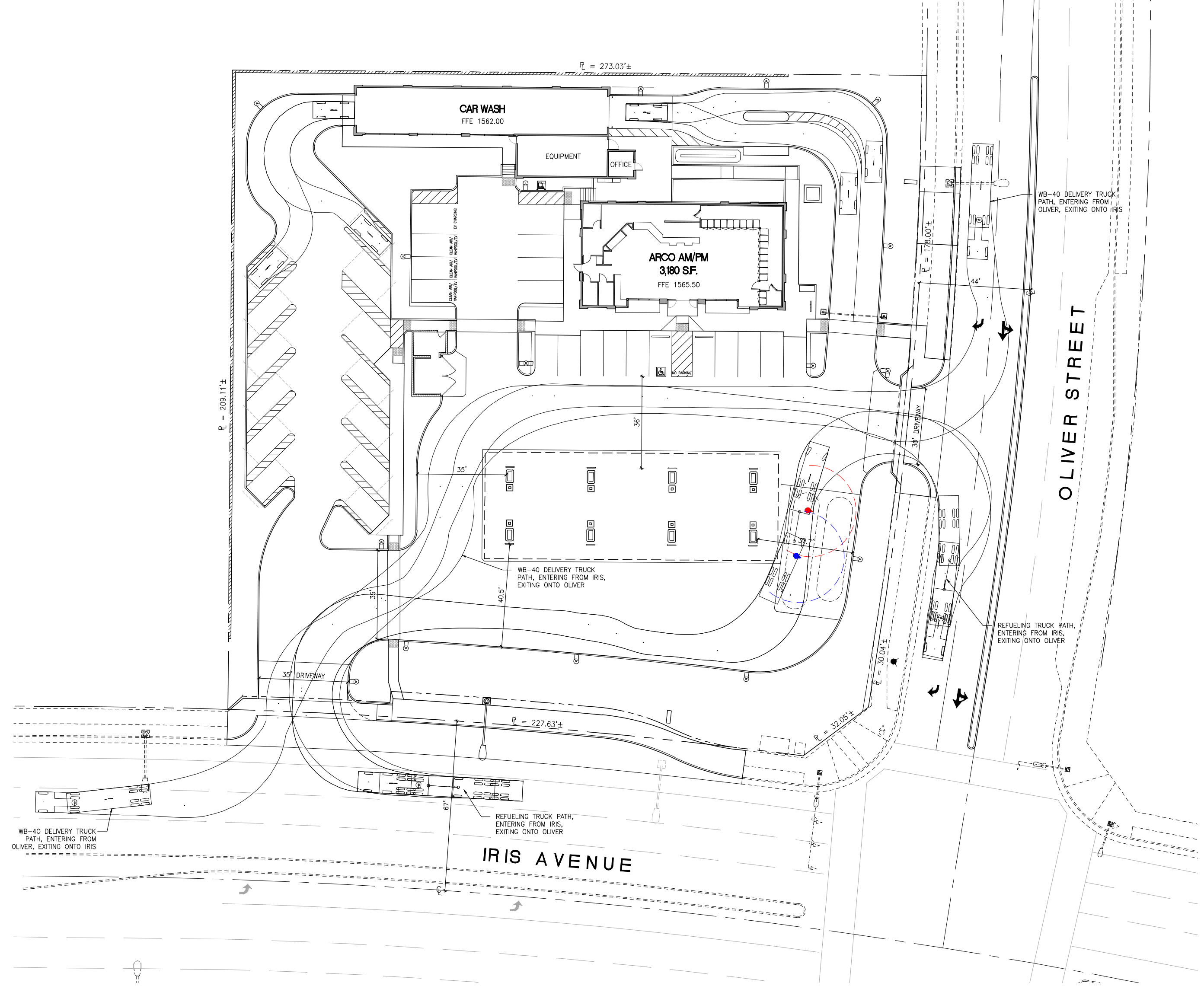
VICINITY MAP NTS

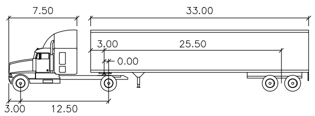
FOR

ARCO AM/PM

PTN OF SEC. 22,
TWP. 3 S., RGE 3 WEST, S.B.M
RIVERSIDE COUNTY STATE OF CALIFORNIA

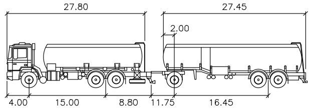






WB-40 feet

Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.00	Steering Angle	: 20.3
Tractor Track	: 8.00	Articulating Angle	: 70.0
Trailer Track	: 8.00		



Arco65'
feet

First Part Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.00	Steering Angle	: 35.0
First Part Track	: 7.70	Articulating Angle	: 70.0
Trailer Track	: 7.70		

File:P:\18000s\18501\preliminary\18501 SP-1_CITY.dwg Date/Time:8/8/2018 12:21 PM Scale:1" = 1' SKATTNER Xref: ----

Preliminary Not For Construction

PEN18-0016

ARC

andea

BARGHA
CONSULTING ENGI

18215 72ND AVENU
KENT, WA 98032
(425)251-6222
(425)251-8782 FA

CIVIL ENGINEERING, LAND
SURVEYING, ENVIRONMENT

NO.	DATE	REVISION
1	3/20/18	CITY COM
2	6/01/18	CITY COM
3	8/07/18	CITY COM

SEAL:

DEVELOPMENT INFORMATION:
ARCO N
3000 am/
FUEL CAN
w/ 8 MPD
26'x100' CAR

SITE ADDRESS:
NWC IRIS AVE @ O
MORENO VALL

FACILITY #

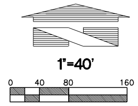
DESIGNED BY: ALLIAN
CHECKED BY: DG BP REF
DRAWN BY: SK ALLIAN
VERSION: - - PROJEC

DRAWING TITLE:
TRUCK P
SITE PL

SHEET NO:
SP-1

Attachment: Site Plan [Revision 1] (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

PRELIMINARY GRADING COVER SHEET
FOR
ARCO AM/PM
PTN OF SEC. 22,
TWP. 3 S., RGE 3 WEST, S.B.M
RIVERSIDE COUNTY STATE OF CALIFORNIA



SURVEY INFORMATION:

TOPO AND ALTA SURVEY PERFORMED BY SALEM ENGINEERING GROUP

SURVEY DATE:
NOVEMBER, 2017

CALCULATED AREA:
68,787± SQ. FT. (1.58± ACRES)

CALCULATED AREA AFTER DEDICATIONS OF ROW:
67,376± SQ. FT. (1.55± ACRES)

APN: 486-310-038

PARCELS 1 AS SHOWN ON PARCEL MAP NO. 33361, RECORDED IN BOOK 239, PAGES 30-32 OF PARCEL MAPS, OFFICIAL RECORD OF RIVERSIDE COUNTY, CALIFORNIA, LYING WITHIN SECTION 22, TOWNSHIP 3 SOUTH, RANGE 3 WEST, S.B.M.,
CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

BASIS OF BEARINGS

NORTH 00°26'04" EAST, BEING THE BEARING OF THE CENTERLINE OF OLIVER STREET, AS SHOWN IN BOOK 239 OF PARCEL MAPS, AT PAGE 32, OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA.

BENCHMARK

RIVERSIDE COUNTY VERTICAL CONTROL POINT "M-32", BEING A 1" IRON PIPE AND COUNTY TAG STAMPED COUNTY SURVEYOR IN A HAND WELL, AT THE INTERSECTION PERRIS BOULEVARD AND IRIS AVENUE, 58.55 FEET SOUTHWEST OF A CHISELED "X" IN A 3" IRON CORNER POST, 40.89 FEET NORTHEAST OF NAIL AND TAG IN THE WEST SIDE POWER POLE #213136, 34.69 FEET NORTHWEST OF A NAIL AND TAG SET IN SOUTHWEST SIDE TELEPHONE POLE *15160, A

ELEVATION: 1503.53 (US SURVEY FEET)
NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 29).

ALL ELEVATIONS SHOWN HEREON ARE (NAVD 88) NORTH AMERICAN VERTICAL DATUM 1988. TO TRANSLATE ELEVATIONS TO (NGVD 29) SUBTRACT -2.36' FROM ELEVATION SHOWN.

FLOOD NOTE

THE SUBJECT PROPERTY IS LOCATED WITHIN A ZONE "X" DESIGNATION PER FLOOD INSURANCE RATE MAP NO. 06065C0770G MAP EFFECTIVE DATE AUGUST 28, 2008. AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.

LEGAL DESCRIPTION:

THE LAND IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, CALIFORNIA, DESCRIBED AS FOLLOWS:

PARCEL A:

PARCEL 1 OF PARCEL MAP NO. 33361, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 239, PAGE 30 THROUGH 32 OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

PARCEL B:

A NONEXCLUSIVE, PERMANENT SEWER AND ACCESS EASEMENT ON OVER AND ACROSS THAT CERTAIN PARCEL OF LAND SITUATED IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, BEING A PORTION OF LOT 7 AND LOT 8 IN BLOCK 151, OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT CO. AS SHOWN BY MAP ON FILE IN BOOK 11 OF MAPS, PAGE 10, RECORDS OF SAN BERNARDINO COUNTY, CALIFORNIA, LYING WITHIN SECTION 22, TOWNSHIP 3 SOUTH, RANGE 3 WEST, S.B.M. MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHWEST CORNER OF SAID LOT 7, SAID POINT ALSO BEING THE INTERSECTION OF THE CENTERLINE OF FILAREE AVENUE AND THE WEST LINE OF LOT 7 AS SHOWN ON MAP REFERENCED ABOVE AND THE TRUE POINT OF BEGINNING;

THENCE SOUTH 89° 33' 36" EAST, 694.50 FEET ALONG THE SOUTH LINE OF SAID LOT 7, SAID SOUTH LINE ALSO BEING THE CENTERLINE OF SAID FILAREE AVENUE, TO A POINT THAT LIES ON THE SOUTH LINE OF SAID LOT 8, SAID POINT BEING DISTANT 34.00 FEET FROM THE SOUTHWEST CORNER OF SAID LOT 8;

THENCE NORTH 00° 26' 02" EAST, 10.00 FEET TO A POINT THAT LIES ON A LINE THAT IS PARALLEL WITH AND 10.00 FEET NORTH OF SAID SOUTH LINE OF SAID LOT 8;

THENCE NORTH 89° 33' 36" WEST, 694.50 FEET ALONG SAID PARALLEL LINE TO A POINT ON THE WEST LINE OF SAID LOT 7, SAID PARALLEL LINE IS ALSO PARALLEL WITH THE SOUTH LINE OF SAID LOT 7;

THENCE SOUTH 00° 19' 23" WEST, 10.00 FEET ALONG SAID WEST LINE OF LOT 7 TO TRUE POINT OF BEGINNING, RECORDED SEPTEMBER 30, 2014 AS INSTRUMENT NO. 2014-0371036, OF OFFICIAL RECORDS, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA.

UTILITY AND SERVICE PURVEYORS:

POWER:	SOUTHERN CALIFORNIA EDISON
GAS:	THE GAS COMPANY
PHONE:	FRONTIER
CABLE:	FRONTIER
WATER:	EASTERN MUNICIPAL WATER DISTRICT
SEWER:	EASTERN MUNICIPAL WATER DISTRICT
SCHOOL DISTRICT:	MORENO VALLEY UNITED SCHOOL DISTRICT

APPLICANT
SATER OIL INTERNATIONAL, LLC
683 CLIFFSIDE DRIVE
SAN DIMAS, CA 91773
PHONE (909) 293-7588
CONTACT: ERIC LEVAUGHN

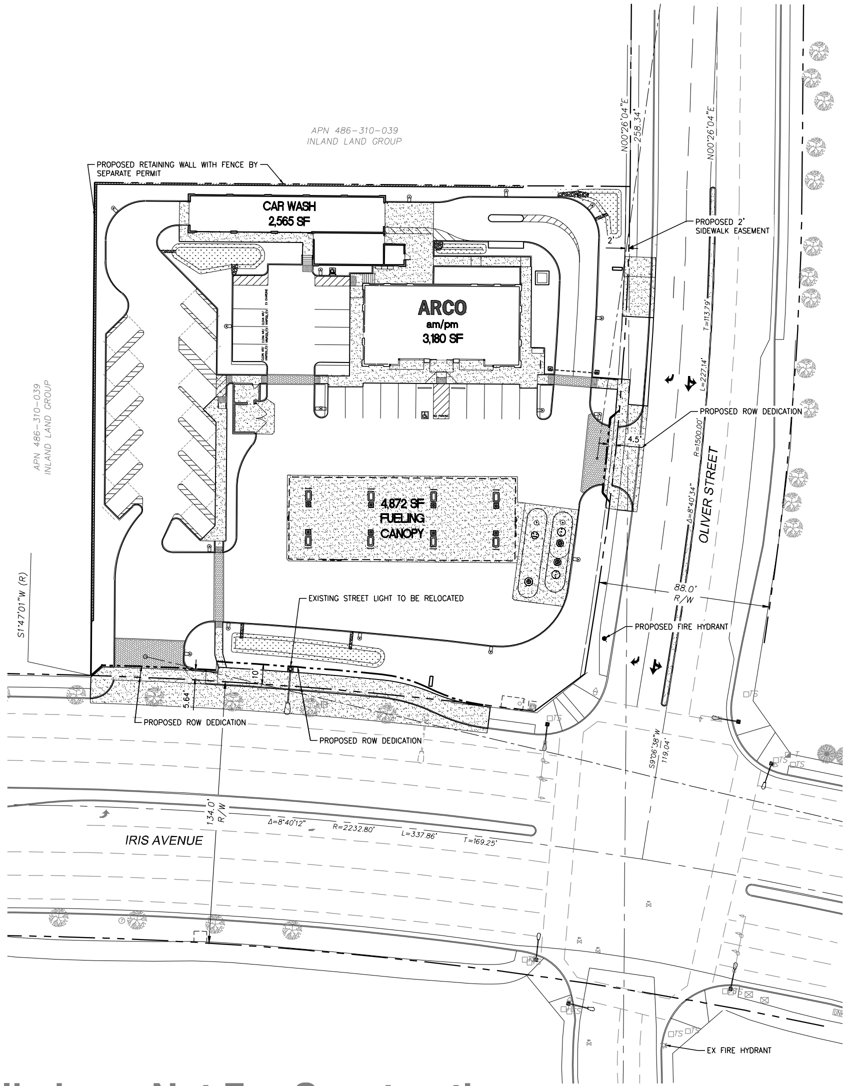
ENGINEER
BARGHAUSEN CONSULTING ENGINEERS, INC.
18215 72ND AVE. SOUTH
KENT, WA 98032
TEL: (425) 251-6222
FAX: (425) 251-8782
CONTACT: HAL GRUBB, P.E.

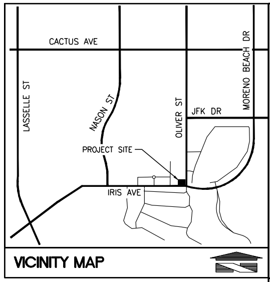
GEOTECHNICAL
SALEM ENGINEERING GROUP, INC.
11650 MISSION PARK DR., #108
RANCHO CUCAMONGA, CA 91730
TEL: (909) 980-6455
FAX: (909) 980-6435

ARCHITECT
BARGHAUSEN CONSULTING ENGINEERS, INC.
18215 72ND AVE. SOUTH
KENT, WA 98032
TEL: (425) 251-6222
FAX: (425) 251-8782
CONTACT: DAN GOALWIN

LANDSCAPE ARCHITECT
BARGHAUSEN CONSULTING ENGINEERS, INC.
18215 72ND AVE. SOUTH
KENT, WA 98032
TEL: (425) 251-6222
FAX: (425) 251-8782
CONTACT: JEFF VARLEY, R.L.A.

SURVEYOR
SALEM ENGINEERING GROUP, INC.
11650 MISSION PARK DRIVE,
SUITE 108
RANCHO CUCAMONGAM CA 91730
TEL: (909) 980-6455





VICINITY MAP

EASEMENTS:

1. A NONEXCLUSIVE, PERMANENT SEWER AND ACCESS EASEMENT ON OVER AND ACROSS THAT CERTAIN PARCEL OF LAND SITUATED IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, BEING A PORTION OF LOT 7 AND LOT 8 IN BLOCK 151, OF BEAR VALLEY AND ALESSANDRO DEVELOPMENTS CO. AS SHOWN BY MAP ON FILE IN BOOK 11 OF MAPS, PAGE 10, RECORDS OF SAN BERNARDINO COUNTY, CALIFORNIA, LYING WITHIN SECTION 22, TOWNSHIP 3 SOUTH, RANGE 3 WEST, S.B.M.

LEGEND:

PROPOSED		EXISTING	
CURB AND GUTTER	═══	CURB	═══
BARRIER CURB	═══	PAINT STRIPE	───
CONCRETE	▨	WATER	— -W- -W—
ASPHALT	▩	SANITARY	— —SS— —
SWALE	──►···──	GAS	── G ──
SAWCUT	- - - - - - -	POWER OVERHEAD	—P (OH)
CONTOUR	- - - - 179 - - - -	POWER UNDERGROUND	—P (UG)
WATER	──W──	OH/UG TEL. LINE	—T(XX)—
WATER METER	⊠	IRRIGATION CONTROL	IR
STORM	━━ ━━	ELECTRICAL TRANSFORMER	ET
CONCRETE CONTROL JOINT	— — — —	ELECTRICAL METER	○E
CONCRETE EXPANSION JOINT	—— —— ——	LUMINAIRE (LUM.)	○─☼
SANITARY	───	WATER VALVE (WV)	WV ⊠
GAS	── G ──	FIRE HYDRANT	☼
POWER	── P ──	SS MANHOLE	Ⓢ
PAINT STRIPE	───	TREES	✱ ✱ ✱ ✱
NEW RETAINING WALL	▭▭▭	TRAFFIC SWITCH	□TS
TYPE 1 CATCH BASIN	■	TELEPHONE RISER	◪ T
TYPE 2 CATCH BASIN	⊡		
SANITARY SEWER CLEANOUT	•		
LOT LIGHT	◙		
FIRE HYDRANT	●		

NOT FOR CONSTRUCTION

ARCO

andea

BARGHAUSEN CONSULTING ENGINEERS

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KENT, WA 98032
(425)251-6222
(425)251-8782 FA

CIVIL ENGINEERING, LANI
SURVEYING, ENVIRONMEN

NO.	DATE	REVISION
1	3/20/18	CITY CO
2	6/01/18	CITY CO
3	8/07/18	CITY CO
4	9/26/18	CITY CO

SEAL:

9

DEVELOPMENT INFORMATION:
ARCO N
3000 am/
FUEL CAN
w/ 8 MPI
26'x100' CAR

SITE ADDRESS:
NWC IRIS AVE @ C
MORENO VALL
FACILITY #

DESIGNED BY:		ALLIAN
CHECKED BY:	JC	BP RE
DRAWN BY:	ZJ	ALLIAN
VERSION:	- -	PROJE

DRAWING TITLE:
PRELIMIN
GRADIN
COVER SH

SHEET NO:
C1.

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Preliminary Not For Construction

PEN18-0016

RETAINING WALL ELEVATIONS:

NOTE: WALLS ARE PER SEPARATE PERMIT

DIFFERENCE IN ELEVATIONS

PROPERTY LINE RETAINING WALL
TW=TOP OF RETAINING WALL ELEVATION
BW=FACE OF WALL AT FINISHED GRADE

DIFFERENCE BETWEEN TW AND BW

TF=TOP OF RETAINING WALL FOOTING

X'
TW=XXX.X
BW=XXX.X
TF=XXX.X

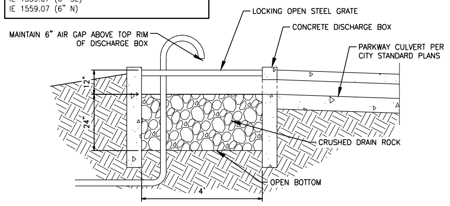
ESTIMATED EARTHWORK QUANTITIES:

CUT: 1000 CY
FILL: 5000 CY
NET: 4000 CY (FILL)
AREA TO BE DISTURBED = 1.58 AC

EARTHWORK QUANTITIES ARE APPROXIMATE AND HIGHLY DEPENDANT ON SOIL CONDITIONS ENCOUNTERED DURING CONSTRUCTION. CONTRACTOR SHOULD PERFORM INDEPENDENT ESTIMATE FOR BIDDING.

STORM STRUCTURES:

CB #1 – PUMP STA, 60" MH W/ PUMP EQUIPMENT RIM 1565.07 IE 1555.42 (18" W) IE 1556.19 (12" N)	CB#9, DI2424, W/STANDARD GRATE RIM 1564.47 IE 1562.91 (6" E)
CB#2, 48" MH W/ SOLID LOCKING LID RIM 1565.01 IE 1555.55 (18" W) IE 1555.55 (18" E)	CB#10, DI2424, W/STANDARD GRATE RIM 1561.90 IE 1557.40 (6" NW) IE 1557.40 (8" W) IE 1557.40 (6" S)
CB#3, DI2424 W/ SOLID LOCKING LID RIM 1562.53 IE 1556.58 (8" W) IE 1556.58 (8" E) IE 1557.08 (6" NW) IE 1556.58 (12" S)	CB#11, 48" MH W/ SOLID LOCKING LID RIM 1564.61 IE 1556.02 (12" S) IE 1556.02 (8" N) IE 1557.02 (6" W) IE 1557.00 (6" SW) IE 1556.02 (18" E)
CB#4, DI2424, W/STANDARD GRATE RIM 1560.20 IE 1556.70 (6" W) IE 1556.70 (8" E)	CB#12, DI2424 W/STANDARD GRATE RIM 1561.89 IE 1559.11 (6" NW)
CB#5, DI2424, W/STANDARD GRATE RIM 1560.55 IE 1556.44 (6" W) IE 1556.44 (8" S)	CB#13, PUBLIC CATCH BASIN PER COMV STANDARD PLAN 300A RIM 1561.10 IE 1557.43 (12" E)
CB#6, DI2424, W/STANDARD GRATE RIM 1560.75 IE 1556.72 (12" N) IE 1556.72 (6" E)	CB#14, DI2424, W/STANDARD GRATE RIM 1560.55 IE 1556.44 (6" S) BUBBLE UP STRUCTURE W/WEEP HOLES IN BASE
CB#7, DI2424, W/STANDARD GRATE RIM 1560.75 IE 1557.04 (12" W) BUBBLE UP STRUCTURE W/WEEP HOLES IN BASE	SDCO#1, W/ TRAFFIC RATED LID RIM 1565.06 IE 1562.77 (6" W) IE 1562.77 (8" N)
CB#8, DI2424, W/STANDARD GRATE RIM 1561.75 IE 1559.07 (6" SE) IE 1559.07 (6" N)	



STORM DISCHARGE BOX

NOT TO SCALE

SURFACE SLOPES:

3.1%	PROPOSED PAVED SURFACE SLOPE
10.2:1	PROPOSED LANDSCAPE SLOPE
8.0%	EXISTING SURFACE SLOPE

SURFACE COVERAGE SUMMARY:

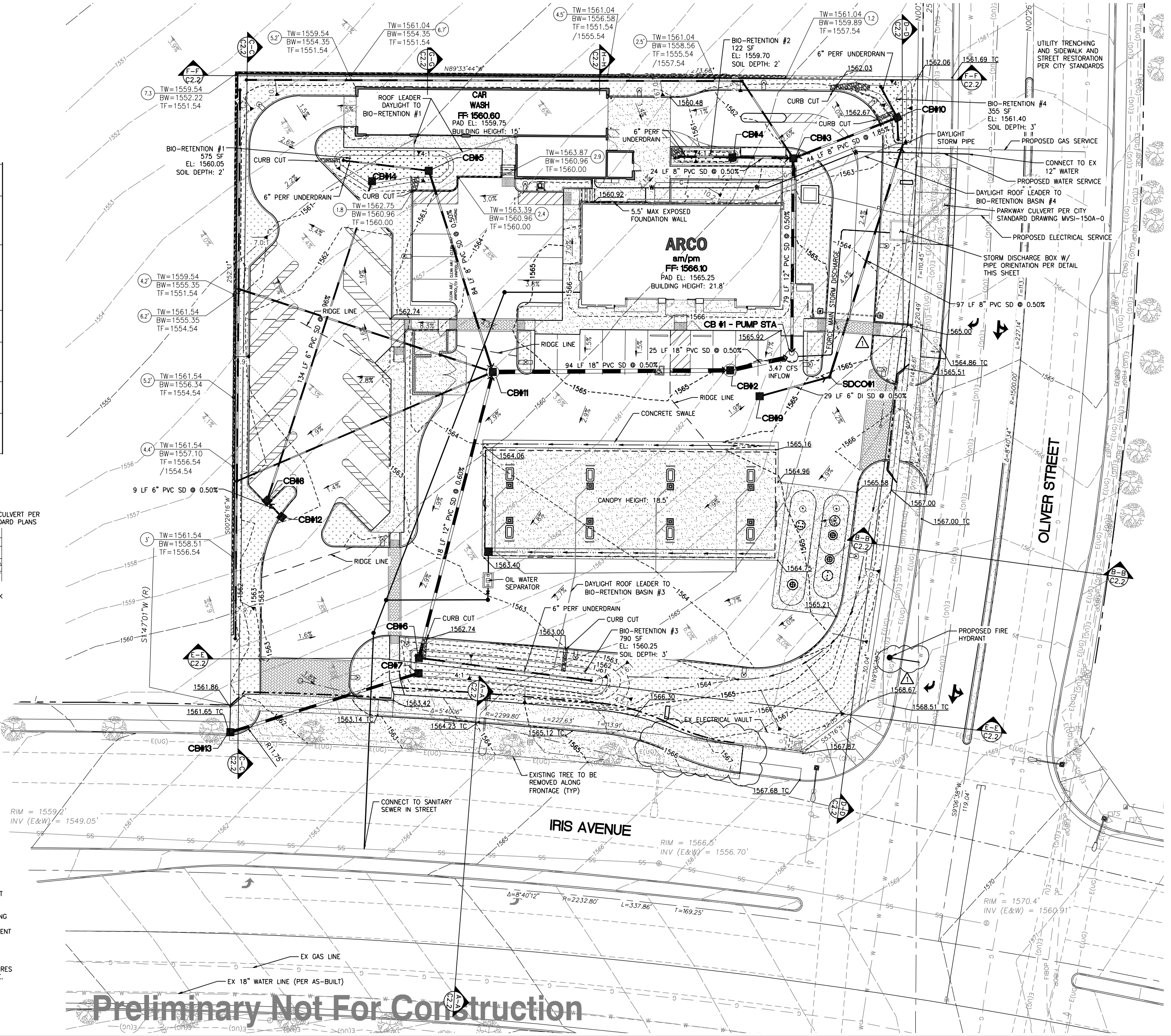
DEVELOPED ON-SITE AREA:	67,420	1.55 ACRE
PROPOSED IMPERVIOUS AREA:	49,586	1.14 ACRE
PERVIOUS TRIBUTARY TO BIO-RETENTION:	12,135	0.28 ACRE
PERVIOUS SELF TREATING:	5,719	0.13 ACRE
OFFSITE IMPERVIOUS AREA:	4,807	0.11 ACRE

SOURCE CONTROL BMP NOTES:

1. GREASE CONTROL FROM FOOD HANDLING ACTIVITIES WILL BE PART OF THIS PROJECT BUT WILL BE SPECIFIED IN A LATER SUBMITTAL.
2. CAR WASH ACTIVITIES WILL BE CONTAINED WITHIN THE CAR WASH BUILDING. GRADING AND DRAINAGE WILL DIRECT RUNOFF FROM CARS LEAVING THE CAR WASH WILL BE COLLECTED BY THE CAR-WASH WATER TREATMENT FACILITIES TO THE GREATEST EXTENT POSSIBLE.
3. INTERIOR FLOOR DRAINS WILL BE PLUMBED TO SANITARY SEWER.
4. FUEL DISPENSING AREAS ARE TO BE HYDRAULICALLY ISOLATED WITH GRADING FEATURES AND THE CANOPY IS NOT TO BE DRAINED TO THE FUELING AREA GROUND SURFACE.
5. TRASH AND RECYCLING ENCLOSURE IS GRADED TO HYDRAULICALLY ISOLATE THE SURFACE TO PREVENT RUN ON FROM THE SURROUNDING SITE.

PRELIMINARY GRADING PLAN
FOR
ARCO AM/PM
PTN OF SEC. 22,
TWP. 3 S., RGE 3 WEST, S.B.M
RIVERSIDE COUNTY STATE OF CALIFORNIA

1"=20'



PEN18-0016

ARC

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18215 72ND AVENU
KENT, WA 98032
(425)251-6222
(425)251-8782 FA

CIVIL ENGINEERING, LAND
SURVEYING, ENVIRONMEN

NO.	DATE	REVISION
1	3/20/18	CITY CO
2	6/01/18	CITY CO
3	8/07/18	CITY CO
4	9/26/18	CITY CO

SEAL:

DEVELOPMENT INFORMATION:
ARCO N
3000 am/
FUEL CAN
w/ 8 MP
26'x100' CAR

SITE ADDRESS:
NWC IRIS AVE @ C
MORENO VALL

FACILITY #

DESIGNED BY: ALLIAN
CHECKED BY: JC BP RE
DRAWN BY: ZJ ALLIAN
VERSION: - PROJE

DRAWING TITLE:
PRELIMI
GRADING

SHEET NO:
C2.

Attachment: Preliminary Grading Plans (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

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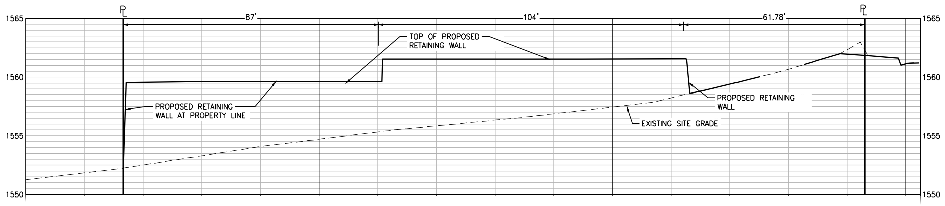
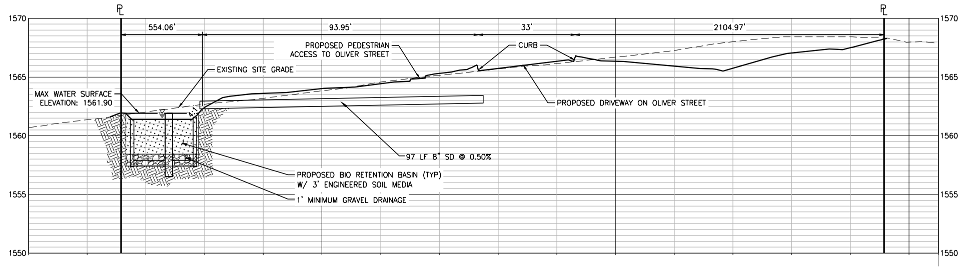
PRELIMINARY SITE CROSS SECTIONS
FOR
ARCO AM/PM
PTN OF SEC. 22,
TWP. 3 S., RGE 3 WEST, S.B.M
RIVERSIDE COUNTY STATE OF CALIFORNIA

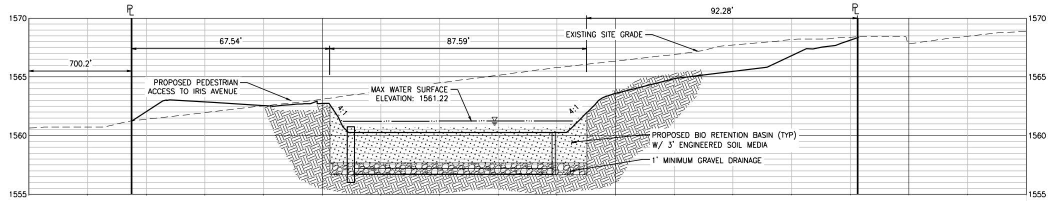
1"=20'
0 20 40 80



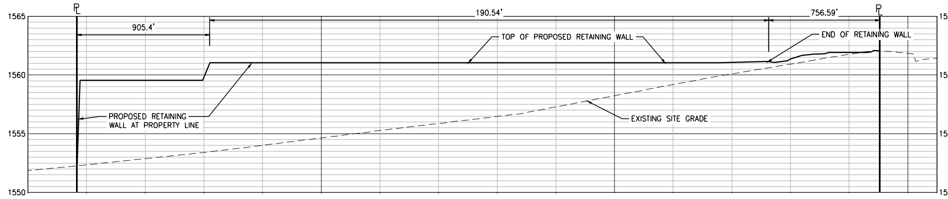
C–C C2.1 **WEST PROPERTY BOUNDARY N TO S**
SCALE: H: 1"=20' V: 1"=5'



D–D C2.1 **EAST PROPERTY BOUNDARY N TO S**
SCALE: H: 1"=20' V: 1"=5'



E–E C2.1 **SOUTH PROPERTY BOUNDARY W TO E**
SCALE: H: 1"=20' V: 1"=5'



F–F C2.1 **NORTH PROPERTY BOUNDARY W TO E**
SCALE: H: 1"=20' V: 1"=5'

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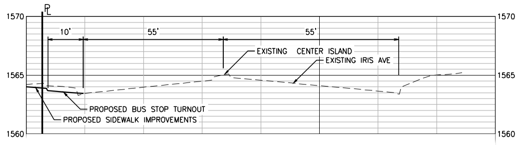
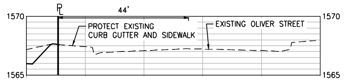
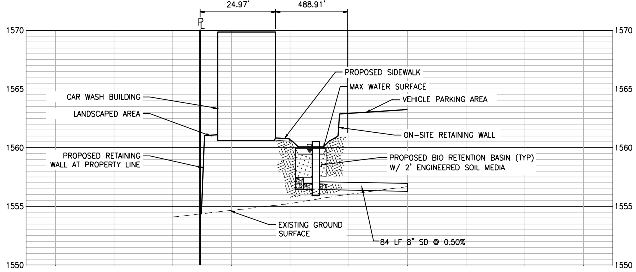


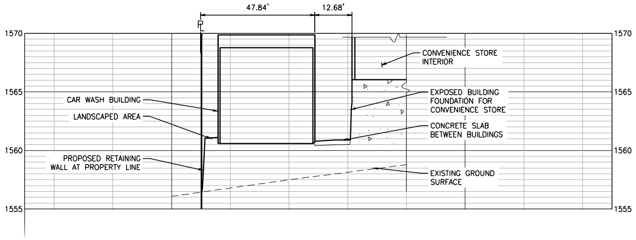
A–A C2.1 **IRIS AVE N TO S**
SCALE: H: 1"=20' V: 1"=5'



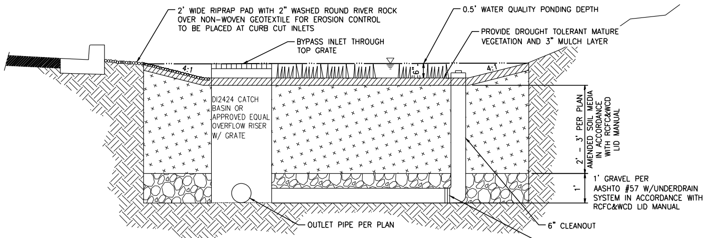
B–B C2.1 **OLIVER ST W TO E**
SCALE: H: 1"=20' V: 1"=5'



G–G C2.1 **NORTH PROPERTY BOUNDARY W TO E**
SCALE: H: 1"=20' V: 1"=5'



H–H C2.1 **NORTH PROPERTY BOUNDARY W TO E**
SCALE: H: 1"=20' V: 1"=5'



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18215 72ND AVENU
KENT, WA 98032
(425)251-6222
(425)251-8782 FA
CIVIL ENGINEERING, LAND
SURVEYING, ENVIRONMEN

NO.	DATE	REVISION
1	3/20/18	CITY CO
2	6/01/18	CITY CO
3	8/07/18	CITY CO
4	9/26/18	CITY CO

SEAL:

9
DEVELOPMENT INFORMATION:
ARCO N
3000 am/
FUEL CAN
w/ 8 MPI
26'x100' CAR

SITE ADDRESS:
NWC IRIS AVE @ C
MORENO VALL

FACILITY #

DESIGNED BY: ALLIAN
CHECKED BY: JC BP RE
DRAWN BY: ZJ ALLIAN
VERSION: - PROJE

DRAWING TITLE:
PRELIMIN
SITE CR
SECTIO

SHEET NO:
C2.

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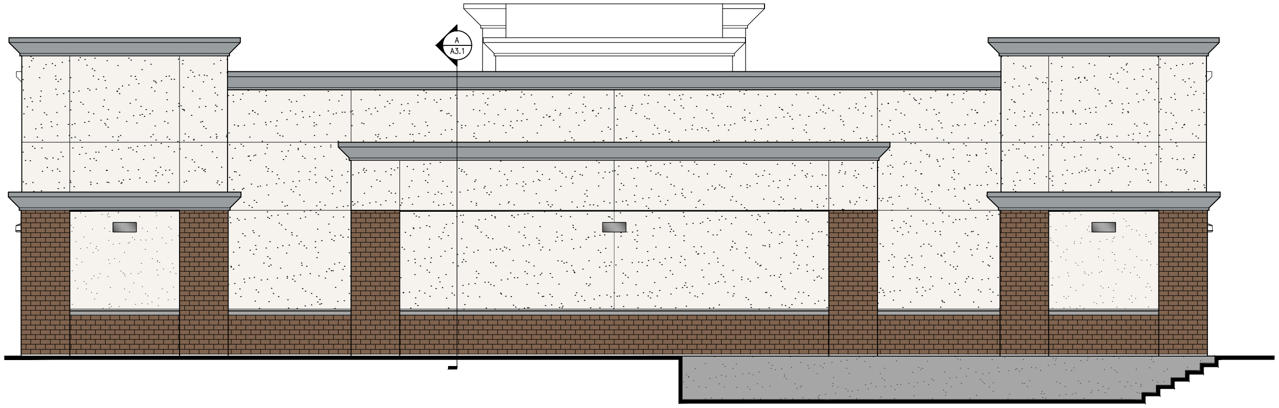
Attachment: Preliminary Grading Plans (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

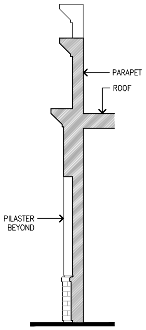
01 SOUTH (FRONT) ELEVATION
SCALE: 1/4"=1'-0"



02 NORTH (REAR) ELEVATION
SCALE: 1/4"=1'-0"

COLOR / MATERIAL LEGEND

⬜	P–1	BENJAMIN MOORE, OC–69, "WHITE OPULENCE"
▨	P–2	BENJAMIN MOORE, 2121–30, "PEWTER", HIGH GLOSS
🟧	ACM–1	ALUMINUM COMPOSITE MATERIAL, PANTONE PMS 166c, "ORANGE"
🟫	ACM–2	ALUMINUM COMPOSITE MATERIAL, ALUCOBOND, "RUSTIC WALNUT"
▦	BRICK	BRICK VENEER – HC MUDDOX 3 5/8"x 7 5/8" THIN BRICK COLOR: SIERRA SLATE
	STUCCO	⅞" CEMENT PLASTER, INSTALLED PER MFG. SPECIFICATIONS; TEXTURE: FINE SAND FINISH
	ALUM	CLEAR ANODIZED ALUMINUM
	STL–1	STEEL AWNING
	C. SILL	PRE–CAST CONCRETE SILL



A WALL SECTION
SCALE: 1/4"=1'-0"

NOT FOR CONSTRUCTION

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KENT, WA 98032
(425)251–6222
(425)251–8782 FAX

CIVIL ENGINEERING, LAND F
SURVEYING, ENVIRONMENTAL

NO.	DATE	REVISION D
1	3/20/18	CITY COMME
2	6/01/18	CITY COMME
3	8/07/18	CITY COMME
△		
△		
△		
△		
△		
△		
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△		
△		

SEAL:

DEVELOPMENT INFORMATION:

ARCO NT

3000 am/p
FUEL CANO
w/ 8 MPD'
26'x100' CAR V

SITE ADDRESS:

NWC IRIS AVE @ OL
MORENO VALLE

FACILITY # T

DESIGNED BY:	ALLIANCE
CHECKED BY:	BP REPM:
DRAWN BY:	ALLIANCE
VERSION: - -	PROJECT 1

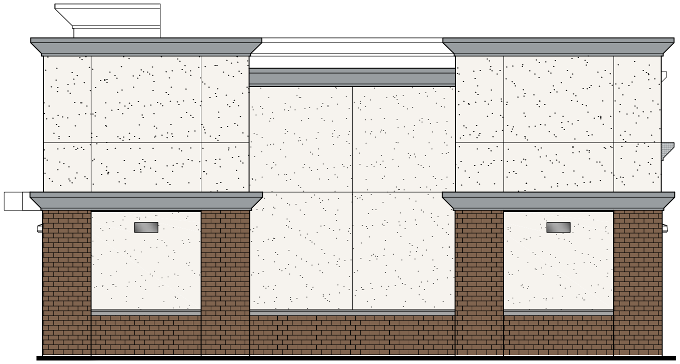
DRAWING TITLE:

COLOR
ELEVATIO

SHEET NO:

A-3.

03 WEST (LEFT) ELEVATION
SCALE: 1/4"=1'-0"



04 EAST (RIGHT) ELEVATION
SCALE: 1/4"=1'-0"

COLOR LEGEND

⬜	P-1	BENJAMIN MOORE, OC-69, "WHITE OPULENCE"
⬛	P-2	BENJAMIN MOORE, 2121-30, "PEWTER", HIGH GLOSS

MATERIAL LEGEND

🟧	ACM-1	ALUMINUM COMPOSITE MATERIAL, PANTONE PMS 166c, "ORANGE"
🟫	ACM-2	ALUMINUM COMPOSITE MATERIAL, ALUCOBOND, "RUSTIC WALNUT"
▦	BRICK	BRICK VENEER – HC MUDDOX 3 5/8"x 7 5/8" THIN BRICK COLOR: SIERRA SLATE
	STUCCO	7/8" CEMENT PLASTER, INSTALLED PER MFG. SPECIFICATIONS; TEXTURE: FINE SAND FINISH
	ALUM	CLEAR ANODIZED ALUMINUM
	STL-1	STEEL AWNING
	C. SILL	PRE-CAST CONCRETE SILL

NOT FOR CONSTRUCTION

ARCO

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KENT, WA 98032
(425)251-6222
(425)251-8782 FAX

CIVIL ENGINEERING, LAND
SURVEYING, ENVIRONMENTA

NO.	DATE	REVISION D
1	3/20/18	CITY COMME
2	6/01/18	CITY COMME
3	8/07/18	CITY COMME
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SEAL:

DEVELOPMENT INFORMATION:
ARCO NT
3000 am/p
FUEL CANO
w/ 8 MPD'
26'x100' CAR

SITE ADDRESS:
NWC IRIS AVE @ OL
MORENO VALLE

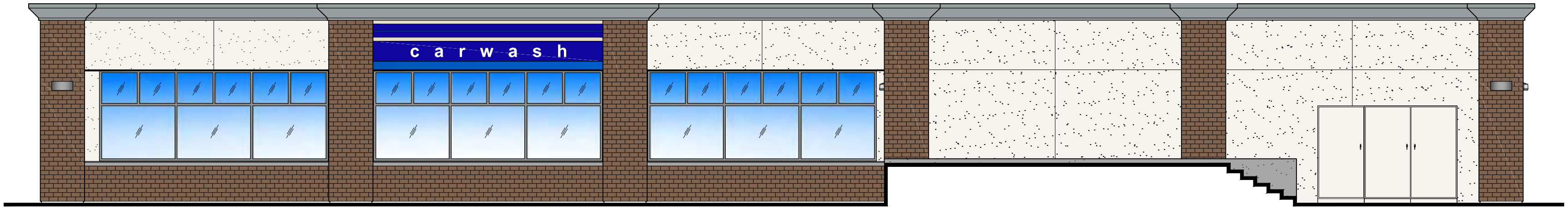
FACILITY #

DESIGNED BY:	ALLIANCE
CHECKED BY:	BP REPM:
DRAWN BY:	ALLIANCE
VERSION: - -	PROJECT 1

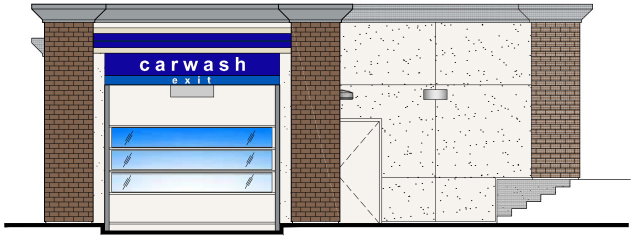
DRAWING TITLE:
COLOR
ELEVATIO

SHEET NO:
A-4.

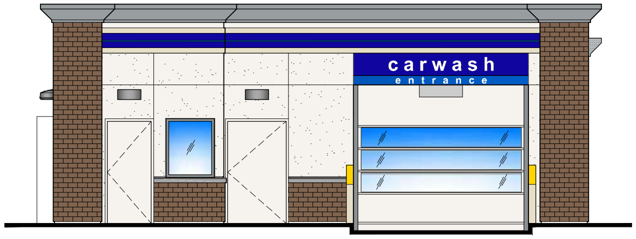
Attachment: Color Elevations (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)



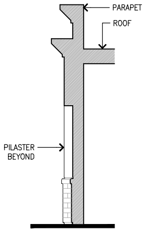
01 EAST ELEVATION
SCALE: 1/4"=1'-0"



02 SOUTH ELEVATION
SCALE: 1/4"=1'-0"



03 NORTH ELEVATION
SCALE: 1/4"=1'-0"



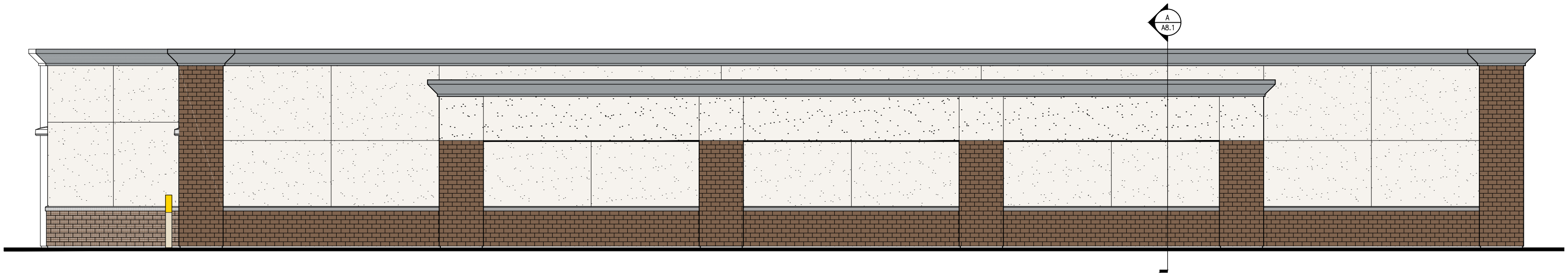
A WALL SECTION
SCALE: 1/4"=1'-0"

COLOR LEGEND

⬜	P-1	BENJAMIN MOORE, OC-69, "WHITE OPULENCE"
▨	P-2	BENJAMIN MOORE, 2121-30, "PEWTER", HIGH GLOSS
⬜	C-01	BP PEARL – BENJAMIN MOORE, OC-8, "ELEPHANT TUSK"
🟨	C-03	BP YELLOW – BENJAMIN MOORE, 2022-10, "YELLOW"

MATERIAL LEGEND

	STUCCO	⅞" CEMENT PLASTER TEXTURE: FINE SAND FINISH
	ACM	ALUMINUM COMPOSITE MATERIAL
	C. SILL	PRE-CAST CONCRETE SILL
	ALUM	ALUMINUM STOREFRONT SYSTEM CLEAR ANODIZED
▨	BRICK	BRICK VENEER – HC MUDDOX 3 5/8"x 7 5/8" THIN BRICK COLOR: SIERRA SLATE



04 WEST ELEVATION
SCALE: 1/4"=1'-0"

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KENT, WA 98032
(425)251-6222
(425)251-8782 FAX

CIVIL ENGINEERING, LAND
SURVEYING, ENVIRONMENTA

NO.	DATE	REVISION D
1	3/20/18	CITY COMME
2	6/01/18	CITY COMME
3	8/07/18	CITY COMME
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△		
△		
△		
△		
△		
△		

SEAL:

DEVELOPMENT INFORMATION:

ARCO NT
3000 am/p
FUEL CANO
w/ 8 MPD'
26'x100' CAR V

SITE ADDRESS:

NWC IRIS AVE @ OL
MORENO VALLE

FACILITY # T

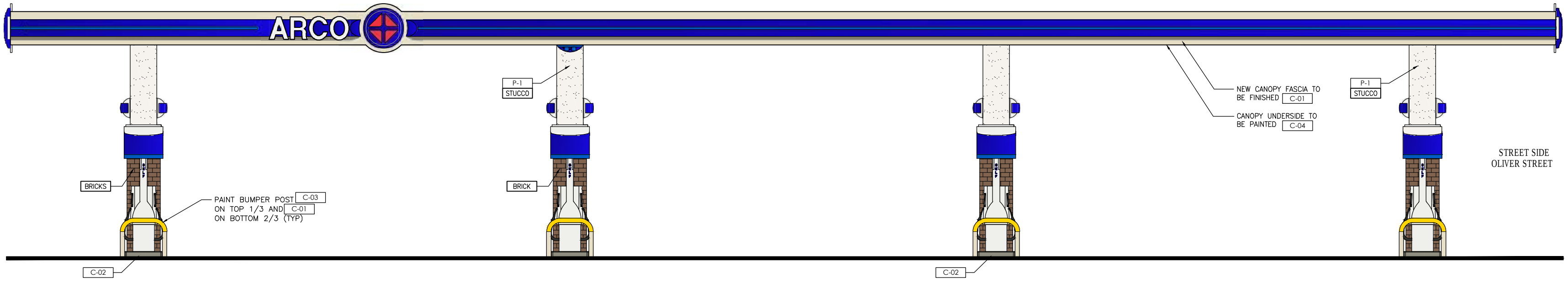
DESIGNED BY:	ALLIANCE
CHECKED BY:	BP REPM:
DRAWN BY:	ALLIANCE
VERSION: - -	PROJECT 1

DRAWING TITLE:

CAR WAS
ELEVATIO

SHEET NO:

A-8.



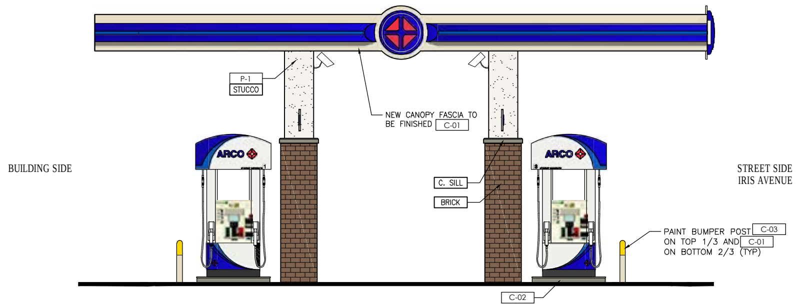
01 CANOPY ELEVATION (FACING IRIS AVENUE)
SCALE: 1/4"=1'-0"

COLOR LEGEND

⬜	C-01	BP PEARL – BENJAMIN MOORE, OC-8, "ELEPHANT TUSK"
▩	C-02	BP WARM GREY – BENJAMIN MOORE, 2137-40, "DESERT TWILIGHT"
🟨	C-03	BP YELLOW – BENJAMIN MOORE, 2022-10, "YELLOW"
⬜	C-04	HIGH HIDING WHITE – BENJAMIN MOORE, 2123-70, "ICE MIST"
⬜	P-1	BENJAMIN MOORE, OC-69, "WHITE OPULENCE"

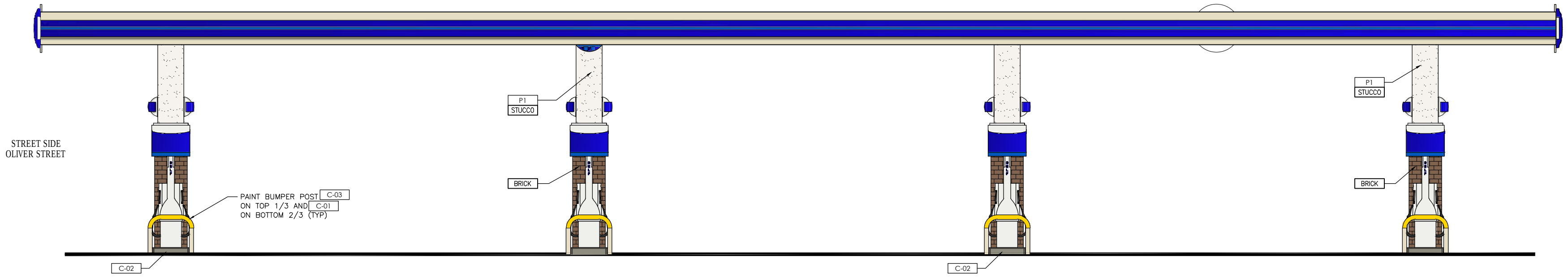
EXTERIOR FINISHES

▨	BRICK	BRICK VENEER – HC MUDDOX 3 5/8"x 7 5/8" THIN BRICK COLOR: SIERRA SLATE
	STUCCO	⅞" CEMENT PLASTER, INSTALLED PER MFG. SPECIFICATIONS; TEXTURE: FINE SAND FINISH
	C. SILL	PRECAST CONCRETE SILL/CAP



02 CANOPY ELEVATION
SCALE: 1/4"=1'-0"

03 CANOPY ELEVATION (FACING OLIVER STREET)
SCALE: 1/4"=1'-0"



04 CANOPY ELEVATION
SCALE: 1/4"=1'-0"

NOT FOR CONSTRUCTION

ARCC

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CONSULTING ENGIN

18215 72ND AVENUE
KENT, WA 98032
(425)251-6222
(425)251-8782 FAX

CIVIL ENGINEERING, LAND F
SURVEYING, ENVIRONMENTA

NO.	DATE	REVISION D
1	3/20/18	CITY COMME
2	6/01/18	CITY COMME
3	8/07/18	CITY COMME

SEAL:

DEVELOPMENT INFORMATION:
ARCO NT
3000 am/p
FUEL CANO
w/ 8 MPD'
26'x100' CAR V

SITE ADDRESS:
NWC IRIS AVE @ OL
MORENO VALLE

FACILITY # T

DESIGNED BY:	ALLIANCE
CHECKED BY: PT	BP REPM:
DRAWN BY: JMW	ALLIANCE
VERSION: - -	PROJECT 1

DRAWING TITLE:
CANOP
ELEVATIC

SHEET NO:
A-9.

Attachment: Color Elevations (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

COLOR LEGEND

⬜	P-1	BENJAMIN MOORE, OC-69, "WHITE OPULENCE"
◼	P-2	BENJAMIN MOORE, 2121-30, "PEWTER", HIGH GLOSS
⬜	C-01	BP PEARL - BENJAMIN MOORE, OC-8, "ELEPHANT TUSK"
◼	C-02	BP WARM GREY - BENJAMIN MOORE, 2137-40, "DESERT TWILIGHT"
🟨	C-03	BP YELLOW - BENJAMIN MOORE, 2022-10, "YELLOW"
⬜	C-04	HIGH HIDING WHITE - BENJAMIN MOORE, 2123-70, "ICE MIST"

MATERIAL LEGEND

▦	BRICK	BRICK VENEER - HC MUDDOX 3 5/8"x 7 5/8" THIN BRICK COLOR: SIERRA SLATE
🟧	ACM-1	ALUMINUM COMPOSITE MATERIAL, PANTONE PMS 166c, "ORANGE"
🟫	ACM-2	ALUMINUM COMPOSITE MATERIAL, ALUCOBOND, "RUSTIC WALNUT"

EXTERIOR FINISHES

STUCCO	⅞" CEMENT PLASTER, INSTALLED PER MFG. SPECIFICATIONS; TEXTURE: FINE SAND FINISH
ALUM	CLEAR ANODIZED ALUMINUM
STL-1	STEEL AWNING
C. SILL	PRE-CAST CONCRETE SILL

Designed –
Drawn –
Checked –
Approved –
Date 03/20/18

BARGHAUSEN CONSULTING ENGINEERS, INC.

ARCO
BP WEST COAST PRODUCTS, LLC

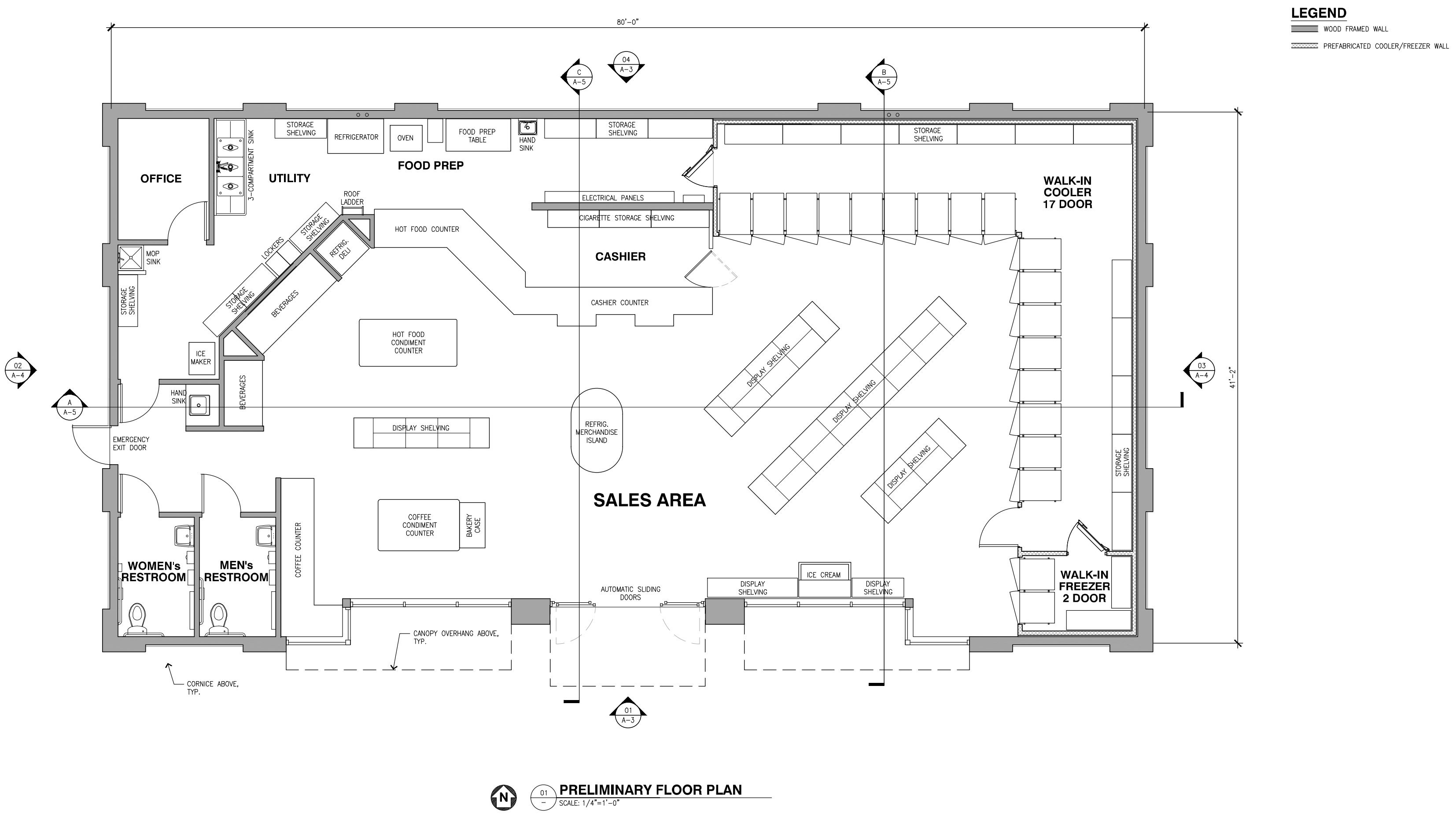
andeavor

For: ARCO AM/PM
NWC IRIS AVENUE • OLIVER STREET
MORENO VALLEY, CA

Title: COLOR BOARD

Job Number 18501

Sheet 1 *of* 1



01
PRELIMINARY FLOOR PLAN
SCALE: 1/4"=1'-0"

ARC

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(425)251-8782 FA

CIVIL ENGINEERING, LAND
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NO.	DATE	REVISION
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SEAL:

DEVELOPMENT INFORMATION:
ARCO N
3000 am/
FUEL CAN
w/ 8 MPD
26'x100' CAR

SITE ADDRESS:
NWC IRIS AVE @ O
MORENO VALL

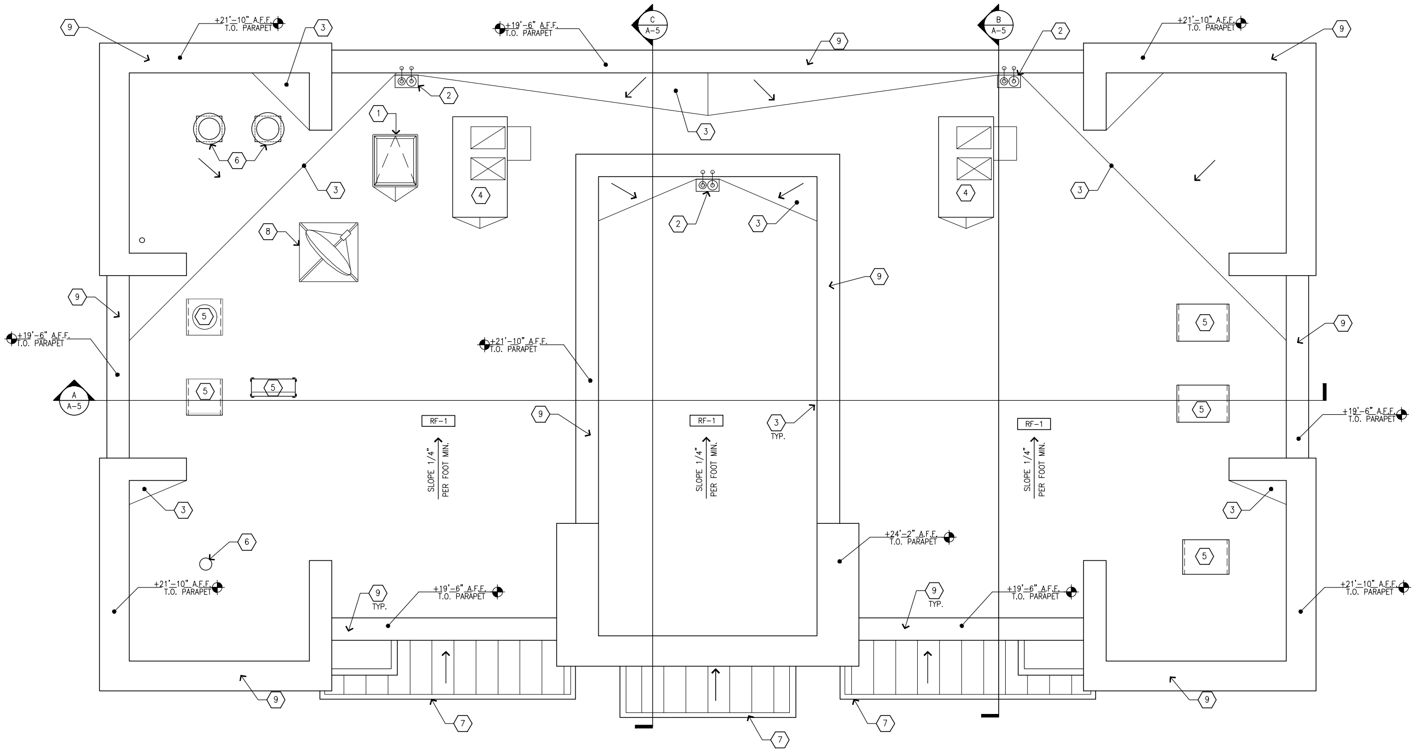
FACILITY #

DESIGNED BY:	ALLIAN
CHECKED BY:	BP REF
DRAWN BY:	ALLIAN
VERSION: - -	PROJEC

DRAWING TITLE:
FLOOR P

SHEET NO:
A-

Attachment: Floor Plan (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)



PRELIMINARY ROOF PLAN

01

SCALE: 1/4"=1'-0"

KEYED NOTES

1	ROOF HATCH
2	ROOF DRAIN AND OVERFLOW
3	TAPERED INSULATION CRICKET
4	ROOFTOP HVAC UNIT
5	REFRIGERATION CONDENSER UNIT
6	EXHAUST FAN
7	STEEL CANOPY BELOW
8	SATELLITE DISH ON BALLASTED SLED
9	PRE-FINISHED METAL COPING OVER PARAPET WALL

ROOFING

RF-1	REINFORCED MECHANICALLY FASTENED .045" THICK SINGLE-PLY EPDM MEMBRANE. ROOF INSULATION: RIGID POLYISOCYANURATE

ARC

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SURVEYING, ENVIRONMEN

NO.	DATE	REVISION
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SEAL:

DEVELOPMENT INFORMATION:

ARCO N
3000 am/
FUEL CAN
w/ 8 MPD
26'x100' CAR

SITE ADDRESS:

NWC IRIS AVE @ O
MORENO VALL

FACILITY #

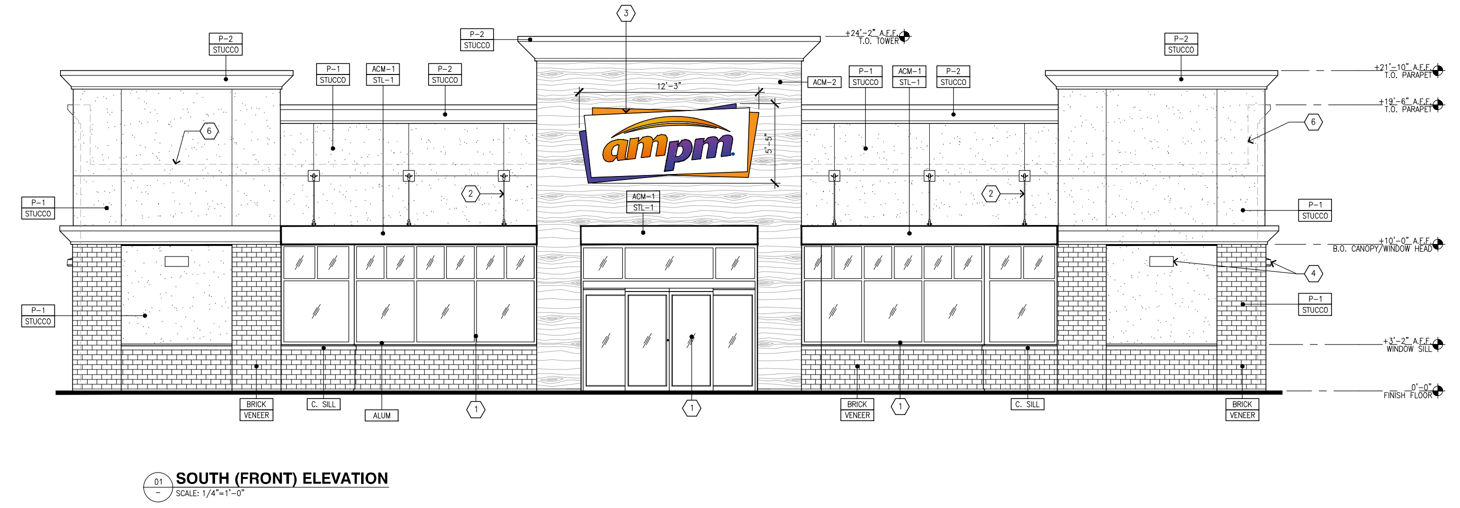
DESIGNED BY:	ALLIAN
CHECKED BY:	BP REF
DRAWN BY:	ALLIAN
VERSION: - -	PROJEC

DRAWING TITLE:

ROOF PL

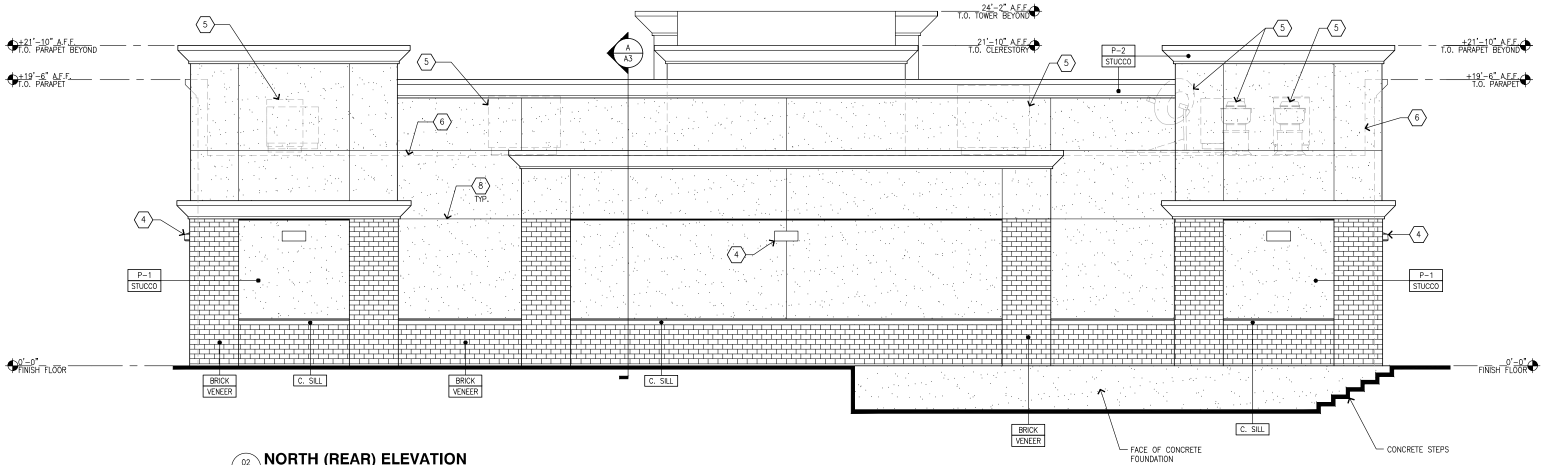
SHEET NO:

A-



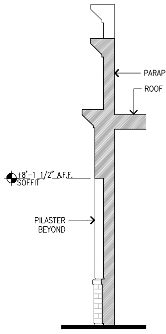
SOUTH (FRONT) ELEVATION

01
SCALE: 1/4"=1'-0"



NORTH (REAR) ELEVATION

02
SCALE: 1/4"=1'-0"



WALL SECTION

A
SCALE: 1/4"=1'-0"

KEYED NOTES

1. ALUMINUM ENTRANCE AND STOREFRONT SYSTEM
2. STEEL AWNING, ROD AND CLEVIS
3. INTERNALLY ILLUMINATED SURFACE MOUNTED WALL SIGN
4. WALL MOUNTED LED FIXTURE
5. ROOF TOP EQUIPMENT BEYOND
6. ROOF LINE BEYOND
7. CLERESTORY WINDOWS BEYOND
8. 1" REVEAL

COLOR LEGEND

P-1	BENJAMIN MOORE, OC-69, "WHITE OPULENCE"
P-2	BENJAMIN MOORE, 2121-30, "PEWTER", HIGH GLOSS

MATERIAL LEGEND

STUCCO	⅞" CEMENT PLASTER, INSTALLED PER MFG. SPECIFICATIONS; TEXTURE: FINE SAND FINISH
ACM-1	ALUMINUM COMPOSITE MATERIAL, PANTONE PMS 166c, "ORANGE"
ACM-2	ALUMINUM COMPOSITE MATERIAL, ALUCOBOND, "RUSTIC WALNUT"
STL-1	STEEL AWNING
BRICK	BRICK VENEER – HC MUDDOX 3 5/8"x 7 5/8" THIN BRICK COLOR: SIERRA SLATE
C. SILL	PRE-CAST CONCRETE SILL

NOT FOR CONSTRUCTION

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KENT, WA 98032
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(425)251-8782 FAX

CIVIL ENGINEERING, LAND
SURVEYING, ENVIRONMENT

NO.	DATE	REVISION
1	3/20/18	CITY COMM

SEAL:

DEVELOPMENT INFORMATION:

ARCO N
3000 am/
FUEL CAN
w/ 8 MPD
26'x100' CAR

SITE ADDRESS:

NWC IRIS AVE @ O
MORENO VALL

FACILITY #

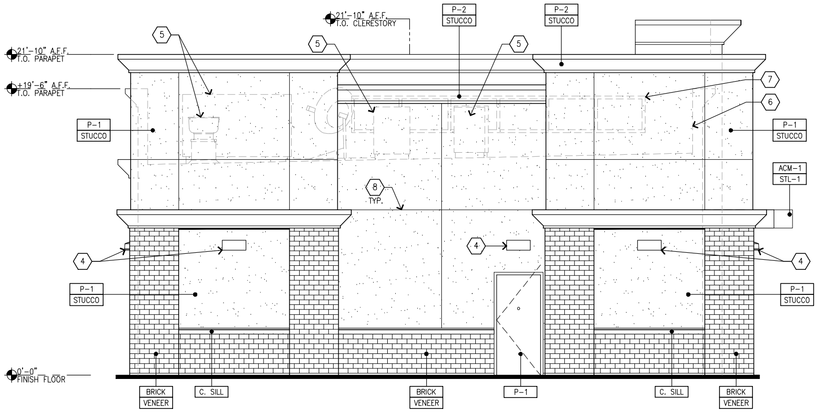
DESIGNED BY:	ALLIAN
CHECKED BY:	BP REF
DRAWN BY:	ALLIAN
VERSION: -	PROJEC

DRAWING TITLE:

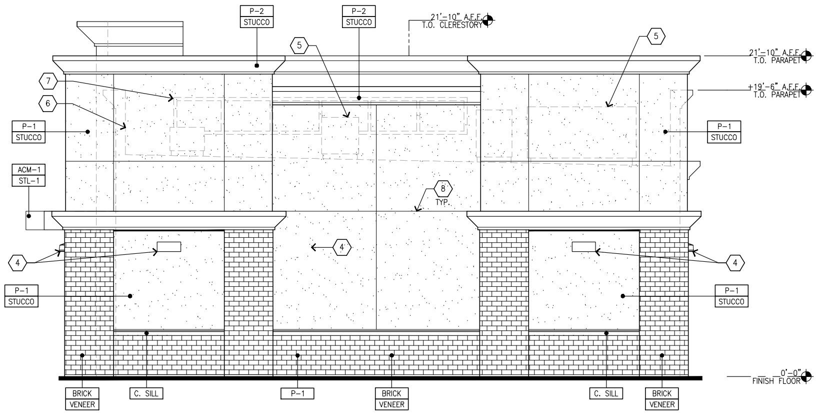
C-STOR
ELEVATI

SHEET NO:

A-



03 **WEST (LEFT) ELEVATION**
SCALE: 1/4"=1'-0"



04 **EAST (RIGHT) ELEVATION**
SCALE: 1/4"=1'-0"

KEYED NOTES

1. ALUMINUM ENTRANCE AND STOREFRONT SYSTEM
2. STEEL AWNING, ROD AND CLEVIS
3. INTERNALLY ILLUMINATED SURFACE MOUNTED WALL SIGN
4. WALL MOUNTED LED FIXTURE
5. ROOF TOP EQUIPMENT BEYOND
6. ROOF LINE BEYOND
7. CLERESTORY WINDOWS BEYOND
8. 1" REVEAL

COLOR LEGEND

P-1	BENJAMIN MOORE, OC-69, "WHITE OPULENCE"
P-2	BENJAMIN MOORE, 2121-30, "PEWTER", HIGH GLOSS

MATERIAL LEGEND

STUCCO	7/8" CEMENT PLASTER, INSTALLED PER MFG. SPECIFICATIONS; TEXTURE: FINE SAND FINISH
ACM-1	ALUMINUM COMPOSITE MATERIAL, PANTONE PMS 166c, "ORANGE"
ACM-2	ALUMINUM COMPOSITE MATERIAL, ALUCOBOND, "RUSTIC WALNUT"
ALUM	CLEAR ANODIZED ALUMINUM
STL-1	STEEL AWNING
BRICK	BRICK VENEER - HC MUDDOX 3 5/8"x 7 5/8" THIN BRICK COLOR: SIERRA SLATE
C. SILL	PRE-CAST CONCRETE SILL

NOT FOR CONSTRUCTION

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CIVIL ENGINEERING, LAND
SURVEYING, ENVIRONMENT

NO.	DATE	REVISION
1	3/20/18	CITY COMM

SEAL:

DEVELOPMENT INFORMATION:
ARCO N
3000 am/
FUEL CAN
w/ 8 MPD
26'x100' CAR

SITE ADDRESS:
NWC IRIS AVE @ O
MORENO VALL

FACILITY #

DESIGNED BY:	ALLIAN
CHECKED BY:	BP REF
DRAWN BY:	ALLIAN
VERSION: - -	PROJEC

DRAWING TITLE:
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ELEVATI

SHEET NO:
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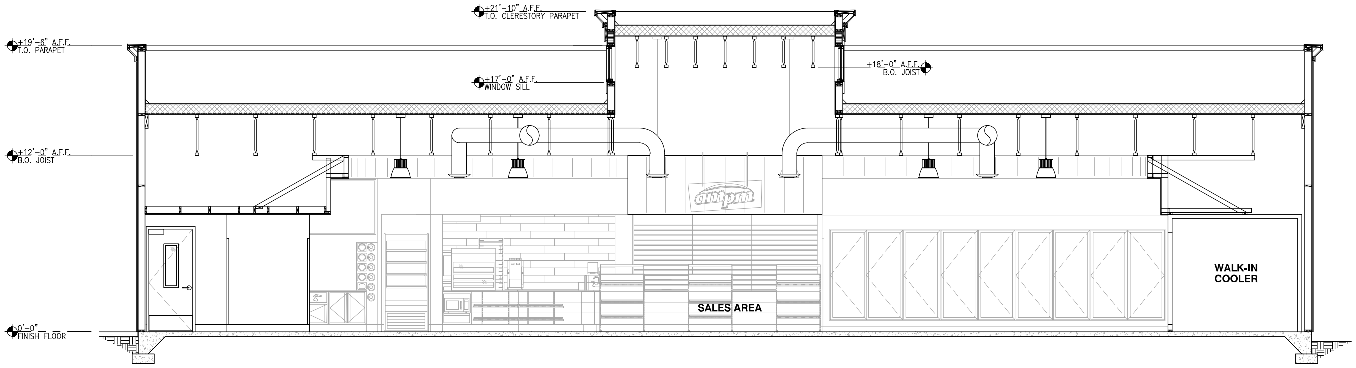
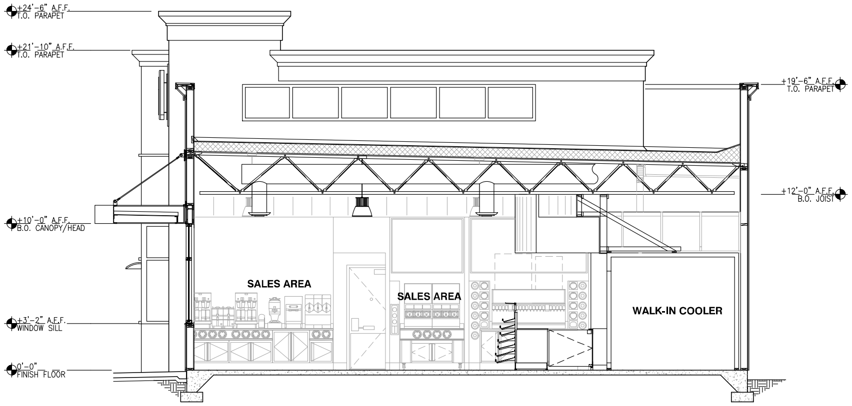
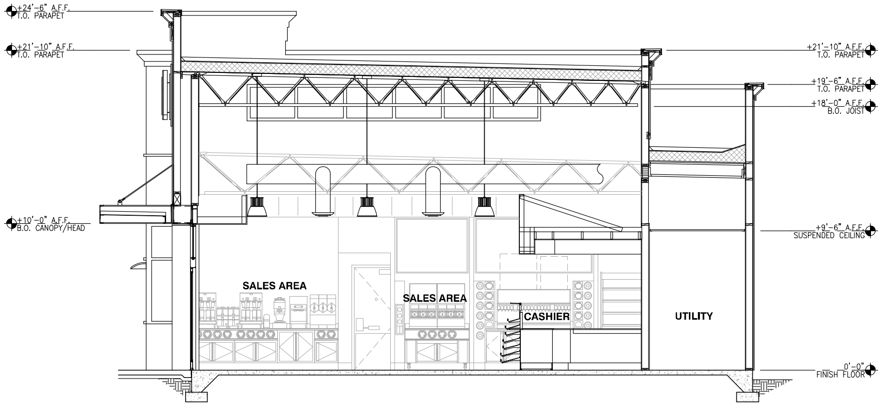
Attachment: Architectural Plans (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)



A BUILDING SECTION
SCALE: 1/4"=1'-0"



B BUILDING SECTION
SCALE: 1/4"=1'-0"



C BUILDING SECTION
SCALE: 1/4"=1'-0"

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(425)251-8782 FA

CIVIL ENGINEERING, LAND
SURVEYING, ENVIRONMENT

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SEAL:

DEVELOPMENT INFORMATION:

ARCO N

3000 am/
FUEL CAN
w/ 8 MPD
26'x100' CAR

SITE ADDRESS:

NWC IRIS AVE @ O
MORENO VALL

FACILITY #

DESIGNED BY: ALLIAN
CHECKED BY: BP REF
DRAWN BY: ALLIAN
VERSION: - - PROJEC

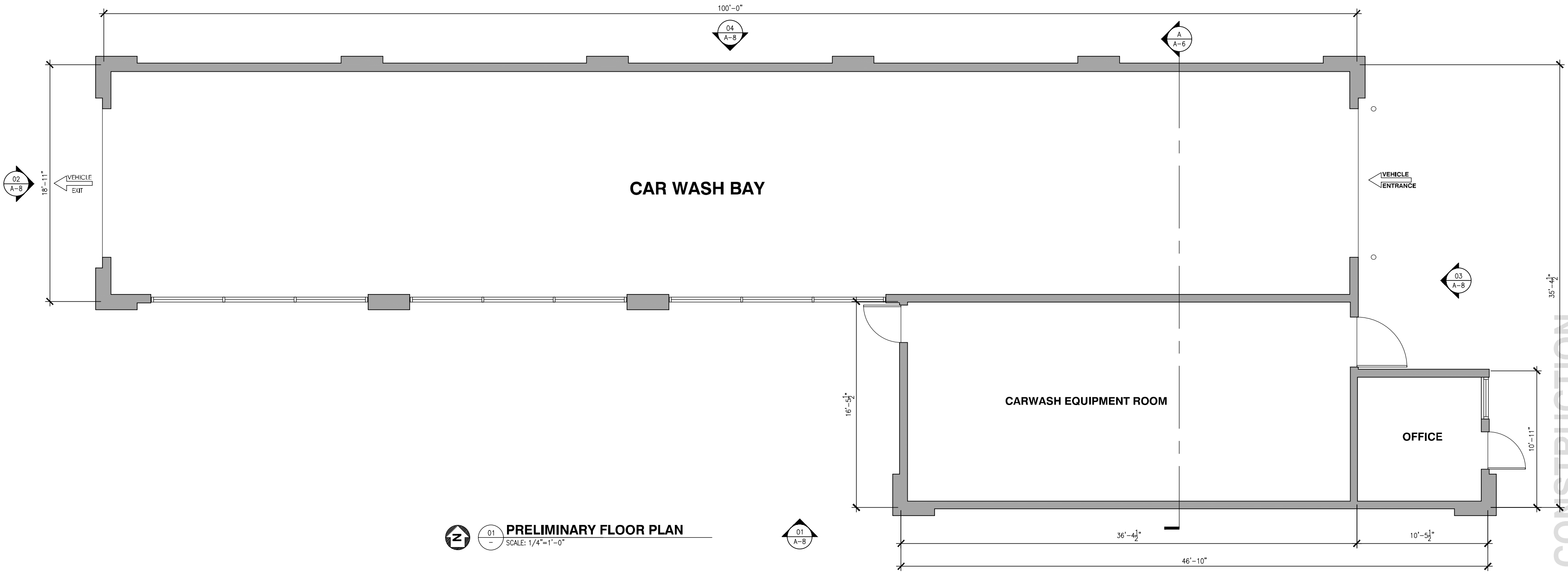
DRAWING TITLE:

C-STO
BLDG SEC

SHEET NO:

A-5

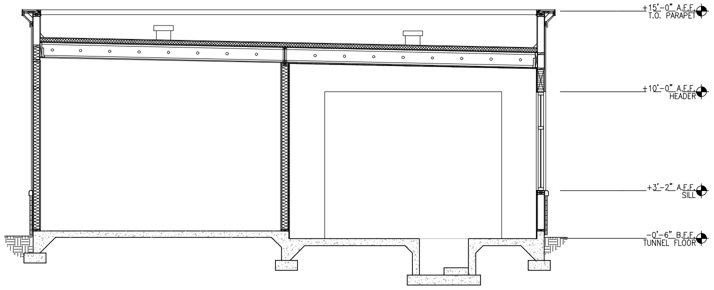
Attachment: Architectural Plans (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)



01
–
PRELIMINARY FLOOR PLAN
SCALE: 1/4"=1'-0"

WALL LEGEND

▬



A
–
BUILDING SECTION
SCALE: 1/4"=1'-0"

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(425)251-8782 FAX

CIVIL ENGINEERING, LAND
SURVEYING, ENVIRONMENT

NO.	DATE	REVISION
1	3/20/18	CITY COMM

SEAL:

DEVELOPMENT INFORMATION:

ARCO N

3000 am/
FUEL CAN
w/ 8 MPD
26'x100' CAR

SITE ADDRESS:

NWC IRIS AVE @ O

MORENO VALL

FACILITY #

DESIGNED BY:	ALLIAN
CHECKED BY:	BP REF
DRAWN BY:	ALLIAN
VERSION: - -	PROJEC

DRAWING TITLE:

CARWA
FLOOR P

SHEET NO:

A-6

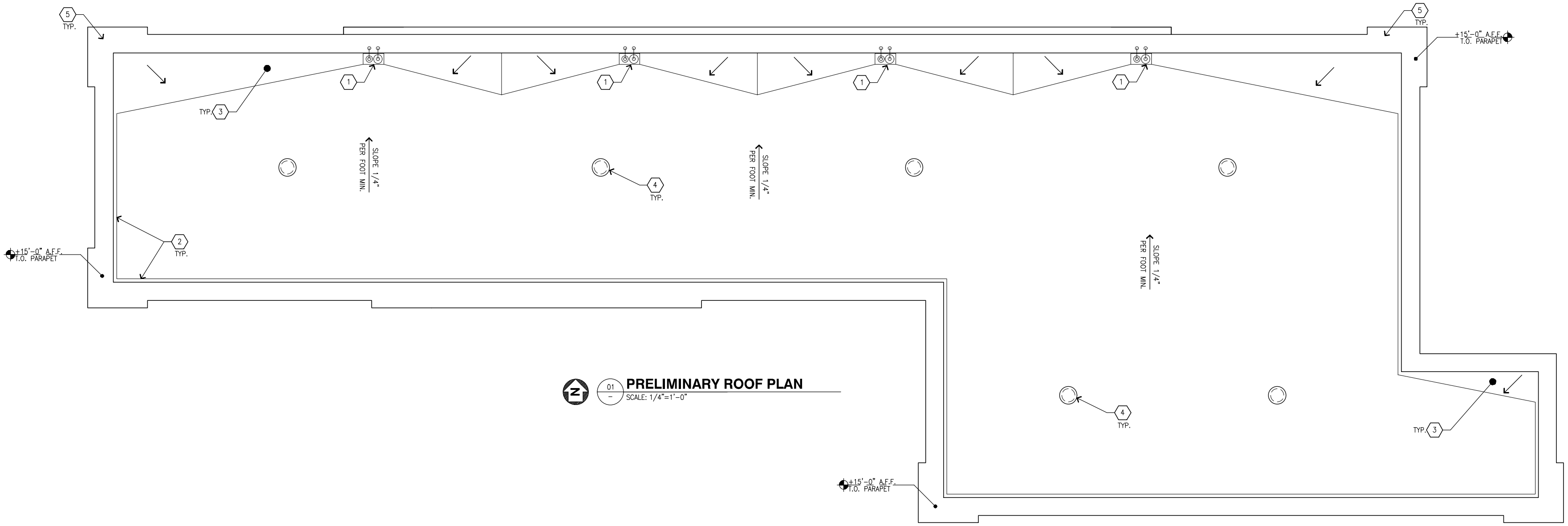
Attachment: Architectural Plans (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

KEYED NOTES

1	ROOF DRAIN AND OVERFLOW
2	CANT STRIP
3	TAPERED INSULATION CRICKET
4	EXHAUST FAN
5	PRE-FINISHED METAL COPING OVER PARAPET WALL

ROOFING

RF-1	REINFORCED MECHANICALLY FASTENED .045" THICK SINGLE-PLY EPDM MEMBRANE.



01
-
PRELIMINARY ROOF PLAN
SCALE: 1/4"=1'-0"

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KENT, WA 98032
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(425)251-8782 FAX

CIVIL ENGINEERING, LAND
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SEAL:

DEVELOPMENT INFORMATION:

ARCO N
3000 am/
FUEL CAN
w/ 8 MPD
26'x100' CAR

SITE ADDRESS:

NWC IRIS AVE @ O
MORENO VALL

FACILITY #

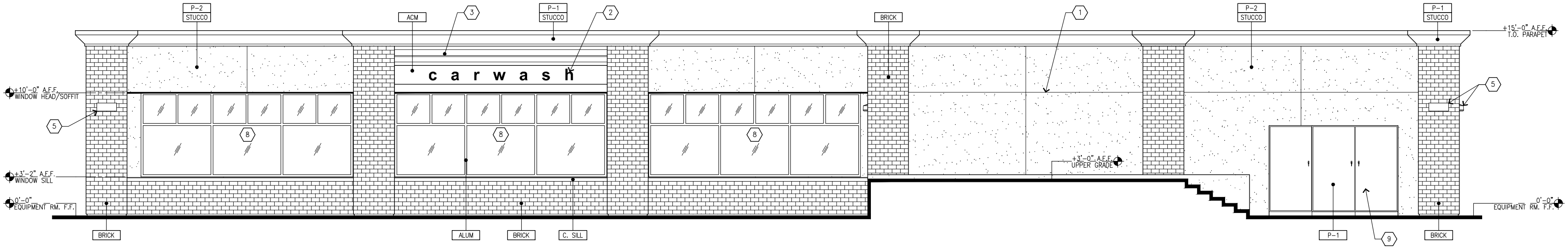
DESIGNED BY:	ALLIAN
CHECKED BY:	BP REF
DRAWN BY:	ALLIAN
VERSION: - -	PROJEC

DRAWING TITLE:

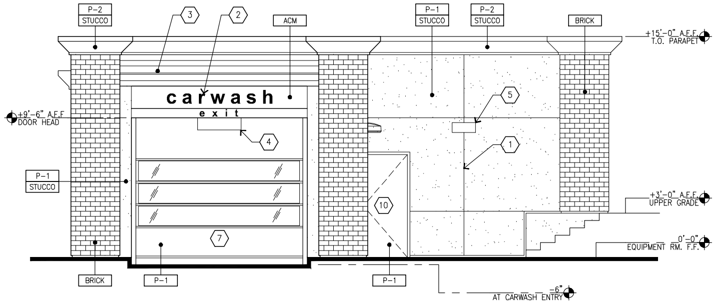
CARWA
ROOF PL

SHEET NO:

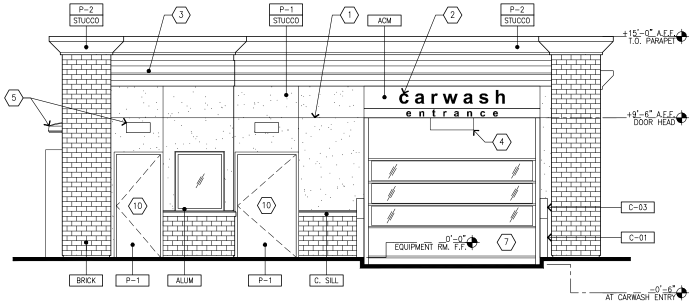
A-7



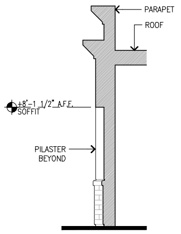
01 **SOUTH ELEVATION**
SCALE: 1/4"=1'-0"



02 **WEST ELEVATION**
SCALE: 1/4"=1'-0"



03 **EAST ELEVATION**
SCALE: 1/4"=1'-0"



A **WALL SECTION**
SCALE: 1/4"=1'-0"

KEYED NOTES

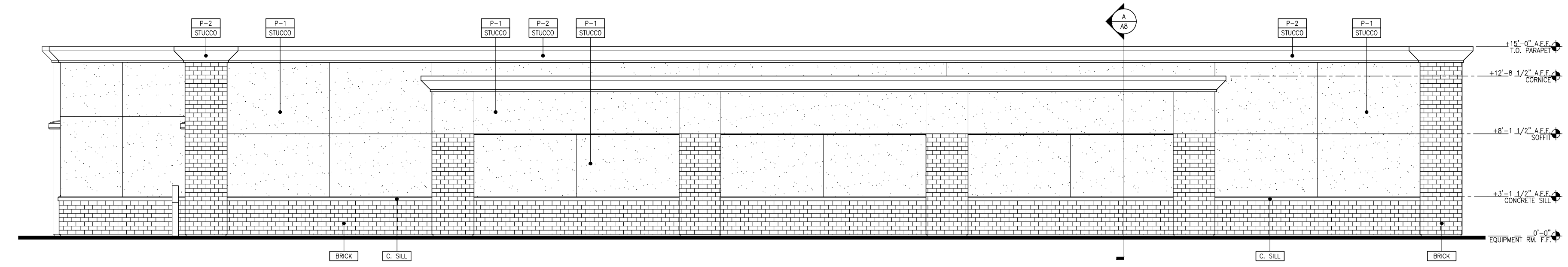
1	1" REVEAL
2	VINYL LETTERS APPLIED TO ACM
3	VINYL DECAL APPLIED TO ACM
4	OVERHEAD CLEARANCE BAR
5	WALL MOUNTED LED FIXTURE
6	6" ROUND CONCRETE FILLED BOLLARD
7	VINYL ROLL UP DOOR
8	WASH BAY WINDOWS
9	ELECTRICAL SERVICE EQUIPMENT
10	METAL DOOR

COLOR LEGEND

⬜	P-1	BENJAMIN MOORE, OC-69, "WHITE OPULENCE"
⬛	P-2	BENJAMIN MOORE, 2121-30, "PEWTER", HIGH GLOSS
⬜	C-01	BP PEARL – BENJAMIN MOORE, OC-8, "ELEPHANT TUSK"
🟨	C-03	BP YELLOW – BENJAMIN MOORE, 2022-10, "YELLOW"

MATERIAL LEGEND

	STUCCO	⅞" CEMENT PLASTER TEXTURE: FINE SAND FINISH
	ACM	ALUMINUM COMPOSITE MATERIAL
	C. SILL	PRE-CAST CONCRETE SILL
	ALUM	ALUMINUM STOREFRONT SYSTEM CLEAR ANODIZED
▨	BRICK	BRICK VENEER – HC MUDDOX 3 5/8"x 7 5/8" THIN BRICK COLOR: SIERRA SLATE



04 **NORTH ELEVATION**
SCALE: 1/4"=1'-0"

ARC

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KENT, WA 98032
(425)251-6222
(425)251-8782 FA

CIVIL ENGINEERING, LAND
SURVEYING, ENVIRONMEN

NO.	DATE	REVISION
1	3/20/18	CITY COM

SEAL:

DEVELOPMENT INFORMATION:

ARCO N
3000 am/
FUEL CAN
w/ 8 MPD
26'x100' CAR

SITE ADDRESS:
NWC IRIS AVE @ O
MORENO VALL

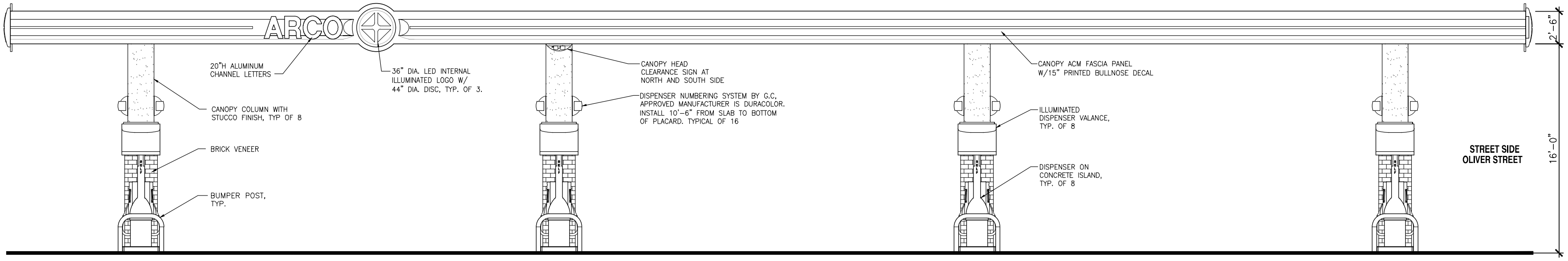
FACILITY #

DESIGNED BY:	ALLIAN
CHECKED BY:	BP REF
DRAWN BY:	ALLIAN
VERSION: - -	PROJEC

DRAWING TITLE:
CAR WA
ELEVATI

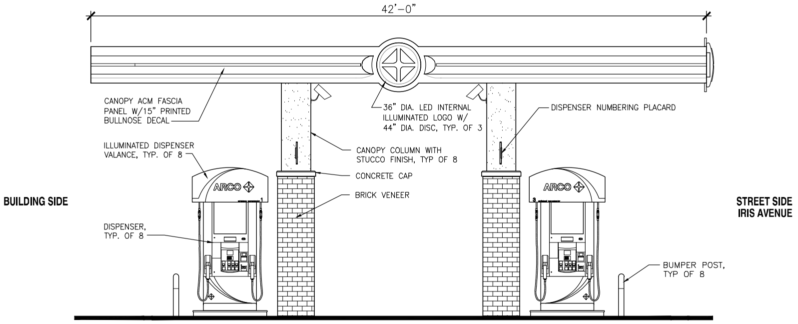
SHEET NO:
A-8

Attachment: Architectural Plans (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)



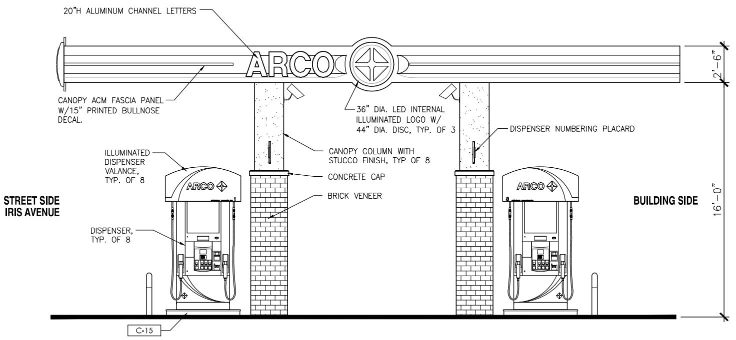
01 CANOPY ELEVATION (ALONG IRIS AVENUE)

SCALE: 1/4"=1'-0"



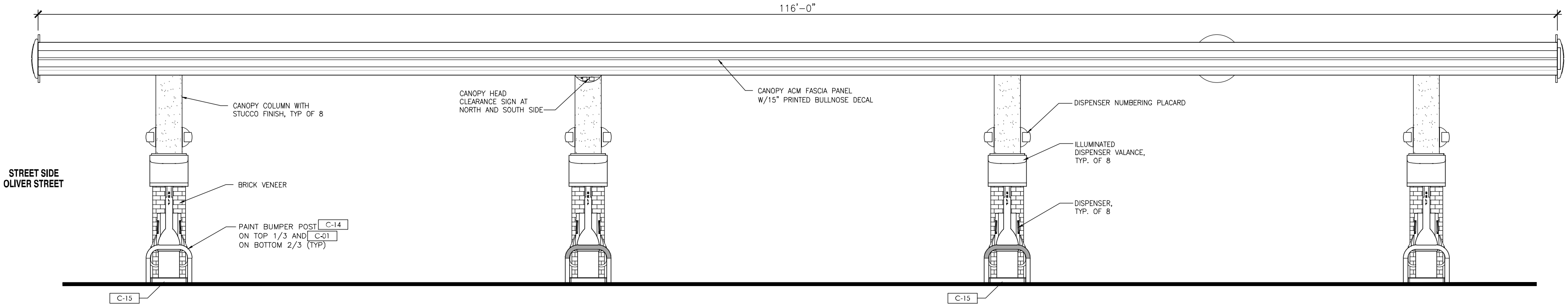
02 CANOPY ELEVATION

SCALE: 1/4"=1'-0"



03 CANOPY ELEVATION (ALONG OLIVER STREET)

SCALE: 1/4"=1'-0"



04 CANOPY ELEVATION

SCALE: 1/4"=1'-0"

SIGNAGE NOTE:
ALL SIGNAGE SHOWN IS FOR VISUAL REFERENCE ONLY-SIGN PERMIT UNDER SEPARATE PERMIT

ARC
andea
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KENT, WA 98032
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(425)251-8782 FA

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NO.	DATE	REVISION
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SEAL:

DEVELOPMENT INFORMATION:
ARCO N
3000 am/
FUEL CAN
w/ 8 MPD
26'x100' CAR

SITE ADDRESS:
NWC IRIS AVE @ O
MORENO VALL

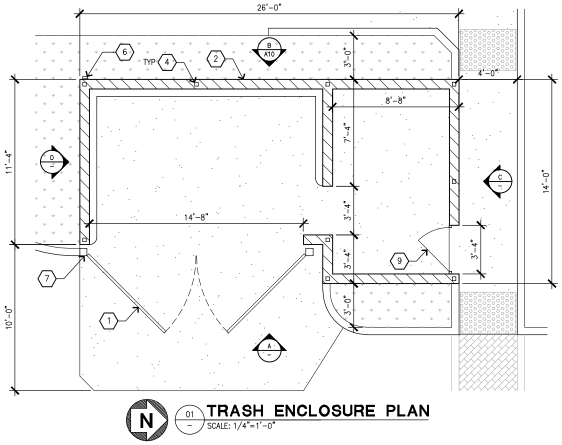
FACILITY #

DESIGNED BY: ALLIAN
CHECKED BY: PT BP REP
DRAWN BY: JMW ALLIAN
VERSION: - PROJEC
-

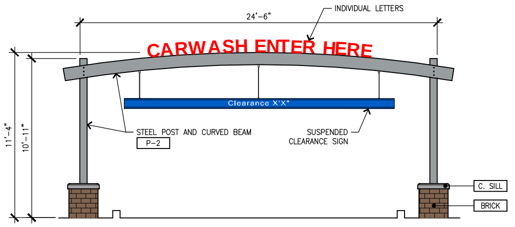
DRAWING TITLE:
CANOP
ELEVATI

SHEET NO:
A-9

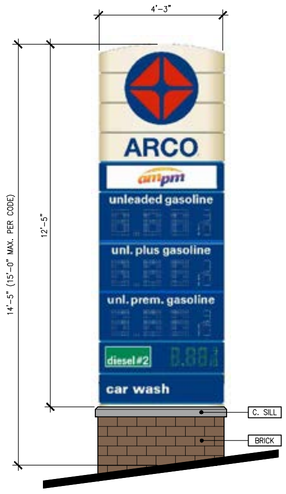
Attachment: Architectural Plans (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)



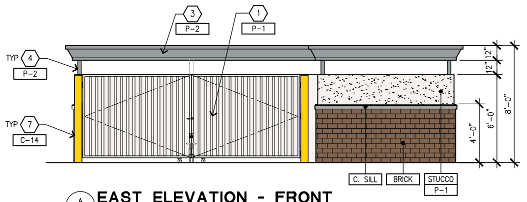
01 **TRASH ENCLOSURE PLAN**
SCALE: 1/4"=1'-0"



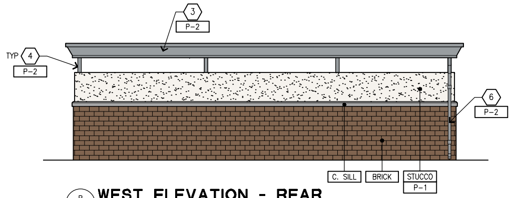
03 **CARWASH CLEARANCE BAR**
SCALE: 1/4"=1'-0"



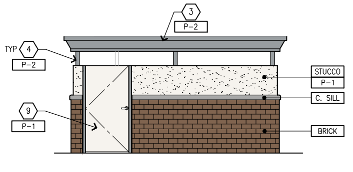
02 **MONUMENT SIGN**
SCALE: 1/2"=1'-0"



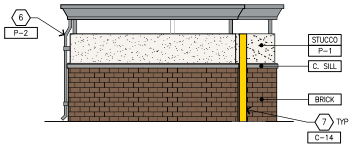
A **EAST ELEVATION - FRONT**
SCALE: 1/4"=1'-0"



B **WEST ELEVATION - REAR**
SCALE: 1/4"=1'-0"



C **NORTH ELEVATION - SIDE**
SCALE: 1/4"=1'-0"



D **SOUTH ELEVATION - SIDE**
SCALE: 1/4"=1'-0"

KEYED NOTES

1. GALVANIZED METAL DECKING GATE, PAINTED
2. STUCCO OVER CMU WALL, PAINTED
3. 24 GA STEEL FASCIA, PAINTED
4. 3"x3" STEEL TUBE SUPPORT, PAINTED
5. 3" DEEP METAL DECK ROOFING, PAINTED
6. 2"x4" DOWNSPOUT, PAINTED
7. 6" TUBE STEEL FILLED W/ CONCRETE, PAINTED
8. METAL GUTTER, PAINTED
9. 36"X72" STEEL DOOR, LOCKABLE, PAINTED

COLOR LEGEND

⬜	P-1	BENJAMIN MOORE, OC-69, "WHITE OPULENCE"
▨	P-2	BENJAMIN MOORE, 2121-30, "PEWTER", HIGH GLOSS
🟨	C-14	BP YELLOW - BENJAMIN MOORE, 2022-10, "YELLOW"
▦	BRICK	BRICK VENEER, SIERRA SLATE

MATERIAL LEGEND

STUCCO	⅞" CEMENT PLASTER OVER CMU TEXTURE: FINE SAND FINISH, PAINTED
C. SILL	PRE-CAST CONCRETE SILL
BRICK	HC MUDDOX 3 5/8" x 7 5/8" THIN BRICK; COLOR: MISSION COMMON

REPRESENTATIVE PHOTO OF THE PROPOSED SYSTEM WITH FABRIC CANOPY

04 **CARWASH VACUUMS**
SCALE: NTS

ARCO
andeav

BARGHAUSEN CONSULTING ENGINEERS

18215 72ND AVENUE
KENT, WA 98032
(425)251-6222
(425)251-8782 FAX

CIVIL ENGINEERING, LAND P
SURVEYING, ENVIRONMENTAL

NO.	DATE	REVISION D
1	3/20/18	CITY COMME
2	6/01/18	CITY COMME
3	8/07/18	CITY COMME

SEAL:

DEVELOPMENT INFORMATION:
ARCO NT
3000 am/p
FUEL CANO
w/ 8 MPD'
26'x100' CAR W

SITE ADDRESS:
NWC IRIS AVE @ OL
MORENO VALLE
FACILITY # T

DESIGNED BY:	ALLIANCE
CHECKED BY:	BP REPM:
DRAWN BY:	ALLIANCE
VERSION: - -	PROJECT 1

DRAWING TITLE:
SITE DETA

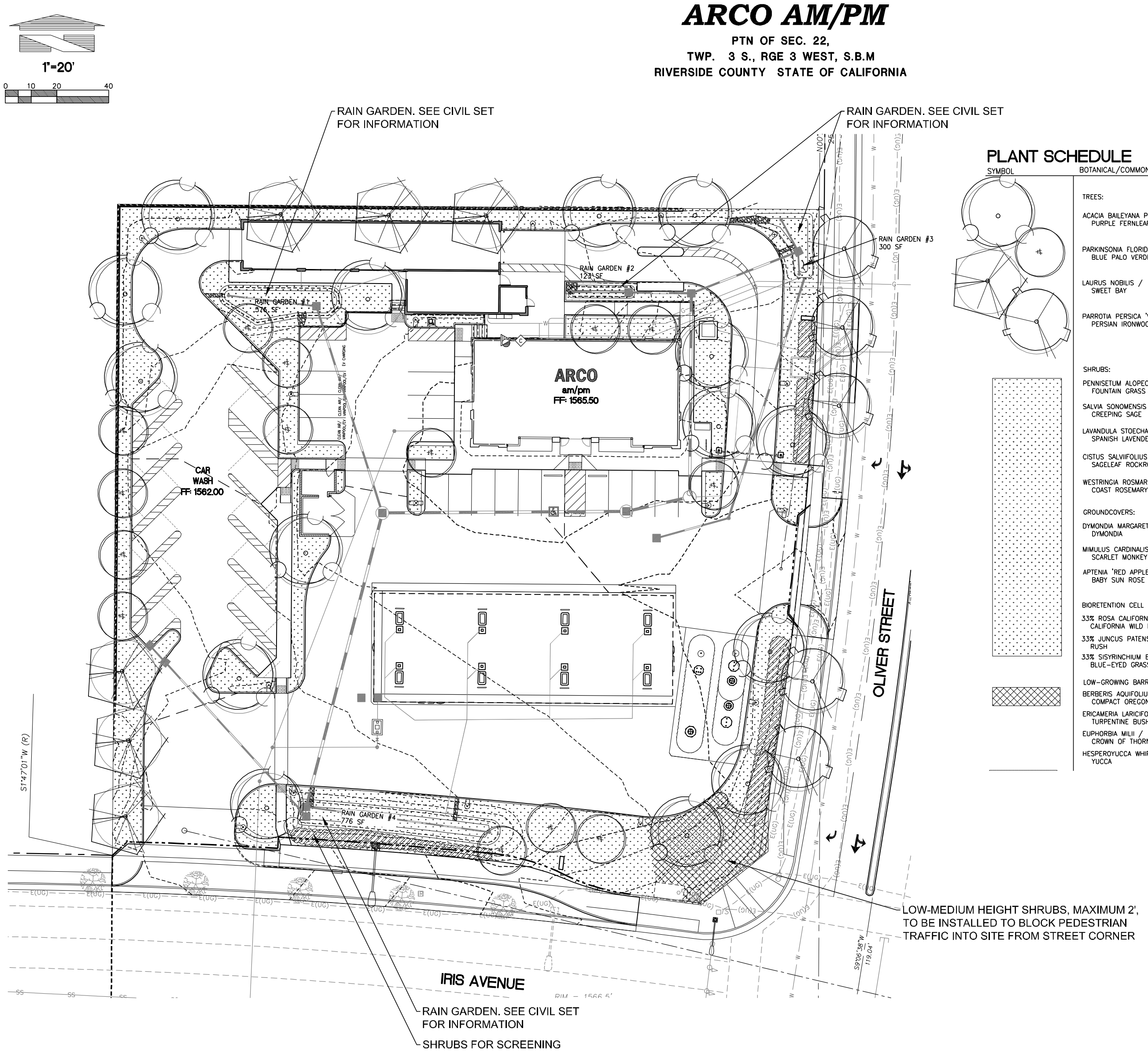
SHEET NO:
A-1

Attachment: Architectural Plans (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

PRELIMINARY LANDSCAPE and IRRIGATION PLAN
FOR

ARCO AM/PM

PTN OF SEC. 22,
TWP. 3 S., RGE 3 WEST, S.B.M
RIVERSIDE COUNTY STATE OF CALIFORNIA



PLANT SCHEDULE

SYMBOL	BOTANICAL/COMMON NAMES	SIZE CONDITION	SPACING	QUANTITY	WUCOLS IV IRRIGATION REGION: 4	REMARKS
	TREES:					
	ACACIA BAILEYANA PURPUREA / PURPLE FERNLEAF ACACIA	24" BOX	AS SHOWN		LOW	STAKE & GUY ONE GROWING SEASON; NURSERY GROWN, BRANCHED AT 5'
	PARKINSONIA FLORIDA / BLUE PALO VERDE	24" BOX	AS SHOWN		VERY LOW	STAKE & GUY ONE GROWING SEASON; NURSERY GROWN, BRANCHED AT 5'
	LAURUS NOBILIS / SWEET BAY	24" BOX	AS SHOWN		LOW	STAKE & GUY ONE GROWING SEASON; NURSERY GROWN, BRANCHED AT 5'
	PARROTIA PERSICA 'VANESSA' / PERSIAN IRONWOOD	24" BOX	30'-0" O.C.		LOW	STAKE & GUY ONE GROWING SEASON; NURSERY GROWN, BRANCHED AT 5'
	SHRUBS:					
░	PENNISETUM ALOPECUROIDES / FOUNTAIN GRASS	1 GALLON	AS SHOWN		LOW	FULL & BUSHY
	SALVIA SONOMENSIS / CREEPING SAGE	1 GALLON	AS SHOWN		LOW	FULL & BUSHY
	LAVANDULA STOECHAS 'OTTO QUAST' / SPANISH LAVENDER	1 GALLON	AS SHOWN		LOW	FULL & BUSHY
	CISTUS SALVIIFOLIUS 'PROSTRATUS' / SAGELEAF ROCKROSE	1 GALLON	AS SHOWN		LOW	FULL & BUSHY
	WESTRINGIA ROSMARINIFORMIS / COAST ROSEMARY	1 GALLON	AS SHOWN		LOW	FULL & BUSHY
	GROUNDCOVERS:					
	DYMONDIA MARGARETAE / DYMONDIA	1 GALLON	24" O.C.	AS REQ'D	LOW	HOLD BACK 16" FROM BORDERS, TREES, AND SHRUBS
	MIMULUS CARDINALIS / SCARLET MONKEY FLOWER	1 GALLON	24" O.C.	AS REQ'D	LOW	HOLD BACK 16" FROM BORDERS, TREES, AND SHRUBS
	APTENIA 'RED APPLE' / BABY SUN ROSE	1 GALLON	24" O.C.	AS REQ'D	LOW	HOLD BACK 16" FROM BORDERS, TREES, AND SHRUBS
	BIORETENTION CELL PLANTS:					
	33% ROSA CALIFORNICA / CALIFORNIA WILD ROSE	1 GALLON	24" O.C.	AS REQ'D	LOW	FULL & BUSHY, ZONES 1 & 2
	33% JUNCUS PATENS 'ELK BLUE' / RUSH	1 GALLON	24" O.C.	AS REQ'D	LOW	FULL & BUSHY, ZONES 1 & 2
	33% SISYRINCHIUM BELLUM / BLUE-EYED GRASS	1 GALLON	24" O.C.	AS REQ'D	VERY LOW	FULL & BUSHY, ZONES 1 & 2
	LOW-GROWING BARRIER SHRUBS					
▨	BERBERIS AQUIFOLIUM 'COMPACTA' / COMPACT OREGON GRAPE	2 GALLON	24" O.C.	AS REQ'D	LOW	FULL & BUSHY. 25% OF EACH SPECIES. INSTALL IN GROUPS OF 15+ PLANTS
	ERICAMERIA LARICIFOLIA / TURPENTINE BUSH					
	EUPHORBIA MILII / CROWN OF THORNS					
	HESPEROYUCCA WHIPLLEI / YUCCA					

NOT FOR CONSTRUCTION

Preliminary Not For Construction

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CIVIL ENGINEERING, LA
SURVEYING, ENVIRONM

NO.	DATE	REVIS
1	3/20/18	CITY
2	6/1/18	CITY
3	8/7/18	CITY

SEAL:
JEFFREY VAR
8-31-20
8-6-20

DEVELOPMENT INFORMATIO
ARCO
3000 am
FUEL CA
w/ 8 MP
26'x100' CA

SITE ADDRESS:
NWC IRIS AVE @
MORENO VA

FACILITY

DESIGNED BY: BLS
CHECKED BY: JMV
DRAWN BY: BLS
VERSION: -

DRAWING TITLE:
PRELIMI
LANDSC
PLA

SHEET NO:
L-

PRELIMINARY LANDSCAPE and IRRIGATION PLAN
FOR

ARCO AM/PM

PTN OF SEC. 22,
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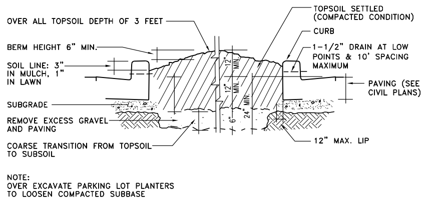
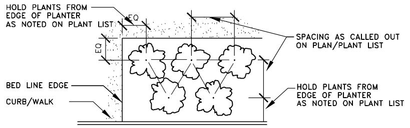


NOTE:
OVER EXCAVATE PARKING LOT PLANTERS
TO LOOSEN COMPACTED SUBBASE

GRADING • PARKING LOT PLANTERS DETAIL

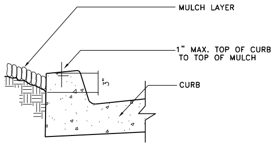
NOT TO SCALE



NOTE:
THIS SPACING APPLIES TO
GROUNDCOVER AND FORMAL
SHRUB ROW PLACEMENT.

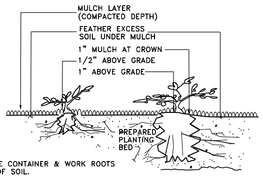
PLANT MATERIAL SPACING DETAIL

NOT TO SCALE



MULCH AT CURB DETAIL

NOT TO SCALE



NOTE:
REMOVE CONTAINER & WORK ROOTS
FREE OF SOIL.
BACKFILL TO BE SETTLED USING WATER ONLY
SEE PLANT LIST FOR PLANT SPACING

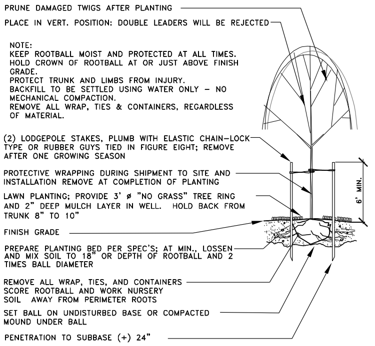
LESS THAN 1 GAL.
(PLANTED BEFORE MULCH)

1 GAL. CONTAINER and LARGER
(PLANTED BEFORE MULCH)

GROUNDCOVER PLANTING DETAIL

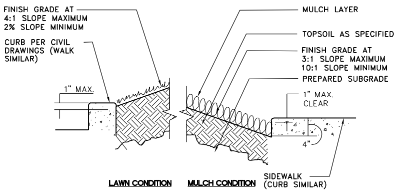
NOT TO SCALE

NOTE:
KEEP ROOTBALL MOIST AND PROTECTED AT ALL TIMES.
HOLD CROWN OF ROOTBALL AT OR JUST ABOVE FINISH GRADE.
PROTECT TRUNK AND LIMBS FROM INJURY.
BACKFILL TO BE SETTLED USING WATER ONLY - NO MECHANICAL COMPACTION.
REMOVE ALL WRAP, TIES & CONTAINERS, REGARDLESS OF MATERIAL.



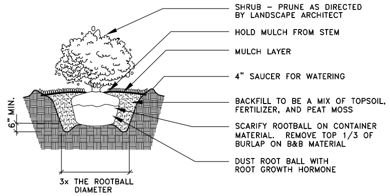
DECIDUOUS TREE PLANTING/STAKING DETAIL

NOT TO SCALE



PLANTER SECTION DETAIL

NOT TO SCALE



NOTE:
APPLY ADDITIONAL 4 OZ. 8-32-16 FERTILIZER INTO TOP 2" OF PLANTING MIX.

PLANT SHRUB HIGH ENOUGH TO ALLOW POSITIVE DRAINAGE AWAY FROM ROOTBALL. ROUGHEN ALL SURFACES OF PIT.

CUT AND REMOVE BURLAP FROM ROOT BALL

SHRUB PLANTING DETAIL

NOT TO SCALE

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(425)251-8782 F

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SURVEYING, ENVIRONME

NO.	DATE	REVISI
1	3/20/18	CITY
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SEAL:

8-31-20
6-1-201

DEVELOPMENT INFORMATIO
ARCO
3000 am
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w/ 8 MF
26'x100' CA

SITE ADDRESS:
NWC IRIS AVE @
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FACILITY

DESIGNED BY: BLS
CHECKED BY: JMV
DRAWN BY: BLS
VERSION: - -

DRAWING TITLE:
PRELIMI
LANDSC
NOTES/DI

SHEET NO:
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PRELIMINARY LANDSCAPE and IRRIGATION PLAN
FOR
ARCO AM/PM
PTN OF SEC. 22,
TWP. 3 S., RGE 3 WEST, S.B.M
RIVERSIDE COUNTY STATE OF CALIFORNIA

SECTION 1000 - LAWNS AND GRASSES

PART 1 GENERAL

1.1 DESCRIPTION

A. WORK TO INCLUDE:
PREPARATION OF SOIL, FINE GRADING AND PLACING OF TOPSOIL IF REQUIRED.
FERTILIZING, SOD INSTALLATION, SEED INSTALLATION IF REQUIRED AND MAINTENANCE.

B. RELATED WORK IN OTHER SECTIONS:
SECTION 02810: IRRIGATION SYSTEM.
SECTION 02950: TREES, PLANTS AND GROUND COVERS.

1.2 REFERENCES

A. ASPA (AMERICAN SOD PRODUCERS ASSOCIATION) – GUIDELINE SPECIFICATIONS TO SODDING.

1.3 DEFINITIONS

A. WEEDS: INCLUDES DANDELION, JIMSONWEED, QUACKGRASS, HORSETAIL, MORNING GLORY, RUSH GRASS, MUSTARD, LAMBSQUARTER, CHICKWEED, CRESS, CRABGRASS, CANADIAN THISTLE NUTGRASS, POISON OAK, BLACKBERRY, TANSY RAGWORT, BERMUDA GRASS, JOHNSON GRASS, POISON IVY, NUT SEDGE, NIMBLE WILL, BINDWEED, BENT GRASS, WILD GARLIC, PERENNIAL SORREL AND BROME GRASS.

1.4 QUALITY ASSURANCE

A. SOD PRODUCER: COMPANY SPECIALIZING IN SOD PRODUCTION AND HARVESTING, WITH MINIMUM FIVE YEARS EXPERIENCE, AND CERTIFIED BY THE STATE IN WHICH PROJECT IS LOCATED.
B. INSTALLER: COMPANY APPROVED BY GENERAL CONTRACTOR.
C. SOD: SOD SHALL HAVE SUFFICIENT ROOT DEVELOPMENT TO SUPPORT ITS OWN WEIGHT WITHOUT TEARING WHEN SUSPENDED VERTICALLY BY HOLDING UPPER TWO CORNERS, FREE OF WEEDS AND UNDESIRABLE NATIVE GRASSES.

1.5 REGULATORY REQUIREMENTS

A. COMPLY WITH REGULATORY AGENCIES FOR FERTILIZER AND HERBICIDE COMPOSITION.

1.6 TESTS

A. SOILS TEST: OBTAIN FROM A CERTIFIED TESTING LABORATORY, AN ANALYSIS OF THE EXISTING SOIL FOR NITROGEN, PHOSPHORUS, POTASSIUM, SOLUBLE SALT CONTENT, MICRO NUTRIENTS, ORGANIC MATTER CONTENT AND PH VALUE.
B. PRESENT FINDINGS OF SOILS TEST TO ARCHITECT BEFORE PROCEEDING WITH INSTALLATION.

1.7 MAINTENANCE DATA

A. NONE REQUIRED.

1.8 DELIVERY, STORAGE AND HANDLING

A. DELIVER SOD ON PALLETS OR IN ROLLS. PROTECT EXPOSED ROOTS FROM DEHYDRATION.
B. DO NOT DELIVER MORE SOD THAN CAN BE LAID WITHIN TWENTY-FOUR (24) HOURS.
C. DELIVER FERTILIZER IN WATERPROOF BAGS SHOWING WEIGHT, CHEMICAL ANALYSIS AND NAME OF MANUFACTURER.
D. STORE MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION AND AS DIRECTED BY OWNER OR ARCHITECT.

1.9 COORDINATION

A. COORDINATE THE WORK OF THIS SECTION WITH INSTALLATION OF UNDERGROUND PIPING, CONDUIT OR WIRING.
B. COORDINATE THE WORK OF THIS SECTION WITH THE INSTALLATION OF PLANT MATERIAL.

1.10 WARRANTY

A. COMPLETE INSTALLATION SHALL BE GUARANTEED BY INSTALLER AGAINST DEFECTS OF MATERIAL AND WORKMANSHIP, FOR A PERIOD OF NINETY DAYS, BEGINNING WITH DATE OF SUBSTANTIAL COMPLETION.
B. IT IS THE RESPONSIBILITY OF CONTRACTOR TO ESTABLISH A DENSE LAWN OF PERMANENT GRASSES AS SPECIFIED.
C. SODDED AREAS SHALL HAVE NO BARE SPOTS OR UNACCEPTABLE COVER TOTALING MORE THAN ONE PERCENT OF INDIVIDUAL LAWN SURFACE AREAS. BARE SPOTS SHALL BE RESODDED TO MEET ORIGINAL SPECIFICATIONS AND HAVE A NEW 90 DAY WARRANTY. OR, IN THE EVENT OF DORMANT SEASON PLANTING, NINETY (90) DAYS FROM DATE OF REEMERGENCE OF LAWN GRASS IN NEXT GROWING SEASON.

1.11 MAINTENANCE SERVICE

A. MAINTAIN INSTALLED SOD UNTIL FINAL ACCEPTANCE. MAINTENANCE SHALL INCLUDE WATERING, FERTILIZING AND WEED TREATMENT AS NECESSARY TO KEEP SOD HEALTHY.

PART 2 PRODUCTS

2.1 MATERIALS

A. SOD: NURSERY GROWN, ASPA APPROVED, WITH STRONG FIBROUS ROOT SYSTEM CAPABLE OF GROWTH, AND DEVELOPMENT WHEN PLANTED; FREE OF STONES, BURNED OR BARE SPOTS; CONTAINING NO MORE THAN TEN (10) WEEDS PER ONE HUNDRED (100) SQUARE FEET. SEE LANDSCAPE PLAN FOR SOD TYPE.
B. TOPSOIL: IF REQUIRED, TOPSOIL SHALL BE SANDY LOAM FREE OF WEEDS AND OTHER DELETERIOUS MATERIALS.
C. FERTILIZER: AS RECOMMENDED BY SOILS TEST OR OTHERWISE CALLED OUT ON DRAWINGS.
D. WATER: CLEAN, FRESH AND FREE OF SUBSTANCES OR MATTER WHICH COULD INHIBIT VIGOROUS GROWTH OF GRASS.

2.2 HARVESTING SOD

A. MACHINE CUT SOD AND LOAD ON PALLETS IN ACCORDANCE WITH ASPA GUIDELINES.
B. CUT SOD WITH MINIMUM OF ONE HALF (1/2) INCH AND MAXIMUM ONE (1) INCH TOPSOIL BASE.

PART 3 EXECUTION

3.1 INSPECTION

A. VERIFY THAT PREPARED SOIL BASE IS READY TO RECEIVE WORK OF THIS SECTION.
B. BY BEGINNING INSTALLATION, CONTRACTOR ACCEPTS EXISTING SITE CONDITIONS.

3.2 PREPARATION

A. SCARIFY SUBSOIL WHERE TOPSOIL IS REQUIRED. REPEAT CULTIVATION IN AREAS WHERE EQUIPMENT USED FOR HAULING AND SPREADING TOPSOIL HAS COMPACTED SUBSOIL.
B. PLACE TOPSOIL DURING DRY WEATHER AND ON DRY UNFROZEN SUBGRADE.
C. REMOVE VEGETABLE MATTER AND FOREIGN NON-ORGANIC MATERIAL PRIOR TO SODDING.
D. GRADE TO ELIMINATE ROUGH, LOW OR SOFT AREAS, AND TO ENSURE POSITIVE DRAINAGE.
E. LAWN AREAS ARE TO BE GRADED TO SMOOTH EVEN SURFACE FREE OF BUMPS AND DEPRESSIONS, WITH LOOSE UNIFORMLY FINE TEXTURE AND ONE (1) INCH BELOW ADJOINING SIDEWALKS AND OTHER PAVED SURFACES.
F. SCARIFY PLANTING SURFACE TO A FRIABLE CONDITION: REMOVE STONES AND FOREIGN MATTER OVER ONE (1) INCH IN DIAMETER FROM TOP TWO (2) INCHES OF SOD BED. PLANT IMMEDIATELY THEREAFTER, PROVIDING THE SOD BED HAS REMAINED IN A FRIABLE CONDITION AND HAS NOT BECOME MUDDY OR HARD. IF IT HAS BECOME HARD, TILL TO A FRIABLE CONDITION AGAIN.

3.3 FERTILIZING

A. APPLY FERTILIZER IN ACCORDANCE WITH SOILS TEST OR AS INDICATED ON PLANS DEPENDING UPON TIME OF INSTALLATION.
B. APPLY AFTER SMOOTH RAKING OF TOPSOIL AND PRIOR TO INSTALLATION OF SOD. APPLY FERTILIZER NO MORE THAN FORTY-EIGHT (48) HOURS BEFORE LAYING SOD.
C. MIX THOROUGHLY INTO UPPER ONE (1) INCH OF TOPSOIL.
D. LIGHTLY WATER BEFORE INSTALLATION TO AID DISSIPATION OF FERTILIZER.

3.4 LAYING SOD

A. MOISTEN PREPARED SURFACE IMMEDIATELY PRIOR TO LAYING SOD. LAY SOD WITHIN TWENTY-FOUR (24)HOURS AFTER HARVESTING TO PREVENT DETERIORATION.
B. LAY SOD TIGHT WITH NO OPEN JOINTS VISIBLE AND WITHOUT OVERLAPPING; STAGGER END JOINTS TWELVE (12) INCHES MINIMUM. DO NOT STRETCH OR OVERLAP SOD PIECES.
C. LAY SMOOTH. PLACE TOP ELEVATION OF SOD LEVEL WITH ADJOINING LAWN AREAS, EDGING, PAVING OR CURBS.
D. ON SLOPES 4:1 AND STEEPER, LAY SOD PERPENDICULAR TO SLOPE AND SECURE EVERY ROW WITH 5" METAL LAWN STAKES AT A MAXIMUM OF EIGHTEEN (18) INCHES ON CENTER. DRIVE STAKES FLUSH WITH SOIL PORTION OF SOD.
E. AFTER SODDING, ROLL WITH COMMERCIAL LAWN ROLLER TO ENSURE GOOD BOND BETWEEN SOD AND SOIL AND TO REMOVE MINOR DEPRESSIONS AND IRREGULARITIES.
F. WATER SODDED AREAS IMMEDIATELY AFTER INSTALLATION AND ROLLING. SATURATE SOIL TO A DEPTH OF FOUR (4").
G. FINISHED SODDING SHALL BE SMOOTH AND FREE OF SIGNIFICANT LUMPS OR DEPRESSIONS.

3.5 CLEAN-UP AND PROTECTION

A. DURING THE PROGRESSION OF WORK, THE PREMISES ARE TO BE KEPT NEAT AND ORDERLY AT ALL TIMES. STORAGE AREAS FOR MATERIALS SHALL ALSO BE ORGANIZED SUCH THAT THEY ARE NEAT AND ORDERLY. TRASH, INCLUDING DEBRIS RESULTING FROM REMOVING WEEDS, ETC. SHALL BE REMOVED FROM SITE DAILY AS WORK PROGRESSES.
B. WALKS AND DRIVES SHALL BE KEPT CLEAN BY SWEEPING OR HOSING.
C. ERECT WARNING SIGNS, TAPE AND BARRIERS AS NECESSARY TO PROTECT SOD AGAINST DAMAGE.

3.6 MAINTENANCE

A. WATER TO PREVENT GRASS AND SOIL FROM DRYING OUT.
B. CONTROL GROWTH OF WEEDS. APPLY HERBICIDES IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. REMEDY DAMAGE RESULTING FROM IMPROPER USE OF HERBICIDES.
C. IMMEDIATELY REPLACE SOD IN AREAS WHICH SHOW DETERIORATION OR BARE SPOTS TO ESTABLISH A SMOOTH ACCEPTABLE LAWN, FREE OF ERODED OR BARE AREAS.
D. REPAIR OR REPLANT AREAS THAT HAVE BEEN DAMAGED OR TRAMPLED.
E. MOW TURF WHEN GRASS REACHES A HEIGHT OF 3". MOWING HEIGHT TO BE 2 1/2" UNTIL ACCEPTANCE.

SECTION 1100 - TREES, PLANTS,AND GROUND COVERS

PART 1 GENERAL

1.1 DESCRIPTION

A. PERFORM WORK REQUIRED TO COMPLETE LANDSCAPE INSTALLATION INCLUDING LABOR, MATERIALS, TAXES, INSURANCE, OVERHEAD, PROFIT, SERVICES, AND EQUIPMENT NECESSARY AS DESCRIBED HEREIN AND SHOWN ON DRAWINGS.
B. WORK TO INCLUDE:
  a. TREES, SHRUBS, VINES AND GROUND COVERS.
  b. TOPSOIL BACKFILL.
  c. MAINTENANCE SERVICE.
C. RELATED WORK IN OTHER SECTIONS:
  d. SECTION 02810: IRRIGATION SYSTEM.
  e. SECTION 02930: LAWNS AND GRASSES.

1.2 DEFINITIONS AND ABBREVIATIONS

A. THE FOLLOWING TERMS WILL APPLY TO THESE SPECIFICATIONS:
  a. "B&B" INDICATES BALLED AND BURLAP WRAPPED ROOT SYSTEM.
  b. "1 GAL." INDICATES STANDARD ONE GALLON NURSERY CONTAINER.
  c. "2 GAL." INDICATES STANDARD TWO GALLON NURSERY CONTAINER.
  d. "3 GAL." INDICATES STANDARD THREE GALLON NURSERY CONTAINER.
  e. "5 GAL." INDICATES STANDARD FIVE GALLON NURSERY CONTAINER.
  f. "7 GAL." INDICATES STANDARD SEVEN GALLON NURSERY CONTAINER.
  g. "M.T." OR "MULTI-TRUNK" INDICATES A TREE WITH A SPECIFIED NUMBER OF TRUNKS AS CALLED OUT ON PLANT LIST. ALSO SEE PART 2 PRODUCTS, 2.1, A3, FOR MORE INFORMATION.
  h. "CAL." REFERS TO CALIPER OF TRUNK AT SIX (6) INCHES ABOVE GROUND LEVEL FOR TRUNKS OF FOUR (4) INCHES IN CALIPER SIZE OR LESS, AND TWELVE (12) INCHES ABOVE GROUND LEVEL FOR TRUNKS OF MORE THAN FOUR (4) INCHES IN CALIPER.
  i. "O.C." MEANS "ON CENTER" AND REFERS TO SPACING USED BETWEEN CENTER OF ONE PLANT AND CENTER OF ANOTHER.

1.3 QUALITY ASSURANCE

A. PLANT NAMES INDICATED COMPLY WITH LATEST ADDITION OF AMERICAN STANDARD FOR NURSERY STOCK PUBLISHED BY AMERICAN ASSOCIATION OF NURSERYMEN AND LATEST EDITION OF STANDARDIZED PLANT NAMES PREPARED BY AMERICAN JOINT COMMITTEE ON HORTICULTURAL NOMENCLATURE. NAMES OF VARIETIES NOT LISTED IN THESE PUBLICATIONS CONFORM GENERALLY WITH NAMES ACCEPTED BY NURSERY TRADE. PROVIDE STOCK TRUE TO BOTANICAL NAME AND LEGIBLY TAGGED.
B. COMPLY WITH SIZING AND GRADING STANDARDS OF LATEST EDITION OF AMERICAN STANDARD FOR NURSERY STOCK. PLANTS WITH IRREGULAR GROWTH, WEAKNESS IN STRUCTURE OF MATERIAL, INFESTATIONS OR IRREGULAR COLORATION WHEN PLANTED WILL NOT BE ACCEPTED.
C. PLANTS SHALL BE GROWN UNDER SUPERVISION OF STANDARDIZED NURSERY CONDITIONS AND IN CLIMATIC CONDITIONS SIMILAR TO THOSE OF PROJECT SITE.
D. STOCK FURNISHED SHALL BE AT LEAST THE MINIMUM SIZE INDICATED. USE OF STOCK LARGER THAN SPECIFIED IS ACCEPTABLE AT NO ADDITIONAL COST TO OWNER. IF THE USE OF THE LARGER STOCK IS APPROVED, SPREAD OF ROOTS OR ROOT BALL OF EARTH SHALL BE INCREASED IN PROPORTION TO THE SIZE OF PLANTS. ROOTS SHOULD BE DISTRIBUTED THROUGHOUT THE ENTIRE CONTAINER SUCH THAT ROOTS ARE VISIBLE AND EXTEND ON ALL SIDES TO THE INSIDE FACE OF CONTAINER. ROOT STRUCTURE SHALL PROVIDE EVIDENCE THAT PLANT HAS BEEN GROWN IN CONTAINER SIZE SPECIFIED.
E. PLANTS AND OTHER PRODUCTS AND MATERIALS TO BE SUPPLIED BY CONTRACTOR SHALL BE SUBJECT TO APPROVAL BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
F. MATERIAL MAY BE INSPECTED AND APPROVED AT PLACE OF GROWTH FOR COMPLIANCE WITH SPECIFICATION REQUIREMENTS FOR QUALITY, SIZE, AND VARIETY. SUCH APPROVAL SHALL NOT ALTER THE RIGHT OF INSPECTION AND REJECTION UPON DELIVERY AT SITE OR DURING THE PROGRESS OF WORK.
G. PROVIDE AND PAY FOR MATERIAL TESTING.
  a. THE FOLLOWING DATA MAY BE REQUESTED:
    1. SOIL ANALYSIS TO DETERMINE IF ADDITIONAL NUTRIENTS ARE NEEDED.
    2. TOPSOIL.
    3. PH FACTOR.
    4. MECHANICAL ANALYSIS.
    5. PERCENTAGE OF ORGANIC CONTENT.
    6. TYPE AND QUANTITY OF ADDITIVES REQUIRED TO ESTABLISH SATISFACTORY PH FACTOR AND SUPPLY OF NUTRIENTS.

1.4 SUBMITTALS

A. THE FOLLOWING MATERIAL SAMPLES WILL BE REQUIRED BY OWNER FOR APPROVAL PRIOR TO INSTALLATION:
  a. SANDY LOAM TOPSOIL.
  b. MULCH.
  c. RIVER ROCK.
  d. WEED BARRIER.
B. CONTRACTOR SHALL SUPPLY UNIT PRICES FOR PRODUCTS AND LABOR. IN THE EVENT THAT A GREATER OR LESSER AMOUNT OF WORK IS COMPLETED, UNIT PRICES SHALL APPLY. UNIT PRICES COVER COST OF WORK AND MATERIALS IN PLACE, INCLUDING MATERIALS, EQUIPMENT, LABOR, TAXES, OVERHEAD, PROFIT, MAINTENANCE AND GUARANTEE REQUIRED TO RENDER WORK COMPLETE.

1.5 DELIVERY, STORAGE AND HANDLING

A. CONTRACTOR SHALL COORDINATE DELIVERY AND INSTALLATION ACTIVITIES WITH GENERAL CONTRACTOR AND SHALL INFORM GENERAL CONTRACTOR AT LEAST 24 HOURS PRIOR TO COMMENCEMENT OF WORK AT PROJECT PREMISES.
B. DELIVER FERTILIZER MATERIALS IN ORIGINAL, UNOPENED AND UNDAMAGED CONTAINERS SHOWING WEIGHT, ANALYSIS AND NAME OF MANUFACTURER. STORE IN MANNER TO PREVENT WETTING AND DETERIORATION.
C. TAKE PRECAUTIONS CUSTOMARY IN GOOD TRADE PRACTICE IN PREPARING PLANTS FOR MOVING. DIG, PACK, WRAP, TRANSPORT AND HANDLE PLANTS WITH CARE TO ENSURE PROTECTION AGAINST INJURY. PROTECT PLANTS FROM DRYING OUT. IF PLANTS CANNOT BE PLANTED IMMEDIATELY UPON DELIVERY, PROPERLY PROTECT THEM WITH TARPS, OR IN A MANNER ACCEPTABLE TO ARCHITECT. NO PLANT SHALL BE BOUND WITH ROPE OR WIRE IN A MANNER THAT COULD DAMAGE OR BREAK BRANCHES.
D. COVER PLANTS TRANSPORTED IN OPEN VEHICLES WITH A PROTECTIVE COVERING TO PREVENT WIND BURN.
E. PROVIDE DRY, LOOSE TOPSOIL FOR PLANTING BED MIXES. MUDDY TOPSOIL IS NOT ACCEPTABLE.

1.6 GUARANTEE

A. PLANTS PROVIDED AND PLANTED BY CONTRACTOR SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE. WARRANTY PERIOD SHALL TERMINATE ONLY IF PLANTS HAVE BEEN IN FULL LEAF FOR A MINIMUM OF THREE (3) WEEKS. IN THE EVENT THE WARRANTY PERIOD OF ONE YEAR WOULD EXPIRE PRIOR TO AFOREMENTIONED REQUIREMENT, PERIOD SHALL BE EXTENDED TO COMPLY. PLANTS, INCLUDING TREES, WHICH HAVE PARTIALLY DIED SO THAT SHAPE, SIZE, OR SYMMETRY HAS BEEN DAMAGED, SHALL BE CONSIDERED SUBJECT TO REPLACEMENT. IN SUCH CASES, THE OPINION OF ARCHITECT SHALL BE FINAL.
B. PLANTS USED FOR REPLACEMENT SHALL BE OF SAME VARIETY AS THOSE ORIGINALLY SPECIFIED AND PLANTED IN SAME CONDITION. REPLACEMENT PLANTS WILL BE AT LEAST SAME OVERALL SIZE OF ADJACENT PLANTS AT TIME OF REPLACEMENT. WORK, INCLUDING MATERIALS, LABOR AND EQUIPMENT USED IN REPLACEMENTS, SHALL BE AT NO COST TO OWNER. DAMAGE, INCLUDING RUTS IN LAWN OR BED AREAS, INCURRED IN MAKING REPLACEMENTS SHALL BE IMMEDIATELY REPAIRED BY CONTRACTOR.
C. CONTRACTOR SHALL CHECK PLANT MATERIALS AND CONDITIONS ONCE PER MONTH FOR FIRST SIX MONTHS AND FOLLOW UP WITH A REPORT TO ARCHITECT. REPORT SHALL PROVIDE, IN DETAIL, DEFICIENCIES, PROBLEMS OR ACCOMPLISHMENTS REGARDING WORK COMPLETED BY CONTRACTOR.

1.7 MAINTENANCE

A. DURING PLANTING OPERATIONS, THE CONTRACTOR SHALL PERFORM MAINTENANCE REQUIRED OF INSTALLED PLANTINGS. MAINTENANCE TO CONTINUE UNTIL COMPLETION AND FINAL ACCEPTANCE, AT WHICH TIME THE OWNER SHALL ASSUME RESPONSIBILITY.

1.8 WATERING

A. WATER WILL BE AVAILABLE ON SITE AT NO EXPENSE TO CONTRACTOR. HOSE AND OTHER WATERING EQUIPMENT REQUIRED FOR WORK SHALL BE FURNISHED BY CONTRACTOR INSTALLING PLANT MATERIALS.

1.9 CLEAN-UP

A. DURING WORK PROGRESSION, THE PREMISES ARE TO BE KEPT NEAT AND ORDERLY AT ALL TIMES. STORAGE AREAS FOR PLANTS AND OTHER MATERIALS SHALL ALSO BE ORGANIZED SUCH THAT THEY, ARE NEAT AND ORDERLY. TRASH, INCLUDING DEBRIS RESULTING FROM REMOVING WEEDS OR ROCK FROM PLANTING AREAS, PREPARING BEDS, OR PLANTING PLANTS SHALL BE REMOVED FROM SITE DAILY AS WORK PROGRESSES.
B. WALKS AND DRIVES SHALL BE KEPT CLEAN BY SWEEPING AND/OR HOSING.

1.10 COMPLETION OF WORK

A. WORK SHALL BE CONSIDERED COMPLETE AND ELIGIBLE FOR ACCEPTANCE ONLY AFTER FULFILLMENT OF THE FOLLOWING REQUIREMENTS AND ANY APPLICABLE REQUIREMENTS AS STATED ELSEWHERE IN SPECIFICATIONS.
B. MATERIALS SHALL BE INSTALLED ACCORDING TO SPECIFICATIONS.

PART 2 PRODUCTS

2.1 PLANT MATERIAL

A. PROVIDE PLANTS TYPICAL OF THEIR SPECIES OR VARIETY WITH NORMAL, DENSELY DEVELOPED BRANCHES AND VIGOROUS FIBROUS ROOT SYSTEMS COMPLYING WITH THE REQUIREMENTS OF "AMERICAN STANDARD FOR NURSERY STOCK", ANSI Z60.1 CURRENT EDITION BY THE AMERICAN ASSOCIATION OF NURSERYMEN. PROVIDE ONLY SOUND, HEALTHY, VIGOROUS PLANTS FREE FROM DEFECTS, DISFIGURING KNOTS, SUN SCALD INJURIES, FROST CRACKS, ABRASIONS OF BARK, PLANT DISEASES, INSECT EGGS, BORERS, AND OTHER FORMS OF INFESTATION. PLANTS SHALL HAVE A FULLY DEVELOPED FORM WITHOUT VOIDS AND OPEN SPACES. PLANTS HELD IN STORAGE WILL BE REJECTED IF THEY DO NOT SHOW SIGNS OF GROWTH DURING STORAGE.
  a. BALLED AND BURLAPPED PLANTS SHALL HAVE FIRM, NATURAL BALLS OF EARTH OF SUFFICIENT DIAMETER AND DEPTH TO ENCOMPASS FIBROUS AND FEEDING ROOT SYSTEM NECESSARY FOR FULL RECOVERY OF PLANT. PROVIDE BALL SIZES COMPLYING WITH LATEST EDITION OF AMERICAN STANDARD FOR NURSERY STOCK.
  b. IF THERE IS NO SPECIFICATION LISTED, THE FOLLOWING GUIDE SHALL BE USED: TREE ROOT BALLS SHALL BE A MINIMUM OF 12" IN DIAMETER FOR EACH 1" OF TRUNK DIAMETER AS MEASURED 6" ABOVE BALL.
  c. MULTI-TRUNK (M.T.) TREES SHALL BE CALIBRATED ACCORDING TO THE FOLLOWING: SMALLEST TRUNK CALIPER SHALL NOT BE LESS THAN ONE CALIPER SIZE SMALLER THAN LARGEST TRUNK WITH NUMBER OF TRUNKS SPECIFIED (REFER TO AMERICAN STANDARD FOR NURSERY STOCK).
  d. CONTAINER-GROWN STOCK SHOULD BE GROWN IN A CONTAINER FOR A SUFFICIENT LENGTH OF TIME FOR ROOT SYSTEM TO HAVE DEVELOPED TO HOLD ITS SOIL TOGETHER.
  e. PLANTS PLANTED IN ROWS SHALL BE MATCHED IN FORM.
  f. PLANTS LARGER THAN THOSE SPECIFIED IN PLANT LIST MAY BE USED AT NO ADDITIONAL COST TO THE OWNER.
B. NO PLANTS SHALL BE LOOSE IN CONTAINER.
C. CONTAINER STOCK SHALL NOT BE POT BOUND.

2.2 SOIL PREPARATION MATERIALS (SOIL AMENDMENTS SHALL BE APPLIED PER SOILS ANALYSIS)

A. SANDY LOAM TOPSOIL TO BE USED SHALL HAVE THE FOLLOWING CHARACTERISTICS: FERTILE, FRIABLE, NATURAL TOPSOIL OF LOAMY CHARACTER, WITHOUT ADMIXTURE OF SUBSOIL MATERIAL, OBTAINED FROM A WELL-DRAINED ARABLE SITE, REASONABLY FREE FROM CLAY, LUMPS, COARSE SANDS, STONES, PLANTS, GRASS, WEEDS, ROOTS, STICKS, AND OTHER FOREIGN MATERIALS.
  a. PROVIDE TOPSOIL FREE OF SUBSTANCES HARMFUL TO PLANTS WHICH WILL BE GROWN IN SOIL.
  b. IDENTIFY SOURCE AND LOCATION OF TOPSOIL PROPOSED FOR USE ON PROJECT.
  c. REUSE EXISTING STOCKPILED TOPSOIL IF IT MEETS SPECIFICATION STANDARDS.
B. ORGANIC SOIL AMENDMENTS:
  a. STERILIZED MANURE.
  b. PEAT MOSS
  c. PINE BARK MULCH
C. TREE AND SHRUB PLANTING FERTILIZER:
  a. SLOW RELEASE (THREE TO FOUR MONTH) GRANULAR FERTILIZER WITH A NPK ANALYSIS OF 17-6-12 PLUS MINUS AS MANUFACTURED BY SIERRA, OR APPROVED EQUAL.
  b. GYPSUM.
D. HERBICIDES:
  a. ROUNDUP, AS MANUFACTURED BY MONSANTO, OR APPROVED EQUAL.
  b. TREFLAN 5G, AS MANUFACTURED BY ELANCO PRODUCTS IN INDIANAPOLIS, INDIANA, OR APPROVED EQUAL.

2.3 STAKING, GUYING & WRAPPING

A. STAKING MATERIAL SHALL CONSIST OF 2" X 2" X 6" HARDWOOD STAKES.
B. GUYING MATERIAL SHALL CONSIST OF WIRE AND BLACK POLY HOSE.
C. TREE WRAP TWINE SHALL BE JUTE TWINE OR APPROVED EQUAL.
D. WRAPPING MATERIAL SHALL CONSIST OF WATERPROOF, CRINKLED DUPLEX HEAVY PAPER MANUFACTURED FOR TREE WRAPPING PURPOSES.

2.4 MULCH

A. DESIGNATED AREAS SHALL RECEIVE 3" ORGANIC MULCH. ORGANIC MULCH SHALL BE CLEAN, FRESH, PEST FREE AND FREE OF BRANCHES, AND FOREIGN MATTER. SEE LANDSCAPE PLAN FOR MULCH TYPE.

2.5 WEED BARRIER

A. WEED BARRIER SHALL BE DEWITT PRO 5.

2.6 EDGING

A. EDGING SHALL BE AS SPECIFIED ON PLANS.

PART 3 EXECUTION

3.1 EXISTING CONDITIONS

A. EXAMINE PROPOSED PLANTING AREAS AND CONDITIONS OF INSTALLATION PRIOR TO CONSTRUCTION. DO NOT START PLANTING WORK UNTIL UNSATISFACTORY CONDITIONS ARE CORRECTED.
B. VERIFY LOCATION OF UTILITIES PRIOR TO LANDSCAPE OPERATIONS. CALL UTILITY COMPANIES PRIOR TO BEGINNING LANDSCAPE OPERATIONS.
C. GENERAL CONTRACTOR IS RESPONSIBLE FOR BRINGING LANDSCAPE AREAS TO FINISH GRADE ± ONE INCH. LANDSCAPE CONTRACTOR SHALL PROVIDE A UNIFORM SURFACE FREE FROM IRREGULAR SURFACE CHANGES. RAKE SURFACES CLEAN OF STONES 1 1/2" OR LARGER IN DIMENSION AND OTHER DEBRIS.

3.2 EXCAVATION (SOIL AMENDMENTS SHALL BE APPLIED PER SOILS ANALYSIS)

A. CONTRACTOR SHALL ADHERE TO THE FOLLOWING DURING EXCAVATION:
  a. PROTECT EXISTING BUILDING, UTILITIES, WALKS, PLANTERS, PLANTS AND OTHER FACILITIES FROM DAMAGE CAUSED BY LANDSCAPING OPERATIONS.
  b. BACKFILL GROUND COVER, SHRUB, AND TREE PLANTING AREAS WITH APPROVED PLANTING MIXTURE.
B. CONTRACTOR SHALL BE FAMILIAR WITH LOCATION AND ALIGNMENT OF EXISTING OR NEW UTILITY LINES, DUCTS, AND BURIED CABLES. CONTRACTOR SHALL FIELD CHECK LOCATION OF UTILITIES BEFORE INSTALLATION OF MATERIALS OR PLANTS. CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE RESULTING FROM NEGLECT OR FAILURE TO COMPLY WITH THIS REQUIREMENT.

3.3 PREPARATION

A. PLANTING SHALL BE PERFORMED ONLY BY EXPERIENCED WORKMEN FAMILIAR WITH PLANTING PROCEDURES UNDER SUPERVISION OF A QUALIFIED SUPERVISOR.
B. PLANTING TIMES AND PROCEDURES SHALL BE ACCORDING TO ACCEPTED PRACTICES. PLANTING SHALL BE SUSPENDED WHEN TEMPERATURE IS BELOW 28 DEGREES °F., THE WIND VELOCITY OVER 30 MILES PER HOUR, NATURAL GROUND IS FROZEN OR TOO WET, OR CONTINUATION OF PREVAILING WEATHER WOULD CAUSE UNSATISFACTORY RESULTS.
C. GRADE PLANTING AREAS TO PREVENT WATER FROM STANDING IN PLANTING BEDS. PROVIDE TOPSOIL TO PROVIDE POSITIVE DRAINAGE AWAY FROM BUILDING AND OUT OF PLANTING BEDS.

3.4 INSTALLATION

A. IF WEEDS OR GRASS ARE APPARENT IN PLANTING AREAS, SPRAY AREA WITH ROUNDUP AT RATE OF 3 OZ. PER 100 SQUARE FEET. AIR TEMPERATURE SHALL BE ABOVE 50 DEGREES °F. WITH NO RAIN IN FORECAST. REPEAT PROCEDURE EVERY 14 DAYS UNTIL FOREIGN GRASS HAS BEEN ELIMINATED. DO NOT INSTALL PLANT MATERIALS UNTIL GRASS AND WEEDS HAVE BEEN ELIMINATED FROM PLANTING BEDS.
B. IF WEEDS AND GRASS ARE DORMANT, EXCAVATE TOP 3 INCHES OF EXISTING SOIL AND REMOVE FROM SITE. BACKFILL WITH SUITABLE TOPSOIL.
C. ADD PROPER PLANTING MIXTURE TO PLANTING BEDS ACCORDING TO PLANS. ROTOTILL PLANTING BEDS TO A DEPTH OF EIGHT (8) INCHES. DO NOT WORK BEDS WHEN IN FROZEN OR MUDDY CONDITIONS.
D. EXCAVATE FOR PLANT MATERIALS. TREE PITS SHALL BE 12" GREATER IN DIAMETER AT SAME DEPTH AS ROOT BALL. SHRUB PITS SHALL BE 6" GREATER IN DIAMETER AND AT SAME DEPTH AS ROOT BALL. TOPSOIL FROM EXCAVATION MAY BE RETAINED FOR BACKFILL. REMOVE EXCAVATED CLAY, SUBSOIL, ROCK AND DEBRIS FROM SITE.
E. PLANT SHRUBS NO CLOSER THAN 18" FROM BACK OF CURB IN PARKING ISLANDS AS INDICATED ON DRAWINGS.
F. ADD PROPER SOIL AMENDMENTS TO BACKFILL USED FOR TREES ACCORDING TO PLANS.
G. SET PLANT MATERIAL IN PLANTING PIT TO PROPER GRADE AND ALIGNMENT. SET PLANTS UPRIGHT, PLUMB, AND FACED TO GIVE BEST APPEARANCE OR RELATIONSHIP TO EACH OTHER OR ADJACENT STRUCTURE. NO FILLING WILL BE PERMITTED AROUND TRUNKS OR STEMS. BACKFILL PIT WITH PLANTING MIXTURE. DO NOT USE WET, MUDDY MIXTURES FOR BACKFILLING.
H. CROWN PARKING ISLANDS SIX INCHES ABOVE TOP OF CURB UNLESS OTHERWISE INDICATED ON PLANS.
I. AFTER BALLED AND BURLAPPED PLANTS ARE SET, MIX PLANTING SOIL AROUND BASES OF THE ROOT BALLS AND FILL VOIDS.
J. SET TREES 3" ABOVE SURROUNDING GRADE, TO ALLOW FOR SETTLEMENT. CUT TWINE FROM AROUND TRUNK AND PULL BACK BURLAP FROM THE TOP 1/3 OF THE ROOT BALL. FORM WATERING RING FOR TREES. SET SHRUBS 2" ABOVE FINISHED GRADE. SET GROUND COVER AT 1" ABOVE FINISHED GRADE.
K. FERTILIZE PLANTINGS WITH SIERRA 17-6-12 PLUS MINORS AT A RATE OF FIVE POUNDS PER 100 SQUARE FEET PRIOR TO MULCHING. MIX FERTILIZER INTO THE SOIL TO A DEPTH OF TWO (2) INCHES. WASH FERTILIZER OFF FOLIAGE AND AWAY FROM TRUNKS OR STEMS.
L. SHRUBS AND GROUND COVER SHALL BE SPACED USING A TRIANGULAR PATTERN, UNLESS OTHERWISE SHOWN ON DRAWINGS, AND SPACED IN ACCORDANCE WITH INDICATED DIMENSIONS. ADJUST SPACING AS NECESSARY TO EVENLY FILL PLANTING BED WITH INDICATED NUMBER OF PLANTS.
M. WHEN PLANTING GROUND COVERS FROM FOUR INCH POTS OR SMALLER, FERTILIZING AND MULCHING MAY BE DONE PRIOR TO PLANT INSTALLATION. ROOT SYSTEM SHALL BE FULLY IMBEDDED IN PREPARED PLANTING SOIL AND PLANT SHALL NOT BE COVERED BY MULCH.
N. ROOT BARRIERS TO BE INSTALLED PER APPROVED LANDSCAPE PLANS.

3.5 MULCH

A. MULCH GROUND COVER, SHRUB BEDS AND TREE WELLS WITH THE REQUIRED MULCHING MATERIAL TO A TWO INCH MINIMUM DEPTH IMMEDIATELY AFTER PLANTING. THOROUGHLY WATER MULCHED AREAS. AFTER WATERING, RAKE MULCH TO PROVIDE A UNIFORM FINISH SURFACE.
B. APPLY SPECIFIED BARRIER ACCORDING TO PLAN AND PRIOR TO PLACING MULCH. WEED BARRIER SHALL NOT BE USED IN SEASONAL PLANTING AREAS IF FLOWERING ANNUALS ARE SPECIFIED ON LANDSCAPE PLAN.

3.6 STAKING, GUYING AND WRAPPING

A. SHADE AND EVERGREEN TREES SHALL BE STAKED SAME DAY THEY ARE PLANTED.
B. DRIVE STAKES VERTICALLY INTO THE GROUND TO A DEPTH OF 2 1/2 TO 3 FEET. AVOID DAMAGING ROOT BALL.
C. HOSE SHALL BE PLACED AROUND WIRE AT THE TRUNK TO PREVENT DAMAGE TO PLANT.
D. WRAP TRUNKS OF DECIDUOUS TREES WITH SPECIFIED MATERIAL BEGINNING AT BASE AND EXTENDING TO FIRST BRANCHES. TIE WRAP SECURELY AT TOP AND BOTTOM. DO NOT USE STAPLES TO SECURE TREE WRAP.

3.7 PRUNING

A. PRUNING SHALL BE LIMITED TO MINIMUM NECESSARY TO REMOVE INJURED TWIGS AND BRANCHES, AND COMPENSATE FOR LOSS OF ROOTS DURING TRANSPLANTING, BUT SHALL NOT EXCEED ONE-FIFTH (1/5) OF BRANCHING STRUCTURE. PRUNING SHALL BE DONE ONLY AFTER PLANTS HAVE BEEN TRANSPLANTED AT SITE. SHEARING OF HEDGES WHERE INDICATED SHALL BE DONE BY CONTRACTOR, BUT ONLY AFTER THE PLANTS HAVE BEEN WELL SETTLED BY SEVERAL WATERINGS.
B. PRUNE EVERGREEN TREES ONLY TO REMOVE BROKEN OR DAMAGED BRANCHES.

3.8 MAINTENANCE

A. MAINTAIN PLANTINGS UNTIL SUBSTANTIAL COMPLETION AND ACCEPTANCE OF PROJECT.
B. MAINTENANCE SHALL INCLUDE PRUNING, WATERING, AND APPLICATION OF APPROPRIATE INSECTICIDES AND FUNGICIDES NECESSARY TO MAINTAIN PLANTS FREE OF INSECTS AND DISEASE. PROVIDE MAINTENANCE AS REQUIRED UNTIL FINAL ACCEPTANCE:
  c. RESET SETTLED PLANTS TO PROPER GRADE AND POSITION. RESTORE PLANTING SAUCER AND REMOVE DEAD MATERIAL.
  d. TIGHTEN AND REPAIR GUY WIRES AND STAKES AS REQUIRED.
  e. CORRECT DEFECTIVE WORK AS SOON AS POSSIBLE AFTER DEFICIENCIES BECOME APPARENT AND WEATHER PERMITS.
  f. WATER TREES, PLANTS, AND GROUND COVER BEDS WITHIN THE FIRST 24 HOURS OF INITIAL PLANTING, AND NOT LESS THAN TWICE PER WEEK UNTIL FINAL ACCEPTANCE. WATER THOROUGHLY WITH SPRINKLER HEAD, IF OPERATIONAL, OR USE SOAKER HOSE AT A LOW FLOW RATE OVER ENTIRE DRIP LINE AREA AS REQUIRED TO ALLOW WATER TO PENETRATE TO A DEPTH OF 12"-18".
  g. REMOVE WEEDS AND GRASS IN PLANTING AREAS AT LEAST ONCE A WEEK. A CONTACT HERBICIDE MAY BE USED PROVIDED LAWN AND PLANTS ARE NOT DAMAGED.
  h. RE-APPLY MULCH AS NECESSARY TO MAINTAIN A TWO (2") INCH THICKNESS IN TREE, SHRUB AND GROUND COVER BEDS.

ARC

andec

18215 72ND AVEN
KENT, WA 98032
(425)251-6222
(425)251-8782 F

CIVIL ENGINEERING, LA
SURVEYING, ENVIRONME

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SITE ADDRESS:
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PRELIMINARY LANDSCAPE and IRRIGATION PLAN
FOR
ARCO AM/PM

PTN OF SEC. 22,
TWP. 3 S., RGE 3 WEST, S.B.M
RIVERSIDE COUNTY STATE OF CALIFORNIA

1"=20'
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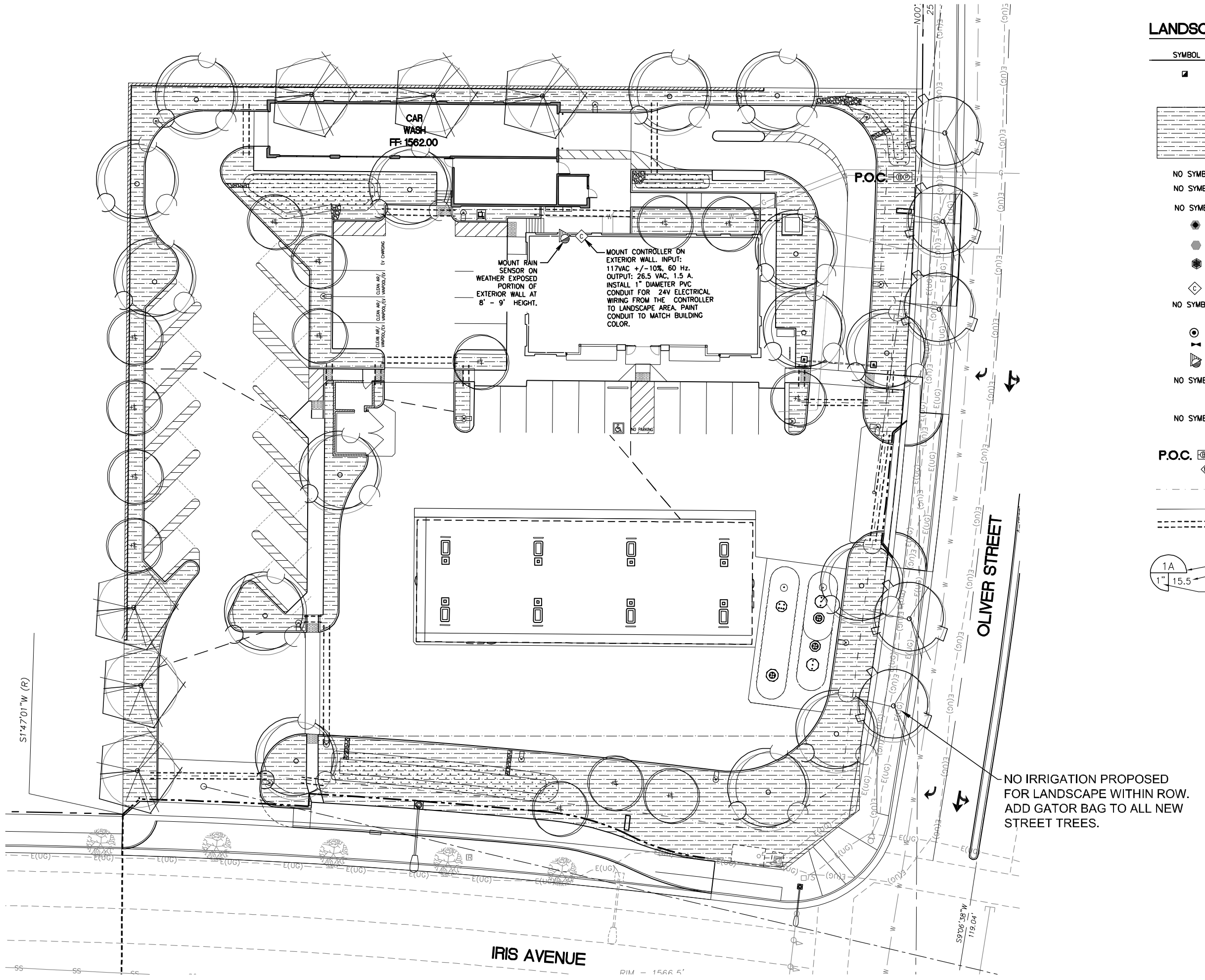


MOUNT RAIN SENSOR ON WEATHER EXPOSED PORTION OF EXTERIOR WALL AT 8' - 9' HEIGHT.

MOUNT CONTROLLER ON EXTERIOR WALL. INPUT: 117VAC +/-10%, 60 Hz. OUTPUT: 26.5 VAC, 1.5 A. INSTALL 1" DIAMETER PVC CONDUIT FOR 24V ELECTRICAL WIRING FROM THE CONTROLLER TO LANDSCAPE AREA. PAINT CONDUIT TO MATCH BUILDING COLOR.

NO IRRIGATION PROPOSED FOR LANDSCAPE WITHIN ROW. ADD GATOR BAG TO ALL NEW STREET TREES.

LANDSCAPE IRRIGATION LEGEND

SYMBOL	DESCRIPTION	MIN. PSI	EMITTER SPACING	EMITTER GPH	MAXIMUM LINEAR FT.
◪	RAINBIRD RWS-B-C-1402 36" ROOT ZONE WATERING SYSTEM	20	AS SHOWN ON PLAN	.50	N/A
	NETAFIM LANDSCAPE TECHLINE DRIPLINE COMPONENTS: TO BE USED WITH NETAFIM LT-INSERT-17MM FITTINGS				
▤	TLCV26-1210 - SUB-SURFACE DRIP IRRIGATION FOR PLANTING AREAS WITH GROUNDCOVER, SHRUBS AND TREES ABOVE NOTED DRIPLINE IS DESIGNED WITH .26 GPH EMITTERS SPACED AT 12 INCHES APART AND A ROW SPACING OF 12 INCHES. THE APPLICATION RATE FOR THIS IS .42 INCHES OF WATER PER HOUR OF RUN TIME.	20	12"	.26	594 @ 45 PSI
NO SYMBOL	NETAFIM: 10-CV-01 DRIP SYSTEM OPERATION/PRESSURE INDICATOR STAKES, PROVIDE FOR EACH ZONE				
NO SYMBOL	NETAFIM: TLS6 SOIL STAPLES, AT 5 FEET ON CENTER				
NO SYMBOL	NETAFIM: TLSOV DRIPLINE FLUSH VALVE: 1 PER IRRIGATION ZONE. LOCATE AT LOWEST ELEVATION WITHIN EACH ZONE, INSTALL IN 10" VALVE BOX				
⬢	NETAFIM: LVCZ-150-HF CONTROL ZONE KIT: FLOW 11.0 - 35 GPM, IN VALVE BOX				
⬢	NETAFIM: LVCZS8010075-HF CONTROL ZONE KIT: FLOW 4.5 - 17.6 GPM, IN VALVE BOX				
⬢	NETAFIM: LVCZS8010075-LF CONTROL ZONE KIT: FLOW 0.25 - 4.4 GPM, IN VALVE BOX				
◇C	NETAFIM: NLCDP-100-C20-L-NO-N, MINIMUM 24-STATION CONTROLLER, (HARDWIRE CONNECTION); PROVIDE GROUND AND BATTERIES PER MFR. SPECS.;				
NO SYMBOL	COORDINATE WITH OWNER AND GENERAL CONTRACTOR FOR BEST LOCATION OF IRRIGATION CONTROLLER. IF LOCATION IS TO BE OUTSIDE, COORDINATE WHETHER THE CONTROLLER IS TO BE MOUNTED ON AN EXTERIOR BUILDING WALL OR MOUNTED ON A METAL PEDESTAL WITH CONC. FOOTING.				
⦿	RAINBIRD 33 DRC-RC: 3/4" QUICK COUPLING VALVE, IN VALVE BOX, PROVIDE THREE KEYS AND HOSE SWIVELS				
⋈	PLASTIC BALL VALVE, MATCH PIPE SIZE, IN VALVE BOX				
◒	RAINBIRD WR2-RC: (2) WIRELESS RAIN SENSOR COMBOS, MOUNT WHERE TREES OR BUILDINGS WILL NOT OBSTRUCT RAIN, WIND OR FROST FROM SENSOR.				
NO SYMBOL	RAINBIRD SMRT-Y SOIL MOISTURE SENSOR KIT: INSTALL WHERE TREES OR BUILDINGS WILL NOT OBSTRUCT RAIN, WIND OR FROST FROM SENSOR. MORE THAN ONE SENSOR MAY BE REQUIRED TO EFFECTIVELY DETERMINE SOIL MOISTURE FOR ENTIRE SITE. CONSULT NETAFIM REPRESENTATIVE FOR ADVISEMENT AS TO THE NUMBER OF SENSORS AND WHERE THE SENSORS NEED TO BE INSTALLED FOR MAXIMUM WATER SAVINGS.				
NO SYMBOL	NETAFIM: HYDROMETER - COMBINATION MASTER VALVE AND WATER METER / FLOW SENSOR; REFER TO SPECIFICATIONS AND LOCAL NETAFIM REPRESENTATIVE FOR CONFIRMATION OF BEST LOCATION FOR HYDROMETER LOCATION WITHIN POINT OF CONNECTION / MAINLINE.				
P.O.C. ⒷⓅ	SEE DETAIL SHEET L-4				
◇MV	NETAFIM 1" SERIES 80 NYLON NORMALLY CLOSED MASTER VALVE. LOCATE IN SUBTERRANEAN BOX				
— · — · —	MAINLINE - SCH 40 PVC (18" COVER); 1-1/2" SIZE MINIMUM				
———	LATERAL - CLASS 200 PVC (12" COVER); SIZE PER PLAN, 3/4" SIZE MINIMUM				
======	SLEEVE - CLASS 200 PVC; 24" MINIMUM COVER AT VEHICLE CROSSINGS; TWICE THE SIZE OF INSERT PIPE AND/OR WIRES, 6" SIZE MINIMUM, COORDINATE WITH GENERAL AND PAVING CONTRACTORS				

TYPICAL VALVE CALL-OUT

1A — VALVE STATION NUMBER
15.5 — VALVE GPM
1" — VALVE SIZE

PIPE SIZING SCHEDULE

TYPE OF PIPE	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	
SCHEDULE 40 PVC: MAINLINE	8	12	22	30	50	75	FLOW GPM
CLASS 200 PVC: LATERALS	10	16	26	35	55	80	FLOW GPM

NOTE: MINIMUM OF 65 -75 PSI STATIC PRESSURE AT POINT OF CONNECTION (P.O.C.)

GENERAL IRRIGATION NOTES:

- IRRIGATION DESIGN SHOWN DIAGRAMATICALLY FOR PLAN CLARITY.
- PRIOR TO INSTALLATION OF DRIP IRRIGATION, CONTRACTOR IS REQUIRED TO CONTACT LOCAL NETAFIM REPRESENTATIVE FOR TRAINING ON THE INSTALLATION AND RUN TIME MANAGEMENT OF DRIP SYSTEM AND NOTIFY LANDSCAPE ARCHITECT THAT FACTORY TRAINING HAS OCCURRED PRIOR TO INSTALLATION. PLEASE GIVE REPRESENTATIVE A MINIMUM TWO WEEK NOTICE.
- DRIP TUBING SHALL BE INSTALLED FOUR (4) INCHES BELOW FINAL GRADE. CONTRACTOR TO RUN EACH ZONE BEFORE COVERING TUBING, TO VERIFY THAT THERE ARE NO CONNECTION LEAKS. TREES TO BE INSTALLED ON A SEPARATE ZONE, USING NETAFIM TLCV .26 18, REFER TO THE TREE IRRIGATION DETAIL FOR ADDITIONAL INFORMATION.
- USE COMMON TRENCH METHODS LOCATING EQUIPMENT WITHIN THE LANDSCAPE.
- PLACE MANIFOLD GROUPED VALVES IN ADJACENT SHRUB BEDS AND ALIGN WITH PAVED SURFACES OR PLANTING BED EDGES.
- SHOVEL-CUT LANDSCAPE EDGING WHERE FEASIBLE.
- ANY WORK AND/OR IRRIGATION LINES PLACED WITHIN ANY TREE PROTECTION ZONES ESTABLISHED FOR THE PROJECT MUST BE INSTALLED IN SUCH A MANNER AS TO NOT CAUSE DAMAGE TO TREE ROOTS WITHIN THE PROTECTION ZONE, SUCH AS BY CUTTING ROOTS, DIGGING TRENCHES, OPERATION OF MACHINERY, ETC..
  - •• SPECIAL CARE MUST BE TAKEN (HAND DIGGING TRENCHES, DESIGNING LINES TO STAY OUT OF THESE AREAS WHERE POSSIBLE, ETC.) TO ENSURE DAMAGE TO THE TREES DOES NOT OCCUR.
  - •• IN THE EVENT DAMAGE DOES OCCUR TO THESE AREAS, THE CITY MAY REQUIRE, AT THEIR DISCRETION, REPLACEMENT OF THE COMPARABLE LANDSCAPE VALVE OF THE TREES DAMAGED OR OTHER MEANS TO MAKE UP THAT LOSS.

Preliminary Not For Construction

NOT FOR CONSTRUCTION

ARC

andec

BARGHA
CONSULTING ENG

18215 72ND AVEN
KENT, WA 98032
(425)251-6222
(425)251-8782 F

CIVIL ENGINEERING, LA
SURVEYING, ENVIRONME

NO.	DATE	REVISI
1	3/20/18	CITY
2	6/1/18	CITY
3	8/7/18	CITY

SEAL:
8-31-20
8-6-20

DEVELOPMENT INFORMATIO
ARCO
3000 am
FUEL CAI
w/ 8 MF
26'x100' CAF

SITE ADDRESS:
NWC IRIS AVE @
MORENO VAL
FACILITY

DESIGNED BY: BLS
CHECKED BY: JMV
DRAWN BY: BLS
VERSION: -

DRAWING TITLE:
PRELIMI
IRRIGA
PLA

SHEET NO:
L-

Attachment: Preliminary Landscape Plans (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

PRELIMINARY LANDSCAPE and IRRIGATION PLAN
FOR
ARCO AM/PM

PTN OF SEC. 22,
TWP. 3 S., RGE 3 WEST, S.B.M
RIVERSIDE COUNTY STATE OF CALIFORNIA

LANDSCAPE IRRIGATION NOTES

1. GENERAL CONTRACTOR AND LANDSCAPE CONTRACTOR TO COORDINATE:

A. INSTALLATION OF 110V ELECTRICAL SERVICE FROM ELECTRICAL SOURCE TO AUTOMATIC CONTROLLER, INCLUDING WIRE HOOK-UP INTO MOUNTED CONTROLLER. IRRIGATION CONTRACTOR WILL MOUNT CONTROLLER PER DESIGN AND COORDINATE WITH GENERAL CONTRACTOR.

B. INSTALLATION OF IRRIGATION/SERVICE METER AND STUB TO IRRIGATION POINT OF CONNECTION, PER UTILITY PLAN(S). PROVIDE STANDARD THREADED STUB-OUT WITH THREADED CAP ON DISCHARGE SIDE OF METER. STUB-OUT TO BE INSTALLED APPROXIMATELY 18 INCHES BELOW FINISH GRADE.

C. VERIFICATION OF STATIC WATER PRESSURE AT POINT-OF-CONNECTION (P.O.C.) CONTRACTOR SHALL NOTIFY OWNER AND BARGHAUSEN CONSULTING ENGINEERS, INC., OF ANY VARIATION IN STATIC PRESSURE OVER 5 PSI GREATER/LESS THAN DESIGN PRESSURE.

D. INSTALLATION OF SLEEVING.

2. LANDSCAPE CONTRACTOR TO TEST AVAILABLE WATER PRESSURE AND PROVIDE WRITTEN TEST RESULTS TO LANDSCAPE ARCHITECT PRIOR TO BEGINNING ANY WORK.

3. ALL WORK PER LOCAL CODE. INSTALLATION PER MANUFACTURER'S WRITTEN SPECIFICATIONS.

4. ALL VALVES TO BE PLACED IN "CARSON" GRADE LEVEL BOXES WITH BOLT-LOCK LIDS (OR APPROVED EQUIVALENT). SET BOXES 2 INCHES HIGHER THAN FINISH GRADE IN MULCH AREAS AND FLUSH WITH FINISH GRADE IN LAWN AREAS. JUMBO BOX FOR CHECK VALVE, 10" ROUND BOX FOR GATE/QUICK COUPLER/WIRE SPLICES, AND 12" STANDARD FOR CONTROL VALVES. PROVIDE BOX EXTENSIONS AS REQUIRED.

5. MAINLINE PIPE TO BE BURIED 18 INCHES AND LATERALS 12 INCHES BELOW FINISH GRADE. NO ROCK OR DEBRIS TO BE BACKFILLED OVER PIPE.

6. IRRIGATION DESIGN SHOWN DIAGRAMATICALLY FOR PLAN CLARITY. PRIOR TO INSTALLATION OF DRIP IRRIGATION, CONTRACTOR IS REQUIRED TO CONTACT LOCAL NETAFIM REPRESENTATIVE FOR TRAINING ON THE INSTALLATION AND RUN TIME MANAGEMENT OF DRIP SYSTEM AND NOTIFY LANDSCAPE ARCHITECT THAT FACTORY TRAINING HAS OCCURRED PRIOR TO INSTALLATION.
CONTACT CALIFORNIA NETAFIM LANDSCAPE & TURF REPRESENTATIVE (888) 638-2346. PLEASE
GIVE REPRESENTATIVE A MINIMUM TWO WEEK NOTICE.

7. DRIP TUBING SHALL BE INSTALLED FOUR (4) INCHES BELOW FINAL GRADE. CONTRACTOR TO RUN EACH ZONE BEFORE COVERING TUBING, TO VERIFY THAT THERE ARE NO CONNECTION LEAKS. TREES TO BE INSTALLED ON A SEPARATE ZONE, USING NETAFIM TLCV .26 18, REFER TO THE TREE IRRIGATION DETAIL FOR ADDITIONAL INFORMATION.

8. PROVIDE OWNER WITH TWO (2) SETS "AS-BUILT" DRAWINGS AND (3) SETS OF OPERATOR'S MANUALS UPON COMPLETION. INSTRUCT OWNER AS TO PROPER OPERATION AND WINTERIZATION OF THE IRRIGATION SYSTEM.

9. FAMILIARIZE OWNERS FACILITY OPERATOR WITH IRRIGATION SYSTEM FUNCTION, CONTROLLER PROGRAMMING, SYSTEM OPERATION AND MAINTENANCE REQUIREMENTS.

10. ALL CONTROL WIRE SPLICES TO BE MADE AT VALVE BOXES WITH WATER TIGHT ELECTRICAL SPLICES, 3M, SCOTT'S LOCK SEAL TACK 3576-78, OR EQUIVALENT.

11. EACH VALVE BOX TO CONTAIN A MINIMUM OF TWO (2) SPARE ORANGE CONTROL WIRES FOR JACKETED WIRE. ROUTE SPARE WIRES FROM THE CONTROLLER TO THE LAST VALVE OF EACH MAINLINE BRANCH. COMMON WIRE TO BE WHITE. SINGLE STRAND WIRE TO BE A MINIMUM OF 14 GAUGE.

12. ALL ELECTRICAL EQUIPMENT TO BE U.L. TESTED AND APPROVED, AND BEAR THE U.L. LABEL.

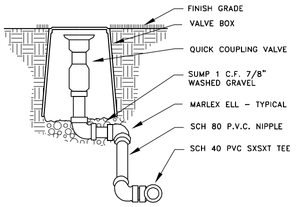
13. CROSS CONNECTION PROTECTION INSPECTION REQUIRED. THE BACKFLOW DEVICE TO BE TESTED UPON THE ORIGINAL INSTALLATION. THE TESTING TO BE PERFORMED BY A PERSON HOLDING A CURRENT CERTIFICATE AS A BACKFLOW TESTER. THE TEST REPORT TO BE SUBMITTED TO THE LOCAL WATER DISTRICT, OR PURVEYOR, AND OWNER WITH A COPY TO BARGHAUSEN CONSULTING ENGINEERS, INC. CONTRACTOR TO INCLUDE TESTING IN THE SCOPE OF WORK. OWNER IS RESPONSIBLE FOR ANNUAL INSPECTIONS AFTER THE INTIAL INSPECTION.

14. CONTRACTOR TO PROVIDE SYSTEM WINTERIZATION/SPRING SERVICE WHEN INSTALLATION HAS BEEN COMPLETED WITHIN 90 DAYS OF NOVEMBER 1 FOR WINTERIZATION, OR MAY 15 FOR SPRING SERVICE. SERVICE TO BE PERFORMED AS NEAR AS PRACTICAL TO THE ABOVE DATES, OR AS FREEZE/PRECIPITATION CONDITIONS DETERMINE SERVICE NEED.

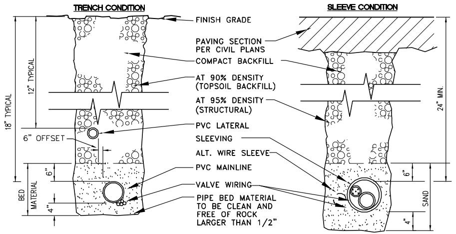
15. IRRIGATION SCHEDULING: THE IRRIGATION CONTROLLER CONTAINS A WATER BUDGET FEATURE. PERIODIC (WEEKLY) ADJUSTMENT OF THE WATER SCHEDULE IS INTENDED TO BE MADE VIA BUDGET ADJUSTMENT. RE-ADJUST WATERING DAYS AT 100 PERCENT BUDGET WHEN ADJUSTMENT EXCEEDS 30%. SET CONTROLLER FOR HIGHEST ETo WATER SCHEDULE, BASED ON PUBLISHED LOCAL EVAPOTRANSPIRATION DATA. SYSTEM HAS BEEN DESIGNED FOR 50 TO 80 PERCENT DISTRIBUTION UNIFORMITY. LAWN ZONES SHOULD BE SCHEDULED FOR 100 PERCENT REPLACEMENT FACTOR ON A TYPICAL MINIMUM 3-DAY CYCLE. SHRUB ZONES SHOULD BE PROGRAMMED AT 40 TO 70 PERCENT OF THE MONTHLY LAWN WATER REQUIREMENT ON A ONCE PER WEEK CYCLE. ALL WATERING IN EXCESS OF THE LOCAL ETo ("FIELD RECHARGE") TO BE COMPLETED DURING THE CONSTRUCTION PHASE WHILE THE CONTRACTOR IS ON THE JOB SITE. OVER WATERING OF LANDSCAPE DUE TO CONTROLLER SCHEDULING TO BE GROUNDS FOR CONTRACTOR TO REPAIR ANY RESULTANT DAMAGES AT CONTRACTOR'S OWN EXPENSE.

16. SUBSTITUTION OF IRRIGATION MATERIAL/EQUIPMENT TO BE MADE ONLY UPON WRITTEN APPROVAL OF LANDSCAPE ARCHITECT AND OWNER'S REPRESENTATIVE.

17. ALL ZONES TO PASS A MINIMUM DISTRIBUTION UNIFORMITY WATER AUDIT, AS REQUIRED BY THE STATE OF CALIFORNIA'S WATER EFFICIENT LANDSCAPE ORDINANCE, AS ADOPTED BY THE CITY COUNCIL. AN IRRIGATION ASSOCIATION CERTIFIED WATER AUDIT REPORT TO BE PROVIDED TO THE CITY.



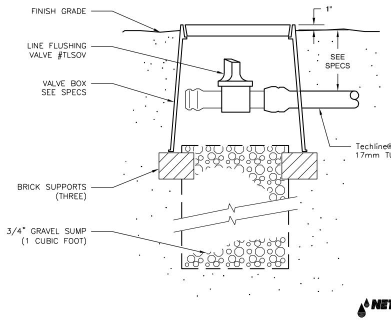
QUICK COUPLING VALVE DETAIL



NOTE:
SLEEVING MATERIAL SHALL BE PVC CLASS 160(SDR-26).
DIMENSIONS ARE MIN. CLEARANCES.
ALL IRRIGATION SLEEVING TRENCH BACKFILL MATERIAL SHALL BE CLASS "B" OR BETTER (MAX. OF 10% PASSING NO.40 SCREEN) AND BE COMPACTED TO MIN. 95% OPTIMUM DENSITY PER ASTM D-1557-70 (MODIFIED PROCTOR)

SLEEVE/TRENCHING DETAIL

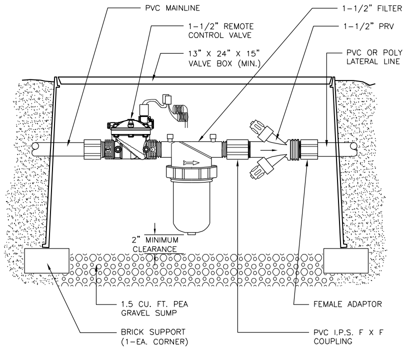
NOT TO SCALE



NETAFIM™

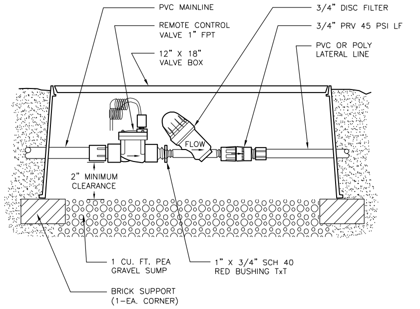
MANUAL LINE FLUSHING VALVE TLSOV PLUMBED TO TUBING

NOT TO SCALE DETAIL – D211



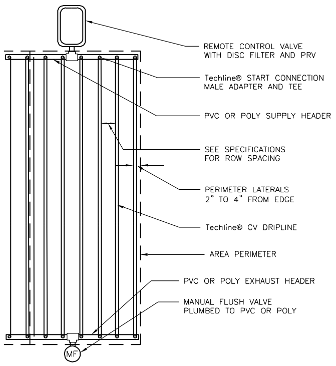
NETAFIM™

COMMERCIAL CONTROL ZONE ASSEMBLY:
P/N LVCZ-150 11 - 35 GPM NOT TO SCALE DETAIL – L223



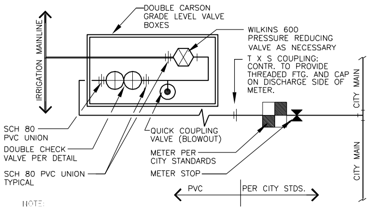
NETAFIM™

LOW-VOLUME CONTROL SYSTEM:
P/N LVCZS80-10075-LF .25 - 4.4 GPM NOT TO SCALE DETAIL – L201LF



Techline® CV END FEED LAYOUT

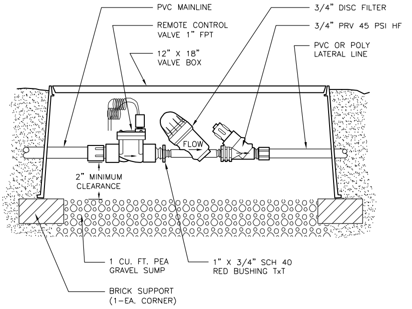
NOT TO SCALE



NOTE:
THE BACKFLOW DEVICE SHALL HAVE 6" MINIMUM UNOBSTRUCTED CLEARANCE ON ALL SIDES

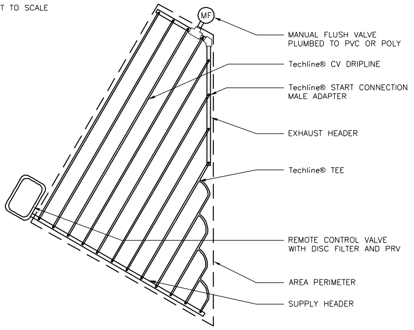
POINT OF CONNECTION (P.O.C.) DETAIL

NOT TO SCALE



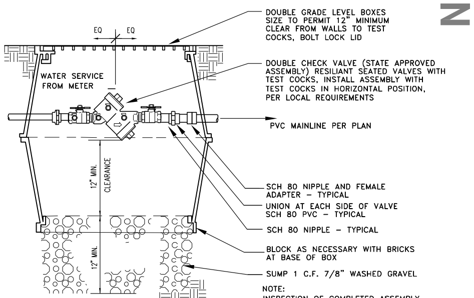
NETAFIM™

LOW-VOLUME CONTROL ZONE ASSEMBLY:
P/N LVCZS80-10075-HF 4.5 - 17.6 GPM NOT TO SCALE DETAIL – L211HF



Techline® CV IRREGULAR AREAS: Triangular

NOT TO SCALE



NOTE:
INSPECTION OF COMPLETED ASSEMBLY BY CERTIFIED TESTER REQUIRED.

CHECK VALVE ASSEMBLY DETAIL

NOT TO SCALE

ARC

andec

18215 72ND AVEN
KENT, WA 98032
(425)251-6222
(425)251-8782 F

CIVIL ENGINEERING, LA
SURVEYING, ENVIRONME

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SEAL:
JEFFREY VAR
8-31-20
6-1-201

DEVELOPMENT INFORMATIO
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3000 am
FUEL CA
w/ 8 MF
26'x100' CA

SITE ADDRESS:
NWC IRIS AVE @
MORENO VAL

FACILITY

DESIGNED BY: BLS
CHECKED BY: JMV
DRAWN BY: BLS
VERSION: -

DRAWING TITLE:
PRELIMI
IRRIGA
NOTES/D

SHEET NO:
L-

LSA

BERKELEY
CARLSBAD
FRESNO
IRVINE
LOS ANGELES
PALM SPRINGS
POINT RICHMOND
RIVERSIDE
ROSEVILLE
SAN LUIS OBISPO

MEMORANDUM

DATE: November 8, 2017

TO: Kent Norton, Associate, LSA

FROM: Michael Slavick, Senior Air Quality Specialist, LSA

SUBJECT: Air Quality and Greenhouse Gas Emission Analysis and Screening Health Risk Assessment Technical Memorandum for the Proposed ARCO AM/PM Gas Service Station with Convenience Store and Car Wash Project (LSA Project No. SAT1701)

This Technical Memorandum provides an evaluation of air quality and greenhouse gas emissions associated with the proposed ARCO Gas Station on 1.31 acres at the northwest corner of Iris Avenue and Oliver Street in the City of Moreno Valley (City), Riverside County. The proposed project site is currently vacant bounded by single-family residential homes approximately 100 feet to the east and 150 feet to the south. Because of the close proximity to the gas station, the City has requested a screening health risk assessment (HRA).

SUMMARY OF AIR QUALITY AND GREENHOUSE GAS EMISSION IMPACT ANALYSIS

Criteria pollutant emissions from construction and operational activities associated with the proposed project would be less than significant. Results of the screening HRA conclude that the cancer risk for future residents associated with exposure to gas station emissions would not exceed the significance criteria for Toxic Air Contaminants (TACs) as established by the South Coast Air Quality Management District (SCAQMD). Therefore, the future residents’ and office workers’ exposure to the gas station emissions would be less than significant. Lastly, the greenhouse gas (GHG) emissions from construction and operational activities associated with the proposed project would be less than significant.

A brief discussion of the air quality, screening health risk, and GHG impact analysis associated with the proposed project is provided below.

SUMMARY OF CEQA SIGNIFICANCE THRESHOLD LIMITS

The SCAQMD has established emissions thresholds for construction and operation for California Environmental Quality Act (CEQA) evaluation of the proposed project in the South Coast Air Basin (Basin). It should be noted that the emissions thresholds were established based on the attainment status of the Basin in regard to air quality standards for specific criteria pollutants. Four sets of thresholds are summarized below.

Regional Emissions Thresholds

Table A presents the significance thresholds for construction and operational emissions as established by the SCAQMD.

Table A: SCAQMD Significance Thresholds

Air Pollutant	Construction Phase	Operational Phase
VOCs	75 lbs/day	55 lbs/day
CO	550 lbs/day	550 lbs/day
NOx	100 lbs/day	55 lbs/day
SOx	150 lbs/day	150 lbs/day
PM_{10}	150 lbs/day	150 lbs/day
$PM_{2.5}$	55 lbs/day	55 lbs/day

Source: South Coast Air Quality Management District Air Quality Significance Thresholds (Last revisions: March 2015).

CO = carbon monoxide
lbs = pounds
NOx = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size
VOCs = volatile organic compounds
SCAQMD = South Coast Air Quality Management District
SOx = sulfur oxides

Projects with construction and/or operational emissions that exceed any of these emission thresholds are considered to be significant under the SCAQMD guidelines.

Localized Significance Thresholds

The SCAQMD published its *Final Localized Significance Threshold Methodology* in June 2003 with revisions in July 2008, recommending that all air quality analyses include an assessment of both construction and operational impacts on the air quality of nearby sensitive receptors. Localized Significance Thresholds (LSTs) represent the maximum emissions from a project site that is not expected to result in an exceedance of the California Ambient Air Quality Standards (CAAQS). LSTs are based on the ambient concentrations of that pollutant within the project Source Receptor Area (SRA) and the distance to the nearest sensitive receptor. For this project, the appropriate SRA for the LST is the Perris Valley Area (SRA 24).

Existing sensitive receptors nearest to the project site are approximately 100 feet, or approximately 31 meters (m), from the project site. Using the operations LST for receptors at 31 m from a 1-acre site for this project would result in a conservative analysis. Therefore, Table B presents the emissions thresholds that apply during project operations.

Table B: SCAQMD Localized Significance Thresholds (lbs/day)

	NOx	CO	PM_{10}	$PM_{2.5}$
Construction	125.0	670.0	5.9	3.2
Operations	125.0	670.0	1.5	1.0

Source: SCAQMD Localized Significance Threshold Methodology (Last revisions: July 2008).
Note: SRA 24 – Perris Valley, 1 acre, 31-meter distance.

Health Risk assessment Thresholds

The California Air Resources Board (ARB) has developed an *Air Quality and Land Use Handbook*[1] (*Handbook*) intended to serve as a general reference guide for evaluating and reducing air pollution impacts associated with new projects that go through the land use decision-making process. According to the *Handbook*, recent air pollution studies have shown an association between respiratory and other non-cancer health effects and proximity to high-traffic roadways. The

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[1] California Air Resources Board, 2005. *Air Quality and Land Use Handbook: A Community Health Perspective.* April.

Handbook recommends that planning agencies strongly consider proximity to these sources when finding new locations for "sensitive" land uses such as residential homes. Key recommendations in the *Handbook* include taking steps to avoid siting new, sensitive land uses within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater). Please note that this ARB buffer recommendation in the 2005 *Handbook* does not consider the ARB required enhanced vapor recovery systems for gasoline dispensing facilities. The *Handbook* specifically states that its recommendations are advisory and acknowledges land use agencies have to balance other considerations, including housing and transportation needs, economic development priorities, and other quality of life issues.

The SCAQMD *Air Quality CEQA Guidelines* establish risk thresholds for projects under CEQA that have the potential to expose sensitive receptors (including residential areas) or the general public to substantial levels of TACs. Table C lists the air district's TAC incremental risk thresholds for operation of a project.

Table C: SCAQMD Toxic Air Contaminant Incremental Risk Thresholds

Maximum Individual Cancer Risk	≥ 10 in 1 million
Cancer Burden	> 0.5 excess cancer cases
Hazard Index	≥ 1.0

Source: South Coast Air Quality Management District Air Quality Significance Thresholds (Last revisions: March 2015).

GHG Emission Thresholds

For projects that are not exempt or where no qualifying GHG reduction plans are directly applicable, the SCAQMD requires an assessment of GHG emissions. The SCAQMD, under Option 1 has identified a "bright-line" screening level threshold of 3,000 metric tons of carbon dioxide equivalents ($MTCO_2e$) annually for all land use types or, under Option 2, the following land-use-specific thresholds: 1,400 $MTCO_2e$ for commercial projects, 3,500 $MTCO_2e$ for residential projects, or 3,000 $MTCO_2e$ for mixed-use projects. This bright-line threshold is based on a review of the Governor's Office of Planning and Research (OPR) database of CEQA projects. Based on OPR review of 711 CEQA projects, 90 percent of CEQA projects would exceed the bright-line thresholds identified above. Therefore, projects that do not exceed the bright-line threshold would have a nominal and therefore less than cumulatively considerable impact on GHG emissions. For the proposed project, the GHG threshold is 1,400 $MTCO_2e$ for commercial projects.

AIR QUALITY ANALYSIS

To evaluate air quality and GHG emissions from the construction and operation of the proposed project, LSA conducted an analysis using the California Emission Estimator Model (CalEEMod), which is the current air quality and land use emissions model recommended by the California Air Pollution Control Officers Association (CAPCOA) for evaluating emissions from land use projects (CAPCOA 2016). Emissions from construction were based on the CalEEMod model default mode construction scenario and schedule. Emissions from operation of the project included vehicle emissions, area source emissions, and energy use emissions. Emissions were then compared with significance thresholds from the SCAQMD.

AQMP Consistency

The SCAQMD 2016 Air Quality Management Plan (AQMP) incorporates the latest scientific and technical information and planning assumptions; updated emissions inventory methodologies for various emissions source categories; and reflects information, plans, and programs presented in the Southern California Association of Governments (SCAG) 2016 Regional Transportation Plan/ Sustainable Communities Strategy (2016 RTP/SCS). Air quality conditions and trends presented in the 2016 AQMP assume that regional development will occur in accordance with population growth projections identified by SCAG in its 2016 RTP/SCS.

The SCAG 2016 RTP/SCS in turn derives its assumptions, in part, from general plans of cities within the SCAG region. Accordingly, if a project is consistent with the development and growth projections reflected in an adopted general plan, that project is considered consistent with the growth assumptions in the 2016 AQMP. The 2016 AQMP further assumes that development projects within the region will implement appropriate strategies to reduce air pollutant emissions, thereby promoting timely implementation of the AQMP.

The proposed project does not propose or require any change in land use designations, nor any increase in development intensity beyond that currently anticipated for the subject site. Because the land uses and development intensities proposed by the proposed project are consistent with the currently adopted City General Plan and applicable zoning standards, the proposed project would not result in air quality violations. The proposed project would not generate operational-source criteria pollutant emissions not already reflected in the current AQMP regional emissions inventory. Based on the preceding, the proposed project is considered to be consistent with the AQMP. The potential for the project to conflict with or obstruct implementation of the applicable air quality plan is therefore considered less than significant.

Construction Air Quality Emissions

Construction emissions can vary greatly depending on the level of activity, the specific operations taking place, the equipment being operated, local soils, weather conditions, and other factors. Construction would require heavy equipment during grading, utility installations, building construction and paving. Construction equipment estimates are based on default values in CalEEMod (Version 2016.3.1). CalEEMod is designed to model construction emissions for land development projects and allows for the input of project-specific information, such as the amount of equipment, hours of operations, duration of construction activities, and selection of emission control measures. Attachment A shows results from the model. Table D shows the construction emissions from the CalEEMod output tables. Application of water three times daily during grading was taken into consideration. The proposed project will be required to comply with SCAQMD Rule 403 to control fugitive dust. Table D includes implementation of fugitive dust control measures required by SCAQMD under Rule 403, including watering disturbed areas a minimum of three times per day, reducing speed limit to 15 miles per hour on unpaved surfaces, and replacing groundcover quickly. Based on CalEEMod default selections, the fugitive dust control efficiency for onsite watering three times daily is 61 percent. The project would balance grading activity on-site, which means that no soil would be transported off-site for disposal nor would soil be transported on-site for use in construction activities. Attachment A includes CalEEMod outputs.

Table D provides a summary of the daily construction emissions estimates by construction activity during each calendar year. Results from the CalEEMod analysis, as shown in Table D, indicate that the construction pollutant emissions from the proposed project would not exceed the corresponding SCAQMD daily emission thresholds for criteria pollutants. Therefore, construction impacts would be less than significant.

Table D: Estimated Construction Emissions

Construction Phase	Peak Daily Pollutant Emissions (lbs/day)					
	VOC	NOx	CO	SOx	PM_{10}	$PM_{2.5}$
Max Daily Emissions during Year 1	2.60	20.78	13.93	0.02	6.84	3.85
Max Daily Emissions during Year 2	3.34	15.98	13.53	0.02	0.93	0.89
SCAQMD Thresholds	**75**	**100**	**550**	**150**	**150**	**55**
Significant Emissions?	**No**	**No**	**No**	**No**	**No**	**No**

Source: Compiled by LSA (October 2017).

CO = carbon monoxide
lbs/day = pounds per day
NOx = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size
SCAQMD = South Coast Air Quality Management District
SOx = sulfur oxides
VOC = volatile organic compounds

Localized Impacts Analysis

The SCAQMD has issued guidance on applying CalEEMod results to localized impacts analyses. Sensitive receptors include residences, schools, hospitals, and similar uses that are sensitive to adverse air quality. There are several existing residences surrounding the project site, the closest of which is approximately 100 feet (31 m). Using the SCAQMD LST guidance for one acre, Table E shows that the emissions of the pollutants on the peak day of construction will result in concentrations of pollutants at the nearest residences that are all below the SCAQMD thresholds of significance. Therefore, project-related construction emissions would be less than significant.

Table E: Construction Localized Impacts Analysis

Emissions Sources	NOx	CO	PM_{10}	$PM_{2.5}$
Onsite Emissions (lbs/day)	21.0	14.0	3.2	2.0
Local Significance Thresholds (lbs/day)	**125.0**	**670.0**	**5.9**	**3.2**
Significant Emissions?	**No**	**No**	**No**	**No**

Source: Compiled by LSA (October 2017).

Note: Source Receptor Area 24 – Perris Valley, 1 acre, 31 meter distance

CO = carbon monoxide
lbs/day = pounds per day
NOx = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size

Operational Air Quality Emissions

Operational emissions from area sources include the combustion of natural gas for heating and hot water, engine emissions from landscape maintenance equipment, and the use of appliances at the residences. Mobile source emissions are associated with project-related vehicle trip generation. Based on the CalEEMod default mode at full buildout, the project would generate approximately 1,111 average daily trips (ADT). Table F presents the estimated operational emissions for the proposed project and demonstrates criteria pollutant emissions from operational activities associated with the proposed project would be below the SCAQMD thresholds. Therefore, project-related operational emissions would be less than significant.

Table F: Operational Emissions

Source	Pollutant Emissions (lbs/day)					
	VOC	NOx	CO	SOx	PM_{10}	$PM_{2.5}$
Area Sources	0.05	<0.01	<0.01	0.00	<0.01	0.02
Energy Sources	<0.01	0.02	0.02	<0.01	<0.01	<0.01
Mobile Sources	5.55	24.40	26.14	0.08	3.73	1.03
Total Project Emissions	**5.60**	**24.42**	**26.16**	**0.08**	**3.73**	**1.03**
SCAQMD Thresholds	55	55	550	150	150	55
Significant?	No	No	No	No	No	No

Source: Compiled by LSA. (October 2017).

CO = carbon monoxide
lbs/day = pounds per day
NOx = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size
SCAQMD = South Coast Air Quality Management District
SOx = sulfur oxides
VOC = volatile organic compounds

Localized Impacts Analysis

Table G shows the calculated emissions for the proposed operational activities compared with the appropriate LSTs. By design, the localized impacts analysis only includes onsite sources; however, CalEEMod outputs do not separate onsite and offsite emissions for mobile sources. For a worst-case scenario assessment, the emissions shown in Table G include all onsite project-related stationary sources and 2 percent of the project-related new mobile sources, which is an estimate of the amount of project-related new vehicle traffic that would occur onsite (i.e., driveways and parking lots). All offsite emissions are subtracted from the total emissions.

Table G: Long-Term Operational Localized Impacts Analysis

Emissions Sources	NOx	CO	PM_{10}	$PM_{2.5}$
Onsite Emissions (lbs/day)[1]	0.3	1.4	0.07	0.04
Local Significance Thresholds (lbs/day)	**125.0**	**670.0**	**1.50**	**1.00**
Significant Emissions?	**No**	**No**	**No**	**No**

Source: Compiled by LSA. (October 2017).

Note: Source Receptor Area 24 – Perris Valley, 1 acre, 31 meter distance.

[1] CalEEMod clearly delineates the onsite and offsite emissions and mobile source trips within the project area (i.e., driveways and parking lots).

CO = carbon monoxide
NOx = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size

Table G shows that the operational emissions rates would not exceed the LSTs for residential receptors at 100 feet (31 m). Therefore, the proposed operational activities would not result in a locally significant air quality impact.

Toxic Air Contaminant Emissions

Dispensing gasoline products has the potential to introduce air toxics (primarily benzene emissions) into the local environment. The SCAQMD regulates these emissions through a permitting process (Health Risk Assessment) that applies to all service stations within Riverside County. As part of its permitting process, the SCAQMD performs an analysis of potential cancer risk associated with anticipated benzene emissions from individual service stations.

The SCAQMD has established thresholds of significance that account for site-specific factors such as gasoline throughput and the locations of nearby receptors. If the analysis indicates that the cancer risk at a nearby receptor location (i.e., area where persons reside, work, or attend school—not including streets or sidewalks) is less than one (1) case per million persons, the risk is considered less than significant and no mitigation is required. If the analysis results indicate that the lifetime cancer risk is between 1 and 10 cases per million, the impact is considered less than significant with the application of Toxics Best Available Control Technology (TBACT). Under existing SCAQMD regulations, a permit cannot be issued for a gas station project with an identified cancer risk between 1 and 10 unless TBACT is made a part of the project. The ARB must certify all vapor recovery equipment that is used at service stations, which would satisfy the TBACT requirement. If the analysis indicates that the cancer risk is greater than 10 cases per million, the impact is considered significant and the SCAQMD would further constrain the service station’s operations in order to stay below a cancer risk of 10 cases in a million.

SCAQMD staff has indicated on previous gas station projects that only a very high throughput service station in close proximity to a school or other sensitive receptor would be likely to exceed the theoretical 10 cases per million threshold. At present, SCAQMD staff runs individual cancer risk assessments on all new service stations or projects where a school is located within 1,000 feet of the project site and there is an increase in emissions. There are no schools within 1,000 feet to the project. The nearest sensitive receptor to the project site is a residential area approximately 100 feet to the east and 150 feet to the south. Compliance with existing SCAQMD rules and regulations would ensure potential impacts associated with air toxics would be less-than-significant.

As indicated in Table F, project operational emissions of criteria pollutants would be below SCAQMD significance thresholds; thus, they are not likely to have a significant impact on these residences given the distance and the dispersion that would occur. Exposure by individuals pumping gasoline would be limited in time, so the dose level for customers would be low. In addition, SCAQMD Rule 461 - Gasoline Transfer and Dispensing, require the installation of enhanced vapor recovery systems that would reduce the amount of vapor that would be emitted into the atmosphere by 95 to 98 percent from levels without such systems.

This would further limit doses and exposures, reducing potential health risk related to gasoline vapors to a level that is not significant. Overall, project impacts related to exposure of sensitive receptors to emissions are considered less than significant.

Odors

CEQA and the SCAQMD Guide consider objectionable odors as a potentially significant environmental impact. SCAQMD Rule 402 prohibits the discharge of air contaminants that could be a nuisance or an annoyance. This prohibition includes potential odors. Potential sources of odors associated with the project include the release of gasoline vapors. Such odors in general would be confined mainly to the project site and would readily dissipate. In accordance with SCAQMD Rule 461, enhanced vapor recovery systems would be required. Project impacts related to odors are considered less than significant.

Conclusion for Air Quality Impacts

As shown in Tables D through G, criteria pollutant emissions from construction and operational activities associated with the proposed project would be below the SCAQMD thresholds. Therefore, project-related construction and operational emissions would be less than significant. Results of the qualitative HRA conclude that compliance with existing SCAQMD rules and regulations and that SCAQMD would ensure the proposed gas station emissions would not exceed the significance criteria for TACs. Therefore, the existing residents' exposure to the gas station emissions would be less than significant.

GREENHOUSE GAS EMISSIONS ANALYSIS

Construction and operation of the project could result in the generation of GHG emissions as described below.

Construction Greenhouse Gas Emissions

Construction activities produce combustion emissions from various sources, such as site grading, utility engines, onsite heavy-duty construction vehicles, and equipment hauling materials to and from the site, asphalt paving, and motor vehicles transporting the construction crew. Exhaust emissions from onsite construction activities would vary daily as construction activity levels change.

Construction GHG emissions were calculated using CalEEMod. Please refer to the CalEEMod modeling output in Attachment A for details. The construction phase in Table H shows GHG emissions from equipment exhaust and energy use. Results indicate that project construction would generate approximately 198 $MTCO_2e$ per year. Amortized over 30 years, the total construction emissions would generate approximately 6.6 $MTCO_2e$ per year.

Table H: Estimated Construction Greenhouse Gas Emissions

Construction Phase	Peak Annual Emissions (mt/yr)			Total Emissions ($MTCO_2e$)
	CO_2	CH_4	N_2O	
Year 1	180.34	0.04	0.00	181.27
Year 2	17.11	<0.01	0.00	17.20
Total Construction Emissions				198.45
Total Construction Emissions Amortized over 30 years				**6.62**

Source: Compiled by LSA (October 2017).

CO_2 = carbon dioxide
CH_4 = methane
N_2O = nitrous oxide
mt/yr = metric tons per year
CO_2e = carbon dioxide equivalent
$MTCO_2e$ = metric tons of carbon dioxide equivalent

Attachment: Appendix A - Air Quality and Greenhouse Gas Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Operational Greenhouse Gas Emissions

Long-term operation of the proposed project would generate GHG emissions from area and mobile sources and indirect emissions from stationary sources associated with energy consumption. Mobile source emissions of GHGs would include project-generated vehicle trips associated with onsite facilities and customers/visitors to the project site. Area source emissions would be associated with activities such as landscaping and maintenance of proposed land uses, natural gas for heating, and other sources. Increases in stationary source emissions would also occur at offsite utility providers as a result of demand for electricity, natural gas, and water by the proposed uses.

The GHG emission estimates presented in Table I show the emissions associated with the level of development envisioned by the proposed project at opening. Attachment A includes the model outputs. Area sources include architectural coatings, consumer products, and landscaping. Energy sources include natural gas consumption for space heating.

Table I: Estimated Operational Greenhouse Gas Emissions

Source	Pollutant Emissions (MT/yr)			
	CO_2	CH_4	N_2O	CO_2e
Construction emissions amortized over 30 years	6.58	<0.01	0.00	6.62
Operational Emissions				
Area Sources	<0.01	<0.01	0.00	<0.01
Energy Sources	11	<0.01	<0.01	11.42
Mobile Sources	1,207.20	<0.01	0.15	1,210.84
Waste Sources	1.7	1.75	0.10	4.34
Water Usage	11	1.41	<0.01	1.64
Total Project Emissions	**1,228.31**	**0.25**	**0.00**	**1,234.85**
SCAQMD GHG Threshold	—	—	—	**1,400**
Significant Emissions?	—	—	—	**No**

Source: Compiled by LSA (October 2017).

Note: Numbers in table may not appear to add up correctly due to rounding of all numbers to two decimal places.

MT/yr = metric tons per year
CH_4 = methane
N_2O = nitrous oxide
CO_2e = carbon dioxide equivalent
CO_2 = carbon dioxide

As shown in Table I, the project will result in a net increase of 1,235 $MTCO_2e$ per year. The emissions level of 1,235 $MTCO_2e$ per year is less than the SCAQMD Tier 3 threshold of 1,400 $MTCO_2e$ per year for commercial projects; therefore, project-level and cumulative GHG emissions would be less than significant.

Conclusion for Greenhouse Gas Impacts

As shown in Tables H and I, GHG emissions from construction and operational activities associated with the proposed project would be below the SCAQMD thresholds. Therefore, project-related construction and operational GHG emissions would be less than significant.

Attachment: Appendix A - Air Quality and Greenhouse Gas Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

REFERENCES

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ATTACHMENT A

CALEEMOD MODEL OUTPUTS

ARCO AM/PM Gas Station Iris Ave Moreno Valley

Riverside-South Coast County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Gasoline/Service Station	16.00	Pump	1.31	2,258.80	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.4	**Precipitation Freq (Days)**	28
Climate Zone	10			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Project site is 1.31 acres.

Construction Phase -

Grading - Grading entire 1.3 acres.

Fleet Mix - Assume 54% LDA, 18% LDT1, 8% LDT2, 12% MDV, 7% HHD, and 1% MC.

Construction Off-road Equipment Mitigation - Fugitive dust control with on-site watering three times daily.

Area Mitigation -

Energy Mitigation -

Water Mitigation - Project applicant will install low flow water applicance and water efficient irrigation system.

Waste Mitigation - Waste diversion would acheive 75% goal.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0
tblConstructionPhase	PhaseEndDate	4/1/2018	1/28/2019
tblConstructionPhase	PhaseEndDate	4/1/2018	1/14/2019
tblConstructionPhase	PhaseEndDate	4/1/2018	4/9/2018
tblConstructionPhase	PhaseEndDate	4/1/2018	1/28/2019
tblConstructionPhase	PhaseEndDate	4/1/2018	4/3/2018
tblConstructionPhase	PhaseStartDate	4/2/2018	1/15/2019
tblConstructionPhase	PhaseStartDate	4/2/2018	4/10/2018
tblConstructionPhase	PhaseStartDate	4/2/2018	4/4/2018
tblConstructionPhase	PhaseStartDate	4/2/2018	1/15/2019
tblFleetMix	HHD	0.07	0.07
tblFleetMix	LDA	0.54	0.54
tblFleetMix	LDT1	0.04	0.18
tblFleetMix	LDT2	0.18	0.08
tblFleetMix	LHD1	0.02	0.00
tblFleetMix	LHD2	5.3390e-003	0.00
tblFleetMix	MCY	4.6290e-003	0.01
tblFleetMix	MDV	0.12	0.12
tblFleetMix	MH	1.1200e-003	0.00
tblFleetMix	MHD	0.02	0.00
tblFleetMix	OBUS	1.3650e-003	0.00
tblFleetMix	SBUS	9.5900e-004	0.00
tblFleetMix	UBUS	1.2130e-003	0.00
tblGrading	AcresOfGrading	1.50	1.30
tblLandUse	LotAcreage	0.05	1.31
tblProjectCharacteristics	OperationalYear	2018	2020

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	2.5979	20.7778	13.9261	0.0222	5.8890	1.0581	6.8418	2.9774	1.0217	3.8540	0.0000	2,042.5716	2,042.5716	0.5431	0.0000	2,052.8012
2019	3.3355	15.9836	13.5315	0.0222	0.1453	0.9159	0.9271	0.0385	0.8846	0.8876	0.0000	2,029.3976	2,029.3976	0.4391	0.0000	2,039.1042
Maximum	**3.3355**	**20.7778**	**13.9261**	**0.0222**	**5.8890**	**1.0581**	**6.8418**	**2.9774**	**1.0217**	**3.8540**	**0.0000**	**2,042.5716**	**2,042.5716**	**0.5431**	**0.0000**	**2,052.8012**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	2.5979	20.7778	13.9261	0.0222	2.3513	1.0581	3.3041	1.1757	1.0217	2.0522	0.0000	2,042.5716	2,042.5716	0.5431	0.0000	2,052.8012
2019	3.3355	15.9836	13.5315	0.0222	0.1453	0.9159	0.9271	0.0385	0.8846	0.8876	0.0000	2,029.3976	2,029.3976	0.4391	0.0000	2,039.1042
Maximum	**3.3355**	**20.7778**	**13.9261**	**0.0222**	**2.3513**	**1.0581**	**3.3041**	**1.1757**	**1.0217**	**2.0522**	**0.0000**	**2,042.5716**	**2,042.5716**	**0.5431**	**0.0000**	**2,052.8012**

Attachment: Appendix A - Air Quality and Greenhouse Gas Analysis (3309 : CONDITIONAL USE PERMIT

ARCO AM/PM Gas Station Iris Ave Moreno Valley - Riverside-South Coast County, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	58.63	0.00	45.54	59.74	0.00	38.00	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0506	2.0000e-005	1.6400e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.5000e-003	3.5000e-003	1.0000e-005		3.7400e-003
Energy	2.1700e-003	0.0198	0.0166	1.2000e-004		1.5000e-003	1.5000e-003		1.5000e-003	1.5000e-003		23.7056	23.7056	4.5000e-004	4.3000e-004	23.8464
Mobile	5.5456	24.4040	26.1451	0.0757	3.6759	0.0513	3.7271	0.9766	0.0479	1.0245		7,750.9534	7,750.9534	0.8460		7,772.1033
Total	**5.5984**	**24.4238**	**26.1633**	**0.0758**	**3.6759**	**0.0528**	**3.7287**	**0.9766**	**0.0494**	**1.0260**		**7,774.6625**	**7,774.6625**	**0.8465**	**4.3000e-004**	**7,795.9534**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0506	2.0000e-005	1.6400e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.5000e-003	3.5000e-003	1.0000e-005		3.7400e-003
Energy	2.1200e-003	0.0193	0.0162	1.2000e-004		1.4700e-003	1.4700e-003		1.4700e-003	1.4700e-003		23.1439	23.1439	4.4000e-004	4.2000e-004	23.2814
Mobile	5.5456	24.4040	26.1451	0.0757	3.6759	0.0513	3.7271	0.9766	0.0479	1.0245		7,750.9534	7,750.9534	0.8460		7,772.1033
Total	**5.5984**	**24.4233**	**26.1629**	**0.0758**	**3.6759**	**0.0528**	**3.7286**	**0.9766**	**0.0494**	**1.0260**		**7,774.1008**	**7,774.1008**	**0.8464**	**4.2000e-004**	**7,795.3884**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.06	0.00	0.00	0.01	0.01	0.00	2.33	0.01

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	4/2/2018	4/3/2018	5	2	
2	Grading	Grading	4/4/2018	4/9/2018	5	4	
3	Building Construction	Building Construction	4/10/2018	1/14/2019	5	200	
4	Architectural Coating	Architectural Coating	1/15/2019	1/28/2019	5	10	
5	Paving	Paving	1/15/2019	1/28/2019	5	10	

Acres of Grading (Site Preparation Phase): 1

Acres of Grading (Grading Phase): 1.3

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 3,388; Non-Residential Outdoor: 1,129; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Attachment: Appendix A - Air Quality and Greenhouse Gas Analysis (3309 : CONDITIONAL USE PERMIT

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Cranes	1	6.00	231	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Site Preparation	Graders	1	8.00	187	0.41
Paving	Pavers	1	6.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Grading	Rubber Tired Dozers	1	6.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	6.00	187	0.41
Paving	Paving Equipment	1	8.00	132	0.36
Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40
Building Construction	Welders	3	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Architectural Coating	1	0.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	1.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Clean Paved Roads

3.2 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.7996	0.0000	5.7996	2.9537	0.0000	2.9537			0.0000			0.0000
Off-Road	1.8061	20.7472	8.0808	0.0172		0.9523	0.9523		0.8761	0.8761		1,735.3630	1,735.3630	0.5402		1,748.8690
Total	**1.8061**	**20.7472**	**8.0808**	**0.0172**	**5.7996**	**0.9523**	**6.7518**	**2.9537**	**0.8761**	**3.8298**		**1,735.3630**	**1,735.3630**	**0.5402**		**1,748.8690**

3.2 Site Preparation - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0482	0.0306	0.3957	9.4000e-004	0.0894	5.6000e-004	0.0900	0.0237	5.1000e-004	0.0242		93.8617	93.8617	2.8600e-003		93.9332
Total	**0.0482**	**0.0306**	**0.3957**	**9.4000e-004**	**0.0894**	**5.6000e-004**	**0.0900**	**0.0237**	**5.1000e-004**	**0.0242**		**93.8617**	**93.8617**	**2.8600e-003**		**93.9332**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.2618	0.0000	2.2618	1.1519	0.0000	1.1519			0.0000			0.0000
Off-Road	1.8061	20.7472	8.0808	0.0172		0.9523	0.9523		0.8761	0.8761	0.0000	1,735.3630	1,735.3630	0.5402		1,748.8690
Total	**1.8061**	**20.7472**	**8.0808**	**0.0172**	**2.2618**	**0.9523**	**3.2141**	**1.1519**	**0.8761**	**2.0280**	**0.0000**	**1,735.3630**	**1,735.3630**	**0.5402**		**1,748.8690**

Attachment: Appendix A - Air Quality and Greenhouse Gas Analysis (3309 : CONDITIONAL USE PERMIT

3.2 Site Preparation - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0482	0.0306	0.3957	9.4000e-004	0.0894	5.6000e-004	0.0900	0.0237	5.1000e-004	0.0242		93.8617	93.8617	2.8600e-003		93.9332
Total	**0.0482**	**0.0306**	**0.3957**	**9.4000e-004**	**0.0894**	**5.6000e-004**	**0.0900**	**0.0237**	**5.1000e-004**	**0.0242**		**93.8617**	**93.8617**	**2.8600e-003**		**93.9332**

3.3 Grading - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.8612	0.0000	4.8612	2.5199	0.0000	2.5199			0.0000			0.0000
Off-Road	1.4972	17.0666	6.7630	0.0141		0.7947	0.7947		0.7311	0.7311		1,421.2605	1,421.2605	0.4425		1,432.3219
Total	**1.4972**	**17.0666**	**6.7630**	**0.0141**	**4.8612**	**0.7947**	**5.6560**	**2.5199**	**0.7311**	**3.2510**		**1,421.2605**	**1,421.2605**	**0.4425**		**1,432.3219**

Attachment: Appendix A - Air Quality and Greenhouse Gas Analysis (3309 : CONDITIONAL USE PERMIT

3.3 Grading - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0482	0.0306	0.3957	9.4000e-004	0.0894	5.6000e-004	0.0900	0.0237	5.1000e-004	0.0242		93.8617	93.8617	2.8600e-003		93.9332
Total	**0.0482**	**0.0306**	**0.3957**	**9.4000e-004**	**0.0894**	**5.6000e-004**	**0.0900**	**0.0237**	**5.1000e-004**	**0.0242**		**93.8617**	**93.8617**	**2.8600e-003**		**93.9332**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.8959	0.0000	1.8959	0.9828	0.0000	0.9828			0.0000			0.0000
Off-Road	1.4972	17.0666	6.7630	0.0141		0.7947	0.7947		0.7311	0.7311	0.0000	1,421.2605	1,421.2605	0.4425		1,432.3219
Total	**1.4972**	**17.0666**	**6.7630**	**0.0141**	**1.8959**	**0.7947**	**2.6906**	**0.9828**	**0.7311**	**1.7139**	**0.0000**	**1,421.2605**	**1,421.2605**	**0.4425**		**1,432.3219**

3.3 Grading - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0482	0.0306	0.3957	9.4000e-004	0.0894	5.6000e-004	0.0900	0.0237	5.1000e-004	0.0242		93.8617	93.8617	2.8600e-003		93.9332
Total	**0.0482**	**0.0306**	**0.3957**	**9.4000e-004**	**0.0894**	**5.6000e-004**	**0.0900**	**0.0237**	**5.1000e-004**	**0.0242**		**93.8617**	**93.8617**	**2.8600e-003**		**93.9332**

3.4 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.5919	17.4280	13.8766	0.0220		1.0580	1.0580		1.0216	1.0216		2,030.8389	2,030.8389	0.4088		2,041.0596
Total	**2.5919**	**17.4280**	**13.8766**	**0.0220**		**1.0580**	**1.0580**		**1.0216**	**1.0216**		**2,030.8389**	**2,030.8389**	**0.4088**		**2,041.0596**

Attachment: Appendix A - Air Quality and Greenhouse Gas Analysis (3309 : CONDITIONAL USE PERMIT

3.4 Building Construction - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	6.0200e-003	3.8300e-003	0.0495	1.2000e-004	0.0112	7.0000e-005	0.0113	2.9600e-003	6.0000e-005	3.0300e-003		11.7327	11.7327	3.6000e-004		11.7416
Total	**6.0200e-003**	**3.8300e-003**	**0.0495**	**1.2000e-004**	**0.0112**	**7.0000e-005**	**0.0113**	**2.9600e-003**	**6.0000e-005**	**3.0300e-003**		**11.7327**	**11.7327**	**3.6000e-004**		**11.7416**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.5919	17.4280	13.8766	0.0220		1.0580	1.0580		1.0216	1.0216	0.0000	2,030.8389	2,030.8389	0.4088		2,041.0596
Total	**2.5919**	**17.4280**	**13.8766**	**0.0220**		**1.0580**	**1.0580**		**1.0216**	**1.0216**	**0.0000**	**2,030.8389**	**2,030.8389**	**0.4088**		**2,041.0596**

3.4 Building Construction - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	6.0200e-003	3.8300e-003	0.0495	1.2000e-004	0.0112	7.0000e-005	0.0113	2.9600e-003	6.0000e-005	3.0300e-003		11.7327	11.7327	3.6000e-004		11.7416
Total	**6.0200e-003**	**3.8300e-003**	**0.0495**	**1.2000e-004**	**0.0112**	**7.0000e-005**	**0.0113**	**2.9600e-003**	**6.0000e-005**	**3.0300e-003**		**11.7327**	**11.7327**	**3.6000e-004**		**11.7416**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2721	15.9802	13.4870	0.0220		0.9158	0.9158		0.8846	0.8846		2,018.0224	2,018.0224	0.3879		2,027.7210
Total	**2.2721**	**15.9802**	**13.4870**	**0.0220**		**0.9158**	**0.9158**		**0.8846**	**0.8846**		**2,018.0224**	**2,018.0224**	**0.3879**		**2,027.7210**

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	5.5100e-003	3.3800e-003	0.0444	1.1000e-004	0.0112	7.0000e-005	0.0113	2.9600e-003	6.0000e-005	3.0300e-003		11.3752	11.3752	3.2000e-004		11.3832
Total	**5.5100e-003**	**3.3800e-003**	**0.0444**	**1.1000e-004**	**0.0112**	**7.0000e-005**	**0.0113**	**2.9600e-003**	**6.0000e-005**	**3.0300e-003**		**11.3752**	**11.3752**	**3.2000e-004**		**11.3832**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2721	15.9802	13.4870	0.0220		0.9158	0.9158		0.8846	0.8846	0.0000	2,018.0224	2,018.0224	0.3879		2,027.7210
Total	**2.2721**	**15.9802**	**13.4870**	**0.0220**		**0.9158**	**0.9158**		**0.8846**	**0.8846**	**0.0000**	**2,018.0224**	**2,018.0224**	**0.3879**		**2,027.7210**

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	5.5100e-003	3.3800e-003	0.0444	1.1000e-004	0.0112	7.0000e-005	0.0113	2.9600e-003	6.0000e-005	3.0300e-003		11.3752	11.3752	3.2000e-004		11.3832
Total	**5.5100e-003**	**3.3800e-003**	**0.0444**	**1.1000e-004**	**0.0112**	**7.0000e-005**	**0.0113**	**2.9600e-003**	**6.0000e-005**	**3.0300e-003**		**11.3752**	**11.3752**	**3.2000e-004**		**11.3832**

3.5 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	2.0936					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288		281.4481	281.4481	0.0238		282.0423
Total	**2.3601**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**		**281.4481**	**281.4481**	**0.0238**		**282.0423**

Attachment: Appendix A - Air Quality and Greenhouse Gas Analysis (3309 : CONDITIONAL USE PERMIT

3.5 Architectural Coating - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	2.0936					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288	0.0000	281.4481	281.4481	0.0238		282.0423
Total	**2.3601**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**	**0.0000**	**281.4481**	**281.4481**	**0.0238**		**282.0423**

3.5 Architectural Coating - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.6 Paving - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9038	9.1743	8.9025	0.0135		0.5225	0.5225		0.4815	0.4815		1,325.0953	1,325.0953	0.4112		1,335.3751
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9038**	**9.1743**	**8.9025**	**0.0135**		**0.5225**	**0.5225**		**0.4815**	**0.4815**		**1,325.0953**	**1,325.0953**	**0.4112**		**1,335.3751**

3.6 Paving - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0716	0.0439	0.5775	1.4900e-003	0.1453	9.0000e-004	0.1462	0.0385	8.3000e-004	0.0394		147.8779	147.8779	4.1400e-003		147.9814
Total	**0.0716**	**0.0439**	**0.5775**	**1.4900e-003**	**0.1453**	**9.0000e-004**	**0.1462**	**0.0385**	**8.3000e-004**	**0.0394**		**147.8779**	**147.8779**	**4.1400e-003**		**147.9814**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9038	9.1743	8.9025	0.0135		0.5225	0.5225		0.4815	0.4815	0.0000	1,325.0953	1,325.0953	0.4112		1,335.3751
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9038**	**9.1743**	**8.9025**	**0.0135**		**0.5225**	**0.5225**		**0.4815**	**0.4815**	**0.0000**	**1,325.0953**	**1,325.0953**	**0.4112**		**1,335.3751**

3.6 Paving - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0716	0.0439	0.5775	1.4900e-003	0.1453	9.0000e-004	0.1462	0.0385	8.3000e-004	0.0394		147.8779	147.8779	4.1400e-003		147.9814
Total	**0.0716**	**0.0439**	**0.5775**	**1.4900e-003**	**0.1453**	**9.0000e-004**	**0.1462**	**0.0385**	**8.3000e-004**	**0.0394**		**147.8779**	**147.8779**	**4.1400e-003**		**147.9814**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Attachment: Appendix A - Air Quality and Greenhouse Gas Analysis (3309 : CONDITIONAL USE PERMIT

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	5.5456	24.4040	26.1451	0.0757	3.6759	0.0513	3.7271	0.9766	0.0479	1.0245		7,750.9534	7,750.9534	0.8460		7,772.1033
Unmitigated	5.5456	24.4040	26.1451	0.0757	3.6759	0.0513	3.7271	0.9766	0.0479	1.0245		7,750.9534	7,750.9534	0.8460		7,772.1033

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Gasoline/Service Station	2,696.96	2,696.96	2696.96	1,744,364	1,744,364
Total	2,696.96	2,696.96	2,696.96	1,744,364	1,744,364

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Gasoline/Service Station	16.60	8.40	6.90	2.00	79.00	19.00	14	27	59

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Gasoline/Service Station	0.540000	0.180000	0.080000	0.120000	0.000000	0.000000	0.000000	0.070000	0.000000	0.000000	0.010000	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

Attachment: Appendix A - Air Quality and Greenhouse Gas Analysis (3309 : CONDITIONAL USE PERMIT

5.1 Mitigation Measures Energy

Exceed Title 24

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	2.1200e-003	0.0193	0.0162	1.2000e-004		1.4700e-003	1.4700e-003		1.4700e-003	1.4700e-003		23.1439	23.1439	4.4000e-004	4.2000e-004	23.2814
NaturalGas Unmitigated	2.1700e-003	0.0198	0.0166	1.2000e-004		1.5000e-003	1.5000e-003		1.5000e-003	1.5000e-003		23.7056	23.7056	4.5000e-004	4.3000e-004	23.8464

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Gasoline/Service Station	201.497	2.1700e-003	0.0198	0.0166	1.2000e-004		1.5000e-003	1.5000e-003		1.5000e-003	1.5000e-003		23.7056	23.7056	4.5000e-004	4.3000e-004	23.8464
Total		**2.1700e-003**	**0.0198**	**0.0166**	**1.2000e-004**		**1.5000e-003**	**1.5000e-003**		**1.5000e-003**	**1.5000e-003**		**23.7056**	**23.7056**	**4.5000e-004**	**4.3000e-004**	**23.8464**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Gasoline/Service Station	0.196723	2.1200e-003	0.0193	0.0162	1.2000e-004		1.4700e-003	1.4700e-003		1.4700e-003	1.4700e-003		23.1439	23.1439	4.4000e-004	4.2000e-004	23.2814
Total		**2.1200e-003**	**0.0193**	**0.0162**	**1.2000e-004**		**1.4700e-003**	**1.4700e-003**		**1.4700e-003**	**1.4700e-003**		**23.1439**	**23.1439**	**4.4000e-004**	**4.2000e-004**	**23.2814**

6.0 Area Detail

6.1 Mitigation Measures Area

No Hearths Installed

Attachment: Appendix A - Air Quality and Greenhouse Gas Analysis (3309 : CONDITIONAL USE PERMIT

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0506	2.0000e-005	1.6400e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.5000e-003	3.5000e-003	1.0000e-005		3.7400e-003
Unmitigated	0.0506	2.0000e-005	1.6400e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.5000e-003	3.5000e-003	1.0000e-005		3.7400e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	5.7400e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0447					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.5000e-004	2.0000e-005	1.6400e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.5000e-003	3.5000e-003	1.0000e-005		3.7400e-003
Total	**0.0506**	**2.0000e-005**	**1.6400e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**3.5000e-003**	**3.5000e-003**	**1.0000e-005**		**3.7400e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	5.7400e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0447					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.5000e-004	2.0000e-005	1.6400e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.5000e-003	3.5000e-003	1.0000e-005		3.7400e-003
Total	**0.0506**	**2.0000e-005**	**1.6400e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**3.5000e-003**	**3.5000e-003**	**1.0000e-005**		**3.7400e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

ARCO AM/PM Gas Station Iris Ave Moreno Valley

Riverside-South Coast County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Gasoline/Service Station	16.00	Pump	1.31	2,258.80	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.4	**Precipitation Freq (Days)**	28
Climate Zone	10			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Project site is 1.31 acres.

Construction Phase -

Grading - Grading entire 1.3 acres.

Fleet Mix - Assume 54% LDA, 18% LDT1, 8% LDT2, 12% MDV, 7% HHD, and 1% MC.

Construction Off-road Equipment Mitigation - Fugitive dust control with on-site watering three times daily.

Area Mitigation -

Energy Mitigation -

Water Mitigation - Project applicant will install low flow water applicance and water efficient irrigation system.

Waste Mitigation - Waste diversion would acheive 75% goal.

ARCO AM/PM Gas Station Iris Ave Moreno Valley - Riverside-South Coast County, Winter

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0
tblConstructionPhase	PhaseEndDate	4/1/2018	1/28/2019
tblConstructionPhase	PhaseEndDate	4/1/2018	1/14/2019
tblConstructionPhase	PhaseEndDate	4/1/2018	4/9/2018
tblConstructionPhase	PhaseEndDate	4/1/2018	1/28/2019
tblConstructionPhase	PhaseEndDate	4/1/2018	4/3/2018
tblConstructionPhase	PhaseStartDate	4/2/2018	1/15/2019
tblConstructionPhase	PhaseStartDate	4/2/2018	4/10/2018
tblConstructionPhase	PhaseStartDate	4/2/2018	4/4/2018
tblConstructionPhase	PhaseStartDate	4/2/2018	1/15/2019
tblFleetMix	HHD	0.07	0.07
tblFleetMix	LDA	0.54	0.54
tblFleetMix	LDT1	0.04	0.18
tblFleetMix	LDT2	0.18	0.08
tblFleetMix	LHD1	0.02	0.00
tblFleetMix	LHD2	5.3390e-003	0.00
tblFleetMix	MCY	4.6290e-003	0.01
tblFleetMix	MDV	0.12	0.12
tblFleetMix	MH	1.1200e-003	0.00
tblFleetMix	MHD	0.02	0.00
tblFleetMix	OBUS	1.3650e-003	0.00
tblFleetMix	SBUS	9.5900e-004	0.00
tblFleetMix	UBUS	1.2130e-003	0.00
tblGrading	AcresOfGrading	1.50	1.30
tblLandUse	LotAcreage	0.05	1.31
tblProjectCharacteristics	OperationalYear	2018	2020

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	2.5978	20.7789	13.9168	0.0222	5.8890	1.0581	6.8418	2.9774	1.0217	3.8540	0.0000	2,041.3660	2,041.3660	0.5427	0.0000	2,051.5945
2019	3.3339	15.9837	13.5231	0.0221	0.1453	0.9159	0.9271	0.0385	0.8846	0.8876	0.0000	2,028.2276	2,028.2276	0.4386	0.0000	2,037.9331
Maximum	**3.3339**	**20.7789**	**13.9168**	**0.0222**	**5.8890**	**1.0581**	**6.8418**	**2.9774**	**1.0217**	**3.8540**	**0.0000**	**2,041.3660**	**2,041.3660**	**0.5427**	**0.0000**	**2,051.5945**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	2.5978	20.7789	13.9168	0.0222	2.3513	1.0581	3.3041	1.1757	1.0217	2.0522	0.0000	2,041.3660	2,041.3660	0.5427	0.0000	2,051.5945
2019	3.3339	15.9837	13.5231	0.0221	0.1453	0.9159	0.9271	0.0385	0.8846	0.8876	0.0000	2,028.2276	2,028.2276	0.4386	0.0000	2,037.9331
Maximum	**3.3339**	**20.7789**	**13.9168**	**0.0222**	**2.3513**	**1.0581**	**3.3041**	**1.1757**	**1.0217**	**2.0522**	**0.0000**	**2,041.3660**	**2,041.3660**	**0.5427**	**0.0000**	**2,051.5945**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	58.63	0.00	45.54	59.74	0.00	38.00	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0506	2.0000e-005	1.6400e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.5000e-003	3.5000e-003	1.0000e-005		3.7400e-003
Energy	2.1700e-003	0.0198	0.0166	1.2000e-004		1.5000e-003	1.5000e-003		1.5000e-003	1.5000e-003		23.7056	23.7056	4.5000e-004	4.3000e-004	23.8464
Mobile	4.4504	23.7154	26.0021	0.0686	3.6759	0.0533	3.7292	0.9766	0.0498	1.0264		7,021.1740	7,021.1740	0.9300		7,044.4235
Total	**4.5032**	**23.7352**	**26.0203**	**0.0687**	**3.6759**	**0.0548**	**3.7307**	**0.9766**	**0.0513**	**1.0280**		**7,044.8831**	**7,044.8831**	**0.9304**	**4.3000e-004**	**7,068.2737**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0506	2.0000e-005	1.6400e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.5000e-003	3.5000e-003	1.0000e-005		3.7400e-003
Energy	2.1200e-003	0.0193	0.0162	1.2000e-004		1.4700e-003	1.4700e-003		1.4700e-003	1.4700e-003		23.1439	23.1439	4.4000e-004	4.2000e-004	23.2814
Mobile	4.4504	23.7154	26.0021	0.0686	3.6759	0.0533	3.7292	0.9766	0.0498	1.0264		7,021.1740	7,021.1740	0.9300		7,044.4235
Total	**4.5032**	**23.7347**	**26.0199**	**0.0687**	**3.6759**	**0.0548**	**3.7306**	**0.9766**	**0.0513**	**1.0279**		**7,044.3214**	**7,044.3214**	**0.9304**	**4.2000e-004**	**7,067.7087**

Attachment: Appendix A - Air Quality and Greenhouse Gas Analysis (3309 : CONDITIONAL USE PERMIT

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.06	0.00	0.00	0.01	0.01	0.00	2.33	0.01

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	4/2/2018	4/3/2018	5	2	
2	Grading	Grading	4/4/2018	4/9/2018	5	4	
3	Building Construction	Building Construction	4/10/2018	1/14/2019	5	200	
4	Architectural Coating	Architectural Coating	1/15/2019	1/28/2019	5	10	
5	Paving	Paving	1/15/2019	1/28/2019	5	10	

Acres of Grading (Site Preparation Phase): 1

Acres of Grading (Grading Phase): 1.3

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 3,388; Non-Residential Outdoor: 1,129; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Cranes	1	6.00	231	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Site Preparation	Graders	1	8.00	187	0.41
Paving	Pavers	1	6.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Grading	Rubber Tired Dozers	1	6.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	6.00	187	0.41
Paving	Paving Equipment	1	8.00	132	0.36
Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40
Building Construction	Welders	3	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Architectural Coating	1	0.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	1.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Clean Paved Roads

3.2 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					5.7996	0.0000	5.7996	2.9537	0.0000	2.9537			0.0000			0.0000
Off-Road	1.8061	20.7472	8.0808	0.0172		0.9523	0.9523		0.8761	0.8761		1,735.3630	1,735.3630	0.5402		1,748.8690
Total	**1.8061**	**20.7472**	**8.0808**	**0.0172**	**5.7996**	**0.9523**	**6.7518**	**2.9537**	**0.8761**	**3.8298**		**1,735.3630**	**1,735.3630**	**0.5402**		**1,748.8690**

3.2 Site Preparation - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0470	0.0317	0.3216	8.5000e-004	0.0894	5.6000e-004	0.0900	0.0237	5.1000e-004	0.0242		84.2175	84.2175	2.4900e-003		84.2797
Total	**0.0470**	**0.0317**	**0.3216**	**8.5000e-004**	**0.0894**	**5.6000e-004**	**0.0900**	**0.0237**	**5.1000e-004**	**0.0242**		**84.2175**	**84.2175**	**2.4900e-003**		**84.2797**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.2618	0.0000	2.2618	1.1519	0.0000	1.1519			0.0000			0.0000
Off-Road	1.8061	20.7472	8.0808	0.0172		0.9523	0.9523		0.8761	0.8761	0.0000	1,735.3630	1,735.3630	0.5402		1,748.8690
Total	**1.8061**	**20.7472**	**8.0808**	**0.0172**	**2.2618**	**0.9523**	**3.2141**	**1.1519**	**0.8761**	**2.0280**	**0.0000**	**1,735.3630**	**1,735.3630**	**0.5402**		**1,748.8690**

3.2 Site Preparation - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0470	0.0317	0.3216	8.5000e-004	0.0894	5.6000e-004	0.0900	0.0237	5.1000e-004	0.0242		84.2175	84.2175	2.4900e-003		84.2797
Total	**0.0470**	**0.0317**	**0.3216**	**8.5000e-004**	**0.0894**	**5.6000e-004**	**0.0900**	**0.0237**	**5.1000e-004**	**0.0242**		**84.2175**	**84.2175**	**2.4900e-003**		**84.2797**

3.3 Grading - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.8612	0.0000	4.8612	2.5199	0.0000	2.5199			0.0000			0.0000
Off-Road	1.4972	17.0666	6.7630	0.0141		0.7947	0.7947		0.7311	0.7311		1,421.2605	1,421.2605	0.4425		1,432.3219
Total	**1.4972**	**17.0666**	**6.7630**	**0.0141**	**4.8612**	**0.7947**	**5.6560**	**2.5199**	**0.7311**	**3.2510**		**1,421.2605**	**1,421.2605**	**0.4425**		**1,432.3219**

3.3 Grading - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0470	0.0317	0.3216	8.5000e-004	0.0894	5.6000e-004	0.0900	0.0237	5.1000e-004	0.0242		84.2175	84.2175	2.4900e-003		84.2797
Total	**0.0470**	**0.0317**	**0.3216**	**8.5000e-004**	**0.0894**	**5.6000e-004**	**0.0900**	**0.0237**	**5.1000e-004**	**0.0242**		**84.2175**	**84.2175**	**2.4900e-003**		**84.2797**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					1.8959	0.0000	1.8959	0.9828	0.0000	0.9828			0.0000			0.0000
Off-Road	1.4972	17.0666	6.7630	0.0141		0.7947	0.7947		0.7311	0.7311	0.0000	1,421.2605	1,421.2605	0.4425		1,432.3219
Total	**1.4972**	**17.0666**	**6.7630**	**0.0141**	**1.8959**	**0.7947**	**2.6906**	**0.9828**	**0.7311**	**1.7139**	**0.0000**	**1,421.2605**	**1,421.2605**	**0.4425**		**1,432.3219**

3.3 Grading - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0470	0.0317	0.3216	8.5000e-004	0.0894	5.6000e-004	0.0900	0.0237	5.1000e-004	0.0242		84.2175	84.2175	2.4900e-003		84.2797
Total	**0.0470**	**0.0317**	**0.3216**	**8.5000e-004**	**0.0894**	**5.6000e-004**	**0.0900**	**0.0237**	**5.1000e-004**	**0.0242**		**84.2175**	**84.2175**	**2.4900e-003**		**84.2797**

3.4 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.5919	17.4280	13.8766	0.0220		1.0580	1.0580		1.0216	1.0216		2,030.8389	2,030.8389	0.4088		2,041.0596
Total	**2.5919**	**17.4280**	**13.8766**	**0.0220**		**1.0580**	**1.0580**		**1.0216**	**1.0216**		**2,030.8389**	**2,030.8389**	**0.4088**		**2,041.0596**

3.4 Building Construction - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	5.8700e-003	3.9700e-003	0.0402	1.1000e-004	0.0112	7.0000e-005	0.0113	2.9600e-003	6.0000e-005	3.0300e-003		10.5272	10.5272	3.1000e-004		10.5350
Total	**5.8700e-003**	**3.9700e-003**	**0.0402**	**1.1000e-004**	**0.0112**	**7.0000e-005**	**0.0113**	**2.9600e-003**	**6.0000e-005**	**3.0300e-003**		**10.5272**	**10.5272**	**3.1000e-004**		**10.5350**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.5919	17.4280	13.8766	0.0220		1.0580	1.0580		1.0216	1.0216	0.0000	2,030.8389	2,030.8389	0.4088		2,041.0596
Total	**2.5919**	**17.4280**	**13.8766**	**0.0220**		**1.0580**	**1.0580**		**1.0216**	**1.0216**	**0.0000**	**2,030.8389**	**2,030.8389**	**0.4088**		**2,041.0596**

3.4 Building Construction - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	5.8700e-003	3.9700e-003	0.0402	1.1000e-004	0.0112	7.0000e-005	0.0113	2.9600e-003	6.0000e-005	3.0300e-003		10.5272	10.5272	3.1000e-004		10.5350
Total	**5.8700e-003**	**3.9700e-003**	**0.0402**	**1.1000e-004**	**0.0112**	**7.0000e-005**	**0.0113**	**2.9600e-003**	**6.0000e-005**	**3.0300e-003**		**10.5272**	**10.5272**	**3.1000e-004**		**10.5350**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2721	15.9802	13.4870	0.0220		0.9158	0.9158		0.8846	0.8846		2,018.0224	2,018.0224	0.3879		2,027.7210
Total	**2.2721**	**15.9802**	**13.4870**	**0.0220**		**0.9158**	**0.9158**		**0.8846**	**0.8846**		**2,018.0224**	**2,018.0224**	**0.3879**		**2,027.7210**

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	5.3800e-003	3.5000e-003	0.0360	1.0000e-004	0.0112	7.0000e-005	0.0113	2.9600e-003	6.0000e-005	3.0300e-003		10.2052	10.2052	2.8000e-004		10.2121
Total	**5.3800e-003**	**3.5000e-003**	**0.0360**	**1.0000e-004**	**0.0112**	**7.0000e-005**	**0.0113**	**2.9600e-003**	**6.0000e-005**	**3.0300e-003**		**10.2052**	**10.2052**	**2.8000e-004**		**10.2121**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.2721	15.9802	13.4870	0.0220		0.9158	0.9158		0.8846	0.8846	0.0000	2,018.0224	2,018.0224	0.3879		2,027.7210
Total	**2.2721**	**15.9802**	**13.4870**	**0.0220**		**0.9158**	**0.9158**		**0.8846**	**0.8846**	**0.0000**	**2,018.0224**	**2,018.0224**	**0.3879**		**2,027.7210**

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	5.3800e-003	3.5000e-003	0.0360	1.0000e-004	0.0112	7.0000e-005	0.0113	2.9600e-003	6.0000e-005	3.0300e-003		10.2052	10.2052	2.8000e-004		10.2121
Total	**5.3800e-003**	**3.5000e-003**	**0.0360**	**1.0000e-004**	**0.0112**	**7.0000e-005**	**0.0113**	**2.9600e-003**	**6.0000e-005**	**3.0300e-003**		**10.2052**	**10.2052**	**2.8000e-004**		**10.2121**

3.5 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	2.0936					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288		281.4481	281.4481	0.0238		282.0423
Total	**2.3601**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**		**281.4481**	**281.4481**	**0.0238**		**282.0423**

Attachment: Appendix A - Air Quality and Greenhouse Gas Analysis (3309 : CONDITIONAL USE PERMIT

3.5 Architectural Coating - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	2.0936					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288	0.0000	281.4481	281.4481	0.0238		282.0423
Total	**2.3601**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**	**0.0000**	**281.4481**	**281.4481**	**0.0238**		**282.0423**

3.5 Architectural Coating - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**		**0.0000**

3.6 Paving - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9038	9.1743	8.9025	0.0135		0.5225	0.5225		0.4815	0.4815		1,325.0953	1,325.0953	0.4112		1,335.3751
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9038**	**9.1743**	**8.9025**	**0.0135**		**0.5225**	**0.5225**		**0.4815**	**0.4815**		**1,325.0953**	**1,325.0953**	**0.4112**		**1,335.3751**

3.6 Paving - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0699	0.0455	0.4681	1.3300e-003	0.1453	9.0000e-004	0.1462	0.0385	8.3000e-004	0.0394		132.6672	132.6672	3.6000e-003		132.7572
Total	**0.0699**	**0.0455**	**0.4681**	**1.3300e-003**	**0.1453**	**9.0000e-004**	**0.1462**	**0.0385**	**8.3000e-004**	**0.0394**		**132.6672**	**132.6672**	**3.6000e-003**		**132.7572**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9038	9.1743	8.9025	0.0135		0.5225	0.5225		0.4815	0.4815	0.0000	1,325.0953	1,325.0953	0.4112		1,335.3751
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.9038**	**9.1743**	**8.9025**	**0.0135**		**0.5225**	**0.5225**		**0.4815**	**0.4815**	**0.0000**	**1,325.0953**	**1,325.0953**	**0.4112**		**1,335.3751**

3.6 Paving - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0699	0.0455	0.4681	1.3300e-003	0.1453	9.0000e-004	0.1462	0.0385	8.3000e-004	0.0394		132.6672	132.6672	3.6000e-003		132.7572
Total	**0.0699**	**0.0455**	**0.4681**	**1.3300e-003**	**0.1453**	**9.0000e-004**	**0.1462**	**0.0385**	**8.3000e-004**	**0.0394**		**132.6672**	**132.6672**	**3.6000e-003**		**132.7572**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Attachment: Appendix A - Air Quality and Greenhouse Gas Analysis (3309 : CONDITIONAL USE PERMIT

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.4504	23.7154	26.0021	0.0686	3.6759	0.0533	3.7292	0.9766	0.0498	1.0264		7,021.1740	7,021.1740	0.9300		7,044.4235
Unmitigated	4.4504	23.7154	26.0021	0.0686	3.6759	0.0533	3.7292	0.9766	0.0498	1.0264		7,021.1740	7,021.1740	0.9300		7,044.4235

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Gasoline/Service Station	2,696.96	2,696.96	2696.96	1,744,364	1,744,364
Total	2,696.96	2,696.96	2,696.96	1,744,364	1,744,364

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Gasoline/Service Station	16.60	8.40	6.90	2.00	79.00	19.00	14	27	59

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Gasoline/Service Station	0.540000	0.180000	0.080000	0.120000	0.000000	0.000000	0.000000	0.070000	0.000000	0.000000	0.010000	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	2.1200e-003	0.0193	0.0162	1.2000e-004		1.4700e-003	1.4700e-003		1.4700e-003	1.4700e-003		23.1439	23.1439	4.4000e-004	4.2000e-004	23.2814
NaturalGas Unmitigated	2.1700e-003	0.0198	0.0166	1.2000e-004		1.5000e-003	1.5000e-003		1.5000e-003	1.5000e-003		23.7056	23.7056	4.5000e-004	4.3000e-004	23.8464

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Gasoline/Service Station	201.497	2.1700e-003	0.0198	0.0166	1.2000e-004		1.5000e-003	1.5000e-003		1.5000e-003	1.5000e-003		23.7056	23.7056	4.5000e-004	4.3000e-004	23.8464
Total		**2.1700e-003**	**0.0198**	**0.0166**	**1.2000e-004**		**1.5000e-003**	**1.5000e-003**		**1.5000e-003**	**1.5000e-003**		**23.7056**	**23.7056**	**4.5000e-004**	**4.3000e-004**	**23.8464**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Gasoline/Service Station	0.196723	2.1200e-003	0.0193	0.0162	1.2000e-004		1.4700e-003	1.4700e-003		1.4700e-003	1.4700e-003		23.1439	23.1439	4.4000e-004	4.2000e-004	23.2814
Total		**2.1200e-003**	**0.0193**	**0.0162**	**1.2000e-004**		**1.4700e-003**	**1.4700e-003**		**1.4700e-003**	**1.4700e-003**		**23.1439**	**23.1439**	**4.4000e-004**	**4.2000e-004**	**23.2814**

6.0 Area Detail

6.1 Mitigation Measures Area

No Hearths Installed

Attachment: Appendix A - Air Quality and Greenhouse Gas Analysis (3309 : CONDITIONAL USE PERMIT

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0506	2.0000e-005	1.6400e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.5000e-003	3.5000e-003	1.0000e-005		3.7400e-003
Unmitigated	0.0506	2.0000e-005	1.6400e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.5000e-003	3.5000e-003	1.0000e-005		3.7400e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	5.7400e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0447					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.5000e-004	2.0000e-005	1.6400e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.5000e-003	3.5000e-003	1.0000e-005		3.7400e-003
Total	**0.0506**	**2.0000e-005**	**1.6400e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**3.5000e-003**	**3.5000e-003**	**1.0000e-005**		**3.7400e-003**

Attachment: Appendix A - Air Quality and Greenhouse Gas Analysis (3309 : CONDITIONAL USE PERMIT

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	5.7400e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0447					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	1.5000e-004	2.0000e-005	1.6400e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		3.5000e-003	3.5000e-003	1.0000e-005		3.7400e-003
Total	**0.0506**	**2.0000e-005**	**1.6400e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**3.5000e-003**	**3.5000e-003**	**1.0000e-005**		**3.7400e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

ARCO AM/PM Gas Station Iris Ave Moreno Valley

Riverside-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Gasoline/Service Station	16.00	Pump	1.31	2,258.80	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.4	**Precipitation Freq (Days)**	28
Climate Zone	10			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Project site is 1.31 acres.

Construction Phase -

Grading - Grading entire 1.3 acres.

Fleet Mix - Assume 54% LDA, 18% LDT1, 8% LDT2, 12% MDV, 7% HHD, and 1% MC.

Construction Off-road Equipment Mitigation - Fugitive dust control with on-site watering three times daily.

Area Mitigation -

Energy Mitigation -

Water Mitigation - Project applicant will install low flow water applicance and water efficient irrigation system.

Waste Mitigation - Waste diversion would acheive 75% goal.

Attachment: Appendix A - Air Quality and Greenhouse Gas Analysis (3309 : CONDITIONAL USE PERMIT

ARCO AM/PM Gas Station Iris Ave Moreno Valley - Riverside-South Coast County, Annual

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	0
tblConstructionPhase	PhaseEndDate	4/1/2018	1/28/2019
tblConstructionPhase	PhaseEndDate	4/1/2018	1/14/2019
tblConstructionPhase	PhaseEndDate	4/1/2018	4/9/2018
tblConstructionPhase	PhaseEndDate	4/1/2018	1/28/2019
tblConstructionPhase	PhaseEndDate	4/1/2018	4/3/2018
tblConstructionPhase	PhaseStartDate	4/2/2018	1/15/2019
tblConstructionPhase	PhaseStartDate	4/2/2018	4/10/2018
tblConstructionPhase	PhaseStartDate	4/2/2018	4/4/2018
tblConstructionPhase	PhaseStartDate	4/2/2018	1/15/2019
tblFleetMix	HHD	0.07	0.07
tblFleetMix	LDA	0.54	0.54
tblFleetMix	LDT1	0.04	0.18
tblFleetMix	LDT2	0.18	0.08
tblFleetMix	LHD1	0.02	0.00
tblFleetMix	LHD2	5.3390e-003	0.00
tblFleetMix	MCY	4.6290e-003	0.01
tblFleetMix	MDV	0.12	0.12
tblFleetMix	MH	1.1200e-003	0.00
tblFleetMix	MHD	0.02	0.00
tblFleetMix	OBUS	1.3650e-003	0.00
tblFleetMix	SBUS	9.5900e-004	0.00
tblFleetMix	UBUS	1.2130e-003	0.00
tblGrading	AcresOfGrading	1.50	1.30
tblLandUse	LotAcreage	0.05	1.31
tblProjectCharacteristics	OperationalYear	2018	2020

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.2517	1.7110	1.3449	2.1500e-003	0.0168	0.1031	0.1199	8.3400e-003	0.0994	0.1077	0.0000	180.3415	180.3415	0.0366	0.0000	181.2555
2019	0.0280	0.1352	0.1238	2.0000e-004	7.7000e-004	7.8400e-003	8.6100e-003	2.0000e-004	7.4800e-003	7.6800e-003	0.0000	17.1055	17.1055	3.7500e-003	0.0000	17.1993
Maximum	**0.2517**	**1.7110**	**1.3449**	**2.1500e-003**	**0.0168**	**0.1031**	**0.1199**	**8.3400e-003**	**0.0994**	**0.1077**	**0.0000**	**180.3415**	**180.3415**	**0.0366**	**0.0000**	**181.2555**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.2517	1.7110	1.3449	2.1500e-003	7.3600e-003	0.1031	0.1104	3.4600e-003	0.0994	0.1029	0.0000	180.3413	180.3413	0.0366	0.0000	181.2553
2019	0.0280	0.1352	0.1238	2.0000e-004	7.7000e-004	7.8400e-003	8.6100e-003	2.0000e-004	7.4800e-003	7.6800e-003	0.0000	17.1055	17.1055	3.7500e-003	0.0000	17.1992
Maximum	**0.2517**	**1.7110**	**1.3449**	**2.1500e-003**	**7.3600e-003**	**0.1031**	**0.1104**	**3.4600e-003**	**0.0994**	**0.1029**	**0.0000**	**180.3413**	**180.3413**	**0.0366**	**0.0000**	**181.2553**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**53.81**	**0.00**	**7.37**	**57.14**	**0.00**	**4.23**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**4-2-2018**	**7-1-2018**	0.6499	0.6499
2	**7-2-2018**	**10-1-2018**	0.6581	0.6581
3	**10-2-2018**	**1-1-2019**	0.6575	0.6575
4	**1-2-2019**	**4-1-2019**	0.1567	0.1567
		Highest	0.6581	0.6581

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	9.2300e-003	0.0000	2.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.0000e-004	4.0000e-004	0.0000	0.0000	4.2000e-004
Energy	4.0000e-004	3.6100e-003	3.0300e-003	2.0000e-005		2.7000e-004	2.7000e-004		2.7000e-004	2.7000e-004	0.0000	11.3664	11.3664	3.8000e-004	1.4000e-004	11.4164
Mobile	0.8029	4.4127	4.7034	0.0130	0.6580	9.4800e-003	0.6674	0.1750	8.8500e-003	0.1839	0.0000	1,207.2041	1,207.2041	0.1455	0.0000	1,210.8417
Waste						0.0000	0.0000		0.0000	0.0000	1.7498	0.0000	1.7498	0.1034	0.0000	4.3350
Water						0.0000	0.0000		0.0000	0.0000	0.0674	1.3427	1.4101	6.9800e-003	1.7000e-004	1.6368
Total	**0.8125**	**4.4164**	**4.7067**	**0.0130**	**0.6580**	**9.7500e-003**	**0.6677**	**0.1750**	**9.1200e-003**	**0.1842**	**1.8172**	**1,219.9137**	**1,221.7309**	**0.2563**	**3.1000e-004**	**1,228.2303**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	9.2300e-003	0.0000	2.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.0000e-004	4.0000e-004	0.0000	0.0000	4.2000e-004
Energy	3.9000e-004	3.5200e-003	2.9600e-003	2.0000e-005		2.7000e-004	2.7000e-004		2.7000e-004	2.7000e-004	0.0000	11.1903	11.1903	3.8000e-004	1.3000e-004	11.2394
Mobile	0.8029	4.4127	4.7034	0.0130	0.6580	9.4800e-003	0.6674	0.1750	8.8500e-003	0.1839	0.0000	1,207.2041	1,207.2041	0.1455	0.0000	1,210.8417
Waste						0.0000	0.0000		0.0000	0.0000	1.7498	0.0000	1.7498	0.1034	0.0000	4.3350
Water						0.0000	0.0000		0.0000	0.0000	0.0569	1.1771	1.2340	5.8900e-003	1.5000e-004	1.4254
Total	**0.8125**	**4.4163**	**4.7066**	**0.0130**	**0.6580**	**9.7500e-003**	**0.6677**	**0.1750**	**9.1200e-003**	**0.1842**	**1.8067**	**1,219.5719**	**1,221.3786**	**0.2552**	**2.8000e-004**	**1,227.8419**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.58**	**0.03**	**0.03**	**0.43**	**9.68**	**0.03**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	4/2/2018	4/3/2018	5	2	
2	Grading	Grading	4/4/2018	4/9/2018	5	4	
3	Building Construction	Building Construction	4/10/2018	1/14/2019	5	200	
4	Architectural Coating	Architectural Coating	1/15/2019	1/28/2019	5	10	
5	Paving	Paving	1/15/2019	1/28/2019	5	10	

Acres of Grading (Site Preparation Phase): 1

Acres of Grading (Grading Phase): 1.3

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 3,388; Non-Residential Outdoor: 1,129; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	1	6.00	9	0.56
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Cranes	1	6.00	231	0.29
Building Construction	Forklifts	1	6.00	89	0.20
Site Preparation	Graders	1	8.00	187	0.41
Paving	Pavers	1	6.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Grading	Rubber Tired Dozers	1	6.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Graders	1	6.00	187	0.41
Paving	Paving Equipment	1	8.00	132	0.36
Site Preparation	Rubber Tired Dozers	1	7.00	247	0.40
Building Construction	Welders	3	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Architectural Coating	1	0.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	7	1.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	5	13.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	8.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

Attachment: Appendix A - Air Quality and Greenhouse Gas Analysis (3309 : CONDITIONAL USE PERMIT

3.1 Mitigation Measures Construction

Water Exposed Area

Clean Paved Roads

3.2 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					5.8000e-003	0.0000	5.8000e-003	2.9500e-003	0.0000	2.9500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.8100e-003	0.0208	8.0800e-003	2.0000e-005		9.5000e-004	9.5000e-004		8.8000e-004	8.8000e-004	0.0000	1.5743	1.5743	4.9000e-004	0.0000	1.5866
Total	**1.8100e-003**	**0.0208**	**8.0800e-003**	**2.0000e-005**	**5.8000e-003**	**9.5000e-004**	**6.7500e-003**	**2.9500e-003**	**8.8000e-004**	**3.8300e-003**	**0.0000**	**1.5743**	**1.5743**	**4.9000e-004**	**0.0000**	**1.5866**

3.2 Site Preparation - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	3.0000e-005	3.4000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0784	0.0784	0.0000	0.0000	0.0784
Total	**4.0000e-005**	**3.0000e-005**	**3.4000e-004**	**0.0000**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0784**	**0.0784**	**0.0000**	**0.0000**	**0.0784**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.2600e-003	0.0000	2.2600e-003	1.1500e-003	0.0000	1.1500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.8100e-003	0.0208	8.0800e-003	2.0000e-005		9.5000e-004	9.5000e-004		8.8000e-004	8.8000e-004	0.0000	1.5743	1.5743	4.9000e-004	0.0000	1.5866
Total	**1.8100e-003**	**0.0208**	**8.0800e-003**	**2.0000e-005**	**2.2600e-003**	**9.5000e-004**	**3.2100e-003**	**1.1500e-003**	**8.8000e-004**	**2.0300e-003**	**0.0000**	**1.5743**	**1.5743**	**4.9000e-004**	**0.0000**	**1.5866**

3.2 Site Preparation - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	3.0000e-005	3.4000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0784	0.0784	0.0000	0.0000	0.0784
Total	**4.0000e-005**	**3.0000e-005**	**3.4000e-004**	**0.0000**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**2.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.0784**	**0.0784**	**0.0000**	**0.0000**	**0.0784**

3.3 Grading - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					9.7200e-003	0.0000	9.7200e-003	5.0400e-003	0.0000	5.0400e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.9900e-003	0.0341	0.0135	3.0000e-005		1.5900e-003	1.5900e-003		1.4600e-003	1.4600e-003	0.0000	2.5787	2.5787	8.0000e-004	0.0000	2.5988
Total	**2.9900e-003**	**0.0341**	**0.0135**	**3.0000e-005**	**9.7200e-003**	**1.5900e-003**	**0.0113**	**5.0400e-003**	**1.4600e-003**	**6.5000e-003**	**0.0000**	**2.5787**	**2.5787**	**8.0000e-004**	**0.0000**	**2.5988**

3.3 Grading - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.0000e-005	7.0000e-005	6.8000e-004	0.0000	1.8000e-004	0.0000	1.8000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.1567	0.1567	0.0000	0.0000	0.1568
Total	**9.0000e-005**	**7.0000e-005**	**6.8000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**1.8000e-004**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.1567**	**0.1567**	**0.0000**	**0.0000**	**0.1568**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.7900e-003	0.0000	3.7900e-003	1.9700e-003	0.0000	1.9700e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.9900e-003	0.0341	0.0135	3.0000e-005		1.5900e-003	1.5900e-003		1.4600e-003	1.4600e-003	0.0000	2.5787	2.5787	8.0000e-004	0.0000	2.5988
Total	**2.9900e-003**	**0.0341**	**0.0135**	**3.0000e-005**	**3.7900e-003**	**1.5900e-003**	**5.3800e-003**	**1.9700e-003**	**1.4600e-003**	**3.4300e-003**	**0.0000**	**2.5787**	**2.5787**	**8.0000e-004**	**0.0000**	**2.5988**

3.3 Grading - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.0000e-005	7.0000e-005	6.8000e-004	0.0000	1.8000e-004	0.0000	1.8000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.1567	0.1567	0.0000	0.0000	0.1568
Total	**9.0000e-005**	**7.0000e-005**	**6.8000e-004**	**0.0000**	**1.8000e-004**	**0.0000**	**1.8000e-004**	**5.0000e-005**	**0.0000**	**5.0000e-005**	**0.0000**	**0.1567**	**0.1567**	**0.0000**	**0.0000**	**0.1568**

3.4 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2462	1.6557	1.3183	2.0900e-003		0.1005	0.1005		0.0971	0.0971	0.0000	175.0229	175.0229	0.0352	0.0000	175.9037
Total	**0.2462**	**1.6557**	**1.3183**	**2.0900e-003**		**0.1005**	**0.1005**		**0.0971**	**0.0971**	**0.0000**	**175.0229**	**175.0229**	**0.0352**	**0.0000**	**175.9037**

Attachment: Appendix A - Air Quality and Greenhouse Gas Analysis (3309 : CONDITIONAL USE PERMIT

3.4 Building Construction - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2000e-004	3.9000e-004	4.0200e-003	1.0000e-005	1.0400e-003	1.0000e-005	1.0500e-003	2.8000e-004	1.0000e-005	2.8000e-004	0.0000	0.9306	0.9306	3.0000e-005	0.0000	0.9313
Total	**5.2000e-004**	**3.9000e-004**	**4.0200e-003**	**1.0000e-005**	**1.0400e-003**	**1.0000e-005**	**1.0500e-003**	**2.8000e-004**	**1.0000e-005**	**2.8000e-004**	**0.0000**	**0.9306**	**0.9306**	**3.0000e-005**	**0.0000**	**0.9313**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2462	1.6557	1.3183	2.0900e-003		0.1005	0.1005		0.0971	0.0971	0.0000	175.0227	175.0227	0.0352	0.0000	175.9035
Total	**0.2462**	**1.6557**	**1.3183**	**2.0900e-003**		**0.1005**	**0.1005**		**0.0971**	**0.0971**	**0.0000**	**175.0227**	**175.0227**	**0.0352**	**0.0000**	**175.9035**

Attachment: Appendix A - Air Quality and Greenhouse Gas Analysis (3309 : CONDITIONAL USE PERMIT

3.4 Building Construction - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2000e-004	3.9000e-004	4.0200e-003	1.0000e-005	1.0400e-003	1.0000e-005	1.0500e-003	2.8000e-004	1.0000e-005	2.8000e-004	0.0000	0.9306	0.9306	3.0000e-005	0.0000	0.9313
Total	**5.2000e-004**	**3.9000e-004**	**4.0200e-003**	**1.0000e-005**	**1.0400e-003**	**1.0000e-005**	**1.0500e-003**	**2.8000e-004**	**1.0000e-005**	**2.8000e-004**	**0.0000**	**0.9306**	**0.9306**	**3.0000e-005**	**0.0000**	**0.9313**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0114	0.0799	0.0674	1.1000e-004		4.5800e-003	4.5800e-003		4.4200e-003	4.4200e-003	0.0000	9.1536	9.1536	1.7600e-003	0.0000	9.1976
Total	**0.0114**	**0.0799**	**0.0674**	**1.1000e-004**		**4.5800e-003**	**4.5800e-003**		**4.4200e-003**	**4.4200e-003**	**0.0000**	**9.1536**	**9.1536**	**1.7600e-003**	**0.0000**	**9.1976**

Attachment: Appendix A - Air Quality and Greenhouse Gas Analysis (3309 : CONDITIONAL USE PERMIT

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-005	2.0000e-005	1.9000e-004	0.0000	5.0000e-005	0.0000	6.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0475	0.0475	0.0000	0.0000	0.0475
Total	**2.0000e-005**	**2.0000e-005**	**1.9000e-004**	**0.0000**	**5.0000e-005**	**0.0000**	**6.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0475**	**0.0475**	**0.0000**	**0.0000**	**0.0475**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0114	0.0799	0.0674	1.1000e-004		4.5800e-003	4.5800e-003		4.4200e-003	4.4200e-003	0.0000	9.1536	9.1536	1.7600e-003	0.0000	9.1976
Total	**0.0114**	**0.0799**	**0.0674**	**1.1000e-004**		**4.5800e-003**	**4.5800e-003**		**4.4200e-003**	**4.4200e-003**	**0.0000**	**9.1536**	**9.1536**	**1.7600e-003**	**0.0000**	**9.1976**

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.0000e-005	2.0000e-005	1.9000e-004	0.0000	5.0000e-005	0.0000	6.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0475	0.0475	0.0000	0.0000	0.0475
Total	**2.0000e-005**	**2.0000e-005**	**1.9000e-004**	**0.0000**	**5.0000e-005**	**0.0000**	**6.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0475**	**0.0475**	**0.0000**	**0.0000**	**0.0475**

3.5 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0105					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.3300e-003	9.1800e-003	9.2100e-003	1.0000e-005		6.4000e-004	6.4000e-004		6.4000e-004	6.4000e-004	0.0000	1.2766	1.2766	1.1000e-004	0.0000	1.2793
Total	**0.0118**	**9.1800e-003**	**9.2100e-003**	**1.0000e-005**		**6.4000e-004**	**6.4000e-004**		**6.4000e-004**	**6.4000e-004**	**0.0000**	**1.2766**	**1.2766**	**1.1000e-004**	**0.0000**	**1.2793**

3.5 Architectural Coating - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0105					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.3300e-003	9.1800e-003	9.2100e-003	1.0000e-005		6.4000e-004	6.4000e-004		6.4000e-004	6.4000e-004	0.0000	1.2766	1.2766	1.1000e-004	0.0000	1.2793
Total	**0.0118**	**9.1800e-003**	**9.2100e-003**	**1.0000e-005**		**6.4000e-004**	**6.4000e-004**		**6.4000e-004**	**6.4000e-004**	**0.0000**	**1.2766**	**1.2766**	**1.1000e-004**	**0.0000**	**1.2793**

3.5 Architectural Coating - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.6 Paving - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.5200e-003	0.0459	0.0445	7.0000e-005		2.6100e-003	2.6100e-003		2.4100e-003	2.4100e-003	0.0000	6.0105	6.0105	1.8700e-003	0.0000	6.0572
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**4.5200e-003**	**0.0459**	**0.0445**	**7.0000e-005**		**2.6100e-003**	**2.6100e-003**		**2.4100e-003**	**2.4100e-003**	**0.0000**	**6.0105**	**6.0105**	**1.8700e-003**	**0.0000**	**6.0572**

3.6 Paving - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.2000e-004	2.4000e-004	2.4700e-003	1.0000e-005	7.1000e-004	0.0000	7.2000e-004	1.9000e-004	0.0000	1.9000e-004	0.0000	0.6173	0.6173	2.0000e-005	0.0000	0.6177
Total	**3.2000e-004**	**2.4000e-004**	**2.4700e-003**	**1.0000e-005**	**7.1000e-004**	**0.0000**	**7.2000e-004**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.6173**	**0.6173**	**2.0000e-005**	**0.0000**	**0.6177**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.5200e-003	0.0459	0.0445	7.0000e-005		2.6100e-003	2.6100e-003		2.4100e-003	2.4100e-003	0.0000	6.0105	6.0105	1.8700e-003	0.0000	6.0572
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**4.5200e-003**	**0.0459**	**0.0445**	**7.0000e-005**		**2.6100e-003**	**2.6100e-003**		**2.4100e-003**	**2.4100e-003**	**0.0000**	**6.0105**	**6.0105**	**1.8700e-003**	**0.0000**	**6.0572**

3.6 Paving - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.2000e-004	2.4000e-004	2.4700e-003	1.0000e-005	7.1000e-004	0.0000	7.2000e-004	1.9000e-004	0.0000	1.9000e-004	0.0000	0.6173	0.6173	2.0000e-005	0.0000	0.6177
Total	**3.2000e-004**	**2.4000e-004**	**2.4700e-003**	**1.0000e-005**	**7.1000e-004**	**0.0000**	**7.2000e-004**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.6173**	**0.6173**	**2.0000e-005**	**0.0000**	**0.6177**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Attachment: Appendix A - Air Quality and Greenhouse Gas Analysis (3309 : CONDITIONAL USE PERMIT

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.8029	4.4127	4.7034	0.0130	0.6580	9.4800e-003	0.6674	0.1750	8.8500e-003	0.1839	0.0000	1,207.2041	1,207.2041	0.1455	0.0000	1,210.8417
Unmitigated	0.8029	4.4127	4.7034	0.0130	0.6580	9.4800e-003	0.6674	0.1750	8.8500e-003	0.1839	0.0000	1,207.2041	1,207.2041	0.1455	0.0000	1,210.8417

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Gasoline/Service Station	2,696.96	2,696.96	2696.96	1,744,364	1,744,364
Total	2,696.96	2,696.96	2,696.96	1,744,364	1,744,364

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Gasoline/Service Station	16.60	8.40	6.90	2.00	79.00	19.00	14	27	59

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Gasoline/Service Station	0.540000	0.180000	0.080000	0.120000	0.000000	0.000000	0.000000	0.070000	0.000000	0.000000	0.010000	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	7.3586	7.3586	3.0000e-004	6.0000e-005	7.3849
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	7.4417	7.4417	3.1000e-004	6.0000e-005	7.4683
NaturalGas Mitigated	3.9000e-004	3.5200e-003	2.9600e-003	2.0000e-005		2.7000e-004	2.7000e-004		2.7000e-004	2.7000e-004	0.0000	3.8317	3.8317	7.0000e-005	7.0000e-005	3.8545
NaturalGas Unmitigated	4.0000e-004	3.6100e-003	3.0300e-003	2.0000e-005		2.7000e-004	2.7000e-004		2.7000e-004	2.7000e-004	0.0000	3.9247	3.9247	8.0000e-005	7.0000e-005	3.9481

Attachment: Appendix A - Air Quality and Greenhouse Gas Analysis (3309 : CONDITIONAL USE PERMIT

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Gasoline/Service Station	73546.5	4.0000e-004	3.6100e-003	3.0300e-003	2.0000e-005		2.7000e-004	2.7000e-004		2.7000e-004	2.7000e-004	0.0000	3.9247	3.9247	8.0000e-005	7.0000e-005	3.9481
Total		**4.0000e-004**	**3.6100e-003**	**3.0300e-003**	**2.0000e-005**		**2.7000e-004**	**2.7000e-004**		**2.7000e-004**	**2.7000e-004**	**0.0000**	**3.9247**	**3.9247**	**8.0000e-005**	**7.0000e-005**	**3.9481**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Gasoline/Service Station	71803.9	3.9000e-004	3.5200e-003	2.9600e-003	2.0000e-005		2.7000e-004	2.7000e-004		2.7000e-004	2.7000e-004	0.0000	3.8317	3.8317	7.0000e-005	7.0000e-005	3.8545
Total		**3.9000e-004**	**3.5200e-003**	**2.9600e-003**	**2.0000e-005**		**2.7000e-004**	**2.7000e-004**		**2.7000e-004**	**2.7000e-004**	**0.0000**	**3.8317**	**3.8317**	**7.0000e-005**	**7.0000e-005**	**3.8545**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Gasoline/Service Station	23356	7.4417	3.1000e-004	6.0000e-005	7.4683
Total		**7.4417**	**3.1000e-004**	**6.0000e-005**	**7.4683**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Gasoline/Service Station	23095.1	7.3586	3.0000e-004	6.0000e-005	7.3849
Total		**7.3586**	**3.0000e-004**	**6.0000e-005**	**7.3849**

6.0 Area Detail

6.1 Mitigation Measures Area

No Hearths Installed

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	9.2300e-003	0.0000	2.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.0000e-004	4.0000e-004	0.0000	0.0000	4.2000e-004
Unmitigated	9.2300e-003	0.0000	2.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.0000e-004	4.0000e-004	0.0000	0.0000	4.2000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.0500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	8.1600e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.0000e-005	0.0000	2.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.0000e-004	4.0000e-004	0.0000	0.0000	4.2000e-004
Total	**9.2300e-003**	**0.0000**	**2.1000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**4.0000e-004**	**4.0000e-004**	**0.0000**	**0.0000**	**4.2000e-004**

Attachment: Appendix A - Air Quality and Greenhouse Gas Analysis (3309 : CONDITIONAL USE PERMIT

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	1.0500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	8.1600e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.0000e-005	0.0000	2.1000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	4.0000e-004	4.0000e-004	0.0000	0.0000	4.2000e-004
Total	**9.2300e-003**	**0.0000**	**2.1000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**4.0000e-004**	**4.0000e-004**	**0.0000**	**0.0000**	**4.2000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Use Water Efficient Irrigation System

Attachment: Appendix A - Air Quality and Greenhouse Gas Analysis (3309 : CONDITIONAL USE PERMIT

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	1.2340	5.8900e-003	1.5000e-004	1.4254
Unmitigated	1.4101	6.9800e-003	1.7000e-004	1.6368

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Gasoline/Service Station	0.21251 / 0.130248	1.4101	6.9800e-003	1.7000e-004	1.6368
Total		**1.4101**	**6.9800e-003**	**1.7000e-004**	**1.6368**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Gasoline/Service Station	0.179359 / 0.122303	1.2340	5.8900e-003	1.5000e-004	1.4254
Total		**1.2340**	**5.8900e-003**	**1.5000e-004**	**1.4254**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	1.7498	0.1034	0.0000	4.3350
Unmitigated	1.7498	0.1034	0.0000	4.3350

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Gasoline/Service Station	8.62	1.7498	0.1034	0.0000	4.3350
Total		**1.7498**	**0.1034**	**0.0000**	**4.3350**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Gasoline/Service Station	8.62	1.7498	0.1034	0.0000	4.3350
Total		**1.7498**	**0.1034**	**0.0000**	**4.3350**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

Attachment: Appendix A - Air Quality and Greenhouse Gas Analysis (3309 : CONDITIONAL USE PERMIT

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

BIOLOGICAL RESOURCES ASSESSMENT AND MSHCP CONSISTENCY ANALYSIS AND HABITAT ASSESSMENT

AM/PM GASOLINE SERVICE STATION PROJECT

CITY OF MORENO VALLEY

RIVERSIDE COUNTY, CALIFORNIA

LSA

September 2017

BIOLOGICAL RESOURCES ASSESSMENT AND MSHCP CONSISTENCY ANALYSIS AND HABITAT ASSESSMENT

AM/PM GASOLINE SERVICE STATION PROJECT

CITY OF MORENO VALLEY

RIVERSIDE COUNTY, CALIFORNIA

Prepared for:

Eric LeVaughn
Sater Oil International
683 Cliffside Drive
San Dimas, California 91773-2957

Prepared by:

LSA
1500 Iowa Avenue, Suite 200
Riverside, California 92507
(951) 781-9210

Project No. SAT1701

LSA

September 2017

TABLE OF CONTENTS

APPENDIX

FIGURES

INTRODUCTION

LSA has conducted a biological resources survey and Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) consistency analysis for the proposed 1.3-acre AM/PM Gasoline Service Station Project (project). The project site is located at the northwest corner of Iris Avenue and Oliver Street in the City of Moreno Valley, (Assessor's Parcel Number 486-310-038). Figure 1 depicts the project location. Figure 2 provides an aerial photograph of the project site to show existing conditions. Figure 3 provides representative site photographs.

BACKGROUND

Mr. Eric Le Vaughn, Sater Oil International, requested LSA to complete the following tasks to acquire development entitlements from the City of Moreno Valley:

- Complete Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) consistency analysis;
- Evaluate California Environmental Quality Act (CEQA) thresholds of significance; and
- Determine the next steps for CEQA compliance.

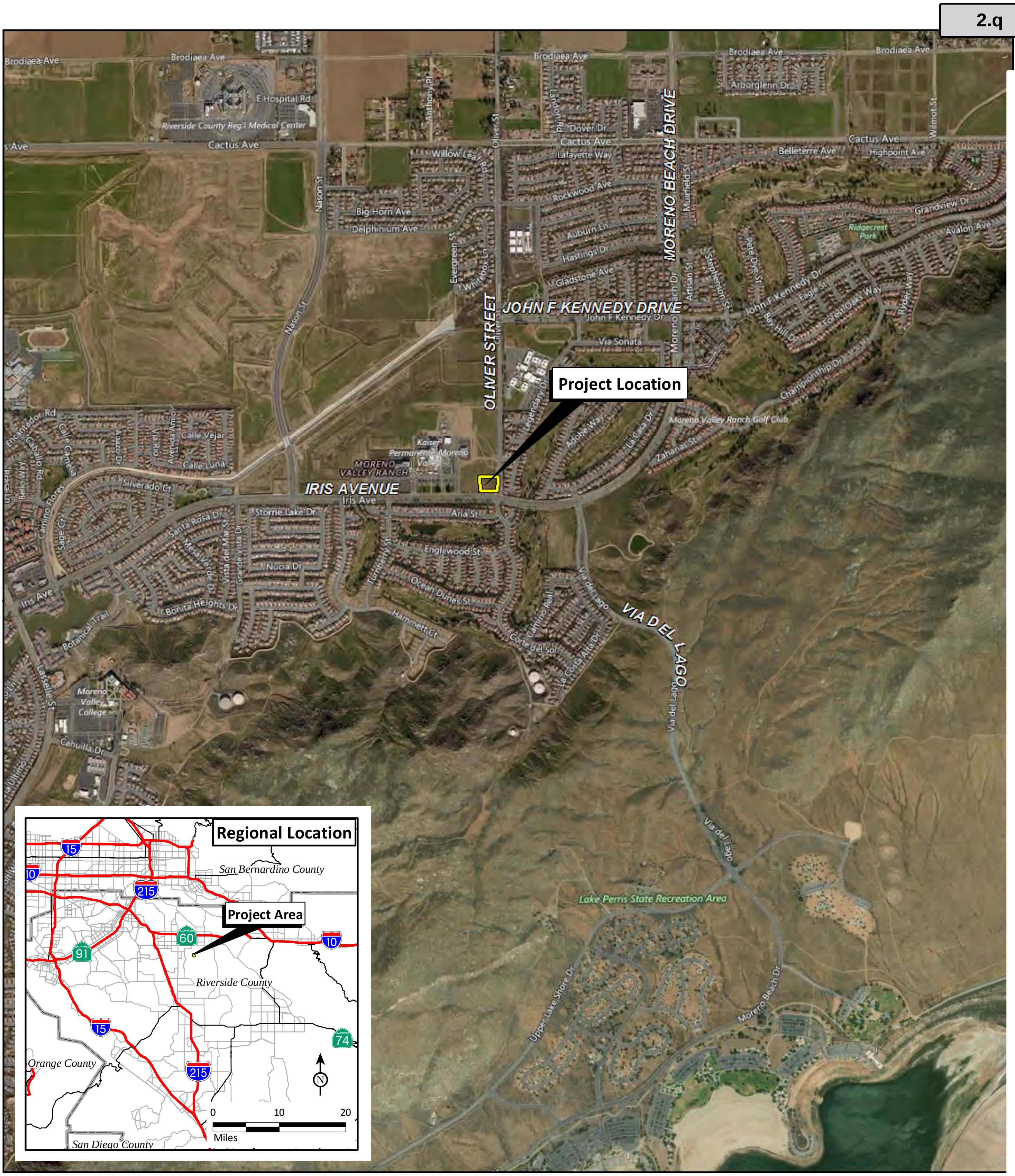
METHODS

Literature Review

A literature review was conducted to determine the existence or potential occurrence of special-status plant and animal species on the project site and in the project vicinity. Database records for the *Sunnymead* and *Perris, California* U.S. Geological Survey (USGS) 7.5-minute series quadrangles and surrounding quadrangles were searched on August 30, 2017, using the California Department of Fish and Wildlife (CDFW) California Natural Diversity Data Base *Rarefind 5* online application (https://map.dfg.ca.gov/rarefind/) and the California Native Plant Society's *Inventory of Rare and Endangered Plants* (http://www.cnps.org/inventory). The United State Fish and Wildlife Service (USFWS) database of designated Critical Habitat, the Riverside County Integrated Project (RCIP) Conservation Summary Report (http://onlineservices.rctlma.org/content/rcip_report_generator.aspx), and Volume 1 of the MSHCP (Riverside County Transportation and Land Management Agency) were queried to determine MSHCP habitat assessment and survey requirements. Soil information was taken from electronic data provided by the Web Soil Survey (Natural Resource Conservation Service 2013). Current and historical aerial photographs were also reviewed in Google Earth (Google Earth 2016).

Field Surveys

Habitat assessments and focused surveys were conducted by LSA Biologist Lonnie Rodriguez on August 30, 2017. Weather conditions consisted of clear skies, warm temperatures (87 to 95° F), calm winds, and visibility of 10 miles. Observations regarding general site conditions, vegetation, potential jurisdictional waters, and habitat suitability for special-interest plant and wildlife species and other biological resources were recorded. All plant and animal species observed during the field survey are listed as Appendix A.



LSA

LEGEND

▭ Project Boundary

N

0 1000 2000

FEET

FIGURE 1

ARCO Iris and Olive
Moreno Valley

Regional and Project Location

SOURCE: Bing Aerial, 2015; Riverside County, 2015.

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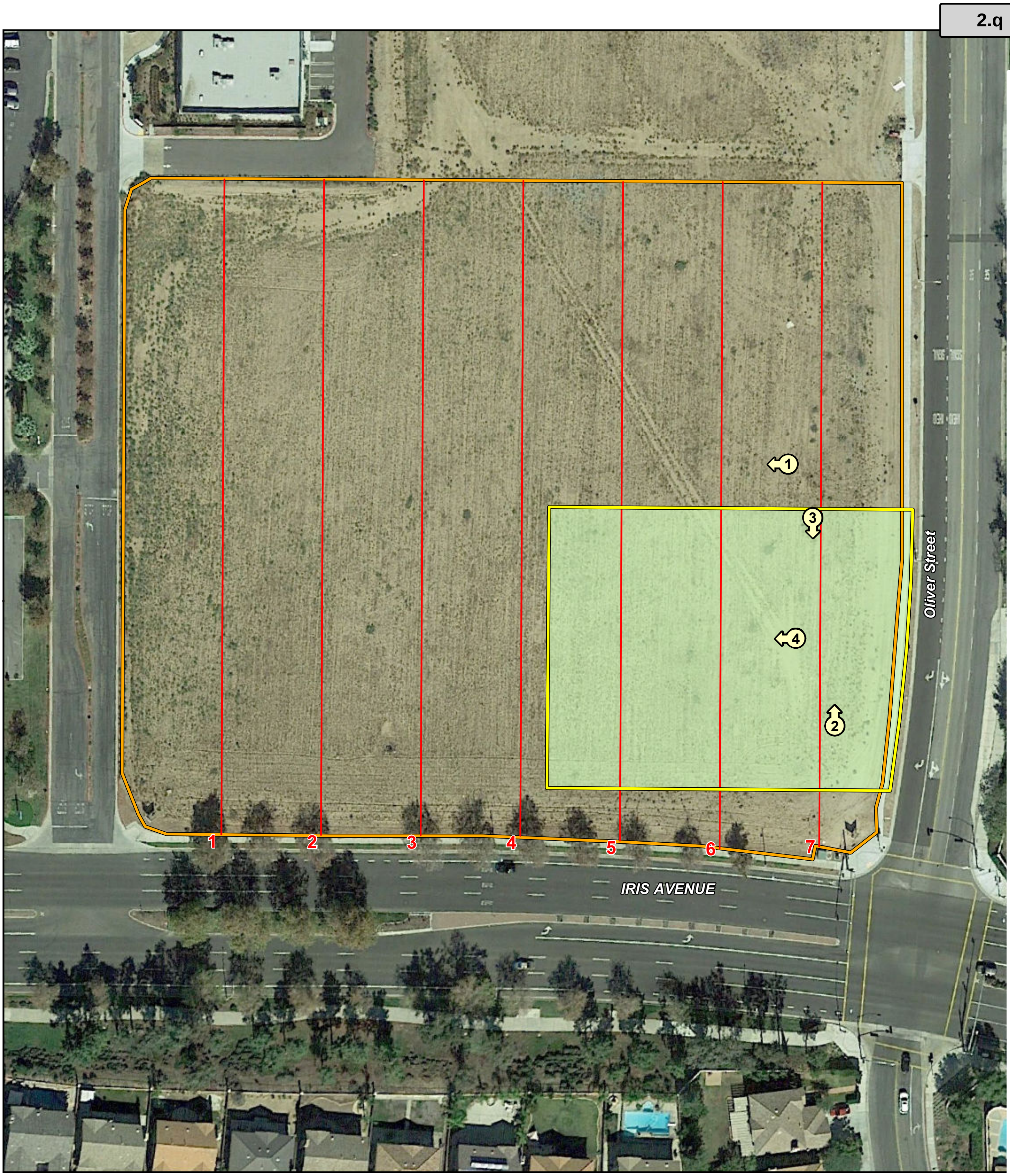

LSA

FIGURE

LEGEND

☐ Biological Study Area

☐ Additional Burrowing Owl Survey Area

— Burrowing Owl Transects

Photo Location

Land Cover

🟩 Disturbed (Disced Field)

N

0 50 100
FEET

ARCO Iris and Olive
Moreno Valle

Biological Study Area, Burrowing Ow
Transects, Land Cover and Photo Locations

SOURCE: Google Earth, 2016.

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Photograph 1: *View looking east (8/30/2017).*

Photograph 2: *View looking north (8/30/2017).*

Photograph 3: *View looking south (8/30/2017)*

Photograph 4: *View of Botta's gopher hole (8/30/2017).*

LSA

FIGURE

ARCO Iris and Olive
Moreno Valle

Site Photographs

Attachment: Appendix B - Biological Resources Assessment (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

The project site is located within the MSHCP City of Moreno Valley Area Plan. The project is not located in a criteria cell and is not adjacent to Public/Quasi-Public or Conservation Land. The project site was assessed for the presence of riparian/riverine and vernal pool resources.

MSHCP Section 6.1.3 NEPSSA Plants Habitat Assessment

No Narrow Endemic Plant Species Survey Area (NEPSSA) survey is needed within this cell.[1]

MSHCP Section 6.3.2 Burrowing Owl Habitat Suitability Assessment

A burrowing owl habitat assessment was conducted in accordance with MSHCP accepted guidelines (*Burrowing Owl Survey Instructions for the Western Riverside County Multiple Species Habitat Conservation Plan Area*, Riverside County Environmental Programs Department, March 29, 2006). The project is adjacent to the MSHCP Burrowing Owl Survey Area. A burrowing owl survey was conducted on the undeveloped project site and adjacent survey buffer area, since there was potential for suitable burrows or for owls to occur in the remainder of the vacant lot. The survey was conducted by walking throughout all potential suitable habitat on the project site using transects spaced at no more than 100 feet, which allowed for 100 percent visual coverage of suitable habitat. Any burrows encountered during the survey were examined for owl sign (e.g., feathers, pellets, whitewash, and prey remnants).

MSHCP Section 6.1.2 Species Associated with Riparian and Riverine Habitat

No riparian habitat was identified on the project area nor were species associated with riparian habitat identified.

Jurisdictional Waters and Streambeds

The site was assessed for the presence of potential jurisdictional waters subject to the regulatory authority of the U.S. Army Corps of Engineers (USACE), CDFW, and Regional Water Quality Control Board (RWQCB). Any areas meeting these definitions were measured and mapped onto an aerial photograph in the field.

EXISTING SETTING

The 1.3-acre project site (survey area) is primarily vacant and not utilized at this time. The project site is bordered by residential and commercial development on all sides.

RESULTS

Topography and Soils

The topography of the project site slightly drops in elevation from the south to north. The elevation averaged 1,580 feet above mean sea level. As Figure 4 shows, the soils within the project site consist

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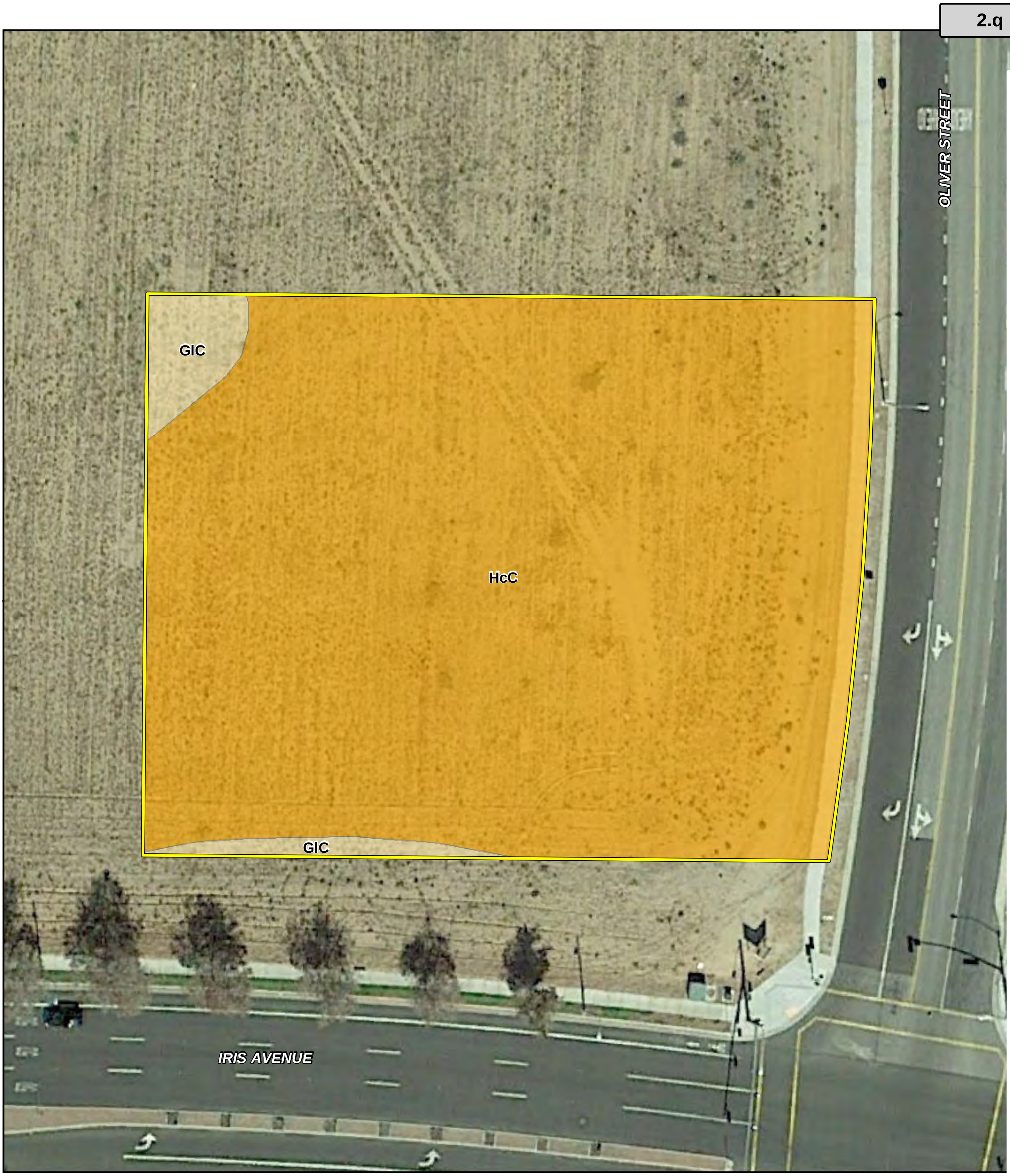
[1] https://www.wrc-rca.org/rcamaps/conservation-summary-report-generator/

of Gorgonio loamy sand, deep, 2 to 8 percent slopes (GlC), and Hanford coarse sandy loam, 2 to 8 percent slopes (HcC).



LSA

FIGURE

LEGEND

☐ Project Location

Soils

🟨 GlC: Gorgonio loamy sand, deep, 2 to 8 percent slopes

🟧 HcC: Hanford coarse sandy loam, 2 to 8 percent slopes

ARCO Iris and Olive
Moreno Valle

Soils

SOURCE: Google Earth, 2016; Soil Data Mart, 2015

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Vegetation

The field is unvegetated since it has been recently plowed for weed abatement. Emergent plant and plant debris includes Saharan mustard (*Brassica tournefortii*), Russian thistle (*Salsola tragus*), doveweed (*Croton setigerus*), puncture vine (*Tribulus terrestris*), red brome (*Bromus madritensis* ssp. *rubens*), flax-leaved horseweed (*Erigeron bonariensis*), morning glory (*Calystegia macrostegia*), Jimsonweed (*Datura wrightii*), and Fremont's goosefoot (*Chenopodium fremontii*). At the time of the survey, the ground was bare with exposed soil, as shown in previously referenced Figure 3.

Riparian/Riverine Habitat

No riparian or riverine habitat was identified within or adjacent to the project area.

Non-Federal Jurisdictional Waters, Wetlands, and Streambeds Regulated by CDFW

No federal jurisdictional waters, wetlands, and/or streambeds regulated by CDFW were identified within the project area.

Wildlife

Wildlife identified within the project area was minimal. No burrowing owl complexes were identified and the two burrows identified were occupied by Botta's pocket gopher (*Thomomys bottae*). See Appendix A, Animal Species Observed.

Special-Status Species

No suitable habitat is present on the project site for the majority of the special-interest plant and animal species known to have occurred in this region of Riverside County.

Based on literature review and the field survey, some special-interest species, including Federal/ State listed species, are known to occur in the region. The species records provided by the CDFW and the USFWS identified the potential occurrence of coastal California gnatcatcher (*Polioptila californica californica*), least Bell's vireo (*Vireo bellii pusillus*), western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), San Bernardino kangaroo rat (*Dipodomys merriami parvus*), and Stephen's kangaroo rat (*Dipodomys stephensi*). The site is devoid of vegetation preferred by the bird species listed above and the soil is highly disturbed (disked) and is therefore not suitable for the kangaroo rat species named above.

Western Burrowing Owl

No special-status species were found or observed during the field surveys. The project is located within the MSHCP Survey Area for the Burrowing Owl. Because the land is an open field, LSA conducted a burrowing owl habitat assessment and burrow survey on August 30, 2017, with negative results for owls and owl sign, and no evidence of usable burrows. CDFW states useable burrows are at least 11 cm/4.3 inches in diameter and longer than 150 cm/58.5 inches deep. Since the species is a mobile and seasonally migratory bird, a pre-construction burrowing owl survey (BIO-2) will be required prior to grading for compliance with the Migratory Bird Treaty Act (MBTA) and the MSHCP. No additional mitigation is required for negative pre-construction survey findings.

MSHCP NEPSSA Plants Habitat Assessment

There are no MSHCP Narrow Endemic Plant species known to occur within the project area. As a result, focused surveys are not required and no further action is required.

MSHCP Consistency Analysis

Conservation Area Requirements

The project site is not located within a Criteria Cell; therefore, it is not subject to possible land conservation requirements under the MSHCP. No further action or mitigation is required.

Listed Plant Species

The site is not suitable for narrow endemics due to lack of suitable soil characteristics and current land use disturbances. No further action is required. No mitigation is required.

Federal Designated Critical Habitat

No federally designated Critical Habitats occur within the project area. Therefore, the project will have no effects to special-interest species or federally designated Critical Habitats.

Other Listed Animal Species

Based on literature review and the field survey, some special-interest species, including Federal/ State listed species, are known to occur in the region.

Wildlife Movement

The project will not affect wildlife movement since the parcel is surrounded by urban development and species associated with urban environments are able to navigate these areas.

MSHCP CONSISTENCY AND CEQA MITIGATION REQUIREMENTS

Special-Status Species

BIO-1: Migratory/Nesting Birds

Sycamore trees (*Platanus racemose*) adjacent to the project site may provide nesting habitat for birds commonly found in the region. It is recommended that initial ground-disturbing activities be conducted outside the general bird nesting season (February 15 through August 31). If project activities are planned during the general bird nesting season, nesting bird surveys would be required within three days prior to any ground-disturbing activities to ensure birds protected under the MBTA and California Fish and Game Code are not affected.

BIO-2: Burrowing Owl

No burrowing owls or features potentially occupied by burrowing owls were detected on the project or adjacent areas during the August 2017 survey. Because the burrowing owl is a mobile species, and site conditions may change, a pre-construction survey would be required within 30 days prior to beginning of site grading, per the MSHCP Burrowing Owl Survey Guidelines Section 6.3.2. If burrowing owls are found to be present at that time, project-specific mitigation would be developed and authorized through consultation with the City of Moreno Valley and the CDFW. No further action is required if the 30-day pre-construction survey does not result in burrowing owl sign or observations.

MSHCP Section 6.1.2: Species Associated with Riparian/Riverine Habitat and Jurisdictional Waters

Riparian/Riverine Habitat

The project contains no riparian or riverine habitat and no action would be needed for a USACE Waters Delineation or preparation of a Determination of Biological Equivalent or Superior Preservation Report (DBESP) for compliance with MSHCP Section 6.1.2.

Non-Federal Jurisdictional Waters, Wetlands, and Streambeds Regulated by CDFW

No non-federal jurisdictional waters, wetlands and streambeds regulated by CDFW were located on site.

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APPENDIX A

PLANT AND ANIMAL SPECIES OBSERVED

PLANT AND ANIMAL SPECIES OBSERVED

Scientific Name	Common Name
PLANTS	
Chenopodiaceae	**Goosefoot family**
Salsola tragus (non-native species)	Russian-thistle
Chenopodium sp.	Chenopodium sp.
Fabaceae	**Legume Family**
Parkinsonia aculeate (non-native species)	Mexican palo verde
Solanaceae	**Nightshade family**
Datura wrightii	Jimsonweed
Zygophyllaceae	**Caltrop Family**
Tribulus terrestris (non-native species)	Puncture vine
ANIMALS	
Tyrannidae	**Tyrant Flycatchers**
Sayornis nigricans	Black phoebe
Libellulidae	**Skimmers**
Tramea lacerate	Black saddlebags
REPTILIA	**REPTILES**
Sceloporus occidentalis	Western fence lizard
AVES	**BIRDS**
Corvidae	**Crows and Jay**
Corvus corax	Common raven
Alaudidae	**Larks**
Eremophila alpestris	Horned Lark
Fringillidae	**Fringilline and Cardueline and Allies**
Haemorpous mexicanus	House finch
MAMMALIA	**MAMMALS**
Geomyidae	**Pocket Gopher**
Thomomys bottae	Botta's pocket gopher

Taxonomy and scientific nomenclature generally conform to Baldwin, B.G., D.H. Goldman et al., eds. (2012; *The Jepson Manual: Vascular Plants of California,* Second Edition; University of California Press, Berkeley and Los Angeles, California).

Common names for each taxa generally conform to Roberts, F.M., Jr. (2008; *The Vascular Plants of Orange County, California: An Annotated Checklist;* F.M. Roberts Publications, San Luis Rey, California) except where Abrams, L. (1923, 1944, and 1951; Illustrated Flora of the Pacific States: Washington, Oregon, and California, Vols. I–III; Stanford University Press, Stanford, California) and Abrams, L. and Ferris, R.S. (1960; *Illustrated Flora of the Pacific States: Washington, Oregon, and California,* Vol. IV; Stanford University Press, Stanford, California) were used, particularly when species-specific common names were not identified in Roberts, F.M., Jr. (2008).

Attachment: Appendix B - Biological Resources Assessment (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

CULTURAL RESOURCES ASSESSMENT

SATER ARCO PROJECT

CITY OF MORENO VALLEY

RIVERSIDE COUNTY, CALIFORNIA

LSA

September 2017

CULTURAL RESOURCES ASSESSMENT

SATER ARCO PROJECT
CITY OF MORENO VALLEY
RIVERSIDE COUNTY, CALIFORNIA

Prepared for:

Eric LeVaughn
Barghausen Consulting Engineers, Inc.
683 Cliffside Drive
San Dimas, California

Prepared by:

Riordan Goodwin
LSA Associates, Inc.
1500 Iowa Avenue, Suite 200
Riverside, California 92507

LSA Project No. SAT1701

National Archaeological Data Base Information:
Type of Study: Reconnaissance Survey
Sites Recorded: 33-027260 (Isolate)
USGS 7.5' Quadrangle: *Sunnymead, California*
Acreage: 1.31 acres
Keywords: Phase I, previously unsurveyed, positive results, monitoring recommended.

LSA

September 2017

MANAGEMENT SUMMARY

LSA was retained by Barghausen Consulting Engineers to conduct a cultural resources assessment for the proposed Sater ARCO Project located in Moreno Valley, Riverside County, California. This cultural resources assessment was completed pursuant to the California Environmental Quality Act (CEQA).

A cultural resources records search, additional research, and a field survey were conducted for the Project area. Although no cultural resources were previously documented within or near the Project area by the records search, a water tank was once located on the parcel, a fragment of historic period irrigation pipe was identified during the survey and a concrete cistern remains to the west. Also, numerous prehistoric resources lie to the south and the sensitivity of the area between these resources and the Project is unknown. Therefore, the Project area has some potential for subsurface resources and part-time archaeological monitoring is recommended.

In the event previously undocumented archaeological resources are identified during earthmoving activities, further work in the area should be halted until the nature and significance of the find can be assessed by a qualified archaeologist.

If human remains are encountered, State Health and Safety Code Section 7050.5. states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to State Public Resources Code Section 5097.98. The County Coroner must be notified of the find immediately. If the remains are determined to be Native American, the County Coroner will notify the Native American Heritage Commission (NAHC), which will determine and notify a Most Likely Descendent (MLD). With the permission of the landowner or his/her authorized representative, the MLD may inspect the site of the discovery. The MLD shall complete the inspection and make recommendations or preferences for treatment within 48 hours of being granted access to the site. The MLD recommendations may include scientific removal and nondestructive analysis of human remains and items associated with Native American burials, preservation of Native American human remains and associated items in place, relinquishment of Native American human remains and associated items to the descendants for treatment, or any other culturally appropriate treatment.

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INTRODUCTION

LSA was retained by Barghausen Consulting Engineers to conduct a cultural resources assessment for the proposed Sater ARCO Project (Project) located in Moreno Valley, Riverside County, California. This cultural resources assessment was completed per the California Environmental Quality Act (CEQA), Public Resources Code Chapter 2.6, Section 21083.2, and California Code of Regulations Title 14, Chapter 3, Article 5, Section 15064.5. The research and field survey was conducted to determine whether the proposed Project would adversely affect any resources considered historical resources per CEQA.

PERSONNEL

LSA staff that worked on this Project included Senior Cultural Resources Manager/Archaeologist Riordan Goodwin who conducted the research and survey and authored the report; Senior Cultural Resources Manager Gini Austerman who conducted the records search; and Deborah McLean, who served as technical editor.

PROJECT LOCATION AND DESCRIPTION

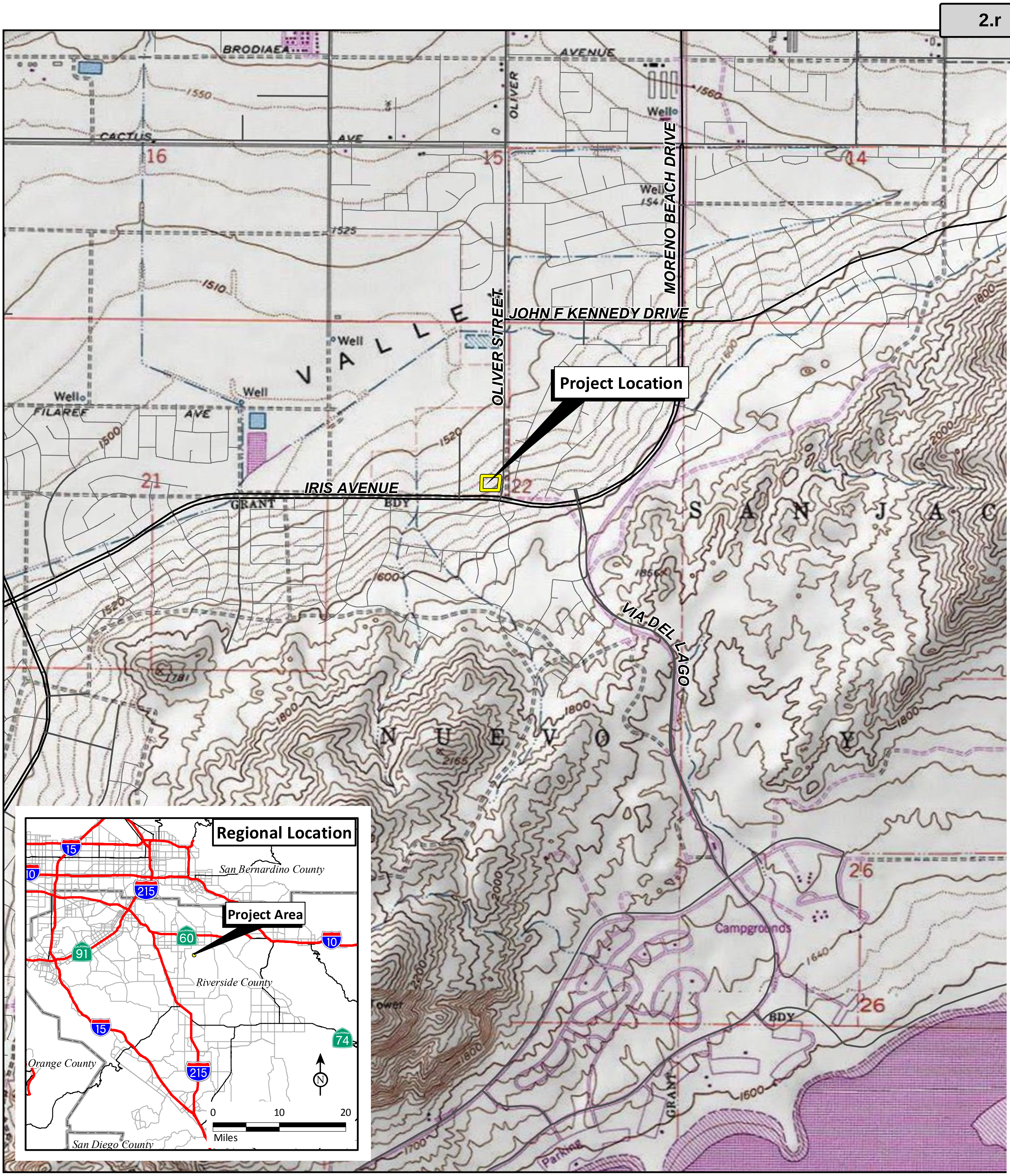
The Project area is near the northwestern corner of Iris Avenue and Oliver Street, bounded by a vacant lot to the north, residential development to the south and east, and a medical center to the west. The Project is depicted on the United States Geological Survey (USGS) *Sunnymead, California* topographic quadrangle map in Township 3 South, Range 3 West in Section 22, San Bernardino Baseline and Meridian (USGS 1967; photo revised 1980; Figure 1). The Project area is within Assessor's Parcel Number 486-310-038, an approximately 1.31-acre lot, which is currently vacant. The proposed Project is an ARCO AM/PM service station with a 3,800-square foot convenience store, a fuel facility with 8 dispensers, a 42-foot × 116-foot canopy, two underground storage tanks, a 24-foot × 100-foot conveyor system carwash, 27 parking stalls, and related site improvements.

NATURAL SETTING

The natural setting of the Project vicinity is presented based on the underlying theoretical assumption that humans and human societies are in continual interaction with the physical environment. Being an integral and major part of the ecological system, humans adapt to the environment through technological and behavioral changes. Locations of archaeological sites are based on the constraints of these adaptations, whether it is proximity to a particular resource, topographical restrictions, or shelter and protection. Sites will also contain an assemblage of artifacts and ecofacts consistent with the particular interaction.

Hydrology

The Project region is characterized by a temperate climate, with dry, hot summers and moderate winters. Rainfall ranges from 12 to 16 inches annually (Beck and Haase 1974). Precipitation usually occurs in the form of winter rain, with warm monsoonal showers in summer. The Project is bracketed by three ephemeral drainages within 0.5 mile, all of which drain north and west.



LEGEND

🟨 Project Boundary

N

0 1000 2000

FEET

SOURCE: USGS 7.5' Quads: Sunnymeadm 1980 and Perris, 1979; Riverside County, 2015.

I:\SAT1701\Reports\Cultural\fig1_RegLoc.mxd (8/21/2017)

LSA

FIGURE

ARCO Iris and Olive

Moreno Valle

Cultural Resources Assessmen

Regional and Project Location

Biology

At an elevation of approximately 1,560 feet above mean sea level (amsl), the Project is within the Lower Sonoran Life Zone of California (Schoenherr 1992), which ranges from below sea level to 3,500 feet amsl. Although the natural vegetation has been almost completely removed from the Project by development, pioneer species such as mustard, Russian thistle, hare oats and xeric grasses were noted on the property. Common animals of this region include rodents, rabbits, coyotes, raptors, reptiles, vultures, and insects.

Geology

The Project area is located at the northern end of the Peninsular Ranges Geomorphic Province, a 900-mile-long northwest-southeast trending structural block that extends from the Transverse Ranges to the tip of Baja California and includes the Los Angeles Basin (California Geological Survey 2002; Norris and Webb 1976). The province is approximately 225 miles wide, extending from the Colorado Desert in the east, across the continental shelf to the Southern Channel Islands (Santa Barbara, San Nicolas, Santa Catalina, and San Clemente) in the west (Sharp 1976). This region is characterized by a series of mountain ranges separated by northwest-trending valleys subparallel to faults branching from the San Andreas Fault. The geology of this province is similar to that of the Sierra Nevada, with granitic rock intruding into the older metamorphic rocks. It contains extensive pre-Cretaceous (older than 145 million years ago [Ma]) igneous and metamorphic rocks covered by limited exposures of post-Cretaceous (younger than 66 Ma) sedimentary deposits (Norris and Webb 1976). Within this province, the Project is located on the Perris Block, a fault-bounded structural block that extends from the southern foot of the San Gabriel and San Bernardino Mountains southeast to the vicinity of Bachelor Mountain and Polly Butte (Morton and Miller 2006; Kenney 1999). It is bounded on the northeast by the San Jacinto Fault and on the southwest by the Elsinore Fault Zone (Morton and Miller 2006).

CULTURAL SETTING

Prehistory

Chronologies of prehistoric cultural change in Southern California area have been attempted numerous times, and several are reviewed in Moratto (2004). No single description is universally accepted as the various chronologies are based primarily on material developments identified by researchers familiar with sites in a particular region and variation exists essentially due to the differences in those items found at the sites. Small differences occur over time and space, which combine to form patterns that are variously interpreted.

Currently, two primary regional culture chronology syntheses are commonly referenced in the archaeological literature. The first, Wallace (1955), describes four cultural horizons or time periods: Horizon I – Early Man (9000–6000 BC), Horizon II – Milling Stone Assemblages (6000–3000 BC), Horizon III – Intermediate Cultures (3000 BC–AD 500), and Horizon IV – Late Prehistoric Cultures (AD 500–historic contact). This chronology was refined (Wallace 1978) using absolute chronological dates obtained after 1955.

The second cultural chronology (Warren 1968) is based broadly on Southern California prehistoric cultures and was also revised (Warren 1984; Warren and Crabtree 1986). Warren's (1984) chronology includes five periods in prehistory: Lake Mojave (7000–5000 BC), Pinto (5000–2000 BC), Gypsum (2000 BC–AD 500), Saratoga Springs (AD 500–1200), and Protohistoric (AD 1200–historic contact). Changes in settlement pattern and subsistence focus are viewed as cultural adaptations to a changing environment, which begins with gradual environmental warming in the late Pleistocene, continues with the desiccation of the desert lakes, followed by a brief return to pluvial conditions, and concludes with a general warming and drying trend, with periodic reversals that continue to the present (Warren and Crabtree 1986).

Ethnography

The Project area is situated within the traditional boundaries of the Cahuilla (Kroeber 1976). Tribal territorial boundaries were somewhat fluid and changed over time. The first written accounts of the Cahuilla are attributed to the mission fathers. Later documentation was by Barrows (1900), Hooper (1920), and Strong (1929) among others.

Cahuilla

The territory of the Cahuilla ranged from the San Bernardino Mountains south to Borrego Springs and the Chocolate Mountains, from Orocopia Mountain to the east, to the San Jacinto Plain and Palomar Mountain to the west (Bean 1978). Cahuilla territory lies within the geographic center of Southern California and encompasses diverse environments ranging from inland river valleys and foothills to mountains and desert (Bean and Shipek 1978).

Cahuilla villages, generally located near water sources within canyons or near alluvial fans, comprised groups of related individuals, generally from a single lineage, and the territory around the village was owned by the villagers (Bean 1978). Like other Native American groups in Southern California, the Cahuilla were semi-nomadic peoples leaving their villages and utilizing temporary campsites to exploit seasonably available plant and animal resources (James 1960).

Cahuilla subsistence was based primarily on acorns, honey mesquite, screw beans, piñon nuts, and cactus fruit, supplemented by a variety of wild fruits and berries, tubers, roots, and greens (Kroeber 1976; Heizer and Elsasser 1980). Hunting deer, rabbit, antelope, bighorn sheep, reptiles, small rodents, quail, doves, ducks, and reptiles by means of bows, throwing sticks, traps, and communal drives is documented (James 1960).

History

In California, the historic era is generally divided into three periods: the Spanish Period (1769 to 1821), the Mexican Period (1821 to 1848), and the American Period (1848 to present). Early exploration of the Riverside County area was slow until Lieutenant Pedro Fages, then the military governor of San Diego, crossed through the San Jacinto Valley in 1772.

Riverside County

The Southern Pacific Railroad completed its line from Los Angeles through the San Gorgonio Pass in 1876. The trains were eventually used to transport settlers into the area, creating a period of agricultural and land development, ultimately resulting in the establishment of Riverside County in 1893. Transportation, agriculture, and the control of water have continued to be central themes in the settlement, development, and growth of Riverside County (Robinson 1979).

Moreno Valley

Originally platted as "New Haven," the community of Moreno Valley was renamed Moreno (Spanish for "brown") in honor of real estate entrepreneur/founder Frank E. Brown who had helped organize the Bear Valley Land and Water Company and instituted an irrigation district that fostered large-scale grain and fruit farming (Holtzclaw et al. 2007). The community thrived during its first few years in the late 1880s and, by 1893, it included a hotel, weekly newspaper, pharmacy, livery stable, stores, offices, two churches, and a nursery; and the surrounding farmland became known as Moreno Valley (Gunther 1984; Brown 1985). The town's prosperity was short-lived, however, and a drought, combined with the City of Redlands' water rights claim along the same Bear Valley Pipeline, precipitated its decline in the final years of the 19th century (Brown 1985; Holtzclaw et al. 2007). Many settlers relocated, homes and all, to nearby Riverside (Brown 1985).

Subsequent attempts at municipal revival of the Moreno Valley area in the 20th century were unsuccessful until 1973, when locals created Lake Perris to retain water transported from the Feather River. The new lake provided recreational infrastructure in addition to a reliable water supply, and stimulated growth throughout Moreno Valley. The communities of Moreno, Sunnymead, and Edgemont were incorporated as the City of Moreno Valley in 1984 (Gunther 1984).

METHODS

Records Search

On August 30, 2017, LSA Archaeologist Gini Austerman conducted a cultural resources records search for the Project area at the Eastern Information Center (EIC) at the University of California, Riverside. The EIC houses the pertinent archaeological site and survey information necessary to determine whether cultural resources are recorded within the study area boundaries and which specific areas have been previously surveyed. The research included a review of all recorded historic and prehistoric archaeological sites within one mile of the Project, as well as a review of known cultural resource survey and excavation reports. In addition, LSA examined the California State Historic Property Data File (HPD), which includes the National Register of Historic Places (National Register), California Historical Landmarks (CHL), and California Points of Historical Interest (CPHI), various local historic registers, and historic maps.

Additional Research

In August 2017, LSA Archaeologist Riordan Goodwin reviewed historic period maps and aerials and conducted additional online research.

Field Survey

On September 1, 2017, the Project area was surveyed by Mr. Goodwin who walked transects spaced by 10 meters, with particular attention given to rodent burrows and back dirt.

RESULTS

Records Search

Results of the August 30, 2017, records search at the EIC indicate there have been 8 previous cultural resources studies conducted within a 1-mile radius of the Project, none of which included any portion of the Project area. Approximately 30 percent of the 1-mile radius study area has been previously surveyed. Although no cultural resources have been documented in the Project area, 21 prehistoric sites have been recorded within 1 mile: 1 rock shelter with an associated milling feature, 4 bedrock milling complexes (milling surfaces on three or more outcrops), 1 bedrock milling feature with associated rock circle, and 15 bedrock milling feature sites (milling surfaces on 1 or 2 outcrops). See Table A. The nearest resource, (33-000543) is approximately 600 meters south of the Project area. Survey of the area between the Project and the bedrock milling feature sites to the south is not documented in the EIC database, and therefore sensitivity of this adjacent area is unknown. None of the resources documented within the study area was in any of the inventories, directories, or registers (see Appendix A for Records Search Bibliography).

Table A: Cultural Resources Within One Mile

Primary #	Site Description
33-000482	Bedrock milling complex
33-000483	Bedrock milling features
33-000484	Bedrock milling complex
33-000485	Bedrock milling complex
33-000536	Bedrock milling features
33-000537	Bedrock milling feature
33-000538	Bedrock milling features
33-000539	Bedrock milling feature
33-000540	Bedrock milling complex
33-000541	Bedrock milling features
33-000542	Bedrock milling feature
33-000543	Bedrock milling features
33-000544	Rock shelter and milling features
33-002867	Bedrock milling feature
33-002963	Bedrock milling feature
33-002964	Bedrock milling feature
33-002965	Bedrock milling features
33-002968	Bedrock milling feature
33-002994	Bedrock milling features
33-004218	Bedrock milling features
33-013110	Bedrock milling feature and rock circle

Attachment: Appendix C - Cultural Resource Assessment (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Additional Research

Review of historic period maps and online research indicated a structure once stood on the southeast corner of the property (probably a water tank), but was removed sometime between 1978 and 1996 (USGS 1954, 1967; Historic Aerials 1978, 1996). This suggests the parcel may have once been under cultivation; however, this was not documented in historic period photographs, nor was it indicated on any maps.

Field Survey

The September 1, 2017, field survey revealed that the Project area is virtually devoid of vegetation, and visibility was excellent throughout the parcel at nearly 100 percent (Figures 2 and 3). The Project parcel has been subjected to surface disturbance from weed abatement disking. Sparse modern refuse was noted on the surface. Soils are medium to fine sandy alluvial silt.

An isolated fragment of riveted steel irrigation pipe (33-027260) was identified in the eastern portion of the site (see evaluation below and Appendix B). Isolated artifacts (particularly historic period items) with no specific association are generally considered not significant and therefore not “historical resources” under CEQA.

Although no other cultural resources were identified within the Project area, a subsurface concrete cistern was noted approximately 100 feet from the western edge of the property and an additional fragment of riveted steel pipe was noted approximately 80 feet north of the Project.

Figure 2: Southern edge of Project area showing site conditions. View to the east.

Figure 3: View west of the Project area.

RECOMMENDATIONS

A cultural resources records search, additional research, and a field survey were conducted for the Project area. Although no cultural resources were previously documented within or near the Project area by the records search, a water tank was once located on the parcel, a fragment of historic period irrigation pipe was identified during the survey and a concrete cistern remains to the west. Also, numerous prehistoric resources lie to the south and the sensitivity of the area between these resources and the Project is unknown. Therefore, the Project area has some potential for subsurface resources and part-time archaeological monitoring is recommended.

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APPENDIX A

RECORDS SEARCH BIBLIOGRAPHY

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
RI-02105	NADB-R - 1082531; Voided - MF-2297	1987	DROVER, C.E.	AN ARCHAEOLOGICAL ASSESSMENT OF THE A.L.T.A. SPECIFIC PLAN, MORENO VALLEY, CALIFORNIA	AUTHOR(S)	
RI-02160	NADB-R - 1082589; Voided - MF-2347	1987	DROVER, C.E.	LETTER REPORT: ARCHAEOLOGICAL EVALUATION OF POTENTIAL HOSPITAL SITE IN MORENO VALLEY	AUTHOR(S)	
RI-02709	NADB-R - 1083199; Voided - MF-2913	1990	PADON, BETH	MORENO RANCH STUDIES ARCHAEOLOGICAL DOCUMENTATION OF CA-RIV-2994 MORENO VALLEY, CALIFORNIA.	LSA ASSOCIATES	33-002994
RI-05288	NADB-R - 1086651	2000	WHITE, LAURIE	LETTER REPORT: RECORDS SEARCH RESULTS FOR SPRINT PCS FACILITY RV35XC093D (GOLF COURSE MAINTENANCE), CITY OF MORENO VALLEY, RIVERSIDE COUNTY, CA	MICHAEL BRANDMAN ASSOCIATES, Irvine, CA	
RI-06644	NADB-R - 1088011; Submitter - JOB #CA-8393B	2006	BILLAT, SCOTT	COLLOCATION ("CO") SUBMISSION PACKET FCC FORM 621, ASHLEY PROJECT	EARTHTOUCH, INC.	
RI-08802		2012	Bai "Tom" Tang, Michael Hogan, Deirdre Encarnacion, and Daniel Ballester	Phase I archaeological Assessment: Moreno Master Drainage Plan Revision	CRM TECH	
RI-09652	Other - TCNS# 107863	2014	Heather R. Puckett	Cultural Resources Summary for the Proposed Verizon Wireless, Inc., Property Site, 27905 John F Kennedy Drive, Moreno Valley, Riverside County, California 92555	TetraTech Inc.	

APPENDIX B

DEPARTMENT OF PARKS AND RECREATION ARTIFACT RECORD FORM

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # 33-027260
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code **Reviewer** **Date**

Page 1 **of** 2 ***Resource Name or #:** LSA-SAT1701-R-1

P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ■ **Unrestricted** ***a. County:** Riverside, California
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad:** *Sunnymeadt* **Date:** 1980 **T** 3S; **R** 3W; SE **¼ of** NW **¼ of Sec** 22**;** M.D. SB**B.M.**
c. Address: 27420 Iris Avenue City: Moreno Valley Zip: 92555
d. UTM: Zone: 11 ; 483068 mE/ 3750632 mN (G.P.S. NAD 83)
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate) APN 486-310-038. Elevation: 1,560 feet AMSL.Access to this site from State Route 60 is via Moreno Beach Drive. The resource is approximately 130 feet northwest of the intersection of Iris Avenue and Oliver Road.

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries) Fragment of pre-WWII riveted steel irrigation pipe, probably associated with water tank or cistern formerly located in SE corner of parcel or board-formed subsurface cistern approximately 100 feet west of the parcel.

***P3b. Resource Attributes:** (List attributes and codes) AP16 (Isolated artifact)

***P4. Resources Present:** ☐Building ☐Structure ☐Object ☐Site ☐District ☐Element of District ■Other (Isolates, etc.)

P5b. Description of Photo: (View, date, accession #) Photo of pipe fragment.

***P6. Date Constructed/Age and Sources:** ■Historic ☐Prehistoric ☐Both
Pre-World War II

***P7. Owner and Address:**
Eric LeVaughn
Sater Oil International
683 Cliffside Drive
San Dimas, CA 91773

***P8. Recorded by:** (Name, affiliation, and address)
Riordan Goodwin,
LSA Associates, Inc.
1500 Iowa Avenue, Suite 200
Riverside, California 92507

***P9. Date Recorded:**
August 31, 2017

***P10. Survey Type:** (Describe)
Reconnaissance

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.").Cultural Resources Assessment, Sater ARCO Project, City of Moreno Valley, Riverside County California.

***Attachments:** ☐NONE ■Location Map ☐Sketch Map ☐Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

DPR 523A (1/95) ***Required information**

State of California - Resource Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary # 33-027260
HRI #
Trinomial

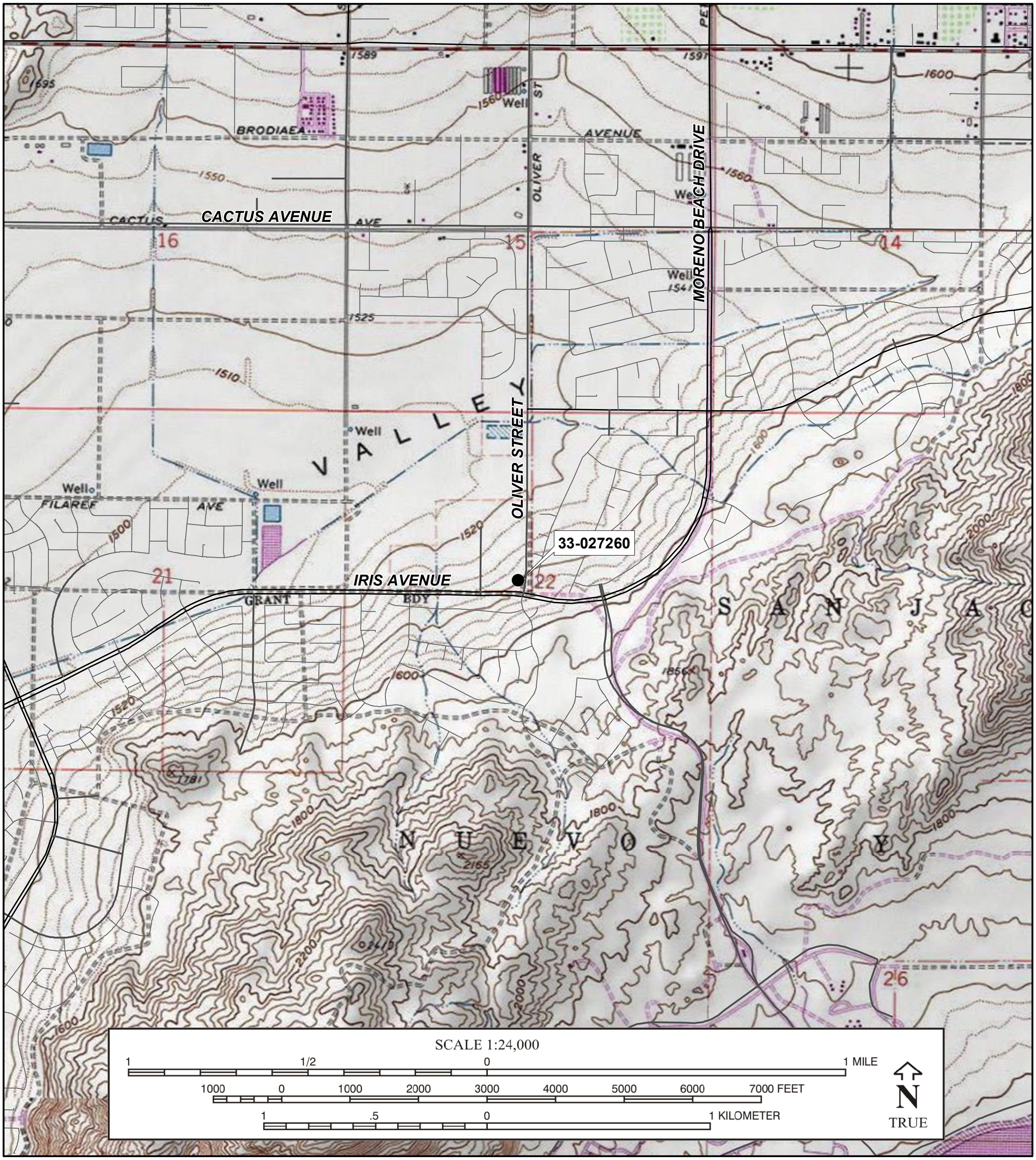
Page 2 of 2

*Resource Name or # (Assigned by recorder) LSA-SAT1701-R-1

*Map Name: USGS 7.5' Quad, Sunnymead

*Scale: 1:24000

*Date of Map: 1980



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*Requ

SALEM
engineering group, inc.

PRELIMINARY GEOTECHNICAL ENGINESERING INVESTIGATION

PROPOSED ARCO STATION
NWC IRIS AVENUE AND OLIVER STREET
MORENO VALLEY, CALIFORNIA

SALEM PROJECT NO. 3-217-1265
NOVEMBER 30, 2017

PREPARED FOR:

MR. ERIC LEVAUGHN
SATER OIL INTERNATIONAL, LLC
683 CLIFFSIDE DRIVE
SAN DIMAS, CA 91773

PREPARED BY:

SALEM ENGINEERING GROUP, INC.
11650 MISSION PARK DR., #108
RANCHO CUCAMONGA, CA 91730
P: (909) 980-6455
F: (909) 980-6435
www.salemeng.com

SALEM
engineering group, inc.

11650 Mission Park Dr., #108
Rancho Cucamonga, CA 91730
Phone (909) 980-6455
Fax (909) 980-6435

November 30, 2017 Project No. 3-217-1265

Mr. Eric LeVaughn
Sater Oil International, LLC
683 Cliffside Drive
San Dimas, CA 91773 85255

SUBJECT: PRELIMINARY GEOTECHNICAL ENGINEERING INVESTIGATION
PROPOSED ARCO STATION
NWC IRIS AVENUE AND OLIVER STREET
MORENO VALLEY, CALIFORNIA

Dear Mr. LeVaughn:

At your request and authorization, SALEM Engineering Group, Inc. (SALEM) has prepared this Preliminary Geotechnical Engineering Investigation report for the Proposed ARCO Station to be located at the subject site.

The accompanying report presents our findings, conclusions, and recommendations regarding the geotechnical aspects of designing and constructing the project as presently proposed. In our opinion, the proposed project is feasible from a geotechnical viewpoint provided our recommendations are incorporated into the design and construction of the project.

We appreciate the opportunity to assist you with this project. Should you have questions regarding this report or need additional information, please contact the undersigned at (909) 980-6455.

Respectfully Submitted,

SALEM ENGINEERING GROUP, INC.

Clarence Jiang, GE
Geotechnical Division Manager
RGE 2477

CLARENCE T. JIANG
No. 2477
Exp. 06/30/19

R. Sammy Salem, MS, PE, GE
Principal Engineer
RCE 52762 / RGE 2549

R. SAMMY SALEM
GE 2549
Exp. Dec. 31, 2018

SAN JOSE ▪ STOCKTON ▪ FRESNO ▪ BAKERSFIELD ▪ RANCHO CUCAMONGA
DALLAS, TX ▪ DENVER, CO ▪ CHARLESTON, SC

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SALEM engineering group, inc.
11650 Mission Park Drive, Suite 108
Rancho Cucamonga, CA 91730
Phone (909) 980-6455
Fax (909) 980-6435

PRELIMINARY GEOTECHNICAL ENGINEERING INVESTIGATION
PROPSOED ARCO STATION
NWC IRIS AVENUE AND OLIVER STREET
MORENO VALLEY, CALIFORNIA

1. PURPOSE AND SCOPE

This report presents the results of our Preliminary Geotechnical Engineering Investigation for the site of the Proposed ARCO Station to be located near the intersection of NWC Iris Avenue and Oliver Street in Moreno Valley, California (see Figure 1, Vicinity Map).

The purpose of our geotechnical engineering investigation was to observe and sample the subsurface conditions encountered at the site, and provide conclusions and recommendations relative to the geotechnical aspects of constructing the project as presently proposed.

The scope of this investigation included a field exploration, percolation testing, laboratory testing, engineering analysis and the preparation of this report. Our field exploration was performed on November 14, 2017 and included the drilling of five (5) small-diameter soil borings to a maximum depth of 50 feet at the site. Additionally, four (4) percolation tests were performed at depths of approximately 8 and 10 feet below existing grade for the determination of the infiltration rate. The locations of the soil borings and percolation tests are depicted on Figure 2, Site Plan. A detailed discussion of our field investigation, percolation tests, and exploratory boring logs are presented in Appendix A.

Laboratory tests were performed on selected soil samples obtained during the investigation to evaluate pertinent physical properties for engineering analyses. Appendix B presents the laboratory test results in tabular and graphic format.

The recommendations presented herein are based on analysis of the data obtained during the investigation and our experience with similar soil and geologic conditions.

If project details vary significantly from those described herein, SALEM should be contacted to determine the necessity for review and possible revision of this report. Earthwork and Pavement Specifications are presented in Appendix C. If text of the report conflict with the specifications in Appendix C, the recommendations in the text of the report have precedence.

2. PROJECT DESCRIPTION

Based on the Site Plan provided to us, we understand that the proposed development will include construction of an ARCO station with an approximately 3,800 square-foot AM/PM convenience store, an 8-MPD's fuel canopy, a 24 feet by 100 feet car wash, and underground storage tanks. On-site parking and landscaping are planned to be associated with the development. Maximum wall load is expected to be on the order of 3 kips per linear foot. Maximum column load is expected to be on the order of 70 kips. Floor slab soil bearing pressure is expected to be on the order of 150 psf.

A site grading plan was not available at the time of preparation of this report. As the existing project area is essentially level, we anticipate that cuts and fills during earthwork will be minimal and limited to providing a level pad and positive site drainage. In the event that changes occur in the nature or design of the project, the conclusions and recommendations contained in this report will not be considered valid unless the changes are reviewed and the conclusions of our report are modified. The site configuration and locations of proposed improvements are shown on the Site Plan, Figure 2.

3. SITE LOCATION AND DESCRIPTION

The subject site is located at the northwest corner of the intersection of Iris Avenue and Oliver Street, in the City of Moreno Valley, CA (see Vicinity Map, Figure 1). The subject site is rectangular in shape and encompasses approximately 1.31 acres.

At the time of SALEM’s field exploration, the site was a vacant lot with sparse shrubs. The site is bounded by vacant lands to the north and west, Oliver Street to the east, and Iris Avenue to the south. The site area is gently sloping to the north with elevations ranging from approximately 1,566 to 1,555 feet above mean sea level based on google earth imagery.

4. FIELD EXPLORATION

Our field exploration consisted of site surface reconnaissance and subsurface exploration. The exploratory test borings (B-1 through B-5) were drilled on November 14, 2017 in the area shown on the Site Plan, Figure 2. The test borings were advanced with a 6-inch diameter hollow stem auger and a 4 inch diameter solid flight auger rotated by a truck-mounted CME 45C drill rig. The test borings were extended to a maximum depth of 50 feet below existing grade.

The materials encountered in the test borings were visually classified in the field, and logs were recorded by a field engineer and stratification lines were approximated on the basis of observations made at the time of drilling. Visual classification of the materials encountered in the test borings were generally made in accordance with the Unified Soil Classification System (ASTM D2487). A soil classification chart and key to sampling is presented on the Unified Soil Classification Chart, in Appendix "A." The logs of the test borings are presented in Appendix "A." The Boring Logs include the soil type, color, moisture content, dry density, and the applicable Unified Soil Classification System symbol.

The location of the test borings were determined by measuring from features shown on the Site Plan, provided to us. Hence, accuracy can be implied only to the degree that this method warrants. The actual boundaries between different soil types may be gradual and soil conditions may vary. For a more detailed description of the materials encountered, the Boring Logs in Appendix "A" should be consulted.

Soil samples were obtained from the test borings at the depths shown on the logs of borings. The MCS samples were recovered and capped at both ends to preserve the samples at their natural moisture content; SPT samples were recovered and placed in a sealed bag to preserve their natural moisture content. The borings were backfilled with soil cuttings after completion of the drilling.

5. LABORATORY TESTING

Laboratory tests were performed on selected soil samples to evaluate their physical characteristics and engineering properties. The laboratory-testing program was formulated with emphasis on the evaluation of natural moisture, in-situ density, shear strength, consolidation potential, maximum density and optimum moisture determination, and gradation of the materials encountered.

In addition, chemical tests were performed to evaluate the corrosivity of the soils to buried concrete and metal. Details of the laboratory test program and the results of laboratory test are summarized in Appendix "B." This information, along with the field observations, was used to prepare the final boring logs in Appendix "A."

6. GEOLOGIC SETTING

The subject site is located within the Peninsular Range Geomorphic Province, an area characterized by active northeast trending strike slip faults, including the San Jacinto to the northwest, and the Elsinore to the southwest. The project site is situated between the Santa Rosa Mountains and the San Jacinto Mountains to the east; and Santa Ana Mountains to the west and south. The near-surface deposits in the vicinity of the subject site are comprised of recent alluvium consisting of unconsolidated sands, silt, and clays derived from erosion of local mountain ranges. Deposits encountered on the subject site during exploratory drilling are discussed in detail in this report.

7. GEOLOGIC HAZARDS

7.1 Faulting and Seismicity

The Peninsular Range has historically been a province of relatively high seismic activity. The nearest faults to the project site are associated with the San Jacinto Fault system located approximately 4.1 miles from the site. There are no known active fault traces in the project vicinity. Based on mapping and historical seismicity, the seismicity of the Peninsular Range has been generally considered high by the scientific community.

The project area is not within an Alquist-Priolo Earthquake Fault (Special Studies) Zone and will not require a special site investigation by an Engineering Geologist. Soils on site are classified as Site Class D in accordance with Chapter 16 of the California Building Code. The proposed structures are determined to be in Seismic Design Category D.

To determine the distance of known active faults within 100 miles of the site, we used the United States Geological Survey (USGS) web-based application *2008 National Seismic Hazard Maps - Fault Parameters*. Site latitude is 33.8958° North; site longitude is 117.1833° West. The ten closest active faults are summarized below in Table 7.1.

TABLE 7.1
REGIONAL FAULT SUMMARY

Fault Name	Distance to Site (miles)	Max. Earthquake Magnitude, M_w
San Jacinto; SBV+SJV+A+CC+B+SM	4.1	7.9
San Jacinto; A+CC+B+SM	4.3	7.6
San Jacinto; SBV	8.9	7.1
S. San Andreas; PK+CH+CC+BB+NM+SM+NSB+SSB+BG+CO	15.1	8.2
S. San Andreas; PK+CH+CC+BB+NM+SM+NSB	17.7	8.0
Elsinore; W+GI+T+J+CM	18.2	7.9
S. San Andreas; BG+CO	22.3	7.4
Chino, alt 2	22.6	6.8
Elsinore; W	23.9	7.0

The faults tabulated above and numerous other faults in the region are sources of potential ground motion. However, earthquakes that might occur on other faults throughout California are also potential generators of significant ground motion and could subject the site to intense ground shaking.

7.2 Surface Fault Rupture

The site is not within a currently established State of California Earthquake Fault Zone for surface fault rupture hazards. No active faults with the potential for surface fault rupture are known to pass directly beneath the site. Therefore, the potential for surface rupture due to faulting occurring beneath the site during the design life of the proposed development is considered low.

7.3 Ground Shaking

We used the USGS web-based application *US Seismic Design Maps* to estimate the peak ground acceleration adjusted for site class effects (PGA_M). Because of the proximity to the subject site and the maximum probable events for these faults, it appears that a maximum probable event along the fault zones could produce a peak horizontal acceleration of approximately 0.871g (2% probability of being exceeded in 50 years). While listing PGA is useful for comparison of potential effects of fault activity in a region, other considerations are important in seismic design, including frequency and duration of motion and soil conditions underlying the site.

7.4 Liquefaction

Soil liquefaction is a state of soil particles suspension caused by a complete loss of strength when the effective stress drops to zero. Liquefaction normally occurs under saturated conditions in soils such as sand in which the strength is purely frictional. Primary factors that trigger liquefaction are: moderate to strong ground shaking (seismic source), relatively clean, loose granular soils (primarily poorly graded sands and silty sands), and saturated soil conditions (shallow groundwater). Due to the increasing overburden pressure with depth, liquefaction of granular soils is generally limited to the upper 50 feet of a soil profile. However, liquefaction has occurred in soils other than clean sand.

The soils encountered within the depth of 50 feet on the project site consisted predominately of very loose to dense silty sand with various amounts of clay and gravel, and dense to very dense silty clayey sand. Low to very low cohesion strength is associated with the sandy soil. A seismic hazard, which could cause damage to the proposed development during seismic shaking, is the post-liquefaction settlement of the liquefied sands.

The site was evaluated for liquefaction potential. The liquefaction analysis indicated that the soils had a low potential for liquefaction under seismic conditions. Therefore, no mitigation measures are warranted. Detailed geotechnical engineering recommendations are presented in the remaining portions of the text. The recommendations are based on the properties of the materials identified during our investigation.

7.5 Lateral Spreading

Lateral spreading is a phenomenon in which soils move laterally during seismic shaking and is often associated with liquefaction. The amount of movement depends on the soil strength, duration and intensity of seismic shaking, topography, and free face geometry. Due to the relatively flat site topography and low liquefaction potential, we judge the likelihood of lateral spreading to be low.

7.6 Landslides

There are no known landslides at the site, nor is the site in the path of any known or potential landslides. We do not consider the potential for a landslide to be a hazard to this project.

7.7 Tsunamis and Seiches

The site is not located within a coastal area. Therefore, tsunamis (seismic sea waves) are not considered a significant hazard at the site. Seiches are large waves generated in enclosed bodies of water in response to ground shaking. No major water-retaining structures are located immediately up gradient from the project site. Flooding from a seismically-induced seiche is considered unlikely.

8. SOIL AND GROUNDWATER CONDITIONS

8.1 Subsurface Conditions

The subsurface conditions encountered appear typical of those found in the geologic region of the site. In general, the soils within the depth of exploration consisted of alluvium deposits of very loose to dense silty sand with various amounts of clay and gravel, and dense to very dense silty clayey sand.

Fill soils maybe present on-site between our test boring locations. Verification of the extent of fill should be determined during site grading. Field and laboratory tests suggest that the deeper native soils are moderately strong and slightly compressible.

The soils were classified in the field during the drilling and sampling operations. The stratification lines were approximated by the field engineer on the basis of observations made at the time of drilling. The actual boundaries between different soil types may be gradual and soil conditions may vary. For a more detailed description of the materials encountered, the Boring Logs in Appendix "A" should be consulted.

The Boring Logs include the soil type, color, moisture content, dry density, and the applicable Unified Soil Classification System symbol. The locations of the test borings were determined by measuring from feature shown on the Site Plan, provided to us. Hence, accuracy can be implied only to the degree that this method warrants.

8.2 Groundwater

The test boring locations were checked for the presence of groundwater during and after the drilling operations. Free groundwater was not encountered during this investigation.

It should be recognized that water table elevations may fluctuate with time, being dependent upon seasonal precipitation, irrigation, land use, localized pumping, and climatic conditions as well as other factors. Therefore, water level observations at the time of the field investigation may vary from those encountered during the construction phase of the project. The evaluation of such factors is beyond the scope of this report.

8.3 Soil Corrosion Screening

Excessive sulfate in either the soil or native water may result in an adverse reaction between the cement in concrete and the soil. The 2011 Edition of ACI 318 (ACI 318) has established criteria for evaluation of sulfate and chloride levels and how they relate to cement reactivity with soil and/or water.

A soil sample was obtained from the project site and was tested for the evaluation of the potential for concrete deterioration or steel corrosion due to attack by soil-borne soluble salts and soluble chloride. The water-soluble sulfate concentration in the saturation extract from the soil sample was detected to be 50 mg/kg. ACI 318 Tables 4.2.1 and 4.3.1 outline exposure categories, classes, and concrete requirements by exposure class. ACI 318 requirements for site concrete based upon soluble sulfate are summarized in Table 8.3 below.

TABLE 8.3
WATER SOLUBLE SULFATE EXPOSURE REQUIREMENTS

Water Soluble Sulfate (SO_4) in Soil, Percentage by Weight	Exposure Severity	Exposure Class	Maximum w/cm Ratio	Minimum Concrete Compressive Strength	Cementitious Materials Type
0.005	Not Applicable	S0	N/A	2,500 psi	No Restriction

The water-soluble chloride concentration detected in saturation extract from the soil samples was 21 mg/kg. This level of chloride concentration is not considered to be severely corrosive.

It is recommended that a qualified corrosion engineer be consulted regarding protection of buried steel or ductile iron piping and conduit or, at a minimum, applicable manufacturer's recommendations for corrosion protection of buried metal pipe be closely followed.

8.4 Percolation Testing

Four percolation tests (P-1 through P-4) were performed within assumed infiltration areas and were conducted in accordance with in accordance with the guidelines established by the County of Riverside. The approximate locations of the percolation tests are shown on the attached Site Plan, Figure 2.

Four (4) 8-inch diameter boreholes were advanced to the depths shown on the percolation test worksheets. The holes were pre-saturated before percolation testing commenced. Percolation rates were measured by filling the test holes with clean water and measuring the water drops at a certain time interval.

The percolation rate data are presented in tabular format at the end of this Report. The difference in the percolation rates are reflected by the varied type of soil materials at the bottom of the test holes. The percolation rates were converted to infiltration rates using the "Porchet Method" according to County Design handbook. The test results are shown on the table below.

PERCOLATION TEST RESULTS

Test No.	Depth (feet)	Measured Percolation Rate (min/inch)	Infiltration Rate* (inch/hour)	Soil Type
P-1	8	7.6	**1.43**	Silty SAND (SM)
P-2	10	25.0	**0.55**	Silty SAND (SM)
P-3	8	25.0	**0.51**	Silty SAND (SM)
P-4	10	7.6	**1.27**	Silty SAND (SM)

*** Tested infiltration Rate = $(\Delta H\ 60\ r) / (\Delta t(r + 2H_{avg}))$**

The soil infiltration or percolation rates are based on tests conducted with clear water. The infiltration/percolation rates may vary with time as a result of soil clogging from water impurities. The infiltration/percolation rates will deteriorate over time due to the soil conditions.

The soils may also become less permeable to impermeable if the soil is compacted. Thus, periodic maintenance consisting of clearing the bottom of the drainage system of clogged soils should be expected. The infiltration/percolation rate may become slower if the surrounding soil is wet or saturated due to prolonged rainfalls. Additional percolation tests may be conducted at bottom of the drainage system during construction to verify the infiltration/percolation rate. Groundwater, if closer to the bottom of the drainage system, will also reduce the infiltration/percolation rate.

The scope of our services did not include a groundwater study and was limited to the performance of percolation testing and soil profile description, and the submitted data only. Our services did not include those associated with septic system design. Neither did services include an Environmental Site Assessment for the presence or absence of hazardous and/or toxic materials in the soil, groundwater, or atmosphere; or the presence of wetlands.

Any statements, or absence of statements, in this report or on any boring logs regarding odors, unusual or suspicious items, or conditions observed, are strictly for descriptive purposes and are not intended to convey engineering judgment regarding potential hazardous and/or toxic assessment.

The geotechnical engineering information presented herein is based upon professional interpretation utilizing standard engineering practices. The work conducted through the course of this investigation, including the preparation of this report, has been performed in accordance with the generally accepted standards of geotechnical engineering practice, which existed in the geographic area at the time the report was written. No other warranty, express or implied, is made.

Please be advised that when performing percolation testing services in relatively small diameter borings, that the testing may not fully model the actual full scale long term performance of a given site. This is particularly true where percolation test data is to be used in the design of large infiltration system such as may be proposed for the site. The measured percolation rate includes dispersion of the water at the sidewalls of the boring as well as into the underlying soils. Subsurface conditions, including percolation rates, can change over time as fine-grained soils migrate. It is not warranted that such information and interpretation cannot be superseded by future geotechnical engineering developments. We emphasize that this report is valid for the project outlined above and should not be used for any other sites.

9. CONCLUSIONS AND RECOMMENDATIONS

9.1 General

9.1.1 Based upon the data collected during this investigation, and from a geotechnical engineering standpoint, it is our opinion that the site is suitable for the proposed construction of improvements at the site as planned, provided the recommendations contained in this report are incorporated into the project design and construction. Conclusions and recommendations provided in this report are based on our review of available literature, analysis of data obtained from our field exploration and laboratory testing program, and our understanding of the proposed development at this time.

9.1.2 The primary geotechnical constraints identified in our investigation is the presence of loose and potentially compressible material at the site. Recommendations to mitigate the effects of these soils are provided in this report.

9.1.3 Fill soils may be present on-site between our test boring locations. Undocumented fill materials are not suitable to support any future structures and should be replaced with Engineered Fill. Prior to fill placement, Salem Engineering Group, Inc. should inspect the bottom of the excavation to verify the fill condition.

9.1.4 Site demolition activities shall include removal of all surface obstructions not intended to be incorporated into final site design. In addition, underground buried structures and/or utility lines encountered during demolition and construction should be properly removed and the resulting excavations backfilled with Engineered Fill. It is suspected that possible demolition activities of the existing structures may disturb the upper soils. After demolition activities, it is recommended that disturbed soils be removed and/or recompacted.

9.1.5 The near-surface onsite soils are moisture-sensitive and are moderately to highly compressible (collapsible soil) under saturated conditions. Structures within the project vicinity have experienced excessive post-construction settlement, when the foundation soils become near saturated. The collapsible or weak soils should be removed and recompacted according to the recommendations in the Grading section of this report (Section 9.5).

9.1.6 Based on the subsurface conditions at the site and the anticipated structural loading, we anticipate that the proposed building may be supported using conventional shallow foundations provided that the recommendations presented herein are incorporated in the design and construction of the project.

9.1.7 Provided the site is graded in accordance with the recommendations of this report and foundations constructed as described herein, we estimate that total settlement due to static loads utilizing conventional shallow foundations for the proposed building will be within 1 inch and corresponding differential settlement will be less than ½ inch.

9.1.8 All references to relative compaction and optimum moisture content in this report are based on ASTM D 1557 (latest edition).

9.1.9 SALEM shall review the project grading and foundation plans prior to final design submittal to assess whether our recommendations have been properly implemented and evaluate if additional analysis and/or recommendations are required. If SALEM is not provided plans and specifications for review, we cannot assume any responsibility for the future performance of the project.

9.1.10 SALEM shall be present at the site during site demolition and preparation to observe site clearing/demolition, preparation of exposed surfaces after clearing, and placement, treatment and compaction of fill material.

9.1.11 SALEM's observations should be supplemented with periodic compaction tests to establish substantial conformance with these recommendations. Moisture content of footings and slab subgrade should be tested immediately prior to concrete placement. SALEM should observe foundation excavations prior to placement of reinforcing steel or concrete to assess whether the actual bearing conditions are compatible with the conditions anticipated during the preparation of this report.

9.2 Seismic Design Criteria

9.2.1 For seismic design of the structures, and in accordance with the seismic provisions of the 2016 CBC, our recommended parameters are shown below. These parameters are based on Probabilistic Ground Motion of 2% Probability of Exceedance in 50 years. The Site Class was determined based on the results of our field exploration.

TABLE 9.2.1
SEISMIC DESIGN PARAMETERS

Seismic Item	Symbol	Value	2016 CBC Reference
Site Coordinates (Datum = NAD 83)		33.8958 Lat -117.1833 Lon	
Site Class	--	D	ASCE 7 Table 20.3
Soil Profile Name	--	Stiff Soil	ASCE 7 Table 20.3
Risk Category	--	II	CBC Table 1604.5
Site Coefficient for PGA	F_{PGA}	1.200	ASCE 7 Table 11.8-1
Peak Ground Acceleration (adjusted for Site Class effects)	PGA_M	0.871 g	ASCE 7 Equation 11.8-1
Seismic Design Category	SDC	D	ASCE 7 Table 11.6-1 & 2
Mapped Spectral Acceleration (Short period - 0.2 sec)	S_S	1.715 g	CBC Figure 1613.3.1(1-6)
Mapped Spectral Acceleration (1.0 sec. period)	S_1	0.670 g	CBC Figure 1613.3.1(1-6)
Site Class Modified Site Coefficient	F_a	1.200	CBC Table 1613.3.3(1)
Site Class Modified Site Coefficient	F_v	1.700	CBC Table 1613.3.3(2)
MCE Spectral Response Acceleration (Short period - 0.2 sec) $S_{MS} = F_a S_S$	S_{MS}	2.058 g	CBC Equation 16-37
MCE Spectral Response Acceleration (1.0 sec. period) $S_{M1} = F_v S_1$	S_{M1}	1.139 g	CBC Equation 16-38
Design Spectral Response Acceleration $S_{DS}=\frac{2}{3}S_{MS}$ (short period - 0.2 sec)	S_{DS}	1.372 g	CBC Equation 16-39
Design Spectral Response Acceleration $S_{D1}=\frac{2}{3}S_{M1}$ (1.0 sec. period)	S_{D1}	0.759 g	CBC Equation 16-40

9.2.2 Conformance to the criteria in the above table for seismic design does not constitute any kind of guarantee or assurance that significant structural damage or ground failure will not occur if a large earthquake occurs. The primary goal of seismic design is to protect life, not to avoid all damage, since such design may be economically prohibitive.

9.3 Soil and Excavation Characteristics

9.3.1 Based on the soil conditions encountered in our soil borings, the onsite soils can be excavated with moderate to laborious effort using conventional heavy-duty or special excavation and earthmoving equipment.

9.3.2 It is the responsibility of the contractor to ensure that all excavations and trenches are properly shored and maintained in accordance with applicable Occupational Safety and Health Administration (OSHA) rules and regulations to maintain safety and maintain the stability of adjacent existing improvements. Temporary excavations are further discussed in a later Section of this report.

9.3.3 The upper soils within the project site are identified primarily as silty sands and clayey sands. The sandy soils are moisture-sensitive and moderately collapsible under saturated conditions. These soils, in their present condition, possess moderate risk to construction in terms of possible post-construction movement of the foundations and floor systems if no mitigation measures are employed. Accordingly, measures are considered necessary to reduce anticipated expansion and collapse potential.

As recommended in Section 9.5, the collapsible soils should be removed and replaced with properly moisture conditioned and compacted Engineered Fill. Mitigation measures will not eliminate post-construction soil movement, but will reduce the soil movement. Success of the mitigation measures will depend on the thoroughness of the contractor in dealing with the soil conditions.

9.3.4 The near surface soils identified as part of our investigation are, generally, slightly moist to moist due to the absorption characteristics of the soil. Earthwork operations may encounter very moist unstable soils which may require removal to a stable bottom. Exposed native soils exposed as part of site grading operations shall not be allowed to dry out and should be kept continuously moist prior to placement of subsequent fill.

9.4 Materials for Fill

9.4.1 Excavated soils generated from cut operations at the site are suitable for use as general Engineered Fill in structural areas, provided they do not contain deleterious matter, organic material, or rock material larger than 3 inches in maximum dimension.

9.4.2 The preferred materials specified for Engineered Fill are suitable for most applications with the exception of exposure to erosion. Project site winterization and protection of exposed soils during the construction phase should be the sole responsibility of the Contractor, since they have complete control of the project site.

9.4.3 Import soil shall be well-graded, slightly cohesive silty fine sand or sandy silt, with relatively impervious characteristics when compacted. A clean sand or very sandy soil is not acceptable for this purpose. This material should be approved by the Engineer prior to use and should typically possess the soil characteristics summarized below in Table 9.4.3.

TABLE 9.4.3
IMPORT FILL REQUIREMENTS

Minimum Percent Passing No. 200 Sieve	20
Maximum Percent Passing No. 200 Sieve	50
Minimum Percent Passing No. 4 Sieve	80
Maximum Particle Size	3"
Maximum Plasticity Index	10
Maximum CBC Expansion Index	15

9.4.4 Environmental characteristics and corrosion potential of import soil materials should also be considered.

9.4.5 Proposed import materials should be sampled, tested, and approved by SALEM prior to its transportation to the site.

9.5 Grading

9.5.1 A representative of our firm should be present during all site clearing and grading operations to test and observe earthwork construction. This testing and observation is an integral part of our service as acceptance of earthwork construction is dependent upon compaction of the material and the stability of the material. The Geotechnical Engineer may reject any material that does not meet compaction and stability requirements. Further recommendations of this report are predicated upon the assumption that earthwork construction will conform to recommendations set forth in this section as well as other portions of this report.

9.5.2 A preconstruction conference should be held at the site prior to the beginning of grading operations with the owner, contractor, civil engineer and geotechnical engineer in attendance.

9.5.3 Site preparation should begin with removal of existing surface/subsurface structures, underground utilities (as required), any existing uncertified fill, and debris. Excavations or depressions resulting from site clearing operations, or other existing excavations or depressions, should be restored with Engineered Fill in accordance with the recommendations of this report.

9.5.4 Surface vegetation consisting of grasses and other similar vegetation should be removed by stripping to a sufficient depth to remove organic-rich topsoil. The upper 2 to 4 inches of the soils containing, vegetation, roots and other objectionable organic matter encountered at the time of grading should be stripped and removed from the surface. Deeper stripping may be required in localized areas. In addition, existing concrete and asphalt materials shall be removed from areas of proposed improvements and stockpiled separately from excavated soil material. The stripped vegetation, asphalt and concrete materials will not be suitable for use as Engineered Fill or within 5 feet of building pads or within pavement areas. However, stripped topsoil may be stockpiled and reused in landscape or non-structural areas or exported from the site.

9.5.5 Structural building pad areas should be considered as areas extending a minimum of 5 feet horizontally beyond the outside dimensions of building, including footings and non-cantilevered overhangs carrying structural loads.

9.5.6 To minimize post-construction soil movement and provide uniform support for the proposed building, overexcavation and recompaction within the proposed building areas should be performed to a minimum depth of **five (5) feet** below existing grade or **three (3) feet** below proposed footing bottom, whichever is deeper. The overexcavation and recompaction should also extend laterally to a minimum of 5 feet beyond the outer edges of the proposed footings.

9.5.7 Within pavement areas, it is recommended that overexcavation and recompaction be performed to a minimum depth of **1.5 feet** below existing grade or proposed grade, whichever is deeper. Deeper overexcavation may be required in some local areas to removal all unsuitable materials.

The overexcavation and recompaction should also extend laterally to a minimum of 2 feet beyond the outer edges of the proposed pavement.

9.5.8 Any fill or disturbed soils encountered during grading should be removed and replaced with engineered fill. The actual depth of the overexcavation and recompaction should be determined by our field representative during construction.

9.5.9 Prior to placement of fill soils, the upper 8 to 10 inches of native subgrade soils should be scarified, moisture-conditioned to no less than the optimum moisture content and recompacted to a minimum of 95 percent of the maximum dry density based on ASTM D1557 Test Method latest edition.

9.5.10 All Engineered Fill (including scarified ground surfaces and backfill) should be placed in thin lifts which will allow for adequate bonding and compaction (typically 6 to 8 inches in loose thickness).

9.5.11 Engineered Fill soils should be placed, moisture conditioned to near optimum moisture content, and compacted to at least 95% relative compaction.

9.5.12 An integral part of satisfactory fill placement is the stability of the placed lift of soil. If placed materials exhibit excessive instability as determined by a SALEM field representative, the lift will be considered unacceptable and shall be remedied prior to placement of additional fill material. Additional lifts should not be placed if the previous lift did not meet the required dry density or if soil conditions are not stable.

9.5.13 Final pavement subgrade should be finished to a smooth, unyielding surface. We further recommend proof-rolling the subgrade with a loaded water truck (or similar equipment with high contact pressure) to verify the stability of the subgrade prior to placing aggregate base.

9.5.14 The most effective site preparation alternatives will depend on site conditions prior to grading. We should evaluate site conditions and provide supplemental recommendations immediately prior to grading, if necessary.

9.5.15 We do not anticipate groundwater or seepage to adversely affect construction if conducted during the drier moths of the year (typically summer and fall). However, groundwater and soil moisture conditions could be significantly different during the wet season (typically winter and spring) as surface soil becomes wet; perched groundwater conditions may develop. Grading during this time period will likely encounter wet materials resulting in possible excavation and fill placement difficulties. Project site winterization consisting of placement of aggregate base and protecting exposed soils during construction should be performed. If the construction schedule requires grading operations during the wet season, we can provide additional recommendations as conditions warrant.

9.5.16 Typical remedial measures include: discing and aerating the soil during dry weather; mixing the soil with dryer materials; removing and replacing the soil with an approved fill material or placement of crushed rocks or aggregate base material; or mixing the soil with an approved lime or cement product.

The most common remedial measure of stabilizing the bottom of the excavation due to wet soil condition is to reduce the moisture of the soil to near the optimum moisture content by having the subgrade soils scarified and aerated or mixed with drier soils prior to compacting. However, the drying process may require an extended period of time and delay the construction operation.

To expedite the stabilizing process, crushed rock may be utilized for stabilization provided this method is approved by the owner for the cost purpose.

If the use of crushed rock is considered, it is recommended that the upper soft and wet soils be replaced by 6 to 24 inches of ¾-inch to 1-inch crushed rocks. The thickness of the rock layer depends on the severity of the soil instability. The recommended 6 to 24 inches of crushed rock material will provide a stable platform. It is further recommended that lighter compaction equipment be utilized for compacting the crushed rock. A layer of geofabric is recommended to be placed on top of the compacted crushed rock to minimize migration of soil particles into the voids of the crushed rock, resulting in soil movement.

Although it is not required, the use of geogrid (e.g. Tensar TX 140) below the crushed rock will enhance stability and reduce the required thickness of crushed rock necessary for stabilization. Our firm should be consulted prior to implementing remedial measures to provide appropriate recommendations.

9.6 Shallow Foundations

9.6.1 The site is suitable for use of conventional shallow foundations consisting of continuous footings and isolated pad footings bearing in properly compacted Engineered Fill.

9.6.2 The bearing wall footings considered for the structure should be continuous with a minimum width of 15 inches and extend to a minimum depth of 18 inches below the lowest adjacent grade. Isolated column footings should have a minimum width of 24 inches and extend a minimum depth of 18 inches below the lowest adjacent grade.

9.6.3 The bottom of footing excavations should be maintained free of loose and disturbed soil. Footing concrete should be placed into a neat excavation.

9.6.4 For design purposes, total settlement due to static loading on the order of 1 inch may be assumed for shallow footings. Differential settlement due to static loading, along a 20-foot exterior wall footing or between adjoining column footings, should be ½ inch, producing an angular distortion of 0.002. Most of the settlement is expected to occur during construction as the loads are applied. However, additional post-construction settlement may occur if the foundation soils are flooded or saturated. The footing excavations should not be allowed to dry out any time prior to pouring concrete.

9.6.5 Footings proportioned as recommended above may be designed for the maximum allowable soil bearing pressures shown in the table below.

Loading Condition	Allowable Bearing
Dead Load Only	2,000 psf
Dead-Plus-Live Load	2,500 psf
Total Load, Including Wind or Seismic Loads	3,325 psf

9.6.6 Resistance to lateral footing displacement can be computed using an allowable coefficient of friction factor of 0.40 acting between the base of foundations and the supporting subgrade.

9.6.7 Lateral resistance for footings can alternatively be developed using an allowable equivalent fluid passive pressure of 400 pounds per cubic foot acting against the appropriate vertical native footing faces. The frictional and passive resistance of the soil may be combined without reduction in determining the total lateral resistance. An increase of one-third is permitted when using the alternate load combination in Section 1605.3.2 of the 2015 IBC/2016 CBC that includes wind or earthquake loads.

9.6.8 Underground utilities running parallel to footings should not be constructed in the zone of influence of footings. The zone of influence may be taken to be the area beneath the footing and within a 1:1 plane extending out and down from the bottom edge of the footing.

9.6.9 The foundation subgrade should be sprinkled as necessary to maintain a moist condition without significant shrinkage cracks as would be expected in any concrete placement. Prior to placing rebar reinforcement, foundation excavations should be evaluated by a representative of SALEM for appropriate support characteristics and moisture content. Moisture conditioning may be required for the materials exposed at footing bottom, particularly if foundation excavations are left open for an extended period.

9.7 Concrete Slabs-on-Grade

9.7.1 Slab thickness and reinforcement should be determined by the structural engineer based on the anticipated loading. We recommend that non-structural slabs-on-grade be at least 4 inches thick and underlain by six (6) inches of compacted granular aggregate subbase material compacted to at least 95% relative compaction.

9.7.2 Granular aggregate subbase material shall conform to ASTM D-2940, Latest Edition (Table 1, bases) with at least 95 percent passing a 1½-inch sieve and not more than 8% passing a No. 200 sieve or its approved equivalent to prevent capillary moisture rise.

9.7.3 We recommend reinforcing slabs, at a minimum, with No. 3 reinforcing bars placed 18 inches on center, each way.

9.7.4 Slabs subject to structural loading may be designed utilizing a modulus of subgrade reaction K of 180 pounds per square inch per inch. The K value was approximated based on inter-relationship of soil classification and bearing values (Portland Cement Association, Rocky Mountain Northwest).

9.7.5 The spacing of crack control joints should be designed by the project structural engineer. In order to regulate cracking of the slabs, we recommend that full depth construction joints or control joints be provided at a maximum spacing of 15 feet in each direction for 5-inch thick slabs and 12 feet for 4-inch thick slabs.

9.7.6 Crack control joints should extend a minimum depth of one-fourth the slab thickness and should be constructed using saw-cuts or other methods as soon as practical after concrete placement. The exterior floors should be poured separately in order to act independently of the walls and foundation system.

9.7.7 It is recommended that the utility trenches within the structure be compacted, as specified in our report, to minimize the transmission of moisture through the utility trench backfill. Special attention to the immediate drainage and irrigation around the structures is recommended.

9.7.8 Moisture within the structure may be derived from water vapors, which were transformed from the moisture within the soils. This moisture vapor penetration can affect floor coverings and produce mold and mildew in the structure. To minimize moisture vapor intrusion, it is recommended that a vapor retarder be installed in accordance with manufacturer's recommendations and/or ASTM guidelines, whichever is more stringent. In addition, ventilation of the structure is recommended to reduce the accumulation of interior moisture.

9.7.9 In areas where it is desired to reduce floor dampness where moisture-sensitive coverings are anticipated, construction should have a suitable waterproof vapor retarder (a minimum of 15 mils thick polyethylene vapor retarder sheeting, Raven Industries "VaporBlock 15, Stego Industries 15 mil "StegoWrap" or W.R. Meadows Sealtight 15 mil "Perminator") incorporated into the floor slab design. The water vapor retarder should be decay resistant material complying with ASTM E96 not exceeding 0.04 perms, ASTM E154 and ASTM E1745 Class A. The vapor barrier should be placed between the concrete slab and the compacted granular aggregate subbase material. The water vapor retarder (vapor barrier) should be installed in accordance with ASTM Specification E 1643-94.

9.7.10 The concrete maybe placed directly on vapor retarder. The vapor retarder should be inspected prior to concrete placement. Cut or punctured retarder should be repaired using vapor retarder material lapped 6 inches beyond damaged areas and taped.

9.7.11 The recommendations of this report are intended to reduce the potential for cracking of slabs due to soil movement. However, even with the incorporation of the recommendations presented herein, foundations, stucco walls, and slabs-on-grade may exhibit some cracking due to soil movement. This is common for project areas that contain expansive soils since designing to eliminate potential soil movement is cost prohibitive. The occurrence of concrete shrinkage cracks is independent of the supporting soil characteristics. Their occurrence may be reduced and/or controlled by limiting the slump of the concrete, proper concrete placement and curing, and by the placement of crack control joints at periodic intervals, in particular, where re-entrant slab corners occur.

9.7.12 Proper finishing and curing should be performed in accordance with the latest guidelines provided by the American Concrete Institute, Portland Cement Association, and ASTM.

9.8 Caisson Foundations

9.8.1 It is recommended that the caisson foundation should have a minimum depth of 12 feet below the lowest adjacent grade.

9.8.2 The caissons may be designed using an allowable sidewall friction of 160 psf. This value is for dead-plus-live loads. An allowable end bearing capacity of 3,000 psf may be used provided that the bottom of the caisson is cleaned with the use of a clean-out bucket or equivalent and inspected by our representative prior to placement of reinforcement and concrete. An increase of one-third is permitted when using the alternate load combination in Section 1605.3.2 of the CBC that includes wind or earthquake loads.

9.8.3 Uplift loads can be resisted by caissons using an allowable sidewall friction of 120 psf of the surface area and the weight of the caisson.

9.8.4 The total static settlement of the caisson footing is not expected to exceed 1 inches. Differential settlement should be less than ½ inch. Most of the settlement is expected to occur during construction as the loads are applied.

9.8.5 Lateral loads for caissons may be designed utilizing the Isolated Pole Formula and Specifications shown on Table 1804.2, Sections 1804.3.1 and 1808.2.2 of the California Building Code. The drilled caissons may be designed for a lateral capacity of 400 pounds per square foot per foot of depth below the lowest adjacent grade to a maximum of 6,000 psf.

9.8.6 The top one-foot of adjacent subgrade should be deleted from the passive pressure computation.

9.8.7 These values may be increased by one-third when using the alternative load combinations in Section 1605.3.2 of the IBC that include wind or earthquake loads. These values should not be doubled since the values given herein are higher than the tabular values shown on the Table 1804.2. The lateral loading criteria is based on the assumption that the load application is applied at the ground level, flexible cap connections applied and a minimum embedment depth of 10 feet.

9.8.8 Sandy soils were encountered at the site. Casing will be required during drilling of the caisson footings.

9.9 Lateral Earth Pressures and Frictional Resistance

9.9.1 Active, at-rest and passive unit lateral earth pressures against footings and walls are summarized in the table below:

Lateral Pressure Level Backfill and Drained Conditions	**Equivalent Fluid Pressure, pcf**
Active Pressure	35
At-Rest Pressure	55
Passive Pressure	400
Related Parameters	
Allowable Coefficient of Friction	0.40
In-Place Soil Density (lbs/ft^3)	120

9.9.2 Active pressure applies to walls, which are free to rotate. At-rest pressure applies to walls, which are restrained against rotation. The preceding lateral earth pressures assume sufficient drainage behind retaining walls to prevent the build-up of hydrostatic pressure.

9.9.3 The top one-foot of adjacent subgrade should be deleted from the passive pressure computation.

9.9.4 A safety factor consistent with the design conditions should be included when using the values in the above table.

9.9.5 For stability against lateral sliding, which is resisted solely by the passive pressure, we recommend a minimum safety factor of 1.5.

9.9.6 For stability against lateral sliding, which is resisted by the combined passive and frictional resistance, a minimum safety factor of 2.0 is recommended.

9.9.7 For lateral stability against seismic loading conditions, we recommend a minimum safety factor of 1.1.

9.9.8 For dynamic seismic lateral loading the following equation shall be used:

Dynamic Seismic Lateral Loading Equation
Dynamic Seismic Lateral Load = $\frac{3}{8}\gamma K_h H^2$
Where: γ = In-Place Soil Density
K_h = Horizontal Acceleration = $\frac{2}{3}PGA_M$
H = Wall Height

9.10 Retaining Walls

9.10.1 Retaining and/or below grade walls should be drained with either perforated pipe encased in free-draining gravel or a prefabricated drainage system. The gravel zone should have a minimum width of 12 inches wide and should extend upward to within 12 inches of the top of the wall. The upper 12 inches of backfill should consist of native soils, concrete, asphaltic-concrete or other suitable backfill to minimize surface drainage into the wall drain system. The gravel should conform to Class II permeable materials graded in accordance with the current CalTrans Standard Specifications.

9.10.2 Prefabricated drainage systems, such as Miradrain®, Enkadrain®, or an equivalent substitute, are acceptable alternatives in lieu of gravel provided they are installed in accordance with the manufacturer's recommendations. If a prefabricated drainage system is proposed, our firm should review the system for final acceptance prior to installation.

9.10.3 Drainage pipes should be placed with perforations down and should discharge in a non-erosive manner away from foundations and other improvements. The top of the perforated pipe should be placed at or below the bottom of the adjacent floor slab or pavements. The pipe should be placed in the center line of the drainage blanket and should have a minimum diameter of 4 inches. Slots should be no wider than 1/8-inch in diameter, while perforations should be no more than ¼-inch in diameter.

9.10.4 If retaining walls are less than 5 feet in height, the perforated pipe may be omitted in lieu of weep holes on 4 feet maximum spacing. The weep holes should consist of 2-inch minimum diameter holes (concrete walls) or unmortared head joints (masonry walls) and placed no higher than 18 inches above the lowest adjacent grade. Two 8-inch square overlapping patches of geotextile fabric (conforming to the CalTrans Standard Specifications for "edge drains") should be affixed to the rear wall opening of each weep hole to retard soil piping.

9.10.5 During grading and backfilling operations adjacent to any walls, heavy equipment should not be allowed to operate within a lateral distance of 5 feet from the wall, or within a lateral distance equal to the wall height, whichever is greater, to avoid developing excessive lateral pressures. Within this zone, only hand operated equipment ("whackers," vibratory plates, or pneumatic compactors) should be used to compact the backfill soils.

9.11 Temporary Excavations

9.11.1 We anticipate that the majority of the sandy site soils will be classified as Cal-OSHA "Type C" soil when encountered in excavations during site development and construction. Excavation sloping, benching, the use of trench shields, and the placement of trench spoils should conform to the latest applicable Cal-OSHA standards. The contractor should have a Cal-OSHA-approved "competent person" onsite during excavation to evaluate trench conditions and make appropriate recommendations where necessary.

9.11.2 It is the contractor's responsibility to provide sufficient and safe excavation support as well as protecting nearby utilities, structures, and other improvements which may be damaged by earth movements. All onsite excavations must be conducted in such a manner that potential surcharges from existing structures, construction equipment, and vehicle loads are resisted. The surcharge area may be defined by a 1:1 projection down and away from the bottom of an existing foundation or vehicle load.

9.11.3 Temporary excavations and slope faces should be protected from rainfall and erosion. Surface runoff should be directed away from excavations and slopes.

9.11.4 Open, unbraced excavations in undisturbed soils should be made according to the slopes presented in the following table:

RECOMMENDED EXCAVATION SLOPES

Depth of Excavation (ft)	Slope (Horizontal : Vertical)
0-5	1:1
5-10	2:1

9.11.5 If, due to space limitation, excavations near property lines or existing structures are performed in a vertical position, slot cuts, braced shorings or shields may be used for supporting vertical excavations. Therefore, in order to comply with the local and state safety regulations, a properly designed and installed shoring system would be required to accomplish planned excavations and installation. A Specialty Shoring Contractor should be responsible for the design and installation of such a shoring system during construction.

9.11.6 Braced shorings should be designed for a maximum pressure distribution of 30H, (where H is the depth of the excavation in feet). The foregoing does not include excess hydrostatic pressure or surcharge loading. Fifty percent of any surcharge load, such as construction equipment weight, should be added to the lateral load given herein. Equipment traffic should concurrently be limited to an area at least 3 feet from the shoring face or edge of the slope.

9.11.7 The excavation and shoring recommendations provided herein are based on soil characteristics derived from the borings within the area. Variations in soil conditions will likely be encountered during the excavations. SALEM Engineering Group, Inc. should be afforded the opportunity to provide field review to evaluate the actual conditions and account for field condition variations not otherwise anticipated in the preparation of this recommendation. Slope height, slope inclination, or excavation depth should in no case exceed those specified in local, state, or federal safety regulation, (e.g. OSHA) standards for excavations, 29 CFR part 1926, or Assessor's regulations.

9.12 Underground Utilities

9.12.1 Underground utility trenches should be backfilled with properly compacted material. The material excavated from the trenches should be adequate for use as backfill provided it does not contain deleterious matter, vegetation or rock larger than 3 inches in maximum dimension. Trench backfill should be placed in loose lifts not exceeding 8 inches and compacted to at least 95% relative compaction at or above optimum moisture content.

9.12.2 Bedding and pipe zone backfill typically extends from the bottom of the trench excavations to approximately 6 to 12 inches above the crown of the pipe. Pipe bedding and backfill material should conform to the requirements of the governing utility agency.

9.12.3 It is suggested that underground utilities crossing beneath new or existing structures be plugged at entry and exit locations to the buildings or structures to prevent water migration. Trench plugs can consist of on-site clay soils, if available, or sand cement slurry. The trench plugs should extend 2 feet beyond each side of individual perimeter foundations.

9.12.4 The contractor is responsible for removing all water-sensitive soils from the trench regardless of the backfill location and compaction requirements. The contractor should use appropriate equipment and methods to avoid damage to the utilities and/or structures during fill placement and compaction.

9.13 Surface Drainage

9.13.1 Proper surface drainage is critical to the future performance of the project. Uncontrolled infiltration of irrigation excess and storm runoff into the soils can adversely affect the performance of the planned improvements. Saturation of a soil can cause it to lose internal shear strength and increase its compressibility, resulting in a change to important engineering properties. Proper drainage should be maintained at all times.

9.13.2 The ground immediately adjacent to the foundation shall be sloped away from the building at a slope of not less than 5 percent for a minimum distance of 10 feet.

9.13.3 Impervious surfaces within 10 feet of the building foundation shall be sloped a minimum of 2 percent away from the building and drainage gradients maintained to carry all surface water to collection facilities and off site. These grades should be maintained for the life of the project. Ponding of water should not be allowed adjacent to the structure. Over-irrigation within landscaped areas adjacent to the structure should not be performed.

9.13.4 Roof drains should be installed with appropriate downspout extensions out-falling on splash blocks so as to direct water a minimum of 5 feet away from the structures or be connected to the storm drain system for the development.

9.14 Pavement Design

9.14.1 Based on site soil conditions, an R-value of 40 was used for the preliminary flexible asphaltic concrete pavement design. The R-value may be verified during grading of the pavement areas.

9.14.2 The pavement design recommendations provided herein are based on the State of California Department of Transportation (CALTRANS) design manual. The asphaltic concrete (flexible pavement) is based on a 20-year pavement life utilizing 1200 passenger vehicles, 10 single unit trucks, and 2 multi-unit trucks. The following table shows the recommended pavement sections for various traffic indices.

TABLE 9.14.2
ASPHALT CONCRETE PAVEMENT THICKNESSES

Traffic Index	Asphaltic Concrete	Class II Aggregate Base*	Compacted Subgrade*
5.0 (Parking and Vehicle Drive Areas)	2.5"	5.0"	18.0"
6.0 (Heavy Truck Areas)	3.0"	6.0"	18.0"

95% compaction based on ASTM D1557-07 Test Method or Cal 216

9.14.3 The following recommendations are for light-duty and heavy-duty Portland Cement Concrete pavement sections.

TABLE 9.14.3
PORTLAND CEMENT CONCRETE PAVEMENT THICKNESSES

Traffic Index	Portland Cement Concrete*	Class II Aggregate Base**	Compacted Subgrade**
5.0 (Light Duty)	5.0"	5.0"	18.0"
6.0 (Heavy Duty)	6.0"	5.0"	18.0"

**** Minimum Compressive Strength of 4,000 psi***
***** 95% compaction based on ASTM D1557-07 Test Method or Cal 216***

10. PLAN REVIEW, CONSTRUCTION OBSERVATION AND TESTING

10.1 Plan and Specification Review

10.1.1 SALEM should review the project plans and specifications prior to final design submittal to assess whether our recommendations have been properly implemented and evaluate if additional analysis and/or recommendations are required.

10.2 Construction Observation and Testing Services

10.2.1 The recommendations provided in this report are based on the assumption that we will continue as Geotechnical Engineer of Record throughout the construction phase. It is important to maintain continuity of geotechnical interpretation and confirm that field conditions encountered are similar to those anticipated during design. If we are not retained for these services, we cannot assume any responsibility for others interpretation of our recommendations, and therefore the future performance of the project.

10.2.2 SALEM should be present at the site during site preparation to observe site clearing, preparation of exposed surfaces after clearing, and placement, treatment and compaction of fill material.

10.2.3 SALEM's observations should be supplemented with periodic compaction tests to establish substantial conformance with these recommendations. Moisture content of footings and slab subgrade should be tested immediately prior to concrete placement. SALEM should observe foundation excavations prior to placement of reinforcing steel or concrete to assess whether the actual bearing conditions are compatible with the conditions anticipated during the preparation of this report.

11. LIMITATIONS AND CHANGED CONDITIONS

The analyses and recommendations submitted in this report are based upon the data obtained from the test borings drilled at the approximate locations shown on the Site Plan, Figure 2. The report does not reflect variations which may occur between borings. The nature and extent of such variations may not become evident until construction is initiated.

If variations then appear, a re-evaluation of the recommendations of this report will be necessary after performing on-site observations during the excavation period and noting the characteristics of such variations. The findings and recommendations presented in this report are valid as of the present and for the proposed construction. If site conditions change due to natural processes or human intervention on the property or adjacent to the site, or changes occur in the nature or design of the project, or if there is a substantial time lapse between the submission of this report and the start of the work at the site, the conclusions and recommendations contained in our report will not be considered valid unless the changes are reviewed by SALEM and the conclusions of our report are modified or verified in writing.

The validity of the recommendations contained in this report is also dependent upon an adequate testing and observations program during the construction phase. Our firm assumes no responsibility for construction compliance with the design concepts or recommendations unless we have been retained to perform the on-site testing and review during construction. SALEM has prepared this report for the exclusive use of the owner and project design consultants.

SALEM does not practice in the field of corrosion engineering. It is recommended that a qualified corrosion engineer be consulted regarding protection of buried steel or ductile iron piping and conduit or, at a minimum, that manufacturer's recommendations for corrosion protection be closely followed. Further, a corrosion engineer may be needed to incorporate the necessary precautions to avoid premature corrosion of concrete slabs and foundations in direct contact with native soil.

The importation of soil and or aggregate materials to the site should be screened to determine the potential for corrosion to concrete and buried metal piping. The report has been prepared in accordance with generally accepted geotechnical engineering practices in the area. No other warranties, either express or implied, are made as to the professional advice provided under the terms of our agreement and included in this report.

If you have any questions, or if we may be of further assistance, please do not hesitate to contact our office at (909) 980-6455.

Respectfully Submitted,

SALEM ENGINEERING GROUP, INC.

Ibrahim Ibrahim, MS, PE
Geotechnical Staff Engineer
RCE 86724

REGISTERED PROFESSIONAL ENGINEER
IBRAHIM FOUD IBRAHIM
C 86724
EXP. 3/31/19
CIVIL
STATE OF CALIFORNIA

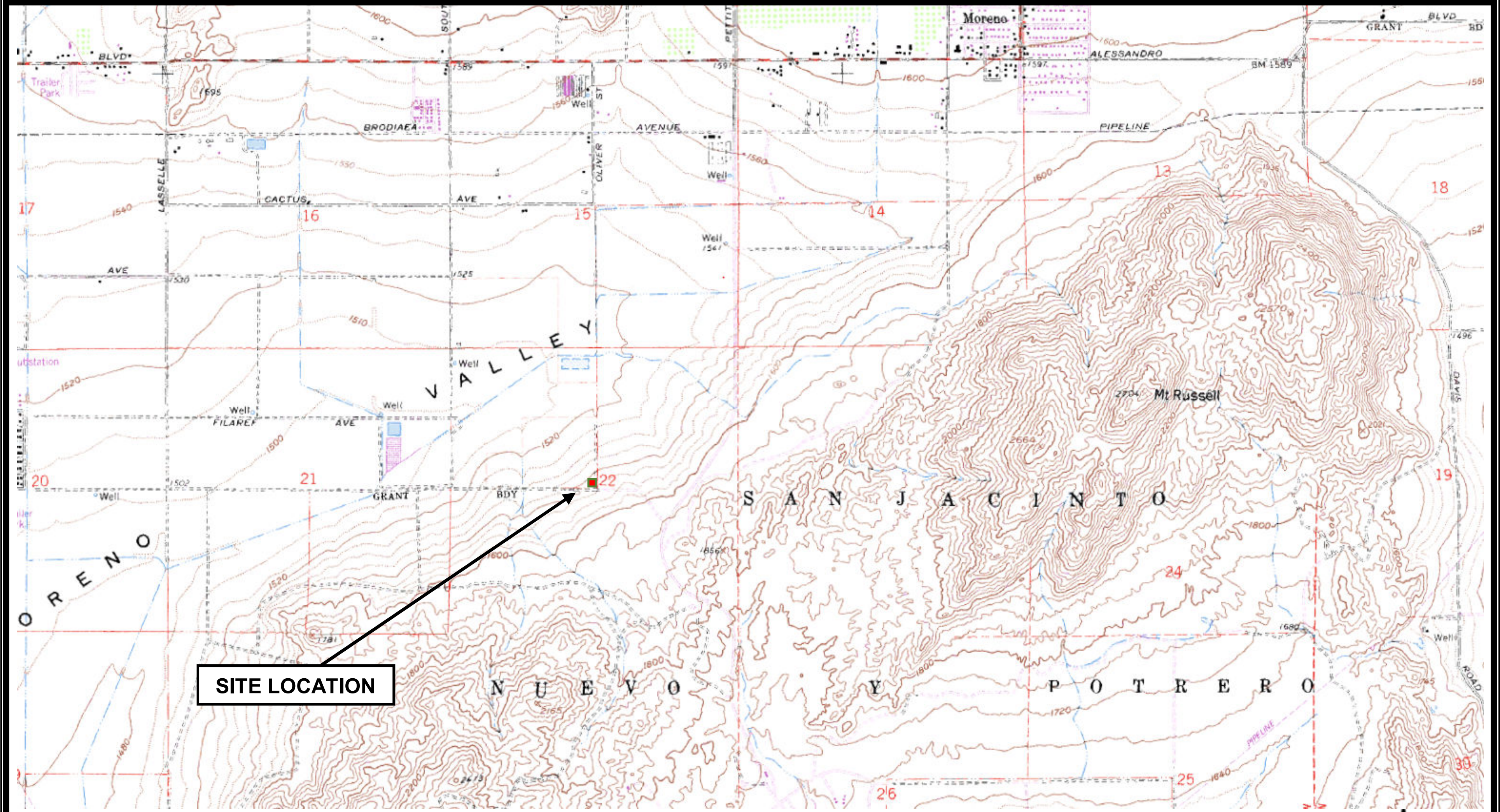
Clarence T. Jiang

Clarence Jiang, GE
Senior Geotechnical Engineer
RGE 2477

REGISTERED PROFESSIONAL ENGINEER
CLARENCE T. JIANG
No. 2477
Exp. 06/30/19
GEOTECHNICAL
STATE OF CALIFORNIA

R. Sammy Salem, MS, PE, GE
Principal Engineer
RCE 52762 / RGE 2549

REGISTERED PROFESSIONAL ENGINEER
R. SAMMY SALEM
GE 2549
Exp. Dec. 31, 2018
GEOTECHNICAL
STATE OF CALIFORNIA



Source Image: U.S. Geological Survey, Sunnymead, Calif. 7.5' Quadrangle, 1967 (Photo Revised 1980)

VICINITY MAP

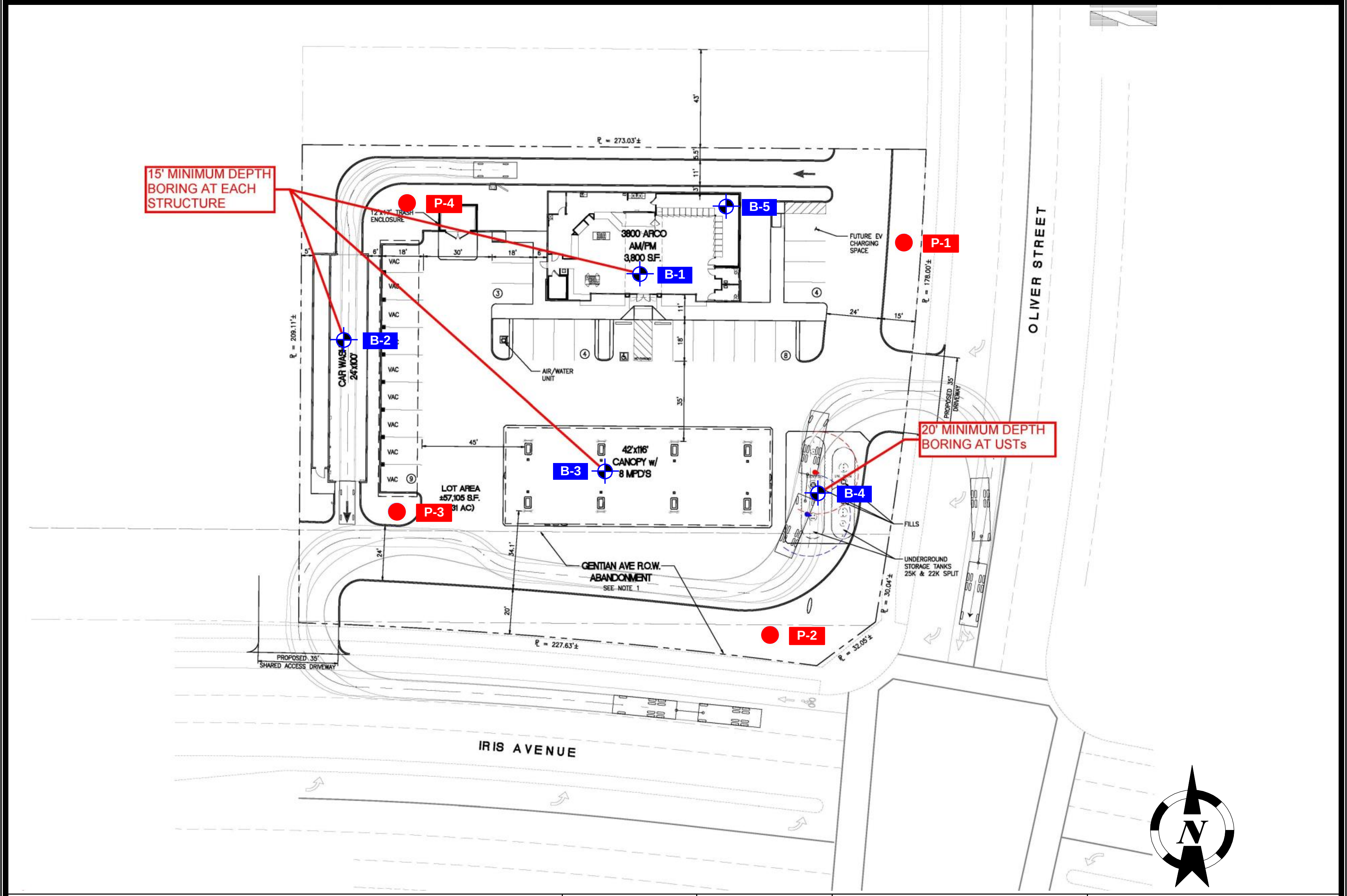
GEOTECHNICAL ENGINEERING INVESTIGATION

Proposed Arco Station
NWC Iris Avenue & Oliver Street
Moreno Valley, California

SCALE: NOT TO SCALE	DATE: 11/2017
DRAWN BY: II	APPROVED BY: CJ
PROJECT NO. 3-217-1265	FIGURE NO. 1

SALEM engineering group, inc.

Attachment: Appendix D - Geotechnical Engineering Investigation (3309 : CONDITIONAL USE PERMIT



SITE PLAN

GEOTECHNICAL ENGINEERING INVESTIGATION
Proposed Arco Station
NWC Iris Avenue & Oliver Street
Moreno Valley, California

SCALE: NOT TO SCALE	DATE: 11/2017
DRAWN BY: II	APPROVED BY: CJ
PROJECT NO. 3-217-1265	FIGURE NO. 2

LEGEND:

⊕ B-1	Soil Boring Location
● P-1	Percolation Location

All Locations Approximate

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APPENDIX

A

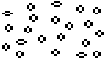
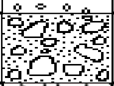
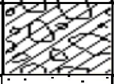
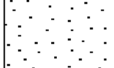
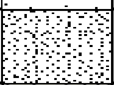
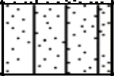
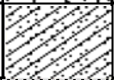
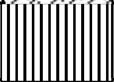
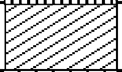
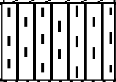
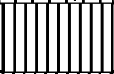
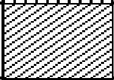
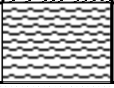
APPENDIX A
FIELD EXPLORATION

Fieldwork for our investigation (drilling) was conducted on November 14, 2017 and included a site visit, subsurface exploration, and soil sampling. Percolation tests were performed on November 15, 2017. The locations of the exploratory borings and percolation tests are shown on the Site Plan, Figure 2. Boring logs for our exploration are presented in figures following the text in this appendix. Borings were located in the field using existing reference points. Therefore, actual boring locations may deviate slightly.

In general, our borings were performed using a truck-mounted CME 45C drill rig equipped with an 8-inch and a 6-inch hollow-stem augers and a 4-inch diameter solid flight auger. Sampling in the borings was accomplished using a hydraulic 140-pound hammer with a 30-inch drop. Samples were obtained with a 3-inch outside-diameter (OD), split spoon (California Modified) sampler, and a 2-inch OD, Standard Penetration Test (SPT) sampler. The number of blows required to drive the sampler the last 12 inches (or fraction thereof) of the 18-inch sampling interval were recorded on the boring logs. The blow counts shown on the boring logs should not be interpreted as standard SPT "N" values; corrections have not been applied. Upon completion, the borings were backfilled with soil cuttings.

Subsurface conditions encountered in the exploratory borings were visually examined, classified and logged in general accordance with the American Society for Testing and Materials (ASTM) Practice for Description and Identification of Soils (Visual-Manual Procedure D2488). This system uses the Unified Soil Classification System (USCS) for soil designations. The logs depict soil and geologic conditions encountered and depths at which samples were obtained. The logs also include our interpretation of the conditions between sampling intervals. Therefore, the logs contain both observed and interpreted data. We determined the lines designating the interface between soil materials on the logs using visual observations, drill rig penetration rates, excavation characteristics and other factors. The transition between materials may be abrupt or gradual. Where applicable, the field logs were revised based on subsequent laboratory testing.

Unified Soil Classification System

Major Divisions			Letter	Symbol	Description
Coarse-grained Soils **More than ½ retained on the No. 200 Sieve**	**Gravels** More than ½ coarse fraction retained on the No. 4 sieve	Clean Gravels	GW		Well-graded gravels and gravel-sand mixtures, little or no fines.
			GP		Poorly-graded gravels and gravel-sand mixtures, little or no fines.
		Gravels With Fines	GM		Silty gravels, gravel-sand-silt mixtures.
			GC		Clayey gravels, gravel-sand-clay mixtures.
	Sands More than ½ passing through the No. 200 sieve	Clean Sands	SW		Well-graded sands and gravelly sands, little or no fines.
			SP		Poorly-graded sands and gravelly sands, little or no fines.
		Sands With Fines	SM		Silty sands, sand-silt mixtures
			SC		Clayey sands, sandy-clay mixtures.
Fine-grained Soils **More than ½ passing through the No. 200 Sieve**	**Silts and Clays** Liquid Limit less than 50%		ML		Inorganic silts, very fine sands, rock flour, silty or clayey fine sands.
			CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL		Organic clays of medium to high plasticity.
	Silts and Clays Liquid Limit greater than 50%		MH		Inorganic silts, micaceous or diatomaceous fines sands or silts, elastic silts.
			CH		Inorganic clays of high plasticity, fat clays.
			OH		Organic clays of medium to high plasticity.
Highly Organic Soils			PT		Peat, muck, and other highly organic soils.

Consistency Classification

Granular Soils			***Cohesive Soils***		
Description - Blows Per Foot (Corrected)			Description - Blows Per Foot (Corrected)		
	MCS	SPT		MCS	SPT
Very loose	<5	<4	Very soft	<3	<2
Loose	5 – 15	4 – 10	Soft	3 – 5	2 – 4
Medium dense	16 – 40	11 – 30	Firm	6 – 10	5 – 8
Dense	41 – 65	31 – 50	Stiff	11 – 20	9 – 15
Very dense	>65	>50	Very Stiff	21 – 40	16 – 30
			Hard	>40	>30

MCS = Modified California Sampler

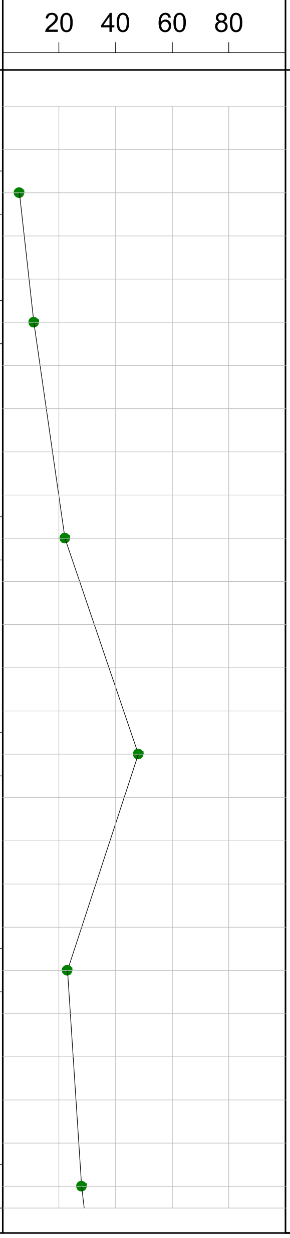
SPT = Standard Penetration Test Sampler

Boring No. B-1

Project: Proposed Arco Station
Client: Sater Oil International, LLC
Location: NWC Iris Avenue & Oliver Street, Moreno Valley, CA
Grnd. Surf. Elev. (Ft. MSL) N/A

Project No: 3-217-1265
Figure No.: A-1
Logged By: JH
Depth to Water> **Initial:** None
At Completion: None

SUBSURFACE PROFILE			SAMPLE						
Depth (ft)	**Symbol**	**Description**	**Dry Density (pcf)**	**Moisture Content (%)**	**Sampler Type**	**Penetration**	**Blow Count**	**Penetration Test**	**Water Level**
0		Ground Surface							
		Silty SAND (SM) Loose; brown; moist; fine to medium-grained.	82.4	10.5	MCS	🟦	6		
5		Grades as above.	111.2	3.1	MCS	🟦	11		
10		Grades as above; medium dense.	109.1	4.6	MCS	🟦	22		
15		**Silty Clayey SAND (SC)** Dense; brown-orange; moist; fine to medium-grained; low plasticity.	--	9.6	SPT	🟦	48		
20		**Silty SAND (SM)** Medium dense; brown; moist; fine to medium-grained.	--	4.2	SPT	🟦	23		
25		Grades as above.	--	4.9	SPT	🟦	28		



Drill Method: Hollow Stem Auger
Drill Rig: CME 45C
Driller: Salem Engineering Group, Inc.
Sheet: 1 of 2

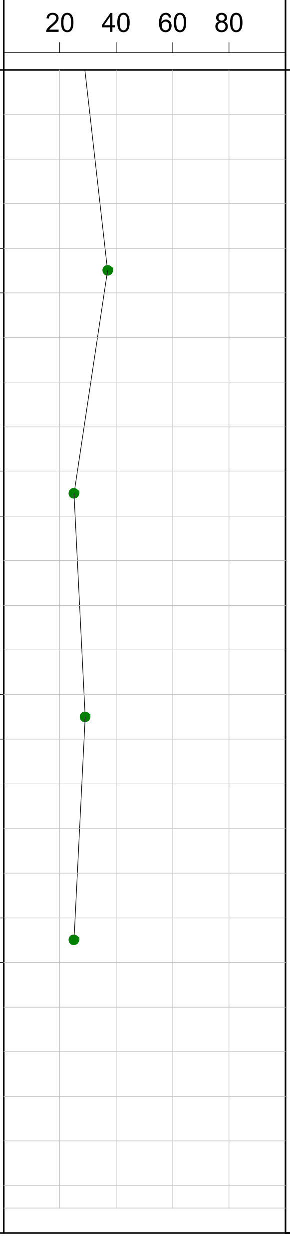
Drill Date: 11/14/2017
Borehole Size: 6 Inches
Hammer Type: Auto Trip
Weight & Drop: 140 lbs./30 in.

Boring No. B-1

Project: Proposed Arco Station
Client: Sater Oil International, LLC
Location: NWC Iris Avenue & Oliver Street, Moreno Valley, CA
Grnd. Surf. Elev. (Ft. MSL) N/A

Project No: 3-217-1265
Figure No.: A-1
Logged By: JH
Depth to Water> **Initial:** None
At Completion: None

SUBSURFACE PROFILE			SAMPLE						
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture Content (%)	Sampler Type	Penetration	Blow Count	Penetration Test	Water Level
30		Grades as above; dense.	--	5.6	SPT	🟦	37		
35		Grades as above; medium dense.	--	4.9	SPT	🟦	25		
40		Grades as above; with trace of clay.	--	5.9	SPT	🟦	29		
45		Grades as above.	--	5.9	SPT	🟦	25		
		Grades as above.							
50		End of Borehole							



Drill Method: Hollow Stem Auger
Drill Rig: CME 45C
Driller: Salem Engineering Group, Inc.
Sheet: 2 of 2

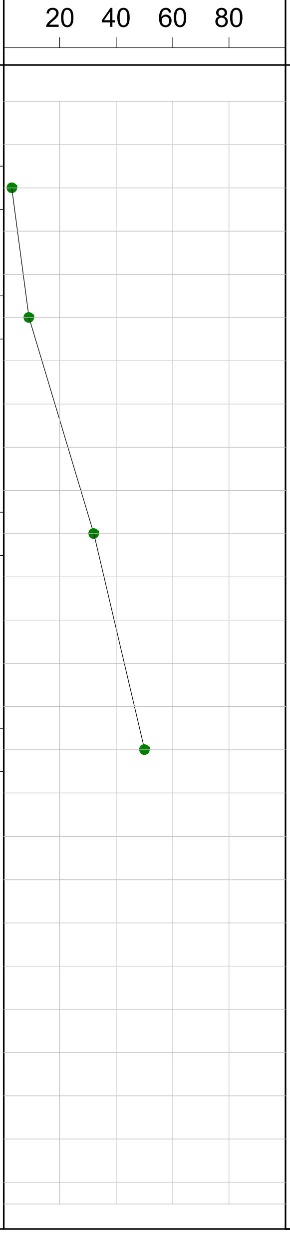
Drill Date: 11/14/2017
Borehole Size: 6 Inches
Hammer Type: Auto Trip
Weight & Drop: 140 lbs./30 in.

Boring No. B-2

Project: Proposed Arco Station
Client: Sater Oil International, LLC
Location: NWC Iris Avenue & Oliver Street, Moreno Valley, CA
Grnd. Surf. Elev. (Ft. MSL) N/A

Project No: 3-217-1265
Figure No.: A-2
Logged By: JH
Depth to Water> **Initial:** None
At Completion: None

SUBSURFACE PROFILE			SAMPLE						
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture Content (%)	Sampler Type	Penetration	Blow Count	Penetration Test	Water Level
		Ground Surface							
0		**Silty SAND (SM) with trace of Gravel** Very loose; brown; moist; fine to coarse-grained.	104.0	4.8	MCS	■	3		
5		**Silty SAND (SM)** Loose; brown; moist; fine to medium-grained.	108.8	5.4	MCS	■	9		
10		Grades as above; medium dense.	109.8	4.1	MCS	■	32		
15		**Silty Clayey SAND (SC)** Very dense; brown; moist; fine to medium-grained.	--	8.4	SPT	■	50		
		End of Borehole							
20									
25									



Drill Method: Solid Flight Auger
Drill Rig: CME 45C
Driller: Salem Engineering Group, Inc.
Sheet: 1 of 1

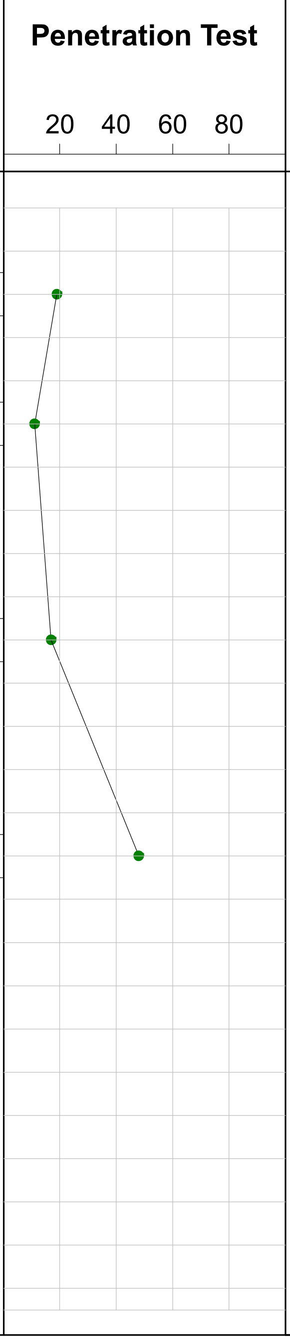
Drill Date: 11/14/2017
Borehole Size: 4 Inches
Hammer Type: Auto Trip
Weight & Drop: 140 lbs/30 in.

Boring No. B-3

Project: Proposed Arco Station
Client: Sater Oil International, LLC
Location: NWC Iris Avenue & Oliver Street, Moreno Valley, CA
Grnd. Surf. Elev. (Ft. MSL) N/A

Project No: 3-217-1265
Figure No.: A-3
Logged By: JH
Depth to Water> **Initial:** None
At Completion: None

SUBSURFACE PROFILE			SAMPLE					
Depth (ft)	**Symbol**	**Description**	**Dry Density (pcf)**	**Moisture Content (%)**	**Sampler Type**	**Penetration**	**Blow Count**	**Water Level**
		Ground Surface						
0	░	**Silty SAND (SM)** Medium dense; brown; moist; fine to medium-grained.						
	░		107.2	2.2	MCS	🟦	19	
5	░	Grades as above; loose.	104.4	2.0	MCS	🟦	11	
10	░	Grades as above; medium dense.	108.9	4.5	MCS	🟦	17	
	▨	**Silty Clayey SAND (SC)** Dense; brown; moist; fine to medium-grained.						
15	▨		--	8.6	SPT	🟦	48	
		End of Borehole						
20								
25								



Drill Method: Solid Flight Auger
Drill Rig: CME 45C
Driller: Salem Engineering Group, Inc.
Sheet: 1 of 1

Drill Date: 11/14/2017
Borehole Size: 4 Inches
Hammer Type: Auto Trip
Weight & Drop: 140 lbs/30 in.

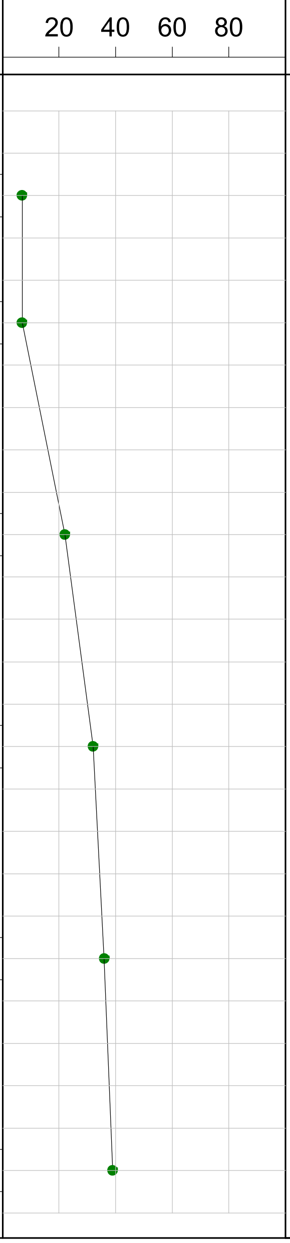
SALEM

Boring No. B-4

Project: Proposed Arco Station
Client: Sater Oil International, LLC
Location: NWC Iris Avenue & Oliver Street, Moreno Valley, CA
Grnd. Surf. Elev. (Ft. MSL) N/A

Project No: 3-217-1265
Figure No.: A-4
Logged By: JH
Depth to Water> **Initial:** None
At Completion: None

SUBSURFACE PROFILE			SAMPLE						
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture Content (%)	Sampler Type	Penetration	Blow Count	Penetration Test 20 40 60 80	Water Level
		Ground Surface							
0		**Silty SAND (SM)** Loose; brown; moist; fine to medium-grained.							
			111.7	4.0	MCS	🟦	7		
5		Grades as above.	106.3	5.2	MCS	🟦	7		
10		Grades as above; medium dense.	112.5	2.5	MCS	🟦	22		
15		**Silty Clayey SAND (SC)** Dense; brown; moist; fine to medium-grained.	--	9.2	SPT	🟦	32		
		Silty SAND (SM) Dense; brown; moist; fine to medium-grained.							
20			--	6.4	SPT	🟦	36		
25		Grades as above.	--	5.4	SPT	🟦	39		
		End of Borehole							



Drill Method: Solid Flight Auger
Drill Rig: CME 45C
Driller: Salem Engineering Group, Inc.
Sheet: 1 of 1

Drill Date: 11/14/2017
Borehole Size: 4 Inches
Hammer Type: Auto Trip
Weight & Drop: 140 lbs/30 in.

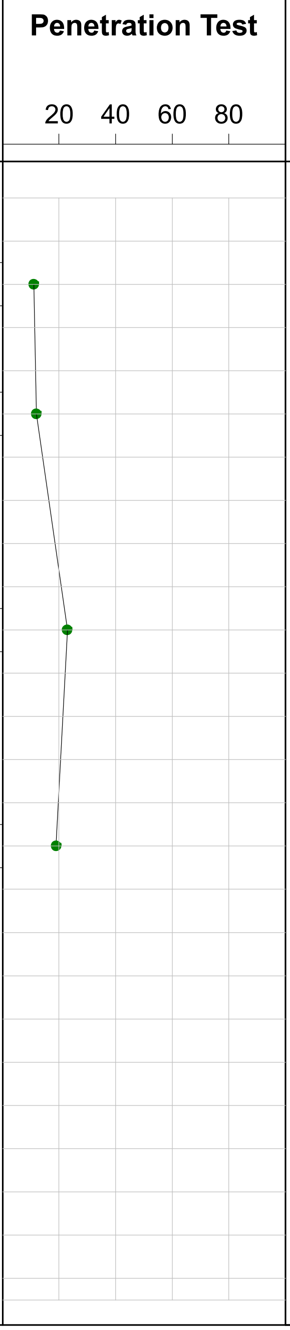
SALEM

Boring No. B-5

Project: Proposed Arco Station
Client: Sater Oil International, LLC
Location: NWC Iris Avenue & Oliver Street, Moreno Valley, CA
Grnd. Surf. Elev. (Ft. MSL) N/A

Project No: 3-217-1265
Figure No.: A-5
Logged By: JH
Depth to Water> **Initial:** None
At Completion: None

SUBSURFACE PROFILE			SAMPLE						
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture Content (%)	Sampler Type	Penetration	Blow Count	Penetration Test	Water Level
		Ground Surface							
0		**Silty SAND (SM)** Loose; brown; moist; fine to medium-grained.							
			105.7	2.0	MCS	■	11		
5		Grades as above.	105.8	2.0	MCS	■	12		
10		Grades as above; medium dense.	114.6	4.4	MCS	■	23		
15		Grades as above; with clay.	--	7.9	SPT	■	19		
		End of Borehole							
20									
25									



Drill Method: Solid Flight Auger
Drill Rig: CME 45C
Driller: Salem Engineering Group, Inc.
Sheet: 1 of 1

Drill Date: 11/14/2017
Borehole Size: 4 Inches
Hammer Type: Auto Trip
Weight & Drop: 140 lbs/30 in.

Percolation Test Worksheet

Project: **Proposed Arco Station**
NWC Iris Ave & Oliver Street
Moreno Valley, CA

Job No.: **3-217-1265**
Date Drilled: **11/14/2017**
Soil Classification: **Silty SAND (SM)**

Hole Radius: 4 in.
Pipe Dia.: 3 in.
Total Depth of Hole: 96 in.

Test Hole No.: **P-1**
Tested by: **JH**
Drilled Hole Depth: **8** ft.

Presoaking Date: **11/14/2017**
Test Date: **11/15/2017**

Stick Up 0 ft

Time Start	Time Finish	Depth of Test Hole (ft)$^{\#}$	Refill- Yes or No	Elapsed Time (hrs:min)	Initial Water Level$^{\#}$ (ft)	Final Water Level$^{\#}$ (ft)	Δ Water Level (in.)	Δ Min.	Meas. Perc Rate (min/in)	Initial Height of Water (in)	Final Height of Water (in)	Average Height of Water (in)	Infiltration Rate, It (in/hr)
11:21	11:46	8.0	Y	0:25	6.15	6.75	7.20	25	3.5	22.2	15.0	18.6	1.68
11:47	12:12	8.0	Y	0:25	6.22	6.77	6.60	25	3.8	21.4	14.8	18.1	1.58
12:14	12:24	8.0	Y	0:10	6.41	6.62	2.52	10	4.0	19.1	16.6	17.8	1.53
12:24	12:34	8.0	N	0:10	6.62	6.80	2.16	10	4.6	16.6	14.4	15.5	1.48
12:34	12:44	8.0	N	0:10	6.80	6.96	1.92	10	5.2	14.4	12.5	13.4	1.49
12:44	12:54	8.0	N	0:10	6.96	7.10	1.68	10	6.0	12.5	10.8	11.6	1.48
12:54	13:04	8.0	N	0:10	7.10	7.22	1.44	10	6.9	10.8	9.4	10.1	1.43
13:04	13:14	8.0	N	0:10	7.22	7.33	1.32	10	7.6	9.4	8.0	8.7	1.48
Recommended for Design:										**Infiltration Rate**			**1.43**

SALEM engineering group, inc.

Percolation Test Worksheet

Project: **Proposed Arco Station**
NWC Iris Ave & Oliver Street
Moreno Valley, CA

Job No.: **3-217-1265**
Date Drilled: **11/14/2017**
Soil Classification: **Silty SAND (SM)**

Hole Radius: 4 in.
Pipe Dia.: 3 in.
Total Depth of Hole: 120 in.

Test Hole No.: **P-2**
Tested by: **JH**
Drilled Hole Depth: **10** ft.

Presoaking Date: **11/14/2017**
Test Date: **11/15/2017**

Stick Up 0 ft

Time Start	Time Finish	Depth of Test Hole (ft)#	Refill-Yes or No	Elapsed Time (hrs:min)	Initial Water Level# (ft)	Final Water Level# (ft)	Δ Water Level (in.)	Δ Min.	Meas. Perc Rate (min/in)	Initial Height of Water (in)	Final Height of Water (in)	Average Height of Water (in)	Infiltration Rate, It (in/hr)
11:13	11:43	10.0	Y	0:30	6.25	6.91	7.92	30	3.8	45.0	37.1	41.0	0.74
11:43	12:13	10.0	N	0:30	6.91	7.41	6.00	30	5.0	37.1	31.1	34.1	0.67
12:13	12:43	10.0	N	0:30	7.41	7.82	4.92	30	6.1	31.1	26.2	28.6	0.64
12:43	13:13	10.0	N	0:30	7.82	8.15	3.96	30	7.6	26.2	22.2	24.2	0.61
13:13	13:43	10.0	N	0:30	8.15	8.42	3.24	30	9.3	22.2	19.0	20.6	0.57
13:43	14:13	10.0	N	0:30	8.42	8.65	2.76	30	10.9	19.0	16.2	17.6	0.56
14:13	14:43	10.0	N	0:30	8.65	8.85	2.40	30	12.5	16.2	13.8	15.0	0.56
14:43	15:13	10.0	N	0:30	8.85	9.02	2.04	30	14.7	13.8	11.8	12.8	0.55
15:13	15:43	10.0	N	0:30	9.02	9.17	1.80	30	16.7	11.8	10.0	10.9	0.56
15:43	16:13	10.0	N	0:30	9.17	9.30	1.56	30	19.2	10.0	8.4	9.2	0.56
16:13	16:43	10.0	N	0:30	9.30	9.42	1.44	30	20.8	8.4	7.0	7.7	0.60
16:43	17:13	10.0	N	0:30	9.42	9.52	1.20	30	25.0	7.0	5.8	6.4	0.57
Recommended for Design:										**Infiltration Rate**			**0.55**

SALEM engineering group, inc.

Percolation Test Worksheet

Project: **Proposed Arco Station**
NWC Iris Ave & Oliver Street
Moreno Valley, CA

Job No.: **3-217-1265**
Date Drilled: **11/14/2017**
Soil Classification: **Silty SAND (SM)**

Hole Radius: 4 in.
Pipe Dia.: 3 in.
Total Depth of Hole: 96 in.

Test Hole No.: **P-3**
Tested by: **JH**
Drilled Hole Depth: **8** ft.

Presoaking Date: **11/14/2017**
Test Date: **11/15/2017**

Stick Up 0 ft

Time Start	Time Finish	Depth of Test Hole (ft)#	Refill- Yes or No	Elapsed Time (hrs:min)	Initial Water Level# (ft)	Final Water Level# (ft)	Δ Water Level (in.)	Δ Min.	Meas. Perc Rate (min/in)	Initial Height of Water (in)	Final Height of Water (in)	Average Height of Water (in)	Infiltration Rate, It (in/hr)
11:15	11:45	8.0	Y	0:30	4.52	5.11	7.08	30	4.2	41.8	34.7	38.2	0.70
11:45	12:15	8.0	N	0:30	5.11	5.54	5.16	30	5.8	34.7	29.5	32.1	0.61
12:15	12:45	8.0	N	0:30	5.54	5.88	4.08	30	7.4	29.5	25.4	27.5	0.55
12:45	13:15	8.0	N	0:30	5.88	6.16	3.36	30	8.9	25.4	22.1	23.8	0.52
13:15	13:45	8.0	N	0:30	6.16	6.40	2.88	30	10.4	22.1	19.2	20.6	0.51
13:45	14:15	8.0	N	0:30	6.40	6.61	2.52	30	11.9	19.2	16.7	17.9	0.51
14:15	14:45	8.0	N	0:30	6.61	6.80	2.28	30	13.2	16.7	14.4	15.5	0.52
14:45	15:15	8.0	N	0:30	6.80	6.97	2.04	30	14.7	14.4	12.4	13.4	0.53
15:15	15:45	8.0	N	0:30	6.97	7.12	1.80	30	16.7	12.4	10.6	11.5	0.53
15:45	16:15	8.0	N	0:30	7.12	7.25	1.56	30	19.2	10.6	9.0	9.8	0.53
16:15	16:45	8.0	N	0:30	7.25	7.36	1.32	30	22.7	9.0	7.7	8.3	0.51
16:45	17:15	8.0	N	0:30	7.36	7.46	1.20	30	25.0	7.7	6.5	7.1	0.53
Recommended for Design:										**Infiltration Rate**			**0.51**

SALEM engineering group, inc.

Percolation Test Worksheet

Project: **Proposed Arco Station**
NWC Iris Ave & Oliver Street
Moreno Valley, CA

Job No.: **3-217-1265**
Date Drilled: **11/14/2017**
Soil Classification: **Silty SAND (SM)**

Hole Radius: 4 in.
Pipe Dia.: 3 in.
Total Depth of Hole: 120 in.

Test Hole No.: **P-4**
Tested by: **JH**
Drilled Hole Depth: **10** ft.

Presoaking Date: **11/14/2017**
Test Date: **11/15/2017**

Stick Up 0 ft

Time Start	Time Finish	Depth of Test Hole (ft)#	Refill- Yes or No	Elapsed Time (hrs:min)	Initial Water Level# (ft)	Final Water Level# (ft)	Δ Water Level (in.)	Δ Min.	Meas. Perc Rate (min/in)	Initial Height of Water (in)	Final Height of Water (in)	Average Height of Water (in)	Infiltration Rate, It (in/hr)
11:23	11:48	10.0	Y	0:25	8.00	8.57	6.84	25	3.7	24.0	17.2	20.6	1.45
11:49	12:14	10.0	Y	0:25	8.11	8.62	6.12	25	4.1	22.7	16.6	19.6	1.36
12:16	12:26	10.0	Y	0:10	8.36	8.55	2.28	10	4.4	19.7	17.4	18.5	1.33
12:26	12:36	10.0	N	0:10	8.55	8.72	2.04	10	4.9	17.4	15.4	16.4	1.33
12:36	12:46	10.0	N	0:10	8.72	8.87	1.80	10	5.6	15.4	13.6	14.5	1.31
12:46	12:56	10.0	N	0:10	8.87	9.00	1.56	10	6.4	13.6	12.0	12.8	1.27
12:56	13:06	10.0	N	0:10	9.00	9.12	1.44	10	6.9	12.0	10.6	11.3	1.30
13:06	13:16	10.0	N	0:10	9.12	9.23	1.32	10	7.6	10.6	9.2	9.9	1.33
Recommended for Design:										**Infiltration Rate**			**1.27**

SALEM
engineering group, inc.

APPENDIX
B

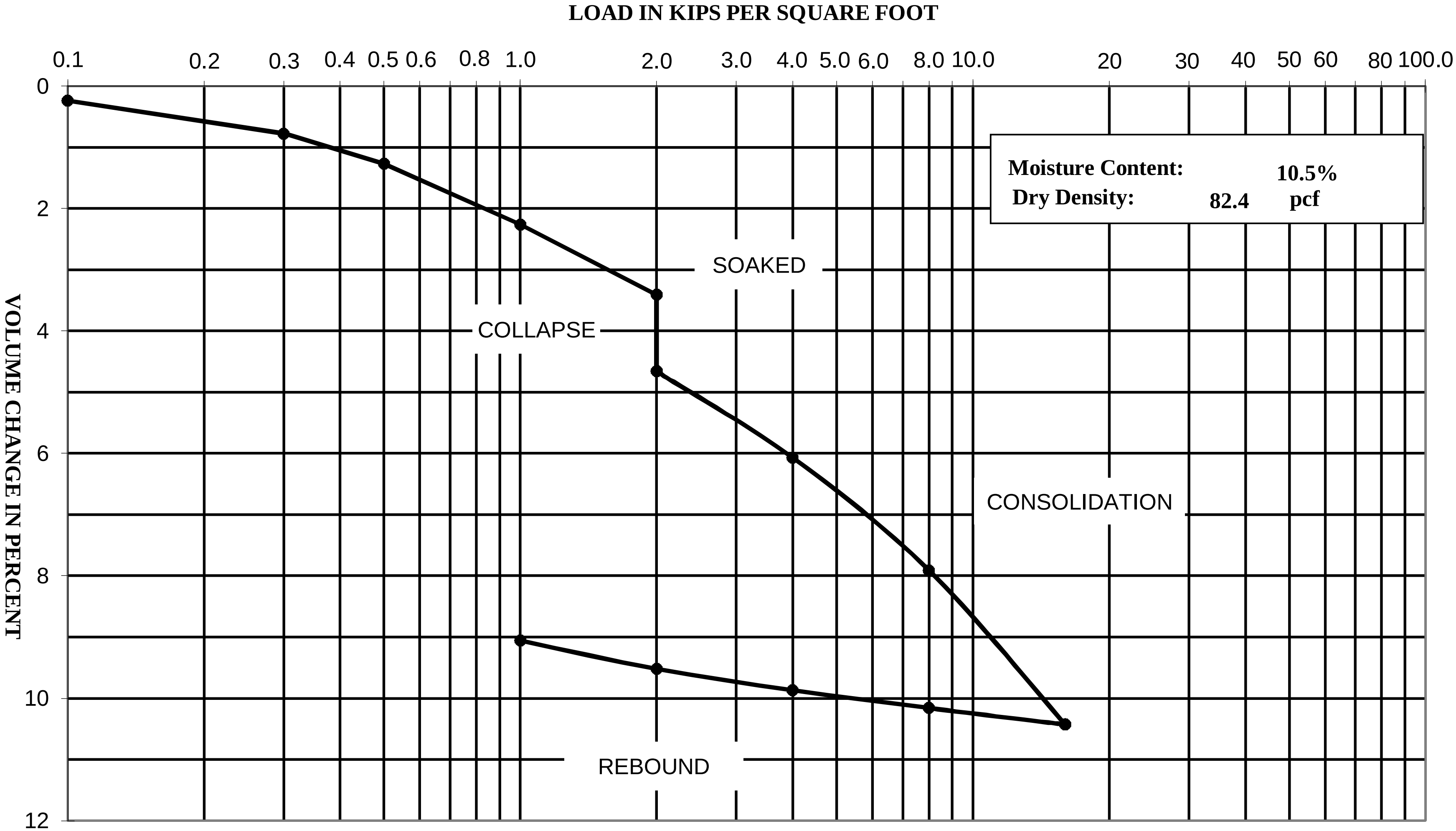
Attachment: Appendix D - Geotechnical Engineering Investigation (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

APPENDIX B
LABORATORY TESTING

Laboratory tests were performed in accordance with generally accepted test methods of the American Society for Testing and Materials (ASTM), Caltrans, or other suggested procedures. Selected samples were tested for in-situ dry density and moisture content, corrosivity, consolidation, shear strength, maximum density and optimum moisture content, and grain size distribution. The results of the laboratory tests are summarized in the following figures.

CONSOLIDATION - PRESSURE TEST DATA

ASTM D 2435



Moisture Content: 10.5%
Dry Density: 82.4 pcf

Prop. Arco Station - Moreno Valley, CA

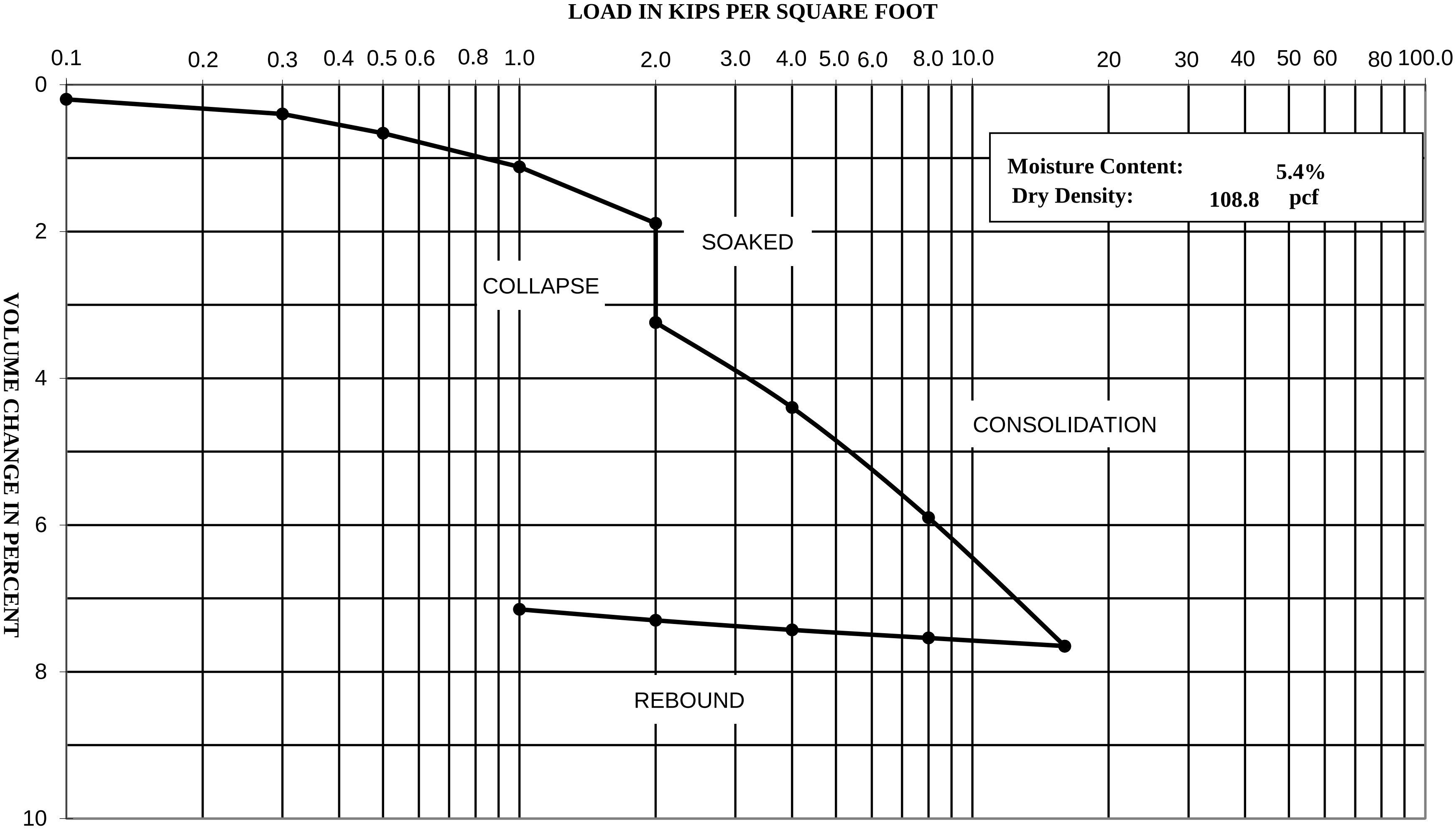
Project Number: 3-217-1265

Boring: B-1 @ 2'

SALEM engineering group, inc.

CONSOLIDATION - PRESSURE TEST DATA

ASTM D 2435



Moisture Content:		**5.4%**
Dry Density:	**108.8**	**pcf**

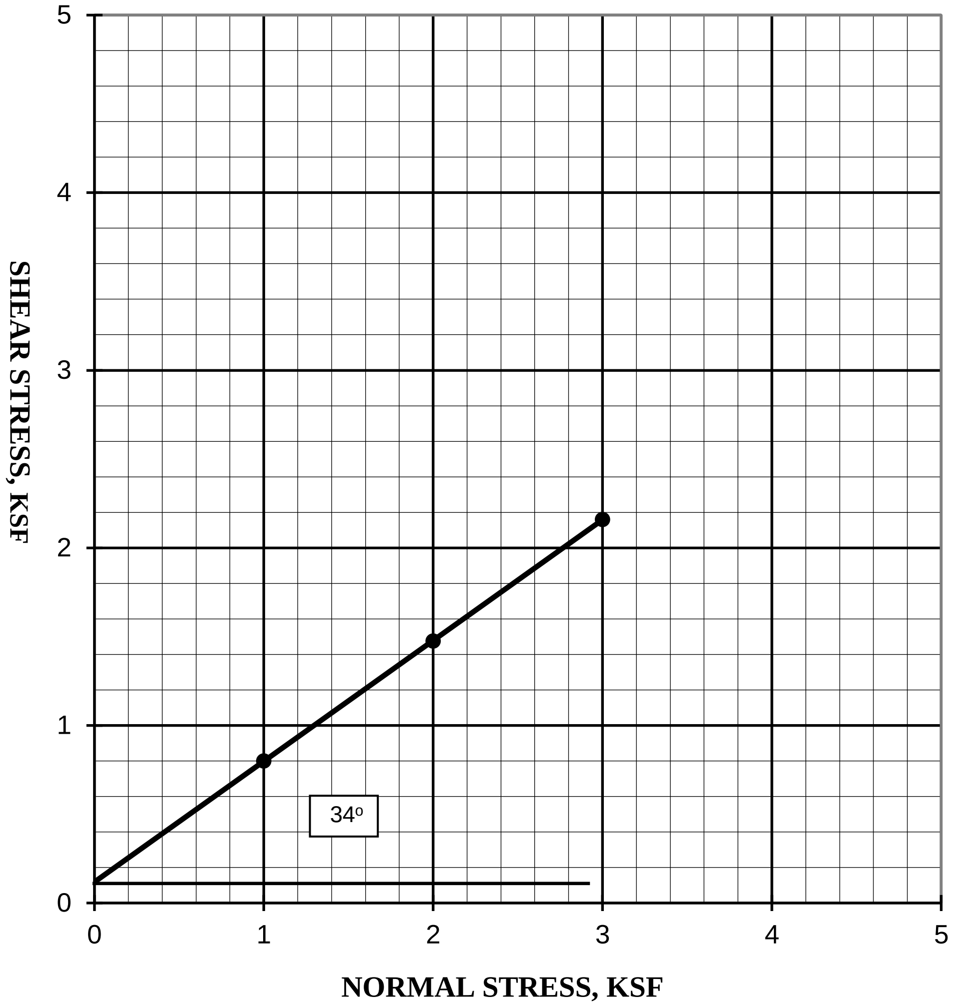
Prop. Arco Station - Moreno Valley, CA

Project Number: 3-217-1265

Boring: B-2 @ 5'

SALEM engineering group, inc.

SHEAR STRENGTH DIAGRAM
(DIRECT SHEAR)
ASTM D - 3080



Prop. Arco Station - Moreno Valley, CA

Project Number: 3-217-1265

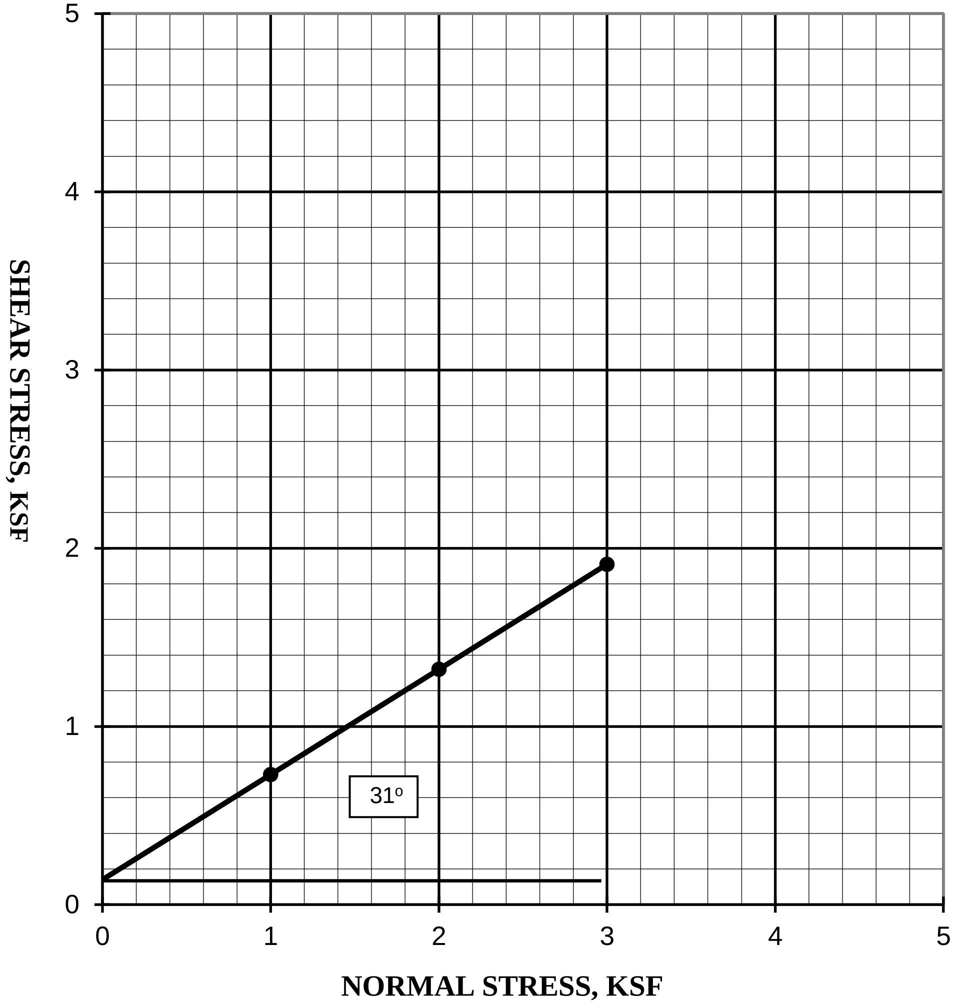
Boring: B-1 @ 5'
Soil Type: Silty SAND (SM)

Friction Angle:	**34**	**degrees**
Cohesion:	**120**	**psf**

Moisture Content	**3.1%**	
Dry Density	**111.2**	**pcf**

SALEM engineering group, inc.

SHEAR STRENGTH DIAGRAM
(DIRECT SHEAR)
ASTM D - 3080



Prop. Arco Station - Moreno Valley, CA

Project Number: 3-217-1265

Boring: B-2 @ 2'
Soil Type: Silty SAND (SM)

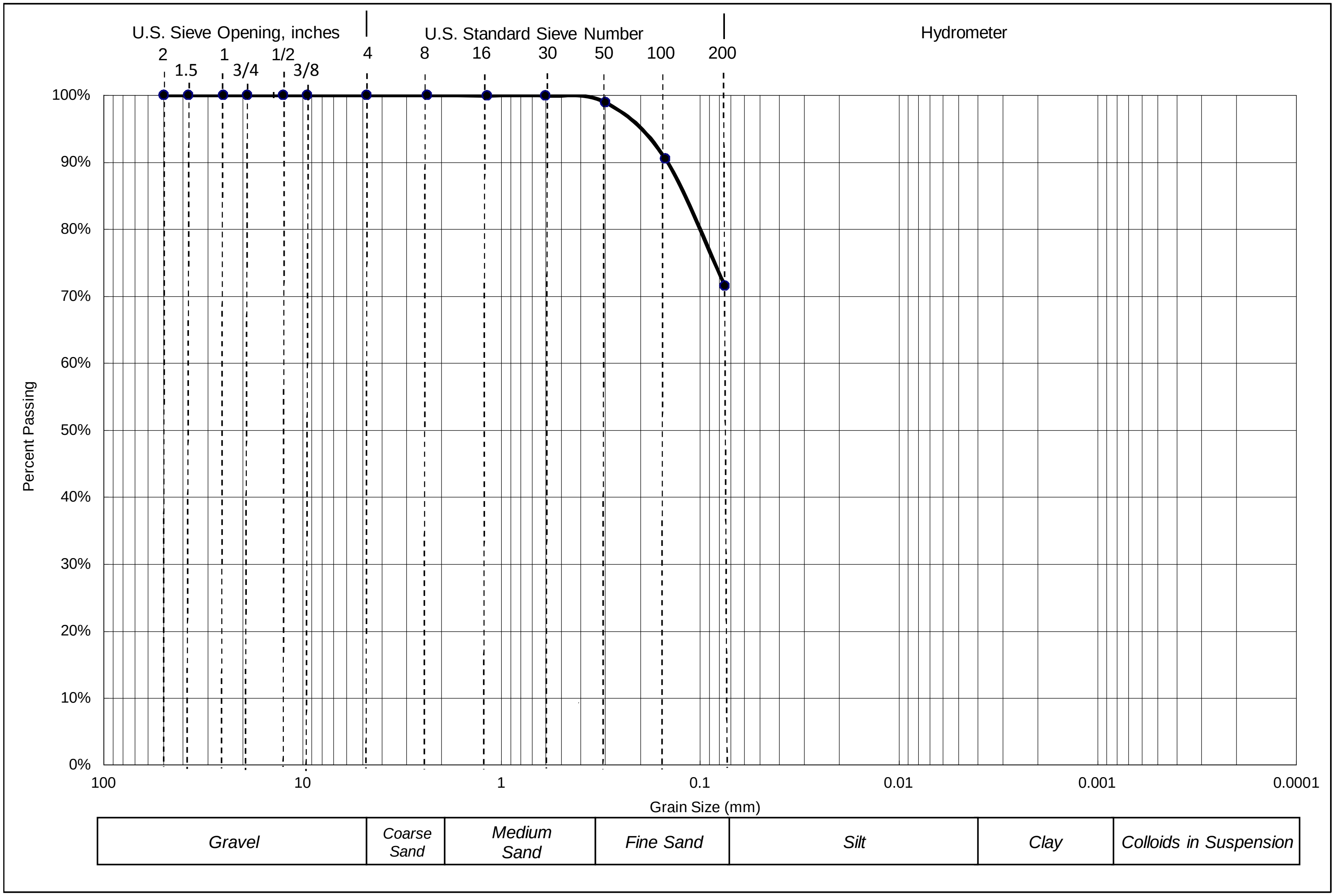
Friction Angle:	**31**	**degrees**
Cohesion:	**140**	**psf**

Moisture Content	**4.8%**	
Dry Density	**104.0**	**pcf**

SALEM
engineering group, inc.

PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Prop. Arco Station - Moreno Valley, CA
Project Number: 3-217-1265
Boring: B-1 @ 2'

SALEM engineering group, inc.

DRY SIEVE ANALYSIS

ASTM C136 (without Hydrometer)

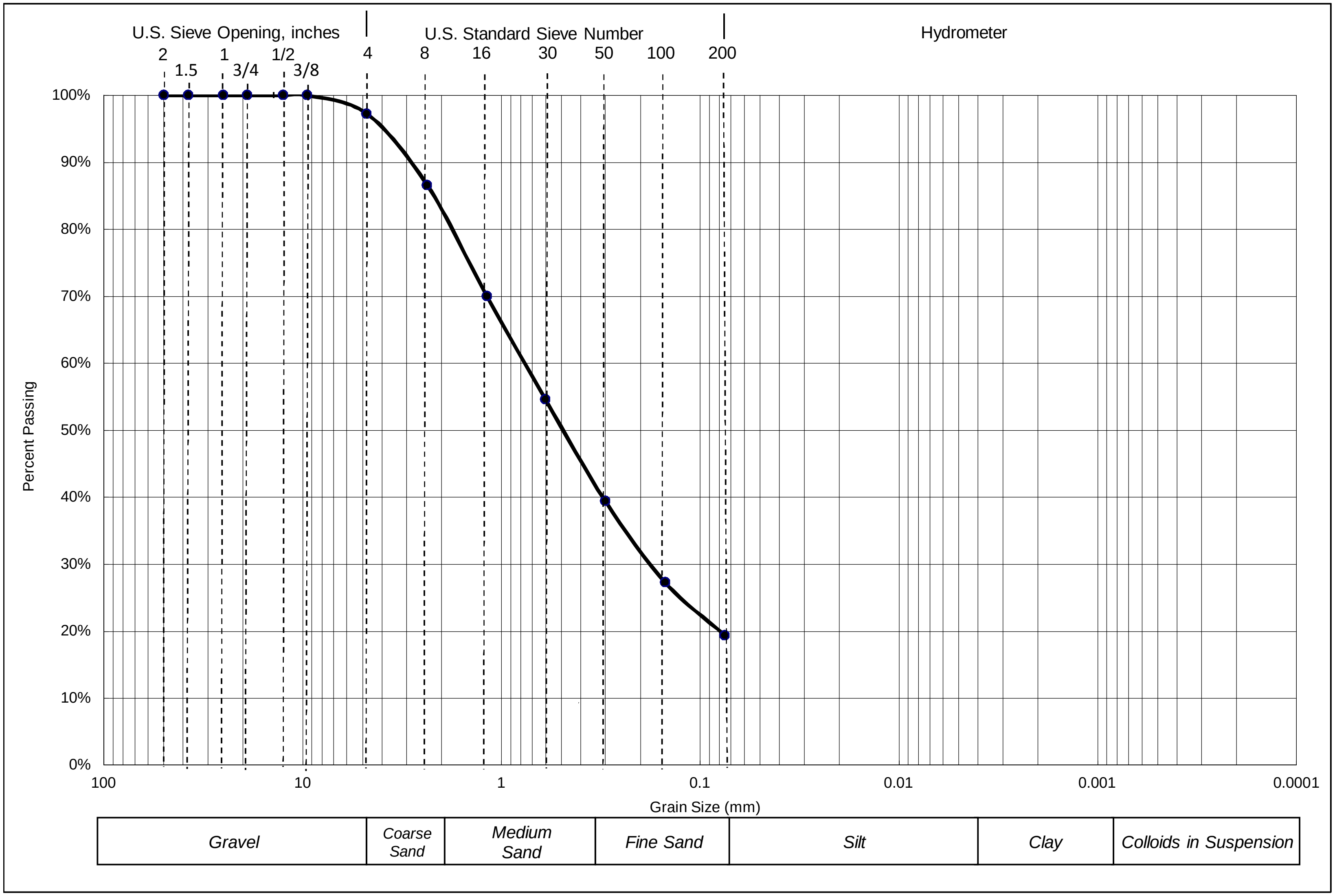
Sieve Size	Particle Size, mm	Percent Passing
1 1/2-in.	37.5	100.0%
1-in.	25	100.0%
3/4-in.	19	100.0%
1/2-in.	12.5	100.0%
3/8-in.	9.5	100.0%
No. 4	4.75	100.0%
No. 8	2.36	100.0%
No. 16	1.18	100.0%
No. 30	0.6	100.0%
No. 50	0.3	99.0%
No. 100	0.15	90.6%
No. 200	0.075	71.59%

Prop. Arco Station - Moreno Valley, CA
Project Number: 3-217-1265
Boring: B-1 @ 2'

SALEM
engineering group, inc.

PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Prop. Arco Station - Moreno Valley, CA

Project Number: 3-217-1265

Boring: B-1 @ 5'

SALEM engineering group, inc.

DRY SIEVE ANALYSIS

ASTM C136 (without Hydrometer)

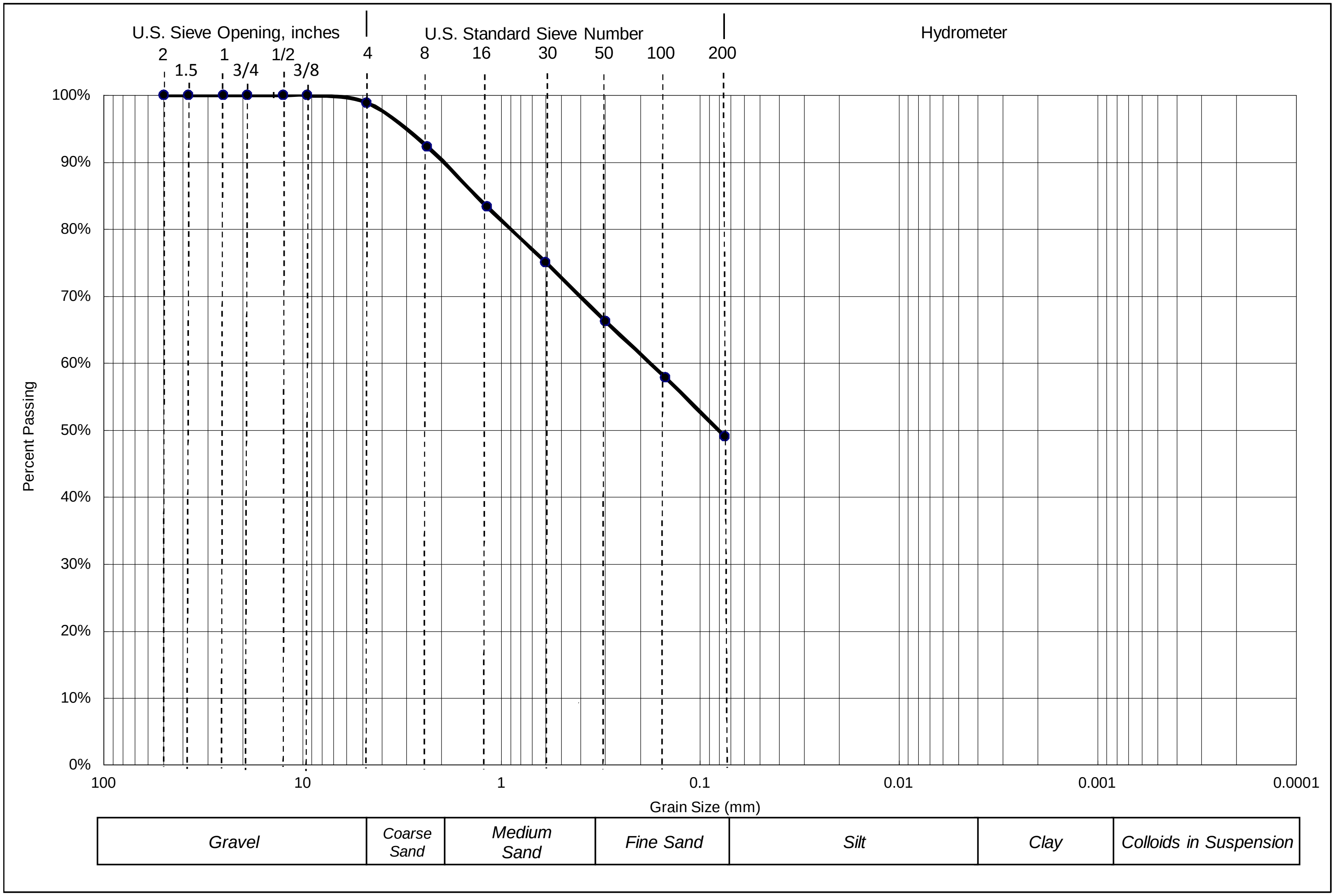
Sieve Size	Particle Size, mm	Percent Passing
1 1/2-in.	37.5	100.0%
1-in.	25	100.0%
3/4-in.	19	100.0%
1/2-in.	12.5	100.0%
3/8-in.	9.5	100.0%
No. 4	4.75	97.2%
No. 8	2.36	86.6%
No. 16	1.18	70.0%
No. 30	0.6	54.6%
No. 50	0.3	39.4%
No. 100	0.15	27.3%
No. 200	0.075	19.36%

Prop. Arco Station - Moreno Valley, CA
Project Number: 3-217-1265
Boring: B-1 @ 5'

SALEM
engineering group, inc.

PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Prop. Arco Station - Moreno Valley, CA

Project Number: 3-217-1265

Boring: B-1 @ 15'

SALEM engineering group, inc.

DRY SIEVE ANALYSIS

ASTM C136 (without Hydrometer)

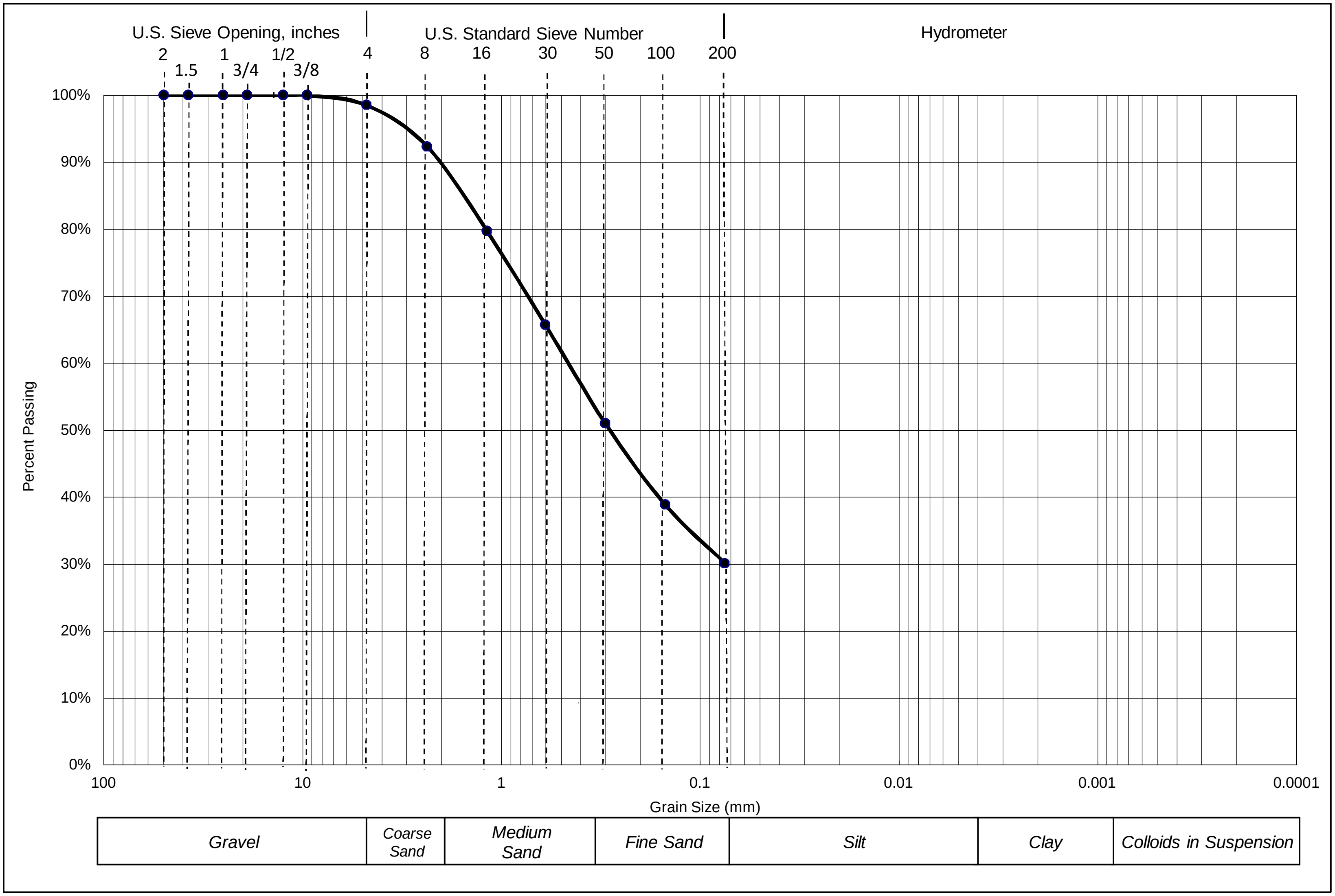
Sieve Size	Particle Size, mm	Percent Passing
1 1/2-in.	37.5	100.0%
1-in.	25	100.0%
3/4-in.	19	100.0%
1/2-in.	12.5	100.0%
3/8-in.	9.5	100.0%
No. 4	4.75	98.9%
No. 8	2.36	92.3%
No. 16	1.18	83.4%
No. 30	0.6	75.1%
No. 50	0.3	66.3%
No. 100	0.15	57.9%
No. 200	0.075	49.05%

Prop. Arco Station - Moreno Valley, CA
Project Number: 3-217-1265
Boring: B-1 @ 15'

SALEM
engineering group, inc.

PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Prop. Arco Station - Moreno Valley, CA
Project Number: 3-217-1265
Boring: B-1 @ 30'

SALEM
engineering group, inc.

DRY SIEVE ANALYSIS

ASTM C136 (without Hydrometer)

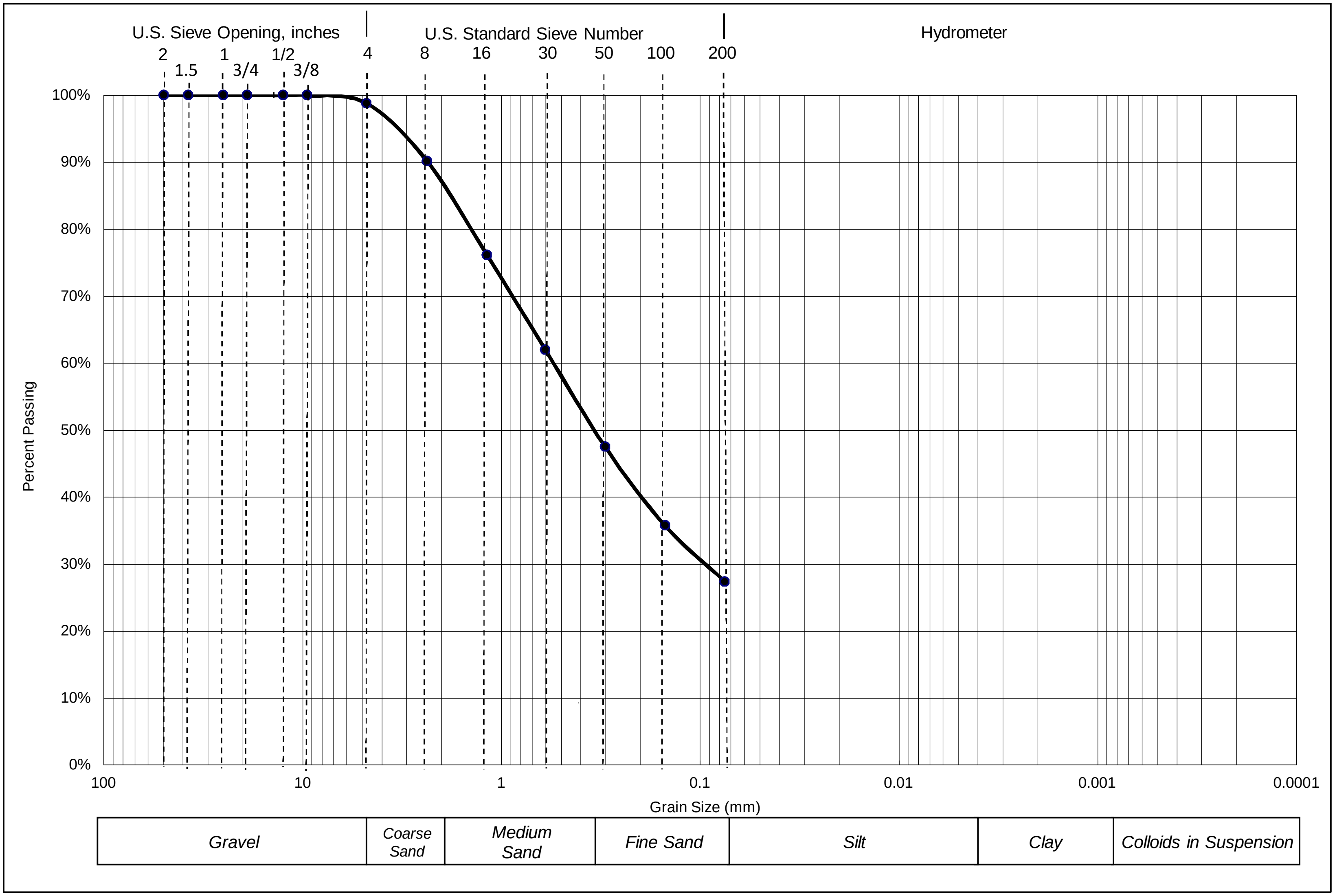
Sieve Size	Particle Size, mm	Percent Passing
1 1/2-in.	37.5	100.0%
1-in.	25	100.0%
3/4-in.	19	100.0%
1/2-in.	12.5	100.0%
3/8-in.	9.5	100.0%
No. 4	4.75	98.5%
No. 8	2.36	92.3%
No. 16	1.18	79.7%
No. 30	0.6	65.7%
No. 50	0.3	51.0%
No. 100	0.15	38.9%
No. 200	0.075	30.13%

Prop. Arco Station - Moreno Valley, CA
Project Number: 3-217-1265
Boring: B-1 @ 30'

SALEM
engineering group, inc.

PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Prop. Arco Station - Moreno Valley, CA
Project Number: 3-217-1265
Boring: B-1 @ 40'

SALEM engineering group, inc.

DRY SIEVE ANALYSIS

ASTM C136 (without Hydrometer)

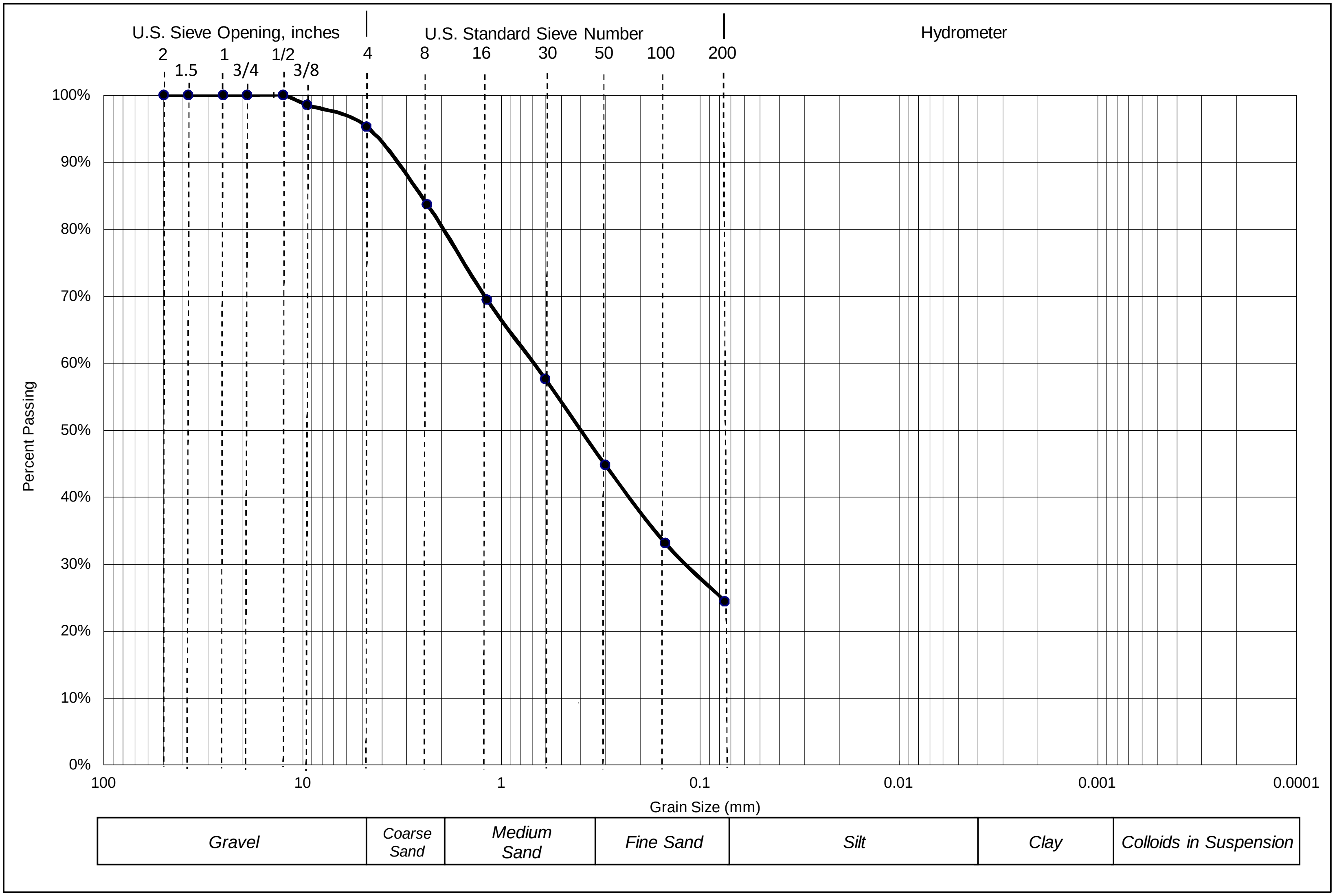
Sieve Size	Particle Size, mm	Percent Passing
1 1/2-in.	37.5	100.0%
1-in.	25	100.0%
3/4-in.	19	100.0%
1/2-in.	12.5	100.0%
3/8-in.	9.5	100.0%
No. 4	4.75	98.8%
No. 8	2.36	90.1%
No. 16	1.18	76.1%
No. 30	0.6	62.0%
No. 50	0.3	47.5%
No. 100	0.15	35.7%
No. 200	0.075	27.40%

Prop. Arco Station - Moreno Valley, CA
Project Number: 3-217-1265
Boring: B-1 @ 40'

SALEM
engineering group, inc.

PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Prop. Arco Station - Moreno Valley, CA

Project Number: 3-217-1265

Boring: B-2 @ 2'

SALEM engineering group, inc.

DRY SIEVE ANALYSIS

ASTM C136 (without Hydrometer)

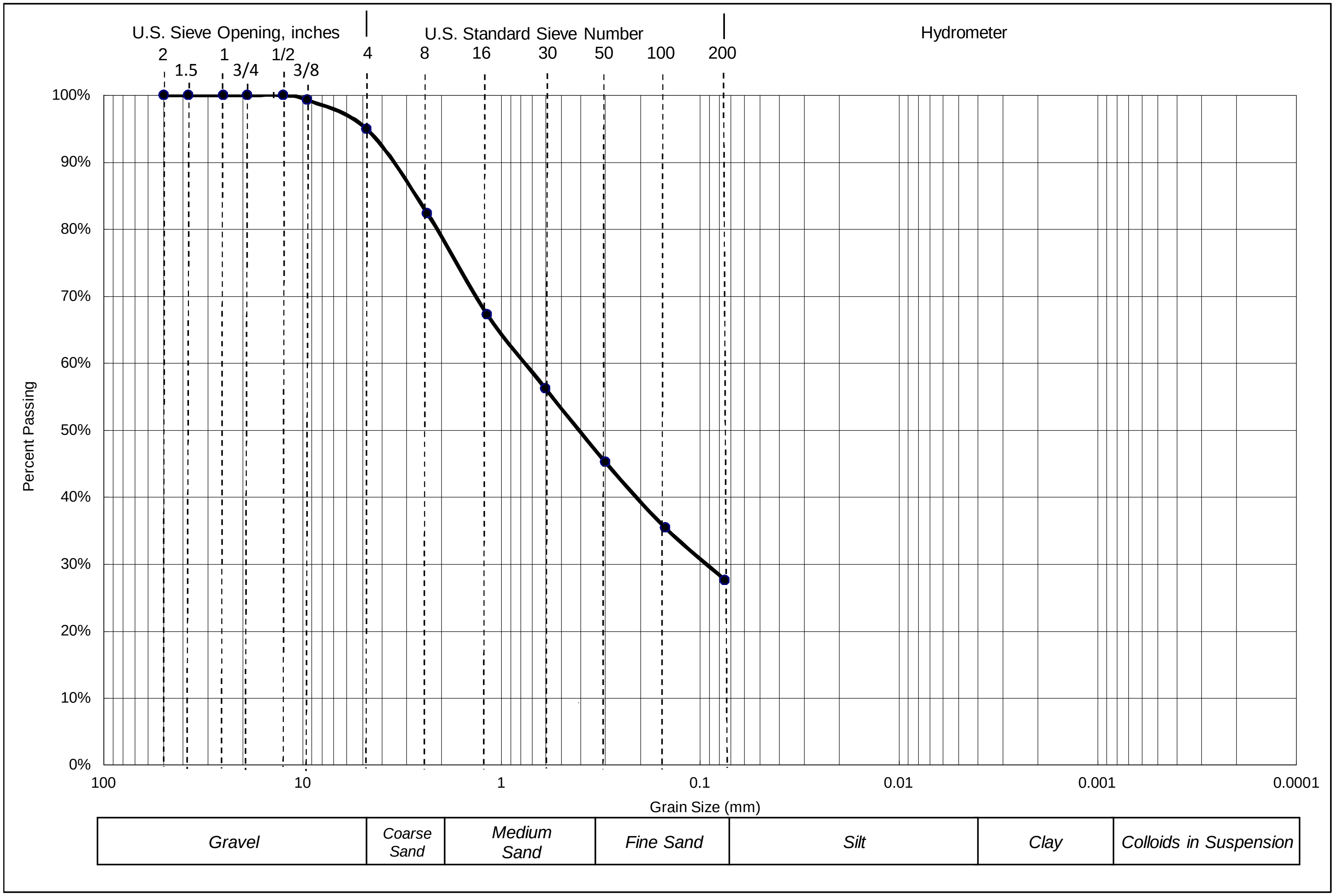
Sieve Size	Particle Size, mm	Percent Passing
1 1/2-in.	37.5	100.0%
1-in.	25	100.0%
3/4-in.	19	100.0%
1/2-in.	12.5	100.0%
3/8-in.	9.5	98.6%
No. 4	4.75	95.3%
No. 8	2.36	83.7%
No. 16	1.18	69.5%
No. 30	0.6	57.6%
No. 50	0.3	44.8%
No. 100	0.15	33.2%
No. 200	0.075	24.46%

Prop. Arco Station - Moreno Valley, CA
Project Number: 3-217-1265
Boring: B-2 @ 2'

SALEM
engineering group, inc.

PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Prop. Arco Station - Moreno Valley, CA

Project Number: 3-217-1265

Boring: B-2 @ 5'

SALEM engineering group, inc.

DRY SIEVE ANALYSIS

ASTM C136 (without Hydrometer)

Sieve Size	Particle Size, mm	Percent Passing
1 1/2-in.	37.5	100.0%
1-in.	25	100.0%
3/4-in.	19	100.0%
1/2-in.	12.5	100.0%
3/8-in.	9.5	99.3%
No. 4	4.75	95.0%
No. 8	2.36	82.4%
No. 16	1.18	67.3%
No. 30	0.6	56.2%
No. 50	0.3	45.2%
No. 100	0.15	35.5%
No. 200	0.075	27.65%

Prop. Arco Station - Moreno Valley, CA
Project Number: 3-217-1265
Boring: B-2 @ 5'

SALEM
engineering group, inc.

CHEMICAL ANALYSIS

SO_4 - Modified Caltrans 417 & Cl - Modified Caltrans 417/422

Prop. Arco Station - Moreno Valley, CA
Project Number: 3-217-1265
Date: 11/17/17
Soil Classification: Silty SAND (SM)

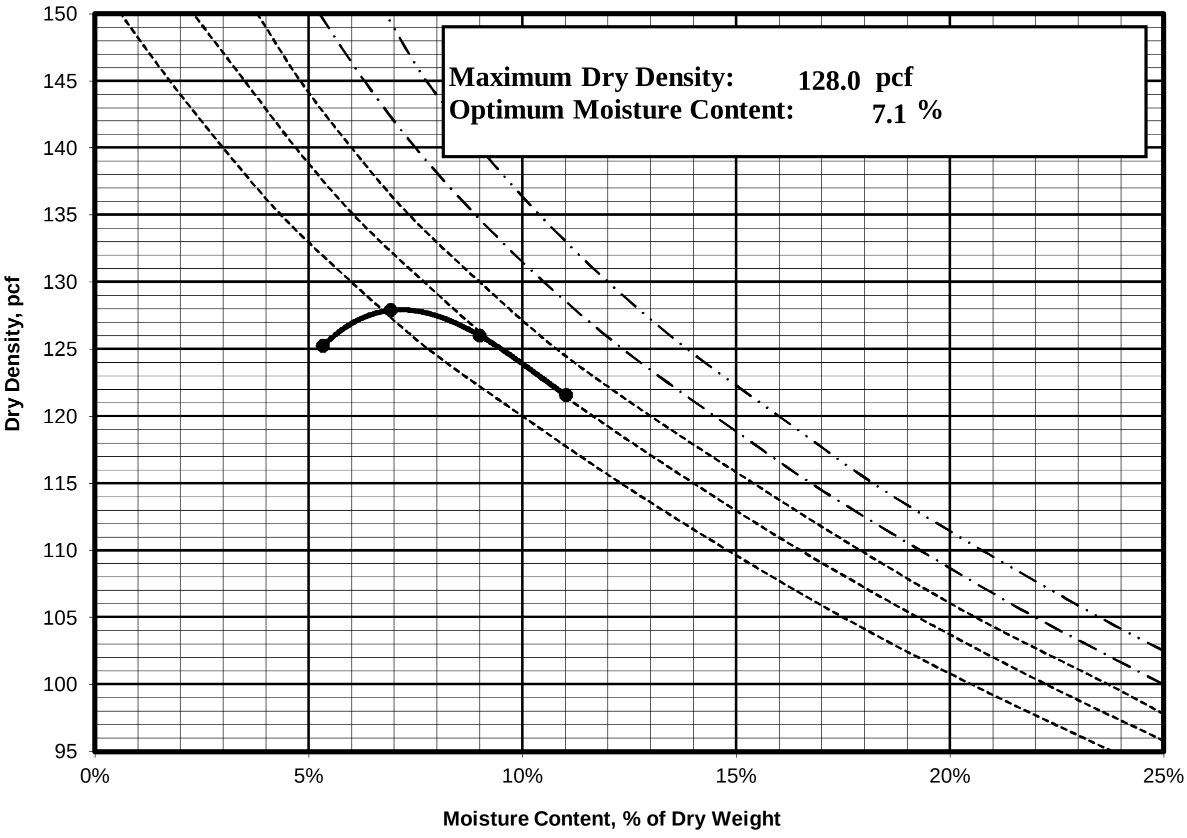
Sample Number	Sample Location	Soluble Sulfate SO_4-S	Soluble Chloride Cl	pH
1a.	B-1 @ 0 - 3'	50 mg/kg	21 mg/kg	7.0
1b.	B-1 @ 0 - 3'	50 mg/kg	20 mg/kg	7.0
1c.	B-1 @ 0 - 3'	50 mg/kg	21 mg/kg	7.0
Average:		**50 mg/kg**	**21 mg/kg**	**7.0**

SALEM engineering group, inc.

Laboratory Compaction Curve
ASTM D1557

Prop. Arco Station - Moreno Valley, CA
Project Number: 3-217-1265
Date Tested: 11/17/17
Sample Location: B-1 @ 0 - 3'
Soil Classification: Silty Sand, Brown, Non-Cohesive
Sample/Curve Number: 1
Test Method: 1557 A

	1	2	3	4
Weight of Moist Specimen & Mold, (g)	3991.6	4064.2	4073.2	4037.0
Weight of Compaction Mold, (g)	1998.9	1998.9	1998.9	1998.9
Weight of Moist Specimen, (g)	1992.7	2065.3	2074.3	2038.1
Volume of mold, (ft^2)	0.0333	0.0333	0.0333	0.0333
Wet Density, (pcf)	131.9	136.7	137.3	134.9
Weight of Wet (Moisture) Sample, (g)	341.2	341.2	341.2	341.2
Weight of Dry (Moisture) Sample, (g)	323.9	319.1	313.0	307.3
Moisture Content, (%)	5.3%	6.9%	9.0%	11.0%
Dry Density, (pcf)	125.2	127.9	126.0	121.5



Maximum Dry Density: 128.0 pcf
Optimum Moisture Content: 7.1 %

SALEM engineering group, inc.

APPENDIX

C

APPENDIX C
GENERAL EARTHWORK AND PAVEMENT SPECIFICATIONS

When the text of the report conflicts with the general specifications in this appendix, the recommendations in the report have precedence.

1.0 SCOPE OF WORK: These specifications and applicable plans pertain to and include all earthwork associated with the site rough grading, including, but not limited to, the furnishing of all labor, tools and equipment necessary for site clearing and grubbing, stripping, preparation of foundation materials for receiving fill, excavation, processing, placement and compaction of fill and backfill materials to the lines and grades shown on the project grading plans and disposal of excess materials.

2.0 PERFORMANCE: The Contractor shall be responsible for the satisfactory completion of all earthwork in accordance with the project plans and specifications. This work shall be inspected and tested by a representative of SALEM Engineering Group, Incorporated, hereinafter referred to as the Soils Engineer and/or Testing Agency. Attainment of design grades, when achieved, shall be certified by the project Civil Engineer. Both the Soils Engineer and the Civil Engineer are the Owner's representatives. If the Contractor should fail to meet the technical or design requirements embodied in this document and on the applicable plans, he shall make the necessary adjustments until all work is deemed satisfactory as determined by both the Soils Engineer and the Civil Engineer. No deviation from these specifications shall be made except upon written approval of the Soils Engineer, Civil Engineer, or project Architect.

No earthwork shall be performed without the physical presence or approval of the Soils Engineer. The Contractor shall notify the Soils Engineer at least 2 working days prior to the commencement of any aspect of the site earthwork.

The Contractor shall assume sole and complete responsibility for job site conditions during the course of construction of this project, including safety of all persons and property; that this requirement shall apply continuously and not be limited to normal working hours; and that the Contractor shall defend, indemnify and hold the Owner and the Engineers harmless from any and all liability, real or alleged, in connection with the performance of work on this project, except for liability arising from the sole negligence of the Owner or the Engineers.

3.0 TECHNICAL REQUIREMENTS: All compacted materials shall be densified to no less that 95 percent of relative compaction (90 percent for cohesive soils) based on ASTM D1557 Test Method (latest edition), UBC or CAL-216, or as specified in the technical portion of the Soil Engineer's report. The location and frequency of field density tests shall be determined by the Soils Engineer. The results of these tests and compliance with these specifications shall be the basis upon which satisfactory completion of work will be judged by the Soils Engineer.

4.0 SOILS AND FOUNDATION CONDITIONS: The Contractor is presumed to have visited the site and to have familiarized himself with existing site conditions and the contents of the data presented in the Geotechnical Engineering Report. The Contractor shall make his own interpretation of the data contained in the Geotechnical Engineering Report and the Contractor shall not be relieved of liability for any loss sustained as a result of any variance between conditions indicated by or deduced from said report and the actual conditions encountered during the progress of the work.

5.0 DUST CONTROL: The work includes dust control as required for the alleviation or prevention of any dust nuisance on or about the site or the borrow area, or off-site if caused by the Contractor's operation either during the performance of the earthwork or resulting from the conditions in which the Contractor leaves the site. The Contractor shall assume all liability, including court costs of codefendants, for all claims related to dust or wind-blown materials attributable to his work. Site preparation shall consist of site clearing and grubbing and preparation of foundation materials for receiving fill.

6.0 CLEARING AND GRUBBING: The Contractor shall accept the site in this present condition and shall demolish and/or remove from the area of designated project earthwork all structures, both surface and subsurface, trees, brush, roots, debris, organic matter and all other matter determined by the Soils Engineer to be deleterious. Such materials shall become the property of the Contractor and shall be removed from the site.

Tree root systems in proposed improvement areas should be removed to a minimum depth of 3 feet and to such an extent which would permit removal of all roots greater than 1 inch in diameter. Tree roots removed in parking areas may be limited to the upper 1½ feet of the ground surface. Backfill of tree root excavations is not permitted until all exposed surfaces have been inspected and the Soils Engineer is present for the proper control of backfill placement and compaction. Burning in areas which are to receive fill materials shall not be permitted.

7.0 SUBGRADE PREPARATION: Surfaces to receive Engineered Fill and/or building or slab loads shall be prepared as outlined above, scarified to a minimum of 12 inches, moisture-conditioned as necessary, and recompacted to 95 percent relative compaction (90 percent for cohesive soils).

Loose soil areas and/or areas of disturbed soil shall be moisture-conditioned as necessary and recompacted to 95 percent relative compaction (90 percent for cohesive soils). All ruts, hummocks, or other uneven surface features shall be removed by surface grading prior to placement of any fill materials. All areas which are to receive fill materials shall be approved by the Soils Engineer prior to the placement of any fill material.

8.0 EXCAVATION: All excavation shall be accomplished to the tolerance normally defined by the Civil Engineer as shown on the project grading plans. All over-excavation below the grades specified shall be backfilled at the Contractor's expense and shall be compacted in accordance with the applicable technical requirements.

9.0 FILL AND BACKFILL MATERIAL: No material shall be moved or compacted without the presence or approval of the Soils Engineer. Material from the required site excavation may be utilized for construction site fills, provided prior approval is given by the Soils Engineer. All materials utilized for constructing site fills shall be free from vegetation or other deleterious matter as determined by the Soils Engineer.

10.0 PLACEMENT, SPREADING AND COMPACTION: The placement and spreading of approved fill materials and the processing and compaction of approved fill and native materials shall be the responsibility of the Contractor. Compaction of fill materials by flooding, ponding, or jetting shall not be permitted unless specifically approved by local code, as well as the Soils Engineer. Both cut and fill shall be surface-compacted to the satisfaction of the Soils Engineer prior to final acceptance.

11.0 SEASONAL LIMITS: No fill material shall be placed, spread, or rolled while it is frozen or thawing, or during unfavorable wet weather conditions. When the work is interrupted by heavy rains, fill operations shall not be resumed until the Soils Engineer indicates that the moisture content and density of previously placed fill is as specified.

12.0 DEFINITIONS - The term "pavement" shall include asphaltic concrete surfacing, untreated aggregate base, and aggregate subbase. The term "subgrade" is that portion of the area on which surfacing, base, or subbase is to be placed.

The term “Standard Specifications”: hereinafter referred to, is the most recent edition of the Standard Specifications of the State of California, Department of Transportation. The term "relative compaction" refers to the field density expressed as a percentage of the maximum laboratory density as determined by ASTM D1557 Test Method (latest edition) or California Test Method 216 (CAL-216), as applicable.

13.0 PREPARATION OF THE SUBGRADE - The Contractor shall prepare the surface of the various subgrades receiving subsequent pavement courses to the lines, grades, and dimensions given on the plans. The upper 12 inches of the soil subgrade beneath the pavement section shall be compacted to a minimum relative compaction of 95 percent based upon ASTM D1557. The finished subgrades shall be tested and approved by the Soils Engineer prior to the placement of additional pavement courses.

14.0 AGGREGATE BASE - The aggregate base material shall be spread and compacted on the prepared subgrade in conformity with the lines, grades, and dimensions shown on the plans. The aggregate base material shall conform to the requirements of Section 26 of the Standard Specifications for Class II material, ¾-inch or 1½-inches maximum size. The aggregate base material shall be compacted to a minimum relative compaction of 95 percent based upon CAL-216. The aggregate base material shall be spread in layers not exceeding 6 inches and each layer of aggregate material course shall be tested and approved by the Soils Engineer prior to the placement of successive layers.

15.0 AGGREGATE SUBBASE - The aggregate subbase shall be spread and compacted on the prepared subgrade in conformity with the lines, grades, and dimensions shown on the plans. The aggregate subbase material shall conform to the requirements of Section 25 of the Standard Specifications for Class II Subbase material. The aggregate subbase material shall be compacted to a minimum relative compaction of 95 percent based upon CAL-216, and it shall be spread and compacted in accordance with the Standard Specifications. Each layer of aggregate subbase shall be tested and approved by the Soils Engineer prior to the placement of successive layers.

16.0 ASPHALTIC CONCRETE SURFACING - Asphaltic concrete surfacing shall consist of a mixture of mineral aggregate and paving grade asphalt, mixed at a central mixing plant and spread and compacted on a prepared base in conformity with the lines, grades, and dimensions shown on the plans. The viscosity grade of the asphalt shall be PG 64-10, unless otherwise stipulated or local conditions warrant more stringent grade. The mineral aggregate shall be Type A or B, ½ inch maximum size, medium grading, and shall conform to the requirements set forth in Section 39 of the Standard Specifications. The drying, proportioning, and mixing of the materials shall conform to Section 39. The prime coat, spreading and compacting equipment, and spreading and compacting the mixture shall conform to the applicable chapters of Section 39, with the exception that no surface course shall be placed when the atmospheric temperature is below 50 degrees F. The surfacing shall be rolled with a combination steel-wheel and pneumatic rollers, as described in the Standard Specifications. The surface course shall be placed with an approved self-propelled mechanical spreading and finishing machine.

SOILS SOUTHWEST, INC.
SOILS, MATERIALS AND ENVIRONMENTAL ENGINEERING CONSULTANTS
897 VIA LATA, SUITE N • COLTON, CA 92324 • (909) 370-0474 • (909) 370-0481 • FAX (909) 370-3156

Feasibility Study
Report of Soils and Foundation Evaluations
Proposed Commercial Center
NWC Iris Ave & Oliver St
City of Moreno Valley, California

Project No. 03194-F
November 12, 2003

Prepared for:

Mr. Guy Roney
3495 Pontiac Drive
Carlsbad, California 92008

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November 12, 2003 Project No. 03194-F

Mr. Guy Roney
3495 Pontiac Drive
Carlsbad, California 92008

Subject: Feasibility Study
Report of Soils and Foundation Evaluations
Proposed Commercial Center
NWC Iris Ave & Oliver St
City of Moreno Valley, California

Dear Mr. Roney:

Presented herewith is the Feasibility Study-Report of Soils and Foundation Evaluations conducted for the site of the planned commercial development to be located near the northwest intersection of Iris Avenue and Oliver Street, City of Moreno Valley, California. In absence of site-specific grading and/or development plan, the recommendations supplied should be considered as preliminary, and may require revision and/or modification following development and grading plan review.

Soils encountered primarily consist of upper 3 to 4 feet of dry, loose and compressible silty fine sand, overlying gravelly fine to medium coarse sand of moderate consistency with scattered rock fragments and rocks. Based on field explorations, laboratory testing and engineering evaluations it is our opinion that the upper dry, loose soils existing at their present state should be considered inadequate for directly supporting structural loadings without excessive differential settlements to footings and concrete slab-on-grade. When, however, graded in form of subexcavations of the upper soils and their replacement as structural fills as recommended herein, the near surface soils used, should be adequate for structural support with tolerable settlements.

In absence of site-specific grading and development plan, the recommendations supplied should be considered preliminary and may require substantial modifications following grading plan review.

This report has been substantiated by subsurface explorations and mathematical analysis made in accordance with the generally accepted engineering principles, including those field and laboratory testing considered necessary in the circumstances. We offer no other warranty, express or implied. Should you have any questions regarding this report, please call the undersigned at your convenience.

Respectfully submitted,
Soils Southwest, Inc.

REGISTERED PROFESSIONAL ENGINEER
MOLOY K. GUPTA
No. 31708
Exp. 12-31-04
CIVIL
STATE OF CALIFORNIA

Moley Gupta, RCE 31708 Roy White

Dist/5-addressee

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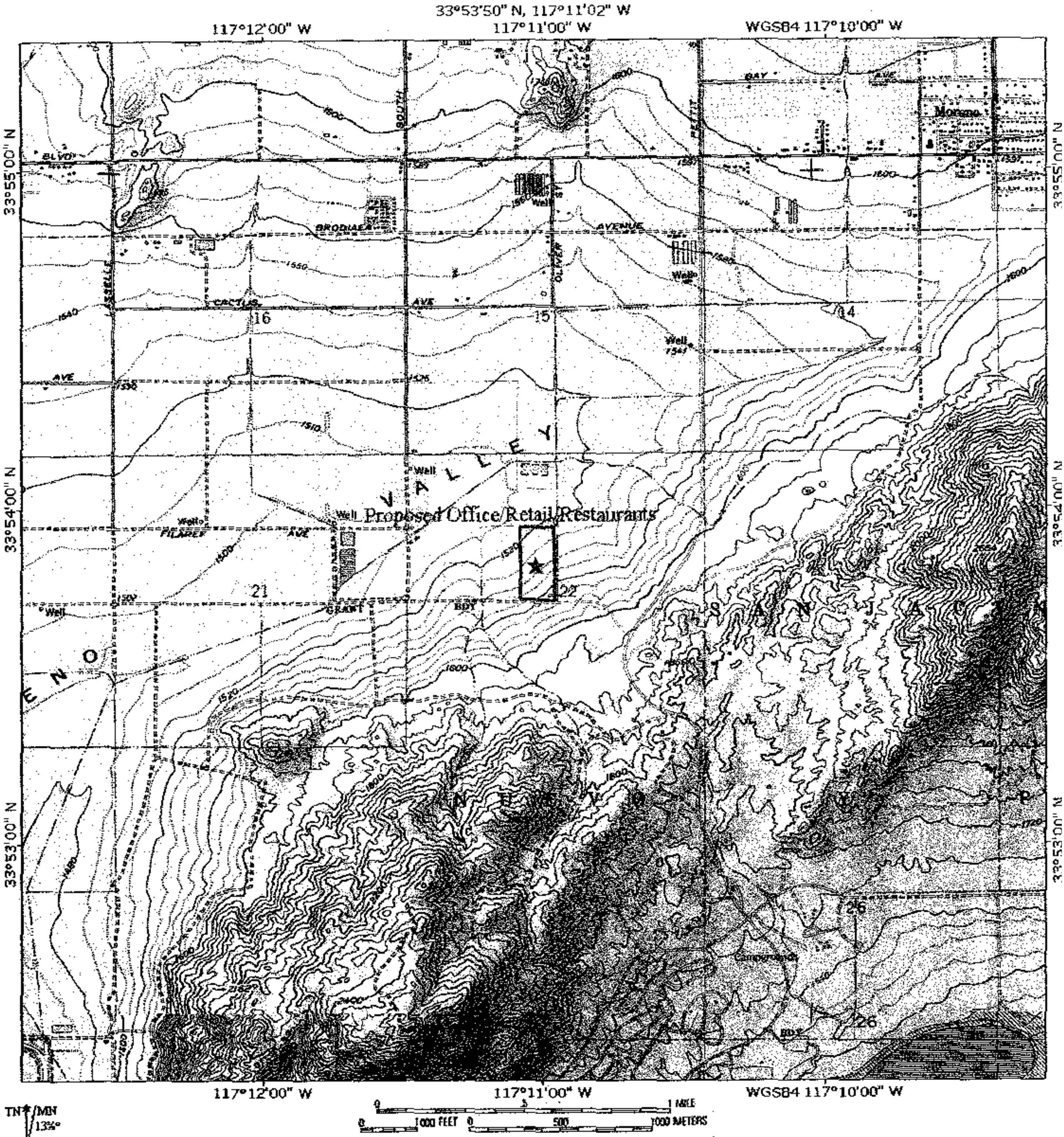

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Soils Southwest, Inc.

Site Index Map

PROPOSED OFFICE / RETAIL / RESTAURANTS
NWC IRIS AVE & OLIVER ST
MORENO VALLEY, CA

FIGURE:	1
PN:	03194-F
DATE:	NOV. 2003

1.0 Introduction

This report presents the results of Feasibility Study-Results of Soils and Foundation Evaluations conducted for the site of the planned commercial center to be constructed on the vacant parcel located near the northwest intersection of Iris Avenue and Oliver Street, City of Moreno Valley, California.

The purpose of this evaluation is to determine the nature and engineering properties of the near grade and subsurface soils, and to provide geotechnical recommendations for foundation design, slab-on-grade, retaining wall, paving and parking, site grading, utility trench backfill and inspection and testing during construction.

The geotechnical evaluations included subsurface explorations, soil sampling, laboratory testing, engineering analyses and preparation of this report. No site-specific geologic evaluation is made and none such is requested at this time.

The recommendations contained reflect our best estimate of the soils conditions encountered during field investigations conducted for the site. It is not to be considered as a warranty of the soils conditions in other areas or for the depths beyond the excavations conducted. Should any unusual subsurface condition becomes apparent during actual grading, this office should be notified.

1.1 Proposed Development

No site grading and/or development plans are prepared and none such is available for review. However based on the project information supplied, it is understood that the subject development, may include a combination of office, retail and/or restaurant buildings.

In absence of site grading plan, and considering the existing sloping nature of the property, moderate site grading, in form of cut and fill placements, is anticipated. Conventional one-story wood frame and stucco construction is expected with spread footings and concrete slab-on-grade. Associated interior paving/parking and off-site street improvements are expected to complete the project.

1.2 Site Description

The rectangular shaped property of 18.81 acres is currently vacant and undeveloped. The near level parcel is bounded on the north by undeveloped parcels, on the south by Iris Avenue, on the east by Oliver Street, and on the west by Moreno Valley Community Hospital. Overall vertical relief within the parcel is estimated to about 55 feet, with sheetflow from incidental rainfall flowing towards the northwest. With the exception of minor weed and scattered debris, no other significant features, pertinent to the planned development, were noted.

2.0 Scope of Work

Geotechnical evaluation for the project included subsurface explorations, soil sampling, necessary laboratory testing, engineering analyses and the preparation of this report. The scope of work included the following tasks:

- Explorations of four (4) test borings advanced to the maximum 25 feet below the present grade surface. The test explorations were made by using a truck mounted Hollow-Stem Auger (HSA) drillrig equipped for Standard Penetration Testing (SPT) and undisturbed soil sampling. During explorations, soils encountered were continuously logged, and bulk and undisturbed samples were procured where feasible. Collected samples were subsequently transferred to our laboratory for necessary testing.

  Descriptions of the soils encountered are provided on the Boring Logs in Appendix A. Approximate locations of the excavated test borings with respect to the surroundings, are shown on Plate 1.

- Laboratory testing conducted on selected bulk and undisturbed soil samples were programmed according to the project requirements. The laboratory testing included determinations of Moisture-Density, Maximum Dry Density and Optimum Moisture contents, soil's Shear Strengths and Consolidation characteristics under anticipated structural loadings. Considering gravelly in nature, no testing is included to evaluate soil's Expansion Index, EI.

  Descriptions of the test procedures used along with the test results are provided in Appendix B.

- Based on the data of our field investigations and laboratory testing, engineering analyses and evaluations were made on which to base our recommendations for foundation design, slab-on-grade, site preparations and grading and inspection during construction, and

- The preparation of this report.

3.0 Existing Site Conditions

3.1 Subsurface Conditions

Evaluations for site subsoil conditions are based upon soil explorations, laboratory testing and on engineering analyses considered necessary for the project.

The subsoils encountered primarily consist of loose, dry, disturbed and compressible near surface soils to about 3.5 to 4 feet, followed by moderately dense gravelly silty sand with pebbles and minor rocks. No shallow-depth groundwater and/or bedrock, was encountered.

Based on field explorations, in-situ testing, laboratory analyses and engineering evaluations, the following describes the site soil characteristics as observed.

Laboratory shear tests conducted on the upper bulk samples remolded to 90 percent indicate moderate shear strengths under increased moisture conditions. Results of the laboratory shear tests are provided in Plate B-1 in Appendix B.

Consolidation testing conducted on the near surface undisturbed samples indicates potential for compressibility under structural loading. When remolded to 90%, the soil sample indicates potential for tolerable settlements under increased moisture conditions. Results of the laboratory determined soils consolidation potentials are shown on the Plate B-2 in Appendix B.

Generally sandy, the site soils are considered non-expansive in nature with an Expansion Index, EI, less than 20. Supplemental laboratory testing on such should be considered following mass grading completion.

With the compressible nature of the near grade soils as described, it is our opinion that no structural fills and/or load bearing foundations and concrete slabs should be constructed bearing directly on the surface soils currently existing. When, however, re-worked in form of subexcavations and their replacement as engineered fills compacted to minimum 90%, the upper soils used, should be geotechnically suitable for directly supporting structural footings with tolerable settlements.

3.2 Excavatibility

It is our opinion that grading and excavations required for the project may be accomplished using conventional construction equipment. However, some difficulty may be experienced during deep trenching due to potential susceptibility to heavy caving for the dry gravelly nature of the sandy soils existing with numerous cobbles and rocks.

3.3 Groundwater

No shallow depth groundwater was encountered. Historical groundwater is expected at a depth in excess of 50 feet below grade.

3.4 Subsurface Variations

It is our opinion that variations in the continuity, depths of subsoil deposits and ground water conditions may be expected. Due to the nature and depositional characteristics of the soils underlying, care should be exercised in interpolating or extrapolating of the subsurface soils existing in between and beyond the test explorations described.

3.5 Liquefaction

Liquefaction is caused by build up of excess hydrostatic pressure in saturated cohesionless soils due to cyclic stress generated by ground shaking during an earthquake. The significant factors on which liquefaction potential of a soil deposit depends, among others include, soil type, relative soil density, intensity of earthquake, duration of ground shaking, and depth of ground water.

Considering granular nature of the existing subsoils, along with the absence of groundwater table within 50 feet; potential susceptibility for site soil liquefaction due to an earthquake, should be considered remote.

3.6 Seismic Design Parameters as Per 1997 UBC

The site is situated at about 5.8 km of B-Fault (San Jacinto-San Jacinto Valley Fault). Accordingly, based on the 1997 UBC, the following Seismic Design Parameters are suggested:

UBC Chapter 16 Table No.	Seismic Design Parameters	Recommended Values
16-I	Seismic Zone Factor, Z	0.4
16-J	Soil Profile Type	S_d
16-Q	Seismic Coefficient, C_a	$0.44N_a$
16-R	Seismic Coefficient, C_v	$0.75N_v$
16-S	Near Source Factor, N_a	1.0
16-T	Near Source Factor, N_v	1.2
16-U	Seismic Source Type	M >/=6.9

Supplemental seismic design parameters are provided in Appendix C of this report.

4.0 Evaluations and Recommendations

4.1 General Evaluations

Based on field explorations, laboratory testing, subsequent engineering analysis, the following conclusions and recommendations are presented for the project under study.

(i) From geotechnical viewpoint, the site is considered grossly stable and suitable for the proposed development, provided the recommendations supplied are implemented during grading and construction.

(ii) Because of the dry and unconsolidated nature, the surface soils should be reworked in form of subexcavations and their replacement as engineered fill compacted to minimum 90%. In event imported fill soils are required; such should be placed following subgrade preparations as described. Unless otherwise specified, a minimum 24-inch thick compacted fill mat blanket should be maintained below footings.

(iii) The subexcavation depths described in the following sections should be considered as 'minimum'. During grading, localized deeper subexcavations may be required in event buried debris and/or abandoned utilities are encountered, or other undesirable subgrade conditions are exposed. IT WILL BE THE RESPONSIBILITY OF THE GRADING CONTRACTOR TO INFORM SOILS ENGINEER THE PRESENCE OF BURIED DEBRIS OR UTILITIES SUCH AS SEPTIC TANK, WHEN SUCH ARE ENCOUNTERED DURING GRADING.

(iv) In order to minimize potentials for differential settlements, it is recommended that structural footings should be established exclusively into engineered fills of local soils or its equivalent or better, compacted to minimum 90%. Construction of footings and slabs straddling over cut/fill transitions should be avoided.

(v) Structural design consideration should include probability for moderate to high peak ground acceleration from relatively active nearby earthquake faults. The effects of ground shaking can be satisfactorily mitigated by implementation of the seismic design requirements and procedures as outlined in the latest Uniform Building Code and as described in Section 3.6.

(vi) Although no groundwater was encountered, provisions should be maintained during construction to divert incidental rainfall away from the structural pads constructed.

(vii) It is our opinion that, if site preparations and grading are performed as recommended herein, and in accordance with the generally accepted construction practices, the proposed development will not adversely affect the stability of the site, or the properties adjacent.

4.1.1 Preparations for Structural Pad

In absence of grading/development plans, it is assumed that the near grade dry, loose and compressible as encountered are considered susceptible to differential settlements under structural loading. For adequate support with tolerable settlements to footings, it is our opinion that the upper soils existing should be subexcavated and such are replaced as engineered fills compacted to minimum 90%. Local soils excavated should be suitable for re-use as structural backfill. Accordingly, the following grading recommendations are suggested for "preliminary" estimation purpose.

The subexcavation depth should extend vertically to MINIMUM (I) 3.5 FEET BELOW THE PRESENT GRADE SURFACE, OR (II) TO THE SUFFICIENT DEPTH SO AS REQUIRED TO MAINTAIN A MINIMUM 24-INCH THICK COMPACTED FILL BLANKET BELOW THE FOOTING BOTTOMS; OR (III) TO THE DEPTH OF THE UNDERLYING MOIST AND DENSE NATURAL SUBGRADES APPROVED BY SOILS ENGINEER, WHICHEVER IS GREATER.

Attachment: Appendix E - Soils Report (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

In planar, such subexcavations should encompass the proposed structural footprint areas and five feet beyond. Where constraint exists from nearby development, or from adjacent property lines, the horizontal extent may be limited to the constraints or to the extent as determined by soils engineer during grading.

For the low-lying areas requiring fill soils to establish pad grade, such may be placed following removal of the upper disturbed soils to about 3 feet, or to the depth as determined by soils engineer, followed by scarification, moisturization and recompaction to minimum 90 percent. The overall compacted fill depth below footings, however, should be maintained to minimum 18-inch as described.

Within areas of the planned pads requiring cuts to existing grade, if any, following such cuts, the subgrades exposed should be further over excavated to sufficient depth so as to maintain the minimum 18-inch thick compacted blanket fill blanket below footings as described.

General earthwork recommendations for fill placement are provided in Section 5 of this report. Unless otherwise stated, structural fills should be compacted to minimum 90% as described below. To provide par certification for further construction, structural fill placement should be monitored by this firm during grading.

4.1.2 Compacted Fills

On-site soils free of organic, debris and rocks larger than 8-inch should be considered suitable for re-use during construction. In event larger rocks are encountered, such may be used within deeper fills in excess of 10 feet. No 'nesting' of large rocks, however, will be allowed during grading. Additional recommendations for such will be provided during grading, if warranted.

4.2 Spread Foundations

The planned structures may be supported by continuous wall and/or isolated spread footings founded exclusively into compacted engineered fills. For adequate support, footings for single story structures should be sized to at least 15-inch wide, embedded to at least 18-inch below the lowest adjacent final grade. No footings and slabs straddling over cut/fill transition conditions should be allowed.

For design, allowable vertical bearing for footings placed into compacted fills may be calculated based on the following equations:

Square Footings: $q_{allowable} = 800 + 500d + 240b$, and
Continuous Footing: $q_{allowable} = 700 + 500d + 300b$, where

q = allowable soil vertical bearing capacity, in psf.
d = footing depth in ft., minimum recommended 1.5 ft.,
b = smallest width of footing in ft., minimum recommended 1.25 ft.

The recommended bearing capacities may be increased for each increment in footing depth in excess of the minimum depth recommended. The bearing values indicated are for total dead and frequently applied live loads. However, in order to minimize potential excessive settlements, total maximum bearing values should be limited to 2500 pounds per square foot.

If normal code requirements are applied, the above capacities may further be increased by an additional 1/3 for short duration of loading which include the effect of wind and seismic forces.

From geotechnical view point, footing reinforcements consisting of minimum 2-#4 rebar placed near the top and 2-#4 rebar near the bottom of continuous footings, are recommended. Additional reinforcements if specified by project structural engineer should be incorporated during construction.

The settlements of properly designed and constructed foundations supported on engineered fill, comprising of site soils or its equivalent or better, and carrying maximum anticipated vertical loadings, are expected to be within tolerable limits. Estimated total and differential settlements are about 3/4 and 1/2-inch, respectively.

4.3 Concrete Slab-on-Grade

The prepared subgrade to receive foundations should be considered adequate for concrete slab-on-grade. For normal load bearing conditions, 4-inch thick (nominal) concrete slabs reinforced with #3 rebar at 24-inch o/c, may be considered. Within storage areas, concrete slabs should be at least 4-inch thick (net), reinforced as recommended by structural engineer. A soil subgrade reaction of 300 pcf may be considered in concrete slab thickness design.

Within moisture sensitive areas (office etc.), concrete slabs should be underlain by 2-inch thick of granular sand, overlying 6-mil thick Visqueen, or with other commercially available similar water proofing membrane.

4.4 Resistance to Lateral Loads

Resistance to lateral loads can be restrained by friction acting at the base of foundations and by passive earth pressure. A coefficient of friction of 0.3 may be assumed with normal dead load forces for footing established into compacted fill. An allowable passive lateral earth resistance of 230 pounds per square foot per foot of depth may be assumed for the sides of foundations poured against compacted fill. The maximum lateral passive earth pressure is recommended not to exceed 2300 pounds per square foot. For design, lateral pressure of native soils when used as level backfill may be estimated from the following equivalent fluid density:

Active:	33 pcf
Passive:	230 pcf
At Rest:	60 pcf

4.5 Shrinkage and Subsidence

Based on the results of field observations and laboratory testing, it is our opinion that the upper soils when reworked may be subjected to a volume change. Assuming a 90% relative compaction for structural fills, and assuming an overexcavation and re-compaction of 36-inch, such volume change due to shrinkage may be on the order of 15 to 20 percent. Further volume change may be expected following removal of concrete slabs, asphalt paving, surface debris and buries utilities such as septic tank and seepage pits etc.

Attachment: Appendix E - Soils Report (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

4.6 Construction Consideration

4.6.1 Unsupported Excavation

Temporary construction excavations up to a maximum depth of 5 feet may be made without any lateral support. It is recommended that no surcharge loading such as construction equipment etc., shall be allowed within a line drawn upward at 45 degree from the toe of excavation. Use of sloping for deep excavation may be applicable where plan dimensions of the excavation are not constrained by any existing structure.

4.6.2 Supported Excavations

If vertical excavations exceeding 4 feet in depths become warranted, such should be achieved using shoring to support side walls.

4.7 Site Preparations

Following removal of surface vegetation and tree roots etc., site preparations should include subexcavations of the upper porous and/or upper disturbed, dry loose soils to about 3 feet, stock-piling of the soils excavated, followed by moisturization and/or aeration of the subgrades exposed to 3% to 5% over optimum moisture content. Site preparations should also include re-placement of the excavated on-site and/or imported fill materials as load bearing fill mat blanket compacted to 90 percent or better. Such earth work should be in accordance with the applicable grading recommendations provided in the current UBC and as recommended in Section 5.0 of this report. Considering dry nature, pre-moisturization may be required.

4.8 Soil Caving

During excavations for deep utility trench etc., some caving may be expected. Otherwise specified, temporary excavations should be made at a slope ratio of 2 to 1 (horizontal to vertical) or flatter, and as per the construction guidelines provided by Cal-Osha.

4.9 Structural Pavement Thickness (Flexible & Rigid)

Flexible Paving:

Based on estimated Traffic Index (TI) and on R-value of 60 for the local sandy soils as encountered, the following flexible pavement sections are recommended for the traffic conditions as described.

Service Area	Traffic Index(TI)	Pavement Type	Thickness (inch)	
			a.c	Cl II base
Driveway & Auto Parking	5.5	a.c over base	3.0	3.5

For interior paving, subgrade soils should be scarified to minimum 12-inch, moisture conditioned from 3% to 5% percent over optimum and compacted to 90% Base material used should conform to Caltrans Class II specification, placed compacted to minimum 95%.

Concrete Paving:

Rigid paving if desired, may be constructed of 5.5-inch thick (net) concrete, placed over local soils compacted to minimum 90%. In order to minimize concrete shrinkage cracks, adequate construction/expansion joints at intervals not exceeding 15 feet, or as recommended by structural engineer, should be considered.

The final design recommendations for rigid paving should be supplied by the project structural engineer based on soils Subgrade Reaction of 250 pcf.

The recommendations supplied are for estimation purposes. Final pavement sections should be verified based on supplemental R-value testing on the soils procured following mass grading completion using the TI as supplied by the local governing agency.

4.10 Retaining Wall

It is unknown if any retaining wall will be associated for the development planned. Retaining wall, if proposed, should be designed using the following equivalent earth pressure:

Slope Surface of Retained Material (horz. to vert.)	Equivalent Fluid Density (pcf)	
	Imported Clean Sand	Local Site Soil
Level	30	34
2:1	35	45

The recommended lateral pressures do not include any surface load surcharge. Use of heavy equipment near retaining wall may develop lateral pressure in excess of the parameters described above. Walls adjacent to traffic areas should be designed to resist a uniform lateral pressure of 100 pounds per square foot, which is a result of an assumed 300 pounds per square foot surcharge behind the walls due to normal traffic. If the traffic is kept back ten feet from the wall, the traffic surcharge may be neglected.

Installation of 'french-drain' behind retaining walls is recommended to minimize water pressure build-up. Use of impervious material is preferred within the upper 18 inches of the backfill placed.

Backfill behind retaining wall should be compacted to a minimum 90 percent relative compaction relative to the Maximum Dry Density as determined by the ASTM D1557-91 test method. Flooding and/or jetting behind wall should not be permitted. On-site sandy soils may be used for backfill behind walls.

4.11 Utility Trench Backfill

Utility trench backfill within the structural pad and beyond should be placed in accordance with the following recommendations:

- o Trench backfill should be placed in thin lifts compacted to 90 percent or better of the laboratory maximum dry density for the soils used. As alternative, clean granular sand may be used having a SE value greater than 30. Adequate jetting is required underneath utilities placed at depth. Soils Southwest, Inc assumes no responsibility, in event sufficient jetting is not associated, thereby causing potential future caving to street paving, curb-gutter, or other peripheral structures.

- o Exterior trenches along a foundation or a toe of a slope and extending below a 1:1 imaginary line projected from the outside bottom edge of the footing or toe of the slope, should be compacted to 90 percent of the Maximum Dry Density for the soils used during backfill. Trench excavations should conform to the requirements and safety as specified by the Cal-Osha

4.12 Pre-Construction Meeting

It is recommended that no clearing of the site or any grading operation be performed without the presence of a representative of this office. An on-site pre-grading meeting should be arranged between the soils engineer and the grading contractor prior to any construction.

ALTHOUGH NOT ENCOUNTERED, CONSIDERING PAST USAGE OF THE PROPERTY, IT IS POSSIBLE THAT BURIED UTILITIES SUCH AS ABANDONED SEPTIC TANKS MAY STILL BE EXISTING UNDERLYING THE SITE. IF SUCH AREA ENCOUNTERED DURING EXCAVATIONS, IT SHOULD BE THE CONTRACTOR'S SOLE RESPONSIBILITY TO UN-EARTH SUCH CONSTRUCTION AND TO BRING TO SOILS ENGINEER'S ATTENTION SO AS TO SUPPLY SUPPLEMENTAL RECOMMENDATIONS FOR FURTHER GRADING.

4.13 Seasonal Limitations

No fill shall be placed, spread or rolled during unfavorable weather conditions. Where the work is interrupted by heavy rains, fill operations shall not be resumed until moisture conditions are considered favorable by the soils engineer.

4.14 Planters

To minimize potential differential settlement to foundations, planters requiring heavy irrigation should be restricted from using adjacent to footings. In event such becomes unavoidable, planter boxes with sealed bottoms, should be considered.

4.15 Landscape Maintenance

Only the amount of irrigation necessary to sustain plant life should be provided. Pad drainage should be directed towards streets and to other approved areas away from foundations. Slope areas should be planted with draught resistant vegetation. Over watering landscape areas could adversely affect the proposed site development during its life-time use.

Attachment: Appendix E - Soils Report (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

4.16 Observations and Testing During Construction

Recommendations provided in this report are based on the assumption that footings will be placed exclusively into properly compacted engineered fill. Excavated footings should be inspected, verified and certified by soils engineer prior to steel and concrete placement to ensure their sufficient embedment and proper bearing on compacted soil. Additional inspections by soils engineer are recommended to verify footing excavations for being free of loose and disturbed material. Structural backfill should be placed and compacted under direct observations and testing by this facility. Excess soils generated from footing excavations should be removed from pad areas and such should not be used as un-compacted subsoil to receive concrete slab-on-grade.

4.17 Plan Review

In absence of precise grading plan, the recommendations presented should be considered 'preliminary'. It is recommended that foundation and grading plans, when prepared, should be reviewed by soils engineer in order to minimize misunderstanding between the plans and the recommendations supplied.

5.0 General Site Grading Recommendations

Structural Backfills:

During grading, excavated site soils may be considered suitable for reuse as structural backfill. Loose soils, formwork and debris should be removed prior to backfilling. On-site soils as backfill should be placed and compacted in accordance with the recommended specifications as provided below. Where space limitations do not allow conventional backfilling operations, special backfill materials and procedures may be required. Pea gravel or other select backfill can be used in limited space areas. Recommendations for placement and densification of pea gravel or other special backfill can be provided during construction.

Site Drainage:

Adequate positive drainage should be provided away from the structure to prevent water from ponding and to reduce percolation of water into backfill. A desirable slope for surface drainage is 2 percent in landscape areas and 1 percent in paved areas. Planters and landscaped areas adjacent to building perimeter should be designed to minimize water filtration into subsoils. Consideration should be given to the use of closed planter bottoms, concrete slabs and perimeter subdrains, where applicable.

Utility Trenches:

Buried utility conduits should be bedded and backfilled around the conduit in accordance with the project specifications. Where conduit underlies concrete slab-on-grade and pavement, the trench backfilled with local soils should be compacted to minimum 90%. In place of mechanically compaction of the backfill, the trench may be backfilled with granular sand followed by water-jetting provided positive drainage for excess water is established.

General Grading Recommendations:

Recommended general specifications for surface preparation to receive fill and compaction for structural and utility trench backfill and others are presented below.

1. Areas to be graded, backfilled or paved, shall be grubbed, stripped and cleaned of buried and undetected debris, structures, concrete, vegetation and other deleterious materials prior to grading.

2. Where compacted fill is to provide vertical support, loose, soft and other incompetent local soils should be removed to full depth as approved by soils engineer, or at least up to the depth as previously described in this report. In plan, areas of such removal should extend to at least 5 feet beyond the perimeter of exterior foundation, or to the extent as approved by soils engineer during grading.

3. Unless otherwise specified, the recommended compaction for fill soils to support foundations and slab should be at least 90% of the soil's Maximum Dry Density, at or near optimum moisture content.

4. Utility trenches within structural pad and beyond, should be backfilled with granular material, and should be compacted to at least 90% of the maximum density for the material used.

5. Compaction for structural fills shall be determined relative to the Maximum Dry Density as determined by ASTM D1557-91 compaction methods. In-situ field density shall be determined by the ASTM D1556-90 standard method, or by other approved procedure.

6. Imported soils if required for filling shall be clean granular, non-expansive in nature as approved by soils engineer.

7. During grading, fill soils shall be placed in thin layers, with maximum compacted thickness not exceeding six inches.

8. No rocks over six inches in diameter shall be used as a grading material without prior approval of soils engineer.

9. No jetting and/or water tampering be considered for backfill compaction for utility trenches without prior approval of the soils engineer. For such backfill, hand tampering with fill layers of 8 to 12 inches thickness, or as approved by the soils engineer, is recommended.

10. Abandoned utility trenches, cesspool or septic tank if encountered during grading, should either be completely excavated and removed, or such should be backfilled with gravel, slurry or by other material as approved by soils engineer.

11. Import soils if required during grading, should be equivalent to the site soils or better. Such materials should be approved by the soils engineer prior to their use.

12. Grading required for pavement, side-walk or other facilities to be used by general public, should be constructed under direct observation of soils engineer as required by the local public agency.

13. A site meeting should be held between grading contractor and soils engineer prior to actual construction. Two days of prior notice will be required for such meeting.

6.0 Closure

The conclusions and recommendations contained are based on the findings and observations made at the time of the subsurface test explorations, laboratory testing and engineering analyses. The recommendations presented should be considered 'preliminary'. If during construction, the subsoils conditions are found to be different from those as described in this report, this office should be notified to consider possible need for modification for the geotechnical recommendations provided.

Recommendations are based on the assumptions that structural footings will be established exclusively into compacted fill. No footings and/or slabs should be allowed straddling over cut/fill transition interface.

Grading plans should be supplied and such should be reviewed prior to site preparations and construction. In event revised or updated plans are used, such should be the available to verify adequacy of the recommendations supplied.

Footing excavations should be inspected prior to steel and concrete placement to ensure that foundations are founded into satisfactory soils and excavations are free of loose and disturbed materials.

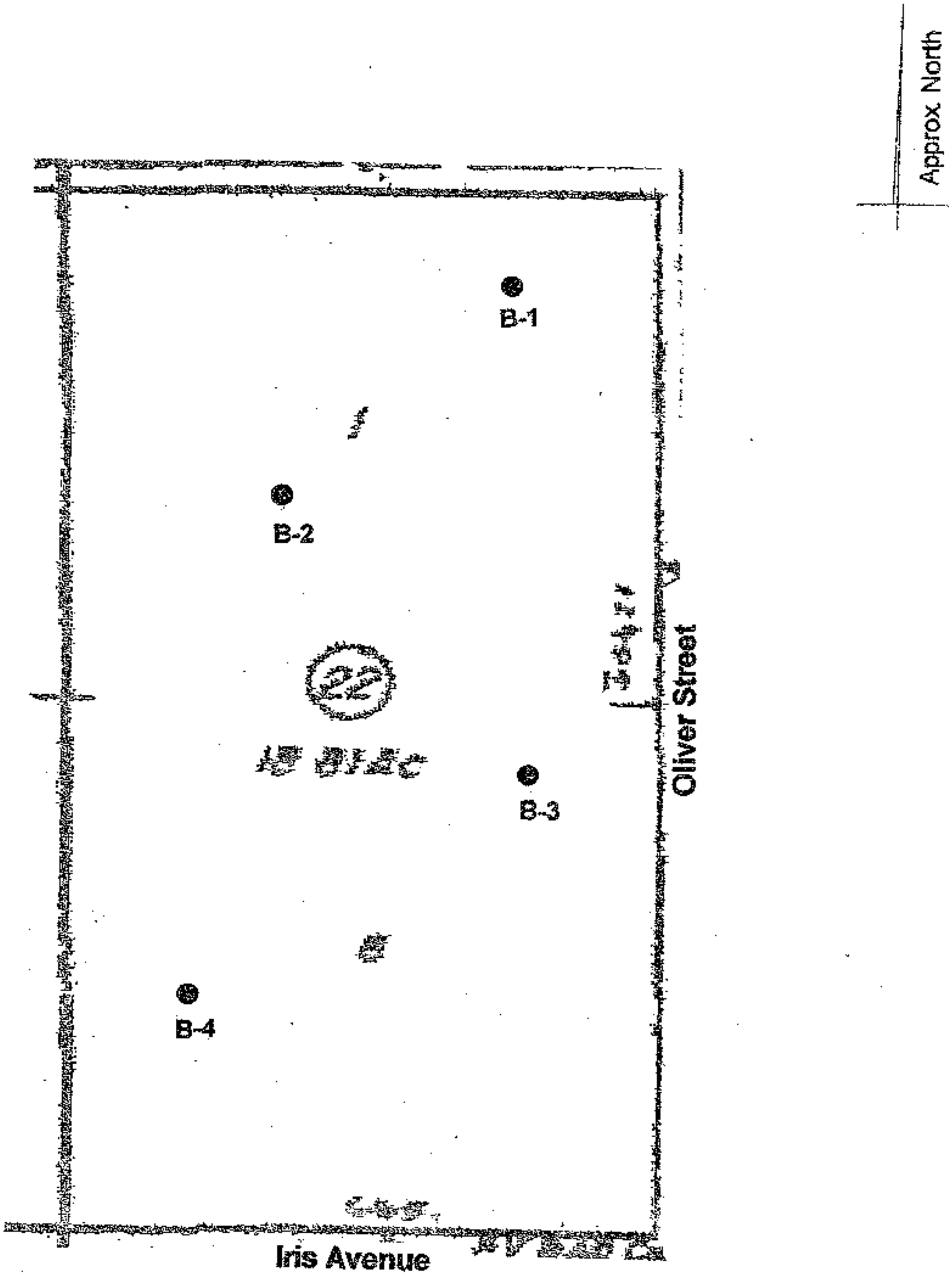
A pregrading meeting between grading contractor and soils engineer should be arranged, preferably at the site, to discuss the grading procedures to be implemented and other requirements described in this report to be fulfilled.

This report has been prepared exclusively for the use of the addressee for the project referenced in the context. It shall not be transferred or be used by other parties without a written consent by Soils Southwest, Inc. We cannot be responsible for use of this report by others without inspection and testing of grading operations by our personnel.

Should the project be delayed beyond one year after the date of this report; the recommendations presented shall be reviewed to consider any possible change in site conditions.

The recommendations presented are based on the assumption that the necessary geotechnical observations and testing during construction will be performed by a representative of this office. The field observations are considered a continuation of the geotechnical investigation performed. If another firm is retained for geotechnical observations and testing, our professional liability and responsibility shall be limited to the extent that Soils Southwest, Inc. would not be the geotechnical engineer of record.

PLOT PLAN AND TEST LOCATIONS
(Schematic, Not To Scale)



Legend: B-1 Approx. location of test borings

Plate 1

PHASE I ENVIRONMENTAL SITE ASSESSMENT REPORT

SUBJECT PROPERTY:	18.81 ACRES OF VACANT LAND OLIVER STREET AND IRIS AVENUE MORENO VALLEY, CALIFORNIA 92555
REPORT DATE:	SEPTEMBER 26, 2003
CLIENT:	MR. GUY RONEY K & S PROPERTY, LLC 3495 PONTIAC DRIVE CARLSBAD, CALIFORNIA 92008
PREPARED FOR:	MR. GUY RONEY K & S PROPERTY, LLC

WRITTEN AND REVIEWED BY:

Martin Kasman

MARTIN A. KASMAN
REGISTERED ENVIRONMENTAL ASSESSOR

MARTIN A. KASMAN
No. 04022
Expires: 6/30/04

P03301

This report was prepared in conformance to meet or exceed the scope and limitations as set forth by the American Society for Testing & Materials (ASTM) Standard Practice E 1527-00. It is for the express use of the client, and its contents are considered to be privileged and confidential. Acceptance of this report constitutes an agreement by the client to assume full liability for information contained herein. This report is for the sole use and interpretation of the client, and it is not to be reproduced or distributed to outside parties. The information in this report is furnished in good faith and was obtained from sources and databases considered to be reliable; however, the accuracy of the information cannot be guaranteed. Our liability is limited to the fee charged.

Prepared by
ORSWELL & KASMAN, INC.
2500 East Colorado Boulevard ■ Suite 330 ■ Pasadena, CA 91107
(626) 844-4150 ■ FAX (626) 844-4155
www.orswell-kasman.com

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ORSWELL & KASMAN, INC.
PHASE I ENVIRONMENTAL SITE ASSESSMENT REPORT

18.81 ACRES OF VACANT LAND
OLIVER STREET AND IRIS AVENUE
MORENO VALLEY, CALIFORNIA 92555

1.0 SUMMARY

Based on a review of regulatory records, historical site information, and a visual inspection of the area, this assessment has revealed no *recognized environmental conditions* or *historical recognized environmental conditions* in connection with the Property. In addition, no offsite locations have been identified as potential risks or threats to the subject property. Based on the results of this assessment, no further environmental studies are recommended for the site.

2.0 INTRODUCTION

2.1 Purpose

The purpose of this Phase I Environmental Site Assessment is to determine if any *recognized environmental conditions* or *historical recognized environmental conditions* exist on or near the subject property. As defined by the ASTM Standard, a *recognized environmental condition* is the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release into structures on the property or into the ground, groundwater, or surface water of the property. The term includes hazardous substances or petroleum products even under conditions in compliance with laws. The term is not intended to include *de minimis* conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.

The ASTM Standard defines a *historical recognized environmental condition* as a condition which in the past would have been considered a *recognized environmental condition*, but which may or may not be considered a *recognized environmental condition* currently. If a past release of any hazardous substance or petroleum products has occurred in connection with the property and has been remediated, with such remediation accepted by the responsible regulatory agency, this condition shall be considered a *historical recognized environmental condition*.

2.2 Detailed Scope of Services

This report is based on a preliminary study into the past and current uses of the subject property and the surrounding area. The report includes a visual inspection of the property and adjacent sites, and a review of regulatory agency records, aerial photographs, and other historic record sources. Also included in this report are maps, diagrams, and photographs pertaining to this site.

2.3 Significant Assumptions

The information in this report is furnished in good faith and was obtained from sources and databases considered to be reliable; however, nothing in this report should be construed as a promise or guarantee that the subject property is free of environmental hazards. In many instances, this report relies on regulatory database information provided by federal, state and local governmental agencies. Although the database information used in this report consists of the most recently released records, it may not reflect the actual current status of the case.

2.4 Limitations and Exceptions

This report was prepared in conformance to meet or exceed the scope and practice as set forth by the American Society for Testing & Materials (ASTM) Standard Practice E 1527-00, "Standard Practice of Environmental Site Assessments: Phase I Environmental Site Assessment Process." No tests were conducted, and no samples of air, water, soil or building materials were taken.

2.5 Special Terms and Conditions

No special terms or conditions have been incorporated into the preparation of this report. There were also no limiting physical conditions such as rain or lack of electrical power, that had a limiting effect on the site inspection.

2.6 User Reliance

This report is prepared for the express use of the client, and its contents are considered to be privileged and confidential. Acceptance of this report constitutes an agreement by the client to assume full liability for information contained herein. This report is for the sole use and interpretation of the client, and it is not be reproduced or distributed to outside parties.

3.0 SITE DESCRIPTION

3.1 Location and Legal Description

The subject property, Oliver Street and Iris Avenue, Moreno Valley, California, is located on the northwest corner of Oliver Street and Iris Avenue. The property is described as Riverside County Tax Assessor's Parcel Number (APN) 486-310-022.

3.2 Site and Vicinity General Characteristics

The site consists of a large parcel of vacant, undeveloped land, located in a mixed commercial and residential area of Moreno Valley, California (see site plan). The site and surrounding area are gently sloping to the northwest, and the subject property is not connected to the municipal water and sewage systems. The electrical power in the area is supplied by underground utility lines, and no transformers were observed with signs indicating the presence of polychlorinated biphenyls (PCBs).

3.3 Current Use of Property

The subject property is approximately 18.81 acres of vacant, unimproved land.

3.4 Descriptions of Structures, Roads, Other Improvements On Site

The site is vacant, unimproved land with no structures, buildings, or roads. No evidence of previous buildings or structures was observed on the site.

3.5 Current Uses of the Adjoining Properties

North of the subject property is vacant land. East of the subject property is Oliver Street, and further east is a vacant lot which is in the process of being graded. Iris Avenue is to the south, and further south is a residential neighborhood. Vacant land is also to the west.

4.0 USER PROVIDED INFORMATION

4.1 Title Records

No recorded land title records were provided by the client for review.

4.2 Environmental Liens or Activity and Use Limitations

The client has not provided any information concerning environmental liens or activity and use limitations.

4.3 Specialized Knowledge

No specialized knowledge of *recognized environmental conditions* or *historical recognized environmental conditions* in connection with the subject property has been provided by the client.

4.4 Valuation Reduction for Environmental Issues

No information has been provided which indicates the subject property is being sold or purchased at a significantly reduced price due to outstanding environmental issues.

4.5 Owner, Property Manager, and Occupant Information

Information provided by the owner, property manager, and/or occupants of the site are included in this report under Section 7.0, Interviews.

4.6 Reasons for Performing Phase I Environmental Site Assessment

The reasons for performing this Phase I Environmental Site Assessment is to satisfy commercial real estate lending requirements, or provide due diligence information concerning the historical uses and current condition of the site.

4.7 Other User Provided Information

No other information concerning the subject property has been provided by the client.

5.0 RECORDS REVIEW

5.1 Standard Environmental Records Sources

FEDERAL AGENCY RECORDS

United States Environmental Protection Agency (USEPA)
National Priorities List

The National Priorities List (NPL) identifies abandoned or uncontrolled hazardous waste sites which have been identified as possibly representing a long-term threat to the public health or environment. These sites have been identified as being highly contaminated with hazardous substances and represent the USEPA's target enforcement and cleanup efforts. Studies of individual sites are conducted by the USEPA to determine level of contamination, and the sites are then compared and ranked to other sites on the NPL.

A review of the USEPA National Priorities List dated April 2003 indicates there are no proposed or final sites within one mile of the subject property.

United States Environmental Protection Agency (USEPA)
Federal Superfund Liens List

The USEPA maintains a list of Superfund Lien sites that have been issued on properties throughout the United States. These sites have been remediated through the expenditures of Superfund monies; the purpose of the lien is to prevent the property owner from gaining a financial benefit from the federal government's cleanup and restoration activities.

A review of the July 1993 Federal Superfund List revealed there are no Superfund Liens on or adjacent to the site.

United States Environmental Protection Agency (USEPA) Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS)

The USEPA has developed a database known as CERCLIS which contains information on potential hazardous waste sites located throughout the United States. There are over 33,000 sites on the CERCLIS inventory. All sites are subjected to a preliminary assessment and thereafter are either placed on the National Priority List (NPL) or are placed in a category for those sites requiring no further Federal Superfund action.

A review of the January 2003 CERCLIS report indicates there are no CERCLIS sites within a ½ mile radius of the subject property. In addition, there are no listed "No Further Remedial Action Planned" (NFRAP) sites on or adjacent to the subject property.

United States Environmental Protection Agency (USEPA) Resource Conservation and Recovery Act (RCRA) Treatment, Storage or Disposal Facilities (TSDF)

The USEPA maintains a list of facilities which have been authorized to receive hazardous waste. These facilities have permits to treat, store, or dispose of the waste, as determined by the RCRA regulations. In addition, the USEPA publishes a list of those facilities who are subject to a corrective action, based on the facilities waste handling and storage procedures. The facilities which are subject to a corrective action are identified as CORRACTS sites.

A review of the January 2001 RCRA TSDF list determined there are no CORRACTS facilities within a one mile radius of the subject property. In addition, there are no non-CORRACTS TSD facilities listed within a ½ mile radius.

United States Environmental Protection Agency (USEPA)
Resource Conservation and Recovery Act (RCRA)
Hazardous Waste Generators

The USEPA maintains a list of facilities which are identified as generators of large and small quantities of hazardous waste. These facilities have permits to generate, store and dispose of the waste, as determined by the RCRA regulations.

A review of the January 2001 RCRA Hazardous Waste Generators list determined there are no large or small quantity hazardous waste generators on or adjacent to the subject property.

United States Environmental Protection Agency (USEPA)
Office of Emergency and Remedial Response
Emergency Response Notification System (ERNS)

The USEPA maintains a list of locations which have reported a release of oil or hazardous substances to the federal government. Most of the data in this system is based on information that was received during the initial notification.

A review of the ERNS list for 1999 determined there are no reported incidents on the subject property.

United States Department of Transportation
United States Coast Guard
National Response Center (NRC)

The NRC is the national point of contact for reporting all oil, chemical, radiological, biological and etiological discharges into the environment anywhere in the United States and its territories. In addition to gathering and distributing spill data for Federal On-Scene Coordinators and serving as the communications and operations center for the National Response Team, the NRC maintains agreements with a variety of federal entities to make additional notifications regarding incidents meeting established trigger criteria.

A review of the NRC list for 2002 determined there are no reported incidents on the subject property.

STATE AGENCY RECORDS

State of California
Environmental Protection Agency (CAL-EPA)
Department of Toxic Substances Control (DTSC)

CAL-EPA is responsible for the regulation and enforcement of environmental health laws within the state of California, as set forth by the California Health and Safety Code. CAL-EPA is also designated by the USEPA to assist in enforcing federal environmental laws. CAL-EPA regulates companies involved in the generation, transportation, storage and disposal of hazardous substances. CAL-EPA records include the "CalSites" database, which is a listing of 7,800 known active, inactive and abandoned hazardous waste sites. These sites have previously been reported in the Abandoned Site Program Information System (ASPIS), Bond Expenditure Plan (BEP), and Cortese databases. CAL-EPA records also include an October 1990 listing of registered underground tanks and the California Integrated Waste Management Board's "Active" and "Closed and Inactive" landfills database.

A review of the July 2003 CAL-EPA records determined there are no listed "CalSite" facilities within a ½ mile of the subject property. According to the records, there are no registered underground storage tanks on or adjacent to the subject property. In addition, there are no active, closed or inactive landfill facilities within a ½ mile radius of the subject property.

State of California
Water Resources Control Board
Regional Water Quality Control Board (RWQCB)

The RWQCB is responsible for monitoring the quality and flow of the groundwater, and compiles lists of known leaking underground storage tanks. In addition, the RWQCB addresses other potential threats to the groundwater from surface spills and leaks. The RWQCB monitors the contamination problem, the investigation and any remedial action.

A review of the April 2003 leaking underground storage tank records of the RWQCB determined the subject property is not listed as the source of a known leaking storage tank. According to the records, there are no known leaking underground tank sites within a ½ mile radius of the subject property. In addition, the subject property and adjacent sites were not identified on the RWQCB Spills, Leaks, Investigations and Cleanups (SLIC) list.

5.2 Additional Environmental Sources

South Coast Air Quality
Management District (AQMD)

The AQMD is responsible for the development and enforcement of regulations concerning air emissions and airborne hazards from stationary sources in the South Coast Air Basin. AQMD maintains a "Hot Spot" list of facilities whose air emissions pose as a risk to the surrounding community.

A review of the AQMD records determined there are no "Hot Spot" facilities on or adjacent to the subject property.

Riverside County
Waste Resources Management Division (RCWRMD)

RCWRMD maintains maps concerning the locations of active, inactive or future solid waste landfill sites in Riverside County.

A review of RCWRMD's major waste systems map determined there are no active, inactive, or future landfill sites within a ½ mile radius of the subject property.

County of Riverside
Environmental Health
Hazardous Materials Division (REH/HMD)

REH/HMD maintains inspection and inventory records of companies involved in the storage and use of hazardous materials or petrochemicals. REH/HMD attempts to maintain a current record of the types of materials which are utilized at a particular site, and conducts periodic inspections for safety and compliance. REH/HMD also maintains records on underground storage tanks, issues installation and removal permits, and monitors the contamination cleanup process.

According to REH/HMD records, there are no records of underground tanks or current hazardous material inventories for the subject or adjacent properties.

Western Municipal Water District (WMWD)
Cooperative Well Measuring Program

The WMWD maintains data concerning the groundwater levels in the Riverside County Area Watershed areas, based on selected water well measurements.

A review of the water resources data indicates the nearest water well is located approximately 2 miles north of the subject property. The elevation at the well is 1,580 feet above sea level, and the groundwater is 172 feet below the surface. Based on the topography of the area, the groundwater flow is expected to be to the south, although this cannot be confirmed due to the lack of nearby wells.

State of California
Department of Conservation
Division of Mines and Geology (CDMG)

The CDMG conducts studies, publishes maps, and provides information concerning the geological formations throughout the state of California. CDMG research information is combined with information from the United States Geological Survey and the ensuing geologic maps of the state are prepared. These geologic maps also illustrate the approximate locations of known earthquake faults.

A review of the area map published by CDMG indicates the geologic area surrounding the subject property consists of a mix of Recent alluvium, which includes alluvial fan, flood-plain, and streambed deposits. The client may wish to refer to the enclosed geologic map.

State of California
Department of Conservation
Division of Oil and Gas (CDOG)

The CDOG regulates the drilling, operation and abandonment of gas and oil wells throughout the state of California. If an active, idle or abandoned well is located on or adjacent to a proposed construction site, CDOG requires a site plan review prior to issuing a building permit. Abandoned oil wells must meet standards established in 1984.

A review of the area map published by CDOG indicates there are no producing, idle or abandoned oil wells on or adjacent to the subject property. The client may wish to review the enclosed map.

5.3 Physical Setting Sources

A United States Geological Survey (USGS) 7.5 Minute Topographical map of the subject property and surrounding area is included in the appendices of the report. The map shows the locations of the identified offsite environmental risks or threats described in the report.

5.4 Historical Use Information on the Property

City of Moreno Valley
Building Department

No building or demolition permits were on file for the subject property.

Historical Aerial Photographs

A review of the August 1953, May 1967, September 1978, October 1986, February 1992, and September 1997 historical aerial photographs for the subject property determined the property has been vacant land for the past 50 years.

Historic Sanborn Fire Insurance Maps

Sanborn Fire Insurance Maps provide information on commercial and industrial properties, based on risk data gathered for the fire insurance companies. The maps show the number of buildings located on the property, and the type of construction. The maps also describe the various businesses located nearby, and show the locations of tanks, boilers, and other potential hazards.

A review of the Sanborn Fire Insurance Map collections from 1867-1970, did not locate any maps for the subject property.

Based on a review of historical aerial photos, the subject property has been vacant, undeveloped land for the past 50 years.

5.5 Historical Use Information on the Adjoining Properties

Historical Aerial Photographs

A review of historical aerial photographs of the adjoining properties determined the following information:

Date of Photo	Description
August 1953	The area surrounding the subject property is vacant, undeveloped land, with no visible buildings or structures.
May 1967	The area surrounding the subject property appears to be about the same as the 1953 photograph.

Date of Photo	Description
September 1978	The area surrounding the subject property is still vacant, undeveloped land.
October 1986	North and east of the subject property is vacant land. South of the subject property is Iris Avenue, and further south is vacant land. Vacant land is also to the west.
February 1992	North of the subject property is vacant land. East of the subject property is Oliver Street, and further east is vacant land. South of the subject property is Iris Avenue, and further south is vacant land. Vacant land is also to the west.
September 1997	The area surrounding the subject property appears to be about the same as the 1992 photograph.

Historic Sanborn Fire Insurance Maps

Sanborn Fire Insurance Maps provide information on commercial and industrial properties, based on risk data gathered for the fire insurance companies. The maps show the number of buildings located on the property, and the type of construction. The maps also describe the various businesses located nearby, and show the locations of tanks, boilers, and other potential hazards.

A review of the Sanborn Fire Insurance Map collections from 1867-1970, did not locate any maps for the area surrounding the subject property.

Based on a review of historical aerial photos, the properties to the north, east, and west have been vacant land for the past 50 years. The residences to the south of Iris Avenue were constructed within the past five years, and the property was previously vacant land.

6.0 SITE RECONNAISSANCE

6.1 Methodology and Limiting Conditions

The site reconnaissance consisted of a walk through the entire property, and visually observing the structures, storage areas, and parking lots. No inspection was conducted under floors, above ceilings, or behind walls.

6.2 General Site Setting

The site consists of a large parcel of vacant, undeveloped land, located in a mixed commercial and residential area of Moreno Valley, California (see site plan). The site and surrounding area are gently sloping to the northwest, and the subject property is not connected to the municipal water and sewage systems. The electrical power in the area is supplied by underground utility lines, and no transformers were observed with signs indicating the presence of polychlorinated biphenyls (PCBs).

6.3 Subject Property Observations

On September 15, 2003, an inspection of the site and surrounding area was conducted by Registered Environmental Assessor Marty Kasman. The subject property is approximately 18.81 acres of vacant, unimproved land (see photo #1 and #2). The property is covered with low grasses and weeds, with a few small bushes on the site. Small amounts of trash and non-hazardous debris were observed throughout the site, however, there were no signs of illegal disposal on the property. No evidence of previous buildings or structures was observed on the site. No large quantities of hazardous materials were observed being stored or used on the property, and there was no evidence of waste water clarifiers, sumps, pits or underground tanks. In addition, no evidence of wells or septic tanks was observed. No visible signs of illegal dumping or distressed vegetation were found on the property, and there was no indication of obvious contamination on the site.

6.4 Adjoining Property Observations

Northern Border

North of the subject property is vacant land (see photo #3). There were no visible signs of spills or contamination on the adjacent property.

Eastern Border

East of the subject property is Oliver Street, and further east is a vacant lot which is in the process of being graded (see photo #4). There were no visible signs of spills or contamination on the adjacent property.

Southern Border

South of the subject property is Iris Avenue, and further south is a residential neighborhood (see photo #5). There were no visible signs of spills or contamination on the adjacent property.

Western Border

West of the subject property is a vacant land (see photo #6). There were no visible signs of spills or contamination on the adjacent property.

7.0 INTERVIEWS

7.1 Interview with Owner

The property is currently vacant land, and the owner was not present during the inspection.

7.2 Interview with Site Manager

The property is currently vacant land, and no property manager was present during the inspection.

7.3 Interviews with Occupants

The property is currently vacant land. There are no occupants.

7.4 Interviews with Local Government Officials

No interviews with local government officials were conducted.

7.5 Interview with Others

No interviews with other people were conducted concerning the subject property.

8.0 FINDINGS

8.1 Recognized Environmental Conditions

We have performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Standard Practice E 1527-00 on the 18.81 acres of vacant land located at Oliver Street and Iris Avenue, Riverside, California, the Property. Any exceptions to, or deletions from the Standard Practice are described in Section 2.4 of this report. This assessment has revealed no evidence of *recognized environmental conditions* in connection with the Property. In addition, no offsite locations have been identified as potential risks or threats to the subject property.

8.2 Historical Recognized Environmental Conditions

We have performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Standard Practice E 1527-00 on the 18.81 acres of vacant land located at Oliver Street and Iris Avenue, Riverside, California, the Property. Any exceptions to, or deletions from the Standard Practice are described in Section 2.4 of this report. This assessment has revealed no evidence of *historical recognized environmental conditions* in connection with the Property.

9.0 OPINION

Based on a review of regulatory and historical records, and a visual inspection of the site, this assessment has found no evidence of *recognized environmental conditions or historical recognized environmental conditions* which are likely to impact the subject property.

10.0 CONCLUSIONS

Based on the results of this assessment, no further environmental studies are recommended for the site.

11.0 DEVIATIONS

This report was prepared in conformance to meet or exceed the scope and practice as set forth by the American Society for Testing & Materials (ASTM) Standard Practice E 1527-00, "Standard Practice of Environmental Site Assessments: Phase I Environmental Site Assessment Process." No significant deviations or deletions were made from this practice.

12.0 ADDITIONAL SERVICES

No additional services including a broader scope of services, liability/risk evaluations, or remedial activities are included in this report.

13.0 REFERENCES

All government records and maps were obtained directly from the regulatory agencies identified in this report. The fire insurance map information was obtained from Digital Sanborn Maps, 1867-1970, Ann Arbor, Michigan. The aerial photographs were obtained from Rupp Aerial Photography, Corona, California; the United States Geological Survey, Menlo Park, California; or the United States Department of Agriculture, Salt Lake City, Utah.

14.0 APPENDICES

14.1 Qualifications of the Environmental Professionals

Attached to this report are the résumés of Jack Orswell and Marty Kasman, who conducted the site inspection, the records review, and prepared the report.

14.2 Site and Vicinity Map

A United States Geological Survey (USGS) 7.5 Minute Topographical map of the subject property and surrounding area is included in the appendices of the report. The map shows the locations of the identified offsite environmental risks or threats described in the report.

14.3 Site Plan

A site plan of the subject property is included in the appendices of the report. The site plan shows the general location of the structures on the property, and other items of interest which were identified in the description of the site.

14.4 Site and Vicinity Photographs

Photographs of the subject property and surrounding neighborhood are attached to this report. These photographs were taken at the time of the site inspection.

14.5 Historical Research Documentation

Building permit records were obtained directly from the regulatory agency identified in this report. The aerial photographs summarized in this report were obtained from Rupp Aerial Photography, Corona, California; the United States Geological Survey, Menlo Park, California; or the United States Department of Agriculture, Salt Lake City, Utah. The Sanborn Fire Insurance Map information was obtained from Digital Sanborn Maps, 1867-1970, Ann Arbor, Michigan.

14.6 Regulatory Records Documentation

All government records were obtained directly from the regulatory agencies identified in this report.

14.7 Interview and Research Documentation

All of the field notes and supporting information obtained from interviews and research concerning the subject property are maintained in the report file at the offices of Orswell & Kasman, Inc.

14.8 Special Contractual Conditions between User and Environmental Professional

No special contractual conditions or agreements exist between the client and any of the employees of Orswell & Kasman, Inc., and Orswell & Kasman, Inc. does not have any financial interest in the subject property.

APPENDIX

JACK ORSWELL

Jack Orswell, a principal of the company, is a Registered Environmental Assessor (#1263) and a licensed Private Investigator (#PI 14366) with the State of California. He is also a USEPA/AHERA accredited Asbestos Management Planner and California Certified Asbestos Consultant (#92-0869). He received his Bachelor of Science degree in Business Administration from the University of Southern California, and spent 15 years as a Special Agent with the Federal Bureau of Investigation in the Denver, San Francisco and Los Angeles offices. Mr. Orswell received specialized training from the United States Environmental Protection Agency (EPA), and he was one of the first FBI Agents to work with the EPA in investigating federal environmental crimes.

While with the FBI, Mr. Orswell worked with the EPA's National Enforcement Investigations Center (NEIC) in Denver, Colorado, and helped establish evidence control procedures for their laboratory personnel. As coordinator of environmental investigations for the FBI's Los Angeles office, Mr. Orswell gained extensive training and experience working with the California Department of Health Services and the Los Angeles County Sheriff's Department.

For the past twelve years, Mr. Orswell has been in private industry, conducting environmental assessments for several financial institutions, real estate companies and law firms. Mr. Orswell has conducted environmental investigations throughout the United States, locating and interviewing witnesses to determine how hazardous materials were handled in various manufacturing operations, and documenting the long term effects of improper disposal.

Mr. Orswell's extensive background in criminal environmental enforcement and civil litigation support make him uniquely qualified as an environmental assessor and investigator. He is a member of the California Hazardous Materials Investigators Association, the Society of Former Special Agents of the Federal Bureau of Investigation, the National Association of Environmental Professionals, the National Association of Government Guarantee Lenders, and the American Society for Testing of Materials (ASTM).

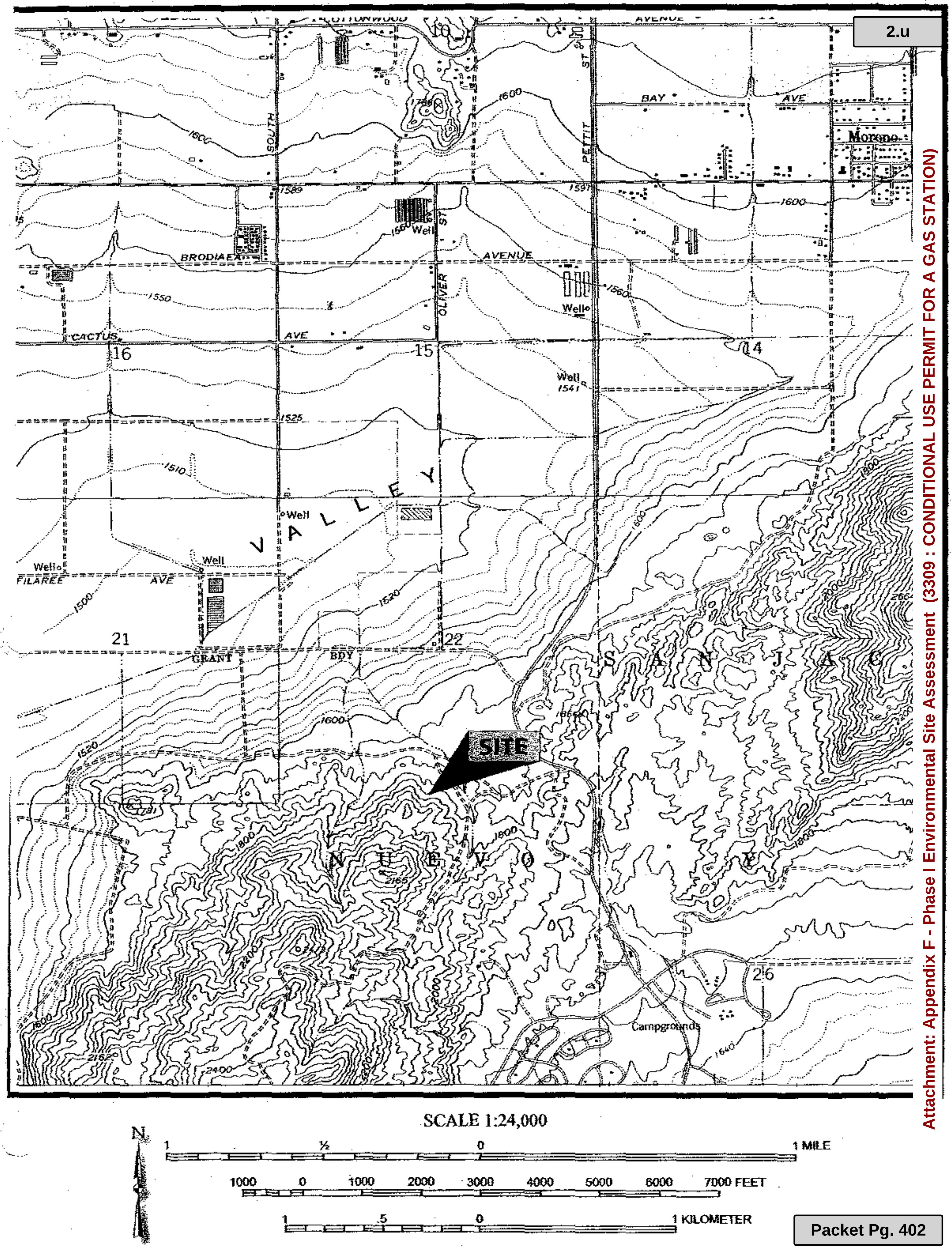
MARTY KASMAN

Marty Kasman, a principal of the company, is a Registered Environmental Health Specialist (#4927) and a Registered Environmental Assessor (#4022) with the State of California. He is also a USEPA/AHERA accredited Asbestos Management Planner and California Certified Asbestos Consultant (#99-2553). He received his Bachelor of Science and Master of Science degrees in Environmental and Occupational Health Science from California State University at Northridge. He also has a Certificate in Hazardous Materials Management from the University of California at Los Angeles (UCLA). In addition, Mr. Kasman also received specialized hazardous materials training at the Federal Law Enforcement Training Center in Georgia.

Mr. Kasman served 14 years with the Los Angeles County Fire Department, as a Supervising Hazardous Material Specialist and Deputy Health Officer. His responsibilities included field and laboratory work in hazardous materials management, conducting inspections of industrial plant operations, and monitoring cleanup activities. In addition, Mr. Kasman has investigated hundreds of abandoned waste sites and other cases involving the illegal dumping of hazardous materials throughout Los Angeles County.

Mr. Kasman currently serves as an environmental consultant to industry management in the proper handling of hazardous materials and waste. He has taught courses in hazardous materials regulatory compliance and waste management at UCLA, California State University at Northridge, and the California Specialized Training Institute at San Luis Obispo. Mr. Kasman is also serving on the State of California Local Unified Program Implementation Committee (LUPIC) to develop a standardized hazardous materials contingency plan.

Mr. Kasman's extensive education, training, and experience in hazardous materials management make him fully qualified to conduct environmental assessments and investigations. He is the former president and director of the California Hazardous Materials Investigators Association. He is also a former director of the Local Environmental Enforcement Officers Association, and the Los Angeles County Association of Environmental Health Specialists. He is a member of California and National Environmental Health Associations, and the National Association of Government Guarantee Lenders.


COTTONWOOD
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BAY
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Moreno
SOUTH
PETTIT
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1600
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1597
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Well
OLIVER
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BRODIAEA
AVENUE
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CACTUS
AVE
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1525
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VALLEY
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FILAREE
AVE
1500
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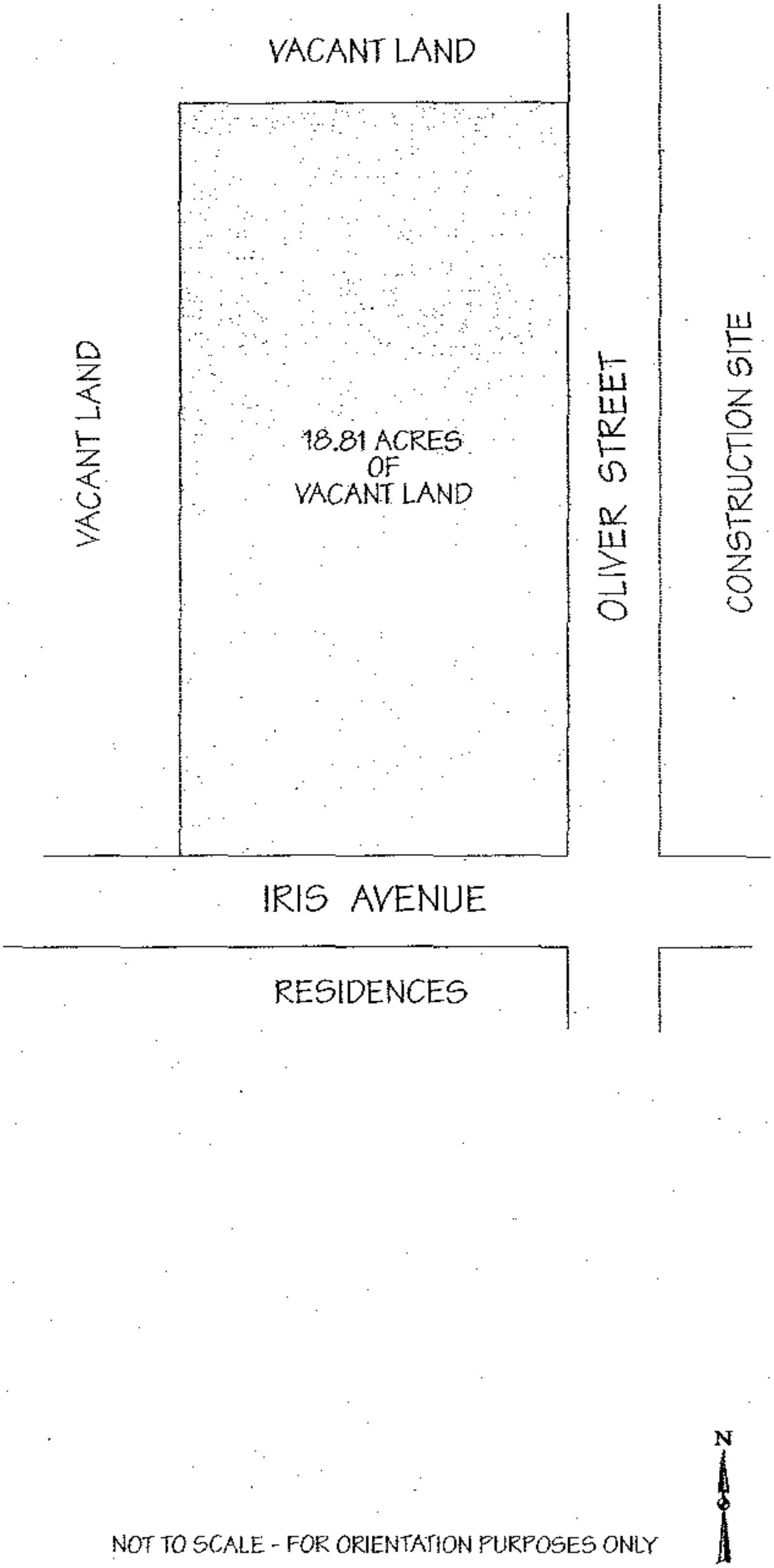

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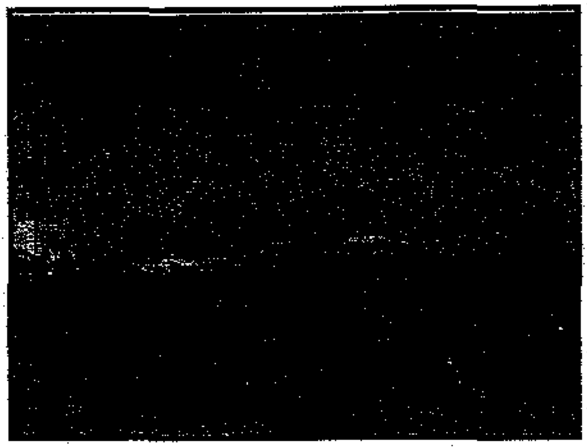

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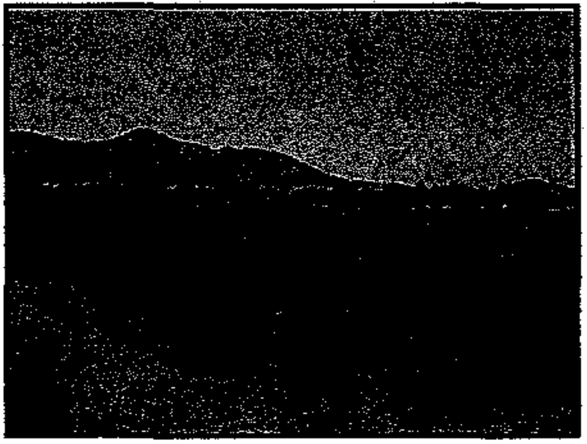

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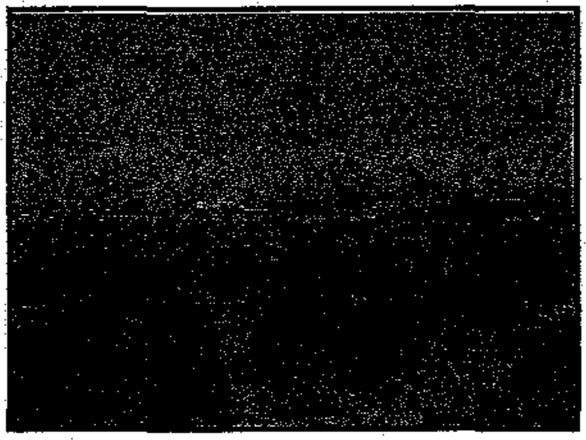

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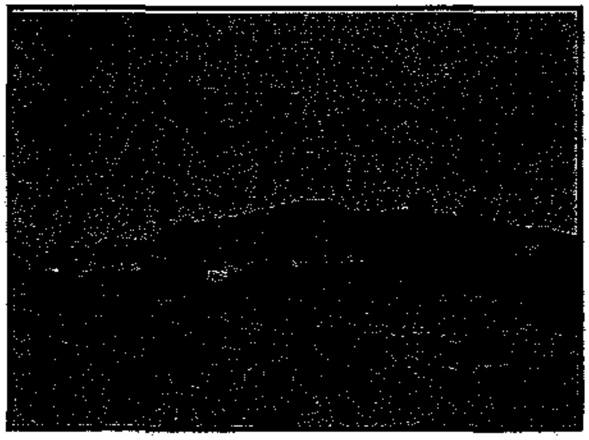

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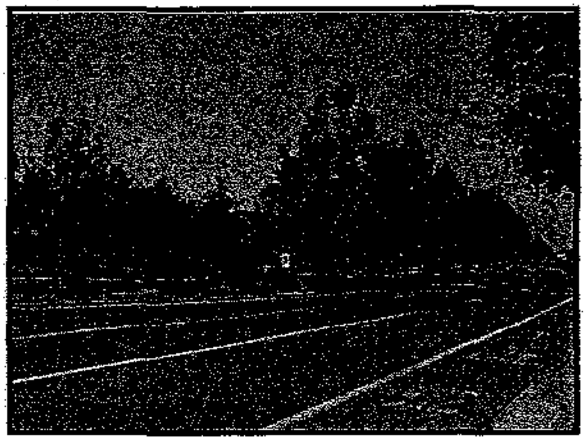

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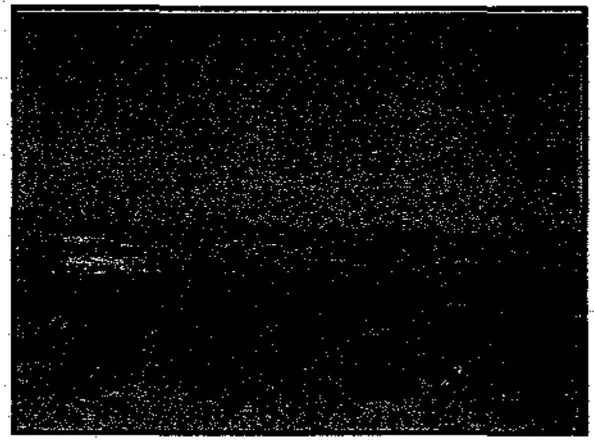

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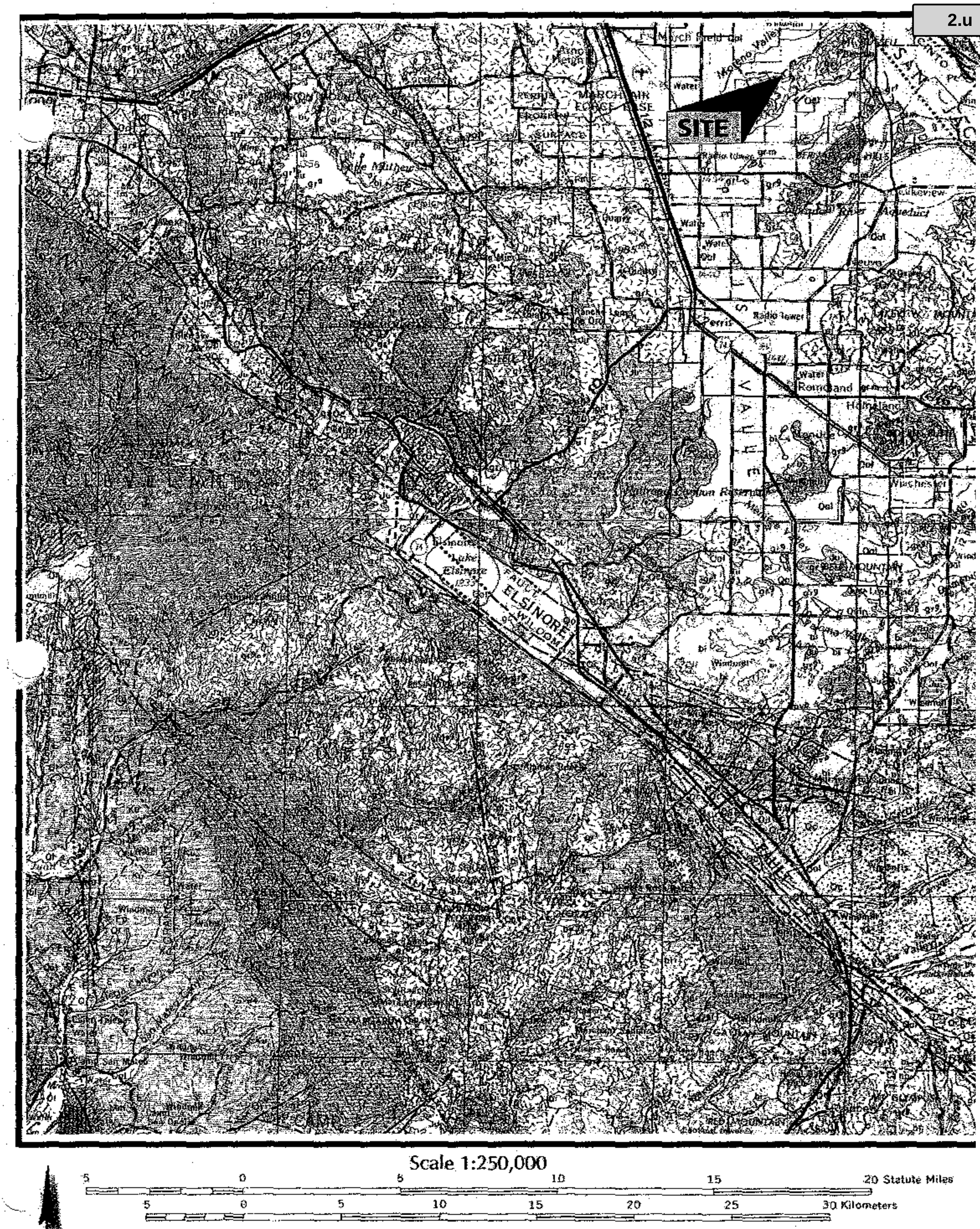


CONTOUR INTERVAL 200 FEET
WITH SUPPLEMENTARY CONTOURS AT 100 FOOT INTERVALS

GEOLOGIC MAP OF CALIFORNIA

EXPLANATION

				SEDIMENTARY AND METASEDIMENTARY ROCKS		IGNEOUS AND META-IGNEOUS ROCKS
CENOZOIC	QUATERNARY	*Recent*	Qs	Dune sand		
			Qal	Alluvium		
			Qsc	Stream channel deposits (GREAT VALLEY)	Qrv	Recent volcanic: Qrv^r —rhyolite; Qrv^a —andesite; Qrv^b —basalt; Qrv^p —pyroclastic rocks
			Qf	Fan deposits (GREAT VALLEY)		
			Qb	Basin deposits (GREAT VALLEY)		
			[illegible]	Salt deposits		
			Ql	Quaternary lake deposits		
			[illegible]	Glacial deposits		
		Pleistocene	Qt	Quaternary nonmarine terrace deposits		
			[illegible]	Pleistocene marine and marine terrace deposits	Qpv	Pleistocene volcanic: Qpv^r —rhyolite; Qpv^a—andesite; Qpv^b —basalt; Qpv^p —pyroclastic rocks
			[illegible]	Pleistocene nonmarine		
			QP	Plio-Pleistocene nonmarine	✳	Quaternary and/or Pliocene cinder cones
	TERTIARY	*Pliocene*	Pc	Undivided Pliocene nonmarine		
			Puc	Upper Pliocene nonmarine		
			Pu	Upper Pliocene marine	Pv	Pliocene volcanic: Pv^r —rhyolite; Pv^a—andesite; Pv^b —basalt; Pv^p —pyroclastic rocks
			[illegible]	Middle and/or lower Pliocene nonmarine		
			[illegible]	Middle and/or lower Pliocene marine		
		Miocene	[illegible]	Undivided Miocene nonmarine		
			[illegible]	Upper Miocene nonmarine		
			[illegible]	Upper Miocene marine	Mv	Miocene volcanic: Mv^r —rhyolite; Mv^a —andesite; Mv^b —basalt; Mv^p —pyroclastic rocks
			[illegible]	Middle Miocene nonmarine		
			[illegible]	Middle Miocene marine		
			Ml	Lower Miocene marine		
		Oligocene	[illegible]	Oligocene nonmarine	Φv	Oligocene volcanic: Φv^r—rhyolite; Φv^a —andesite; Φv^b —basalt; Φv^p—pyroclastic rocks
			[illegible]	Oligocene marine		
		Eocene	Ec	Eocene nonmarine	Ev	Eocene volcanic: Ev^r —rhyolite; Ev^a—andesite; Ev^b —basalt; Ev^p —pyroclastic rocks
			E	Eocene marine		
		Paleocene	[illegible]	Paleocene nonmarine		
			Ep	Paleocene marine		

REGIONAL
WILDCAT MAP

SHOWING WELLS NOT ON
DIVISION OF OIL & GAS FIELD MAPS
STATE OF CALIFORNIA
DEPARTMENT OF CONSERVATION

DIVISION OF OIL & GAS

SCALE IN MILES
0 4 8 12

OCTOBER 7, 1989

LEGEND

- DRILLING
- DRILLING - IDLE
- 67-2613 PLUGGED AND ABANDONED - DRY HOLE (showing year drilled and total depth)
- PRODUCING - OIL
- IDLE - OIL
- PLUGGED AND ABANDONED - OIL
- PRODUCING - GAS
- IDLE - GAS
- PLUGGED AND ABANDONED - GAS
- WATER SOURCE
- GAS INJECTION
- STEAM FLOOD
- WATER DISPOSAL
- BURIED IDLE
- OBSERVATION

- BOUNDARY OF FIELD MAP COVERAGE
- FIELD BOUNDARY

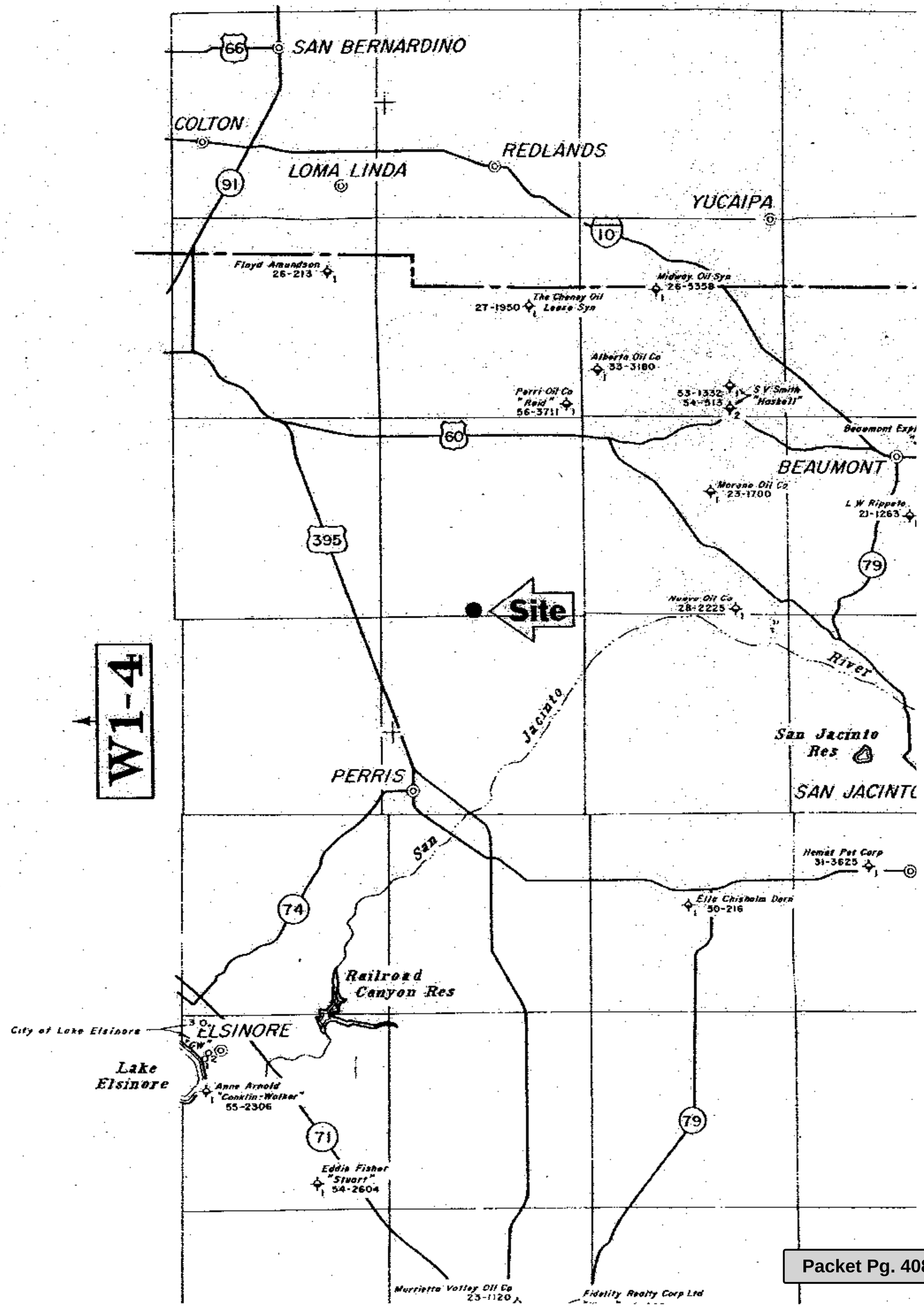
100,000-foot grid based on California coordinate system, zone 6

NOTE: WELLS WITH DIRECTIONAL SURVEYS ON FILE WITH THE DIVISION OF OIL AND GAS ARE INDICATED WITH A SHORT LINE UNDER THE WELL SYMBOL.

CURRENT WELL STATUS SHOULD BE CONFIRMED AT THE APPROPRIATE DIVISION OF OIL AND GAS DISTRICT OFFICE

DIVISION OF OIL AND GAS
1416 9th STREET
SACRAMENTO, CA. 95814

Attachment: Appendix F - Phase I Environmental Site Assessment (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)



ORSWELL & KASMAN, INC.

ENVIRONMENTAL RECORDS RESEARCH REPORT

Property Information:

18.81 Acres of Vacant Land
Oliver Street & Iris Avenue
Moreno Valley, CA 92555

OKI Report #:

P03301

Report Date:

September 26, 2003

Prepared For:

Guy Roney
K & S Property, LLC

Prepared by:

Orswell & Kasman, Inc.
2500 East Colorado Boulevard, Suite 330
Pasadena, California 91107
(626) 844 - 4150 * FAX (626) 844 - 4155
www.orswell-kasman.com

The information provided herein is based upon research of public records listed on the "Reference to the Regulatory Agency Database" page of this report and not on a physical inspection of the property. By requesting this report, the client accepts the terms and conditions described on the "Response Notification Sheet" of this report. The client may want to obtain detailed subject property information from a qualified consultant or specialist to determine if any potential hazards exist on the property.

RESPONSE NOTIFICATION SHEET

This report is in conformance with the ASTM standard for a Phase I Environmental Site Assessment governemment records check

	No Sites Within Specified Radius	Property & Adjacent	¼ Mile Radius	½ Mile Radius	1 Mile Radius
National Priority List (NPL)	✓				
RCRA CORRACTS Facilities*	✓				
CERCLIS	✓				▨
CALSITES**	✓				▨
Leaking Underground Storage Tanks (LUSTIS)*	✓				▨
Active / Inactive Landfills	✓				▨
Treatment, Storage & Disposal (TSD)	✓				▨
Emergency Response Notification System (ERNS)	✓		▨	▨	▨
Generators (HWIS)	✓		▨	▨	▨
Registered Underground Tanks	✓		▨	▨	▨
Superfund Leins	✓		▨	▨	▨
CERCLIS NFRAP	✓		▨	▨	▨

Sites reported as "Case Closed"* or "NFA - No Further Action"** may not be listed in this report

OKI Report #: **P03301**
Completion Date: **9/26/03**

Property Information:
18.81 Acres of Vacant Land
Oliver Street & Iris Avenue
Moreno Valley, CA 92555

Martin Kasman
Martin A. Kasman
Registered Environmental Assessor

MARTIN A. KASMAN
No. 04022
Expires 6/30/04

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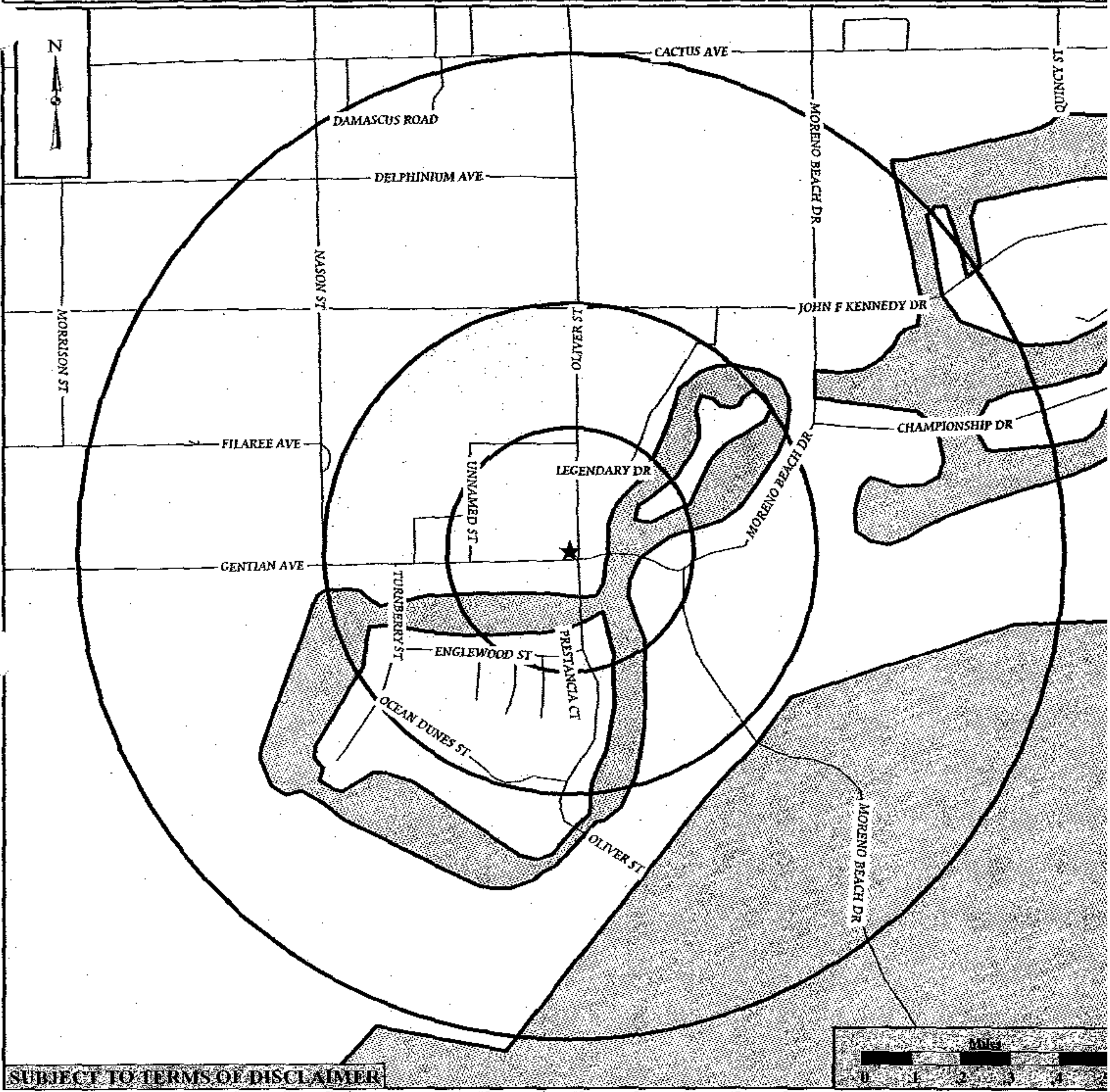
Orswell & Kasman, Inc.
2500 East Colorado Boulevard, Suite 330
Pasadena, California 91107
(626) 844 - 4150 * FAX (626) 844 - 4155
www.orswell-kasman.com

Orswell & Kasman, Inc.

Environmental
Assessments & Consulting

Subject Property Loca
Oliver Street & Iris Avenue
Moreno Valley, CA 92555



MAP LEGEND

☐ One Mile Radius

☐ Half Mile Radius

☐ Quarter Mile Radius

★ Subject Property

▨ Airports

▨ Parks & Golf Courses

▨ Waterways

+++ Railroads

— Roads

━ Highways

HAZARDOUS SITE SYMBOLS

⬢ National Priority List

▼ RCRA Corracts

✕ CERCLIS

● CalSites

Leaking Underground Storage Tanks

◉ Active / Inactive Landfills

⬬ Treatment, Storage, & Disposal Facilities

◆ Emergency Response Notification System

Generators

Registered Underground Tanks

Superfund Liens

✕ CERCLIS No Further Remedial Action Planned

For more information please contact us at (626) 844-4150 or www.orswell-kasman.com

REFERENCE GUIDE TO THE REGULATORY AGENCY DATABASES

SOURCE	DESCRIPTION
PL: *1 mile search radius*	The Naional Priority List (NPL) identifies abandoned or uncontrolled hazardous waste sites, which have been identified as possibly representing a long-term threat to the public health or environment. These sites have been identified as being highly contaminated with hazardous substances and represent the USEPA's target enforcement and cleanup efforts. Studies of individual sites are conducted by the USEPA to determine the level of contamination, and the sites are then compared and ranked to other sites on the NPL.
CORRACTS: *1 mile search radius*	The USEPA maintains a list of facilities which have been authorized to receive hazardous waste. These facilities have permits to treat, store or dispose of the waste as determined by the RCRA regulations. In addition, the USEPA publishes a list of those facilities who are subject to a corrective action based on the facilities waste handling and storage procedures. The facilities, which are subject to a corrective action, are identified as CORRACTS sites.
CERCLIS: *½ mile search radius*	The USEPA has developed a database known as the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS), which contains information on potential hazardous waste sites located throughout the United States. There are over 33,000 sites on the CERCLIS inventory. All sites are subjected to a preliminary assessment and thereafter are either placed on the National Priority List (NPL) or are placed in a category for those sites requiring no further Federal Superfund action.
CALST: *½ mile search radius*	The State of California Environmental Protection Agency maintains the "CalSite" database, which is a listing of 7,800 known active, inactive and abandoned hazardous sites. These sites have previously been reported in the Abandoned Site Program Information System (ASPIS), Bond Ependiture Plan (BEP) and Cortese database.
LUSTIS: *½ mile search radius*	The State of California Water Resources Control Board is responsible for monitoring the quality of flow of the groundwater and compiles lists of known leaking undergound storage tanks. The list is maintained as the Leaking Underground Storage Tank Information System (LUSTIS). The local Regional Water Quality Control Board (RWQCB) monitors the contamination problem, the investigation and any remedial activities.
WIS: *½ mile search radius*	The State of California Integrated Waste Management Board maintains a list of active and inactive landfill sites within California and provides information concerning the ownership and types of wastes brought to the landfills.
TSD: *½ mile search radius*	Treatment, Storage or Disposal Facilities (TSDF) is a federal listing of facilities, which have been authorized to receive hazardous waste. These facilities have permits to treat, store or dispose of waste as determined by the RCRA regulations.
ERNS: *Property & adjacent*	The Emergency Response Notification System (ERNS) is a list of locations which have reported a release of oil or hazardous substances to the USEPA Office of Emergency and Remedial Response. Most of the data in this system is based on information that was received during the initial notification.
HWIS: *Property & adjacent*	The State of California Environmental Protection Agency maintains the Hazardous Waste Information System (HWIS) which includes a list of known hazardous waste generators in the state. A company on the list generates reportable quantities of hazardous waste, and the disposal and transportation of the waste is monitored through the use of a hazardous waste manifest.
UTANK: *Property & adjacent*	The location and identy of registered underground tanks is maintained by the State of California Water Resources Control Board in the Hazardous Substance Storage Container Database. The list was compiled in 1991 and there are currently no plans to update the database at the present time.
SFL: *Property & adjacent*	The USEPA maintains a list of Superfund Leins that have been issued on properties throughout the United States. These sites have been remediated through the expenditures of Superfund monies. The purpose of the lein is to prevent the property owner from gaining a financial benefit from the federal government's cleanup and restoration activities.

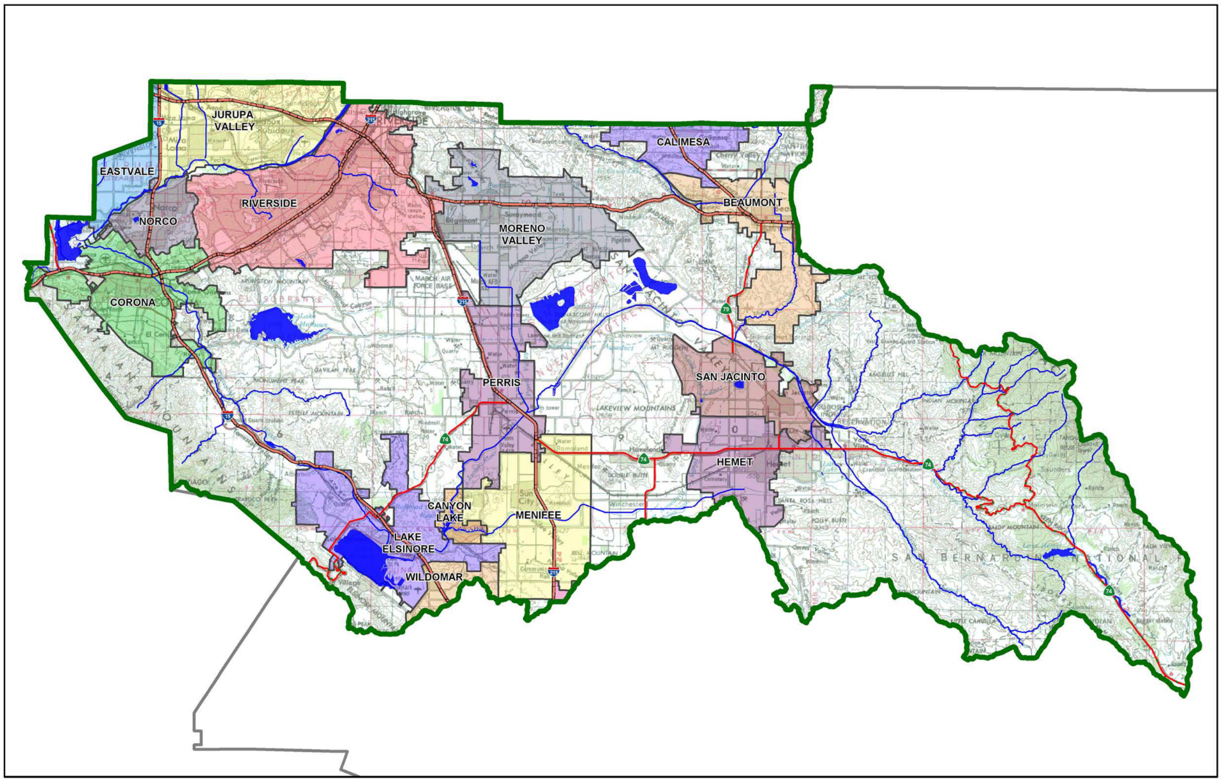
Project Specific Water Quality Management Plan

*A Template for Projects located within the **Santa Ana Watershed** Region of Riverside County*

Project Title: Moreno Valley ARCO

Development No: Parcel 1 - Map no. 33361

Design Review/Case No: PEN18-0016 / LWQ18-0003



Contact Information:
Prepared for:
Sater Oil International, LLC
683 Cliffside Drive
San Dimas, CA 91773

☒ **Preliminary**
☐ **Final**

Prepared by:
Barghausen Consulting Engineers, Inc.
Hal Grubb, Director of Engineering Svcs
18215 72nd Avenue South
Kent, WA 98032
(425) 251-6222
hgrubb@barghausen.com
BCE# 18501

Original Date Prepared: January 18, 2018

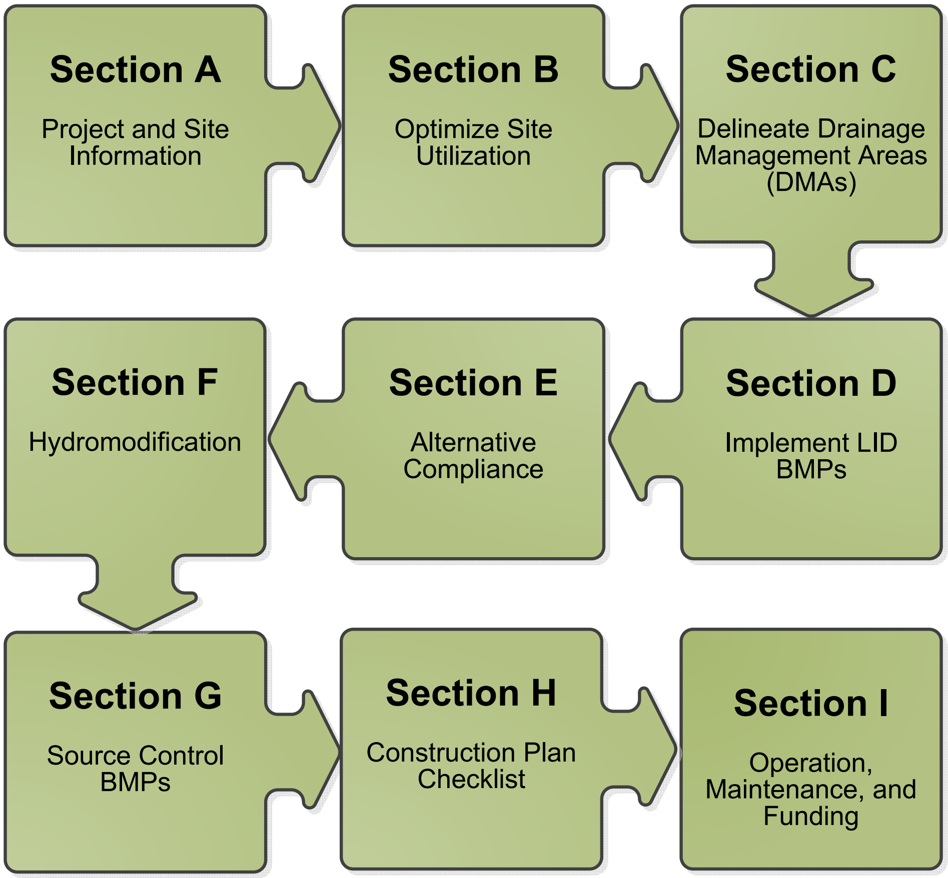
Revision Date(s): April 2, 2018, August 6, 2018,

September 25, 2018, October 12, 2018

Prepared for Compliance with
Regional Board Order No. **R8-2010-0033**

A Brief Introduction

This Project-Specific WQMP Template for the **Santa Ana Region** has been prepared to help guide you in documenting compliance for your project. Because this document has been designed to specifically document compliance, you will need to utilize the WQMP Guidance Document as your "how-to" manual to help guide you through this process. Both the Template and Guidance Document go hand-in-hand, and will help facilitate a well prepared Project-Specific WQMP. Below is a flowchart for the layout of this Template that will provide the steps required to document compliance.



OWNER'S CERTIFICATION

This Project-Specific Water Quality Management Plan (WQMP) has been prepared for Sater Oil by Barghausen Consulting Engineers, Inc. for the Moreno Valley ARCO ampm project.

This WQMP is intended to comply with the requirements of The City of Moreno Valley for Ordinance 827 which includes the requirement for the preparation and implementation of a Project-Specific WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation and funding of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. In addition, the property owner accepts responsibility for interim operation and maintenance of Stormwater BMPs until such time as this responsibility is formally transferred to a subsequent owner. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site or project office in perpetuity. The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under Moreno Valley Water Quality Ordinance (Municipal Code Section 8.10).

"I, the undersigned, certify under penalty of law that the provisions of this WQMP have been reviewed and accepted and that the WQMP will be transferred to future successors in interest."

Owner's Signature

Date

Owner's Printed Name

Owner's Title/Position

PREPARER'S CERTIFICATION

"The selection, sizing and design of stormwater treatment and other stormwater quality and quantity control measures in this plan meet the requirements of Regional Water Quality Control Board Order No. **R8-2010-0033** and any subsequent amendments thereto."

Preparer's Signature

10/12/18
Date

Hal P. Grubb, P.E.
Preparer's Printed Name

Director of Engineering Services
Preparer's Title/Position

Preparer's Licensure:

Table of Contents

List of Tables

List of Appendices

Section A: Project and Site Information

Project Information	
Type of Project:	Commercial - Fuel Station, Car Wash and Convenience Store
Planning Area:	Reche Canyon/Badlands
Community Name:	Moreno Valley, CA
Development Name:	ARCO ampm
Project Location	
Latitude & Longitude (DMS):	33°53'45"N, 117°11'00"W
Project Watershed and Sub-Watershed:	Santa Ana Watershed / San Jacinto Sub-watershed
APN(s):	486-310-038
Map Book and Page No.:	Book 239, Pages 30-32
Project Characteristics	
Proposed or Potential Land Use(s)	Fuel Station and Convenience Store
Proposed or Potential SIC Code(s)	7542 and 5541
Area of Impervious Project Footprint (SF)	54,393
Total Area of <u>proposed</u> Impervious Surfaces within the Project Limits (SF)/or Replacement	54,393
Does the project consist of offsite road improvements?	☒ Y ☐ N
Does the project propose to construct unpaved roads?	☐ Y ☒ N
Is the project part of a larger common plan of development (phased project)?	☐ Y ☒ N
Existing Site Characteristics	
Total area of <u>existing</u> Impervious Surfaces within the project limits (SF)	0
Is the project located within any MSHCP Criteria Cell?	☐ Y ☒ N
If so, identify the Cell number:	N/A
Are there any natural hydrologic features on the project site?	☐ Y ☒ N
Is a Geotechnical Report attached?	☒ Y ☐ N
If no Geotech. Report, list the NRCS soils type(s) present on the site (A, B, C and/or D)	Geo Report is Provided
What is the Water Quality Design Storm Depth for the project?	0.68 inches

A.1 Maps and Site Plans

When completing your Project-Specific WQMP, include a map of the local vicinity and existing site. In addition, include all grading, drainage, landscape/plant palette and other pertinent construction plans in Appendix 2. At a **minimum**, your WQMP Site Plan should include the following:

- Drainage Management Areas
- Proposed Structural BMPs
- Drainage Path
- Drainage Infrastructure, Inlets, Overflows
- Source Control BMPs
- Buildings, Roof Lines, Downspouts
- Impervious Surfaces
- Standard Labeling

Use your discretion on whether or not you may need to create multiple sheets or can appropriately accommodate these features on one or two sheets. Keep in mind that the Co-Permittee plan reviewer must be able to easily analyze your project utilizing this template and its associated site plans and maps.

A WQMP Site Plan / Basin Map is included in Appendix 1 as Figure 6. Appendix 2 Contains Construction Plans that show the

A.2 Identify Receiving Waters

Using Table A.1 below, list in order of upstream to downstream, the receiving waters that the project site is tributary to. Continue to fill each row with the Receiving Water's 303(d) listed impairments (if any), designated beneficial uses, and proximity, if any, to a RARE beneficial use. Include a map of the receiving waters in Appendix 1.

Table A.1 Identification of Receiving Waters

Receiving Waters	EPA Approved 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
Line F Storm Drain	None	None	Not a water body classified as RARE
Kitching Street Channel Line N	None	None	Not a water body classified as RARE
Perris Valley Storm Drain (Channel)	None	None	Not a water body classified as RARE
San Jacinto River (Reach 3) (HU# 802.11)	None	AGR, GWR, REC1, REC2, WARM, WILD	Not a water body classified as RARE
San Jacinto River Reach 2, Canyon Lake (HU #802.11, 802.12)	Nutrients	MUN, AGR, GWR, REC1, REC2, WARM, WILD	Not a water body classified as RARE
San Jacinto River (Reach 1) (HU #802.31, 802.32)	None	AGR, GWR, MUN, REC1, REC2, WARM, WILD	Not a water body classified as RARE
Lake Elsinore (HU #802.31)	PCBs, Nutrients, Organic Enrichment (Low DO), DDT Toxicity	REC1, REC2, WARM, WILD	Not a water body classified as RARE

A.3 Additional Permits/Approvals required for the Project:

Table A.2 Other Applicable Permits

Agency	Permit Required	
State Department of Fish and Game, 1602 Streambed Alteration Agreement	☐ Y	☒ N
State Water Resources Control Board, Clean Water Act (CWA) Section 401 Water Quality Cert.	☐ Y	☒ N
US Army Corps of Engineers, CWA Section 404 Permit	☐ Y	☒ N
US Fish and Wildlife, Endangered Species Act Section 7 Biological Opinion	☐ Y	☒ N
Statewide Construction General Permit Coverage	☒ Y	☐ N
Statewide Industrial General Permit Coverage	☐ Y	☒ N
Western Riverside MSHCP Consistency Approval (e.g., JPR, DBESP)	☐ Y	☒ N
Other *(please list in the space below as required)* Grading Permit	☒ Y	☐ N

If yes is answered to any of the questions above, the Co-Permittee may require proof of approval/coverage from those agencies as applicable including documentation of any associated requirements that may affect this Project-Specific WQMP.

Section B: Optimize Site Utilization (LID Principles)

Review of the information collected in Section 'A' will aid in identifying the principal constraints on site design and selection of LID BMPs as well as opportunities to reduce imperviousness and incorporate LID Principles into the site and landscape design. For example, **constraints** might include impermeable soils, high groundwater, groundwater pollution or contaminated soils, steep slopes, geotechnical instability, high-intensity land use, heavy pedestrian or vehicular traffic, utility locations or safety concerns. **Opportunities** might include existing natural areas, low areas, oddly configured or otherwise unbuildable parcels, easements and landscape amenities including open space and buffers (which can double as locations for bioretention BMPs), and differences in elevation (which can provide hydraulic head). Prepare a brief narrative for each of the site optimization strategies described below. This narrative will help you as you proceed with your LID design and explain your design decisions to others.

The 2010 Santa Ana MS4 Permit further requires that LID Retention BMPs (Infiltration Only or Harvest and Use) be used unless it can be shown that those BMPs are infeasible. Therefore, it is important that your narrative identify and justify if there are any constraints that would prevent the use of those categories of LID BMPs. Similarly, you should also note opportunities that exist which will be utilized during project design. Upon completion of identifying Constraints and Opportunities, include these on your WQMP Site plan in Appendix 1.

Site Optimization

The following questions are based upon Section 3.2 of the WQMP Guidance Document. Review of the WQMP Guidance Document will help you determine how best to optimize your site and subsequently identify opportunities and/or constraints, and document compliance.

Did you identify and preserve existing drainage patterns? If so, how? If not, why?

The existing site topography slopes down in a northwest direction. The project proposes to treat and convey into the right-of-way that then conveys into the same basin north of the site.

Did you identify and protect existing vegetation? If so, how? If not, why?

No, the site is currently undeveloped with sparse vegetation.

Did you identify and preserve natural infiltration capacity? If so, how? If not, why?

No, infiltration on site does not meet the required 1.6 inch/hour and infiltration will not be utilized for storm management.

Did you identify and minimize impervious area? If so, how? If not, why?

Yes, the impervious areas were minimized. Approximately 25% of the site will be pervious ground cover.

Did you identify and disperse runoff to adjacent pervious areas? If so, how? If not, why?

All on-site runoff will surface flow to proposed LID treatment facilities.

Section C: Delineate Drainage Management Areas (DMAs)

Utilizing the procedure in Section 3.3 of the WQMP Guidance Document which discusses the methods of delineating and mapping your project site into individual DMAs, complete Table C.1 below to appropriately categorize the types of classification (e.g., Type A, Type B, etc.) per DMA for your project site. Upon completion of this table, this information will then be used to populate and tabulate the corresponding tables for their respective DMA classifications.

Table C.1 DMA Classifications

DMA Name or ID	Surface Type(s)[1]	Area (Sq. Ft.)	DMA Type
1A	Concrete Or Asphalt	8341	D
1B	Roofs	2656	D
1C	Ornamental landscaping	1635	D
1D	Concrete Or Asphalt	5158	D
1E	Ornamental Landscaping	699	D
2A	Concrete Or Asphalt	3000	D
2B	Ornamental Landscaping	1080	D
3A	Concrete Or Asphalt	15897	D
3B	Concrete Or Asphalt	0	NA
3C	Roofs	4732	D
3D	Ornamental Landscaping	8298	D
3E (offsite)	Concrete Or Asphalt	3375	D
4A	Concrete Or Asphalt	2393	D
4B	Concrete Or Asphalt	4204	D
4C	Roofs	3205	D
4D	Ornamental Landscaping	423	D
LS-1	Self-Treating Landscaped Area	2149	A
LS-2	Self-Treating Landscaped Area	882	A
LS-3	Self-Treating Landscaped Area	1125	A
LS-4	Self-Treating Landscaped Area	1563	A
OS	Concrete or Asphalt	1432	NA

[1] *Reference Table 2-1 in the WQMP Guidance Document to populate this column*

Table C.2 Type 'A', Self-Treating Areas

DMA Name or ID	Area (Sq. Ft.)	Stabilization Type	Irrigation Type (if any)
LS-1	Ornamental Landscaping	2149	Drip Irrigation
LS-2	Ornamental Landscaping	882	Drip Irrigation
LS-3	Ornamental Landscaping	1125	Drip Irrigation

Attachment: Appendix G - Water Quality Management Plan (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

LS-4	Ornamental Landscaping	1563	Drip Irrigation

Table C.3 **Type 'B', Self-Retaining Areas**

Self-Retaining Area				**Type 'C' DMAs that are draining to the Self-Retaining Area**		
DMA Name/ ID	Post-project surface type	Area (square feet)	Storm Depth (inches)	DMA Name / ID	[C] from Table C.4 =	Required Retention Depth (inches)
		[A]	[B]		[C]	[D]

$$[D] = [B] + \frac{[B] \cdot [C]}{[A]}$$

Table C.4 Type 'C', Areas that Drain to Self-Retaining Areas

DMA					**Receiving Self-Retaining DMA**		
DMA Name/ ID	Area (square feet)	Post-project surface type	Runoff factor	Product	DMA name /ID	Area (square feet)	Ratio
	[A]		[B]	[C] = [A] x [B]		[D]	[C]/[D]
N/A					N/A		

Table C.5 Type 'D', Areas Draining to BMPs

DMA Name or ID	BMP Name or ID

DMA #1A, B, C, D, E	Bio-Retention #1
DMA #2A, B	Bio-Retention #2
DMA #3A, C, D, E	Bio-Retention #3
DMA #4A, B, C, D	Bio-Retention #4

Note: More than one drainage management area can drain to a single LID BMP, however, one drainage management area may not drain to more than one BMP.

Section D: Implement LID BMPs

D.1 Infiltration Applicability

Is there an approved downstream 'Highest and Best Use' for stormwater runoff (see discussion in Chapter 2.4.4 of the WQMP Guidance Document for further details)? ☐ Y ☒ N

If yes has been checked, Infiltration BMPs shall not be used for the site. If no, continue working through this section to implement your LID BMPs. It is recommended that you contact your Co-Permittee to verify whether or not your project discharges to an approved downstream 'Highest and Best Use' feature.

Geotechnical Report

A Geotechnical Report or Phase I Environmental Site Assessment may be required by the Copermittee to confirm present and past site characteristics that may affect the use of Infiltration BMPs. In addition, the Co-Permittee, at their discretion, may not require a geotechnical report for small projects as described in Chapter 2 of the WQMP Guidance Document. If a geotechnical report has been prepared, include it in Appendix 3. In addition, if a Phase I Environmental Site Assessment has been prepared, include it in Appendix 4.

Is this project classified as a small project consistent with the requirements of Chapter 2 of the WQMP Guidance Document? ☐ Y ☒ N

Infiltration Feasibility

Table D.1 below is meant to provide a simple means of assessing which DMAs on your site support Infiltration BMPs and is discussed in the WQMP Guidance Document in Chapter 2.4.5. Check the appropriate box for each question and then list affected DMAs as applicable. If additional space is needed, add a row below the corresponding answer.

Table D.1 Infiltration Feasibility

Does the project site…	YES	NO
…have any DMAs with a seasonal high groundwater mark shallower than 10 feet?		X
If Yes, list affected DMAs:		
…have any DMAs located within 100 feet of a water supply well?		X
If Yes, list affected DMAs:		
…have any areas identified by the geotechnical report as posing a public safety risk where infiltration of stormwater could have a negative impact?		X
If Yes, list affected DMAs:		
…have measured in-situ infiltration rates of less than 1.6 inches / hour?	X	
If Yes, list affected DMAs: All DMAs		
…have significant cut and/or fill conditions that would preclude in-situ testing of infiltration rates at the final infiltration surface?		X

If Yes, list affected DMAs: None		
…geotechnical report identify other site-specific factors that would preclude effective and safe infiltration?		X
Describe here:		

If you answered “Yes” to any of the questions above for any DMA, Infiltration BMPs should not be used for those DMAs and you should proceed to the assessment for Harvest and Use below.

D.2 Harvest and Use Assessment

Please check what applies*:*

☐ Reclaimed water will be used for the non-potable water demands for the project.

☐Downstream water rights may be impacted by Harvest and Use as approved by the Regional Board (verify with the Copermittee).

☐The Design Capture Volume will be addressed using Infiltration Only BMPs. In such a case, Harvest and Use BMPs are still encouraged, but it would not be required if the Design Capture Volume will be infiltrated or evapotranspired.

If any of the above boxes have been checked, Harvest and Use BMPs need not be assessed for the site. If neither of the above criteria applies, follow the steps below to assess the feasibility of irrigation use, toilet use and other non-potable uses (e.g., industrial use).

Irrigation Use Feasibility

Complete the following steps to determine the feasibility of harvesting stormwater runoff for Irrigation Use BMPs on your site:

Step 1: Identify the total area of irrigated landscape on the site, and the type of landscaping used.

Total Area of Irrigated Landscape: **0.41 Acres**

Type of Landscaping (Conservation Design or Active Turf): **Conservation Design**

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for irrigation use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: **1.25 Acres**

Step 3: Cross reference the Design Storm depth for the project site (see Exhibit A of the WQMP Guidance Document) with the left column of Table 2-3 in Chapter 2 to determine the minimum area of Effective Irrigated Area per Tributary Impervious Area (EIATIA).

Enter your EIATIA factor: Conservative Design (Kl=0.35): 1.21 (Interpolated)

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum irrigated area that would be required.

Minimum required irrigated area: 1.21 x 1.25 = 1.51 Acres

Step 5: Determine if harvesting stormwater runoff for irrigation use is feasible for the project by comparing the total area of irrigated landscape (Step 1) to the minimum required irrigated area (Step 4).

Minimum required irrigated area (Step 4)	Available Irrigated Landscape (Step 1)
1.51	0.41

Toilet Use Feasibility

Complete the following steps to determine the feasibility of harvesting stormwater runoff for toilet flushing uses on your site:

Step 1: Identify the projected total number of daily toilet users during the wet season, and account for any periodic shut downs or other lapses in occupancy:

Projected Number of Daily Toilet Users: 96 (including customer use)

Project Type: Retail

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for toilet use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: 1.25 Acres

Step 3: Enter the Design Storm depth for the project site (see Exhibit A) into the left column of Table 2-1 in Chapter 2 to determine the minimum number or toilet users per tributary impervious acre (TUTIA).

Enter your TUTIA factor: 146

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum number of toilet users that would be required.

Minimum number of toilet users: 183

Step 5: Determine if harvesting stormwater runoff for toilet flushing use is feasible for the project by comparing the Number of Daily Toilet Users (Step 1) to the minimum required number of toilet users (Step 4).

Minimum required Toilet Users (Step 4)	**Projected number of toilet users (Step 1)**
183	96

Other Non-Potable Use Feasibility

Are there other non-potable uses for stormwater runoff on the site (e.g. industrial use)? See Chapter 2 of the Guidance for further information. If yes, describe below. If no, write N/A.

N/A

Step 1: Identify the projected average daily non-potable demand, in gallons per day, during the wet season and accounting for any periodic shut downs or other lapses in occupancy or operation.

Average Daily Demand: gpd

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for the identified non-potable use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: *Acres*

Step 3: Enter the Design Storm depth for the project site (see Exhibit A) into the left column of Table 2-3 in Chapter 2 to determine the minimum demand for non-potable uses per tributary impervious acre.

Enter the factor from Table 2-3:

Step 4: Multiply the unit value obtained from Step 4 by the total of impervious areas from Step 3 to develop the minimum number of gallons per day of non-potable use that would be required.

Minimum required use: *gpd*

Step 5: Determine if harvesting stormwater runoff for other non-potable use is feasible for the project by comparing the Number of Daily Toilet Users (Step 1) to the minimum required number of toilet users (Step 4).

Minimum required non-potable use (Step 4)	**Projected average daily use (Step 1)**
N/A	N/A

If Irrigation, Toilet and Other Use feasibility anticipated demands are less than the applicable minimum values, Harvest and Use BMPs are not required and you should proceed to utilize LID Bioretention and Biotreatment, unless a site-specific analysis has been completed that demonstrates technical infeasibility as noted in D.3 below.

D.3 Bioretention and Biotreatment Assessment

Other LID Bioretention and Biotreatment BMPs as described in Chapter 2.4.7 of the WQMP Guidance Document are feasible on nearly all development sites with sufficient advance planning.

Select one of the following:

☒LID Bioretention/Biotreatment BMPs will be used for some or all DMAs of the project as noted below in Section D.4 (note the requirements of Section 3.4.2 in the WQMP Guidance Document).

☐ A site-specific analysis demonstrating the technical infeasibility of all LID BMPs has been performed and is included in Appendix 5. If you plan to submit an analysis demonstrating the technical infeasibility of LID BMPs, request a pre-submittal meeting with the Copermittee to discuss this option. Proceed to Section E to document your alternative compliance measures.

D.4 Feasibility Assessment Summaries

From the Infiltration, Harvest and Use, Bioretention and Biotreatment Sections above, complete Table D.2 below to summarize which LID BMPs are technically feasible, and which are not, based upon the established hierarchy.

Table D.2 LID Prioritization Summary Matrix

DMA Name/ID	LID BMP Hierarchy				No LID (Alternative Compliance)
	1. Infiltration	2. Harvest and use	3. Bioretention	4. Biotreatment	
DMA #1A	☐	☐	☒	☐	☐
DMA #1B	☐	☐	☒	☐	☐
DMA #1C	☐	☐	☒	☐	☐
DMA #1D	☐	☐	☒	☐	☐
DMA #1E	☐	☐	☒	☐	☐
DMA #2A	☐	☐	☒	☐	☐
DMA #2B	☐	☐	☒	☐	☐
DMA #3A	☐	☐	☒	☐	☐
DMA #3C	☐	☐	☒	☐	☐
DMA #3D	☐	☐	☒	☐	☐
DMA #3E	☐	☐	☒	☐	☐
DMA #4A	☐	☐	☒	☐	☐
DMA#4B	☐	☐	☒	☐	☐
DMA#4C	☐	☐	☒	☐	☐
DMA#4D	☐	☐	☒	☐	☐

For those DMAs where LID BMPs are not feasible, provide a brief narrative below summarizing why they are not feasible, include your technical infeasibility criteria in Appendix 5, and proceed to Section E below to document Alternative Compliance measures for those DMAs. Recall that each proposed DMA must pass through the LID BMP hierarchy before alternative compliance measures may be considered.

Each of the five (5) Drainage Management Areas on site drain to a corresponding Bioretention area that is to provide bioretention.

D.5 LID BMP Sizing

Each LID BMP must be designed to ensure that the Design Capture Volume will be addressed by the selected BMPs. First, calculate the Design Capture Volume for each LID BMP using the V_{BMP} worksheet in Appendix F of the LID BMP Design Handbook. Second, design the LID BMP to meet the required V_{BMP} using a method approved by the Co-permittee. Utilize the worksheets found in the LID BMP Design Handbook or consult with your Co-permittee to assist you in correctly sizing your LID BMPs. Complete Table D.3 below to document the Design Capture Volume and the Proposed Volume for each LID BMP. Provide the completed design procedure sheets for each LID BMP in Appendix 6. You may add additional rows to the table below as needed.

Table D.3 DCV Calculations for LID BMPs

DMA Type/ID	DMA Area (square feet) [A]	Post-Project Surface Type	Effective Impervious Fraction, I_f [B]	DMA Runoff Factor [C]	DMA Areas x Runoff Factor [A] x [C]	*Enter BMP Name / Identifier Here*		
1A	8341	Paving	1.0	0.89	7423			
1B	2656	Roofs	1.0	0.89	2364			
1C	1635	Ornamental LS	0.1	0.11	180			
1D	5158	Paving	1.0	0.89	4591			
1E	699	Ornamental LS	0.1	0.11	77			
						Design Storm Depth (in)	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
	A_T=Σ[A]=18,489				Σ= [D]=14,635	[E]= 0.68	$[F] = \frac{[D]x[E]}{12}$ =829 cf 832	[G] 832

Table D.4 DCV Calculations for LID BMPs

DMA Type/ID	DMA Area (square feet) [A]	Post-Project Surface Type	Effective Impervious Fraction, I_f [B]	DMA Runoff Factor [C]	DMA Areas x Runoff Factor [A] x [C]	*Enter BMP Name / Identifier Here*		
2A	3000	Paving	1.0	0.89	2670			
2B	1080	Ornamental LS	0.1	0.11	119			
						Design Storm Depth (in)	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
	A_T=Σ[A]=4,080				Σ= [D]=2,789	[E]= 0.68	$[F] = \frac{[D]x[E]}{12}$ = 158cf 159	[G] 169

Table D.5 DCV Calculations for LID BMPs

<table>
<tr><th>DMA Type/ID</th><th>DMA Area (square feet)
[A]</th><th>Post-Project Surface Type</th><th>Effective Impervious Fraction, I_f
[B]</th><th>DMA Runoff Factor
[C]</th><th>DMA Areas x Runoff Factor
[A] x [C]</th><th colspan="4">Enter BMP Name / Identifier Here</th></tr>
<tr><td>3A</td><td>15897</td><td>Paving</td><td>1.0</td><td>0.89</td><td>14148</td><td colspan="4" rowspan="5"></td></tr>
<tr><td>3B</td><td>0</td><td>Paving</td><td>0.1</td><td>0.89</td><td>0</td></tr>
<tr><td>3C</td><td>4732</td><td>Roofs</td><td>1.0</td><td>0.89</td><td>4211</td></tr>
<tr><td>3D</td><td>8298</td><td>Ornamental LS</td><td>0.1</td><td>0.11</td><td>913</td></tr>
<tr><td>3E</td><td>3375</td><td>Paving</td><td>1.0</td><td>0.89</td><td>3004</td></tr>
<tr><td colspan="6"></td><td>Design Storm Depth (in)</td><td>Design Volume, (cubic feet)</td><td>Capture V_{BMP}</td><td>Proposed Volume on Plans (cubic feet)</td></tr>
<tr><td></td><td colspan="4">A_T=Σ[A]=32,302</td><td>Σ= [D]=22,276</td><td>[E]=
0.68</td><td>$[F] = \frac{[D]x[E]}{12}$
=1,262 cf</td><td>1,266</td><td>[G]
1345</td></tr>
</table>

Table D.6 DCV Calculations for LID BMPs

<table>
<tr><th>DMA Type/ID</th><th>DMA Area (square feet)
[A]</th><th>Post-Project Surface Type</th><th>Effective Impervious Fraction, I_f
[B]</th><th>DMA Runoff Factor
[C]</th><th>DMA Areas x Runoff Factor
[A] x [C]</th><th colspan="4">Enter BMP Name / Identifier Here</th></tr>
<tr><td>4A</td><td>2393</td><td>Paving</td><td>1.0</td><td>0.89</td><td>2130</td><td colspan="4" rowspan="4"></td></tr>
<tr><td>4B</td><td>4204</td><td>Paving</td><td>1.0</td><td>0.89</td><td>3742</td></tr>
<tr><td>4C</td><td>3205</td><td>Roofs</td><td>1.0</td><td>0.89</td><td>2852</td></tr>
<tr><td>4D</td><td>423</td><td>Ornamental LS</td><td>0.1</td><td>0.11</td><td>47</td></tr>
<tr><td colspan="6"></td><td>Design Storm Depth (in)</td><td>Design Volume, (cubic feet)</td><td>Capture V_{BMP}</td><td>Proposed Volume on Plans (cubic feet)</td></tr>
<tr><td></td><td colspan="4">A_T=Σ[A]=10,225</td><td>Σ= [D]=8790</td><td>[E]=
0.68</td><td>$[F] = \frac{[D]x[E]}{12}$
=498 cf</td><td>504</td><td>[G]
504</td></tr>
</table>

[B], [C] is obtained as described in Section 2.3.1 of the WQMP Guidance Document

[E] is obtained from Exhibit A in the WQMP Guidance Document

[G] is obtained from a design procedure sheet, such as in LID BMP Design Handbook and placed in Appendix 6

Section E: Alternative Compliance (LID Waiver Program)

LID BMPs are expected to be feasible on virtually all projects. Where LID BMPs have been demonstrated to be infeasible as documented in Section D, other Treatment Control BMPs must be used (subject to LID waiver approval by the Copermittee). Check one of the following Boxes:

☒LID Principles and LID BMPs have been incorporated into the site design to fully address all Drainage Management Areas. No alternative compliance measures are required for this project and thus this Section is not required to be completed.

- *Or* -

☐ The following Drainage Management Areas are unable to be addressed using LID BMPs. A site-specific analysis demonstrating technical infeasibility of LID BMPs has been approved by the Co-Permittee and included in Appendix 5. Additionally, no downstream regional and/or sub-regional LID BMPs exist or are available for use by the project. The following alternative compliance measures on the following pages are being implemented to ensure that any pollutant loads expected to be discharged by not incorporating LID BMPs, are fully mitigated.

E.1 Identify Pollutants of Concern

Utilizing Table A.1 from Section A above which noted your project’s receiving waters and their associated EPA approved 303(d) listed impairments, cross reference this information with that of your selected Priority Development Project Category in Table E.1 below. If the identified General Pollutant Categories are the same as those listed for your receiving waters, then these will be your Pollutants of Concern and the appropriate box or boxes will be checked on the last row. The purpose of this is to document compliance and to help you appropriately plan for mitigating your Pollutants of Concern in lieu of implementing LID BMPs.

Table E.1 Potential Pollutants by Land Use Type

Priority Development Project Categories and/or Project Features (check those that apply)	**General Pollutant Categories**							
	Bacterial Indicators	**Metals**	**Nutrients**	**Pesticides**	**Toxic Organic Compounds**	**Sediments**	**Trash & Debris**	**Oil & Grease**
☐ Detached Residential Development	P	N	P	P	N	P	P	P
☐ Attached Residential Development	P	N	P	P	N	P	P	P(2)
☐ Commercial/Industrial Development	P(3)	P	P(1)	P(1)	P(5)	P(1)	P	P
☐ Automotive Repair Shops	N	P	N	N	P(4, 5)	N	P	P
☐ Restaurants (>5,000 ft^2)	P	N	N	N	N	N	P	P
☐ Hillside Development (>5,000 ft^2)	P	N	P	P	N	P	P	P
☐ Parking Lots (>5,000 ft^2)	P(6)	P	P(1)	P(1)	P(4)	P(1)	P	P
☐ Retail Gasoline Outlets	N	P	N	N	P	N	P	P
Project Priority Pollutant(s) of Concern	☐	☐	☐	☐	☐	☐	☐	☐

P = Potential

N = Not Potential

(1) A potential Pollutant if non-native landscaping exists or is proposed onsite; otherwise not expected

(2) A potential Pollutant if the project includes uncovered parking areas; otherwise not expected

(3) A potential Pollutant is land use involving animal waste

(4) Specifically petroleum hydrocarbons

(5) Specifically solvents

(6) Bacterial indicators are routinely detected in pavement runoff

E.2 Stormwater Credits

Projects that cannot implement LID BMPs but nevertheless implement smart growth principles are potentially eligible for Stormwater Credits. Utilize Table 3-8 within the WQMP Guidance Document to identify your Project Category and its associated Water Quality Credit. If not applicable, write N/A.

Table E.2 Water Quality Credits

Qualifying Project Categories	Credit Percentage[2]
Total Credit Percentage[1]	

[1] *Cannot Exceed 50%*

[2] *Obtain corresponding data from Table 3-8 in the WQMP Guidance Document*

E.3 Sizing Criteria

After you appropriately considered Stormwater Credits for your project, utilize Table E.3 below to appropriately size them to the DCV, or Design Flow Rate, as applicable. Please reference Chapter 3.5.2 of the WQMP Guidance Document for further information.

Table E.3 Treatment Control BMP Sizing

DMA Type/ID	**DMA Area (square feet)** [A]	**Post-Project Surface Type**	**Effective Impervious Fraction, I_f** [B]	**DMA Runoff Factor** [C]	**DMA Area x Runoff Factor** [A] x [C]		***Enter BMP Name / Identifier Here***		
						Design Storm Depth (in)	*Minimum Design Capture Volume or Design Flow Rate (cubic feet or cfs)*	*Total Storm Water Credit % Reduction*	*Proposed Volume or Flow on Plans (cubic feet or cfs)*
	$A_T = \Sigma[A]$				Σ= [D]	[E]	$[F] = \frac{[D]x[E]}{[G]}$	[F] X (1-[H])	[I]

[B], [C] is obtained as described in Section 2.3.1 from the WQMP Guidance Document
[E] is obtained from Exhibit A in the WQMP Guidance Document
[G] is for Flow-Based Treatment Control BMPs [G] = 43,560, for Volume-Based Control Treatment BMPs, [G] = 12
[H] is from the Total Credit Percentage as Calculated from Table E.2 above
[I] as obtained from a design procedure sheet from the BMP manufacturer and should be included in Appendix 6

E.4 Treatment Control BMP Selection

Treatment Control BMPs typically provide proprietary treatment mechanisms to treat potential pollutants in runoff, but do not sustain significant biological processes. Treatment Control BMPs must have a removal efficiency of a medium or high effectiveness as quantified below:

- **High**: equal to or greater than 80% removal efficiency
- **Medium**: between 40% and 80% removal efficiency

Such removal efficiency documentation (e.g., studies, reports, etc.) as further discussed in Chapter 3.5.2 of the WQMP Guidance Document, must be included in Appendix 6. In addition, ensure that proposed Treatment Control BMPs are properly identified on the WQMP Site Plan in Appendix 1.

Table E.4 Treatment Control BMP Selection

Selected Treatment Control BMP Name or ID[1]	Priority Pollutant(s) of Concern to Mitigate[2]	Removal Efficiency Percentage[3]

[1] Treatment Control BMPs must not be constructed within Receiving Waters. In addition, a proposed Treatment Control BMP may be listed more than once if they possess more than one qualifying pollutant removal efficiency.

[2] Cross Reference Table E.1 above to populate this column.

[3] As documented in a Co-Permittee Approved Study and provided in Appendix 6.

Section F: Hydromodification

F.1 Hydrologic Conditions of Concern (HCOC) Analysis

Once you have determined that the LID design is adequate to address water quality requirements, you will need to assess if the proposed LID Design may still create a HCOC. Review Chapters 2 and 3 (including Figure 3-7) of the WQMP Guidance Document to determine if your project must mitigate for Hydromodification impacts. If your project meets one of the following criteria which will be indicated by the check boxes below, you do not need to address Hydromodification at this time. However, if the project does not qualify for Exemptions 1, 2 or 3, then additional measures must be added to the design to comply with HCOC criteria. This is discussed in further detail below in Section F.2.

HCOC EXEMPTION 1: The Priority Development Project disturbs less than one acre. The Copermittee has the discretion to require a Project-Specific WQMP to address HCOCs on projects less than one acre on a case by case basis. The disturbed area calculation should include all disturbances associated with larger common plans of development.

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, HCOC criteria do not apply.

HCOC EXEMPTION 2: The volume and time of concentration[1] of storm water runoff for the post-development condition is not significantly different from the pre-development condition for a 2-year return frequency storm (a difference of 5% or less is considered insignificant) using one of the following methods to calculate:

- Riverside County Hydrology Manual
- Technical Release 55 (TR-55): Urban Hydrology for Small Watersheds (NRCS 1986), or derivatives thereof, such as the Santa Barbara Urban Hydrograph Method
- Other methods acceptable to the Co-Permittee

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, report results in Table F.1 below and provide your substantiated hydrologic analysis in Appendix 7.

Table F.1 Hydrologic Conditions of Concern Summary

	2 year – 24 hour		
	Pre-condition	**Post-condition**	**% Difference**
Time of Concentration			
Volume (Cubic Feet)			

---

[1] Time of concentration is defined as the time after the beginning of the rainfall when all portions of the drainage basin are contributing to flow at the outlet.

HCOC EXEMPTION 3: All downstream conveyance channels to an adequate sump (for example, Prado Dam, Lake Elsinore, Canyon Lake, Santa Ana River, or other lake, reservoir or naturally erosion resistant feature) that will receive runoff from the project are engineered and regularly maintained to ensure design flow capacity; no sensitive stream habitat areas will be adversely affected; or are not identified on the Co-Permittees Hydromodification Sensitivity Maps.

Does the project qualify for this HCOC Exemption? ☒ Y ☐ N

If Yes, HCOC criteria do not apply and note below which adequate sump applies to this HCOC qualifier:

The proposed site will discharge into Canyon Lake.

F.2 HCOC Mitigation

If none of the above HCOC Exemption Criteria are applicable, HCOC criteria is considered mitigated if they meet one of the following conditions:

a. Additional LID BMPS are implemented onsite or offsite to mitigate potential erosion or habitat impacts as a result of HCOCs. This can be conducted by an evaluation of site-specific conditions utilizing accepted professional methodologies published by entities such as the California Stormwater Quality Association (CASQA), the Southern California Coastal Water Research Project (SCCRWP), or other Co-Permittee approved methodologies for site-specific HCOC analysis.

b. The project is developed consistent with an approved Watershed Action Plan that addresses HCOC in Receiving Waters.

c. Mimicking the pre-development hydrograph with the post-development hydrograph, for a 2-year return frequency storm. Generally, the hydrologic conditions of concern are not significant, if the post-development hydrograph is no more than 10% greater than pre-development hydrograph. In cases where excess volume cannot be infiltrated or captured and reused, discharge from the site must be limited to a flow rate no greater than 110% of the pre-development 2-year peak flow.

Be sure to include all pertinent documentation used in your analysis of the items a, b or c in Appendix 7.

Section G: Source Control BMPs

Source control BMPs include permanent, structural features that may be required in your project plans — such as roofs over and berms around trash and recycling areas — and Operational BMPs, such as regular sweeping and “housekeeping”, that must be implemented by the site’s occupant or user. The MEP standard typically requires both types of BMPs. In general, Operational BMPs cannot be substituted for a feasible and effective permanent BMP. Using the Pollutant Sources/Source Control Checklist in Appendix 8, review the following procedure to specify Source Control BMPs for your site:

1. ***Identify Pollutant Sources***: Review Column 1 in the Pollutant Sources/Source Control Checklist. Check off the potential sources of Pollutants that apply to your site.

2. ***Note Locations on Project-Specific WQMP Exhibit***: Note the corresponding requirements listed in Column 2 of the Pollutant Sources/Source Control Checklist. Show the location of each Pollutant source and each permanent Source Control BMP in your Project-Specific WQMP Exhibit located in Appendix 1.

3. ***Prepare a Table and Narrative***: Check off the corresponding requirements listed in Column 3 in the Pollutant Sources/Source Control Checklist. In the left column of Table G.1 below, list each potential source of runoff Pollutants on your site (from those that you checked in the Pollutant Sources/Source Control Checklist). In the middle column, list the corresponding permanent, Structural Source Control BMPs (from Columns 2 and 3 of the Pollutant Sources/Source Control Checklist) used to prevent Pollutants from entering runoff. **Add additional narrative** in this column that explains any special features, materials or methods of construction that will be used to implement these permanent, Structural Source Control BMPs.

4. ***Identify Operational Source Control BMPs:*** To complete your table, refer once again to the Pollutant Sources/Source Control Checklist. List in the right column of your table the Operational BMPs that should be implemented as long as the anticipated activities continue at the site. Copermittee stormwater ordinances require that applicable Source Control BMPs be implemented; the same BMPs may also be required as a condition of a use permit or other revocable Discretionary Approval for use of the site.

Table G.1 Permanent and Operational Source Control Measures

Potential Sources of Runoff pollutants	Permanent Structural Source Control BMPs	Operational Source Control BMPs
A. On-site storm drain catch basins and grated inlets. Locations are shown on the PWQMP Exhibit in Appendix 1.	On-site storm drain signage will utilize language "No Dumping Drains to River," or equally approved text that is consistent with City of Moreno Valley's requirements. Landscape area drains surrounded by vegetation will not be signed. Catch Basin Markers may be available from the Riverside County Flood Control and Water	Maintain and periodically repaint or replace inlet markings. Provide stormwater pollution prevention information to new site owners, lessees, or operators. See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance, " in Appendix 10 (CASQA Stormwater Quality

	Conservation District, call 951-955-1200 to verify.	Handbook at www.cabmphandbooks.com)
B. Interior floor drains	The interior floor drains will be plumbed to sanitary sewer	Inspect and maintain drains to prevent blockages and overflow.
D1. Need for indoor and outdoor pest control	Note building design features that discourage entry of pests.	Provide Integrated Pest Management information to owners, lessees, and operators.
D2. Landscape/Outdoor Pesticide Use	The final landscape shall be designed to accomplish all of the following: Design landscape to minimize irrigation and runoff, to promote surface infiltration where appropriate and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions. Consider using pest-resistant plants, especially adjacent to hardscape. To insure successful establishments, select plants appropriate to site, soils, slopes, climate, sun, wind, rain, lad use, air movement, ecological consistency, and plant interactions. Pesticide usage should be at a necessary minimum and be consistent with the instructions contained on product labels and with the regulations administered by the State Department of Pesticide Regulation. Pesticides should be used at an absolute minimum or not at all in the retention/infiltration basin. If used, it should not be applied in close proximity to the rainy season.	Maintain landscaping using minimum or no pesticide. See applicable operational BMPs in "What you should know for…. Landscape and Gardening" at http://rcflood.org/stormwater and Appendix 10. Provide IPM information to new owners, lessees, and operators. Landscape maintenance should include mowing, weeding, trimming, removal of trash and debris, repair of erosion, re-vegetation, and removal of cut and dead vegetation. Irrigation maintenance should include the repair of leaky or broken sprinkler heads, the maintaining of timing apparatus accuracy, and the maintaining of shit off valves in good working order.
F. Food Service	For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment. On the drawing, show a note that this drain will be connected to a grease interceptor before	See the brochure, "The Food Service Industry Best Management Practices for: Restaurants, Grocery Stores, Delicatessens and Bakeries" in Appendix 10.

	discharging to the sanitary sewer.	
G. Refuse Trash Storage Areas	Trash container storage areas shall be paved with an impervious surface, designed not to allow run-on from adjoining areas, designed to divert drainage from adjoining roofs and pavements from the surrounding area, and screened or walled to prevent off-site transport of trash. Trash dumpsters (containers) shall be leak proof and have attached covers or lids. Trash enclosures shall be roofed per City Standards and the details on the PWQMP Exhibit in Appendix 1. Signs shall be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.	Adequate number of receptacles shall be provided. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit /prevent dumping of liquid or hazardous wastes. Post 'No hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on site. See Fact Sheet SC-34, in Appendix 10, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbook at www.cabmphandbooks.com
J. Vehicle and Equipment Cleaning	Show on drawings as appropriate: (1) Commercial/industrial facilities having vehicle / equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle / equipment washing by removing hose bibs and installing signs prohibiting such uses. (2) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.	Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system. Refer to "Outdoor Cleaning Activities and Professional Mobile Service Providers" for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http://rcflood.org/stormwater/
L. Fuel Dispensing Areas	Fueling areas shall have impermeable floors (i.e., Portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable. Fueling areas shall be covered by a	

	canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area.] The canopy [or cover] shall not drain onto the fueling area.	
N. Fire Sprinkler Test Water	Provide a means to drain fire sprinkler test water to the sanitary sewer.	See the note in the Fact Sheet SC-41, in Appendix 10, "Building and Grounds Maintenance", in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
O. Miscellaneous Drain or Wash Water or Other Sources		
Condensate drain lines	Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur.	
Rooftop equipment	Condensate drain lines may not discharge to the storm drain system. Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment.	
Drainage sumps	Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water.	
Roofing, gutters and trim	Avoid roofing, gutters and trim made of copper of other unprotected metals that may leach into runoff.	
Other sources	Include controls for other sources as specified by local reviewer.	
P. Plazas, sidewalks, and parking lots	Spill kits are to be kept on-site at all times per SC-11.	Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.

Section H: Construction Plan Checklist

Populate Table H.1 below to assist the plan checker in an expeditious review of your project. The first two columns will contain information that was prepared in previous steps, while the last column will be populated with the corresponding plan sheets. This table is to be completed with the submittal of your final Project-Specific WQMP.

Table H.1 Construction Plan Cross-reference

BMP No. or ID	BMP Identifier and Description	Corresponding Plan Sheet(s)

Note that the updated table — or Construction Plan WQMP Checklist — is **only a reference tool** to facilitate an easy comparison of the construction plans to your Project-Specific WQMP. Co-Permittee staff can advise you regarding the process required to propose changes to the approved Project-Specific WQMP.

Section I: Operation, Maintenance and Funding

The Copermittee will periodically verify that Stormwater BMPs on your site are maintained and continue to operate as designed. To make this possible, your Copermittee will require that you include in Appendix 9 of this Project-Specific WQMP:

1. A means to finance and implement facility maintenance in perpetuity, including replacement cost.
2. Acceptance of responsibility for maintenance from the time the BMPs are constructed until responsibility for operation and maintenance is legally transferred. A warranty covering a period following construction may also be required.
3. An outline of general maintenance requirements for the Stormwater BMPs you have selected.
4. Figures delineating and designating pervious and impervious areas, location, and type of Stormwater BMP, and tables of pervious and impervious areas served by each facility. Geo-locating the BMPs using a coordinate system of latitude and longitude is recommended to help facilitate a future statewide database system.
5. A separate list and location of self-retaining areas or areas addressed by LID Principles that do not require specialized O&M or inspections but will require typical landscape maintenance as noted in Chapter 5, pages 85-86, in the WQMP Guidance. Include a brief description of typical landscape maintenance for these areas.

Your local Co-Permittee will also require that you prepare and submit a detailed Stormwater BMP Operation and Maintenance Plan that sets forth a maintenance schedule for each of the Stormwater BMPs built on your site. An agreement assigning responsibility for maintenance and providing for inspections and certification may also be required.

Details of these requirements and instructions for preparing a Stormwater BMP Operation and Maintenance Plan are in Chapter 5 of the WQMP Guidance Document.

Maintenance Mechanism: WQMP Covenant and Agreement with the City of Moreno Valley. All funding will be provided by Sater Oil International. If at any time Sater Oil International sells the property, then the operation and maintenance responsibilities will be recorded against the property and will be responsibility of the new property owner.

Will the proposed BMPs be maintained by a Home Owners' Association (HOA) or Property Owners Association (POA)?

☐ Y ☒ N

Include your Operation and Maintenance Plan and Maintenance Mechanism in Appendix 9. Additionally, include all pertinent forms of educational materials for those personnel that will be maintaining the proposed BMPs within this Project-Specific WQMP in Appendix 10.

Appendix 1: Maps and Site Plans

Location Map, WQMP Site Plan and Receiving Waters Map

Appendix 2: Construction Plans

Grading and Drainage Plans

Appendix 3: Soils Information

Geotechnical Study and Other Infiltration Testing Data

Appendix 4: Historical Site Conditions

Phase I Environmental Site Assessment or Other Information on Past Site Use

Appendix 5: LID Infeasibility

LID Technical Infeasibility Analysis

(N/A)

Appendix 6: BMP Design Details

BMP Sizing, Design Details and other Supporting Documentation

Appendix 7: Hydromodification

Supporting Detail Relating to Hydrologic Conditions of Concern

"EXEMPT"

Appendix 8: Source Control

Pollutant Sources/Source Control Checklist

Appendix 9: O&M

Operation and Maintenance Plan and Documentation of Finance, Maintenance and Recording Mechanisms

"TO BE PROVIDED DURING FINAL WQMP"

Appendix 10: Educational Materials

BMP Fact Sheets, Maintenance Guidelines and Other End-User BMP Information

"TO BE PROVIDED DURING FINAL WQMP"

Appendix 1: Maps and Site Plans

Location Map, WQMP Site Plan and Receiving Waters Map

REFERENCE: Rand McNally (2018)

Scale:

Horizontal: **N.T.S.** Vertical: **N/A**

BARGHAUSEN CONSULTING ENGINEERS, INC.

18215 72ND AVENUE SOUTH
KENT, WA 98032
(425) 251-6222
(425) 251-8782

CIVIL ENGINEERING, LAND PLANNING,
SURVEYING, ENVIRONMENTAL SERVICES

For:

Sater ARCO
Moreno Valley, CA

Title:

VICINITY MAP

Job Number
18501

Figure
1

DATE: 01/15/18

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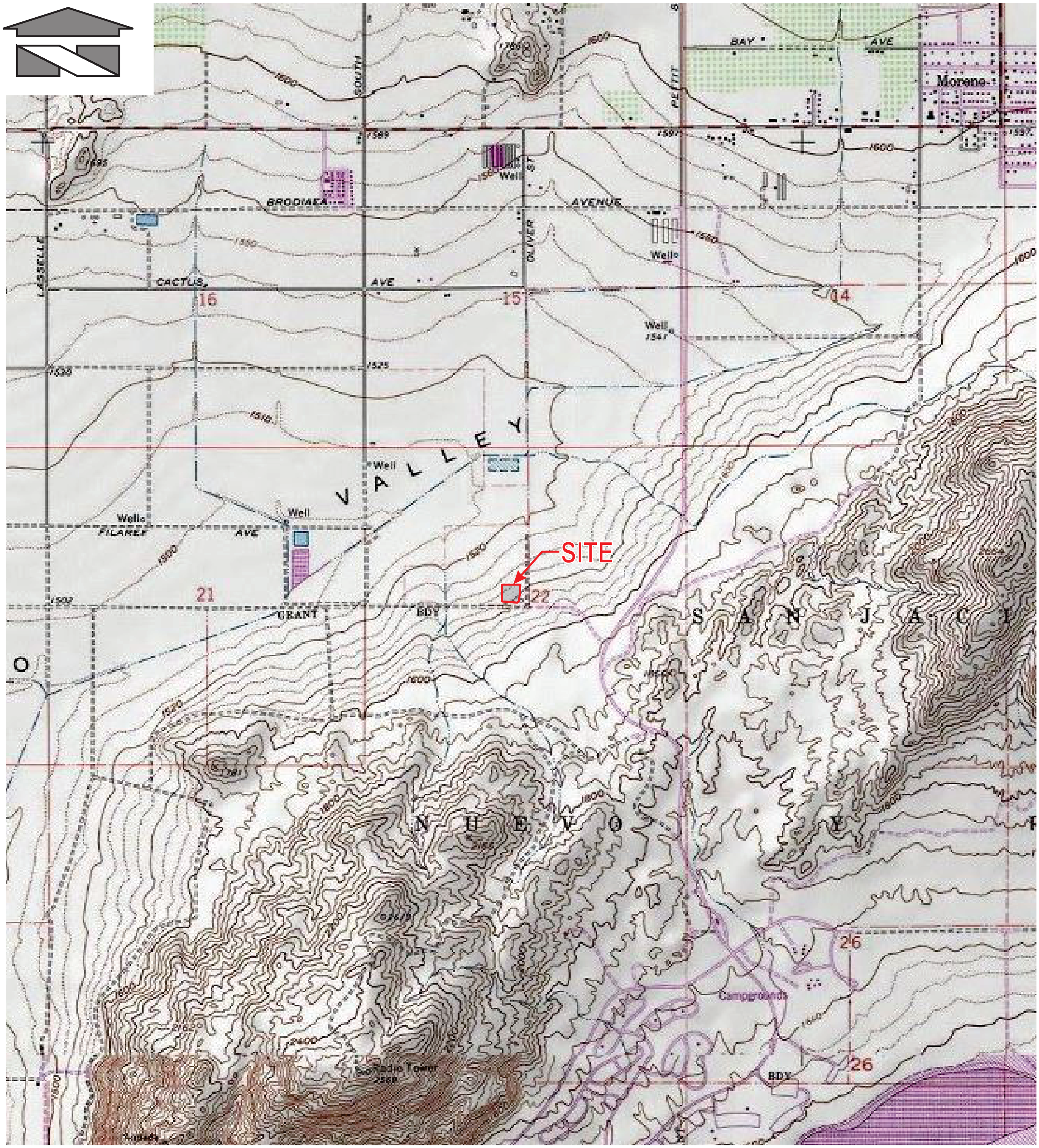
Attachment: Appendix G - Water Quality Management Plan (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)



REFERENCE: ESRI/USGS

Scale:

Horizontal: **N.T.S.** Vertical: **N/A**

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(425) 251-8782

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For:

Sater ARCO
Moreno Valley, CA

Title:

USGS TOPOGRAPHY
MAP

Job Number

18501

Figure

2

DATE: 01/15/18

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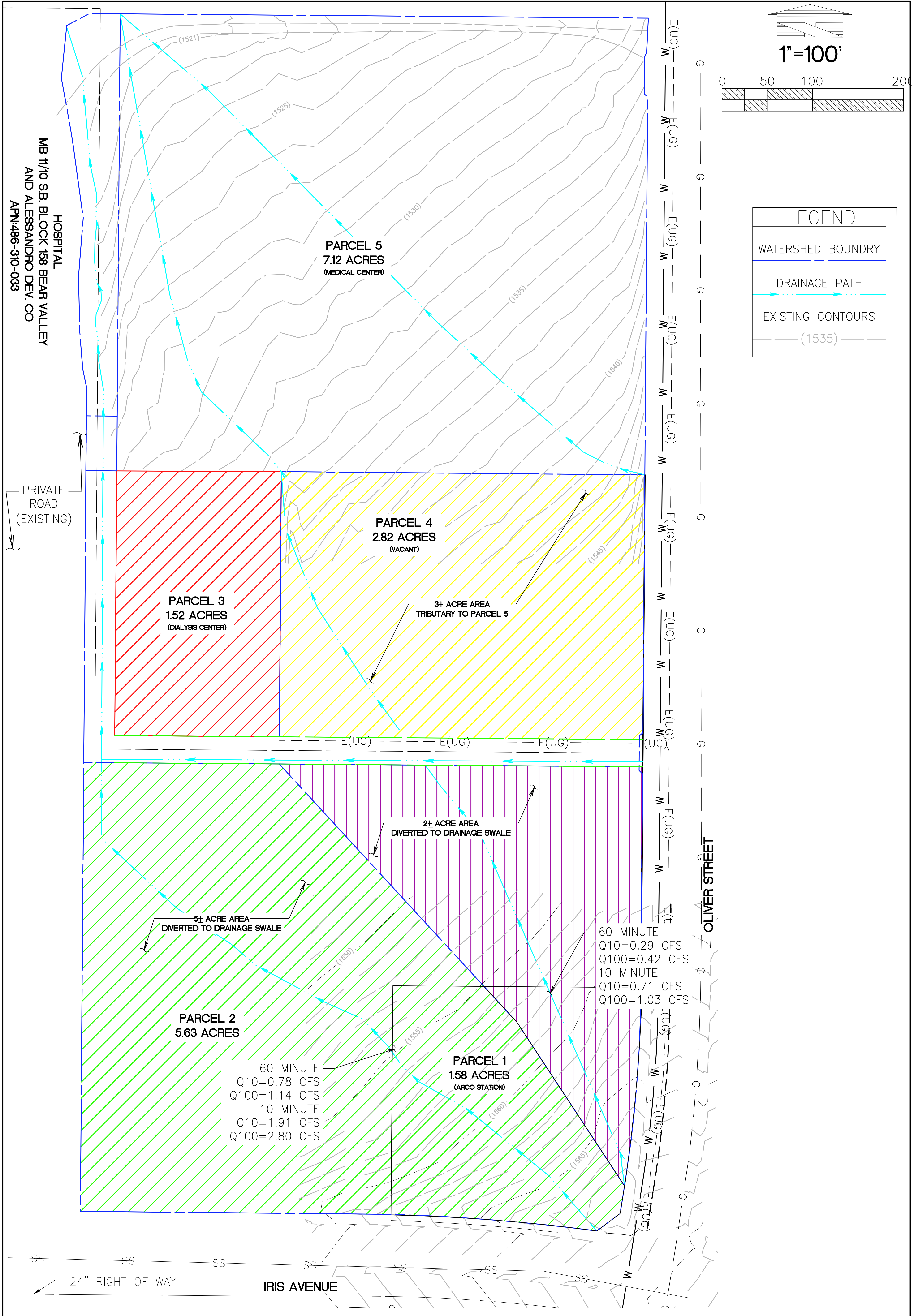
Attachment: Appendix G - Water Quality Management Plan (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)



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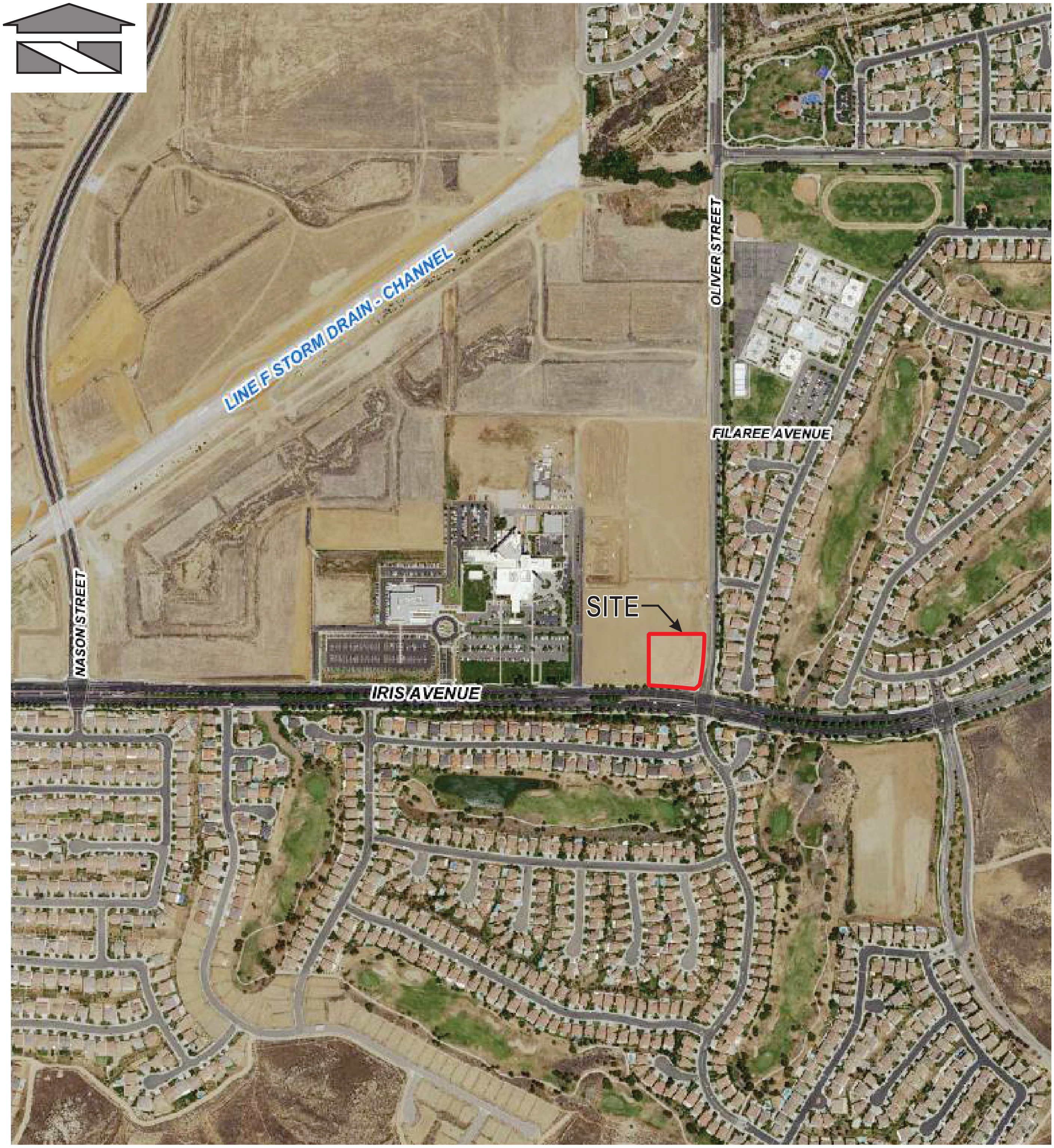
SITE SOILS GROUP: B
EXISTING CONDITION : UNDEVELOPED POOR COVER, C=78
PROPOSED COMMERCIAL IMPERVIOUS SURFACES, C=90
PROPOSED COMMERCIAL LANDSCAPING, C=56
SEE SECTION 2.0 OF THIS DRAINAGE REPORT

EXISTING DRAINAGE BASIN PLAN

FIGURE 2A



REFERENCE: USDA-FSA Aerial Photography

Scale:
Horizontal: **N.T.S.** Vertical: **N/A**

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CIVIL ENGINEERING, LAND PLANNING,
SURVEYING, ENVIRONMENTAL SERVICES

For:
Sater ARCO
Moreno Valley, CA

Title:
AERIAL PHOTOGRAPH

Job Number
18501

Figure
3

DATE: 01/15/18

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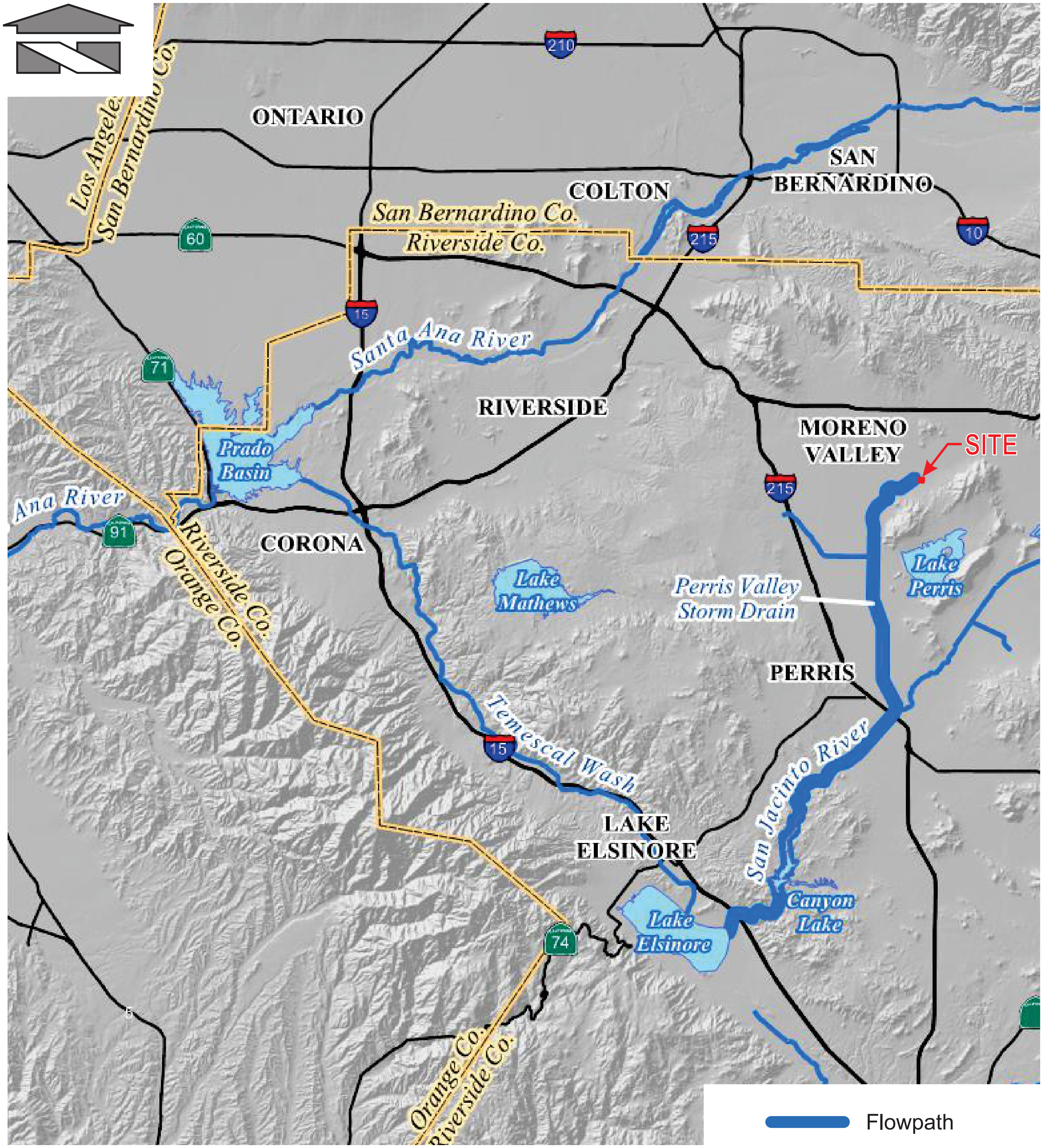
Attachment: Appendix G - Water Quality Management Plan (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)



REFERENCE: USGS

Scale:

Horizontal: **N.T.S.** Vertical: **N/A**

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(425) 251-8782

CIVIL ENGINEERING, LAND PLANNING,
SURVEYING, ENVIRONMENTAL SERVICES

For:

Sater ARCO
Moreno Valley, CA

Title:

RECEIVING
WATERBODIES

Job Number
18501

Figure
4

DATE: 01/15/18

P:\18000s\18501\exhibit\graphics\18501 flow.cdr

Attachment: Appendix G - Water Quality Management Plan (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

REFERENCE: USDA, Natural Resources Conservation Service

LEGEND:

HcC = Hanford coarse sandy loam, 2-8% slopes

GlC = Gorgonio loamy sand, deep, 2-8% slopes

Scale:

Horizontal: **N.T.S.** Vertical: **N/A**

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(425) 251-8782

CIVIL ENGINEERING, LAND PLANNING,
SURVEYING, ENVIRONMENTAL SERVICES

For:

Sater ARCO
Moreno Valley, CA

Title:

SOIL SURVEY MAP

Job Number

18501

Figure

5

DATE: 01/15/18

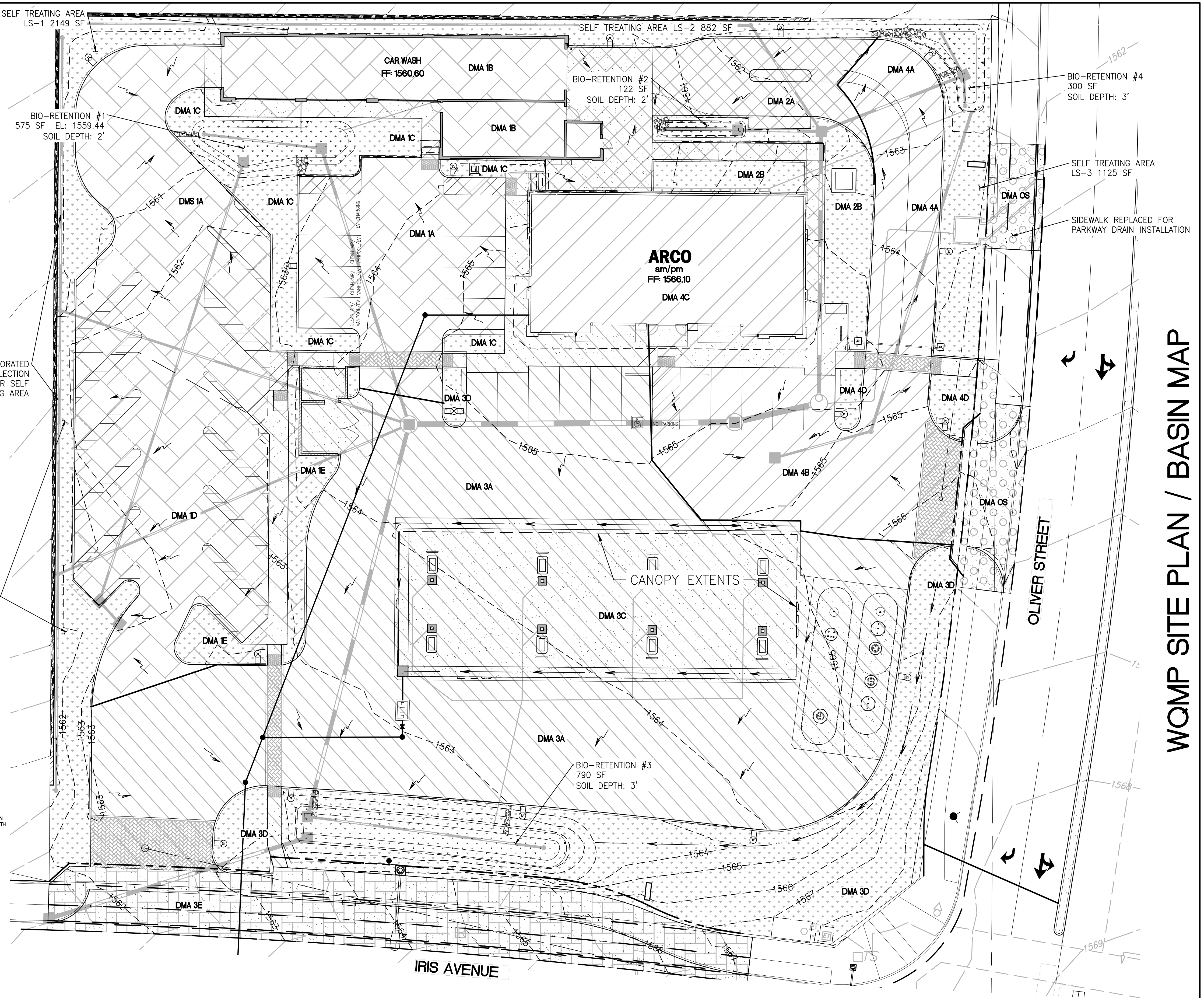
P:\18000s\18501\exhibit\graphics\18501 soil.cdr

1"=30'

0 15 30 60

DRAINAGE MANAGEMENT AREA LEGEND:

DRAINAGE MANAGEMENT AREA 1	▨
DRAINAGE MANAGEMENT AREA 2	▨
DRAINAGE MANAGEMENT AREA 3	▨
DRAINAGE MANAGEMENT AREA 4	▨
OFFSITE DRAINAGE MANAGEMENT AREA 3E	▦
OFFSITE DRAINAGE MANAGEMENT AREA OS	○ ○ ○ ○

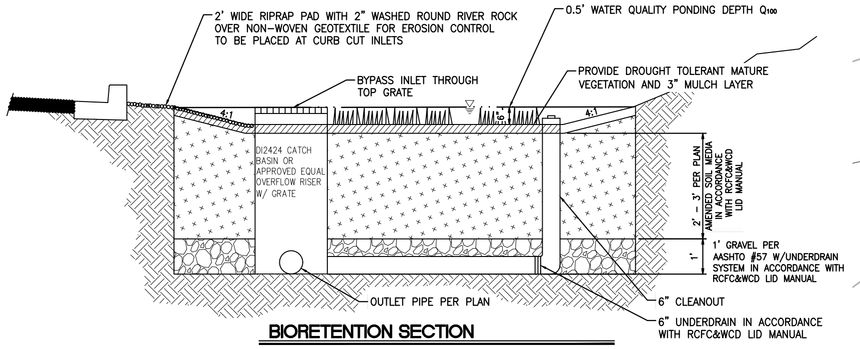


SURFACE COVERAGE SUMMARY:

DEVELOPED ON-SITE AREA:	67,420	1.55 ACRE
PROPOSED IMPERVIOUS AREA:	49,586	1.14 ACRE
PERVIOUS TRIBUTARY TO BIO-RETENTION:	12,135	0.28 ACRE
PERVIOUS SELF TREATING:	5,719	0.13 ACRE
OFFSITE IMPERVIOUS AREA:	4,807	0.11 ACRE

SOURCE CONTROL BMP NOTES:

1. GREASE CONTROL FROM FOOD HANDLING ACTIVITIES WILL BE PART OF THIS PROJECT BUT WILL BE SPECIFIED IN A LATER SUBMITTAL.
2. CAR WASH ACTIVITIES WILL BE CONTAINED WITHIN THE CAR WASH BUILDING. GRADING AND DRAINAGE WILL DIRECT RUNOFF FROM CARS LEAVING THE CAR WASH WILL BE COLLECTED BY THE CAR-WASH WATER TREATMENT FACILITIES TO THE GREATEST EXTENT POSSIBLE.
3. INTERIOR FLOOR DRAINS WILL BE PLUMBED TO SANITARY SEWER.
4. FUEL DISPENSING AREAS ARE TO BE HYDRAULICALLY ISOLATED WITH GRADING FEATURES AND THE CANOPY IS NOT TO BE DRAINED TO THE FUELING AREA GROUND SURFACE.
5. TRASH AND RECYCLING ENCLOSURE IS GRADED TO HYDRAULICALLY ISOLATE THE SURFACE TO PREVENT RUN ON FROM THE SURROUNDING SITE.



BIORETENTION SECTION

NOT TO SCALE

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CIVIL ENGINEERING, LAND PLANNING,
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WQMP SITE PLAN / BASIN MAP

WQMP SITE PLAN / BASIN MAP

FIGURE 6

Appendix 2: Construction Plans

Grading and Drainage Plans

PRELIMINARY GRADING COVER SHEET
FOR
ARCO AM/PM
PTN OF SEC. 22,
TWP. 3 S., RGE 3 WEST, S.B.M
RIVERSIDE COUNTY STATE OF CALIFORNIA

SURVEY INFORMATION:

TOPO AND ALTA SURVEY PERFORMED BY SALEM ENGINEERING GROUP

SURVEY DATE:
NOVEMBER, 2017

CALCULATED AREA:
68,787± SQ. FT. (1.58± ACRES)

CALCULATED AREA AFTER DEDICATIONS OF ROW:
67,376± SQ. FT. (1.55± ACRES)

APN: 486-310-038

PARCELS 1 AS SHOWN ON PARCEL MAP NO. 33361, RECORDED IN BOOK 239, PAGES 30-32 OF PARCEL MAPS, OFFICIAL RECORD OF RIVERSIDE COUNTY, CALIFORNIA, LYING WITHIN SECTION 22, TOWNSHIP 3 SOUTH, RANGE 3 WEST, S.B.M.,
CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

BASIS OF BEARINGS

NORTH 00°26'04" EAST, BEING THE BEARING OF THE CENTERLINE OF OLIVER STREET, AS SHOWN IN BOOK 239 OF PARCEL MAPS, AT PAGE 32, OFFICIAL RECORDS OF RIVERSIDE COUNTY, CALIFORNIA.

BENCHMARK

RIVERSIDE COUNTY VERTICAL CONTROL POINT "M-32", BEING A 1" IRON PIPE AND COUNTY TAG STAMPED COUNTY SURVEYOR IN A HAND WELL, AT THE INTERSECTION PERRIS BOULEVARD AND IRIS AVENUE, 58.55 FEET SOUTHWEST OF A CHISELED "X" IN A 3" IRON CORNER POST, 40.89 FEET NORTHEAST OF NAIL AND TAG IN THE WEST SIDE POWER POLE #213136, 34.69 FEET NORTHWEST OF A NAIL AND TAG SET IN SOUTHWEST SIDE TELEPHONE POLE *15160, A

ELEVATION: 1503.53 (US SURVEY FEET)
NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 29).

ALL ELEVATIONS SHOWN HEREON ARE (NAVD 88) NORTH AMERICAN VERTICAL DATUM 1988. TO TRANSLATE ELEVATIONS TO (NGVD 29) SUBTRACT -2.36' FROM ELEVATION SHOWN.

FLOOD NOTE

THE SUBJECT PROPERTY IS LOCATED WITHIN A ZONE "X" DESIGNATION PER FLOOD INSURANCE RATE MAP NO. 06065C0770G MAP EFFECTIVE DATE AUGUST 28, 2008. AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.

LEGAL DESCRIPTION:

THE LAND IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, CALIFORNIA, DESCRIBED AS FOLLOWS:

PARCEL A:

PARCEL 1 OF PARCEL MAP NO. 33361, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 239, PAGE 30 THROUGH 32 OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

PARCEL B:

A NONEXCLUSIVE, PERMANENT SEWER AND ACCESS EASEMENT ON OVER AND ACROSS THAT CERTAIN PARCEL OF LAND SITUATED IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, BEING A PORTION OF LOT 7 AND LOT 8 IN BLOCK 151, OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT CO. AS SHOWN BY MAP ON FILE IN BOOK 11 OF MAPS, PAGE 10, RECORDS OF SAN BERNARDINO COUNTY, CALIFORNIA, LYING WITHIN SECTION 22, TOWNSHIP 3 SOUTH, RANGE 3 WEST, S.B.M. MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHWEST CORNER OF SAID LOT 7, SAID POINT ALSO BEING THE INTERSECTION OF THE CENTERLINE OF FILAREE AVENUE AND THE WEST LINE OF LOT 7 AS SHOWN ON MAP REFERENCED ABOVE AND THE TRUE POINT OF BEGINNING;

THENCE SOUTH 89° 33' 36" EAST, 694.50 FEET ALONG THE SOUTH LINE OF SAID LOT 7, SAID SOUTH LINE ALSO BEING THE CENTERLINE OF SAID FILAREE AVENUE, TO A POINT THAT LIES ON THE SOUTH LINE OF SAID LOT 8, SAID POINT BEING DISTANT 34.00 FEET FROM THE SOUTHWEST CORNER OF SAID LOT 8;

THENCE NORTH 00° 26' 02" EAST, 10.00 FEET TO A POINT THAT LIES ON A LINE THAT IS PARALLEL WITH AND 10.00 FEET NORTH OF SAID SOUTH LINE OF SAID LOT 8;

THENCE NORTH 89° 33' 36" WEST, 694.50 FEET ALONG SAID PARALLEL LINE TO A POINT ON THE WEST LINE OF SAID LOT 7, SAID PARALLEL LINE IS ALSO PARALLEL WITH THE SOUTH LINE OF SAID LOT 7;

THENCE SOUTH 00° 19' 23" WEST, 10.00 FEET ALONG SAID WEST LINE OF LOT 7 TO TRUE POINT OF BEGINNING, RECORDED SEPTEMBER 30, 2014 AS INSTRUMENT NO. 2014-0371036, OF OFFICIAL RECORDS, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA.

UTILITY AND SERVICE PURVEYORS:

POWER:	SOUTHERN CALIFORNIA EDISON
GAS:	THE GAS COMPANY
PHONE:	FRONTIER
CABLE:	FRONTIER
WATER:	EASTERN MUNICIPAL WATER DISTRICT
SEWER:	EASTERN MUNICIPAL WATER DISTRICT
SCHOOL DISTRICT:	MORENO VALLEY UNITED SCHOOL DISTRICT

APPLICANT
SATER OIL INTERNATIONAL, LLC
683 CLIFFSIDE DRIVE
SAN DIMAS, CA 91773
PHONE (909) 293-7588
CONTACT: ERIC LEVAUGHN

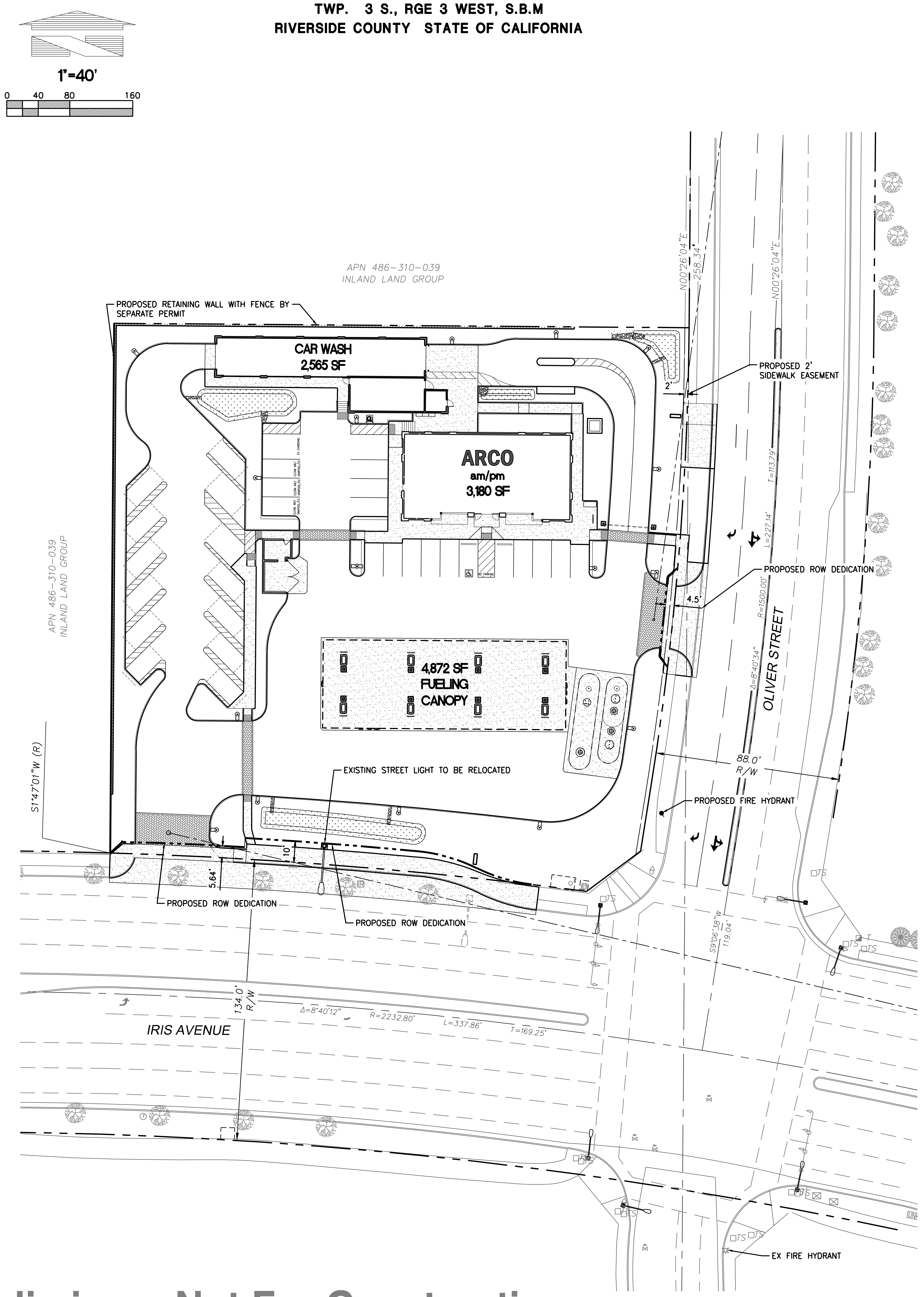
ENGINEER
BARGHAUSEN CONSULTING ENGINEERS, INC.
18215 72ND AVE. SOUTH
KENT, WA 98032
TEL: (425) 251-6222
FAX: (425) 251-8782
CONTACT: HAL GRUBB, P.E.

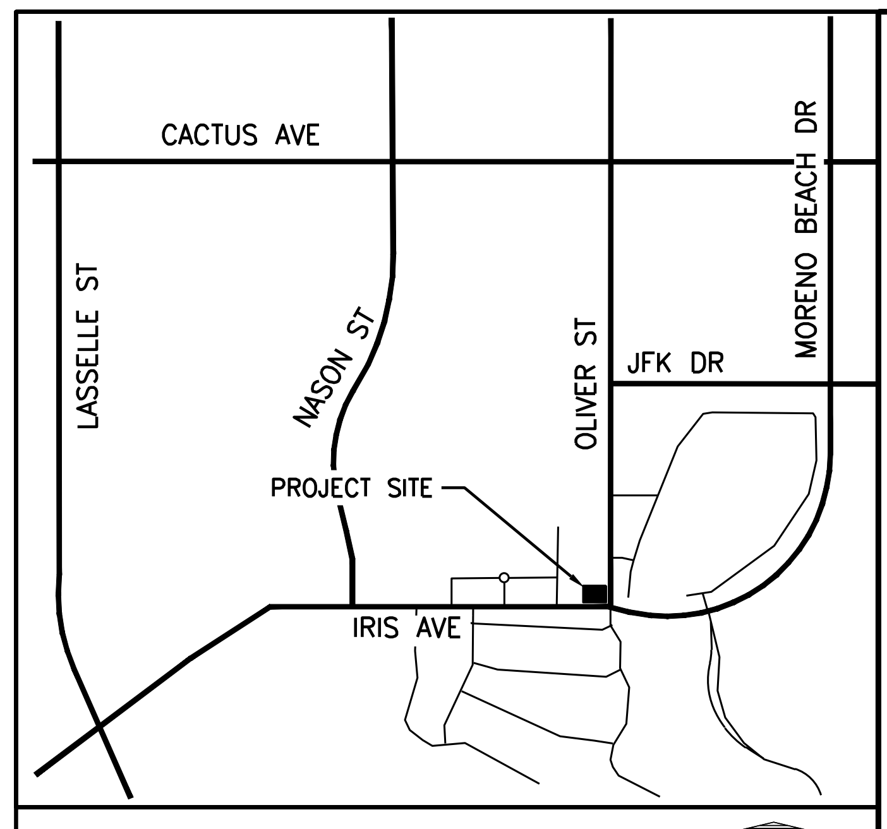
GEOTECHNICAL
SALEM ENGINEERING GROUP, INC.
11650 MISSION PARK DR., #108
RANCHO CUCAMONGA, CA 91730
TEL: (909) 980-6455
FAX: (909) 980-6435

ARCHITECT
BARGHAUSEN CONSULTING ENGINEERS, INC.
18215 72ND AVE. SOUTH
KENT, WA 98032
TEL: (425) 251-6222
FAX: (425) 251-8782
CONTACT: DAN GOALWIN

LANDSCAPE ARCHITECT
BARGHAUSEN CONSULTING ENGINEERS, INC.
18215 72ND AVE. SOUTH
KENT, WA 98032
TEL: (425) 251-6222
FAX: (425) 251-8782
CONTACT: JEFF VARLEY, R.L.A.

SURVEYOR
SALEM ENGINEERING GROUP, INC.
11650 MISSION PARK DRIVE,
SUITE 108
RANCHO CUCAMONGAM CA 91730
TEL: (909) 980-6455





VICINITY MAP

EASEMENTS:

1. A NONEXCLUSIVE, PERMANENT SEWER AND ACCESS EASEMENT ON OVER AND ACROSS THAT CERTAIN PARCEL OF LAND SITUATED IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, BEING A PORTION OF LOT 7 AND LOT 8 IN BLOCK 151, OF BEAR VALLEY AND ALESSANDRO DEVELOPMENTS CO. AS SHOWN BY MAP ON FILE IN BOOK 11 OF MAPS, PAGE 10, RECORDS OF SAN BERNARDINO COUNTY, CALIFORNIA, LYING WITHIN SECTION 22, TOWNSHIP 3 SOUTH, RANGE 3 WEST, S.B.M.

LEGEND:

PROPOSED	
CURB AND GUTTER	═
BARRIER CURB	═
CONCRETE	▨
ASPHALT	▨
SWALE	→
SAWCUT	- - - -
CONTOUR	---- 179 ----
WATER	—W—
WATER METER	⊠
STORM	▬
CONCRETE CONTROL JOINT	— — —
CONCRETE EXPANSION JOINT	— — —
SANITARY	—
GAS	—G—
POWER	—P—
PAINT STRIPE	—
NEW RETAINING WALL	▨
TYPE 1 CATCH BASIN	■
TYPE 2 CATCH BASIN	◉
SANITARY SEWER CLEANOUT	•
LOT LIGHT	◘
FIRE HYDRANT	●

EXISTING	
CURB	═
PAINT STRIPE	—
WATER	— -W- -W—
SANITARY	— — SS— —
GAS	—G—
POWER OVERHEAD	—P (OH)
POWER UNDERGROUND	—P (UG)
OH/UG TEL. LINE	—T(XX)—
IRRIGATION CONTROL	IR
ELECTRICAL TRANSFORMER	ET
ELECTRICAL METER	○E
LUMINAIRE (LUM.)	○—☆
WATER VALVE (WV)	WV ⋈
FIRE HYDRANT	☆
SS MANHOLE	Ⓢ
TREES	✱ ✱ ✱ ☆
TRAFFIC SWITCH	□TS
TELEPHONE RISER	◪ T

NOT FOR CONSTRUCTION

PEN18-0016

ARCO

andeavor

BARGHAUSEN CONSULTING ENGINEERS, INC.

18215 72ND AVENUE SOUTH
KENT, WA 98032
(425)251-6222
(425)251-8782 FAX

CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES

NO.	DATE	REVISION DESCRIPTION
1	3/20/18	CITY COMMENTS
2	6/01/18	CITY COMMENTS
3	8/07/18	CITY COMMENTS
4	9/26/18	CITY COMMENTS
△		
△		
△		
△		
△		
△		
△		
△		

SEAL:

9/25/2018

DEVELOPMENT INFORMATION:
ARCO NTI
3000 am/pm
FUEL CANOPY
w/ 8 MPD's
26'x100' CAR WASH

SITE ADDRESS:
NWC IRIS AVE @ OLIVER ST
MORENO VALLEY, CA

FACILITY # TBD

DESIGNED BY:	ALLIANCE Z&DM:
CHECKED BY: JC	BP REPM:
DRAWN BY: ZJ	ALLIANCE PM:
VERSION: - -	PROJECT NO: 18501

DRAWING TITLE:
PRELIMINARY
GRADING
COVER SHEET

SHEET NO:
C1.0

PRELIMINARY GRADING PLAN
FOR
ARCO AM/PM
PTN OF SEC. 22,
TWP. 3 S., RGE 3 WEST, S.B.M
RIVERSIDE COUNTY STATE OF CALIFORNIA

1"=20'

RETAINING WALL ELEVATIONS:

NOTE: WALLS ARE PER SEPARATE PERMIT

DIFFERENCE IN ELEVATIONS

PROPERTY LINE RETAINING WALL
TW=TOP OF RETAINING WALL ELEVATION
BW=FACE OF WALL AT FINISHED GRADE

DIFFERENCE BETWEEN TW AND BW

TF=TOP OF RETAINING WALL FOOTING

X'
TW=XXX.X
BW=XXX.X
TF=XXX.X

ESTIMATED EARTHWORK QUANTITIES:

CUT: 1000 CY
FILL: 5000 CY
NET: 4000 CY (FILL)
AREA TO BE DISTURBED = 1.58 AC

EARTHWORK QUANTITIES ARE APPROXIMATE AND HIGHLY DEPENDANT ON SOIL CONDITIONS ENCOUNTERED DURING CONSTRUCTION. CONTRACTOR SHOULD PERFORM INDEPENDENT ESTIMATE FOR BIDDING.

STORM STRUCTURES:

CB #1 – PUMP STA, 60" MH W/ PUMP EQUIPMENT
RIM 1565.07
IE 1555.42 (18" W)
IE 1556.19 (12" N)

CB#2, 48" MH W/ SOLID LOCKING LID
RIM 1565.01
IE 1555.55 (18" W)
IE 1555.55 (18" E)

CB#3, DI2424 W/ SOLID LOCKING LID
RIM 1562.53
IE 1556.58 (8" W)
IE 1556.58 (8" E)
IE 1557.08 (6" NW)
IE 1556.58 (12" S)

CB#4, DI2424, W/STANDARD GRATE
RIM 1560.20
IE 1556.70 (6" W)
IE 1556.70 (8" E)

CB#5, DI2424, W/STANDARD GRATE
RIM 1560.55
IE 1556.44 (6" W)
IE 1556.44 (8" S)

CB#6, DI2424, W/STANDARD GRATE
RIM 1560.75
IE 1556.72 (12" N)
IE 1556.72 (6" E)

CB#7, DI2424, W/STANDARD GRATE
RIM 1560.75
IE 1557.04 (12" W)
BUBBLE UP STRUCTURE W/WEEP HOLES IN BASE

CB#8, DI2424, W/STANDARD GRATE
RIM 1561.75
IE 1559.07 (6" SE)
IE 1559.07 (6" N)

CB#9, DI2424, W/STANDARD GRATE
RIM 1564.47
IE 1562.91 (6" E)

CB#10, DI2424, W/STANDARD GRATE
RIM 1561.90
IE 1557.40 (6" NW)
IE 1557.40 (8" W)
IE 1557.40 (6" S)

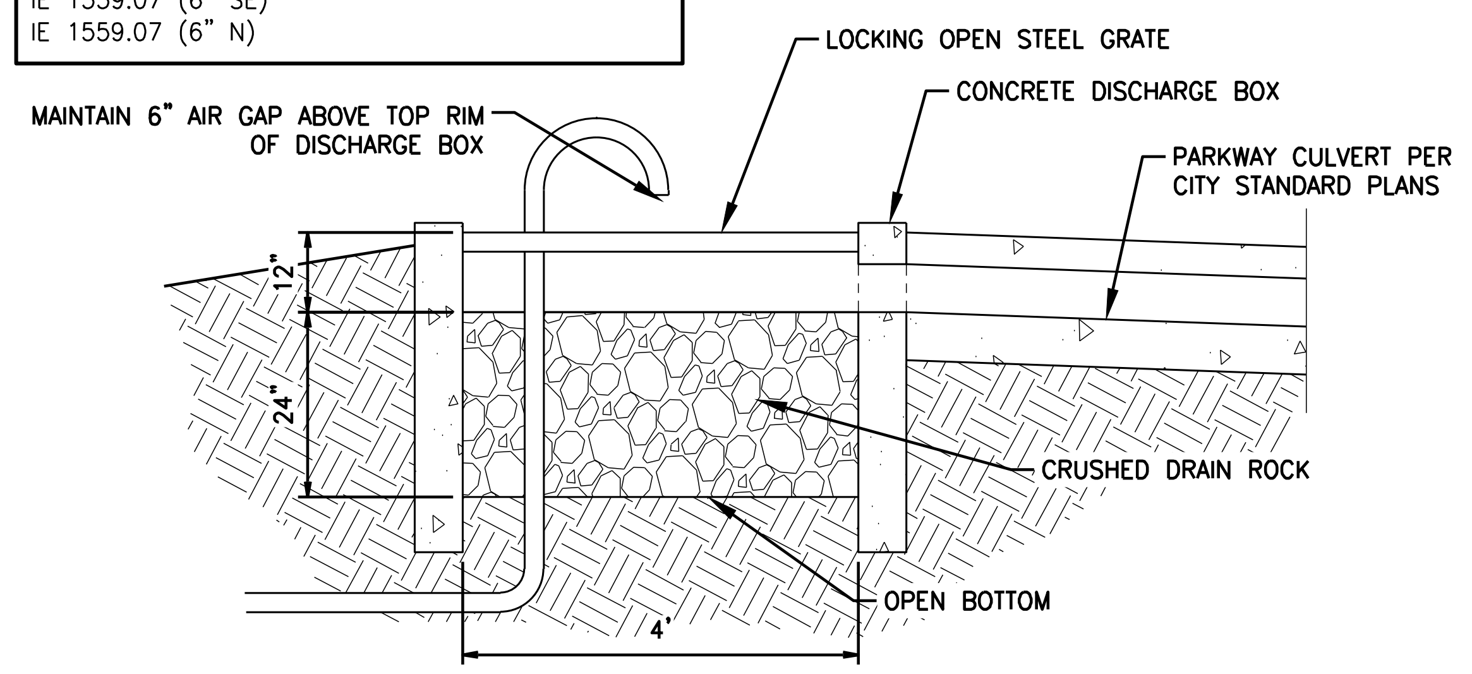
CB#11, 48" MH W/ SOLID LOCKING LID
RIM 1564.61
IE 1556.02 (12" S)
IE 1556.02 (8" N)
IE 1557.02 (6" W)
IE 1557.00 (6" SW)
IE 1556.02 (18" E)

CB#12, DI2424 W/STANDARD GRATE
RIM 1561.89
IE 1559.11 (6" NW)

CB#13, PUBLIC CATCH BASIN PER COMV STANDARD PLAN 300A
RIM 1561.10
IE 1557.43 (12" E)

CB#14, DI2424, W/STANDARD GRATE
RIM 1560.55
IE 1556.44 (6" S)
BUBBLE UP STRUCTURE W/WEEP HOLES IN BASE

SDCO#1, W/ TRAFFIC RATED LID
RIM 1565.06
IE 1562.77 (6" W)
IE 1562.77 (8" N)



STORM DISCHARGE BOX

NOT TO SCALE

SURFACE SLOPES:

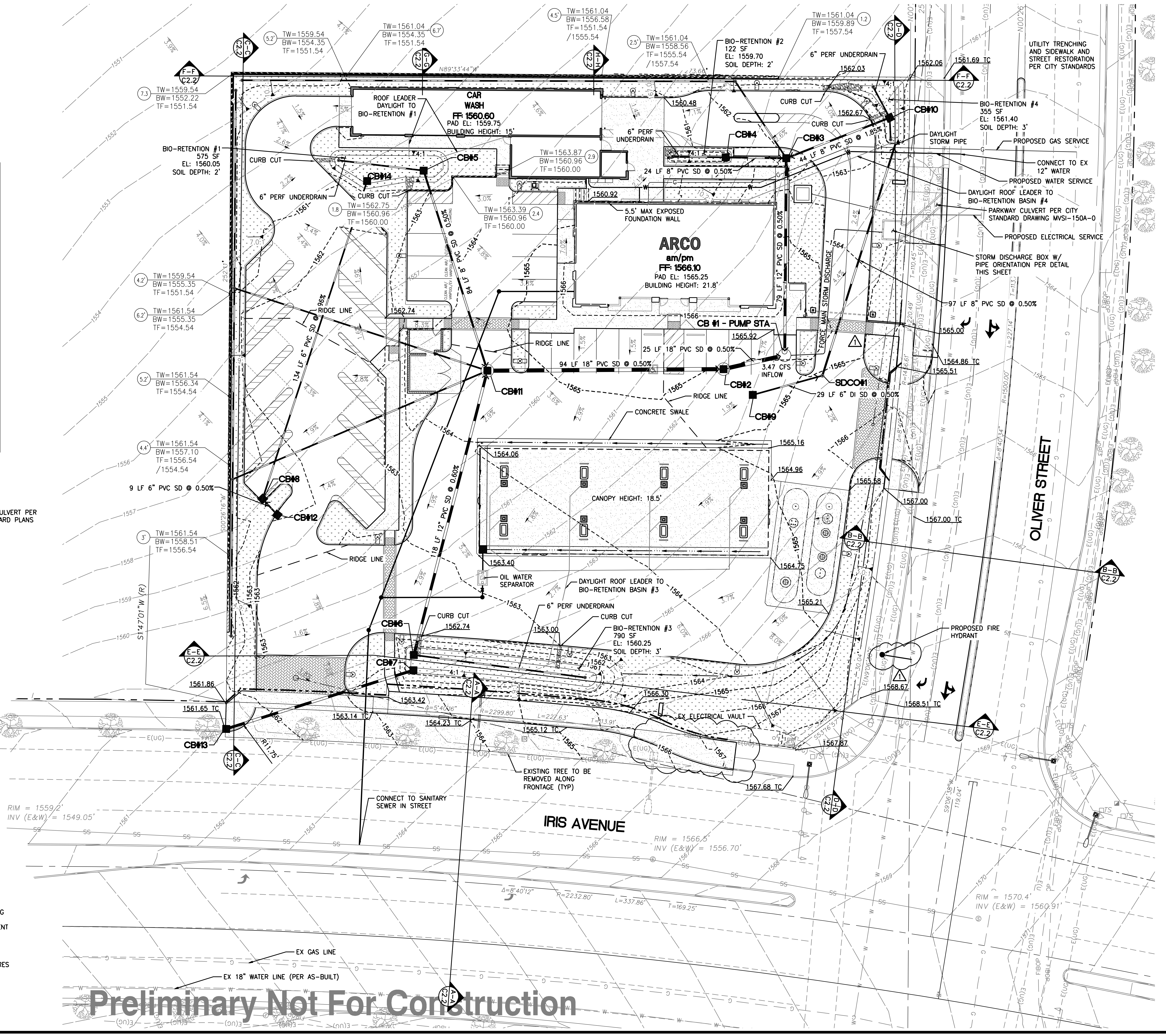
3.1%	PROPOSED PAVED SURFACE SLOPE
10.2:1	PROPOSED LANDSCAPE SLOPE
8.0%	EXISTING SURFACE SLOPE

SURFACE COVERAGE SUMMARY:

DEVELOPED ON-SITE AREA:	67,420	1.55 ACRE
PROPOSED IMPERVIOUS AREA:	49,586	1.14 ACRE
PERVIOUS TRIBUTARY TO BIO-RETENTION:	12,135	0.28 ACRE
PERVIOUS SELF TREATING:	5,719	0.13 ACRE
OFFSITE IMPERVIOUS AREA:	4,807	0.11 ACRE

SOURCE CONTROL BMP NOTES:

1. GREASE CONTROL FROM FOOD HANDLING ACTIVITIES WILL BE PART OF THIS PROJECT BUT WILL BE SPECIFIED IN A LATER SUBMITTAL.
2. CAR WASH ACTIVITIES WILL BE CONTAINED WITHIN THE CAR WASH BUILDING. GRADING AND DRAINAGE WILL DIRECT RUNOFF FROM CARS LEAVING THE CAR WASH WILL BE COLLECTED BY THE CAR-WASH WATER TREATMENT FACILITIES TO THE GREATEST EXTENT POSSIBLE.
3. INTERIOR FLOOR DRAINS WILL BE PLUMBED TO SANITARY SEWER.
4. FUEL DISPENSING AREAS ARE TO BE HYDRAULICALLY ISOLATED WITH GRADING FEATURES AND THE CANOPY IS NOT TO BE DRAINED TO THE FUELING AREA GROUND SURFACE.
5. TRASH AND RECYCLING ENCLOSURE IS GRADED TO HYDRAULICALLY ISOLATE THE SURFACE TO PREVENT RUN ON FROM THE SURROUNDING SITE.



PEN18-0016

BARGHAUSEN CONSULTING ENGINEERS, INC.

18215 72ND AVENUE SOUTH
KENT, WA 98032
(425)251-6222
(425)251-8782 FAX

CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES

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1	3/20/18	CITY COMMENTS
2	6/01/18	CITY COMMENTS
3	8/07/18	CITY COMMENTS
4	9/26/18	CITY COMMENTS

SEAL:

9/25/2018

DEVELOPMENT INFORMATION:
ARCO NTI
3000 am/pm
FUEL CANOPY
w/ 8 MPD's
26'x100' CAR WASH

SITE ADDRESS:
NWC IRIS AVE @ OLIVER ST
MORENO VALLEY, CA
FACILITY # TBD

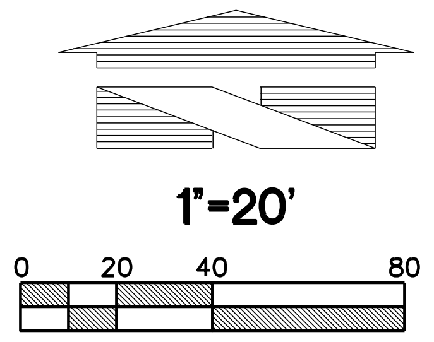
DESIGNED BY:	ALLIANCE Z&DM:
CHECKED BY: JC	BP REPM:
DRAWN BY: ZJ	ALLIANCE PM:
VERSION: - -	PROJECT NO: 18501

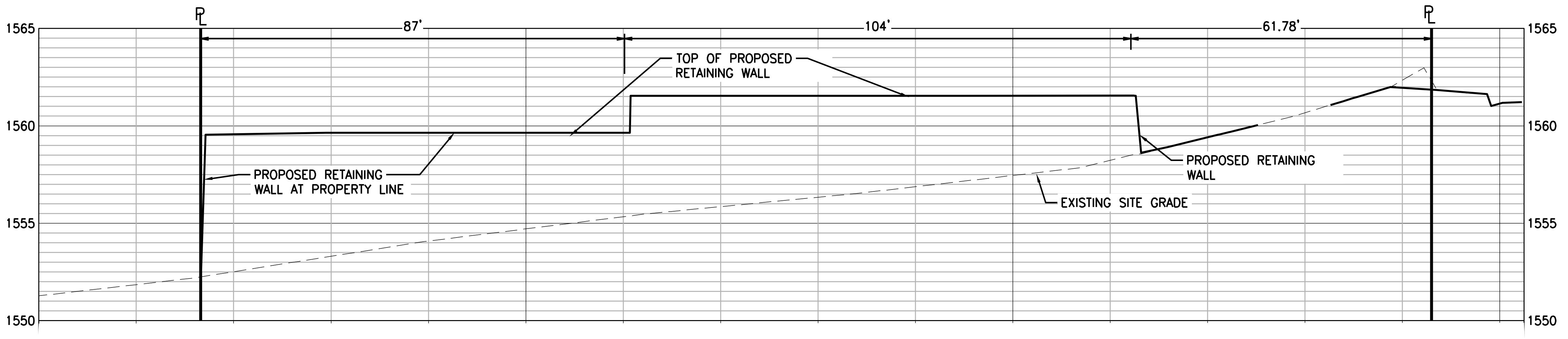
DRAWING TITLE:
PRELIMINARY GRADING PLAN

SHEET NO:
C2.1

PRELIMINARY SITE CROSS SECTIONS
FOR
ARCO AM/PM

PTN OF SEC. 22,
TWP. 3 S., RGE 3 WEST, S.B.M
RIVERSIDE COUNTY STATE OF CALIFORNIA

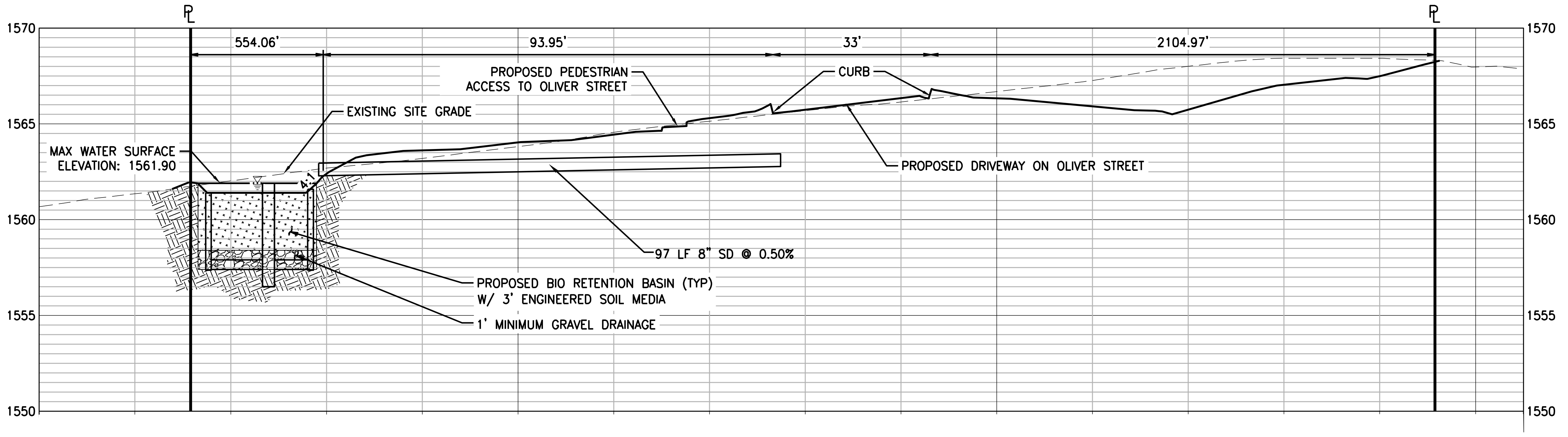




C-C
C2.1

WEST PROPERTY BOUNDARY N TO S

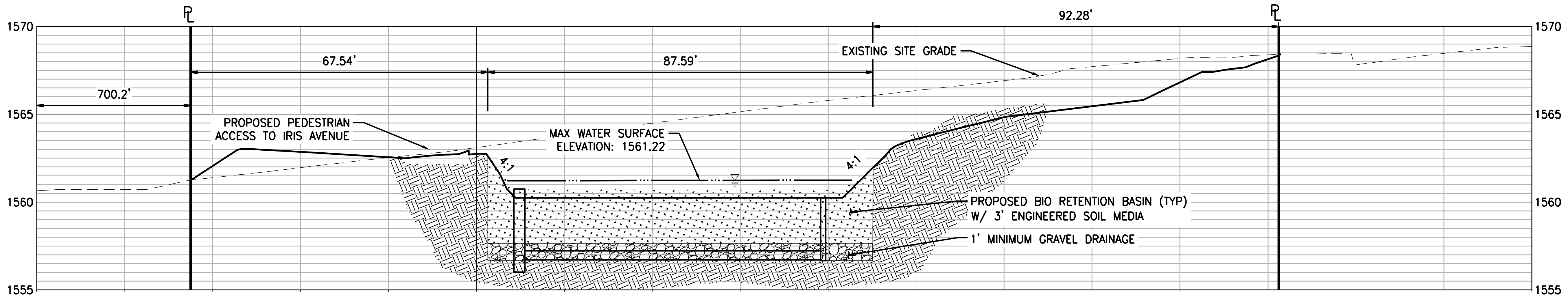
SCALE: H: 1"=20' V: 1"=5'



D-D
C2.1

EAST PROPERTY BOUNDARY N TO S

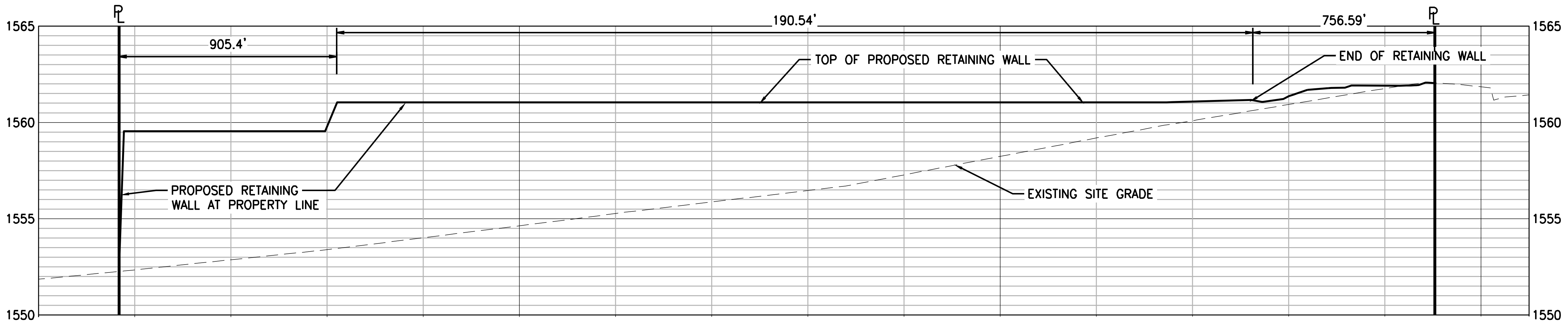
SCALE: H: 1"=20' V: 1"=5'



E-E
C2.1

SOUTH PROPERTY BOUNDARY W TO E

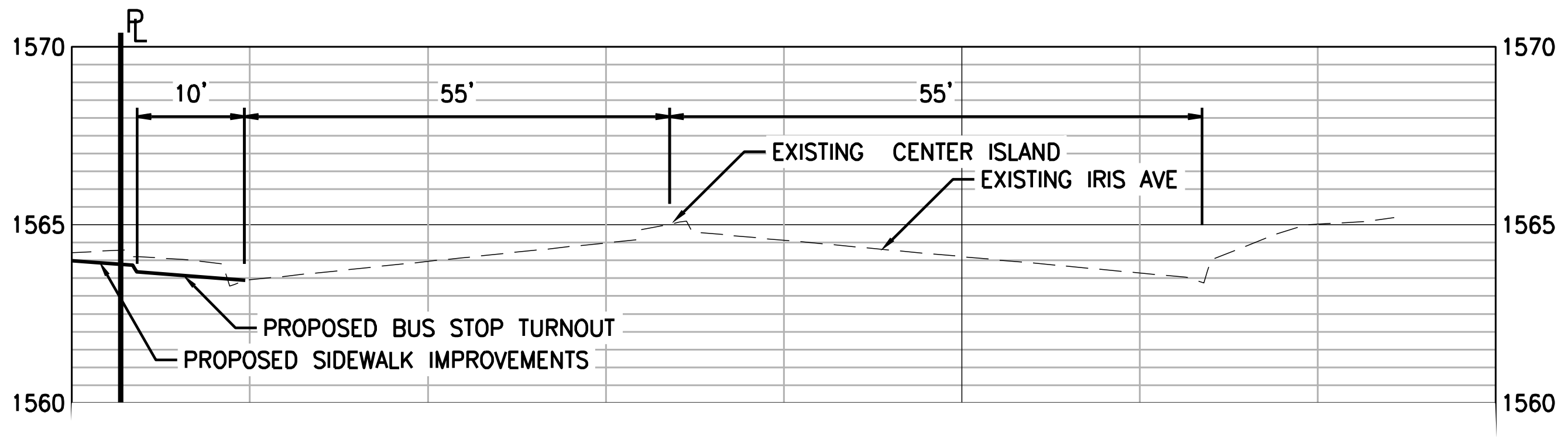
SCALE: H: 1"=20' V: 1"=5'



F-F
C2.1

NORTH PROPERTY BOUNDARY W TO E

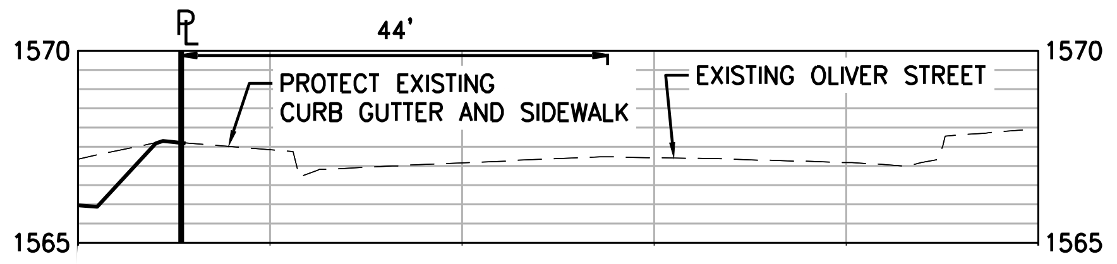
SCALE: H: 1"=20' V: 1"=5'



A-A
C2.1

IRIS AVE N TO S

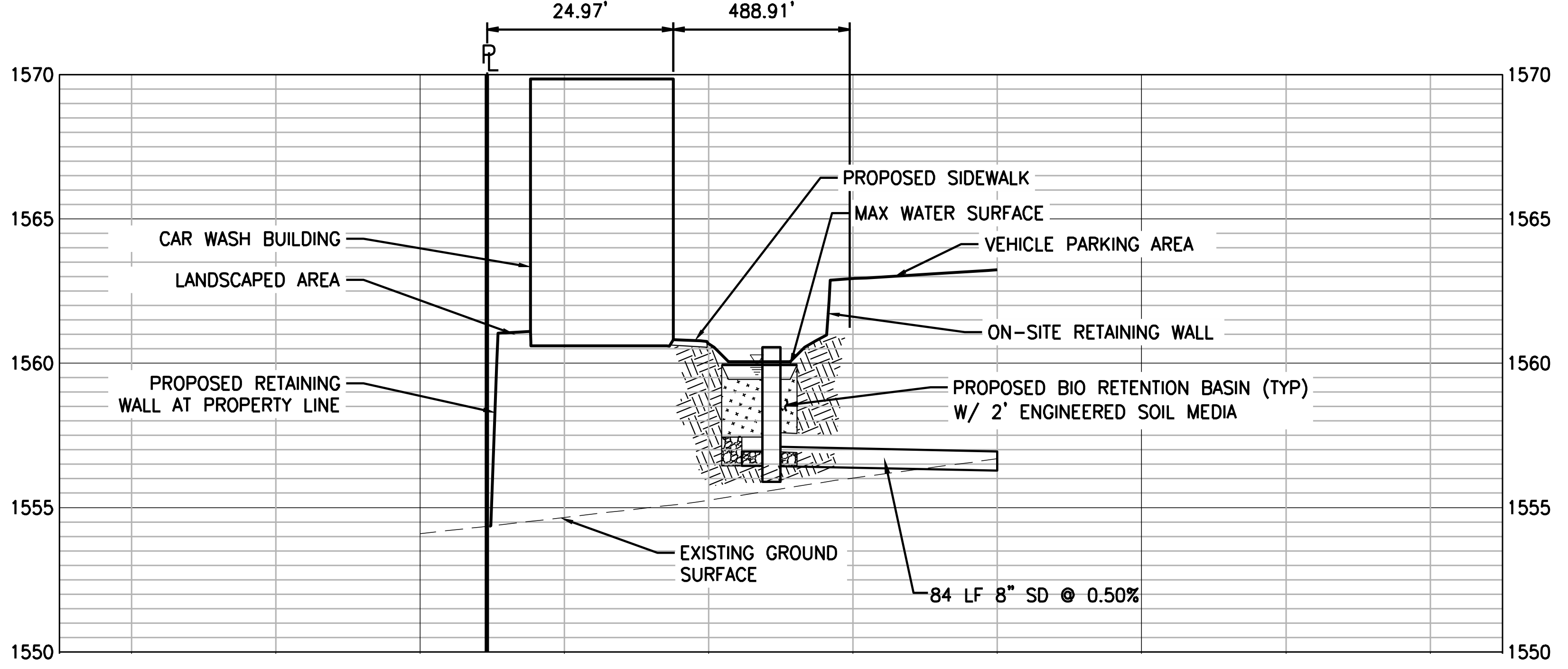
SCALE: H: 1"=20' V: 1"=5'



B-B
C2.1

OLIVER ST W TO E

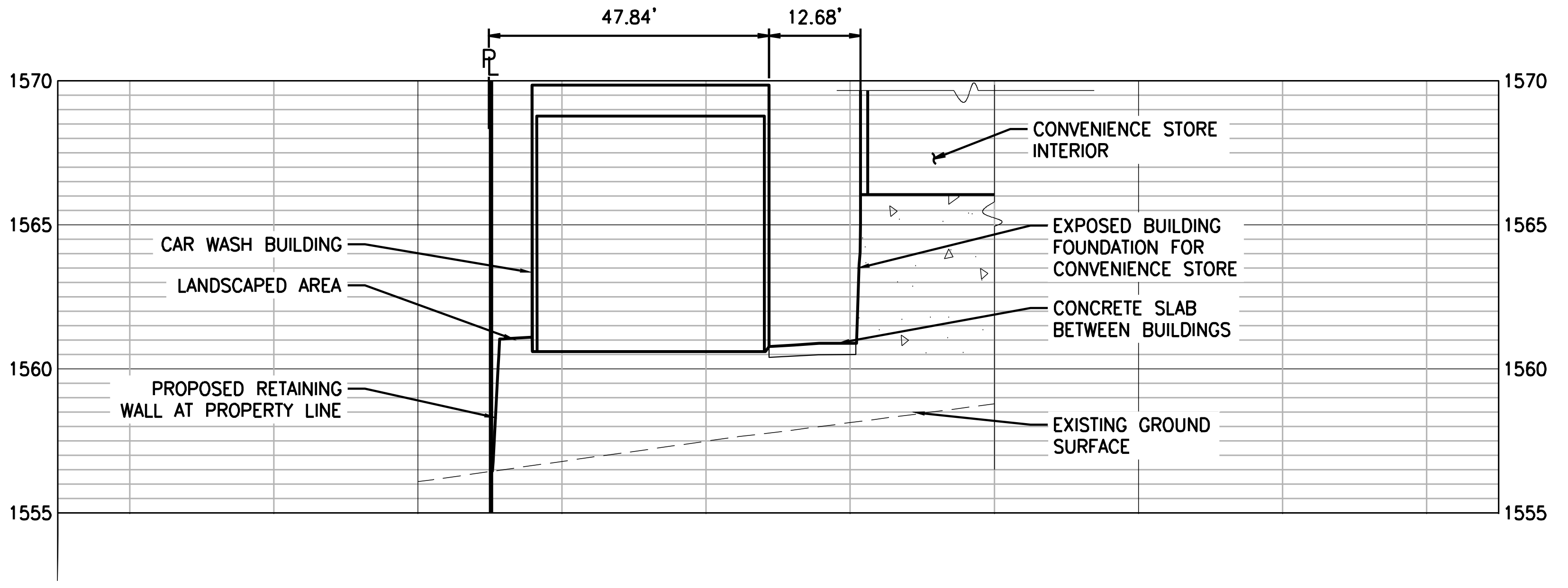
SCALE: H: 1"=20' V: 1"=5'



G-G
C2.1

NORTH PROPERTY BOUNDARY W TO E

SCALE: H: 1"=20' V: 1"=5'



H-H
C2.1

NORTH PROPERTY BOUNDARY W TO E

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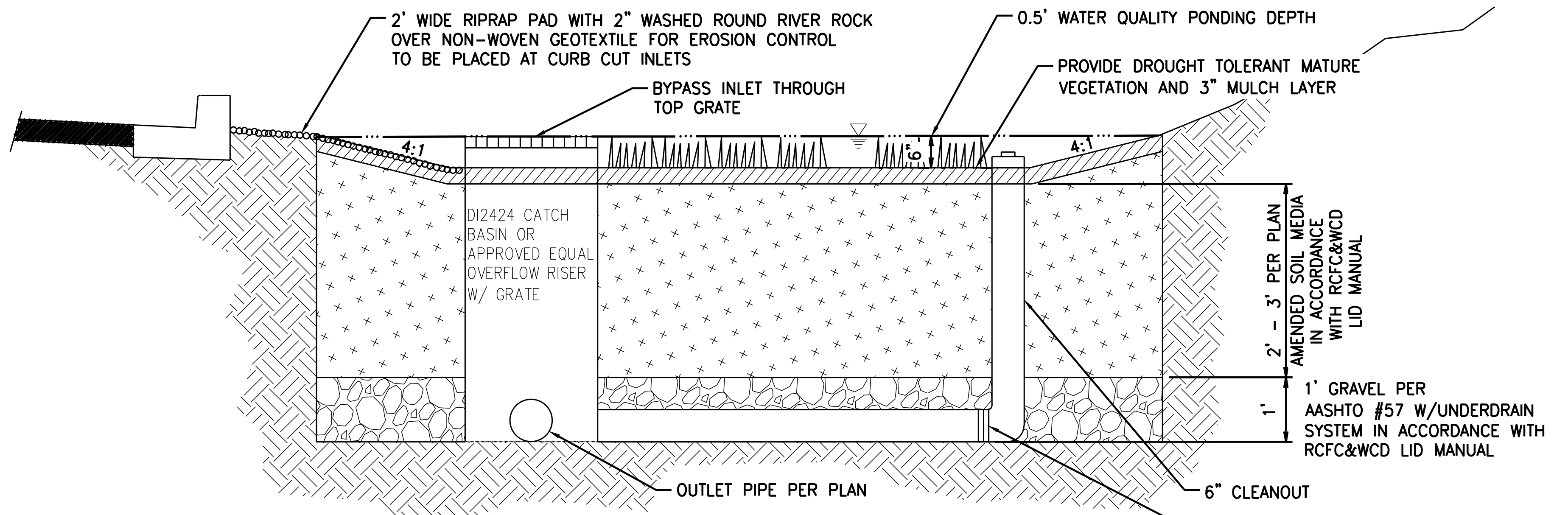

BIORETENTION SECTION

NOT TO SCALE

PEN18-0016

ARCO

andeavor

BARGHAUSEN CONSULTING ENGINEERS, INC.

18215 72ND AVENUE SOUTH
KENT, WA 98032
(425)251-6222
(425)251-8782 FAX

CIVIL ENGINEERING, LAND PLANNING, SURVEYING, ENVIRONMENTAL SERVICES

NO.	DATE	REVISION DESCRIPTION
1	3/20/18	CITY COMMENTS
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△		
△		
△		
△		
△		
△		
△		
△		

SEAL:

9/25/2018

DEVELOPMENT INFORMATION:

ARCO NTI

3000 am/pm
FUEL CANOPY
w/ 8 MPD's
26'x100' CAR WASH

SITE ADDRESS:

NWC IRIS AVE @ OLIVER ST
MORENO VALLEY, CA

FACILITY # TBD

DESIGNED BY:	ALLIANCE Z&DM:
CHECKED BY: JC	BP REPM:
DRAWN BY: ZJ	ALLIANCE PM:
VERSION: - -	PROJECT NO: 18501

DRAWING TITLE:
PRELIMINARY
SITE CROSS
SECTIONS

SHEET NO:
C2.2

Appendix 3: Soils Information

Geotechnical Study and Other Infiltration Testing Data

GEOTECHNICAL • ENVIRONMENTAL • GEOLOGY • MATERIALS TESTING & INSPECTION • FORENSIC • LABORATORY

SALEM
engineering group, inc.

PRELIMINARY GEOTECHNICAL ENGINESERING INVESTIGATION

PROPOSED ARCO STATION
NWC IRIS AVENUE AND OLIVER STREET
MORENO VALLEY, CALIFORNIA

SALEM PROJECT NO. 3-217-1265
NOVEMBER 30, 2017

PREPARED FOR:

MR. ERIC LEVAUGHN
SATER OIL INTERNATIONAL, LLC
683 CLIFFSIDE DRIVE
SAN DIMAS, CA 91773

PREPARED BY:

SALEM ENGINEERING GROUP, INC.
11650 MISSION PARK DR., #108
RANCHO CUCAMONGA, CA 91730
P: (909) 980-6455
F: (909) 980-6435
www.salemeng.com

SAN JOSE ▪ STOCKTON ▪ FRESNO ▪ BAKERSFIELD ▪ RANCHO CUCAMONGA
DALLAS, TX ▪ DENVER, CO ▪ CHARLESTON, SC

SALEM
engineering group, inc.

11650 Mission Park Dr., #108
Rancho Cucamonga, CA 91730
Phone (909) 980-6455
Fax (909) 980-6435

November 30, 2017

Project No. 3-217-1265

Mr. Eric LeVaughn
Sater Oil International, LLC
683 Cliffside Drive
San Dimas, CA 91773 85255

SUBJECT: PRELIMINARY GEOTECHNICAL ENGINEERING INVESTIGATION
PROPOSED ARCO STATION
NWC IRIS AVENUE AND OLIVER STREET
MORENO VALLEY, CALIFORNIA

Dear Mr. LeVaughn:

At your request and authorization, SALEM Engineering Group, Inc. (SALEM) has prepared this Preliminary Geotechnical Engineering Investigation report for the Proposed ARCO Station to be located at the subject site.

The accompanying report presents our findings, conclusions, and recommendations regarding the geotechnical aspects of designing and constructing the project as presently proposed. In our opinion, the proposed project is feasible from a geotechnical viewpoint provided our recommendations are incorporated into the design and construction of the project.

We appreciate the opportunity to assist you with this project. Should you have questions regarding this report or need additional information, please contact the undersigned at (909) 980-6455.

Respectfully Submitted,

SALEM ENGINEERING GROUP, INC.

Clarence Jiang, GE
Geotechnical Division Manager
RGE 2477

CLARENCE T. JIANG
No. 2477
Exp. 06/30/19

R. Sammy Salem, MS, PE, GE
Principal Engineer
RCE 52762 / RGE 2549

R. SAMMY SALEM
GE 2549
Exp. Dec. 31, 2018

TABLE OF CONTENTS

TABLE OF CONTENTS (cont.)

SALEM engineering group, inc.

11650 Mission Park Drive, Suite 108
Rancho Cucamonga, CA 91730
Phone (909) 980-6455
Fax (909) 980-6435

PRELIMINARY GEOTECHNICAL ENGINEERING INVESTIGATION
PROPSOED ARCO STATION
NWC IRIS AVENUE AND OLIVER STREET
MORENO VALLEY, CALIFORNIA

1. PURPOSE AND SCOPE

This report presents the results of our Preliminary Geotechnical Engineering Investigation for the site of the Proposed ARCO Station to be located near the intersection of NWC Iris Avenue and Oliver Street in Moreno Valley, California (see Figure 1, Vicinity Map).

The purpose of our geotechnical engineering investigation was to observe and sample the subsurface conditions encountered at the site, and provide conclusions and recommendations relative to the geotechnical aspects of constructing the project as presently proposed.

The scope of this investigation included a field exploration, percolation testing, laboratory testing, engineering analysis and the preparation of this report. Our field exploration was performed on November 14, 2017 and included the drilling of five (5) small-diameter soil borings to a maximum depth of 50 feet at the site. Additionally, four (4) percolation tests were performed at depths of approximately 8 and 10 feet below existing grade for the determination of the infiltration rate. The locations of the soil borings and percolation tests are depicted on Figure 2, Site Plan. A detailed discussion of our field investigation, percolation tests, and exploratory boring logs are presented in Appendix A.

Laboratory tests were performed on selected soil samples obtained during the investigation to evaluate pertinent physical properties for engineering analyses. Appendix B presents the laboratory test results in tabular and graphic format.

The recommendations presented herein are based on analysis of the data obtained during the investigation and our experience with similar soil and geologic conditions.

If project details vary significantly from those described herein, SALEM should be contacted to determine the necessity for review and possible revision of this report. Earthwork and Pavement Specifications are presented in Appendix C. If text of the report conflict with the specifications in Appendix C, the recommendations in the text of the report have precedence.

2. PROJECT DESCRIPTION

Based on the Site Plan provided to us, we understand that the proposed development will include construction of an ARCO station with an approximately 3,800 square-foot AM/PM convenience store, an 8-MPD’s fuel canopy, a 24 feet by 100 feet car wash, and underground storage tanks. On-site parking and landscaping are planned to be associated with the development. Maximum wall load is expected to be on the order of 3 kips per linear foot. Maximum column load is expected to be on the order of 70 kips. Floor slab soil bearing pressure is expected to be on the order of 150 psf.

A site grading plan was not available at the time of preparation of this report. As the existing project area is essentially level, we anticipate that cuts and fills during earthwork will be minimal and limited to providing a level pad and positive site drainage. In the event that changes occur in the nature or design of the project, the conclusions and recommendations contained in this report will not be considered valid unless the changes are reviewed and the conclusions of our report are modified. The site configuration and locations of proposed improvements are shown on the Site Plan, Figure 2.

3. SITE LOCATION AND DESCRIPTION

The subject site is located at the northwest corner of the intersection of Iris Avenue and Oliver Street, in the City of Moreno Valley, CA (see Vicinity Map, Figure 1). The subject site is rectangular in shape and encompasses approximately 1.31 acres.

At the time of SALEM's field exploration, the site was a vacant lot with sparse shrubs. The site is bounded by vacant lands to the north and west, Oliver Street to the east, and Iris Avenue to the south. The site area is gently sloping to the north with elevations ranging from approximately 1,566 to 1,555 feet above mean sea level based on google earth imagery.

4. FIELD EXPLORATION

Our field exploration consisted of site surface reconnaissance and subsurface exploration. The exploratory test borings (B-1 through B-5) were drilled on November 14, 2017 in the area shown on the Site Plan, Figure 2. The test borings were advanced with a 6-inch diameter hollow stem auger and a 4 inch diameter solid flight auger rotated by a truck-mounted CME 45C drill rig. The test borings were extended to a maximum depth of 50 feet below existing grade.

The materials encountered in the test borings were visually classified in the field, and logs were recorded by a field engineer and stratification lines were approximated on the basis of observations made at the time of drilling. Visual classification of the materials encountered in the test borings were generally made in accordance with the Unified Soil Classification System (ASTM D2487). A soil classification chart and key to sampling is presented on the Unified Soil Classification Chart, in Appendix "A." The logs of the test borings are presented in Appendix "A." The Boring Logs include the soil type, color, moisture content, dry density, and the applicable Unified Soil Classification System symbol.

The location of the test borings were determined by measuring from features shown on the Site Plan, provided to us. Hence, accuracy can be implied only to the degree that this method warrants. The actual boundaries between different soil types may be gradual and soil conditions may vary. For a more detailed description of the materials encountered, the Boring Logs in Appendix "A" should be consulted.

Soil samples were obtained from the test borings at the depths shown on the logs of borings. The MCS samples were recovered and capped at both ends to preserve the samples at their natural moisture content; SPT samples were recovered and placed in a sealed bag to preserve their natural moisture content. The borings were backfilled with soil cuttings after completion of the drilling.

5. LABORATORY TESTING

Laboratory tests were performed on selected soil samples to evaluate their physical characteristics and engineering properties. The laboratory-testing program was formulated with emphasis on the evaluation of natural moisture, in-situ density, shear strength, consolidation potential, maximum density and optimum moisture determination, and gradation of the materials encountered.

In addition, chemical tests were performed to evaluate the corrosivity of the soils to buried concrete and metal. Details of the laboratory test program and the results of laboratory test are summarized in Appendix "B." This information, along with the field observations, was used to prepare the final boring logs in Appendix "A."

6. GEOLOGIC SETTING

The subject site is located within the Peninsular Range Geomorphic Province, an area characterized by active northeast trending strike slip faults, including the San Jacinto to the northwest, and the Elsinore to the southwest. The project site is situated between the Santa Rosa Mountains and the San Jacinto Mountains to the east; and Santa Ana Mountains to the west and south. The near-surface deposits in the vicinity of the subject site are comprised of recent alluvium consisting of unconsolidated sands, silt, and clays derived from erosion of local mountain ranges. Deposits encountered on the subject site during exploratory drilling are discussed in detail in this report.

7. GEOLOGIC HAZARDS

7.1 Faulting and Seismicity

The Peninsular Range has historically been a province of relatively high seismic activity. The nearest faults to the project site are associated with the San Jacinto Fault system located approximately 4.1 miles from the site. There are no known active fault traces in the project vicinity. Based on mapping and historical seismicity, the seismicity of the Peninsular Range has been generally considered high by the scientific community.

The project area is not within an Alquist-Priolo Earthquake Fault (Special Studies) Zone and will not require a special site investigation by an Engineering Geologist. Soils on site are classified as Site Class D in accordance with Chapter 16 of the California Building Code. The proposed structures are determined to be in Seismic Design Category D.

To determine the distance of known active faults within 100 miles of the site, we used the United States Geological Survey (USGS) web-based application *2008 National Seismic Hazard Maps - Fault Parameters*. Site latitude is 33.8958° North; site longitude is 117.1833° West. The ten closest active faults are summarized below in Table 7.1.

TABLE 7.1
REGIONAL FAULT SUMMARY

Fault Name	Distance to Site (miles)	Max. Earthquake Magnitude, M_w
San Jacinto; SBV+SJV+A+CC+B+SM	4.1	7.9
San Jacinto; A+CC+B+SM	4.3	7.6
San Jacinto; SBV	8.9	7.1
S. San Andreas; PK+CH+CC+BB+NM+SM+NSB+SSB+BG+CO	15.1	8.2
S. San Andreas; PK+CH+CC+BB+NM+SM+NSB	17.7	8.0
Elsinore; W+GI+T+J+CM	18.2	7.9
S. San Andreas; BG+CO	22.3	7.4
Chino, alt 2	22.6	6.8
Elsinore; W	23.9	7.0

The faults tabulated above and numerous other faults in the region are sources of potential ground motion. However, earthquakes that might occur on other faults throughout California are also potential generators of significant ground motion and could subject the site to intense ground shaking.

7.2 Surface Fault Rupture

The site is not within a currently established State of California Earthquake Fault Zone for surface fault rupture hazards. No active faults with the potential for surface fault rupture are known to pass directly beneath the site. Therefore, the potential for surface rupture due to faulting occurring beneath the site during the design life of the proposed development is considered low.

7.3 Ground Shaking

We used the USGS web-based application *US Seismic Design Maps* to estimate the peak ground acceleration adjusted for site class effects (PGA_M). Because of the proximity to the subject site and the maximum probable events for these faults, it appears that a maximum probable event along the fault zones could produce a peak horizontal acceleration of approximately 0.871g (2% probability of being exceeded in 50 years). While listing PGA is useful for comparison of potential effects of fault activity in a region, other considerations are important in seismic design, including frequency and duration of motion and soil conditions underlying the site.

7.4 Liquefaction

Soil liquefaction is a state of soil particles suspension caused by a complete loss of strength when the effective stress drops to zero. Liquefaction normally occurs under saturated conditions in soils such as sand in which the strength is purely frictional. Primary factors that trigger liquefaction are: moderate to strong ground shaking (seismic source), relatively clean, loose granular soils (primarily poorly graded sands and silty sands), and saturated soil conditions (shallow groundwater). Due to the increasing overburden pressure with depth, liquefaction of granular soils is generally limited to the upper 50 feet of a soil profile. However, liquefaction has occurred in soils other than clean sand.

The soils encountered within the depth of 50 feet on the project site consisted predominately of very loose to dense silty sand with various amounts of clay and gravel, and dense to very dense silty clayey sand. Low to very low cohesion strength is associated with the sandy soil. A seismic hazard, which could cause damage to the proposed development during seismic shaking, is the post-liquefaction settlement of the liquefied sands.

The site was evaluated for liquefaction potential. The liquefaction analysis indicated that the soils had a low potential for liquefaction under seismic conditions. Therefore, no mitigation measures are warranted. Detailed geotechnical engineering recommendations are presented in the remaining portions of the text. The recommendations are based on the properties of the materials identified during our investigation.

7.5 Lateral Spreading

Lateral spreading is a phenomenon in which soils move laterally during seismic shaking and is often associated with liquefaction. The amount of movement depends on the soil strength, duration and intensity of seismic shaking, topography, and free face geometry. Due to the relatively flat site topography and low liquefaction potential, we judge the likelihood of lateral spreading to be low.

7.6 Landslides

There are no known landslides at the site, nor is the site in the path of any known or potential landslides. We do not consider the potential for a landslide to be a hazard to this project.

7.7 Tsunamis and Seiches

The site is not located within a coastal area. Therefore, tsunamis (seismic sea waves) are not considered a significant hazard at the site. Seiches are large waves generated in enclosed bodies of water in response to ground shaking. No major water-retaining structures are located immediately up gradient from the project site. Flooding from a seismically-induced seiche is considered unlikely.

8. SOIL AND GROUNDWATER CONDITIONS

8.1 Subsurface Conditions

The subsurface conditions encountered appear typical of those found in the geologic region of the site. In general, the soils within the depth of exploration consisted of alluvium deposits of very loose to dense silty sand with various amounts of clay and gravel, and dense to very dense silty clayey sand.

Fill soils maybe present on-site between our test boring locations. Verification of the extent of fill should be determined during site grading. Field and laboratory tests suggest that the deeper native soils are moderately strong and slightly compressible.

The soils were classified in the field during the drilling and sampling operations. The stratification lines were approximated by the field engineer on the basis of observations made at the time of drilling. The actual boundaries between different soil types may be gradual and soil conditions may vary. For a more detailed description of the materials encountered, the Boring Logs in Appendix "A" should be consulted.

The Boring Logs include the soil type, color, moisture content, dry density, and the applicable Unified Soil Classification System symbol. The locations of the test borings were determined by measuring from feature shown on the Site Plan, provided to us. Hence, accuracy can be implied only to the degree that this method warrants.

8.2 Groundwater

The test boring locations were checked for the presence of groundwater during and after the drilling operations. Free groundwater was not encountered during this investigation.

It should be recognized that water table elevations may fluctuate with time, being dependent upon seasonal precipitation, irrigation, land use, localized pumping, and climatic conditions as well as other factors. Therefore, water level observations at the time of the field investigation may vary from those encountered during the construction phase of the project. The evaluation of such factors is beyond the scope of this report.

8.3 Soil Corrosion Screening

Excessive sulfate in either the soil or native water may result in an adverse reaction between the cement in concrete and the soil. The 2011 Edition of ACI 318 (ACI 318) has established criteria for evaluation of sulfate and chloride levels and how they relate to cement reactivity with soil and/or water.

A soil sample was obtained from the project site and was tested for the evaluation of the potential for concrete deterioration or steel corrosion due to attack by soil-borne soluble salts and soluble chloride. The water-soluble sulfate concentration in the saturation extract from the soil sample was detected to be 50 mg/kg. ACI 318 Tables 4.2.1 and 4.3.1 outline exposure categories, classes, and concrete requirements by exposure class. ACI 318 requirements for site concrete based upon soluble sulfate are summarized in Table 8.3 below.

TABLE 8.3
WATER SOLUBLE SULFATE EXPOSURE REQUIREMENTS

Water Soluble Sulfate (SO_4) in Soil, Percentage by Weight	Exposure Severity	Exposure Class	Maximum w/cm Ratio	Minimum Concrete Compressive Strength	Cementitious Materials Type
0.005	Not Applicable	S0	N/A	2,500 psi	No Restriction

The water-soluble chloride concentration detected in saturation extract from the soil samples was 21 mg/kg. This level of chloride concentration is not considered to be severely corrosive.

It is recommended that a qualified corrosion engineer be consulted regarding protection of buried steel or ductile iron piping and conduit or, at a minimum, applicable manufacturer's recommendations for corrosion protection of buried metal pipe be closely followed.

8.4 Percolation Testing

Four percolation tests (P-1 through P-4) were performed within assumed infiltration areas and were conducted in accordance with in accordance with the guidelines established by the County of Riverside. The approximate locations of the percolation tests are shown on the attached Site Plan, Figure 2.

Four (4) 8-inch diameter boreholes were advanced to the depths shown on the percolation test worksheets. The holes were pre-saturated before percolation testing commenced. Percolation rates were measured by filling the test holes with clean water and measuring the water drops at a certain time interval.

The percolation rate data are presented in tabular format at the end of this Report. The difference in the percolation rates are reflected by the varied type of soil materials at the bottom of the test holes. The percolation rates were converted to infiltration rates using the "Porchet Method" according to County Design handbook. The test results are shown on the table below.

PERCOLATION TEST RESULTS

Test No.	Depth (feet)	Measured Percolation Rate (min/inch)	Infiltration Rate* (inch/hour)	Soil Type
P-1	8	7.6	**1.43**	Silty SAND (SM)
P-2	10	25.0	**0.55**	Silty SAND (SM)
P-3	8	25.0	**0.51**	Silty SAND (SM)
P-4	10	7.6	**1.27**	Silty SAND (SM)

*** Tested infiltration Rate = $(\Delta H\ 60\ r) / (\Delta t(r + 2H_{avg}))$**

The soil infiltration or percolation rates are based on tests conducted with clear water. The infiltration/percolation rates may vary with time as a result of soil clogging from water impurities. The infiltration/percolation rates will deteriorate over time due to the soil conditions.

The soils may also become less permeable to impermeable if the soil is compacted. Thus, periodic maintenance consisting of clearing the bottom of the drainage system of clogged soils should be expected. The infiltration/percolation rate may become slower if the surrounding soil is wet or saturated due to prolonged rainfalls. Additional percolation tests may be conducted at bottom of the drainage system during construction to verify the infiltration/percolation rate. Groundwater, if closer to the bottom of the drainage system, will also reduce the infiltration/percolation rate.

The scope of our services did not include a groundwater study and was limited to the performance of percolation testing and soil profile description, and the submitted data only. Our services did not include those associated with septic system design. Neither did services include an Environmental Site Assessment for the presence or absence of hazardous and/or toxic materials in the soil, groundwater, or atmosphere; or the presence of wetlands.

Any statements, or absence of statements, in this report or on any boring logs regarding odors, unusual or suspicious items, or conditions observed, are strictly for descriptive purposes and are not intended to convey engineering judgment regarding potential hazardous and/or toxic assessment.

The geotechnical engineering information presented herein is based upon professional interpretation utilizing standard engineering practices. The work conducted through the course of this investigation, including the preparation of this report, has been performed in accordance with the generally accepted standards of geotechnical engineering practice, which existed in the geographic area at the time the report was written. No other warranty, express or implied, is made.

Please be advised that when performing percolation testing services in relatively small diameter borings, that the testing may not fully model the actual full scale long term performance of a given site. This is particularly true where percolation test data is to be used in the design of large infiltration system such as may be proposed for the site. The measured percolation rate includes dispersion of the water at the sidewalls of the boring as well as into the underlying soils. Subsurface conditions, including percolation rates, can change over time as fine-grained soils migrate. It is not warranted that such information and interpretation cannot be superseded by future geotechnical engineering developments. We emphasize that this report is valid for the project outlined above and should not be used for any other sites.

9. CONCLUSIONS AND RECOMMENDATIONS

9.1 General

9.1.1 Based upon the data collected during this investigation, and from a geotechnical engineering standpoint, it is our opinion that the site is suitable for the proposed construction of improvements at the site as planned, provided the recommendations contained in this report are incorporated into the project design and construction. Conclusions and recommendations provided in this report are based on our review of available literature, analysis of data obtained from our field exploration and laboratory testing program, and our understanding of the proposed development at this time.

9.1.2 The primary geotechnical constraints identified in our investigation is the presence of loose and potentially compressible material at the site. Recommendations to mitigate the effects of these soils are provided in this report.

9.1.3 Fill soils may be present on-site between our test boring locations. Undocumented fill materials are not suitable to support any future structures and should be replaced with Engineered Fill. Prior to fill placement, Salem Engineering Group, Inc. should inspect the bottom of the excavation to verify the fill condition.

9.1.4 Site demolition activities shall include removal of all surface obstructions not intended to be incorporated into final site design. In addition, underground buried structures and/or utility lines encountered during demolition and construction should be properly removed and the resulting excavations backfilled with Engineered Fill. It is suspected that possible demolition activities of the existing structures may disturb the upper soils. After demolition activities, it is recommended that disturbed soils be removed and/or recompacted.

9.1.5 The near-surface onsite soils are moisture-sensitive and are moderately to highly compressible (collapsible soil) under saturated conditions. Structures within the project vicinity have experienced excessive post-construction settlement, when the foundation soils become near saturated. The collapsible or weak soils should be removed and recompacted according to the recommendations in the Grading section of this report (Section 9.5).

9.1.6 Based on the subsurface conditions at the site and the anticipated structural loading, we anticipate that the proposed building may be supported using conventional shallow foundations provided that the recommendations presented herein are incorporated in the design and construction of the project.

9.1.7 Provided the site is graded in accordance with the recommendations of this report and foundations constructed as described herein, we estimate that total settlement due to static loads utilizing conventional shallow foundations for the proposed building will be within 1 inch and corresponding differential settlement will be less than ½ inch.

9.1.8 All references to relative compaction and optimum moisture content in this report are based on ASTM D 1557 (latest edition).

9.1.9 SALEM shall review the project grading and foundation plans prior to final design submittal to assess whether our recommendations have been properly implemented and evaluate if additional analysis and/or recommendations are required. If SALEM is not provided plans and specifications for review, we cannot assume any responsibility for the future performance of the project.

9.1.10 SALEM shall be present at the site during site demolition and preparation to observe site clearing/demolition, preparation of exposed surfaces after clearing, and placement, treatment and compaction of fill material.

9.1.11 SALEM's observations should be supplemented with periodic compaction tests to establish substantial conformance with these recommendations. Moisture content of footings and slab subgrade should be tested immediately prior to concrete placement. SALEM should observe foundation excavations prior to placement of reinforcing steel or concrete to assess whether the actual bearing conditions are compatible with the conditions anticipated during the preparation of this report.

9.2 Seismic Design Criteria

9.2.1 For seismic design of the structures, and in accordance with the seismic provisions of the 2016 CBC, our recommended parameters are shown below. These parameters are based on Probabilistic Ground Motion of 2% Probability of Exceedance in 50 years. The Site Class was determined based on the results of our field exploration.

TABLE 9.2.1
SEISMIC DESIGN PARAMETERS

Seismic Item	Symbol	Value	2016 CBC Reference
Site Coordinates (Datum = NAD 83)		33.8958 Lat -117.1833 Lon	
Site Class	--	D	ASCE 7 Table 20.3
Soil Profile Name	--	Stiff Soil	ASCE 7 Table 20.3
Risk Category	--	II	CBC Table 1604.5
Site Coefficient for PGA	F_{PGA}	1.200	ASCE 7 Table 11.8-1
Peak Ground Acceleration (adjusted for Site Class effects)	PGA_M	0.871 g	ASCE 7 Equation 11.8-1
Seismic Design Category	SDC	D	ASCE 7 Table 11.6-1 & 2
Mapped Spectral Acceleration (Short period - 0.2 sec)	S_S	1.715 g	CBC Figure 1613.3.1(1-6)
Mapped Spectral Acceleration (1.0 sec. period)	S_1	0.670 g	CBC Figure 1613.3.1(1-6)
Site Class Modified Site Coefficient	F_a	1.200	CBC Table 1613.3.3(1)
Site Class Modified Site Coefficient	F_v	1.700	CBC Table 1613.3.3(2)
MCE Spectral Response Acceleration (Short period - 0.2 sec) $S_{MS} = F_a S_S$	S_{MS}	2.058 g	CBC Equation 16-37
MCE Spectral Response Acceleration (1.0 sec. period) $S_{M1} = F_v S_1$	S_{M1}	1.139 g	CBC Equation 16-38
Design Spectral Response Acceleration $S_{DS}=\frac{2}{3}S_{MS}$ (short period - 0.2 sec)	S_{DS}	1.372 g	CBC Equation 16-39
Design Spectral Response Acceleration $S_{D1}=\frac{2}{3}S_{M1}$ (1.0 sec. period)	S_{D1}	0.759 g	CBC Equation 16-40

9.2.2 Conformance to the criteria in the above table for seismic design does not constitute any kind of guarantee or assurance that significant structural damage or ground failure will not occur if a large earthquake occurs. The primary goal of seismic design is to protect life, not to avoid all damage, since such design may be economically prohibitive.

9.3 Soil and Excavation Characteristics

9.3.1 Based on the soil conditions encountered in our soil borings, the onsite soils can be excavated with moderate to laborious effort using conventional heavy-duty or special excavation and earthmoving equipment.

9.3.2 It is the responsibility of the contractor to ensure that all excavations and trenches are properly shored and maintained in accordance with applicable Occupational Safety and Health Administration (OSHA) rules and regulations to maintain safety and maintain the stability of adjacent existing improvements. Temporary excavations are further discussed in a later Section of this report.

9.3.3 The upper soils within the project site are identified primarily as silty sands and clayey sands. The sandy soils are moisture-sensitive and moderately collapsible under saturated conditions. These soils, in their present condition, possess moderate risk to construction in terms of possible post-construction movement of the foundations and floor systems if no mitigation measures are employed. Accordingly, measures are considered necessary to reduce anticipated expansion and collapse potential.

As recommended in Section 9.5, the collapsible soils should be removed and replaced with properly moisture conditioned and compacted Engineered Fill. Mitigation measures will not eliminate post-construction soil movement, but will reduce the soil movement. Success of the mitigation measures will depend on the thoroughness of the contractor in dealing with the soil conditions.

9.3.4 The near surface soils identified as part of our investigation are, generally, slightly moist to moist due to the absorption characteristics of the soil. Earthwork operations may encounter very moist unstable soils which may require removal to a stable bottom. Exposed native soils exposed as part of site grading operations shall not be allowed to dry out and should be kept continuously moist prior to placement of subsequent fill.

9.4 Materials for Fill

9.4.1 Excavated soils generated from cut operations at the site are suitable for use as general Engineered Fill in structural areas, provided they do not contain deleterious matter, organic material, or rock material larger than 3 inches in maximum dimension.

9.4.2 The preferred materials specified for Engineered Fill are suitable for most applications with the exception of exposure to erosion. Project site winterization and protection of exposed soils during the construction phase should be the sole responsibility of the Contractor, since they have complete control of the project site.

9.4.3 Import soil shall be well-graded, slightly cohesive silty fine sand or sandy silt, with relatively impervious characteristics when compacted. A clean sand or very sandy soil is not acceptable for this purpose. This material should be approved by the Engineer prior to use and should typically possess the soil characteristics summarized below in Table 9.4.3.

TABLE 9.4.3
IMPORT FILL REQUIREMENTS

Minimum Percent Passing No. 200 Sieve	20
Maximum Percent Passing No. 200 Sieve	50
Minimum Percent Passing No. 4 Sieve	80
Maximum Particle Size	3"
Maximum Plasticity Index	10
Maximum CBC Expansion Index	15

9.4.4 Environmental characteristics and corrosion potential of import soil materials should also be considered.

9.4.5 Proposed import materials should be sampled, tested, and approved by SALEM prior to its transportation to the site.

9.5 Grading

9.5.1 A representative of our firm should be present during all site clearing and grading operations to test and observe earthwork construction. This testing and observation is an integral part of our service as acceptance of earthwork construction is dependent upon compaction of the material and the stability of the material. The Geotechnical Engineer may reject any material that does not meet compaction and stability requirements. Further recommendations of this report are predicated upon the assumption that earthwork construction will conform to recommendations set forth in this section as well as other portions of this report.

9.5.2 A preconstruction conference should be held at the site prior to the beginning of grading operations with the owner, contractor, civil engineer and geotechnical engineer in attendance.

9.5.3 Site preparation should begin with removal of existing surface/subsurface structures, underground utilities (as required), any existing uncertified fill, and debris. Excavations or depressions resulting from site clearing operations, or other existing excavations or depressions, should be restored with Engineered Fill in accordance with the recommendations of this report.

9.5.4 Surface vegetation consisting of grasses and other similar vegetation should be removed by stripping to a sufficient depth to remove organic-rich topsoil. The upper 2 to 4 inches of the soils containing, vegetation, roots and other objectionable organic matter encountered at the time of grading should be stripped and removed from the surface. Deeper stripping may be required in localized areas. In addition, existing concrete and asphalt materials shall be removed from areas of proposed improvements and stockpiled separately from excavated soil material. The stripped vegetation, asphalt and concrete materials will not be suitable for use as Engineered Fill or within 5 feet of building pads or within pavement areas. However, stripped topsoil may be stockpiled and reused in landscape or non-structural areas or exported from the site.

9.5.5 Structural building pad areas should be considered as areas extending a minimum of 5 feet horizontally beyond the outside dimensions of building, including footings and non-cantilevered overhangs carrying structural loads.

9.5.6 To minimize post-construction soil movement and provide uniform support for the proposed building, overexcavation and recompaction within the proposed building areas should be performed to a minimum depth of **five (5) feet** below existing grade or **three (3) feet** below proposed footing bottom, whichever is deeper. The overexcavation and recompaction should also extend laterally to a minimum of 5 feet beyond the outer edges of the proposed footings.

9.5.7 Within pavement areas, it is recommended that overexcavation and recompaction be performed to a minimum depth of **1.5 feet** below existing grade or proposed grade, whichever is deeper. Deeper overexcavation may be required in some local areas to removal all unsuitable materials.

The overexcavation and recompaction should also extend laterally to a minimum of 2 feet beyond the outer edges of the proposed pavement.

9.5.8 Any fill or disturbed soils encountered during grading should be removed and replaced with engineered fill. The actual depth of the overexcavation and recompaction should be determined by our field representative during construction.

9.5.9 Prior to placement of fill soils, the upper 8 to 10 inches of native subgrade soils should be scarified, moisture-conditioned to no less than the optimum moisture content and recompacted to a minimum of 95 percent of the maximum dry density based on ASTM D1557 Test Method latest edition.

9.5.10 All Engineered Fill (including scarified ground surfaces and backfill) should be placed in thin lifts which will allow for adequate bonding and compaction (typically 6 to 8 inches in loose thickness).

9.5.11 Engineered Fill soils should be placed, moisture conditioned to near optimum moisture content, and compacted to at least 95% relative compaction.

9.5.12 An integral part of satisfactory fill placement is the stability of the placed lift of soil. If placed materials exhibit excessive instability as determined by a SALEM field representative, the lift will be considered unacceptable and shall be remedied prior to placement of additional fill material. Additional lifts should not be placed if the previous lift did not meet the required dry density or if soil conditions are not stable.

9.5.13 Final pavement subgrade should be finished to a smooth, unyielding surface. We further recommend proof-rolling the subgrade with a loaded water truck (or similar equipment with high contact pressure) to verify the stability of the subgrade prior to placing aggregate base.

9.5.14 The most effective site preparation alternatives will depend on site conditions prior to grading. We should evaluate site conditions and provide supplemental recommendations immediately prior to grading, if necessary.

9.5.15 We do not anticipate groundwater or seepage to adversely affect construction if conducted during the drier moths of the year (typically summer and fall). However, groundwater and soil moisture conditions could be significantly different during the wet season (typically winter and spring) as surface soil becomes wet; perched groundwater conditions may develop. Grading during this time period will likely encounter wet materials resulting in possible excavation and fill placement difficulties. Project site winterization consisting of placement of aggregate base and protecting exposed soils during construction should be performed. If the construction schedule requires grading operations during the wet season, we can provide additional recommendations as conditions warrant.

9.5.16 Typical remedial measures include: discing and aerating the soil during dry weather; mixing the soil with dryer materials; removing and replacing the soil with an approved fill material or placement of crushed rocks or aggregate base material; or mixing the soil with an approved lime or cement product.

The most common remedial measure of stabilizing the bottom of the excavation due to wet soil condition is to reduce the moisture of the soil to near the optimum moisture content by having the subgrade soils scarified and aerated or mixed with drier soils prior to compacting. However, the drying process may require an extended period of time and delay the construction operation.

To expedite the stabilizing process, crushed rock may be utilized for stabilization provided this method is approved by the owner for the cost purpose.

If the use of crushed rock is considered, it is recommended that the upper soft and wet soils be replaced by 6 to 24 inches of ¾-inch to 1-inch crushed rocks. The thickness of the rock layer depends on the severity of the soil instability. The recommended 6 to 24 inches of crushed rock material will provide a stable platform. It is further recommended that lighter compaction equipment be utilized for compacting the crushed rock. A layer of geofabric is recommended to be placed on top of the compacted crushed rock to minimize migration of soil particles into the voids of the crushed rock, resulting in soil movement.

Although it is not required, the use of geogrid (e.g. Tensar TX 140) below the crushed rock will enhance stability and reduce the required thickness of crushed rock necessary for stabilization. Our firm should be consulted prior to implementing remedial measures to provide appropriate recommendations.

9.6 Shallow Foundations

9.6.1 The site is suitable for use of conventional shallow foundations consisting of continuous footings and isolated pad footings bearing in properly compacted Engineered Fill.

9.6.2 The bearing wall footings considered for the structure should be continuous with a minimum width of 15 inches and extend to a minimum depth of 18 inches below the lowest adjacent grade. Isolated column footings should have a minimum width of 24 inches and extend a minimum depth of 18 inches below the lowest adjacent grade.

9.6.3 The bottom of footing excavations should be maintained free of loose and disturbed soil. Footing concrete should be placed into a neat excavation.

9.6.4 For design purposes, total settlement due to static loading on the order of 1 inch may be assumed for shallow footings. Differential settlement due to static loading, along a 20-foot exterior wall footing or between adjoining column footings, should be ½ inch, producing an angular distortion of 0.002. Most of the settlement is expected to occur during construction as the loads are applied. However, additional post-construction settlement may occur if the foundation soils are flooded or saturated. The footing excavations should not be allowed to dry out any time prior to pouring concrete.

9.6.5 Footings proportioned as recommended above may be designed for the maximum allowable soil bearing pressures shown in the table below.

Loading Condition	Allowable Bearing
Dead Load Only	2,000 psf
Dead-Plus-Live Load	2,500 psf
Total Load, Including Wind or Seismic Loads	3,325 psf

9.6.6 Resistance to lateral footing displacement can be computed using an allowable coefficient of friction factor of 0.40 acting between the base of foundations and the supporting subgrade.

9.6.7 Lateral resistance for footings can alternatively be developed using an allowable equivalent fluid passive pressure of 400 pounds per cubic foot acting against the appropriate vertical native footing faces. The frictional and passive resistance of the soil may be combined without reduction in determining the total lateral resistance. An increase of one-third is permitted when using the alternate load combination in Section 1605.3.2 of the 2015 IBC/2016 CBC that includes wind or earthquake loads.

9.6.8 Underground utilities running parallel to footings should not be constructed in the zone of influence of footings. The zone of influence may be taken to be the area beneath the footing and within a 1:1 plane extending out and down from the bottom edge of the footing.

9.6.9 The foundation subgrade should be sprinkled as necessary to maintain a moist condition without significant shrinkage cracks as would be expected in any concrete placement. Prior to placing rebar reinforcement, foundation excavations should be evaluated by a representative of SALEM for appropriate support characteristics and moisture content. Moisture conditioning may be required for the materials exposed at footing bottom, particularly if foundation excavations are left open for an extended period.

9.7 Concrete Slabs-on-Grade

9.7.1 Slab thickness and reinforcement should be determined by the structural engineer based on the anticipated loading. We recommend that non-structural slabs-on-grade be at least 4 inches thick and underlain by six (6) inches of compacted granular aggregate subbase material compacted to at least 95% relative compaction.

9.7.2 Granular aggregate subbase material shall conform to ASTM D-2940, Latest Edition (Table 1, bases) with at least 95 percent passing a 1½-inch sieve and not more than 8% passing a No. 200 sieve or its approved equivalent to prevent capillary moisture rise.

9.7.3 We recommend reinforcing slabs, at a minimum, with No. 3 reinforcing bars placed 18 inches on center, each way.

9.7.4 Slabs subject to structural loading may be designed utilizing a modulus of subgrade reaction K of 180 pounds per square inch per inch. The K value was approximated based on inter-relationship of soil classification and bearing values (Portland Cement Association, Rocky Mountain Northwest).

9.7.5 The spacing of crack control joints should be designed by the project structural engineer. In order to regulate cracking of the slabs, we recommend that full depth construction joints or control joints be provided at a maximum spacing of 15 feet in each direction for 5-inch thick slabs and 12 feet for 4-inch thick slabs.

9.7.6 Crack control joints should extend a minimum depth of one-fourth the slab thickness and should be constructed using saw-cuts or other methods as soon as practical after concrete placement. The exterior floors should be poured separately in order to act independently of the walls and foundation system.

9.7.7 It is recommended that the utility trenches within the structure be compacted, as specified in our report, to minimize the transmission of moisture through the utility trench backfill. Special attention to the immediate drainage and irrigation around the structures is recommended.

9.7.8 Moisture within the structure may be derived from water vapors, which were transformed from the moisture within the soils. This moisture vapor penetration can affect floor coverings and produce mold and mildew in the structure. To minimize moisture vapor intrusion, it is recommended that a vapor retarder be installed in accordance with manufacturer's recommendations and/or ASTM guidelines, whichever is more stringent. In addition, ventilation of the structure is recommended to reduce the accumulation of interior moisture.

9.7.9 In areas where it is desired to reduce floor dampness where moisture-sensitive coverings are anticipated, construction should have a suitable waterproof vapor retarder (a minimum of 15 mils thick polyethylene vapor retarder sheeting, Raven Industries "VaporBlock 15, Stego Industries 15 mil "StegoWrap" or W.R. Meadows Sealtight 15 mil "Perminator") incorporated into the floor slab design. The water vapor retarder should be decay resistant material complying with ASTM E96 not exceeding 0.04 perms, ASTM E154 and ASTM E1745 Class A. The vapor barrier should be placed between the concrete slab and the compacted granular aggregate subbase material. The water vapor retarder (vapor barrier) should be installed in accordance with ASTM Specification E 1643-94.

9.7.10 The concrete maybe placed directly on vapor retarder. The vapor retarder should be inspected prior to concrete placement. Cut or punctured retarder should be repaired using vapor retarder material lapped 6 inches beyond damaged areas and taped.

9.7.11 The recommendations of this report are intended to reduce the potential for cracking of slabs due to soil movement. However, even with the incorporation of the recommendations presented herein, foundations, stucco walls, and slabs-on-grade may exhibit some cracking due to soil movement. This is common for project areas that contain expansive soils since designing to eliminate potential soil movement is cost prohibitive. The occurrence of concrete shrinkage cracks is independent of the supporting soil characteristics. Their occurrence may be reduced and/or controlled by limiting the slump of the concrete, proper concrete placement and curing, and by the placement of crack control joints at periodic intervals, in particular, where re-entrant slab corners occur.

9.7.12 Proper finishing and curing should be performed in accordance with the latest guidelines provided by the American Concrete Institute, Portland Cement Association, and ASTM.

9.8 Caisson Foundations

9.8.1 It is recommended that the caisson foundation should have a minimum depth of 12 feet below the lowest adjacent grade.

9.8.2 The caissons may be designed using an allowable sidewall friction of 160 psf. This value is for dead-plus-live loads. An allowable end bearing capacity of 3,000 psf may be used provided that the bottom of the caisson is cleaned with the use of a clean-out bucket or equivalent and inspected by our representative prior to placement of reinforcement and concrete. An increase of one-third is permitted when using the alternate load combination in Section 1605.3.2 of the CBC that includes wind or earthquake loads.

9.8.3 Uplift loads can be resisted by caissons using an allowable sidewall friction of 120 psf of the surface area and the weight of the caisson.

9.8.4 The total static settlement of the caisson footing is not expected to exceed 1 inches. Differential settlement should be less than ½ inch. Most of the settlement is expected to occur during construction as the loads are applied.

9.8.5 Lateral loads for caissons may be designed utilizing the Isolated Pole Formula and Specifications shown on Table 1804.2, Sections 1804.3.1 and 1808.2.2 of the California Building Code. The drilled caissons may be designed for a lateral capacity of 400 pounds per square foot per foot of depth below the lowest adjacent grade to a maximum of 6,000 psf.

9.8.6 The top one-foot of adjacent subgrade should be deleted from the passive pressure computation.

9.8.7 These values may be increased by one-third when using the alternative load combinations in Section 1605.3.2 of the IBC that include wind or earthquake loads. These values should not be doubled since the values given herein are higher than the tabular values shown on the Table 1804.2. The lateral loading criteria is based on the assumption that the load application is applied at the ground level, flexible cap connections applied and a minimum embedment depth of 10 feet.

9.8.8 Sandy soils were encountered at the site. Casing will be required during drilling of the caisson footings.

9.9 Lateral Earth Pressures and Frictional Resistance

9.9.1 Active, at-rest and passive unit lateral earth pressures against footings and walls are summarized in the table below:

Lateral Pressure Level Backfill and Drained Conditions	Equivalent Fluid Pressure, pcf
Active Pressure	35
At-Rest Pressure	55
Passive Pressure	400
Related Parameters	
Allowable Coefficient of Friction	0.40
In-Place Soil Density (lbs/ft^3)	120

9.9.2 Active pressure applies to walls, which are free to rotate. At-rest pressure applies to walls, which are restrained against rotation. The preceding lateral earth pressures assume sufficient drainage behind retaining walls to prevent the build-up of hydrostatic pressure.

9.9.3 The top one-foot of adjacent subgrade should be deleted from the passive pressure computation.

9.9.4 A safety factor consistent with the design conditions should be included when using the values in the above table.

9.9.5 For stability against lateral sliding, which is resisted solely by the passive pressure, we recommend a minimum safety factor of 1.5.

9.9.6 For stability against lateral sliding, which is resisted by the combined passive and frictional resistance, a minimum safety factor of 2.0 is recommended.

9.9.7 For lateral stability against seismic loading conditions, we recommend a minimum safety factor of 1.1.

9.9.8 For dynamic seismic lateral loading the following equation shall be used:

Dynamic Seismic Lateral Loading Equation
Dynamic Seismic Lateral Load = $\frac{3}{8}\gamma K_h H^2$
Where: γ = In-Place Soil Density
K_h = Horizontal Acceleration = $\frac{2}{3}PGA_M$
H = Wall Height

9.10 Retaining Walls

9.10.1 Retaining and/or below grade walls should be drained with either perforated pipe encased in free-draining gravel or a prefabricated drainage system. The gravel zone should have a minimum width of 12 inches wide and should extend upward to within 12 inches of the top of the wall. The upper 12 inches of backfill should consist of native soils, concrete, asphaltic-concrete or other suitable backfill to minimize surface drainage into the wall drain system. The gravel should conform to Class II permeable materials graded in accordance with the current CalTrans Standard Specifications.

9.10.2 Prefabricated drainage systems, such as Miradrain®, Enkadrain®, or an equivalent substitute, are acceptable alternatives in lieu of gravel provided they are installed in accordance with the manufacturer's recommendations. If a prefabricated drainage system is proposed, our firm should review the system for final acceptance prior to installation.

9.10.3 Drainage pipes should be placed with perforations down and should discharge in a non-erosive manner away from foundations and other improvements. The top of the perforated pipe should be placed at or below the bottom of the adjacent floor slab or pavements. The pipe should be placed in the center line of the drainage blanket and should have a minimum diameter of 4 inches. Slots should be no wider than 1/8-inch in diameter, while perforations should be no more than ¼-inch in diameter.

9.10.4 If retaining walls are less than 5 feet in height, the perforated pipe may be omitted in lieu of weep holes on 4 feet maximum spacing. The weep holes should consist of 2-inch minimum diameter holes (concrete walls) or unmortared head joints (masonry walls) and placed no higher than 18 inches above the lowest adjacent grade. Two 8-inch square overlapping patches of geotextile fabric (conforming to the CalTrans Standard Specifications for "edge drains") should be affixed to the rear wall opening of each weep hole to retard soil piping.

9.10.5 During grading and backfilling operations adjacent to any walls, heavy equipment should not be allowed to operate within a lateral distance of 5 feet from the wall, or within a lateral distance equal to the wall height, whichever is greater, to avoid developing excessive lateral pressures. Within this zone, only hand operated equipment ("whackers," vibratory plates, or pneumatic compactors) should be used to compact the backfill soils.

9.11 Temporary Excavations

9.11.1 We anticipate that the majority of the sandy site soils will be classified as Cal-OSHA "Type C" soil when encountered in excavations during site development and construction. Excavation sloping, benching, the use of trench shields, and the placement of trench spoils should conform to the latest applicable Cal-OSHA standards. The contractor should have a Cal-OSHA-approved "competent person" onsite during excavation to evaluate trench conditions and make appropriate recommendations where necessary.

9.11.2 It is the contractor's responsibility to provide sufficient and safe excavation support as well as protecting nearby utilities, structures, and other improvements which may be damaged by earth movements. All onsite excavations must be conducted in such a manner that potential surcharges from existing structures, construction equipment, and vehicle loads are resisted. The surcharge area may be defined by a 1:1 projection down and away from the bottom of an existing foundation or vehicle load.

9.11.3 Temporary excavations and slope faces should be protected from rainfall and erosion. Surface runoff should be directed away from excavations and slopes.

9.11.4 Open, unbraced excavations in undisturbed soils should be made according to the slopes presented in the following table:

RECOMMENDED EXCAVATION SLOPES

Depth of Excavation (ft)	Slope (Horizontal : Vertical)
0-5	1:1
5-10	2:1

9.11.5 If, due to space limitation, excavations near property lines or existing structures are performed in a vertical position, slot cuts, braced shorings or shields may be used for supporting vertical excavations. Therefore, in order to comply with the local and state safety regulations, a properly designed and installed shoring system would be required to accomplish planned excavations and installation. A Specialty Shoring Contractor should be responsible for the design and installation of such a shoring system during construction.

9.11.6 Braced shorings should be designed for a maximum pressure distribution of 30H, (where H is the depth of the excavation in feet). The foregoing does not include excess hydrostatic pressure or surcharge loading. Fifty percent of any surcharge load, such as construction equipment weight, should be added to the lateral load given herein. Equipment traffic should concurrently be limited to an area at least 3 feet from the shoring face or edge of the slope.

9.11.7 The excavation and shoring recommendations provided herein are based on soil characteristics derived from the borings within the area. Variations in soil conditions will likely be encountered during the excavations. SALEM Engineering Group, Inc. should be afforded the opportunity to provide field review to evaluate the actual conditions and account for field condition variations not otherwise anticipated in the preparation of this recommendation. Slope height, slope inclination, or excavation depth should in no case exceed those specified in local, state, or federal safety regulation, (e.g. OSHA) standards for excavations, 29 CFR part 1926, or Assessor's regulations.

9.12 Underground Utilities

9.12.1 Underground utility trenches should be backfilled with properly compacted material. The material excavated from the trenches should be adequate for use as backfill provided it does not contain deleterious matter, vegetation or rock larger than 3 inches in maximum dimension. Trench backfill should be placed in loose lifts not exceeding 8 inches and compacted to at least 95% relative compaction at or above optimum moisture content.

9.12.2 Bedding and pipe zone backfill typically extends from the bottom of the trench excavations to approximately 6 to 12 inches above the crown of the pipe. Pipe bedding and backfill material should conform to the requirements of the governing utility agency.

9.12.3 It is suggested that underground utilities crossing beneath new or existing structures be plugged at entry and exit locations to the buildings or structures to prevent water migration. Trench plugs can consist of on-site clay soils, if available, or sand cement slurry. The trench plugs should extend 2 feet beyond each side of individual perimeter foundations.

9.12.4 The contractor is responsible for removing all water-sensitive soils from the trench regardless of the backfill location and compaction requirements. The contractor should use appropriate equipment and methods to avoid damage to the utilities and/or structures during fill placement and compaction.

9.13 Surface Drainage

9.13.1 Proper surface drainage is critical to the future performance of the project. Uncontrolled infiltration of irrigation excess and storm runoff into the soils can adversely affect the performance of the planned improvements. Saturation of a soil can cause it to lose internal shear strength and increase its compressibility, resulting in a change to important engineering properties. Proper drainage should be maintained at all times.

9.13.2 The ground immediately adjacent to the foundation shall be sloped away from the building at a slope of not less than 5 percent for a minimum distance of 10 feet.

9.13.3 Impervious surfaces within 10 feet of the building foundation shall be sloped a minimum of 2 percent away from the building and drainage gradients maintained to carry all surface water to collection facilities and off site. These grades should be maintained for the life of the project. Ponding of water should not be allowed adjacent to the structure. Over-irrigation within landscaped areas adjacent to the structure should not be performed.

9.13.4 Roof drains should be installed with appropriate downspout extensions out-falling on splash blocks so as to direct water a minimum of 5 feet away from the structures or be connected to the storm drain system for the development.

9.14 Pavement Design

9.14.1 Based on site soil conditions, an R-value of 40 was used for the preliminary flexible asphaltic concrete pavement design. The R-value may be verified during grading of the pavement areas.

9.14.2 The pavement design recommendations provided herein are based on the State of California Department of Transportation (CALTRANS) design manual. The asphaltic concrete (flexible pavement) is based on a 20-year pavement life utilizing 1200 passenger vehicles, 10 single unit trucks, and 2 multi-unit trucks. The following table shows the recommended pavement sections for various traffic indices.

TABLE 9.14.2
ASPHALT CONCRETE PAVEMENT THICKNESSES

Traffic Index	Asphaltic Concrete	Class II Aggregate Base*	Compacted Subgrade*
5.0 (Parking and Vehicle Drive Areas)	2.5"	5.0"	18.0"
6.0 (Heavy Truck Areas)	3.0"	6.0"	18.0"

95% compaction based on ASTM D1557-07 Test Method or Cal 216

9.14.3 The following recommendations are for light-duty and heavy-duty Portland Cement Concrete pavement sections.

TABLE 9.14.3
PORTLAND CEMENT CONCRETE PAVEMENT THICKNESSES

Traffic Index	Portland Cement Concrete*	Class II Aggregate Base**	Compacted Subgrade**
5.0 (Light Duty)	5.0"	5.0"	18.0"
6.0 (Heavy Duty)	6.0"	5.0"	18.0"

**** Minimum Compressive Strength of 4,000 psi***
***** 95% compaction based on ASTM D1557-07 Test Method or Cal 216***

10. PLAN REVIEW, CONSTRUCTION OBSERVATION AND TESTING

10.1 Plan and Specification Review

10.1.1 SALEM should review the project plans and specifications prior to final design submittal to assess whether our recommendations have been properly implemented and evaluate if additional analysis and/or recommendations are required.

10.2 Construction Observation and Testing Services

10.2.1 The recommendations provided in this report are based on the assumption that we will continue as Geotechnical Engineer of Record throughout the construction phase. It is important to maintain continuity of geotechnical interpretation and confirm that field conditions encountered are similar to those anticipated during design. If we are not retained for these services, we cannot assume any responsibility for others interpretation of our recommendations, and therefore the future performance of the project.

10.2.2 SALEM should be present at the site during site preparation to observe site clearing, preparation of exposed surfaces after clearing, and placement, treatment and compaction of fill material.

10.2.3 SALEM's observations should be supplemented with periodic compaction tests to establish substantial conformance with these recommendations. Moisture content of footings and slab subgrade should be tested immediately prior to concrete placement. SALEM should observe foundation excavations prior to placement of reinforcing steel or concrete to assess whether the actual bearing conditions are compatible with the conditions anticipated during the preparation of this report.

11. LIMITATIONS AND CHANGED CONDITIONS

The analyses and recommendations submitted in this report are based upon the data obtained from the test borings drilled at the approximate locations shown on the Site Plan, Figure 2. The report does not reflect variations which may occur between borings. The nature and extent of such variations may not become evident until construction is initiated.

If variations then appear, a re-evaluation of the recommendations of this report will be necessary after performing on-site observations during the excavation period and noting the characteristics of such variations. The findings and recommendations presented in this report are valid as of the present and for the proposed construction. If site conditions change due to natural processes or human intervention on the property or adjacent to the site, or changes occur in the nature or design of the project, or if there is a substantial time lapse between the submission of this report and the start of the work at the site, the conclusions and recommendations contained in our report will not be considered valid unless the changes are reviewed by SALEM and the conclusions of our report are modified or verified in writing.

The validity of the recommendations contained in this report is also dependent upon an adequate testing and observations program during the construction phase. Our firm assumes no responsibility for construction compliance with the design concepts or recommendations unless we have been retained to perform the on-site testing and review during construction. SALEM has prepared this report for the exclusive use of the owner and project design consultants.

SALEM does not practice in the field of corrosion engineering. It is recommended that a qualified corrosion engineer be consulted regarding protection of buried steel or ductile iron piping and conduit or, at a minimum, that manufacturer's recommendations for corrosion protection be closely followed. Further, a corrosion engineer may be needed to incorporate the necessary precautions to avoid premature corrosion of concrete slabs and foundations in direct contact with native soil.

The importation of soil and or aggregate materials to the site should be screened to determine the potential for corrosion to concrete and buried metal piping. The report has been prepared in accordance with generally accepted geotechnical engineering practices in the area. No other warranties, either express or implied, are made as to the professional advice provided under the terms of our agreement and included in this report.

If you have any questions, or if we may be of further assistance, please do not hesitate to contact our office at (909) 980-6455.

Respectfully Submitted,

SALEM ENGINEERING GROUP, INC.

Ibrahim Ibrahim, MS, PE
Geotechnical Staff Engineer
RCE 86724

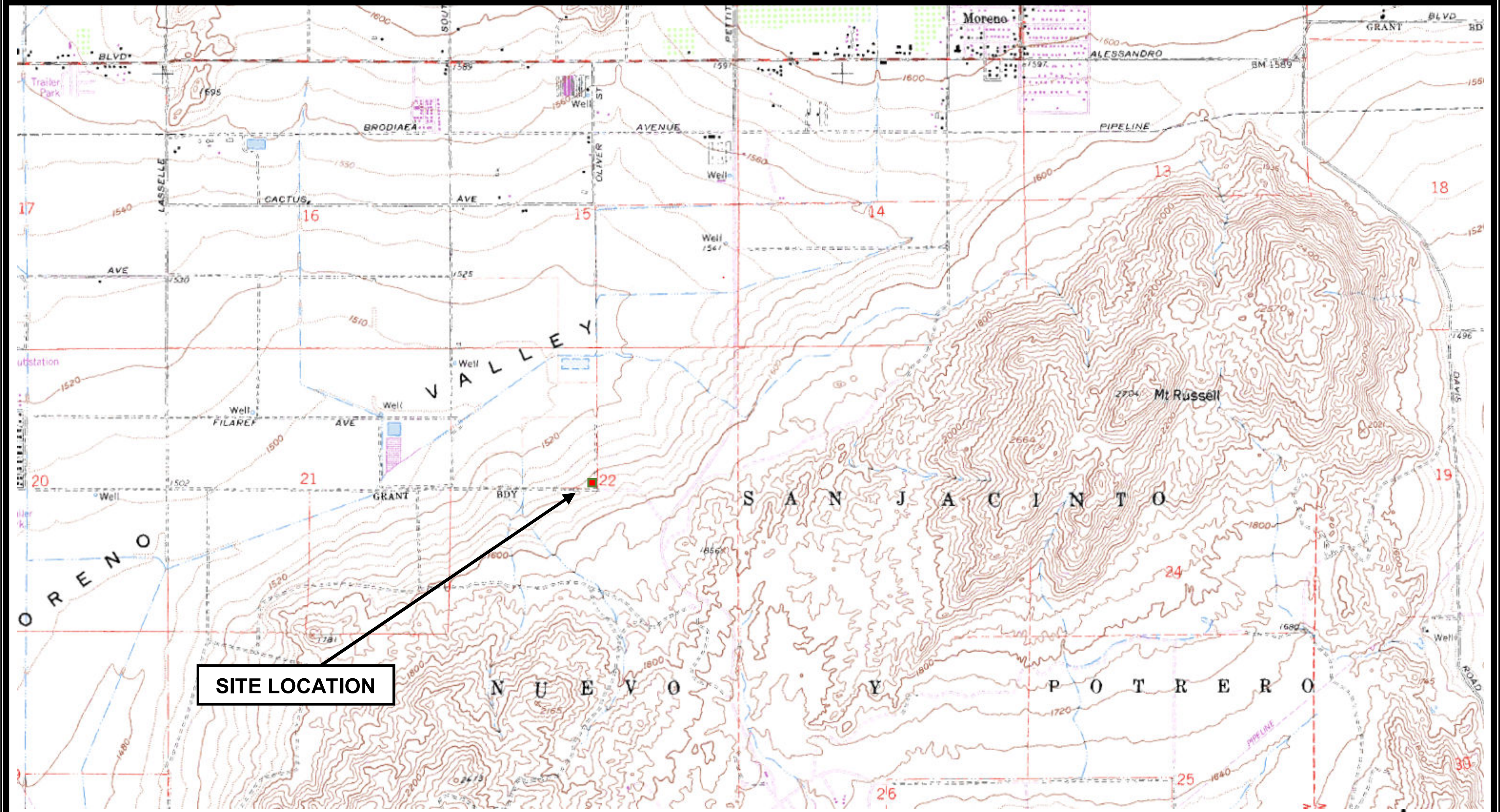
REGISTERED PROFESSIONAL ENGINEER
IBRAHIM FOUD IBRAHIM
C 86724
EXP. 3/31/19
CIVIL
STATE OF CALIFORNIA

Clarence Jiang, GE
Senior Geotechnical Engineer
RGE 2477

REGISTERED PROFESSIONAL ENGINEER
CLARENCE T. JIANG
No. 2477
Exp. 06/30/19
GEOTECHNICAL
STATE OF CALIFORNIA

R. Sammy Salem, MS, PE, GE
Principal Engineer
RCE 52762 / RGE 2549

REGISTERED PROFESSIONAL ENGINEER
R. SAMMY SALEM
GE 2549
Exp. Dec. 31, 2018
GEOTECHNICAL
STATE OF CALIFORNIA



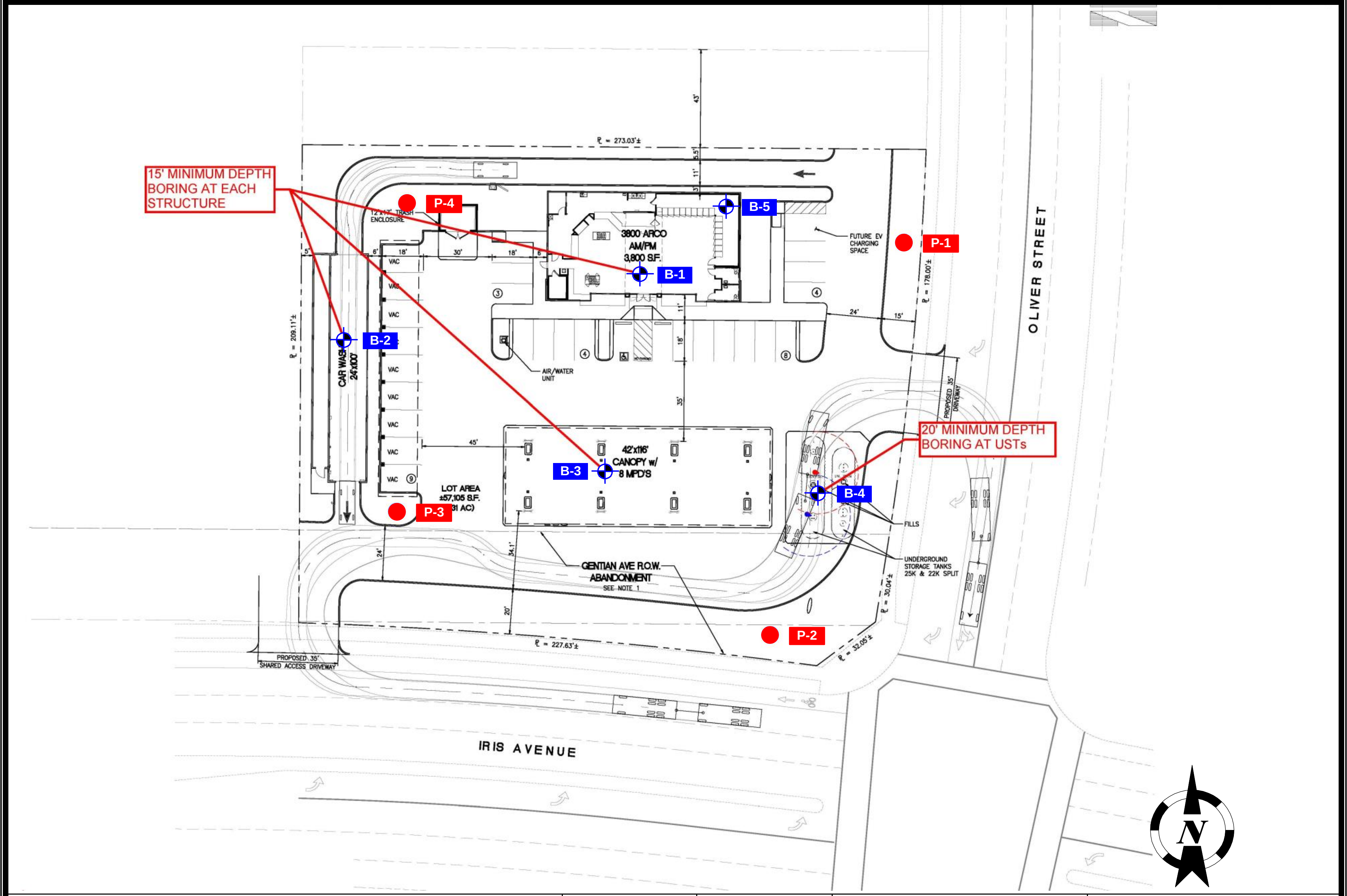
Source Image: U.S. Geological Survey, Sunnymead, Calif. 7.5’ Quadrangle, 1967 (Photo Revised 1980)

VICINITY MAP

GEOTECHNICAL ENGINEERING INVESTIGATION
Proposed Arco Station
NWC Iris Avenue & Oliver Street
Moreno Valley, California

SCALE: NOT TO SCALE	DATE: 11/2017
DRAWN BY: II	APPROVED BY: CJ
PROJECT NO. 3-217-1265	FIGURE NO. 1

SALEM
engineering group, inc.



SITE PLAN

GEOTECHNICAL ENGINEERING INVESTIGATION
Proposed Arco Station
NWC Iris Avenue & Oliver Street
Moreno Valley, California

SCALE: NOT TO SCALE	DATE: 11/2017
DRAWN BY: II	APPROVED BY: CJ
PROJECT NO. 3-217-1265	FIGURE NO. 2

LEGEND:

⊕ B-1	Soil Boring Location
● P-1	Percolation Location

All Locations Approximate

SALEM engineering group, inc.

APPENDIX

A

APPENDIX A
FIELD EXPLORATION

Fieldwork for our investigation (drilling) was conducted on November 14, 2017 and included a site visit, subsurface exploration, and soil sampling. Percolation tests were performed on November 15, 2017. The locations of the exploratory borings and percolation tests are shown on the Site Plan, Figure 2. Boring logs for our exploration are presented in figures following the text in this appendix. Borings were located in the field using existing reference points. Therefore, actual boring locations may deviate slightly.

In general, our borings were performed using a truck-mounted CME 45C drill rig equipped with an 8-inch and a 6-inch hollow-stem augers and a 4-inch diameter solid flight auger. Sampling in the borings was accomplished using a hydraulic 140-pound hammer with a 30-inch drop. Samples were obtained with a 3-inch outside-diameter (OD), split spoon (California Modified) sampler, and a 2-inch OD, Standard Penetration Test (SPT) sampler. The number of blows required to drive the sampler the last 12 inches (or fraction thereof) of the 18-inch sampling interval were recorded on the boring logs. The blow counts shown on the boring logs should not be interpreted as standard SPT “N” values; corrections have not been applied. Upon completion, the borings were backfilled with soil cuttings.

Subsurface conditions encountered in the exploratory borings were visually examined, classified and logged in general accordance with the American Society for Testing and Materials (ASTM) Practice for Description and Identification of Soils (Visual-Manual Procedure D2488). This system uses the Unified Soil Classification System (USCS) for soil designations. The logs depict soil and geologic conditions encountered and depths at which samples were obtained. The logs also include our interpretation of the conditions between sampling intervals. Therefore, the logs contain both observed and interpreted data. We determined the lines designating the interface between soil materials on the logs using visual observations, drill rig penetration rates, excavation characteristics and other factors. The transition between materials may be abrupt or gradual. Where applicable, the field logs were revised based on subsequent laboratory testing.

Unified Soil Classification System

Major Divisions			Letter	Symbol	Description
Coarse-grained Soils **More than ½ retained on the No. 200 Sieve**	**Gravels** More than ½ coarse fraction retained on the No. 4 sieve	Clean Gravels	GW	⁘	Well-graded gravels and gravel-sand mixtures, little or no fines.
			GP	⁘	Poorly-graded gravels and gravel-sand mixtures, little or no fines.
		Gravels With Fines	GM	▥	Silty gravels, gravel-sand-silt mixtures.
			GC	▨	Clayey gravels, gravel-sand-clay mixtures.
	Sands More than ½ passing through the No. 200 sieve	Clean Sands	SW	░	Well-graded sands and gravelly sands, little or no fines.
			SP	░	Poorly-graded sands and gravelly sands, little or no fines.
		Sands With Fines	SM	▥	Silty sands, sand-silt mixtures
			SC	▨	Clayey sands, sandy-clay mixtures.
Fine-grained Soils **More than ½ passing through the No. 200 Sieve**	**Silts and Clays** Liquid Limit less than 50%		ML	▥	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands.
			CL	▨	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	▥	Organic clays of medium to high plasticity.
	Silts and Clays Liquid Limit greater than 50%		MH	▥	Inorganic silts, micaceous or diatomaceous fines sands or silts, elastic silts.
			CH	▨	Inorganic clays of high plasticity, fat clays.
			OH	▨	Organic clays of medium to high plasticity.
Highly Organic Soils			PT	☰	Peat, muck, and other highly organic soils.

Consistency Classification

Granular Soils

Description - Blows Per Foot (Corrected)

	MCS	SPT
Very loose	<5	<4
Loose	5 - 15	4 - 10
Medium dense	16 - 40	11 - 30
Dense	41 - 65	31 - 50
Very dense	>65	>50

Cohesive Soils

Description - Blows Per Foot (Corrected)

	MCS	SPT
Very soft	<3	<2
Soft	3 - 5	2 - 4
Firm	6 - 10	5 - 8
Stiff	11 - 20	9 - 15
Very Stiff	21 - 40	16 - 30
Hard	>40	>30

MCS = Modified California Sampler

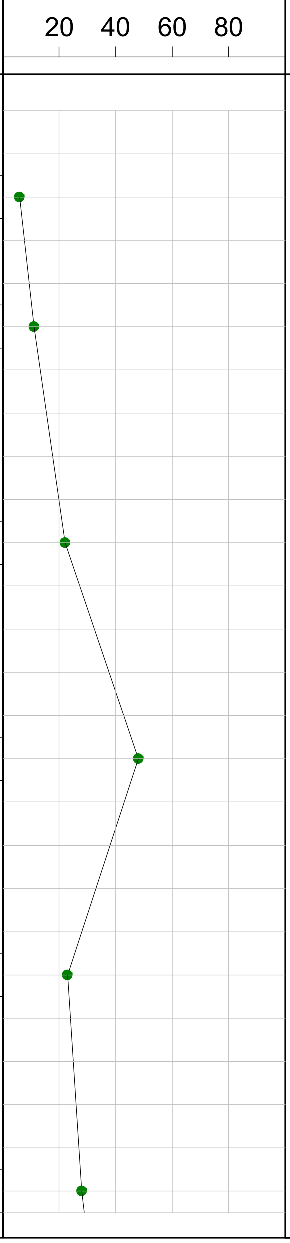
SPT = Standard Penetration Test Sampler

Boring No. B-1

Project: Proposed Arco Station
Client: Sater Oil International, LLC
Location: NWC Iris Avenue & Oliver Street, Moreno Valley, CA
Grnd. Surf. Elev. (Ft. MSL) N/A

Project No: 3-217-1265
Figure No.: A-1
Logged By: JH
Depth to Water> Initial: None
At Completion: None

SUBSURFACE PROFILE			SAMPLE						
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture Content (%)	Sampler Type	Penetration	Blow Count	Penetration Test	Water Level
		Ground Surface							
0		**Silty SAND (SM)** Loose; brown; moist; fine to medium-grained.							
			82.4	10.5	MCS	🟦	6		
5		Grades as above.	111.2	3.1	MCS	🟦	11		
10		Grades as above; medium dense.	109.1	4.6	MCS	🟦	22		
		Silty Clayey SAND (SC) Dense; brown-orange; moist; fine to medium-grained; low plasticity.							
15			--	9.6	SPT	🟦	48		
		Silty SAND (SM) Medium dense; brown; moist; fine to medium-grained.							
20			--	4.2	SPT	🟦	23		
25		Grades as above.	--	4.9	SPT	🟦	28		



Drill Method: Hollow Stem Auger
Drill Rig: CME 45C
Driller: Salem Engineering Group, Inc.
Sheet: 1 of 2

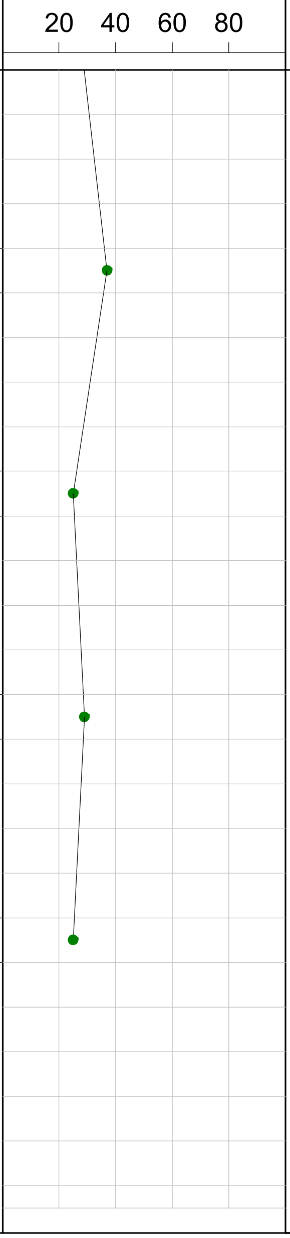
Drill Date: 11/14/2017
Borehole Size: 6 Inches
Hammer Type: Auto Trip
Weight & Drop: 140 lbs./30 in.

Boring No. B-1

Project: Proposed Arco Station
Client: Sater Oil International, LLC
Location: NWC Iris Avenue & Oliver Street, Moreno Valley, CA
Grnd. Surf. Elev. (Ft. MSL) N/A

Project No: 3-217-1265
Figure No.: A-1
Logged By: JH
Depth to Water> **Initial:** None
At Completion: None

SUBSURFACE PROFILE			SAMPLE						
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture Content (%)	Sampler Type	Penetration	Blow Count	Penetration Test	Water Level
30		Grades as above; dense.	--	5.6	SPT	■	37		
35		Grades as above; medium dense.	--	4.9	SPT	■	25		
40		Grades as above; with trace of clay.	--	5.9	SPT	■	29		
45		Grades as above.	--	5.9	SPT	■	25		
50		Grades as above. End of Borehole							



Drill Method: Hollow Stem Auger
Drill Rig: CME 45C
Driller: Salem Engineering Group, Inc.
Sheet: 2 of 2

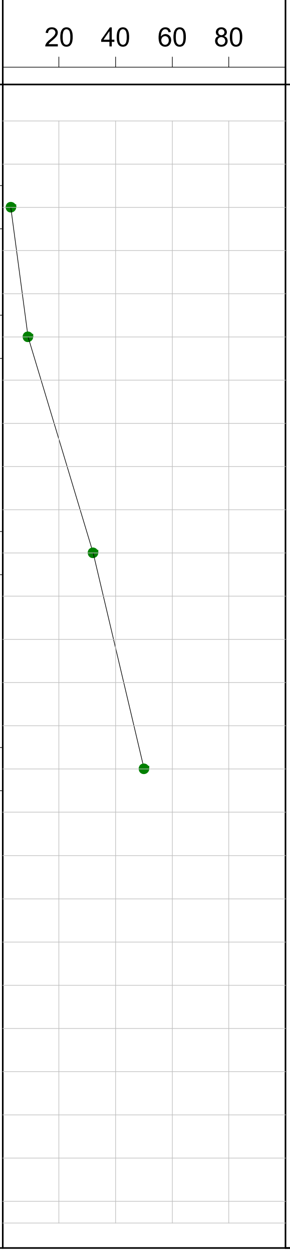
Drill Date: 11/14/2017
Borehole Size: 6 Inches
Hammer Type: Auto Trip
Weight & Drop: 140 lbs./30 in.

Boring No. B-2

Project: Proposed Arco Station
Client: Sater Oil International, LLC
Location: NWC Iris Avenue & Oliver Street, Moreno Valley, CA
Grnd. Surf. Elev. (Ft. MSL) N/A

Project No: 3-217-1265
Figure No.: A-2
Logged By: JH
Depth to Water> **Initial:** None
At Completion: None

SUBSURFACE PROFILE			SAMPLE						
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture Content (%)	Sampler Type	Penetration	Blow Count	Penetration Test	Water Level
		Ground Surface							
0		**Silty SAND (SM) with trace of Gravel** Very loose; brown; moist; fine to coarse-grained.	104.0	4.8	MCS	🟦	3		
5		**Silty SAND (SM)** Loose; brown; moist; fine to medium-grained.	108.8	5.4	MCS	🟦	9		
10		Grades as above; medium dense.	109.8	4.1	MCS	🟦	32		
		Silty Clayey SAND (SC) Very dense; brown; moist; fine to medium-grained.							
15			--	8.4	SPT	🟦	50		
		End of Borehole							
20									
25									



Drill Method: Solid Flight Auger
Drill Rig: CME 45C
Driller: Salem Engineering Group, Inc.
Sheet: 1 of 1

Drill Date: 11/14/2017
Borehole Size: 4 Inches
Hammer Type: Auto Trip
Weight & Drop: 140 lbs/30 in.

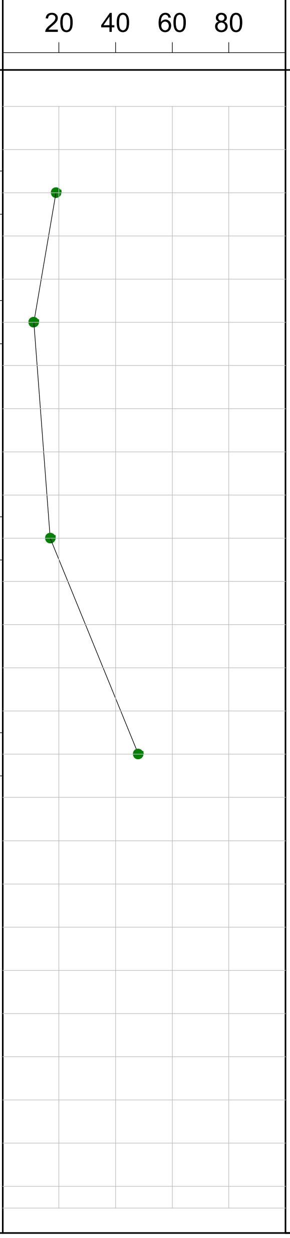
Boring No. B-3

Project: Proposed Arco Station
Client: Sater Oil International, LLC
Location: NWC Iris Avenue & Oliver Street, Moreno Valley, CA
Grnd. Surf. Elev. (Ft. MSL) N/A

Project No: 3-217-1265
Figure No.: A-3
Logged By: JH
Depth to Water> **Initial:** None
At Completion: None

SUBSURFACE PROFILE			SAMPLE						
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture Content (%)	Sampler Type	Penetration	Blow Count	Penetration Test	Water Level
		Ground Surface							
0		**Silty SAND (SM)** Medium dense; brown; moist; fine to medium-grained.							
			107.2	2.2	MCS	🟦	19		
5		Grades as above; loose.	104.4	2.0	MCS	🟦	11		
10		Grades as above; medium dense.	108.9	4.5	MCS	🟦	17		
		Silty Clayey SAND (SC) Dense; brown; moist; fine to medium-grained.							
15			--	8.6	SPT	🟦	48		
		End of Borehole							
20									
25									

Penetration Test



Drill Method: Solid Flight Auger
Drill Rig: CME 45C
Driller: Salem Engineering Group, Inc.
Sheet: 1 of 1

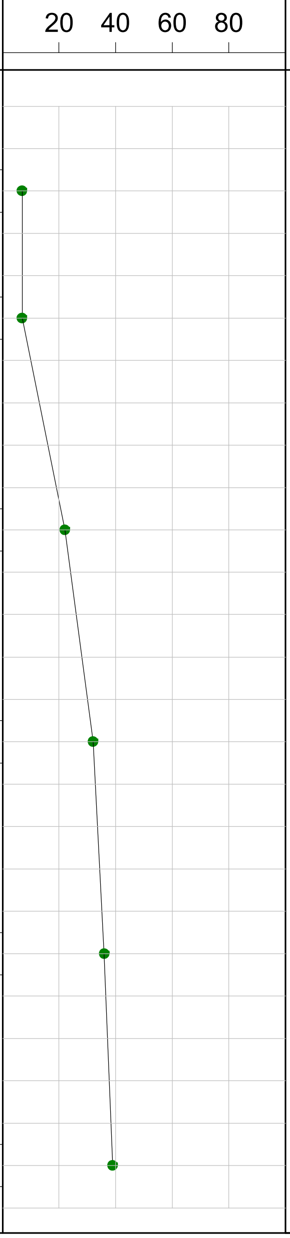
Drill Date: 11/14/2017
Borehole Size: 4 Inches
Hammer Type: Auto Trip
Weight & Drop: 140 lbs/30 in.

Boring No. B-4

Project: Proposed Arco Station
Client: Sater Oil International, LLC
Location: NWC Iris Avenue & Oliver Street, Moreno Valley, CA
Grnd. Surf. Elev. (Ft. MSL) N/A

Project No: 3-217-1265
Figure No.: A-4
Logged By: JH
Depth to Water> **Initial:** None
At Completion: None

SUBSURFACE PROFILE			SAMPLE						
Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture Content (%)	Sampler Type	Penetration	Blow Count	Penetration Test	Water Level
		Ground Surface							
0		**Silty SAND (SM)** Loose; brown; moist; fine to medium-grained.							
			111.7	4.0	MCS	🟦	7		
5		Grades as above.	106.3	5.2	MCS	🟦	7		
10		Grades as above; medium dense.	112.5	2.5	MCS	🟦	22		
15		**Silty Clayey SAND (SC)** Dense; brown; moist; fine to medium-grained.	--	9.2	SPT	🟦	32		
		Silty SAND (SM) Dense; brown; moist; fine to medium-grained.							
20			--	6.4	SPT	🟦	36		
25		Grades as above.	--	5.4	SPT	🟦	39		
		End of Borehole							



Drill Method: Solid Flight Auger
Drill Rig: CME 45C
Driller: Salem Engineering Group, Inc.
Sheet: 1 of 1

Drill Date: 11/14/2017
Borehole Size: 4 Inches
Hammer Type: Auto Trip
Weight & Drop: 140 lbs/30 in.

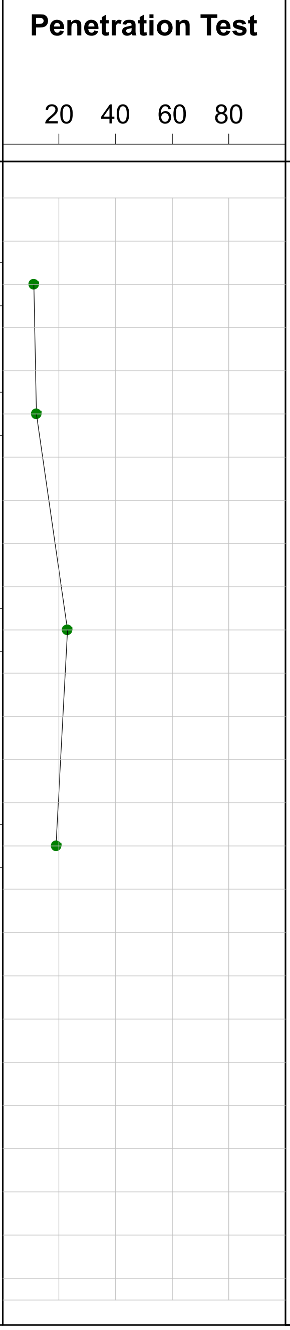
Boring No. B-5

Project: Proposed Arco Station
Client: Sater Oil International, LLC
Location: NWC Iris Avenue & Oliver Street, Moreno Valley, CA
Grnd. Surf. Elev. (Ft. MSL) N/A

Project No: 3-217-1265
Figure No.: A-5
Logged By: JH
Depth to Water> **Initial:** None
At Completion: None

SUBSURFACE PROFILE / SAMPLE

Depth (ft)	Symbol	Description	Dry Density (pcf)	Moisture Content (%)	Sampler Type	Penetration	Blow Count	Water Level
		Ground Surface						
0		**Silty SAND (SM)** Loose; brown; moist; fine to medium-grained.						
			105.7	2.0	MCS	■	11	
5		Grades as above.	105.8	2.0	MCS	■	12	
10		Grades as above; medium dense.	114.6	4.4	MCS	■	23	
15		Grades as above; with clay.	--	7.9	SPT	■	19	
		End of Borehole						
20								
25								



Drill Method: Solid Flight Auger
Drill Rig: CME 45C
Driller: Salem Engineering Group, Inc.
Sheet: 1 of 1

Drill Date: 11/14/2017
Borehole Size: 4 Inches
Hammer Type: Auto Trip
Weight & Drop: 140 lbs/30 in.

Percolation Test Worksheet

Project: **Proposed Arco Station**
NWC Iris Ave & Oliver Street
Moreno Valley, CA

Job No.: **3-217-1265**
Date Drilled: **11/14/2017**
Soil Classification: **Silty SAND (SM)**

Hole Radius: 4 in.
Pipe Dia.: 3 in.
Total Depth of Hole: 96 in.

Test Hole No.: **P-1**
Tested by: **JH**
Drilled Hole Depth: **8** ft.

Presoaking Date: **11/14/2017**
Test Date: **11/15/2017**

Stick Up 0 ft

Time Start	Time Finish	Depth of Test Hole (ft)$^{\#}$	Refill-Yes or No	Elapsed Time (hrs:min)	Initial Water Level$^{\#}$ (ft)	Final Water Level$^{\#}$ (ft)	Δ Water Level (in.)	Δ Min.	Meas. Perc Rate (min/in)	Initial Height of Water (in)	Final Height of Water (in)	Average Height of Water (in)	Infiltration Rate, It (in/hr)
11:21	11:46	8.0	Y	0:25	6.15	6.75	7.20	25	3.5	22.2	15.0	18.6	1.68
11:47	12:12	8.0	Y	0:25	6.22	6.77	6.60	25	3.8	21.4	14.8	18.1	1.58
12:14	12:24	8.0	Y	0:10	6.41	6.62	2.52	10	4.0	19.1	16.6	17.8	1.53
12:24	12:34	8.0	N	0:10	6.62	6.80	2.16	10	4.6	16.6	14.4	15.5	1.48
12:34	12:44	8.0	N	0:10	6.80	6.96	1.92	10	5.2	14.4	12.5	13.4	1.49
12:44	12:54	8.0	N	0:10	6.96	7.10	1.68	10	6.0	12.5	10.8	11.6	1.48
12:54	13:04	8.0	N	0:10	7.10	7.22	1.44	10	6.9	10.8	9.4	10.1	1.43
13:04	13:14	8.0	N	0:10	7.22	7.33	1.32	10	7.6	9.4	8.0	8.7	1.48
Recommended for Design:										**Infiltration Rate**			**1.43**

Percolation Test Worksheet

Project: **Proposed Arco Station**
NWC Iris Ave & Oliver Street
Moreno Valley, CA

Job No.: **3-217-1265**
Date Drilled: **11/14/2017**
Soil Classification: **Silty SAND (SM)**

Hole Radius: 4 in.
Pipe Dia.: 3 in.
Total Depth of Hole: 120 in.

Test Hole No.: **P-2**
Tested by: **JH**
Drilled Hole Depth: **10** ft.

Presoaking Date: **11/14/2017**
Test Date: **11/15/2017**

Stick Up 0 ft

Time Start	Time Finish	Depth of Test Hole (ft)#	Refill- Yes or No	Elapsed Time (hrs:min)	Initial Water Level# (ft)	Final Water Level# (ft)	Δ Water Level (in.)	Δ Min.	Meas. Perc Rate (min/in)	Initial Height of Water (in)	Final Height of Water (in)	Average Height of Water (in)	Infiltration Rate, It (in/hr)
11:13	11:43	10.0	Y	0:30	6.25	6.91	7.92	30	3.8	45.0	37.1	41.0	0.74
11:43	12:13	10.0	N	0:30	6.91	7.41	6.00	30	5.0	37.1	31.1	34.1	0.67
12:13	12:43	10.0	N	0:30	7.41	7.82	4.92	30	6.1	31.1	26.2	28.6	0.64
12:43	13:13	10.0	N	0:30	7.82	8.15	3.96	30	7.6	26.2	22.2	24.2	0.61
13:13	13:43	10.0	N	0:30	8.15	8.42	3.24	30	9.3	22.2	19.0	20.6	0.57
13:43	14:13	10.0	N	0:30	8.42	8.65	2.76	30	10.9	19.0	16.2	17.6	0.56
14:13	14:43	10.0	N	0:30	8.65	8.85	2.40	30	12.5	16.2	13.8	15.0	0.56
14:43	15:13	10.0	N	0:30	8.85	9.02	2.04	30	14.7	13.8	11.8	12.8	0.55
15:13	15:43	10.0	N	0:30	9.02	9.17	1.80	30	16.7	11.8	10.0	10.9	0.56
15:43	16:13	10.0	N	0:30	9.17	9.30	1.56	30	19.2	10.0	8.4	9.2	0.56
16:13	16:43	10.0	N	0:30	9.30	9.42	1.44	30	20.8	8.4	7.0	7.7	0.60
16:43	17:13	10.0	N	0:30	9.42	9.52	1.20	30	25.0	7.0	5.8	6.4	0.57
Recommended for Design:										**Infiltration Rate**			**0.55**

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Percolation Test Worksheet

Project: **Proposed Arco Station**
NWC Iris Ave & Oliver Street
Moreno Valley, CA

Job No.: **3-217-1265**
Date Drilled: **11/14/2017**
Soil Classification: **Silty SAND (SM)**

Hole Radius: 4 in.
Pipe Dia.: 3 in.
Total Depth of Hole: 96 in.

Test Hole No.: **P-3**
Tested by: **JH**
Drilled Hole Depth: **8** ft.

Presoaking Date: **11/14/2017**
Test Date: **11/15/2017**

Stick Up 0 ft

Time Start	Time Finish	Depth of Test Hole (ft)$^{\#}$	Refill- Yes or No	Elapsed Time (hrs:min)	Initial Water Level$^{\#}$ (ft)	Final Water Level$^{\#}$ (ft)	Δ Water Level (in.)	Δ Min.	Meas. Perc Rate (min/in)	Initial Height of Water (in)	Final Height of Water (in)	Average Height of Water (in)	Infiltration Rate, It (in/hr)
11:15	11:45	8.0	Y	0:30	4.52	5.11	7.08	30	4.2	41.8	34.7	38.2	0.70
11:45	12:15	8.0	N	0:30	5.11	5.54	5.16	30	5.8	34.7	29.5	32.1	0.61
12:15	12:45	8.0	N	0:30	5.54	5.88	4.08	30	7.4	29.5	25.4	27.5	0.55
12:45	13:15	8.0	N	0:30	5.88	6.16	3.36	30	8.9	25.4	22.1	23.8	0.52
13:15	13:45	8.0	N	0:30	6.16	6.40	2.88	30	10.4	22.1	19.2	20.6	0.51
13:45	14:15	8.0	N	0:30	6.40	6.61	2.52	30	11.9	19.2	16.7	17.9	0.51
14:15	14:45	8.0	N	0:30	6.61	6.80	2.28	30	13.2	16.7	14.4	15.5	0.52
14:45	15:15	8.0	N	0:30	6.80	6.97	2.04	30	14.7	14.4	12.4	13.4	0.53
15:15	15:45	8.0	N	0:30	6.97	7.12	1.80	30	16.7	12.4	10.6	11.5	0.53
15:45	16:15	8.0	N	0:30	7.12	7.25	1.56	30	19.2	10.6	9.0	9.8	0.53
16:15	16:45	8.0	N	0:30	7.25	7.36	1.32	30	22.7	9.0	7.7	8.3	0.51
16:45	17:15	8.0	N	0:30	7.36	7.46	1.20	30	25.0	7.7	6.5	7.1	0.53
Recommended for Design:										**Infiltration Rate**			**0.51**

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Percolation Test Worksheet

Project: Proposed Arco Station
NWC Iris Ave & Oliver Street
Moreno Valley, CA

Job No.: 3-217-1265
Date Drilled: 11/14/2017
Soil Classification: Silty SAND (SM)

Hole Radius: 4 in.
Pipe Dia.: 3 in.
Total Depth of Hole: 120 in.

Test Hole No.: **P-4**
Tested by: JH
Drilled Hole Depth: 10 ft.

Presoaking Date: 11/14/2017
Test Date: 11/15/2017

Stick Up 0 ft

Time Start	Time Finish	Depth of Test Hole (ft)$^{\#}$	Refill-Yes or No	Elapsed Time (hrs:min)	Initial Water Level$^{\#}$ (ft)	Final Water Level$^{\#}$ (ft)	Δ Water Level (in.)	Δ Min.	Meas. Perc Rate (min/in)	Initial Height of Water (in)	Final Height of Water (in)	Average Height of Water (in)	Infiltration Rate, It (in/hr)
11:23	11:48	10.0	Y	0:25	8.00	8.57	6.84	25	3.7	24.0	17.2	20.6	1.45
11:49	12:14	10.0	Y	0:25	8.11	8.62	6.12	25	4.1	22.7	16.6	19.6	1.36
12:16	12:26	10.0	Y	0:10	8.36	8.55	2.28	10	4.4	19.7	17.4	18.5	1.33
12:26	12:36	10.0	N	0:10	8.55	8.72	2.04	10	4.9	17.4	15.4	16.4	1.33
12:36	12:46	10.0	N	0:10	8.72	8.87	1.80	10	5.6	15.4	13.6	14.5	1.31
12:46	12:56	10.0	N	0:10	8.87	9.00	1.56	10	6.4	13.6	12.0	12.8	1.27
12:56	13:06	10.0	N	0:10	9.00	9.12	1.44	10	6.9	12.0	10.6	11.3	1.30
13:06	13:16	10.0	N	0:10	9.12	9.23	1.32	10	7.6	10.6	9.2	9.9	1.33
Recommended for Design:										**Infiltration Rate**			**1.27**

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APPENDIX

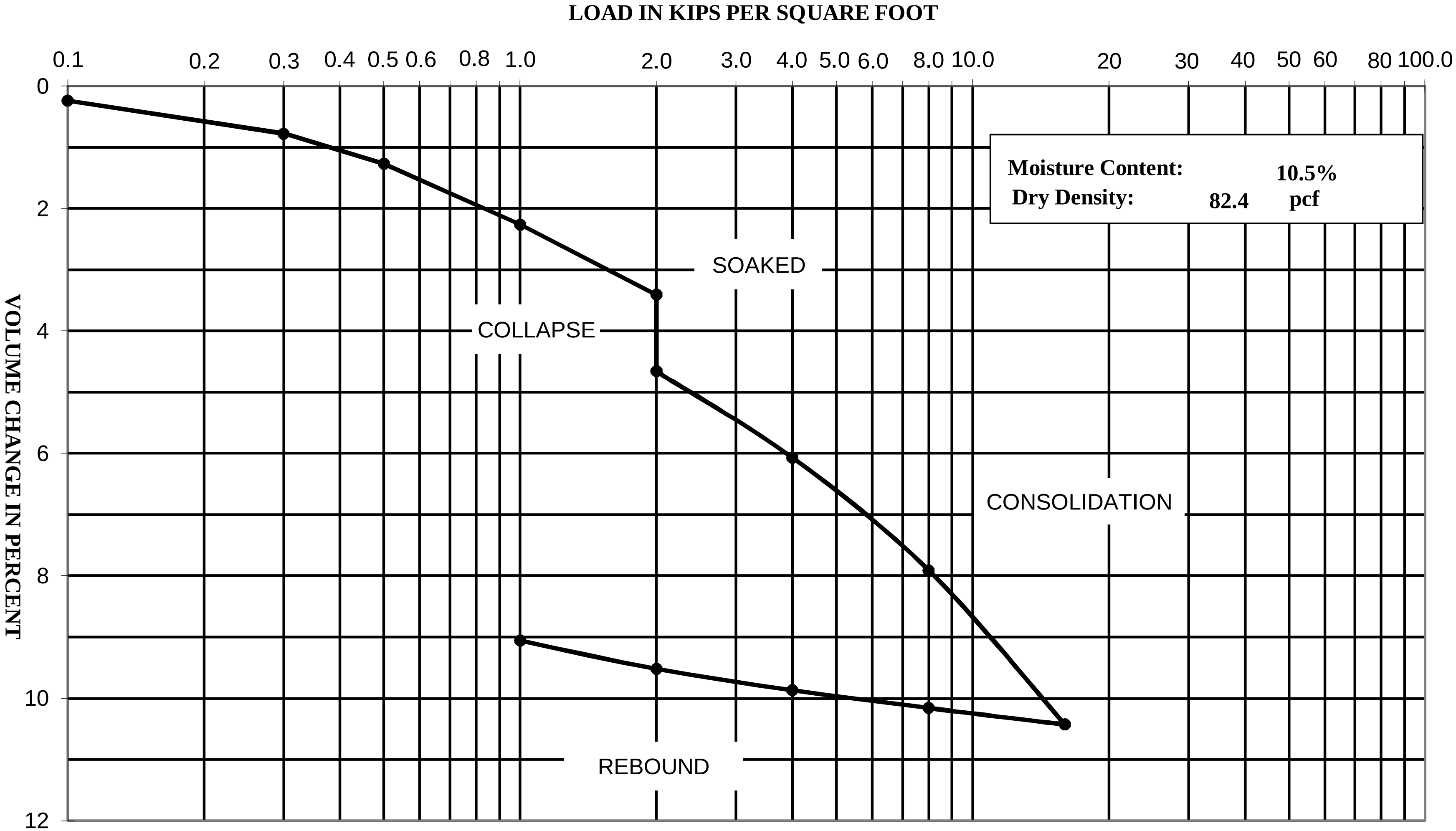
B

APPENDIX B
LABORATORY TESTING

Laboratory tests were performed in accordance with generally accepted test methods of the American Society for Testing and Materials (ASTM), Caltrans, or other suggested procedures. Selected samples were tested for in-situ dry density and moisture content, corrosivity, consolidation, shear strength, maximum density and optimum moisture content, and grain size distribution. The results of the laboratory tests are summarized in the following figures.

CONSOLIDATION - PRESSURE TEST DATA

ASTM D 2435



Prop. Arco Station - Moreno Valley, CA

Project Number: 3-217-1265

Boring: B-1 @ 2'

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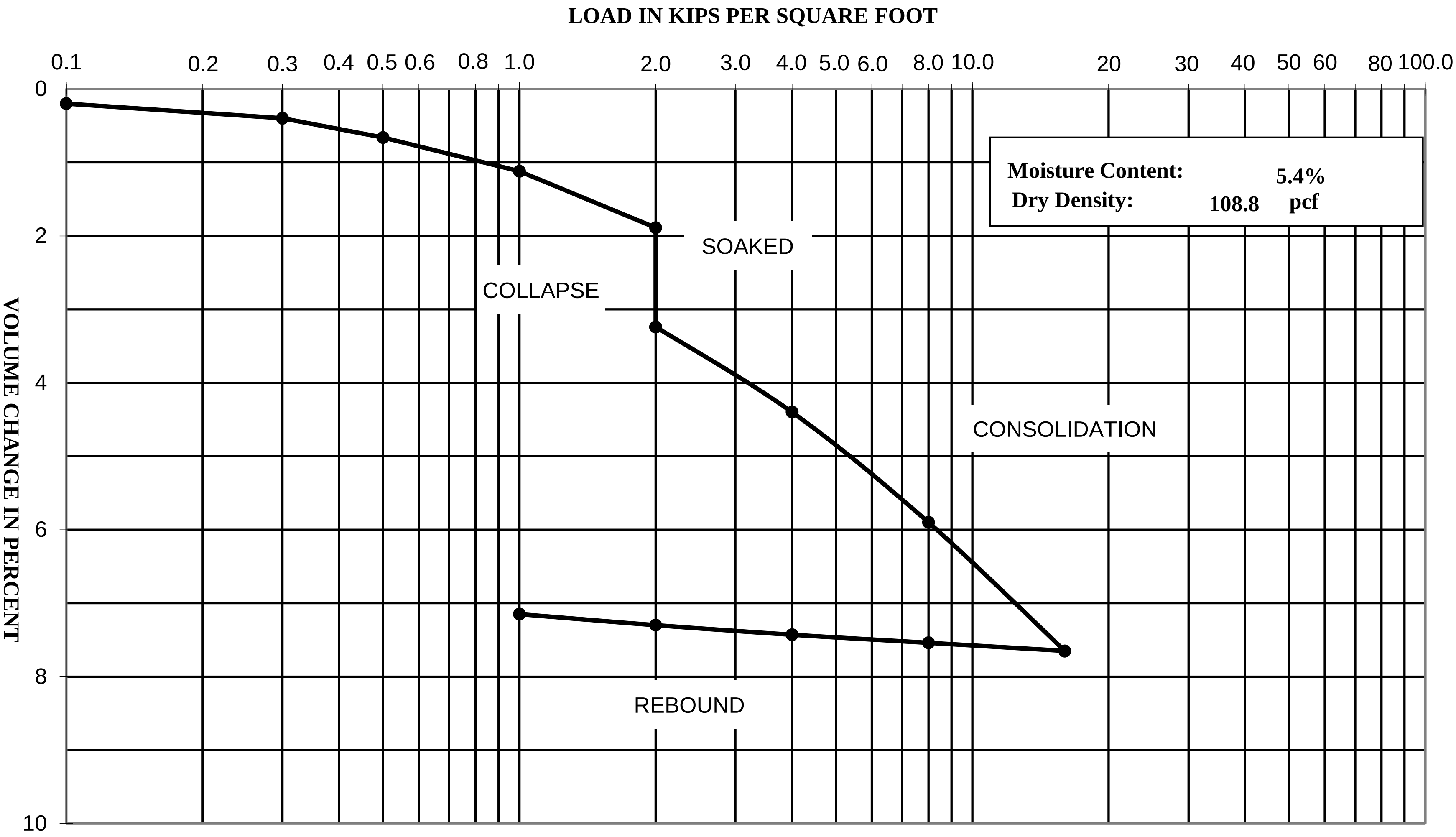
CONSOLIDATION - PRESSURE TEST DATA

ASTM D 2435



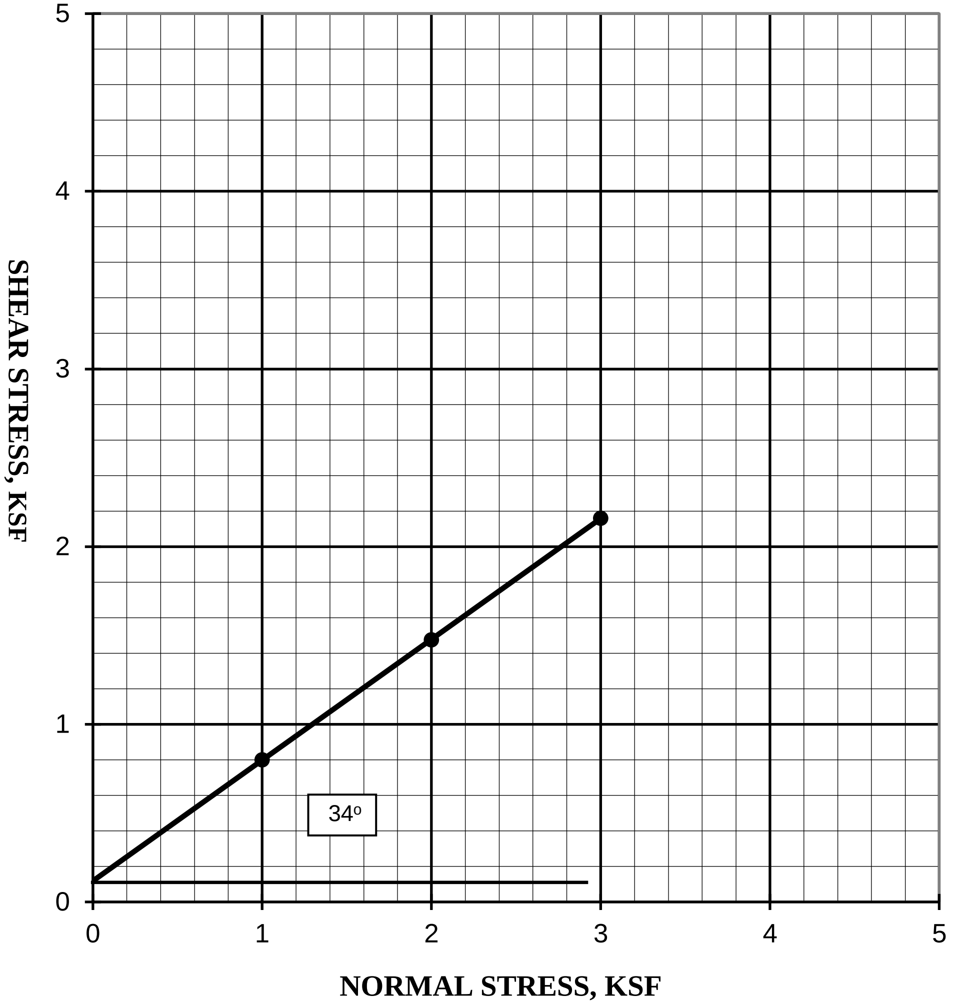
Prop. Arco Station - Moreno Valley, CA

Project Number: 3-217-1265

Boring: B-2 @ 5'

SALEM engineering group, inc.

SHEAR STRENGTH DIAGRAM
(DIRECT SHEAR)
ASTM D - 3080



Prop. Arco Station - Moreno Valley, CA

Project Number: 3-217-1265

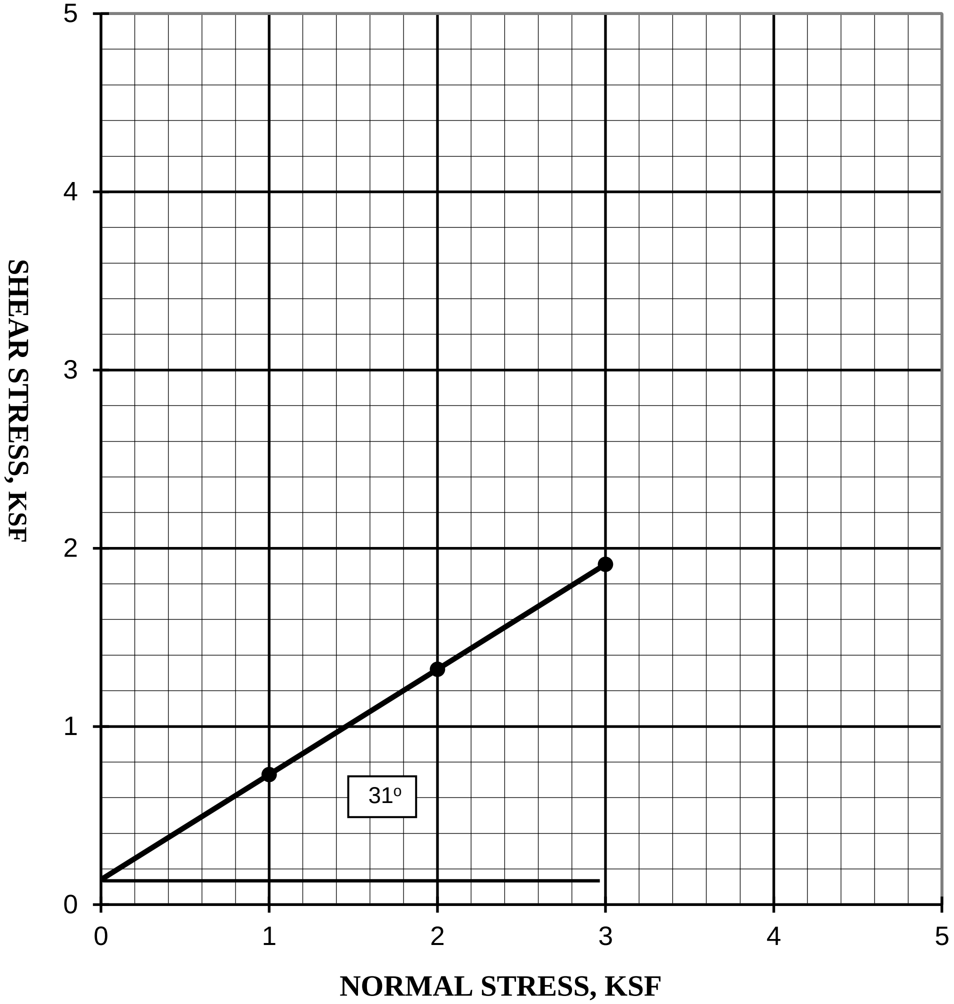
Boring: B-1 @ 5'
Soil Type: Silty SAND (SM)

Friction Angle:	**34**	**degrees**
Cohesion:	**120**	**psf**

Moisture Content	**3.1%**	
Dry Density	**111.2**	**pcf**

SALEM engineering group, inc.

SHEAR STRENGTH DIAGRAM
(DIRECT SHEAR)
ASTM D - 3080



Prop. Arco Station - Moreno Valley, CA

Project Number: 3-217-1265

Boring: B-2 @ 2'
Soil Type: Silty SAND (SM)

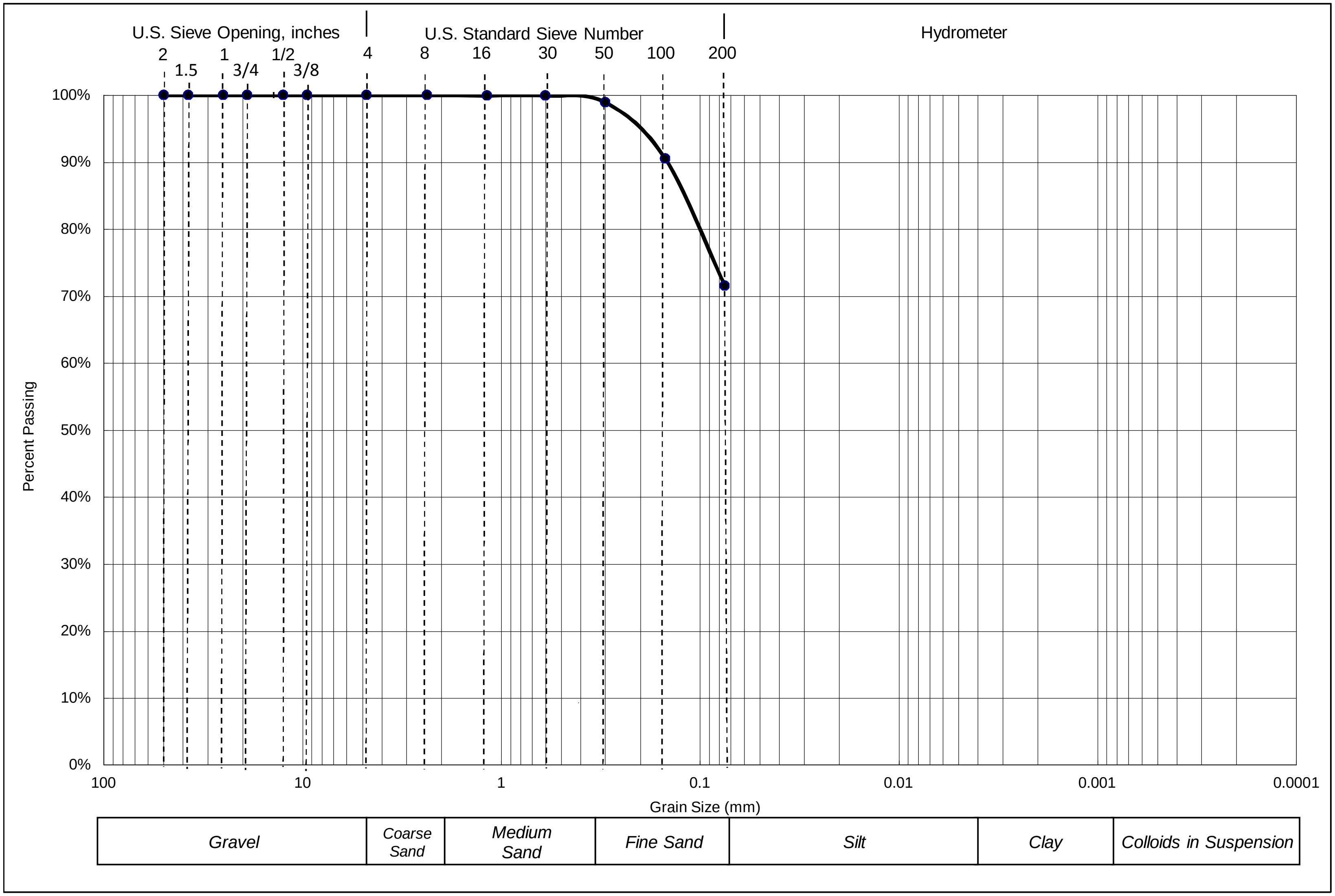
Friction Angle:	**31**	**degrees**
Cohesion:	**140**	**psf**

Moisture Content	**4.8%**	
Dry Density	**104.0**	**pcf**

SALEM engineering group, inc.

PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Prop. Arco Station - Moreno Valley, CA

Project Number: 3-217-1265

Boring: B-1 @ 2'

SALEM
engineering group, inc.

DRY SIEVE ANALYSIS

ASTM C136 (without Hydrometer)

Sieve Size	Particle Size, mm	Percent Passing
1 1/2-in.	37.5	100.0%
1-in.	25	100.0%
3/4-in.	19	100.0%
1/2-in.	12.5	100.0%
3/8-in.	9.5	100.0%
No. 4	4.75	100.0%
No. 8	2.36	100.0%
No. 16	1.18	100.0%
No. 30	0.6	100.0%
No. 50	0.3	99.0%
No. 100	0.15	90.6%
No. 200	0.075	71.59%

Prop. Arco Station - Moreno Valley, CA
Project Number: 3-217-1265
Boring: B-1 @ 2'

SALEM
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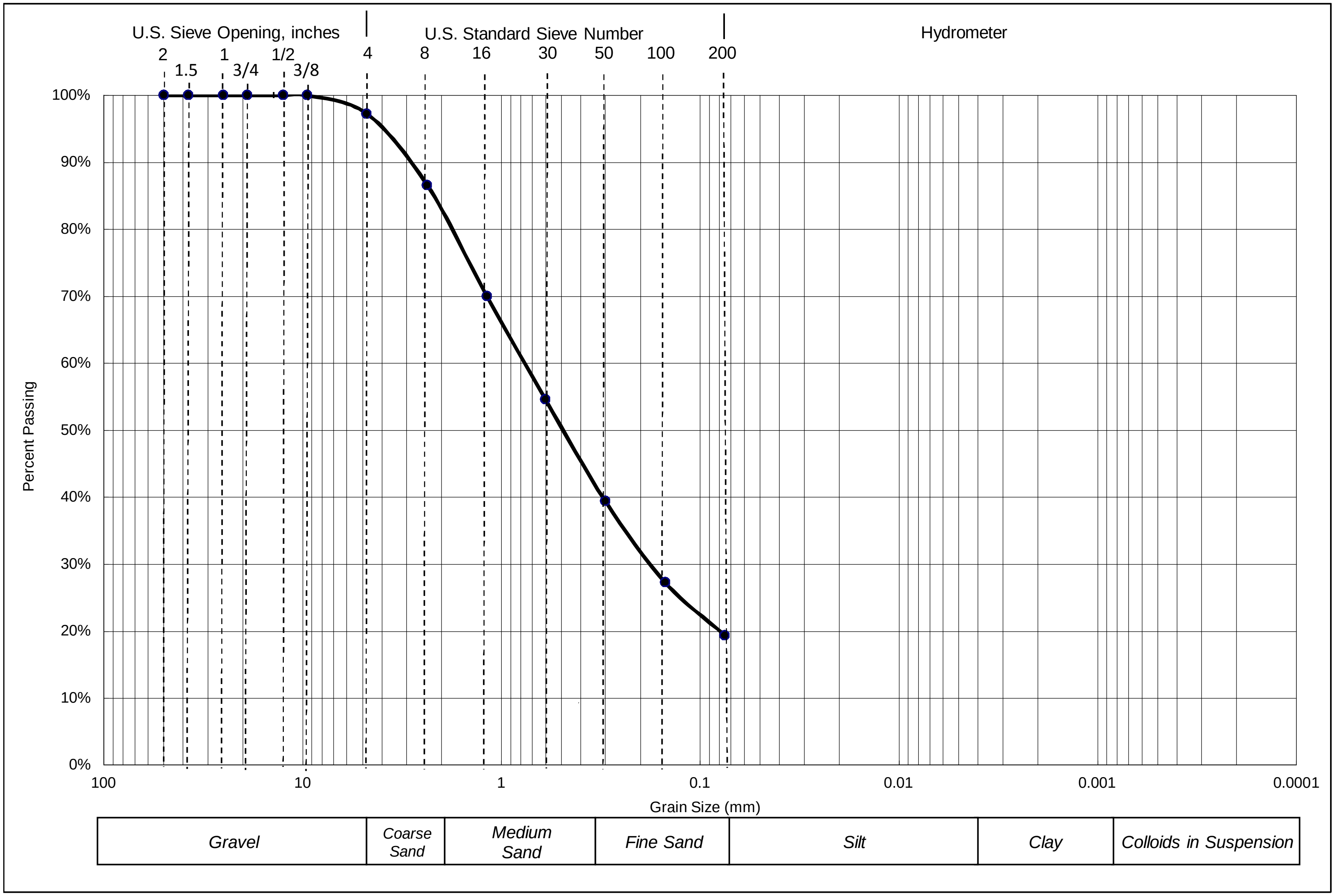
PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Prop. Arco Station - Moreno Valley, CA
Project Number: 3-217-1265
Boring: B-1 @ 5'

SALEM
engineering group, inc.

DRY SIEVE ANALYSIS

ASTM C136 (without Hydrometer)

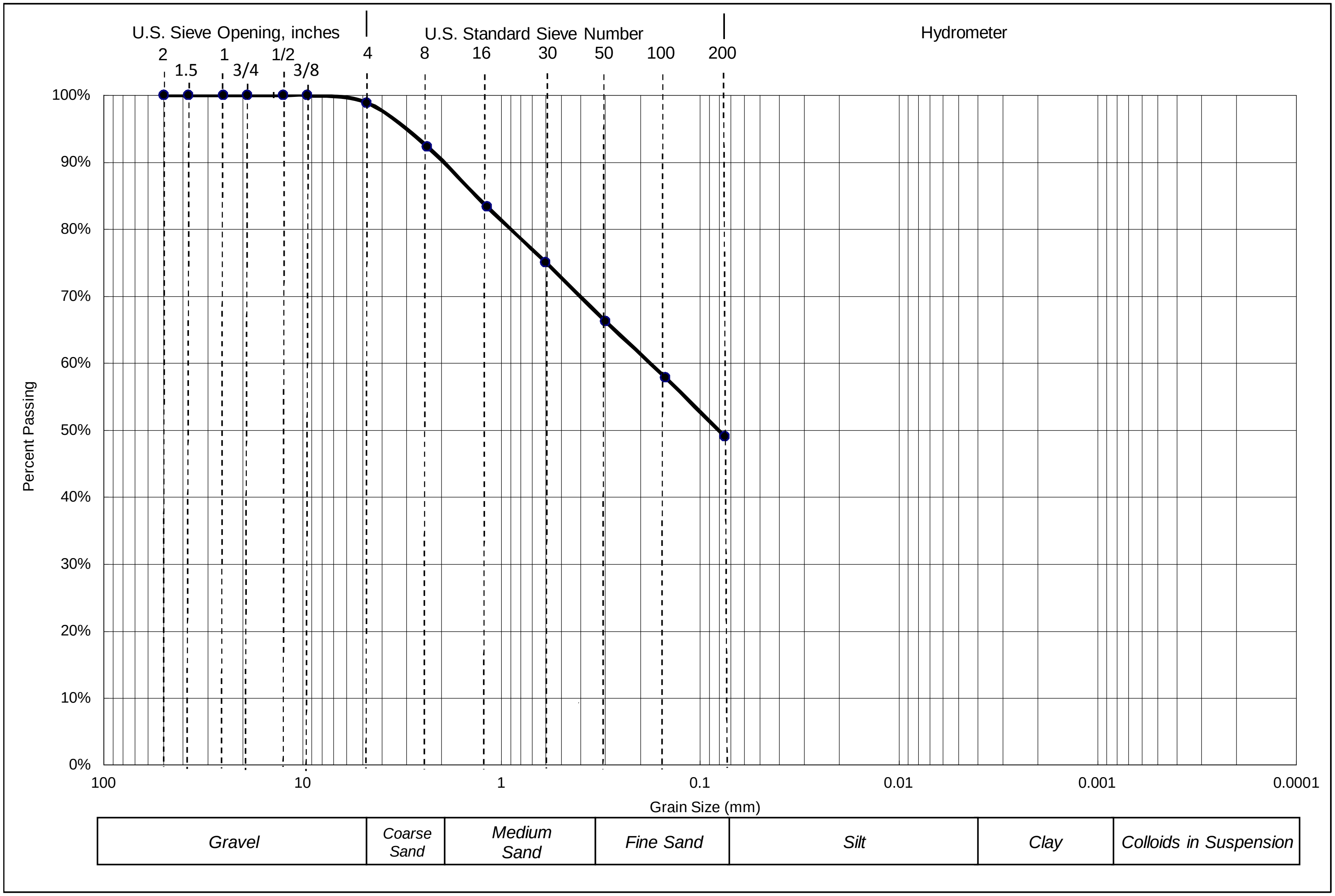
Sieve Size	Particle Size, mm	Percent Passing
1 1/2-in.	37.5	100.0%
1-in.	25	100.0%
3/4-in.	19	100.0%
1/2-in.	12.5	100.0%
3/8-in.	9.5	100.0%
No. 4	4.75	97.2%
No. 8	2.36	86.6%
No. 16	1.18	70.0%
No. 30	0.6	54.6%
No. 50	0.3	39.4%
No. 100	0.15	27.3%
No. 200	0.075	19.36%

Prop. Arco Station - Moreno Valley, CA
Project Number: 3-217-1265
Boring: B-1 @ 5'

SALEM
engineering group, inc.

PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Prop. Arco Station - Moreno Valley, CA

Project Number: 3-217-1265

Boring: B-1 @ 15'

SALEM
engineering group, inc.

DRY SIEVE ANALYSIS

ASTM C136 (without Hydrometer)

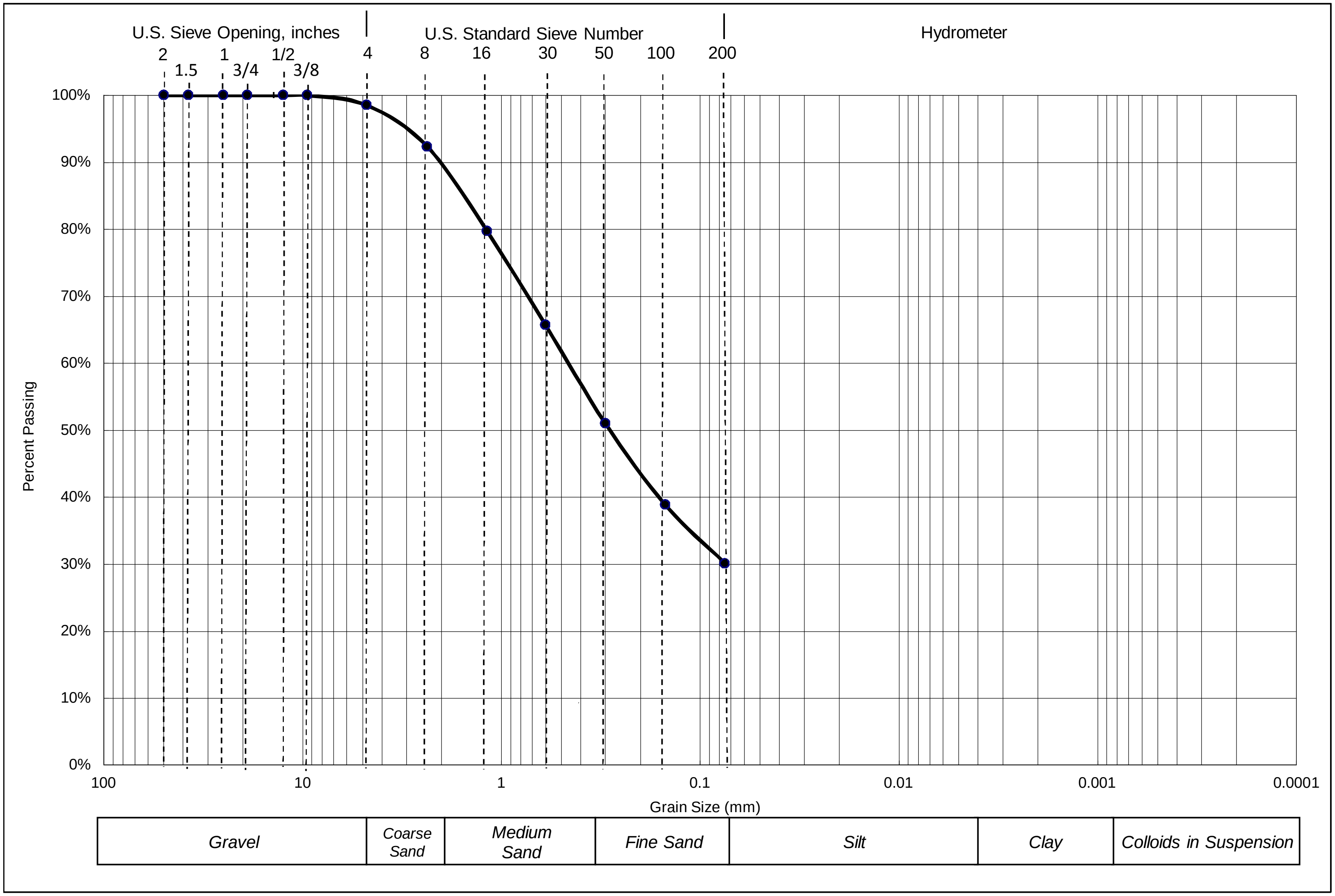
Sieve Size	Particle Size, mm	Percent Passing
1 1/2-in.	37.5	100.0%
1-in.	25	100.0%
3/4-in.	19	100.0%
1/2-in.	12.5	100.0%
3/8-in.	9.5	100.0%
No. 4	4.75	98.9%
No. 8	2.36	92.3%
No. 16	1.18	83.4%
No. 30	0.6	75.1%
No. 50	0.3	66.3%
No. 100	0.15	57.9%
No. 200	0.075	49.05%

Prop. Arco Station - Moreno Valley, CA
Project Number: 3-217-1265
Boring: B-1 @ 15'

SALEM
engineering group, inc.

PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Prop. Arco Station - Moreno Valley, CA

Project Number: 3-217-1265

Boring: B-1 @ 30'

SALEM engineering group, inc.

DRY SIEVE ANALYSIS

ASTM C136 (without Hydrometer)

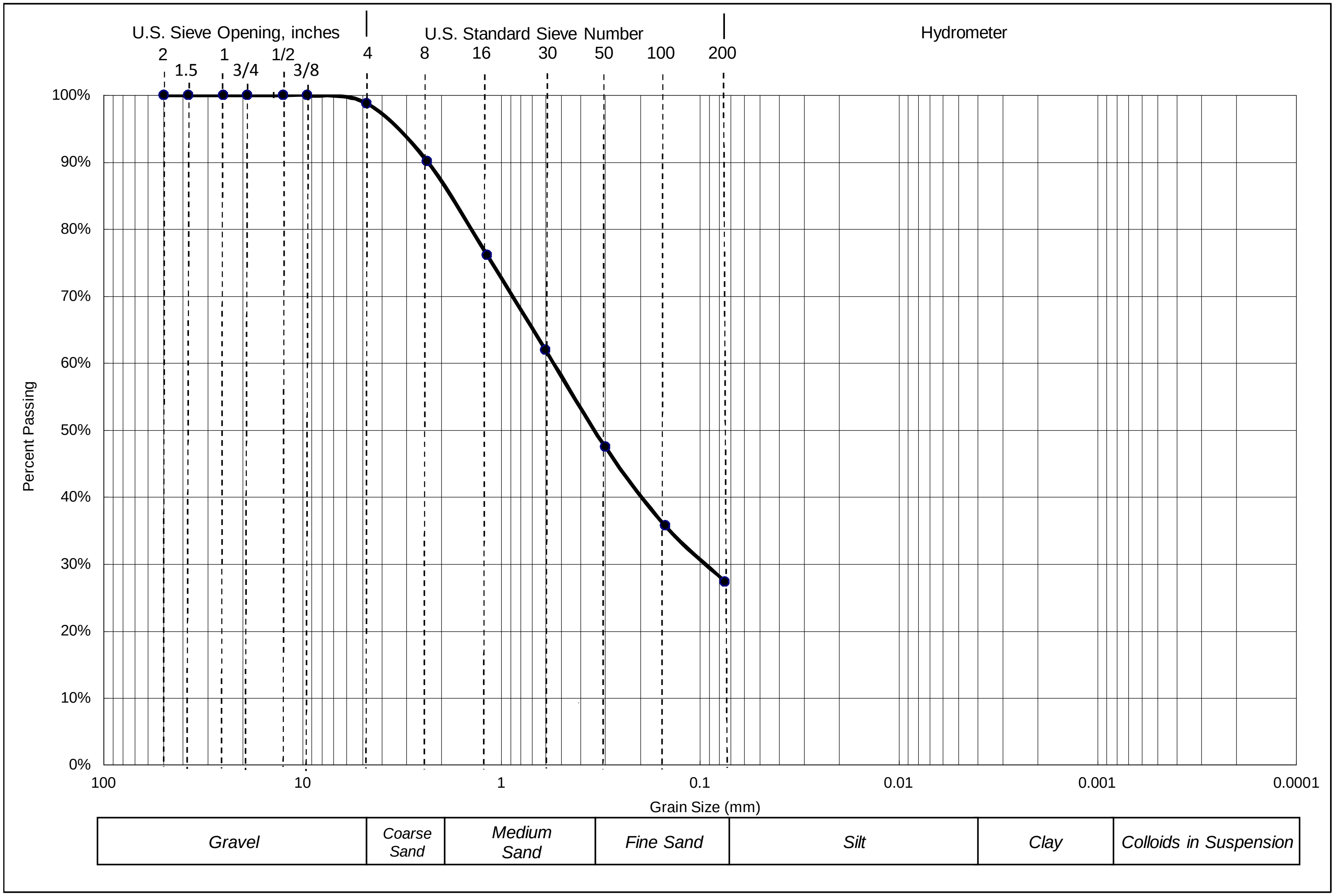
Sieve Size	Particle Size, mm	Percent Passing
1 1/2-in.	37.5	100.0%
1-in.	25	100.0%
3/4-in.	19	100.0%
1/2-in.	12.5	100.0%
3/8-in.	9.5	100.0%
No. 4	4.75	98.5%
No. 8	2.36	92.3%
No. 16	1.18	79.7%
No. 30	0.6	65.7%
No. 50	0.3	51.0%
No. 100	0.15	38.9%
No. 200	0.075	30.13%

Prop. Arco Station - Moreno Valley, CA
Project Number: 3-217-1265
Boring: B-1 @ 30'

SALEM
engineering group, inc.

PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Prop. Arco Station - Moreno Valley, CA
Project Number: 3-217-1265
Boring: B-1 @ 40'

SALEM engineering group, inc.

DRY SIEVE ANALYSIS

ASTM C136 (without Hydrometer)

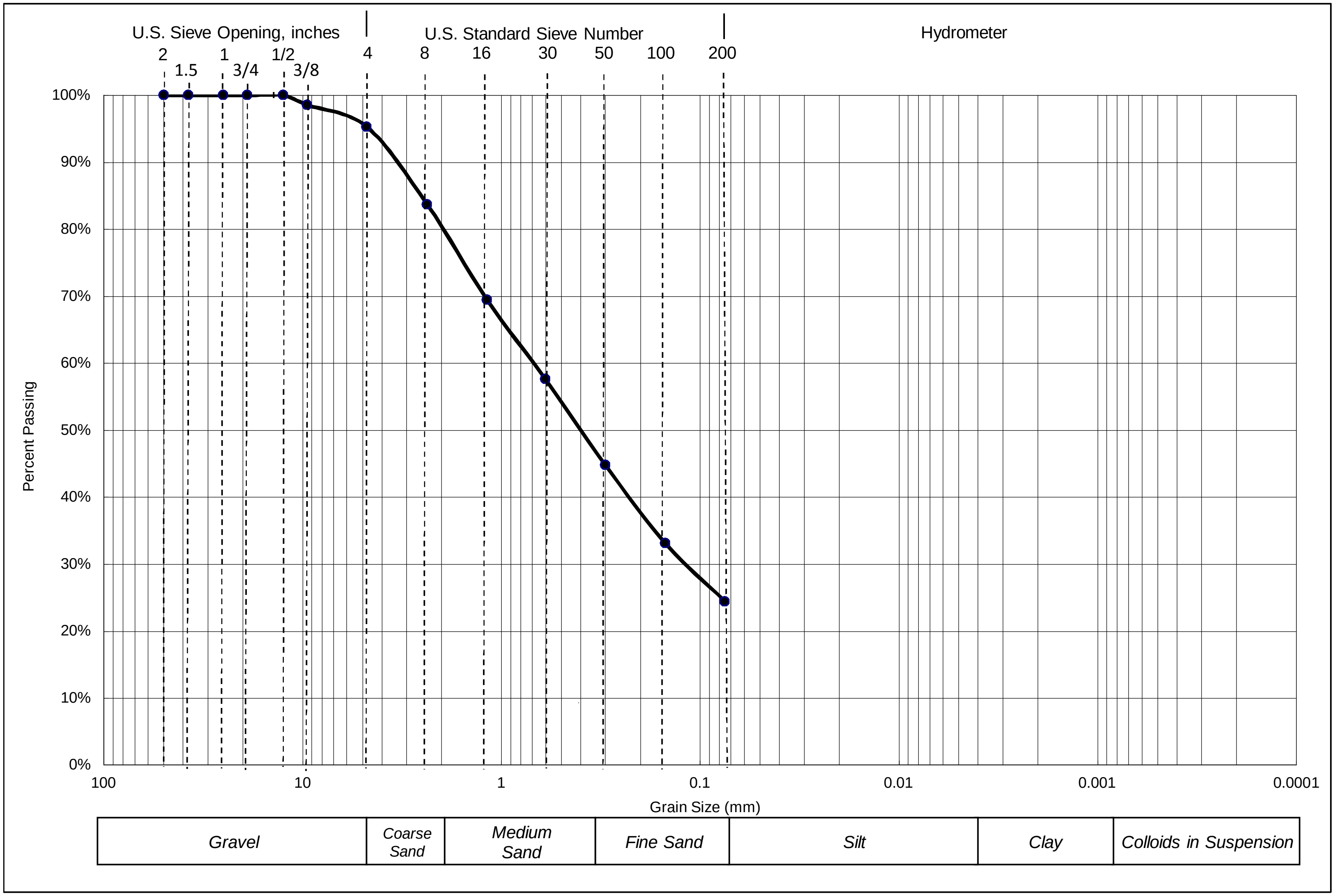
Sieve Size	Particle Size, mm	Percent Passing
1 1/2-in.	37.5	100.0%
1-in.	25	100.0%
3/4-in.	19	100.0%
1/2-in.	12.5	100.0%
3/8-in.	9.5	100.0%
No. 4	4.75	98.8%
No. 8	2.36	90.1%
No. 16	1.18	76.1%
No. 30	0.6	62.0%
No. 50	0.3	47.5%
No. 100	0.15	35.7%
No. 200	0.075	27.40%

Prop. Arco Station - Moreno Valley, CA
Project Number: 3-217-1265
Boring: B-1 @ 40'

SALEM
engineering group, inc.

PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Prop. Arco Station - Moreno Valley, CA
Project Number: 3-217-1265
Boring: B-2 @ 2'

SALEM engineering group, inc.

DRY SIEVE ANALYSIS

ASTM C136 (without Hydrometer)

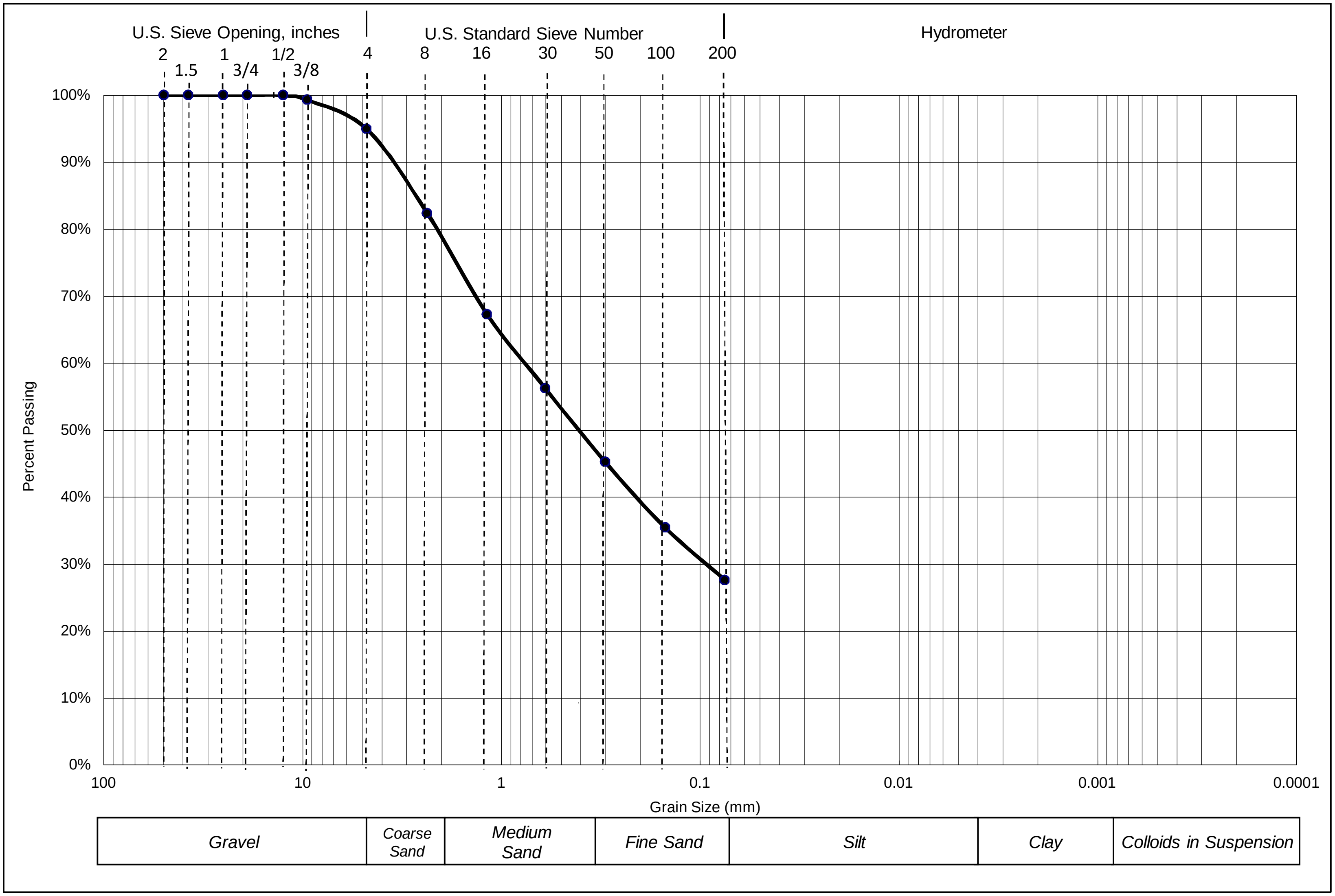
Sieve Size	Particle Size, mm	Percent Passing
1 1/2-in.	37.5	100.0%
1-in.	25	100.0%
3/4-in.	19	100.0%
1/2-in.	12.5	100.0%
3/8-in.	9.5	98.6%
No. 4	4.75	95.3%
No. 8	2.36	83.7%
No. 16	1.18	69.5%
No. 30	0.6	57.6%
No. 50	0.3	44.8%
No. 100	0.15	33.2%
No. 200	0.075	24.46%

Prop. Arco Station - Moreno Valley, CA
Project Number: 3-217-1265
Boring: B-2 @ 2'

SALEM
engineering group, inc.

PARTICLE SIZE DISTRIBUTION DIAGRAM

GRADATION TEST - ASTM C136



Prop. Arco Station - Moreno Valley, CA
Project Number: 3-217-1265
Boring: B-2 @ 5'

SALEM engineering group, inc.

DRY SIEVE ANALYSIS

ASTM C136 (without Hydrometer)

Sieve Size	Particle Size, mm	Percent Passing
1 1/2-in.	37.5	100.0%
1-in.	25	100.0%
3/4-in.	19	100.0%
1/2-in.	12.5	100.0%
3/8-in.	9.5	99.3%
No. 4	4.75	95.0%
No. 8	2.36	82.4%
No. 16	1.18	67.3%
No. 30	0.6	56.2%
No. 50	0.3	45.2%
No. 100	0.15	35.5%
No. 200	0.075	27.65%

Prop. Arco Station - Moreno Valley, CA
Project Number: 3-217-1265
Boring: B-2 @ 5'

SALEM
engineering group, inc.

CHEMICAL ANALYSIS

SO_4 - Modified Caltrans 417 & Cl - Modified Caltrans 417/422

Prop. Arco Station - Moreno Valley, CA
Project Number: 3-217-1265
Date: 11/17/17
Soil Classification: Silty SAND (SM)

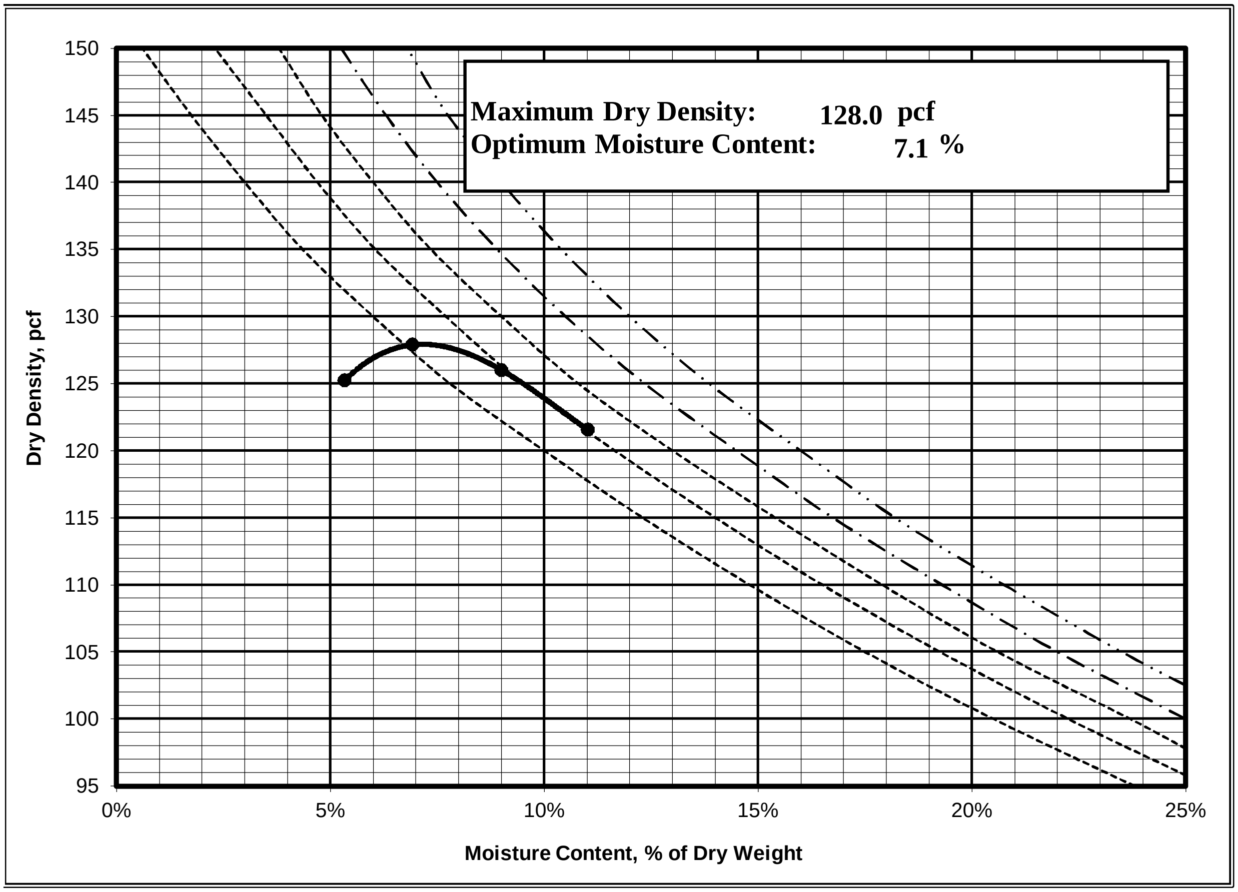
Sample Number	Sample Location	Soluble Sulfate SO_4-S	Soluble Chloride Cl	pH
1a.	B-1 @ 0 - 3'	50 mg/kg	21 mg/kg	7.0
1b.	B-1 @ 0 - 3'	50 mg/kg	20 mg/kg	7.0
1c.	B-1 @ 0 - 3'	50 mg/kg	21 mg/kg	7.0
Average:		**50 mg/kg**	**21 mg/kg**	**7.0**

SALEM
engineering group, inc.

Laboratory Compaction Curve
ASTM D1557

Prop. Arco Station - Moreno Valley, CA
Project Number: 3-217-1265
Date Tested: 11/17/17
Sample Location: B-1 @ 0 - 3'
Soil Classification: Silty Sand, Brown, Non-Cohesive
Sample/Curve Number: 1
Test Method: 1557 A

	1	2	3	4
Weight of Moist Specimen & Mold, (g)	3991.6	4064.2	4073.2	4037.0
Weight of Compaction Mold, (g)	1998.9	1998.9	1998.9	1998.9
Weight of Moist Specimen, (g)	1992.7	2065.3	2074.3	2038.1
Volume of mold, (ft^2)	0.0333	0.0333	0.0333	0.0333
Wet Density, (pcf)	131.9	136.7	137.3	134.9
Weight of Wet (Moisture) Sample, (g)	341.2	341.2	341.2	341.2
Weight of Dry (Moisture) Sample, (g)	323.9	319.1	313.0	307.3
Moisture Content, (%)	5.3%	6.9%	9.0%	11.0%
Dry Density, (pcf)	125.2	127.9	126.0	121.5



Attachment: Appendix G - Water Quality Management Plan (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

APPENDIX
C

APPENDIX C
GENERAL EARTHWORK AND PAVEMENT SPECIFICATIONS

When the text of the report conflicts with the general specifications in this appendix, the recommendations in the report have precedence.

1.0 SCOPE OF WORK: These specifications and applicable plans pertain to and include all earthwork associated with the site rough grading, including, but not limited to, the furnishing of all labor, tools and equipment necessary for site clearing and grubbing, stripping, preparation of foundation materials for receiving fill, excavation, processing, placement and compaction of fill and backfill materials to the lines and grades shown on the project grading plans and disposal of excess materials.

2.0 PERFORMANCE: The Contractor shall be responsible for the satisfactory completion of all earthwork in accordance with the project plans and specifications. This work shall be inspected and tested by a representative of SALEM Engineering Group, Incorporated, hereinafter referred to as the Soils Engineer and/or Testing Agency. Attainment of design grades, when achieved, shall be certified by the project Civil Engineer. Both the Soils Engineer and the Civil Engineer are the Owner's representatives. If the Contractor should fail to meet the technical or design requirements embodied in this document and on the applicable plans, he shall make the necessary adjustments until all work is deemed satisfactory as determined by both the Soils Engineer and the Civil Engineer. No deviation from these specifications shall be made except upon written approval of the Soils Engineer, Civil Engineer, or project Architect.

No earthwork shall be performed without the physical presence or approval of the Soils Engineer. The Contractor shall notify the Soils Engineer at least 2 working days prior to the commencement of any aspect of the site earthwork.

The Contractor shall assume sole and complete responsibility for job site conditions during the course of construction of this project, including safety of all persons and property; that this requirement shall apply continuously and not be limited to normal working hours; and that the Contractor shall defend, indemnify and hold the Owner and the Engineers harmless from any and all liability, real or alleged, in connection with the performance of work on this project, except for liability arising from the sole negligence of the Owner or the Engineers.

3.0 TECHNICAL REQUIREMENTS: All compacted materials shall be densified to no less that 95 percent of relative compaction (90 percent for cohesive soils) based on ASTM D1557 Test Method (latest edition), UBC or CAL-216, or as specified in the technical portion of the Soil Engineer's report. The location and frequency of field density tests shall be determined by the Soils Engineer. The results of these tests and compliance with these specifications shall be the basis upon which satisfactory completion of work will be judged by the Soils Engineer.

4.0 SOILS AND FOUNDATION CONDITIONS: The Contractor is presumed to have visited the site and to have familiarized himself with existing site conditions and the contents of the data presented in the Geotechnical Engineering Report. The Contractor shall make his own interpretation of the data contained in the Geotechnical Engineering Report and the Contractor shall not be relieved of liability for any loss sustained as a result of any variance between conditions indicated by or deduced from said report and the actual conditions encountered during the progress of the work.

5.0 DUST CONTROL: The work includes dust control as required for the alleviation or prevention of any dust nuisance on or about the site or the borrow area, or off-site if caused by the Contractor's operation either during the performance of the earthwork or resulting from the conditions in which the Contractor leaves the site. The Contractor shall assume all liability, including court costs of codefendants, for all claims related to dust or wind-blown materials attributable to his work. Site preparation shall consist of site clearing and grubbing and preparation of foundation materials for receiving fill.

6.0 CLEARING AND GRUBBING: The Contractor shall accept the site in this present condition and shall demolish and/or remove from the area of designated project earthwork all structures, both surface and subsurface, trees, brush, roots, debris, organic matter and all other matter determined by the Soils Engineer to be deleterious. Such materials shall become the property of the Contractor and shall be removed from the site.

Tree root systems in proposed improvement areas should be removed to a minimum depth of 3 feet and to such an extent which would permit removal of all roots greater than 1 inch in diameter. Tree roots removed in parking areas may be limited to the upper 1½ feet of the ground surface. Backfill of tree root excavations is not permitted until all exposed surfaces have been inspected and the Soils Engineer is present for the proper control of backfill placement and compaction. Burning in areas which are to receive fill materials shall not be permitted.

7.0 SUBGRADE PREPARATION: Surfaces to receive Engineered Fill and/or building or slab loads shall be prepared as outlined above, scarified to a minimum of 12 inches, moisture-conditioned as necessary, and recompacted to 95 percent relative compaction (90 percent for cohesive soils).

Loose soil areas and/or areas of disturbed soil shall be moisture-conditioned as necessary and recompacted to 95 percent relative compaction (90 percent for cohesive soils). All ruts, hummocks, or other uneven surface features shall be removed by surface grading prior to placement of any fill materials. All areas which are to receive fill materials shall be approved by the Soils Engineer prior to the placement of any fill material.

8.0 EXCAVATION: All excavation shall be accomplished to the tolerance normally defined by the Civil Engineer as shown on the project grading plans. All over-excavation below the grades specified shall be backfilled at the Contractor's expense and shall be compacted in accordance with the applicable technical requirements.

9.0 FILL AND BACKFILL MATERIAL: No material shall be moved or compacted without the presence or approval of the Soils Engineer. Material from the required site excavation may be utilized for construction site fills, provided prior approval is given by the Soils Engineer. All materials utilized for constructing site fills shall be free from vegetation or other deleterious matter as determined by the Soils Engineer.

10.0 PLACEMENT, SPREADING AND COMPACTION: The placement and spreading of approved fill materials and the processing and compaction of approved fill and native materials shall be the responsibility of the Contractor. Compaction of fill materials by flooding, ponding, or jetting shall not be permitted unless specifically approved by local code, as well as the Soils Engineer. Both cut and fill shall be surface-compacted to the satisfaction of the Soils Engineer prior to final acceptance.

11.0 SEASONAL LIMITS: No fill material shall be placed, spread, or rolled while it is frozen or thawing, or during unfavorable wet weather conditions. When the work is interrupted by heavy rains, fill operations shall not be resumed until the Soils Engineer indicates that the moisture content and density of previously placed fill is as specified.

12.0 DEFINITIONS - The term "pavement" shall include asphaltic concrete surfacing, untreated aggregate base, and aggregate subbase. The term "subgrade" is that portion of the area on which surfacing, base, or subbase is to be placed.

The term "Standard Specifications": hereinafter referred to, is the most recent edition of the Standard Specifications of the State of California, Department of Transportation. The term "relative compaction" refers to the field density expressed as a percentage of the maximum laboratory density as determined by ASTM D1557 Test Method (latest edition) or California Test Method 216 (CAL-216), as applicable.

13.0 PREPARATION OF THE SUBGRADE - The Contractor shall prepare the surface of the various subgrades receiving subsequent pavement courses to the lines, grades, and dimensions given on the plans. The upper 12 inches of the soil subgrade beneath the pavement section shall be compacted to a minimum relative compaction of 95 percent based upon ASTM D1557. The finished subgrades shall be tested and approved by the Soils Engineer prior to the placement of additional pavement courses.

14.0 AGGREGATE BASE - The aggregate base material shall be spread and compacted on the prepared subgrade in conformity with the lines, grades, and dimensions shown on the plans. The aggregate base material shall conform to the requirements of Section 26 of the Standard Specifications for Class II material, ¾-inch or 1½-inches maximum size. The aggregate base material shall be compacted to a minimum relative compaction of 95 percent based upon CAL-216. The aggregate base material shall be spread in layers not exceeding 6 inches and each layer of aggregate material course shall be tested and approved by the Soils Engineer prior to the placement of successive layers.

15.0 AGGREGATE SUBBASE - The aggregate subbase shall be spread and compacted on the prepared subgrade in conformity with the lines, grades, and dimensions shown on the plans. The aggregate subbase material shall conform to the requirements of Section 25 of the Standard Specifications for Class II Subbase material. The aggregate subbase material shall be compacted to a minimum relative compaction of 95 percent based upon CAL-216, and it shall be spread and compacted in accordance with the Standard Specifications. Each layer of aggregate subbase shall be tested and approved by the Soils Engineer prior to the placement of successive layers.

16.0 ASPHALTIC CONCRETE SURFACING - Asphaltic concrete surfacing shall consist of a mixture of mineral aggregate and paving grade asphalt, mixed at a central mixing plant and spread and compacted on a prepared base in conformity with the lines, grades, and dimensions shown on the plans. The viscosity grade of the asphalt shall be PG 64-10, unless otherwise stipulated or local conditions warrant more stringent grade. The mineral aggregate shall be Type A or B, ½ inch maximum size, medium grading, and shall conform to the requirements set forth in Section 39 of the Standard Specifications. The drying, proportioning, and mixing of the materials shall conform to Section 39. The prime coat, spreading and compacting equipment, and spreading and compacting the mixture shall conform to the applicable chapters of Section 39, with the exception that no surface course shall be placed when the atmospheric temperature is below 50 degrees F. The surfacing shall be rolled with a combination steel-wheel and pneumatic rollers, as described in the Standard Specifications. The surface course shall be placed with an approved self-propelled mechanical spreading and finishing machine.

Appendix 4: Historical Site Conditions

Phase I Environmental Site Assessment or Other Information on Past Site Use

SCHEDULE A

1. Commitment Date: December 29, 2017 at 7:30 A.M.

2. Policy or Policies to be issued:

		Amount
(A)	ALTA Standard Owner Policy	$1,600,000.00

Proposed Insured:

Mike Sater, a married man as his sole and separate property

(B)	ALTA Extended Loan Policy	$To Be Determined

Proposed Insured:

To Be Determined

3. (A) The estate or interest in the land described in this Commitment is:

Fee as to Parcel A, an easement as to Parcel B

(B) Title to said estate or interest at the date hereof is vested in:

Inland Land Group, LLC, a California limited liability company

4. The land referred to in this Commitment is situated in the City of Moreno Valley, County of Riverside, State of California, and is described as follows:

PARCEL A:

PARCEL 1 OF PARCEL MAP NO. 33361, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 239, PAGE 30 THROUGH 32 OF PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

PARCEL B:

A NONEXCLUSIVE, PERMANENT SEWER AND ACCESS EASEMENT ON OVER AND ACROSS THAT CERTAIN PARCEL OF LAND SITUATED IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, BEING A PORTION OF LOT 7 AND LOT 8 IN BLOCK 151, OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT CO. AS SHOWN BY MAP ON FILE IN BOOK 11 OF MAPS, PAGE 10, RECORDS OF SAN BERNARDINO COUNTY, CALIFORNIA, LYING WITHIN SECTION 22, TOWNSHIP 3 SOUTH, RANGE 3 WEST, S.B.M. MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHWEST CORNER OF SAID LOT 7, SAID POINT ALSO BEING THE INTERSECTION OF THE CENTERLINE OF FILAREE AVENUE AND THE WEST LINE OF LOT 7 AS SHOWN ON MAP REFERENCED ABOVE AND THE TRUE POINT OF BEGINNING;

THENCE SOUTH 89° 33' 36" EAST, 694.50 FEET ALONG THE SOUTH LINE OF SAID LOT 7, SAID SOUTH LINE ALSO BEING THE CENTERLINE OF SAID FILAREE AVENUE, TO A POINT THAT LIES ON THE SOUTH LINE OF SAID LOT 8, SAID POINT BEING DISTANT 34.00 FEET FROM TH

SOUTHWEST CORNER OF SAID LOT 8;

THENCE NORTH 00° 26' 02" EAST, 10.00 FEET TO A POINT THAT LIES ON A LINE THAT IS PARALLEL WITH AND 10.00 FEET NORTH OF SAID SOUTH LINE OF SAID LOT 8;

THENCE NORTH 89° 33' 36" WEST, 694.50 FEET ALONG SAID PARALLEL LINE TO A POINT ON THE WEST LINE OF SAID LOT 7, SAID PARALLEL LINE IS ALSO PARALLEL WITH THE SOUTH LINE OF SAID LOT 7;

THENCE SOUTH 00° 19' 23" WEST, 10.00 FEET ALONG SAID WEST LINE OF LOT 7 TO TRUE POINT OF BEGINNING, RECORDED SEPTEMBER 30, 2014 AS INSTRUMENT NO. 2014-0371036, OF OFFICIAL RECORDS, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA.

APN: 486-310-038-3

SCHEDULE B

SECTION TWO

EXCEPTIONS

Any policy we issue will have the following exceptions unless they are taken care of to our satisfaction. The printed exceptions and exclusions from the coverage of the policy or policies are set forth in Exhibit A attached. Copies of the policy forms should be read. They are available from the office which issued this Commitment.

A. General and special taxes and assessments for the fiscal year 2018-2019, a lien not yet due or payable.

1. General and special taxes and assessments for the fiscal year 2017-2018.

First Installment:	$1,362.70, PAID
Penalty:	$0.00
Second Installment:	$1,362.70, OPEN
Penalty:	$0.00
Tax Rate Area:	021-411
A. P. No.:	486-310-038-3

2. The lien of supplemental taxes, if any, assessed pursuant to Chapter 3.5 commencing with Section 75 of the California Revenue and Taxation Code.

3. A right of way over, under, through and upon said land and every part thereof, for all necessary pipelines, ditches and flumes; also, the right to enter upon said land, at any and all times, to lay, construct and repair said pipelines, ditches and flumes, together with the right to conduct water in and through same, as reserved to the Bear Valley and Alessandro Development Company.

   The location of the easement cannot be determined from record information.

4. An easement for conduits and incidental purposes, recorded March 04, 1955 in Book 1702, Page 467 of Official Records.

In Favor of:	Eastern Municipal District
Affects:	As described therein

   The location of the easement cannot be determined from record information.

5. An easement for construction, access, maintenance and incidental purposes, recorded April 03, 1987 as Instrument No. 93091 of Official Records.

In Favor of:	The Robert P. Warmington Company
Affects:	As described therein

6. The effect of a Resolution recorded January 22, 1990 as Instrument No. 90-24337 of Official Records of Riverside County, California, which recites among other things that said land lies within Improvement District No. U-22 of the Eastern Municipal Water District.

Attachment: Appendix G - Water Quality Management Plan (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

7. An easement for ingress, egress, gold cart path, storm drain facilities and incidental purposes, recorded December 30, 1991 as Instrument No. 449424 of Official Records.

In Favor of:	Atsugi Kokusan Kanko (U.S.A), Inc.
Affects:	As described therein

8. The terms, provisions and easement(s) contained in the document entitled "Hold Harmless Agreement For Water" recorded July 09, 2014 as Instrument No. 2014-0255170 of Official Records.

9. The terms, provisions and easement(s) contained in the document entitled "Resolution No. 2014-091" recorded July 11, 2014 as Instrument No.2014-0258025 of Official Records.

10. The terms, provisions and easement(s) contained in the document entitled "Hold Harmless Agreement Remote Sewer Service Connection And Private Onsite Sewer System" recorded September 25, 2014 as Instrument No. 2014-0364824 of Official Records.

11. The terms, provisions and easement(s) contained in the document entitled "Hold Harmless Agreement For Water" recorded December 04, 2014 as Instrument No. 2014-0462962 of Official Records.

12. The terms, provisions and easement(s) contained in the document entitled "Storm Water Treatment Device And Control Measure Access And Maintenance Covenant" recorded January 21, 2015 as Instrument No. 2015-0024272 of Official Records.

    The location of the easement cannot be determined from record information.

13. This item has been intentionally deleted.

14. This item has been intentionally deleted.

15. Abutter's rights of ingress and egress to or from Iris Avenue, except the general easement of travel, have been dedicated or relinquished on the map of Parcel Map No. 33361 on file in book 239, page 30 through 32, of Parcel Maps.

16. An easement shown or dedicated on the map of Parcel Map No. 33361 recorded August 10, 2015 and on file in Book 239, Page 30 through 32, of Parcel Maps.
    For: Public utility (P.U.E.) and incidental purposes.

    The location of the easement cannot be determined from record information.

17. The terms and provisions contained in the document entitled "Agreement for Public Improvements for Project No. PA05-0034 (PM 33361)" recorded August 31, 2015 as Instrument No. 2015-0386586 of Official Records.

18. Water rights, claims or title to water, whether or not shown by the public records.

19. Rights of parties in possession.

20. The terms, provisions and easement(s) contained in the document entitled "Declaration of Covenants, Conditions and Restrictions and Reservation of Easements" recorded December 05, 2016 as Instrument No. 2016-0540617 of Official Records.

    Document re-recorded December 28, 2016 as Instrument No. 2016-0579235 of Official Records.

21. Any lien, assessment, and /or violation or enforcement of any law, ordinance, permit or governmental regulation arising from the document entitled Notice of Code Violation Non Compliance recorded December 29, 2017 as Instrument No. 2017-0546995 of Official Records.

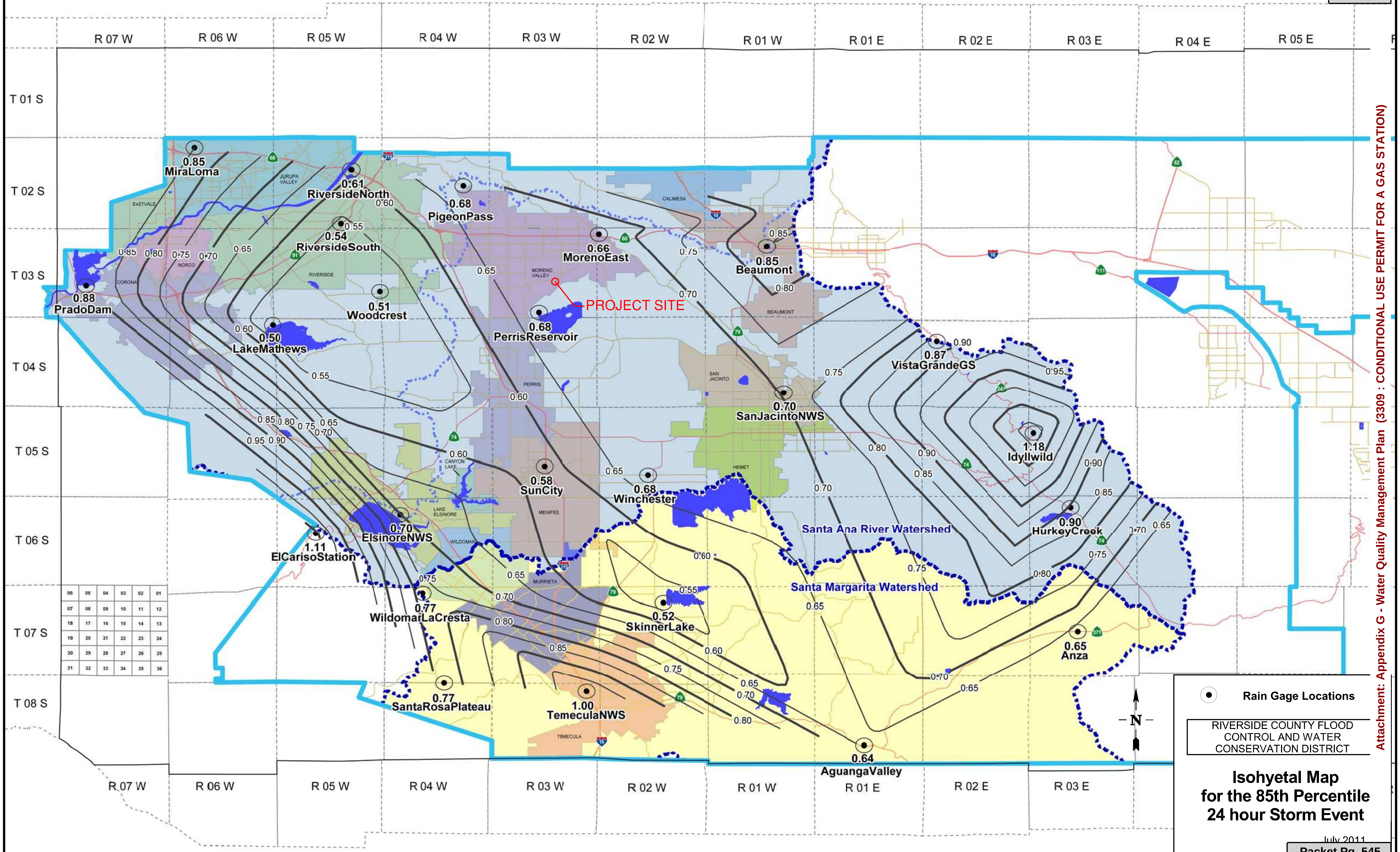
Appendix 5: LID Infeasibility

LID Technical Infeasibility Analysis

(N/A)

Appendix 6: BMP Design Details

BMP Sizing, Design Details and other Supporting Documentation



RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

Isohyetal Map for the 85th Percentile 24 hour Storm Event

July 2011

Attachment: Appendix G - Water Quality Management Plan (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Bioretention Facility - Design Procedure (Rev. 06-2014)	BMP ID bio ret #1	Legend:	Required Entries ▢ Calculated Cells ▨

Company Name: Barghuasen Consulting Engineers, Inc.

Date: 9/21/2018

Designed by: Zereck Jones

County/City Case No.: PEN18-0016LST18

Design Volume

Enter the area tributary to this feature A_{TRIB}= 0.34 acres

Enter V_{BMP} determined from Section 4.3 of this Handbook V_{BMP}= 832 ft^3

Type of Bioretention Facility Design

● Side slopes required (parallel to parking spaces or adjacent to walkways)

○ No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer d_S = 2.0 ft

Top Width of Bioretention Facility, excluding curb w_T = 9.0 ft

Total Effective Depth, d_E

$$d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$$

d_E = 1.42 ft

Minimum Surface Area, A_m

$$A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$$

A_M = 585 ft^2

Proposed Surface Area A= 585 ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility z = 832 :1

Diameter of Underdrain 6 inches

Longitudinal Slope of Site (3% maximum) 0.5 %

6" Check Dam Spacing 0 feet

Describe Landscaping:

Notes: The bio-retention basin is to provide treatment for surface runoff for the gas station parking and manuevering areas and fueling canopy roof.

Santa Ana Watershed - BMP Design Volume, V_{BMP}

Legend: 🟦 Required Entries
▨ Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name Barghausen Consulting Engineers, Inc.
Date 9/21/2018
Designed by Zereck Jones
Case No PEN18-0016LST1
Company Project Number/Name Moreno Valley ARCO Station BCE#18501

BMP Identification

BMP NAME / ID DMA #1 North end of site paving and all vacuum area paving with associated landscaping

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth,
from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.68 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
1A	*8341*	*Concrete or Asphalt*	*1*	*0.89*	*7440.2*			
1B	*2656*	*Roofs*	*1*	*0.892*	*2369.2*			
1C	*1635*	*Ornamental Landscaping*	*0.1*	*0.110458*	*180.6*			
1D	*5158*	*Concrete or Asphalt*	*1*	*0.892*	*4600.9*			
1E	*699*	*Ornamental Landscaping*	*0.1*	*0.110458*	*77.2*			
	18489	***Total***			**14668.1**	**0.68**	***831.2***	***832***

Notes:

Bioretention Facility - Design Procedure (Rev. 06-2014)	BMP ID	Legend:	Required Entries	🟦
	bio ret #2		Calculated Cells	▨

Company Name: Barghuasen Consulting Engineers, Inc.
Date: 9/21/2018
Designed by: Zereck Jones
County/City Case No.: PEN18-0016LST18

Design Volume

Enter the area tributary to this feature	A_{TRIB}=	0.07	acres
Enter V_{BMP} determined from Section 4.3 of this Handbook	V_{BMP}=	159	ft^3

Type of Bioretention Facility Design

● Side slopes required (parallel to parking spaces or adjacent to walkways)

○ No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer	d_S =	2.0	ft
Top Width of Bioretention Facility, excluding curb	w_T =	6.0	ft

Total Effective Depth, d_E

$$d_E = (0.3) \text{ x } d_S + (0.4) \text{ x } 1 - (0.7/w_T) + 0.5$$

d_E = 1.38 ft

Minimum Surface Area, A_m

$$A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$$

A_M = 115 ft^2

Proposed Surface Area A= 122 ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility	z =	4	:1
Diameter of Underdrain		6	inches
Longitudinal Slope of Site (3% maximum)		0.5	%
6" Check Dam Spacing		0	feet

Describe Landscaping:

Notes: The bio-retention basin is to provide treatment for surface runoff from the back drive isle to the car wash and the ped ramp and conc pad in front of the car wash office

Santa Ana Watershed - BMP Design Volume, V_{BMP}

Legend:	
🟦	Required Entries
⬜	Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name Barghausen Consulting Engineers, Inc.
Date 9/21/2018
Designed by Zereck Jones
Case No PEN18-0016LST1
Company Project Number/Name Moreno Valley ARCO Station BCE#18501

BMP Identification

BMP NAME / ID DMA #2 Car Wash driveway and back walkway and carwash office pad

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth,
from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.68 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
2A	*3000*	*Concrete or Asphalt*	*1*	*0.89*	*2676*			
2B	*1080*	*Ornamental Landscaping*	*0.1*	*0.110458*	*119.3*			
	4080		***Total***		**2795.3**	**0.68**	***158.4***	***169***

Notes:

Bioretention Facility - Design Procedure (Rev. 06-2014)	BMP ID	Legend:	Required Entries	🟦
	bio ret #3		Calculated Cells	▨

Company Name: Barghuasen Consulting Engineers, Inc.
Date: 9/25/2018
Designed by: Zereck Jones
County/City Case No.: PEN18-0016LST18

Design Volume

Enter the area tributary to this feature A_{TRIB}= 0.74 acres

Enter V_{BMP} determined from Section 4.3 of this Handbook V_{BMP}= 1,266 ft^3

Type of Bioretention Facility Design

● Side slopes required (parallel to parking spaces or adjacent to walkways)

○ No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer d_S = 3.0 ft

Top Width of Bioretention Facility, excluding curb w_T = 11.0 ft

Total Effective Depth, d_E

$$d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$$

d_E = 1.74 ft

Minimum Surface Area, A_m

$$A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$$

A_M = 730 ft^2

Proposed Surface Area A= 776 ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility z = 4 :1

Diameter of Underdrain 6 inches

Longitudinal Slope of Site (3% maximum) 0 %

6" Check Dam Spacing 0 feet

Describe Landscaping:

Notes: The bio-retention basin is to provide treatment for surface runoff for the gas station parking and manuevering areas and fueling canopy roof. This area will also include the collected impervious area in the

Attachment: Appendix G - Water Quality Management Plan (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Santa Ana Watershed - BMP Design Volume, V_{BMP}

Legend: Required Entries
Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: Barghausen Consulting Engineers, Inc.
Date: 9/21/2018
Designed by: Zereck Jones
Case No: PEN18-0016LST1
Company Project Number/Name: Moreno Valley ARCO Station BCE#18501

BMP Identification

BMP NAME / ID: DMA #3 South end of site paving and south vacuum area paving and canopy

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth,
from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.68 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
3A	*15897*	*Concrete or Asphalt*	*1*	*0.89*	*14180.1*			
3B	*0*	*Concrete or Asphalt*	*1*	*0.892*	*0*			
3C	*4732*	*Roofs*	*1*	*0.892*	*4220.9*			
3D	*8298*	*Ornamental Landscaping*	*0.1*	*0.110458*	*916.6*			
3E	*3375*	*Concrete or Asphalt*	*1*	*0.892*	*3010.5*			
	32302	***Total***			**22328.1**	**0.68**	***1265.3***	***1345***

Notes:

Bioretention Facility - Design Procedure (Rev. 06-2014)

BMP ID: bio ret #4

Legend:	
Required Entries	🟦
Calculated Cells	▨

Company Name: Barghuasen Consulting Engineers, Inc.
Date: 9/21/2018
Designed by: Zereck Jones
County/City Case No.: PEN18-0016LST18

Design Volume

Enter the area tributary to this feature A_{TRIB}= 0.23 acres

Enter V_{BMP} determined from Section 4.3 of this Handbook V_{BMP}= 499 ft^3

Type of Bioretention Facility Design

● Side slopes required (parallel to parking spaces or adjacent to walkways)
○ No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer d_S = 3.0 ft

Top Width of Bioretention Facility, excluding curb w_T = 6.0 ft

Total Effective Depth, d_E

$$d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$$

d_E = 1.68 ft

Minimum Surface Area, A_m

$$A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$$

A_M = 297 ft^2

Proposed Surface Area A= 300 ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility z = 4 :1

Diameter of Underdrain 6 inches

Longitudinal Slope of Site (3% maximum) 0.5 %

6" Check Dam Spacing 0 feet

Describe Landscaping:

Notes: The bio-retention basin is to provide treatment for surface runoff from the east drive isle to the car wash and the east half of the store frontage and parking/manuevering area via catch basin and pipe conveyance and the C-store Roof

Santa Ana Watershed - BMP Design Volume, V_{BMP}

Legend: Required Entries
Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name Barghausen Consulting Engineers, Inc.
Date 9/21/2018
Designed by Zereck Jones
Case No PEN18-0016LST1
Company Project Number/Name Moreno Valley ARCO Station BCE#18501

BMP Identification

BMP NAME / ID DMA #4 Car Wash driveway and east side of store frontage

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth,
from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.68 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

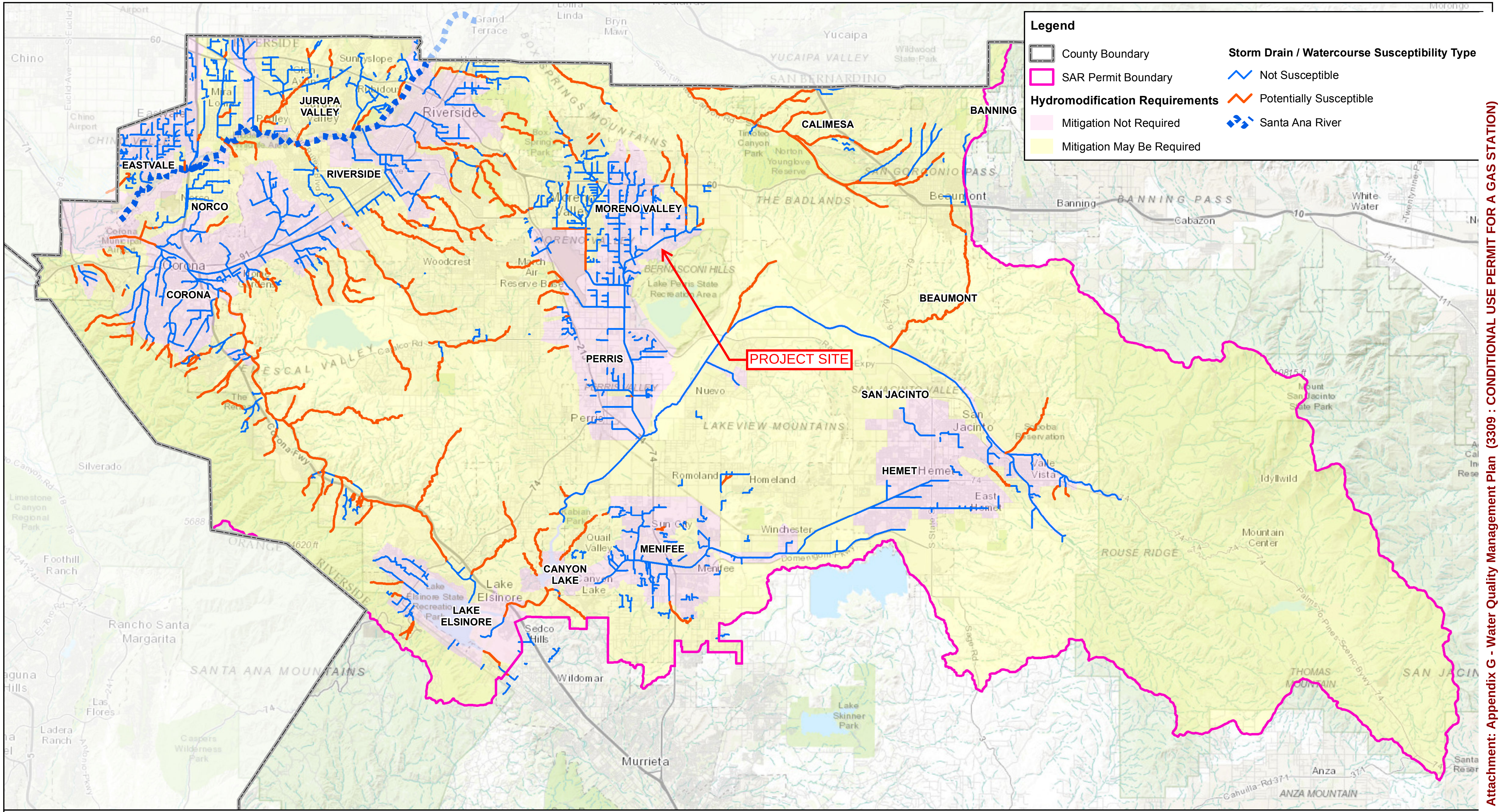
DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
4A	*2393*	*Concrete or Asphalt*	*1*	*0.89*	*2134.6*			
4B	*4204*	*Concrete or Asphalt*	*1*	*0.892*	*3750*			
4C	*3205*	*Roofs*	*1*	*0.892*	*2858.9*			
4D	*423*	*Ornamental Landscaping*	*0.1*	*0.110458*	*46.7*			
	10225	***Total***			**8790.2**	**0.68**	***498.1***	***504***

Notes:

Appendix 7: Hydromodification

Supporting Detail Relating to Hydrologic Conditions of Concern

"EXEMPT"



HCOC Applicability Map
SAR Permittees

Map

N

0 2.5 5 10 Miles

Updated February 2017

NTS

Legend

▭ County Boundary	**Storm Drain / Watercourse Susceptibility Type**
🟪 SAR Permit Boundary	Not Susceptible
Hydromodification Requirements	Potentially Susceptible
▢ Mitigation Not Required	Santa Ana River
🟨 Mitigation May Be Required	DESERT HOT SPRING

18215 72ND AVENUE SOUTH
KENT, WA 98032
(425)251-6222
(425)251-8782 FAX

BARGHAUSEN CONSULTING ENGINEERS, INC

CIVIL ENGINEERING, LAND PLANNING,
SURVEYING, ENVIRONMENTAL SERVICES

HCOC APPLICABILITY MAP EXCERPT

APPENDIX 7B

Attachment: Appendix G - Water Quality Management Plan (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Appendix 8: Source Control

Pollutant Sources/Source Control Checklist

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

How to use this worksheet (also see instructions in Section G of the WQMP Template):

1. Review Column 1 and identify which of these potential sources of stormwater pollutants apply to your site. Check each box that applies.
2. Review Column 2 and incorporate all of the corresponding applicable BMPs in your WQMP Exhibit.
3. Review Columns 3 and 4 and incorporate all of the corresponding applicable permanent controls and operational BMPs in your WQMP. Use the format shown in Table G.1on page 23 of this WQMP Template. Describe your specific BMPs in an accompanying narrative, and explain any special conditions or situations that required omitting BMPs or substituting alternative BMPs for those shown here.

IF THESE SOURCES WILL BE ON THE PROJECT SITE …	… THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☒ A. **On-site storm drain inlets**	☒ **Locations of inlets.**	☒ **Mark all inlets with the words "Only Rain Down the Storm Drain" or similar. Catch Basin Markers may be available from the Riverside County Flood Control and Water Conservation District, call 951.955.1200 to verify.**	☒ **Maintain and periodically repaint or replace inlet markings.** ☒ **Provide stormwater pollution prevention information to new site owners, lessees, or operators.** ☒ **See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com** ☒ **Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."**
☒ B. **Interior floor drains and elevator shaft sump pumps**		☒ **State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.**	☒ **Inspect and maintain drains to preven blockages and overflow.**
☐ C. **Interior parking garages**		☐ **State that parking garage floor drains will be plumbed to the sanitary sewer.**	☐ **Inspect and maintain drains to preven blockages and overflow.**

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☒ D1. **Need for future indoor & structural pest control**		☒ **Note building design features that discourage entry of pests.**	☒ **Provide Integrated Pest Management information to owners, lessees, and operators.**
☒ D2. **Landscape/ Outdoor Pesticide Use**	☐ **Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained.** ☒ **Show self-retaining landscape areas, if any.** ☒ **Show stormwater treatment and hydrograph modification management BMPs. (See instructions in Chapter 3, Step 5 and guidance in Chapter 5.)**	**State that final landscape plans will accomplish all of the following.** ☒ **Preserve existing native trees, shrubs, and ground cover to the maximum extent possible.** ☒ **Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution.** ☒ **Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions.** ☒ **Consider using pest-resistant plants, especially adjacent to hardscape.** ☒ **To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.**	☒ **Maintain landscaping using minimum or no pesticides.** ☒ **See applicable operational BMPs in "What you should know for…..Landscape and Gardening"** at http://rcflood.org/stormwater/**Error! Hyperlink reference not valid.** ☒ **Provide IPM information to new owners, lessees and operators.**

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☐ E. **Pools, spas, ponds, decorative fountains, and other water features.**	☐ **Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet. (Exception: Public pools must be plumbed according to County Department of Environmental Health Guidelines.)**	**If the Co-Permittee requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.**	☐ **See applicable operational BMPs in** "Guidelines for Maintaining Your Swimming Pool, Jacuzzi and Garden Fountain" at http://rcflood.org/stormwater/
☒ F. **Food service**	☒ **For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment.** ☒ **On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.**	☒ **Describe the location and features of the designated cleaning area.** ☒ **Describe the items to be cleaned in this facility and how it has been sized to insure that the largest items can be accommodated.**	☒ **See the brochure, "**The Food Service Industry Best Management Practices for: Restaurants, Grocery Stores, Delicatessens and Bakeries" at http://rcflood.org/stormwater/ **Provide this brochure to new site owners, lessees, and operators.**
☒ G. **Refuse areas**	☒ **Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas.** ☒ **If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run-on and show locations of berms to prevent runoff from the area.** ☒ **Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer.**	☒ **State how site refuse will be handled and provide supporting detail to what is shown on plans.** ☒ **State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.**	☒ **State how the following will be implemented:** **Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☐ H. **Industrial processes.**	☐ **Show process area.**	☐ **If industrial processes are to be located on site, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."**	☐ **See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com** See the brochure "Industrial & Commercial Facilities Best Management Practices for: Industrial, Commercial Facilities" at http://rcflood.org/stormwater/

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☐ I. **Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)**	☐ **Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or run-off from area.** ☐ **Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults.** ☐ **Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.**	**Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains.** **Where appropriate, reference documentation of compliance with the requirements of Hazardous Materials Programs for:** ▪ **Hazardous Waste Generation** ▪ **Hazardous Materials Release Response and Inventory** ▪ **California Accidental Release (CalARP)** ▪ **Aboveground Storage Tank** ▪ **Uniform Fire Code Article 80 Section 103(b) & (c) 1991** ▪ **Underground Storage Tank** **www.cchealth.org/groups/hazmat/**	☐ **See the Fact Sheets SC-31, “Outdoor Liquid Container Storage” and SC-33, “Outdoor Storage of Raw Materials ” in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☒ J. **Vehicle and Equipment Cleaning**	☒ **Show on drawings as appropriate:** **(1) Commercial/industrial facilities having vehicle/equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses.** **(2) Multi-dwelling complexes shall have a paved, bermed, and covered car wash area (unless car washing is prohibited on-site and hoses are provided with an automatic shut-off to discourage such use).** **(3) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer.** **(4) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.**	☐ **If a car wash area is not provided, describe any measures taken to discourage on-site car washing and explain how these will be enforced.**	**Describe operational measures to implement the following (if applicable):** ☒ **Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system.** Refer to “Outdoor Cleaning Activities and Professional Mobile Servic Providers” for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http://rcflood.org/stormwater/ ☐ **Car dealerships and similar may rinse cars with water only.**

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE …	… THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☐ K. **Vehicle/Equipment Repair and Maintenance**	☐ **Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater.** ☐ **Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas.** ☐ **Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.**	☐ **State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area.** ☐ **State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.** ☐ **State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.**	**In the Stormwater Control Plan, note that all of the following restrictions apply to use the site:** ☐ **No person shall dispose of, nor permi the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains.** ☐ **No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately.** ☐ **No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment.** Refer to "Automotive Maintenance & Ca Care Best Management Practices for Aut Body Shops, Auto Repair Shops, Car Dealerships, Gas Stations and Fleet Service Operations". Brochure can be found at http://rcflood.org/stormwater/ Refer to Outdoor Cleaning Activities and Professional Mobile Service Providers fo many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http://rcflood.org/stormwater/

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☒ L. **Fuel Dispensing Areas**	☒ **Fueling areas[6] shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable.** ☒ **Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area[1].] The canopy [or cover] shall not drain onto the fueling area.**		☒ **The property owner shall dry sweep the fueling area routinely.** ☒ **See the Fact Sheet SD-30 , "Fueling Areas" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

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[6] The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☐ M. **Loading Docks**	☐ **Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas shall be drained to the sanitary sewer, or diverted and collected for ultimate discharge to the sanitary sewer.** ☐ **Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation.** ☐ **Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.**		☐ **Move loaded and unloaded items indoors as soon as possible.** ☐ **See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☐ N. **Fire Sprinkler Test Water**		☐ **Provide a means to drain fire sprinkler test water to the sanitary sewer.**	☐ **See the note in Fact Sheet SC-41, "Building and Grounds Maintenance, in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**
O. **Miscellaneous Drain or Wash Water or Other Sources** ☐ **Boiler drain lines** ☒ **Condensate drain lines** ☐ **Rooftop equipment** ☐ **Drainage sumps** ☒ **Roofing, gutters, and trim.** ☐ **Other sources**		☐ **Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system.** ☒ **Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system.** ☐ **Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment.** ☐ **Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water.** ☐ ☒ **Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff.** **Include controls for other sources as specified by local reviewer.**	

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☒ P. **Plazas, sidewalks, and parking lots.**			☒ **Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain**

Appendix 9: O&M

Operation and Maintenance Plan and Documentation of Finance, Maintenance and Recording Mechanisms

"TO BE PROVIDED DURING FINAL WQMP"

Appendix 10: Educational Materials

BMP Fact Sheets, Maintenance Guidelines and Other End-User BMP Information

"TO BE PROVIDED DURING FINAL WQMP"

PRELIMINARY DRAINAGE REPORT

Moreno Valley ARCO Fuel Station
NWC of Iris Avenue and Oliver Street
Moreno Valley, CA 92555

City of Moreno Valley Case Number PEN18-0016, LST-18

Prepared for:
Sater Oil International, LLC
683 Cliffside Drive
San Dimas, CA 91773

Prepared by:
Barghausen Consulting Engineers, Inc.
18215 72nd Avenue South
Kent, WA 98032
(425) 251-6222
Hal G. Grubb, P.E.

Revised September 25, 2018
Revised August 7, 2018
Revised April 2, 2018
January 18, 2017
Our Job No. 18501

TABLE OF CONTENTS

APPENDICES

Tab 1.0

1.0 SUMMARY

1.1 PURPOSE

The purpose of this report is to document the hydrologic and hydraulic analyses performed in support of the proposed ARCO Fuel Facility and Convenience Store. The project is situated in Section 22, Township 3 South, Range 3 West, San Bernardino Meridian in the City of Moreno Valley, Riverside County, California. Please see Figure 1 for the Vicinity Map, for a more accurate depiction of the location of the site.

The project site is located northwest of the intersection of Oliver Street to the east and Iris Avenue to the south. The project proposes to build a new fueling station, convenience store, car wash, queuing lanes, parking, and associated vehicle maneuvering area on the approximately 1.58-acre site. The proposed project will make some dedication of right-of-way for driveway entrances and a new bus stop turnout, reducing the site area to approximately 1.55 acres. This report will summarize the hydrology and hydraulic analyses that were completed in order to determine the necessary drainage improvements required to provide flood protection for the proposed buildings and to effectively convey runoff from the site.

The scope of this report will include the following:

- Determine the peak 100-year and 10-year flow rates for the developed condition using the Riverside County Flood Control and Water Conservation District (RCFC & WCD) Rational Method.

- Determine the 2-year, 5-year, 10-year, 1-hour, 3-hour, 6-hour, 24-hour peak flow rates and flood volumes for the existing and developed conditions using the Riverside County Flood Control and Water Conservation District (RCFC & WCD) Unit Hydrograph Method.

1.2 EXISTING SITE CONDITIONS

The project site is a vacant parcel of 1.58 acres. Existing elevations across the site vary from 1568 at the southeast corner to 1552 at the northwest corner (NAVD88 datum). The existing site is currently undeveloped pasture with grass cover. The site currently slopes from southeast to northwest at 3.5 to 7.5 percent. The existing drainage for the site sheet flows overland following the topography from southeast to northwest, which conveys runoff produced from storm events on to the adjacent lot along the north and west property lines. The runoff that does not infiltrate in the adjacent vacant lot will make its way to the south side of the existing Fresenius Dialysis Center, where a curb cut has been constructed to allow water to outflow into the private drive fronting the Dialysis Center. The private drive continues sloping to the north where provisions are currently under consideration for better conveyance to the watershed. The adjacent Iris Avenue slopes away to the west and Oliver Street slopes away to the north. See Figure 2 for the Topography Map and Figure 3 for the Aerial Photograph of site. The subject site is located within a zone "X" designation per Flood Insurance Rate Map No. 06065C0770G, with an effective date of August 28, 2008. A zone "X" designation indicates that the site is outside of the 0.2 percent annual chance floodplain.

1.3 WATERSHED DESCRIPTION

The project is located within the Moreno Master Drainage Plan watershed area. The drainage enters the Line F channel further north of the Fresenius Dialysis Center, which contributes to the Kitching Street Channel, to the Perris Valley Storm Drain which contributes to the San Jacinto River, and finally reaches Canyon Lake. See Figure 4 for the Watershed Map.

Attachment: Appendix H - Preliminary Drainage Report (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

1.4 PROPOSED CONDITIONS

The proposed project is located at the northwest corner of Iris Avenue and Oliver Street. The proposed project primarily entails the development of a vacant property south of the existing Fresenius Kidney Care Center. There is an additional vacant property separating the subject site and the Kidney Center.

Specifically, the project includes the installation of an ARCO fuel facility, including the construction of a convenience store, a pump island canopy with multi-product dispensers, a car wash, underground storage tanks for fuel, new on-site curb, sidewalk, asphalt pavement, storm drainage improvements including LID BMPs and conveyance, landscaping, lot lights, and utility connections. Frontage improvements along Iris Avenue will include reconstruction of the sidewalk for a bus turnout.

Stormwater generated from the proposed impervious areas will be conveyed to one of four bio-retention basins in order to provide water quality treatment. Bio-retention basins will then be collected via an under-drain or overflow structure and conveyed to an on-site pump station to discharge along the Oliver street side of the site. Stormwater will then be pumped to an outlet spreader and allowed to flow via a parkway drain under the sidewalk and into the Oliver Street gutter. Stormwater detention will not be provided.

No mitigation will be performed for an increase in runoff for the 1-, 3-, 6-, and 24-hour duration events for the 2-, 5-, and 10-year return frequencies. The outlet flow rate from the proposed on-site pump station will instead discharge in a cycle that will be governed by the pump flow rate.

1.5 HYDROLOGY AND HYDRAULICS

Hydrologic calculations were performed in accordance with the RCFC & WCD Hydrology Manual dated April 1978. Peak flow rates for the 10-year and 100-year storm were calculated using the Rational Method. Calculations are included in Appendix A.

The parameters applied to the calculations, including soil types and rainfall data were gathered from the RCFC & WCD Hydrology Manual. The Design Handbook for LID BMPs for RCFC & WCD provided guidance to size the four on-site water quality treatment bio-retention basins using spreadsheets that are downloaded from RCFC & WCD's web site. The water quality storm is sized per the volume of runoff generated from an 85th percentile, 24-hour storm event. Details regarding the bio-retention design are located in the Project Specific WQMP.

Rational Method calculations were performed at the direction of the RCFC & WCD Hydrology Manual and input into Microsoft Excel for ease of calculation and updating for site changes. The Rational Method was utilized to calculate the peak discharge flow rates to size the pipe and pump station, to convey site stormwater from the overflow structure at each of the bio-retention basins to the proposed discharge point at the edge of the right-of-way. Calculations are included in Appendix A-1.

The Unit Hydrograph Method was used to determine the peak flow rates and volumes associated with the 1-, 3-, 6-, and 24-hour duration events for the 2-, 5-, and 10-year storms for the site. Calculations were performed using the Hydraulic Engineering Center (HEC), HEC-HMS software provided by the Army Corps of Engineers. Inputs were derived from the RCFC & WCD Preprocessor, found at http://rcflood.org/hechms/. Calculation are included in Appendix A-5.

Figure 1

Site Vicinity Map

REFERENCE: Rand McNally (2018)

Scale:

Horizontal: **N.T.S.** Vertical: **N/A**

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SURVEYING, ENVIRONMENTAL SERVICES

For:

Sater ARCO
Moreno Valley, CA

Title:

VICINITY MAP

Job Number
18501

Figure
1

DATE: 01/15/18

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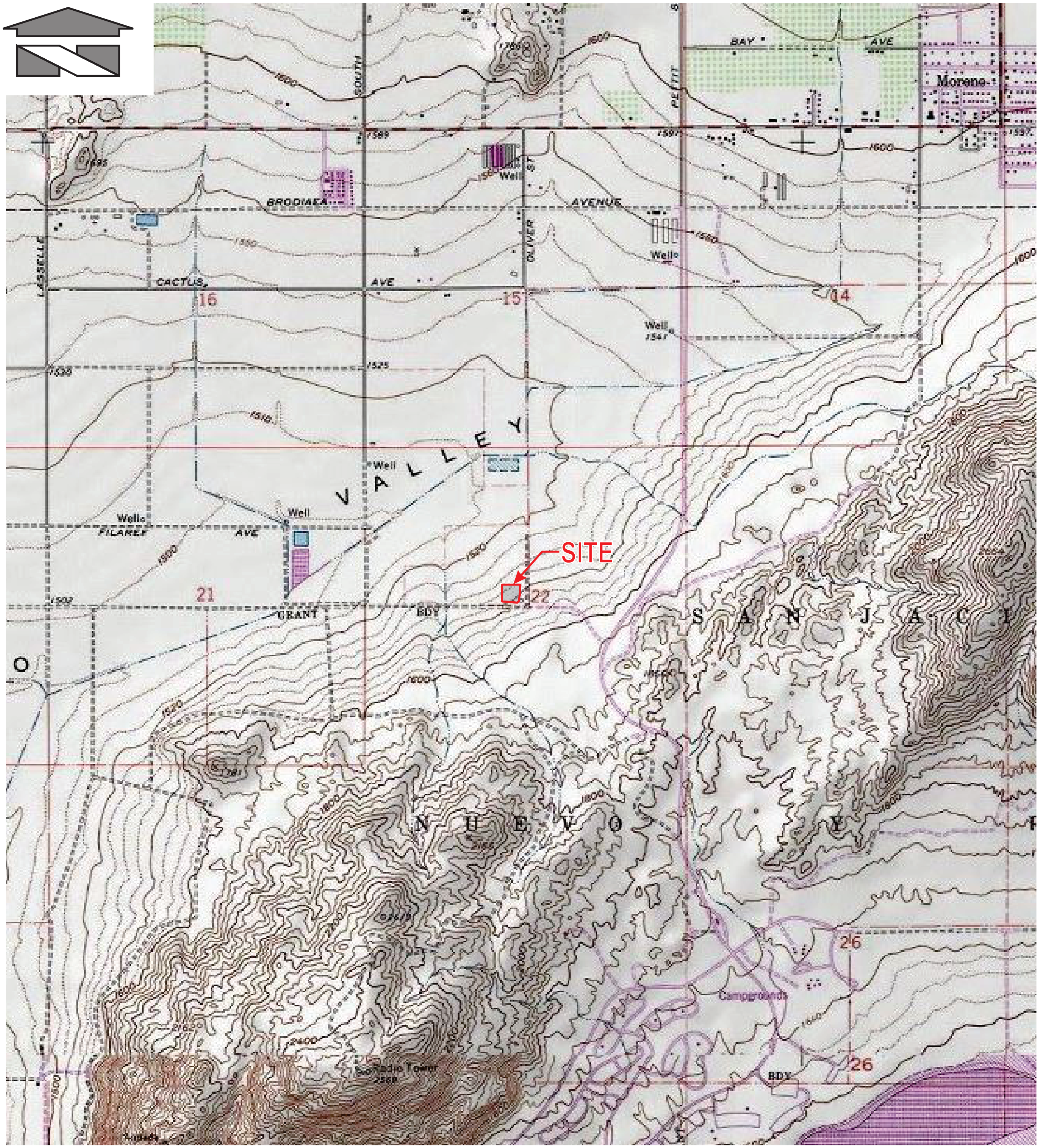
Figure 2

Topography Map



REFERENCE: ESRI/USGS

Scale:
Horizontal: **N.T.S.** Vertical: **N/A**

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(425) 251-8782

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For:
Sater ARCO
Moreno Valley, CA

Title:
USGS TOPOGRAPHY
MAP

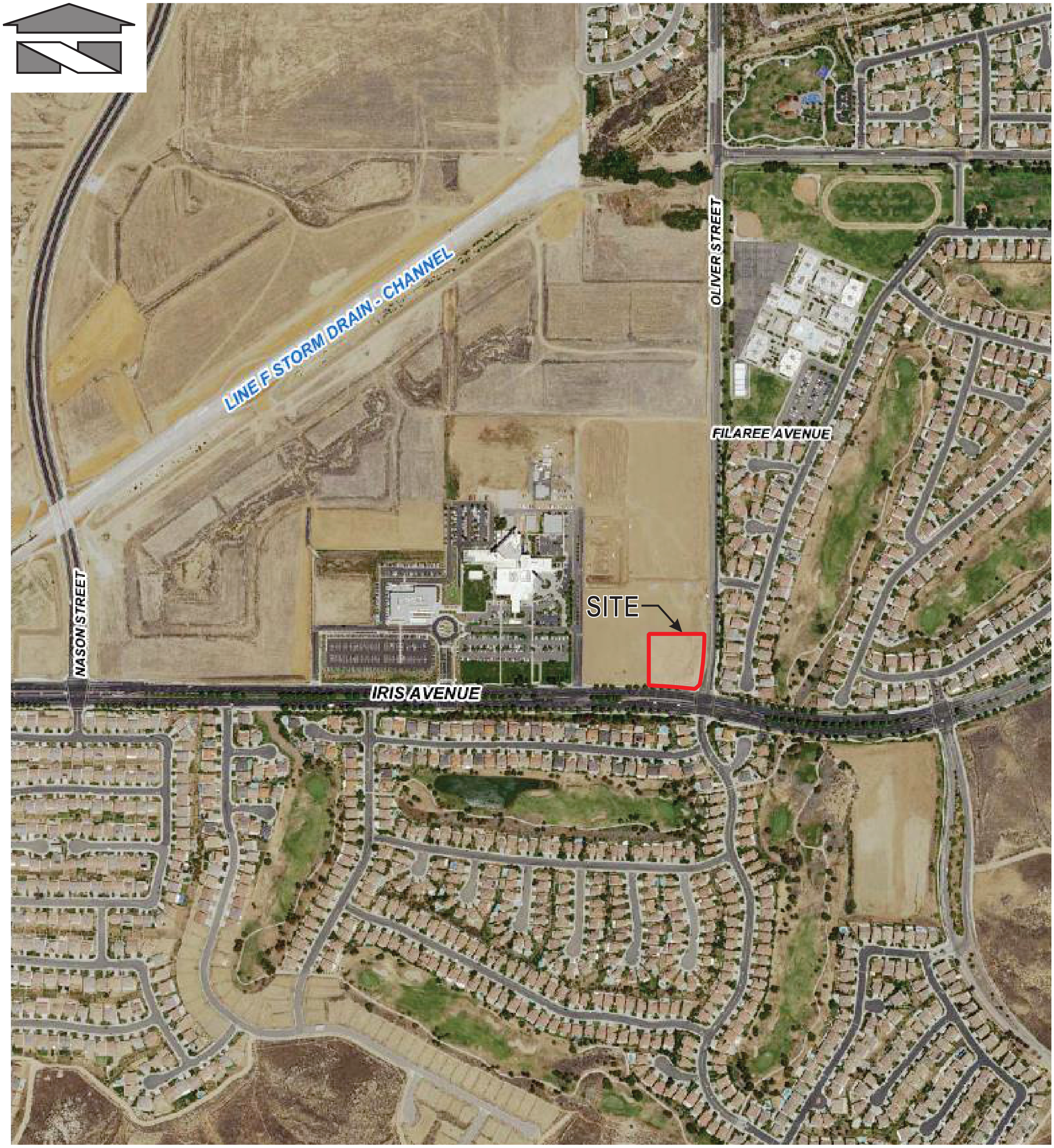
Job Number
18501

Figure
2

DATE: 01/15/18

Figure 3

Aerial Map



REFERENCE: USDA-FSA Aerial Photography

Scale:
Horizontal: **N.T.S.** Vertical: **N/A**

For:

Sater ARCO
Moreno Valley, CA

Job Number
18501

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Title:
AERIAL PHOTOGRAPH

Figure
3

DATE: 01/15/18

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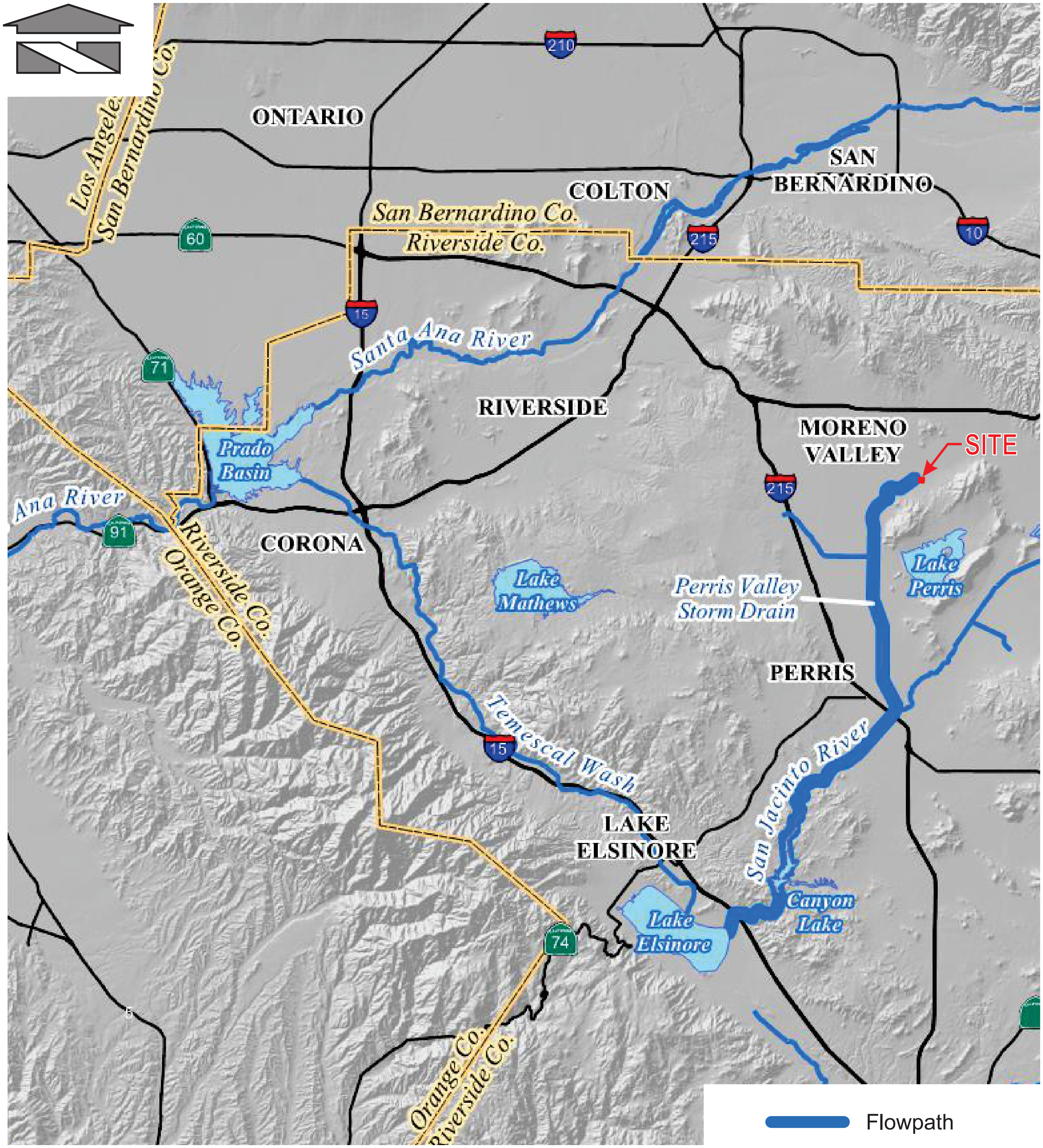
Figure 4

Watershed Map



REFERENCE: USGS

Scale:

Horizontal: **N.T.S.** Vertical: **N/A**

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For:

Sater ARCO
Moreno Valley, CA

Title:

RECEIVING
WATERBODIES

Job Number

18501

Figure

4

DATE: 01/15/18

P:\18000s\18501\exhibit\graphics\18501 flow.cdr

Attachment: Appendix H - Preliminary Drainage Report (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Tab 2.0

2.0 HYDROLOGY ANALYSIS - RATIONAL METHOD

The RCFC&WCD Hydrology Manual was used to determine several hydrological parameters.

Storm Event	Duration 1-Hour (inches)
10-Year	0.82
100-Year	1.2

Table 1- Precipitation Values

The precipitation values and value for slope of intensity, 0.50, are listed on Plate D-4.1 (6 of 6). The plate is included in Appendix A-2.

Based on Plate C1.17 of the RCFC & WCD Manual, the project is primarily located within an area classified at Type B. (Appendix A-3)

The ground cover type for design procedure is selected from Plate D-5.5 (Appendix A-4):

Cover Type	Soil Group A	**Soil Group B**	Soil Group C	Soil Group D	% Of Impervious Cover
Undeveloped Poor Cover	67	**78**	86	89	0
Developed-Commercial Landscaping	32	**56**	69	75	74

Table 2- Ground Cover Types

2.1 ON-SITE RATIONAL METHOD HYDROLOGY

The rational method was implemented to calculate peak flows to size the proposed subsurface conveyance including drains, piping, pump station, and discharge facility. The site was divided into four Drainage Management Areas based on topography and each area surface flows to one of four associated bio-retention facilities. The car wash building, fueling canopy, and convenience store are also directed to one of the four bio-retention facilities. Two of the four Drainage Management Areas are sub-divided due to topographical limitations and require the use of a catch basin that will flow to one of the bio-retention facilities underground. This condition exists in Drainage Management Area Nos. 1, 3 and 4. DMA No. 4 has enough fall that the inlet pipe is above the rim of the bio-retention basin. DMA Nos. 1 and 3 will utilize a bubble-up structure with its rim placed at the same elevation as the overflow outlet structure. See Figure 5 for the Basin Map. Conveyance Infrastructure on site is designed to convey the following Rational Method Peak Flows. Calculations are included in Appendix A-1 for flow generation and pipe conveyance. It should be noted that Drainage Management Area 3 also includes tributary from off-site improvements. Runoff from the right-of-way is to be collected at the gutter flow line with a curb inlet catch basin. Water will be conveyed to treatment via a submerged bubble-up structure.

DMA 1			10 yr	100 yr	
Pre-Developed	10 min	Q=	0.77	1.12	cfs
	60 min	Q=	0.31	0.46	cfs
Developed	10 min	Q=	0.75	1.09	cfs
	60 min	Q=	0.30	0.45	cfs
DMA 2			10 yr	100 yr	
Pre-Developed	10 min	Q=	0.18	0.26	cfs
	60 min	Q=	0.07	0.11	cfs
Developed	10 min	Q=	0.15	0.22	cfs
	60 min	Q=	0.06	0.09	cfs
DMA 3			10 yr	100 yr	
Pre-Developed	10 min	Q=	1.18	1.73	cfs
	60 min	Q=	0.48	0.71	cfs
Developed	10 min	Q=	1.21	1.77	cfs
	60 min	Q=	0.49	0.72	cfs
DMA 4			10 yr	100 yr	
Pre-Developed	10 min	Q=	0.49	0.72	cfs
	60 min	Q=	0.20	0.29	cfs
Developed	10 min	Q=	0.50	0.73	cfs
	60 min	Q=	0.20	0.30	cfs

Table 3- Rational Method Basin Peak Outlet Flows

2.2 ON-SITE UNIT HYDROGRAPH HYDROLOGY

The unit hydrograph method was used to determine the peak flow rates and volumes as required by the RCFC and WCD. A unit hydrograph was performed for the drainage area contributing to site runoff. Unit hydrographs were performed for both the existing condition and developed condition. The following table summarizes the results of the unit hydrograph analysis. Calculations are included in Appendix B for flow unit hydrograph calculations.

	Existing Condition			Proposed Condition		
	Volume (AC-ft)	Volume (in)	Peak Flow (cfs)	Volume (AC-ft)	Volume (in)	Peak Flow (cfs)
Storm Event						
2 yr 1 hr	0.1	0.42	1.7	0.1	0.49	1.6
2 yr 3 hr	0.1	0.85	1.2	0.1	0.84	1.1
2 yr 6 hr	0.2	1.22	1.1	0.2	1.21	1.1
2 yr 24 hr	0.3	2.04	0.4	0.3	2.04	0.4
5 yr 1 hr	0.1	0.58	2.3	0.1	0.57	2.2
5 yr 3 hr	0.1	1.11	1.5	0.1	1.1	1.5
5 yr 6 hr	0.2	1.57	1.4	0.2	1.56	1.4
5 yr 24 hr	0.4	2.79	0.6	0.4	2.79	0.6
10 yr 1 hr	0.1	0.71	2.8	0.1	0.69	2.8
10 yr 3 hr	0.2	1.32	1.8	0.2	1.31	1.8
10 yr 6 hr	0.2	1.86	1.7	0.2	1.85	1.7
10 yr 24 hr	0.4	3.31	0.7	0.4	3.31	0.7

2.3 OFF-SITE HYDROLOGY

Off-site stormwater flows calculations include a combination of the four proposed on-site Drainage Management Areas and one off-site DMA that will discharge at a point along the east site frontage into the gutter flow line.

			10 yr	100 yr	
Pre-Developed	10 min	Q=	2.62	3.83	cfs
Combined Peak Flow	60 min	Q=	1.07	1.56	cfs

Combined Peak Flow	10 min	Q=	2.61	3.81	cfs
	60 min	Q=	1.06	1.56	cfs

Pre-Developed and Proposed Condition Comparison

The pre-developed site condition consists of Undeveloped Poor Cover grass land on a slope of 4 to 8%. With the on-site soil group B, the runoff coefficient is expected to be 78. The proposed conditions will consist of buildings, paved impervious surfaces and landscaping areas. The intermixing of areas, impervious and landscaping will result in a proportioned runoff coefficient that corresponds to each drainage basin. Combined with the plateauing of the site by implementing retaining walls along the north and west sides of the lot, the runoff flows calculated by the rational method in some cases result in decreased flows for the developed condition.

Figure 5

Basin Map

1"=30'

0 15 30 60

DRAINAGE MANAGEMENT AREA LEGEND:

DRAINAGE MANAGEMENT AREA 1	▨
DRAINAGE MANAGEMENT AREA 2	▨
DRAINAGE MANAGEMENT AREA 3	▨
DRAINAGE MANAGEMENT AREA 4	▨
OFFSITE DRAINAGE MANAGEMENT AREA 3E	▦

DEVELOPED STORM FLOW SUMMARY:

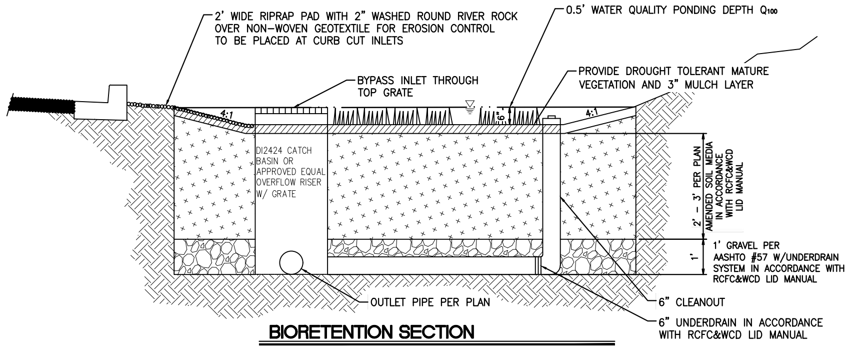
			10 yr	100 yr	
DMA 1	10 min	Q=	0.75	1.09	cfs
	60 min	Q=	0.30	0.45	cfs
DMA 2	10 min	Q=	0.15	0.22	cfs
	60 min	Q=	0.06	0.09	cfs
DMA 3	10 min	Q=	1.21	1.77	cfs
	60 min	Q=	0.49	0.72	cfs
DMA 4	10 min	Q=	0.50	0.73	cfs
	60 min	Q=	0.20	0.30	cfs
Combined PeakFlow	10 min	Q=	2.61	3.81	cfs
	60 min	Q=	1.06	1.56	cfs

SURFACE COVERAGE SUMMARY:

DEVELOPED SITE AREA:	67,420	1.55 ACRE
PROPOSED IMPERVIOUS AREA:	49,586	1.14 ACRE
PERVIOUS TRIBUTARY TO BIO-RETENTION:	12,115	0.28 ACRE
PERVIOUS SELF TREATING AREA:	5,719	0.13 ACRE
OFFSITE IMPERVIOUS AREA:	5799	0.13 ACRE

SOURCE CONTROL BMP NOTES:

1. GREASE CONTROL FROM FOOD HANDLING ACTIVITIES WILL BE PART OF THIS PROJECT BUT WILL BE SPECIFIED IN A LATER SUBMITTAL.
2. CAR WASH ACTIVITIES WILL BE CONTAINED WITHIN THE CAR WASH BUILDING. GRADING AND DRAINAGE WILL DIRECT RUNOFF FROM CARS LEAVING THE CAR WASH WILL BE COLLECTED BY THE CAR-WASH WATER TREATMENT FACILITIES TO THE GREATEST EXTENT POSSIBLE.
3. INTERIOR FLOOR DRAINS WILL BE PLUMBED TO SANITARY SEWER.
4. FUEL DISPENSING AREAS ARE TO BE HYDRAULICALLY ISOLATED WITH GRADING FEATURES AND THE CANOPY IS NOT TO BE DRAINED TO THE FUELING AREA GROUND SURFACE.
5. TRASH AND RECYCLING ENCLOSURE IS GRADED TO HYDRAULICALLY ISOLATE THE SURFACE TO PREVENT RUN ON FROM THE SURROUNDING SITE.



BIORETENTION SECTION

NOT TO SCALE

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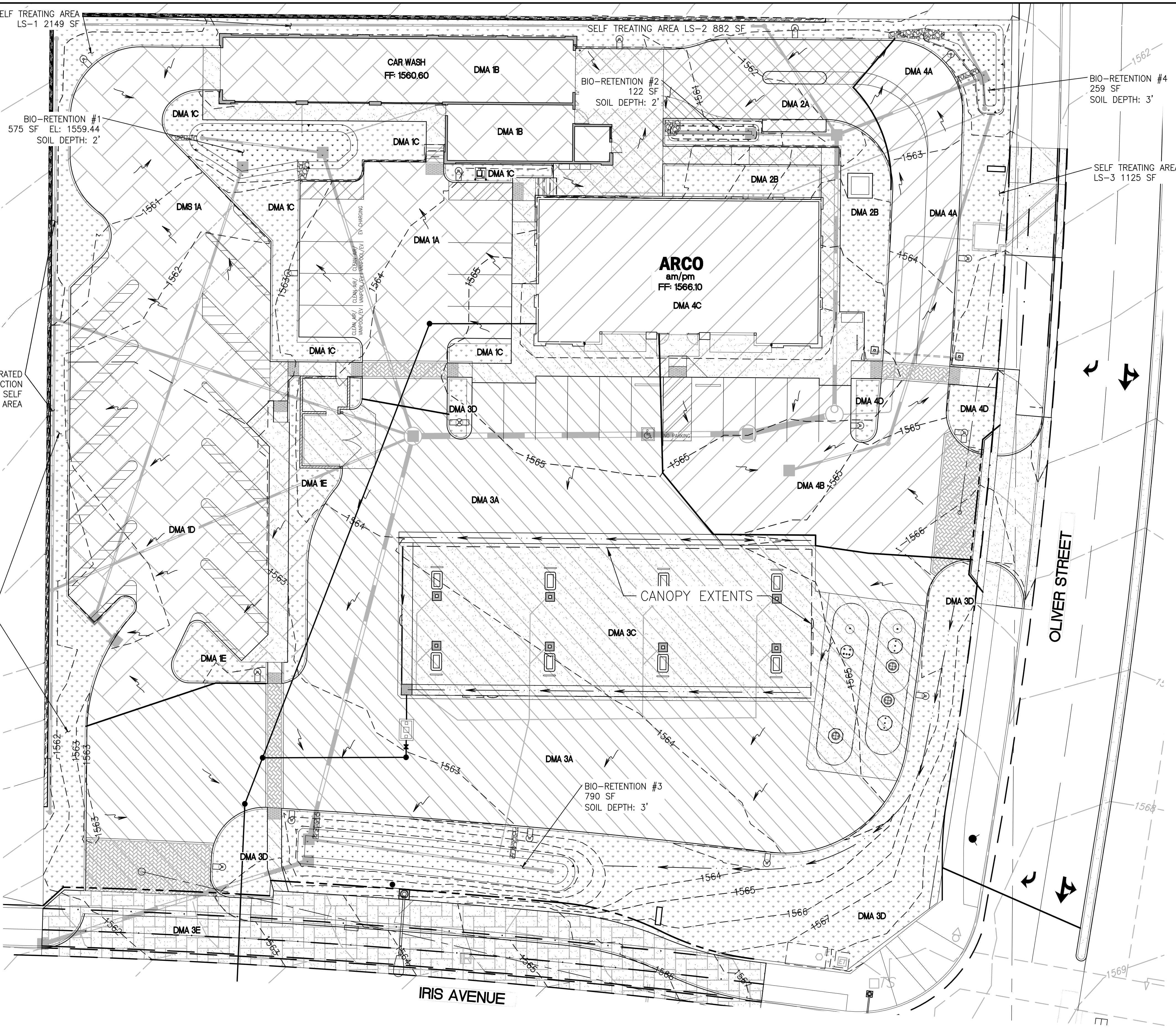


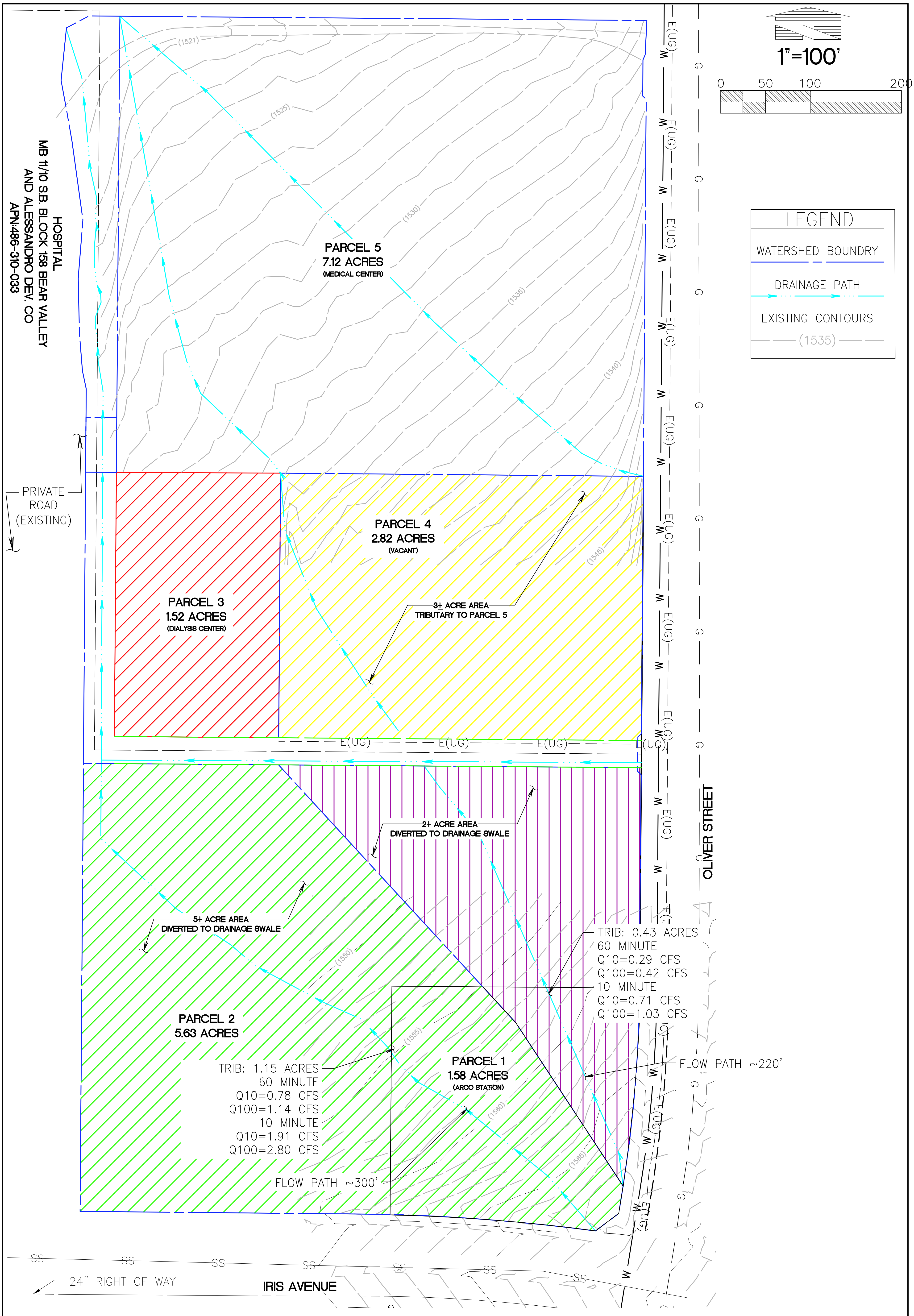
DRAINAGE MANAGEMENT AREA SITE PLAN

FIGURE 5

DRAINAGE MANAGEMENT AREA SITE PLAN

Figure 6

Existing Drainage Basin Site Plan



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SITE SOILS GROUP: B
EXISTING CONDITION : UNDEVELOPED POOR COVER, C=78
PROPOSED COMMERCIAL IMPERVIOUS SURFACES, C=90
PROPOSED COMMERCIAL LANDSCAPING, C=56
SEE SECTION 2.0 OF THIS DRAINAGE REPORT

EXISTING DRAINAGE BASIN PLAN

FIGURE 2A

Attachment: Appendix H - Preliminary Drainage Report (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

File:P:\18000s\18501\exhibit\18501 DMA EX BASIN MAP FIG 2A AND 6.dwg Date/Time:9/26/2018 9:07 AM Z.JONES

Tab 3.0

3.0 CONCLUSION

Based on the analyses and results of this report, the following conclusions can be made:

1. The proposed bio-retention will collect surface stormwater runoff and convey through the amended soil as specified by the RCFC & WCD LID Manual. The water quality design storm will be collected by underdrains in the bio-retention basins and conveyed to the point of discharge.

2. The proposed on-site drainage improvements will adequately convey flow from proposed impervious and pervious surfaces for the 100-year storm to the point of off-site discharge. Bio-retention is to be bypassed during storm events via an overflow drain within each of the bio-retention basins. Thus, the project site is flood protected for the 100-year design storm event.

3. The proposed project will not impact site runoff conditions for sites upstream or downstream of it.

4. Due to the high runoff coefficient of the existing pasture condition, overall site discharge will be similar to that of the existing condition. The offsite discharge will, however, be concentrated to the flow line at the Oliver Street frontage.

5. Runoff from the proposed frontage improvements on Iris Avenue will be brought on site for treatment and discharged along with the on-site stormwater.

6. There will be very similar peak flows leaving the site in the proposed condition as in the existing condition due to conversion of sloped poor grassland to a flatter mix of impervious and landscaped surfaces.

Appendices

Appendix A-1

Rational Method Calculations

Santa Ana Watershed - BMP Design Volume, V_{BMP}

Legend: ▢ Required Entries
▨ Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name Barghausen Consulting Engineers, Inc.
Date 9/21/2018
Designed by Zereck Jones
Case No PEN18-0016LST1
Company Project Number/Name Moreno Valley ARCO Station BCE#18501

BMP Identification

BMP NAME / ID DMA #1 North end of site paving and all vacuum area paving with associated landscaping

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth,
from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.68 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
1A	*8341*	*Concrete or Asphalt*	*1*	*0.89*	*7440.2*			
1B	*2656*	*Roofs*	*1*	*0.892*	*2369.2*			
1C	*1635*	*Ornamental Landscaping*	*0.1*	*0.110458*	*180.6*			
1D	*5158*	*Concrete or Asphalt*	*1*	*0.892*	*4600.9*			
1E	*699*	*Ornamental Landscaping*	*0.1*	*0.110458*	*77.2*			
	18489	***Total***			**14668.1**	**0.68**	***831.2***	***832***

Notes:

Bioretention Facility - Design Procedure (Rev. 06-2014)	BMP ID bio ret #1	Legend:	Required Entries 🟦 Calculated Cells ▨

Company Name: Barghuasen Consulting Engineers, Inc.　Date: 9/21/2018

Designed by: Zereck Jones　County/City Case No.: PEN18-0016LST18

Design Volume

Enter the area tributary to this feature　A_{TRIB}= 0.34 acres

Enter V_{BMP} determined from Section 4.3 of this Handbook　V_{BMP}= 832 ft^3

Type of Bioretention Facility Design

● Side slopes required (parallel to parking spaces or adjacent to walkways)

○ No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer　d_S = 2.0 ft

Top Width of Bioretention Facility, excluding curb　w_T = 9.0 ft

Total Effective Depth, d_E

$$d_E = (0.3) \text{ x } d_S + (0.4) \text{ x } 1 - (0.7/w_T) + 0.5$$

d_E = 1.42 ft

Minimum Surface Area, A_m

$$A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$$

A_M = 585 ft^2

Proposed Surface Area　A= 585 ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility　z = 832 :1

Diameter of Underdrain　6 inches

Longitudinal Slope of Site (3% maximum)　0.5 %

6" Check Dam Spacing　0 feet

Describe Landscaping:

Notes: The bio-retention basin is to provide treatment for surface runoff for the gas station parking and manuevering areas and fueling canopy roof.

Santa Ana Watershed - BMP Design Volume, V_{BMP}

Legend: ▢ Required Entries
▨ Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name Barghausen Consulting Engineers, Inc.
Date 9/21/2018
Designed by Zereck Jones
Case No PEN18-0016LST1
Company Project Number/Name Moreno Valley ARCO Station BCE#18501

BMP Identification

BMP NAME / ID DMA #2 Car Wash driveway and back walkway and carwash office pad

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth,
from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.68 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
2A	*3000*	*Concrete or Asphalt*	*1*	*0.89*	*2676*			
2B	*1080*	*Ornamental Landscaping*	*0.1*	*0.110458*	*119.3*			
	4080	***Total***			**2795.3**	**0.68**	***158.4***	***169***

Notes:

Bioretention Facility - Design Procedure (Rev. 06-2014)	BMP ID bio ret #2	Legend:	Required Entries 🟦 Calculated Cells ▨

Company Name: Barghuasen Consulting Engineers, Inc. Date: 9/21/2018

Designed by: Zereck Jones County/City Case No.: PEN18-0016LST18

Design Volume

Enter the area tributary to this feature A_{TRIB}= 0.07 acres

Enter V_{BMP} determined from Section 4.3 of this Handbook V_{BMP}= 159 ft^3

Type of Bioretention Facility Design

● Side slopes required (parallel to parking spaces or adjacent to walkways)

○ No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer d_S = 2.0 ft

Top Width of Bioretention Facility, excluding curb w_T = 6.0 ft

Total Effective Depth, d_E

$$d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$$

d_E = 1.38 ft

Minimum Surface Area, A_m

$$A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$$

A_M = 115 ft^2

Proposed Surface Area A= 122 ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility z = 4 :1

Diameter of Underdrain 6 inches

Longitudinal Slope of Site (3% maximum) 0.5 %

6" Check Dam Spacing 0 feet

Describe Landscaping:

Notes: The bio-retention basin is to provide treatment for surface runoff from the back drive isle to the car wash and the ped ramp and conc pad in front of the car wash office

Santa Ana Watershed - BMP Design Volume, V_{BMP}

Legend: ▭ Required Entries
▨ Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: Barghausen Consulting Engineers, Inc.
Date: 9/21/2018
Designed by: Zereck Jones
Case No: PEN18-0016LST1
Company Project Number/Name: Moreno Valley ARCO Station BCE#18501

BMP Identification

BMP NAME / ID: DMA #3 South end of site paving and south vacuum area paving and canopy

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E: D_{85}= 0.68 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
3A	*15897*	*Concrete or Asphalt*	*1*	*0.89*	*14180.1*			
3B	*0*	*Concrete or Asphalt*	*1*	*0.892*	*0*			
3C	*4732*	*Roofs*	*1*	*0.892*	*4220.9*			
3D	*8298*	*Ornamental Landscaping*	*0.1*	*0.110458*	*916.6*			
3E	*3375*	*Concrete or Asphalt*	*1*	*0.892*	*3010.5*			
	32302	***Total***			**22328.1**	**0.68**	***1265.3***	***1345***

Notes:

Bioretention Facility - Design Procedure (Rev. 06-2014)	BMP ID bio ret #3	Legend:	Required Entries 🟦 Calculated Cells ▨

Company Name: Barghuasen Consulting Engineers, Inc.

Date: 9/25/2018

Designed by: Zereck Jones

County/City Case No.: PEN18-0016LST18

Design Volume

Enter the area tributary to this feature	A_{TRIB}=	0.74	acres
Enter V_{BMP} determined from Section 4.3 of this Handbook	V_{BMP}=	1,266	ft^3

Type of Bioretention Facility Design

● Side slopes required (parallel to parking spaces or adjacent to walkways)

○ No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer	d_S =	3.0	ft
Top Width of Bioretention Facility, excluding curb	w_T =	11.0	ft

Total Effective Depth, d_E

$$d_E = (0.3) \text{ x } d_S + (0.4) \text{ x } 1 - (0.7/w_T) + 0.5$$

d_E = 1.74 ft

Minimum Surface Area, A_m

$$A_M\,(ft^2) = \frac{V_{BMP}\,(ft^3)}{d_E\,(ft)}$$

A_M = 730 ft

Proposed Surface Area A= 776 ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility	z =	4	:1
Diameter of Underdrain		6	inches
Longitudinal Slope of Site (3% maximum)		0	%
6" Check Dam Spacing		0	feet

Describe Landscaping:

Notes: The bio-retention basin is to provide treatment for surface runoff for the gas station parking and manuevering areas and fueling canopy roof. This area will also include the collected impervious area in the

Santa Ana Watershed - BMP Design Volume, V_{BMP}

Legend: 🟦 Required Entries
▨ Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name Barghausen Consulting Engineers, Inc.
Date 9/21/2018
Designed by Zereck Jones
Case No PEN18-0016LST1
Company Project Number/Name Moreno Valley ARCO Station BCE#18501

BMP Identification

BMP NAME / ID DMA #4 Car Wash driveway and east side of store frontage

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth,
from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.68 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
4A	*2393*	*Concrete or Asphalt*	*1*	*0.89*	*2134.6*			
4B	*4204*	*Concrete or Asphalt*	*1*	*0.892*	*3750*			
4C	*3205*	*Roofs*	*1*	*0.892*	*2858.9*			
4D	*423*	*Ornamental Landscaping*	*0.1*	*0.110458*	*46.7*			
	10225	***Total***			**8790.2**	**0.68**	***498.1***	***504***

Notes:

Bioretention Facility - Design Procedure (Rev. 06-2014)	BMP ID	Legend:	Required Entries
	bio ret #4		Calculated Cells

Company Name: Barghuasen Consulting Engineers, Inc.

Date: 9/21/2018

Designed by: Zereck Jones

County/City Case No.: PEN18-0016LST18

Design Volume

Enter the area tributary to this feature A_{TRIB}= 0.23 acres

Enter V_{BMP} determined from Section 4.3 of this Handbook V_{BMP}= 499 ft^3

Type of Bioretention Facility Design

● Side slopes required (parallel to parking spaces or adjacent to walkways)

○ No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer d_S = 3.0 ft

Top Width of Bioretention Facility, excluding curb w_T = 6.0 ft

Total Effective Depth, d_E

$$d_E = (0.3) \text{ x } d_S + (0.4) \text{ x } 1 - (0.7/w_T) + 0.5$$

d_E = 1.68 ft

Minimum Surface Area, A_m

$$A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$$

A_M = 297 ft^2

Proposed Surface Area A= 300 ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility z = 4 :1

Diameter of Underdrain 6 inches

Longitudinal Slope of Site (3% maximum) 0.5 %

6" Check Dam Spacing 0 feet

Describe Landscaping:

Notes: The bio-retention basin is to provide treatment for surface runoff from the east drive isle to the car wash and the east half of the store frontage and parking/manuevering area via catch basin and pipe conveyance and the C-store Roof

Company Name: **Barghausen Consulting Engineers, Inc.** Designer: **ZTJ**
Project Name/# **Moreno Valley ARCO BCE#18501**
Case # PEN18-0016LST18 Date: **9/21/2018**

DMA#	1

The Site Area of Approximately 1.55 Acres Shall utilize the Rational Method per RCFD&WCD Hydrology Manual.

Rational Method: Q=C x I x A

		Storm Interval	10 yr	100 yr		
Enter Intensity:						
10 MINUTE	"I" =		2.01	2.94	inch/hr	Per Plate
60 MINUTE	"I" =		0.82	1.2	inch/hr	D-4.1 (6 of 6)

Areas: "A" =

	SQ FT	Acre
Total Basin	21267	0.49
Buildings	2656	0.06
Paving	13499	0.31
Pervious Trib	2963	0.07
Self Retaining Area	2149	0.05
Total Tributary Area	19118	0.44

Runoff Index	Plate D-5.5
Commercial	0.9
Urban Cover- Commercial Landscape	0.56
Existing Pasture/ Dryland	0.78

Assume Soil Group:		B
Avg Developed Runoff Coeff:	"C"=	0.85

Q=			10 yr	100 yr	
Pre-Developed	10 min	Q=	0.77	1.12	cfs
	60 min	Q=	0.31	0.46	cfs
Developed	10 min	Q=	0.75	1.09	cfs
	60 min	Q=	0.30	0.45	cfs

Note: Self Retaing area is a landscaped area that is topographically isolated or sloped in such a way that runoff cannot be collected and conveyed to treatement. It therefore will not be conveyed to bio-retention and collected by conveyance.

Attachment: Appendix H - Preliminary Drainage Report (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Company Name: **Barghausen Consulting Engineers, Inc.** Designer: **ZTJ**
Project Name/# **Moreno Valley ARCO BCE#18501**
Case # PEN18-0016LST18 Date: **3/14/2018**

DMA #	2

The Site Area of Approximately 1.55 Acres Shall utilize the Rational Method per RCFD&WCD Hydrology Manual.

Rational Method: Q=C x I x A

	Storm Interval	10 yr	100 yr		
Enter Intensity:					
10 MINUTE	**"I" =**	2.01	2.94	inch/hr	Per Plate
60 MINUTE	**"I" =**	0.82	1.2	inch/hr	D-4.1 (6 of 6)

Areas: "A" =

	SQ FT	Acre
Total Basin	4962	0.11
Buildings	0	0.00
Paving	3000	0.07
Pervious Trib	1080	0.02
Self Retaining Area	882	0.02
Total Tributary Area	4080	0.09

Runoff Index	Plate D-5.5
Commercial	0.9
Urban Cover- Commercial Landscape	0.56
Existing Pasture/ Dryland	0.78

Assume Soil Group: B
Avg Developed Runoff Coeff: **"C"=** 0.81

Q=			10 yr	100 yr	
Pre-Developed	10 min	Q=	0.18	0.26	cfs
	60 min	Q=	0.07	0.11	cfs
Developed	10 min	Q=	0.15	0.22	cfs
	60 min	Q=	0.06	0.09	cfs

Note: Self Retaing area is a landscaped area that is topographically isolated or sloped in such a way that runoff cannot be collected and conveyed to treatement. It therefore will not be conveyed to bio-retention and collected by conveyance.

Company Name: **Barghausen Consulting Engineers, Inc.** Designer: **ZTJ**
Project Name/# **Moreno Valley ARCO BCE#18501**
Case # PEN18-0016LST18 Date: **9/21/2018**

DMA #	3

The Site Area of Approximately 1.55 Acres Shall utilize the Rational Method per RCFD&WCD Hydrology Manual.

Rational Method: Q=C x I x A

Enter Intensity:

		Storm Interval	10 yr	100 yr		
10 MINUTE		**"I" =**	2.01	2.94	inch/hr	Per Plate
60 MINUTE		**"I" =**	0.82	1.2	inch/hr	D-4.1 (6 of 6)

Areas: "A" =

	SQ FT	Acre
Total Basin	32837	0.75
Buildings	4732	0.11
Paving	19272	0.44
Pervious Trib	8298	0.19
Self Retaining Area	535	0.01
Total Tributary Area	32302	0.74

Runoff Index	Plate D-5.5
Commercial	0.9
Urban Cover- Commercial Landscape	0.56
Existing Pasture/ Dryland	0.78

Assume Soil Group:		B
Avg Developed Runoff Coeff:	**"C"=**	0.81

Q=

			10 yr	100 yr	
Pre-Developed	10 min	Q=	1.18	1.73	cfs
	60 min	Q=	0.48	0.71	cfs
Developed	10 min	Q=	1.21	1.77	cfs
	60 min	Q=	0.49	0.72	cfs

Note: Self Retaing area is a landscaped area that is topographically isolated or sloped in such a way that runoff cannot be collected and conveyed to treatement. It therefore will not be conveyed to bio-retention and collected by conveyance.

Company Name: **Barghausen Consulting Engineers, Inc.** Designer: **ZTJ**
Project Name/# **Moreno Valley ARCO BCE#18501**
Case # PEN18-0016LST18 Date: **3/14/2018**

DMA #	4

The Site Area of Approximately 1.55 Acres Shall utilize the Rational Method per RCFD&WCD Hydrology Manual.

Rational Method: Q=C x I x A

		Storm Interval	10 yr	100 yr		
Enter Intensity:						
10 MINUTE	"I" =		2.01	2.94	inch/hr	Per Plate
60 MINUTE	"I" =		0.82	1.2	inch/hr	D-4.1 (6 of 6)

Areas: "A" =

	SQ FT	Acre
Total Basin	13676	0.31
Buildings	3205	0.07
Paving	8485	0.19
Pervious Trib	423	0.01
Self Retaining Area	1563	0.04
Total Tributary Area	12113	0.28

Runoff Index	Plate D-5.5
Commercial	0.9
Urban Cover- Commercial Landscape	0.56
Existing Pasture/ Dryland	0.78

Assume Soil Group: B
Avg Developed Runoff Coeff: **"C"=** 0.89

Q=			10 yr	100 yr	
Pre-Developed	10 min	Q=	0.49	0.72	cfs
	60 min	Q=	0.20	0.29	cfs
Developed	10 min	Q=	0.50	0.73	cfs
	60 min	Q=	0.20	0.30	cfs

Note: Self Retaing area is a landscaped area that is topographically isolated or sloped in such a way that runoff cannot be collected and conveyed to treatement. It therefore will not be conveyed to bio-retention and collected by conveyance.

Attachment: Appendix H - Preliminary Drainage Report (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Company Name: **Barghausen Consulting Engineers, Inc.** Designer: **ZTJ**
Project Name/# **Moreno Valley ARCO BCE#18501**
Case # PEN18-0016LST18 Date: **9/21/2018**

DMA #	Off-Site Iris Additional runoff collection

This Calculation is for storm Conveyance of off-site tributary that will not be treated it is incidental storm water collected in association with the existing pavement on Iris Ave that must be collected due to requirements of city catch basin location.

Rational Method: Q=C x I x A

		10 yr	100 yr		
Storm Interval					
Enter Intensity:					
10 MINUTE	**"I" =**	2.01	2.94	inch/hr	Per Plate
60 MINUTE	**"I" =**	0.82	1.2	inch/hr	D-4.1 (6 of 6)

Areas: "A" =

	SQ FT	Acre
Total Basin	22000	0.51
Buildings	0	0.00
Paving	22000	0.51
Pervious Trib	0	0.00
Self Retaining Area	0	0.00
Total Tributary Area	22000	0.51

Runoff Index	Plate D-5.5
Commercial	0.9
Urban Cover- Commercial Landscape	0.56
Existing Pasture/ Dryland	0.78

Assume Soil Group:		B
Avg Developed Runoff Coeff:	**"C"=**	0.90

Q=

			10 yr	100 yr	
Pre-Developed	10 min	Q=	0.79	1.16	cfs
	60 min	Q=	0.32	0.47	cfs
Developed	10 min	Q=	0.91	1.34	cfs
	60 min	Q=	0.37	0.55	cfs

Note: Self Retaing area is a landscaped area that is topographically isolated or sloped in such a way that runoff cannot be collected and conveyed to treatement. It therefore will not be conveyed to bio-retention and collected by conveyance.

BARGHAUSEN CONSULTING ENGINEERS - PIPE FLOW CALCULATOR
using Manning Formula

JOB NAME Moreno Valley ARCO
JOB#: 18501
Date : 9/26/2018

NOTE: ENTER DEFAULTS AND STORM DATA BEFORE BEGINNING

DEFAULTS C= 1 n= 0.009
d= 8 Tc= 5

A= Contributing Area (Ac)
C= Runoff Coefficient
Tc= Time of Concentration (min)
I= Intensity at Tc (in/hr)
d= Diameter of Pipe (in)
L= Length of Pipe (ft)
D= Water Depth at Qd (in)

Qd= Design Flow (cfs)
Qf= Full Capacity Flow (cfs)
Vd= Velocity at Design Flow (fps)
Vf= Velocity at Full Flow (fps)
s= Slope of pipe (%)
n= Manning Roughness Coefficient
Tt= Travel Time at Vd (min)

Notes:
1. C has already been accounted for in sheet flow conveyance to Bio-Retention Facilities
2. Qd has been entered Manualy from the peak flow derived from the Rational Method Calculations based on the tributaries to each of the Bio-Retention Facilities.
3. Tc has been accounted for for surface flow to the bio-retention facilities in the previous Rational Method

	FROM	TO	A	s	L	d	Tc	n	C	SUM A	A*C	SUM A*C	I	Qd	Qf	**Qd/Qf**	X	D/d	D	Vf	Vd
TRUE	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======
FALSE	CB#5	CB#11		0.96	84	8	5.0	0.009	1	0	0.00	0.00	0.00	1.09	1.71	**0.638**	0.580	0.586	4.69	4.90	5.21
TRUE																					
FALSE	CB#13	CB#6		0.50	118	12	5.3	0.009	1	0	0.00	0.00	0.00	1.34	3.64	**0.368**	0.420	0.419	5.03	4.64	4.28
FALSE	CB#6	CB#11		0.50	118	12	5.0	0.009	1	0	0.00	0.00	0.00	1.77	3.64	**0.487**	0.480	0.492	5.91	4.64	4.63
FALSE	CB#11	CB#2		0.50	94	**18**	5.0	0.009	1	0	0.00	0.00	0.00	4.20	10.73	**0.392**	0.420	0.434	7.82	6.07	5.71
FALSE	CB#2	PUMP STA		0.50	12	**18**	5.0	0.009	1	0	0.00	0.00	0.00	4.20	10.73	**0.392**	0.420	0.434	7.82	6.07	5.71
TRUE	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======
FALSE	CB#10	CB#3		1.85	44	8	5.0	0.009	1	0	0.00	0.00	0.00	0.73	2.37	**0.308**	0.380	0.378	3.02	6.80	5.97
TRUE																					
FALSE	CB#4	CB#3		0.50	24	8	5.0	0.009	1	0	0.00	0.00	0.00	0.22	1.23	**0.178**	0.280	0.283	2.26	3.54	2.66
FALSE	CB#3	CB#1		0.50	94	**12**	5.0	0.009	1	0	0.00	0.00	0.00	0.95	3.64	**0.261**	0.340	0.349	4.19	4.64	3.90
FALSE	CB#1	PUMP STA		0.50	132	**12**	5.0	0.009	1	0	0.00	0.00	0.00	0.95	3.64	**0.261**	0.340	0.349	4.19	4.64	3.90

Q_{100} Total Flow: 5.15 cfs

Appendix A-2

Plate 4.1 (6 of 6) Standard Intensity - Duration Curves Date

RCFC & WCD
HYDROLOGY MANUAL

RAINFALL INTENSITY–INCHES PER HOUR

SUNNYMEAD – MORENO

DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR
5	2.84	4.16
6	2.59	3.79
7	2.40	3.51
8	2.25	3.29
9	2.12	3.10
10	2.01	2.94
11	1.92	2.80
12	1.83	2.68
13	1.76	2.58
14	1.70	2.48
15	1.64	2.40
16	1.59	2.32
17	1.54	2.25
18	1.50	2.19
19	1.46	2.13
20	1.42	2.08
22	1.35	1.98
24	1.30	1.90
26	1.25	1.82
28	1.20	1.76
30	1.16	1.70
32	1.12	1.64
34	1.09	1.59
36	1.06	1.55
38	1.03	1.51
40	1.00	1.47
45	.95	1.39
50	.90	1.31
55	.86	1.25
60	.82	1.20
65	.79	1.15
70	.76	1.11
75	.73	1.07
80	.71	1.04
85	.69	1.01

SLOPE = .500

WOODCREST

DURATION MINUTES	FREQUENCY 10 YEAR	FREQUENCY 100 YEAR
5	3.37	5.30
6	3.05	4.79
7	2.80	4.40
8	2.60	4.09
9	2.44	3.83
10	2.30	3.62
11	2.19	3.43
12	2.08	3.27
13	1.99	3.13
14	1.91	3.01
15	1.84	2.89
16	1.78	2.79
17	1.72	2.70
18	1.67	2.62
19	1.62	2.54
20	1.57	2.47
22	1.49	2.34
24	1.42	2.23
26	1.36	2.14
28	1.31	2.05
30	1.26	1.98
32	1.22	1.91
34	1.18	1.85
36	1.14	1.79
38	1.11	1.74
40	1.07	1.69
45	1.01	1.58
50	.95	1.49
55	.90	1.42
60	.86	1.35
65	.82	1.29
70	.79	1.24
75	.76	1.19
80	.73	1.15
85	.71	1.11

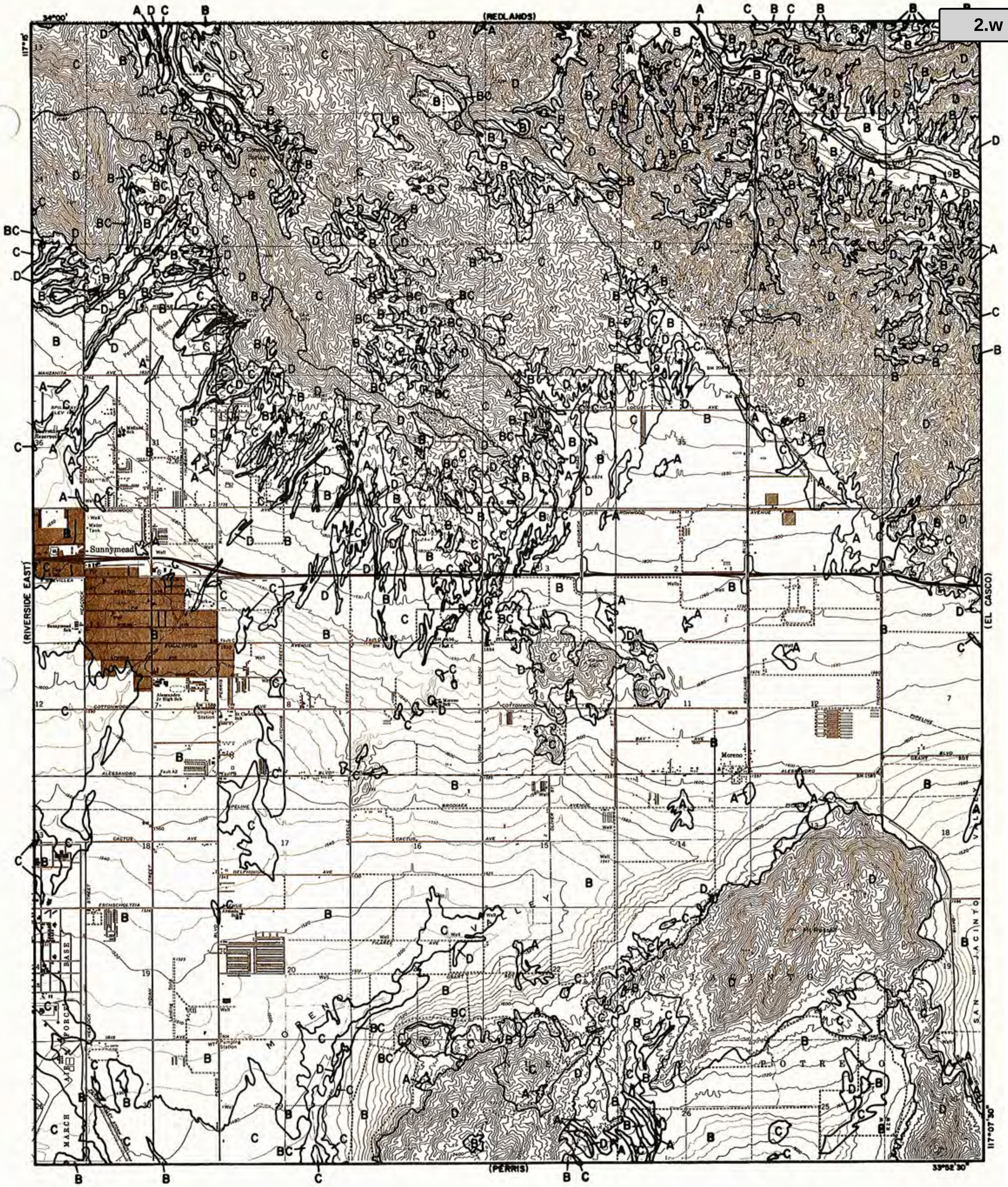
SLOPE = .550

STANDARD
INTENSITY – DURATION
CURVES DATA

PLATE D-4.1 (6 of 6)

Appendix A-3

Plate C-1.17



LEGEND

- SOILS GROUP BOUNDARY
- A SOILS GROUP DESIGNATION

RCFC & WCD

HYDROLOGY MANUAL

0 FEET 5000

HYDROLOGIC SOILS GROUP MAP
FOR
SUNNYMEAD

Appendix A-4

Plate D-5.5

RUNOFF INDEX NUMBERS OF HYDROLOGIC SOIL-COVER COMPLEXES FOR PERVIOUS AREAS-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group			
		A	B	C	D
NATURAL COVERS -					
Barren (Rockland, eroded and graded land)		78	86	91	93
Chaparrel, Broadleaf (Manzonita, ceanothus and scrub oak)	Poor	53	70	80	85
	Fair	40	63	75	81
	Good	31	57	71	78
Chaparrel, Narrowleaf (Chamise and redshank)	Poor	71	82	88	91
	Fair	55	72	81	86
Grass, Annual or Perennial	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Meadows or Cienegas (Areas with seasonally high water table, principal vegetation is sod forming grass)	Poor	63	77	85	88
	Fair	51	70	80	84
	Good	30	58	72	78
Open Brush (Soft wood shrubs - buckwheat, sage, etc.)	Poor	62	76	84	88
	Fair	46	66	77	83
	Good	41	63	75	81
Woodland (Coniferous or broadleaf trees predominate. Canopy density is at least 50 percent)	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	28	55	70	77
Woodland, Grass (Coniferous or broadleaf trees with canopy density from 20 to 50 percent)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
URBAN COVERS -					
Residential or Commercial Landscaping (Lawn, shrubs, etc.)	Good	32	56	69	75
Turf (Irrigated and mowed grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
AGRICULTURAL COVERS -					
Fallow (Land plowed but not tilled or seeded)		76	85	90	92

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HYDROLOGY MANUAL

RUNOFF INDEX NUMBERS
FOR
PERVIOUS AREA

RUNOFF INDEX NUMBERS OF HYDROLOGIC SOIL-COVER COMPLEXES FOR PERVIOUS AREAS-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
AGRICULTURAL COVERS (cont.) -					
Legumes, Close Seeded (Alfalfa, sweetclover, timothy, etc.)	Poor	66	77	85	89
	Good	58	72	81	85
Orchards, Deciduous (Apples, apricots, pears, walnuts, etc.)		See Note 4			
Orchards, Evergreen (Citrus, avocados, etc.)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
Pasture, Dryland (Annual grasses)	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Pasture, Irrigated (Legumes and perennial grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
Row Crops (Field crops - tomatoes, sugar beets, etc.)	Poor	72	81	88	91
	Good	67	78	85	89
Small Grain (Wheat, oats, barley, etc.)	Poor	65	76	84	88
	Good	63	75	83	87
Vineyard		See Note 4			

Notes:

1. All runoff index (RI) numbers are for Antecedent Moisture Condition (AMC) II.
2. Quality of cover definitions:
   Poor-Heavily grazed or regularly burned areas. Less than 50 percent of the ground surface is protected by plant cover or brush and tree canopy.
   Fair-Moderate cover with 50 percent to 75 percent of the ground surface protected.
   Good-Heavy or dense cover with more than 75 percent of the ground surface protected.
3. See Plate C-2 for a detailed description of cover types.
4. Use runoff index numbers based on ground cover type. See discussion under "Cover Type Descriptions" on Plate C-2.
5. Reference Bibliography item 17.

RCFC & WCD
HYDROLOGY MANUAL

RUNOFF INDEX NUMBERS FOR PERVIOUS AREA

Santa Ana Watershed - BMP Design Volume, V_{BMP}

Legend: ▭ Required Entries
▨ Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name Barghausen Consulting Engineers, Inc.
Date 9/21/2018
Designed by Zereck Jones
Case No PEN18-0016LST1
Company Project Number/Name Moreno Valley ARCO Station BCE#18501

BMP Identification

BMP NAME / ID DMA #1 North end of site paving and all vacuum area paving with associated landscaping

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth,
from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.68 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
1A	*8341*	*Concrete or Asphalt*	*1*	*0.89*	*7440.2*			
1B	*2656*	*Roofs*	*1*	*0.892*	*2369.2*			
1C	*1635*	*Ornamental Landscaping*	*0.1*	*0.110458*	*180.6*			
1D	*5158*	*Concrete or Asphalt*	*1*	*0.892*	*4600.9*			
1E	*699*	*Ornamental Landscaping*	*0.1*	*0.110458*	*77.2*			
	18489	***Total***			**14668.1**	**0.68**	***831.2***	***832***

Notes:

Santa Ana Watershed - BMP Design Volume, V_{BMP}

Legend: 🟦 Required Entries
▨ Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name Barghausen Consulting Engineers, Inc.
Date 9/21/2018
Designed by Zereck Jones
Case No PEN18-0016LST1
Company Project Number/Name Moreno Valley ARCO Station BCE#18501

BMP Identification

BMP NAME / ID DMA #2 Car Wash driveway and back walkway and carwash office pad

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.68 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
2A	*3000*	*Concrete or Asphalt*	*1*	*0.89*	*2676*			
2B	*1080*	*Ornamental Landscaping*	*0.1*	*0.110458*	*119.3*			
	4080		***Total***		**2795.3**	**0.68**	***158.4***	***169***

Notes:

Santa Ana Watershed - BMP Design Volume, V_{BMP}

Legend: ▨ Required Entries
▨ Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name Barghausen Consulting Engineers, Inc.
Date 9/21/2018
Designed by Zereck Jones
Case No PEN18-0016LST1
Company Project Number/Name Moreno Valley ARCO Station BCE#18501

BMP Identification

BMP NAME / ID DMA #3 South end of site paving and south vacuum area paving and canopy

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth,
from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.68 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
3A	*15897*	*Concrete or Asphalt*	*1*	*0.89*	*14180.1*			
3B	*0*	*Concrete or Asphalt*	*1*	*0.892*	*0*			
3C	*4732*	*Roofs*	*1*	*0.892*	*4220.9*			
3D	*8298*	*Ornamental Landscaping*	*0.1*	*0.110458*	*916.6*			
3E	*3375*	*Concrete or Asphalt*	*1*	*0.892*	*3010.5*			
	32302	***Total***			**22328.1**	**0.68**	***1265.3***	***1345***

Notes:

Santa Ana Watershed - BMP Design Volume, V_{BMP}

Legend: 🟦 Required Entries
▨ Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name Barghausen Consulting Engineers, Inc.
Date 9/21/2018
Designed by Zereck Jones
Case No PEN18-0016LST1
Company Project Number/Name Moreno Valley ARCO Station BCE#18501

BMP Identification

BMP NAME / ID DMA #4 Car Wash driveway and east side of store frontage

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth,
from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.68 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
4A	*2393*	*Concrete or Asphalt*	*1*	*0.89*	*2134.6*			
4B	*4204*	*Concrete or Asphalt*	*1*	*0.892*	*3750*			
4C	*3205*	*Roofs*	*1*	*0.892*	*2858.9*			
4D	*423*	*Ornamental Landscaping*	*0.1*	*0.110458*	*46.7*			
	10225	***Total***			**8790.2**	**0.68**	***498.1***	***504***

Notes:

Attachment: Appendix H - Preliminary Drainage Report (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Santa Ana Watershed - BMP Design Volume, V_{BMP}

Legend: 🟦 Required Entries
▨ Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name Barghausen Consulting Engineers, Inc.
Date 3/9/2018
Designed by Zereck Jones
Case No PEN18-0016LST1
Company Project Number/Name Moreno Valley ARCO Station BCE#18501

BMP Identification

BMP NAME / ID DMA #3 South end of site paving and south vacuum area paving and canopy

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth,
from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.68 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
3A	*15897*	*Concrete or Asphalt*	*1*	*0.89*	*14180.1*			
3B	*5158*	*Concrete or Asphalt*	*1*	*0.892*	*4600.9*			
3C	*4732*	*Roofs*	*1*	*0.892*	*4220.9*			
3D	*8997*	*Ornamental Landscaping*	*0.1*	*0.110458*	*993.8*			
	34784	***Total***			**23995.7**	**0.68**	***1359.8***	***1360***

Notes:

Attachment: Appendix H - Preliminary Drainage Report (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Bioretention Facility - Design Procedure (Rev. 06-2014)	BMP ID bio ret #3	Legend:	Required Entries 🟦 Calculated Cells ▨

Company Name: Barghuasen Consulting Engineers, Inc.
Date: 3/9/2018
Designed by: Zereck Jones
County/City Case No.: PEN18-0016LST18

Design Volume

Enter the area tributary to this feature A_{TRIB}= 0.59 acres

Enter V_{BMP} determined from Section 4.3 of this Handbook V_{BMP}= 1,360 ft^3

Type of Bioretention Facility Design

● Side slopes required (parallel to parking spaces or adjacent to walkways)

○ No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer d_S = 3.0 ft

Top Width of Bioretention Facility, excluding curb w_T = 9.0 ft

Total Effective Depth, d_E

$$d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$$

d_E = 1.72 ft

Minimum Surface Area, A_m

$$A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$$

A_M = 790 ft^2

Proposed Surface Area A= 790 ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility z = 4 :1

Diameter of Underdrain 6 inches

Longitudinal Slope of Site (3% maximum) 0.5 %

6" Check Dam Spacing 0 feet

Describe Landscaping:

Notes: The bio-retention basin is to provide treatment for surface runoff for the gas station parking and manuevering areas and fueling canopy roof.

Attachment: Appendix H - Preliminary Drainage Report (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Santa Ana Watershed - BMP Design Volume, V_{BMP}

Legend: 🟦 Required Entries
▨ Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name Barghausen Consulting Engineers, Inc.
Date 3/9/2018
Designed by Zereck Jones
Case No PEN18-0016LST1
Company Project Number/Name Moreno Valley ARCO Station BCE#18501

BMP Identification

BMP NAME / ID DMA #4 Car Wash driveway and east side of store frontage

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth,
from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.68 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
4A	*2393*	*Concrete or Asphalt*	*1*	*0.89*	*2134.6*			
4B	*4204*	*Concrete or Asphalt*	*1*	*0.892*	*3750*			
4C	*3205*	*Roofs*	*1*	*0.892*	*2858.9*			
4D	*423*	*Ornamental Landscaping*	*0.1*	*0.110458*	*46.7*			
	10225	***Total***			**8790.2**	**0.68**	***498.1***	***504***

Notes:

Attachment: Appendix H - Preliminary Drainage Report (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Bioretention Facility - Design Procedure (Rev. 06-2014)	BMP ID bio ret #4	Legend:	Required Entries Calculated Cells

Company Name: Barghuasen Consulting Engineers, Inc. Date: 3/9/2018

Designed by: Zereck Jones County/City Case No.: PEN18-0016LST18

Design Volume

Enter the area tributary to this feature A_{TRIB}= 0.15 acres

Enter V_{BMP} determined from Section 4.3 of this Handbook V_{BMP}= 499 ft^3

Type of Bioretention Facility Design

● Side slopes required (parallel to parking spaces or adjacent to walkways)

○ No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer d_S = 3.0 ft

Top Width of Bioretention Facility, excluding curb w_T = 6.0 ft

Total Effective Depth, d_E

$d_E = (0.3) \text{ x } d_S + (0.4) \text{ x } 1 - (0.7/w_T) + 0.5$ d_E = 1.68 ft

Minimum Surface Area, A_m

$$A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$$

A_M = 297 ft^2

Proposed Surface Area A= 297 ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility z = 4 :1

Diameter of Underdrain 6 inches

Longitudinal Slope of Site (3% maximum) 0.5 %

6" Check Dam Spacing 0 feet

Describe Landscaping:

Notes: The bio-retention basin is to provide treatment for surface runoff from the east drive isle to the car wash and the east half of the store frontage and parking/manuevering area via catch basin and pipe conveyance and the C-store Roof

Santa Ana Watershed - BMP Design Volume, V_{BMP}

Legend: 🟦 Required Entries
▨ Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name Barghausen Consulting Engineers, Inc.
Date 8/6/2018
Designed by Zereck Jones
Case No PEN18-0016LST1
Company Project Number/Name Moreno Valley ARCO Station BCE#18501

BMP Identification

BMP NAME / ID DMA #OS Frontage improvements

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth,
from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.68 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
OS-1	*963*	*Concrete or Asphalt*	*1*	*0.89*	*859*			
OS-2A	*3875*	*Concrete or Asphalt*	*1*	*0.892*	*3456.5*			
OS-2B	*563*	*Ornamental Landscaping*	*0.1*	*0.110458*	*62.2*			
	5401		***Total***		**4377.7**	**0.68**	***248.1***	***255***

Notes:

Bioretention Facility - Design Procedure (Rev. 06-2014)	BMP ID bio ret # OS	Legend:	Required Entries Calculated Cells

Company Name: Barghuasen Consulting Engineers, Inc. Date: 8/6/2018

Designed by: Zereck Jones County/City Case No.: PEN18-0016LST18

Design Volume

Enter the area tributary to this feature A_{TRIB}= 0.15 acres

Enter V_{BMP} determined from Section 4.3 of this Handbook V_{BMP}= 248 ft^3

Type of Bioretention Facility Design

● Side slopes required (parallel to parking spaces or adjacent to walkways)

○ No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer d_S = 2.0 ft

Top Width of Bioretention Facility, excluding curb w_T = 6.0 ft

Total Effective Depth, d_E

$$d_E = (0.3) \text{ x } d_S + (0.4) \text{ x } 1 - (0.7/w_T) + 0.5$$

d_E = 1.38 ft

Minimum Surface Area, A_m

$$A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$$

A_M = 180 ft^2

Proposed Surface Area A= 184 ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility z = 4 :1

Diameter of Underdrain 6 inches

Longitudinal Slope of Site (3% maximum) 0.5 %

6" Check Dam Spacing 0 feet

Describe Landscaping:

Notes: The bio-retention basin is to provide treatment for surface runoff from the east drive isle to the car wash and the east half of the store frontage and parking/manuevering area via catch basin and pipe conveyance and the C-store Roof

Company Name: **Barghausen Consulting Engineers, Inc.** Designer: **ZTJ**
Project Name/# **Moreno Valley ARCO BCE#18501**
Case # PEN18-0016LST18 Date: **3/14/2018**

DMA#	1

The Site Area of Approximately 1.55 Acres Shall utilize the Rational Method per RCFD&WCD Hydrology Manual.

Rational Method: Q=C x I x A

		Storm Interval	10 yr	100 yr		
Enter Intensity:						
10 MINUTE	**"I" =**		2.01	2.94	inch/hr	Per Plate
60 MINUTE	**"I" =**		0.82	1.2	inch/hr	D-4.1 (6 of 6)

Areas: "A" =

	SQ FT	Acre
Total Basin	14781	0.34
Buildings	2656	0.06
Paving	8341	0.19
Pervious Trib	1635	0.04
Self Retaining Area	2149	0.05
Total Tributary Area	12632	0.29

Runoff Index	Plate D-5.5
Commercial	0.9
Urban Cover- Commercial Landscape	0.56
Existing Pasture/ Dryland	0.78

Assume Soil Group:		B
Avg Developed Runoff Coeff:	**"C"=**	0.86

Q=

			10 yr	100 yr	
Pre-Developed	10 min	Q=	0.53	0.78	cfs
	60 min	Q=	0.22	0.32	cfs
Developed	10 min	Q=	0.50	0.73	cfs
	60 min	Q=	0.20	0.30	cfs

Note: Self Retaing area is a landscaped area that is topographically isolated or sloped in such a way that runoff cannot be collected and conveyed to treatement. It therefore will not be conveyed to bio-retention and collected by conveyance.

Company Name: **Barghausen Consulting Engineers, Inc.** Designer: **ZTJ**
Project Name/# **Moreno Valley ARCO BCE#18501**
Case # PEN18-0016LST18 Date: **3/14/2018**

DMA #	2

The Site Area of Approximately 1.55 Acres Shall utilize the Rational Method per RCFD&WCD Hydrology Manual.

Rational Method: Q=C x I x A

		10 yr	100 yr		
Enter Intensity:	Storm Interval				
10 MINUTE	**"I" =**	2.01	2.94	inch/hr	Per Plate
60 MINUTE	**"I" =**	0.82	1.2	inch/hr	D-4.1 (6 of 6)

Areas: "A" =

	SQ FT	Acre
Total Basin	4962	0.11
Buildings	0	0.00
Paving	3000	0.07
Pervious Trib	1080	0.02
Self Retaining Area	882	0.02
Total Tributary Area	4080	0.09

Runoff Index	Plate D-5.5
Commercial	0.9
Urban Cover- Commercial Landscape	0.56
Existing Pasture/ Dryland	0.78

Assume Soil Group:		B
Avg Developed Runoff Coeff:	**"C"=**	0.81

Q=			10 yr	100 yr	
Pre-Developed	10 min	Q=	0.18	0.26	cfs
	60 min	Q=	0.07	0.11	cfs
Developed	10 min	Q=	0.15	0.22	cfs
	60 min	Q=	0.06	0.09	cfs

Note: Self Retaing area is a landscaped area that is topographically isolated or sloped in such a way that runoff cannot be collected and conveyed to treatement. It therefore will not be conveyed to bio-retention and collected by conveyance.

Attachment: Appendix H - Preliminary Drainage Report (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Company Name: **Barghausen Consulting Engineers, Inc.** Designer: **ZTJ**
Project Name/# **Moreno Valley ARCO BCE#18501**
Case # PEN18-0016LST18 Date: **3/14/2018**

DMA #	3

The Site Area of Approximately 1.55 Acres Shall utilize the Rational Method per RCFD&WCD Hydrology Manual.

Rational Method: Q=C x I x A

		Storm Interval	10 yr	100 yr		
Enter Intensity:						
10 MINUTE	**"I" =**		2.01	2.94	inch/hr	Per Plate
60 MINUTE	**"I" =**		0.82	1.2	inch/hr	D-4.1 (6 of 6)

Areas: "A" =

	SQ FT	Acre
Total Basin	35889	0.82
Buildings	4732	0.11
Paving	21055	0.48
Pervious Trib	8977	0.21
Self Retaining Area	1125	0.03
Total Tributary Area	34764	0.80

Runoff Index	Plate D-5.5
Commercial	0.9
Urban Cover- Commercial Landscape	0.56
Existing Pasture/ Dryland	0.78

Assume Soil Group:		B
Avg Developed Runoff Coeff:	**"C"=**	0.81

Q=			10 yr	100 yr	
Pre-Developed	10 min	Q=	1.29	1.89	cfs
	60 min	Q=	0.53	0.77	cfs
Developed	10 min	Q=	1.30	1.91	cfs
	60 min	Q=	0.53	0.78	cfs

Note: Self Retaing area is a landscaped area that is topographically isolated or sloped in such a way that runoff cannot be collected and conveyed to treatement. It therefore will not be conveyed to bio-retention and collected by conveyance.

Company Name:	**Barghausen Consulting Engineers, Inc.**	Designer:	**ZTJ**
Project Name/#	**Moreno Valley ARCO BCE#18501**		
Case # PEN18-0016LST18	Date:	**3/14/2018**	

DMA #	4

The Site Area of Approximately 1.55 Acres Shall utilize the Rational Method per RCFD&WCD Hydrology Manual.

Rational Method: Q=C x I x A

	Storm Interval	10 yr	100 yr		
Enter Intensity:					
10 MINUTE	"I" =	2.01	2.94	inch/hr	Per Plate
60 MINUTE	"I" =	0.82	1.2	inch/hr	D-4.1 (6 of 6)

Areas: "A" =

	SQ FT	Acre
Total Basin	11788	0.27
Buildings	3205	0.07
Paving	6597	0.15
Pervious Trib	423	0.01
Self Retaining Area	1563	0.04
Total Tributary Area	10225	0.23

Runoff Index	Plate D-5.5
Commercial	0.9
Urban Cover- Commercial Landscape	0.56
Existing Pasture/ Dryland	0.78

Assume Soil Group:		B
Avg Developed Runoff Coeff:	"C"=	0.89

Q=			10 yr	100 yr	
Pre-Developed	10 min	Q=	0.42	0.62	cfs
	60 min	Q=	0.17	0.25	cfs
Developed	10 min	Q=	0.42	0.61	cfs
	60 min	Q=	0.17	0.25	cfs

Note: Self Retaing area is a landscaped area that is topographically isolated or sloped in such a way that runoff cannot be collected and conveyed to treatement. It therefore will not be conveyed to bio-retention and collected by conveyance.

Company Name: **Barghausen Consulting Engineers, Inc.** Designer: **ZTJ**
Project Name/# **Moreno Valley ARCO BCE#18501**
Case # PEN18-0016LST18 Date: **8/7/2018**

DMA #	OS

The Site Area of Approximately 1.55 Acres Shall utilize the Rational Method per RCFD&WCD Hydrology Manual.

Rational Method: Q=C x I x A

		Storm Interval	10 yr	100 yr		
Enter Intensity:						
10 MINUTE	**"I" =**		2.01	2.94	inch/hr	Per Plate
60 MINUTE	**"I" =**		0.82	1.2	inch/hr	D-4.1 (6 of 6)

Areas: "A" =

	SQ FT	Acre
Total Basin	5401	0.12
Buildings	0	0.00
Paving	4838	0.11
Pervious Trib	563	0.01
Self Retaining Area	0	0.00
Total Tributary Area	5401	0.12

Runoff Index	Plate D-5.5
Commercial	0.9
Urban Cover- Commercial Landscape	0.56
Existing Pasture/ Dryland	0.78

Assume Soil Group: B
Avg Developed Runoff Coeff: **"C"=** 0.86

Q=			10 yr	100 yr	
Pre-Developed	10 min	Q=	0.19	0.28	cfs
	60 min	Q=	0.08	0.12	cfs
Developed	10 min	Q=	0.22	0.32	cfs
	60 min	Q=	0.09	0.13	cfs

Note: Self Retaing area is a landscaped area that is topographically isolated or sloped in such a way that runoff cannot be collected and conveyed to treatement. It therefore will not be conveyed to bio-retention and collected by conveyance.

BARGHAUSEN CONSULTING ENGINEERS - PIPE FLOW CALCULATOR
using Manning Formula

JOB NAMI Moreno Valley ARCO
JOB#: 18501
Date : 3/19/2018

NOTE: ENTER DEFAULTS AND STORM DATA BEFORE BEGINNING
DEFAULTS C= 1 n= 0.009
d= 8 Tc= 5

Notes:
1. C has already been accounted for in sheet flow conveyance to Bio-Retention Facilities
2. Qd has been entered Manualy from the peak flow derived from the Rational Method Calculations based on the tributaries to each of the Bio-Retention Facilities.
3. Tc has been accounted for for surface flow to the bio-retention facilities in the previous Rational Method

A= Contributing Area (Ac)
C= Runoff Coefficient
Tc= Time of Concentration (min)
I= Intensity at Tc (in/hr)
d= Diameter of Pipe (in)
L= Length of Pipe (ft)
D= Water Depth at Qd (in)

Qd= Design Flow (cfs)
Qf= Full Capacity Flow (cfs)
Vd= Velocity at Design Flow (fps)
Vf= Velocity at Full Flow (fps)
s= Slope of pipe (%)
n= Manning Roughness Coefficient
Tt= Travel Time at Vd (min)

	FROM	TO	A	s	L	d	Tc	n	C	SUM A	A*C	SUM A*C	I	Qd	Qf	**Qd/Qf**	X	D/d	D	Vf	Vd
TRUE	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======
FALSE	CB#5	CB#11		0.96	84	8	5.0	0.009	1	0	0.00	0.00	0.00	0.73	1.71	**0.427**	0.460	0.458	3.67	4.90	4.75
TRUE																					
FALSE	CB#6	CB#11		0.50	118	12	5.0	0.009	1	0	0.00	0.00	0.00	1.91	3.64	**0.525**	0.500	0.514	6.17	4.64	4.69
FALSE	CB#11	CB#2		0.50	94	**12**	5.0	0.009	1	0	0.00	0.00	0.00	2.64	3.64	**0.726**	0.620	0.632	7.58	4.64	5.06
FALSE	CB#2	PUMP STA		0.50	12	**12**	5.0	0.009	1	0	0.00	0.00	0.00	2.64	3.64	**0.726**	0.620	0.632	7.58	4.64	5.06
TRUE	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======	======
FALSE	CB#10	CB#3		1.85	44	8	5.0	0.009	1	0	0.00	0.00	0.00	0.61	2.37	**0.257**	0.340	0.346	2.76	6.80	5.70
TRUE																					
FALSE	CB#4	CB#3		0.50	24	8	5.0	0.009	1	0	0.00	0.00	0.00	0.22	1.23	**0.178**	0.280	0.283	2.26	3.54	2.66
FALSE	CB#3	CB#1		0.50	94	**12**	5.0	0.009	1	0	0.00	0.00	0.00	0.83	3.64	**0.228**	0.320	0.323	3.87	4.64	3.75
FALSE	CB#1	PUMP STA		0.50	132	**12**	5.0	0.009	1	0	0.00	0.00	0.00	0.83	3.64	**0.228**	0.320	0.323	3.87	4.64	3.75

Q_{100} Total Flow: 3.47 cfs

Appendix A-2

Plate 4.1 (6 of 6) Standard Intensity - Duration Curves Date

RCFC & WCD
HYDROLOGY MANUAL

RAINFALL INTENSITY–INCHES PER HOUR

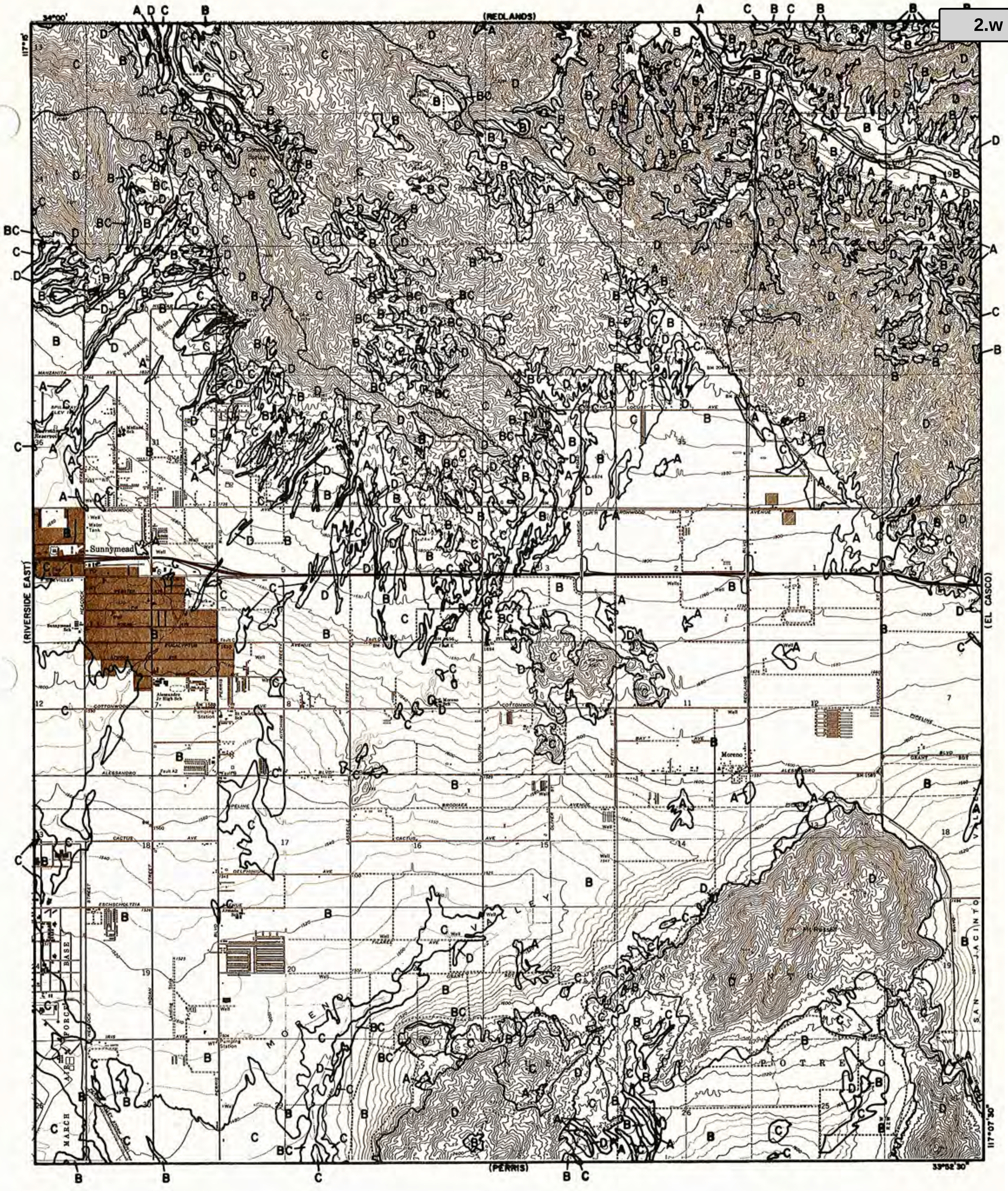
SUNNYMEAD - MORENO			WOODCREST		
DURATION MINUTES	FREQUENCY		DURATION MINUTES	FREQUENCY	
	10 YEAR	100 YEAR		10 YEAR	100 YEAR
5	2.84	4.16	5	3.37	5.30
6	2.59	3.79	6	3.05	4.79
7	2.40	3.51	7	2.80	4.40
8	2.25	3.29	8	2.60	4.09
9	2.12	3.10	9	2.44	3.83
10	2.01	2.94	10	2.30	3.62
11	1.92	2.80	11	2.19	3.43
12	1.83	2.68	12	2.08	3.27
13	1.76	2.58	13	1.99	3.13
14	1.70	2.48	14	1.91	3.01
15	1.64	2.40	15	1.84	2.89
16	1.59	2.32	16	1.78	2.79
17	1.54	2.25	17	1.72	2.70
18	1.50	2.19	18	1.67	2.62
19	1.46	2.13	19	1.62	2.54
20	1.42	2.08	20	1.57	2.47
22	1.35	1.98	22	1.49	2.34
24	1.30	1.90	24	1.42	2.23
26	1.25	1.82	26	1.36	2.14
28	1.20	1.76	28	1.31	2.05
30	1.16	1.70	30	1.26	1.98
32	1.12	1.64	32	1.22	1.91
34	1.09	1.59	34	1.18	1.85
36	1.06	1.55	36	1.14	1.79
38	1.03	1.51	38	1.11	1.74
40	1.00	1.47	40	1.07	1.69
45	.95	1.39	45	1.01	1.58
50	.90	1.31	50	.95	1.49
55	.86	1.25	55	.90	1.42
60	.82	1.20	60	.86	1.35
65	.79	1.15	65	.82	1.29
70	.76	1.11	70	.79	1.24
75	.73	1.07	75	.76	1.19
80	.71	1.04	80	.73	1.15
85	.69	1.01	85	.71	1.11
SLOPE = .500			SLOPE = .550		

STANDARD
INTENSITY–DURATION
CURVES DATA

PLATE D-4.1 (6 of 6)

Appendix A-3

Plate C-1.17



LEGEND

—— SOILS GROUP BOUNDARY
A SOILS GROUP DESIGNATION

RCFC & WCD
HYDROLOGY MANUAL

0 FEET 5000

HYDROLOGIC SOILS GROUP MAP
FOR
SUNNYMEAD

PLATE C

Attachment: Appendix H - Preliminary Drainage Report (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Appendix A-4

Plate D-5.5

RUNOFF INDEX NUMBERS OF HYDROLOGIC SOIL-COVER COMPLEXES FOR PERVIOUS AREAS-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group			
		A	B	C	D
NATURAL COVERS -					
Barren (Rockland, eroded and graded land)		78	86	91	93
Chaparral, Broadleaf (Manzonita, ceanothus and scrub oak)	Poor	53	70	80	85
	Fair	40	63	75	81
	Good	31	57	71	78
Chaparrel, Narrowleaf (Chamise and redshank)	Poor	71	82	88	91
	Fair	55	72	81	86
Grass, Annual or Perennial	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Meadows or Cienegas (Areas with seasonally high water table, principal vegetation is sod forming grass)	Poor	63	77	85	88
	Fair	51	70	80	84
	Good	30	58	72	78
Open Brush (Soft wood shrubs - buckwheat, sage, etc.)	Poor	62	76	84	88
	Fair	46	66	77	83
	Good	41	63	75	81
Woodland (Coniferous or broadleaf trees predominate. Canopy density is at least 50 percent)	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	28	55	70	77
Woodland, Grass (Coniferous or broadleaf trees with canopy density from 20 to 50 percent)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
URBAN COVERS -					
Residential or Commercial Landscaping (Lawn, shrubs, etc.)	Good	32	56	69	75
Turf (Irrigated and mowed grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
AGRICULTURAL COVERS -					
Fallow (Land plowed but not tilled or seeded)		76	85	90	92

RCFC & WCD
HYDROLOGY MANUAL

RUNOFF INDEX NUMBERS
FOR
PERVIOUS AREA

Attachment: Appendix H - Preliminary Drainage Report (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

RUNOFF INDEX NUMBERS OF HYDROLOGIC SOIL-COVER COMPLEXES FOR PERVIOUS AREAS-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group			
		A	B	C	D
AGRICULTURAL COVERS (cont.) -					
Legumes, Close Seeded (Alfalfa, sweetclover, timothy, etc.)	Poor	66	77	85	89
	Good	58	72	81	85
Orchards, Deciduous (Apples, apricots, pears, walnuts, etc.)		See Note 4			
Orchards, Evergreen (Citrus, avocados, etc.)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
Pasture, Dryland (Annual grasses)	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Pasture, Irrigated (Legumes and perennial grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
Row Crops (Field crops - tomatoes, sugar beets, etc.)	Poor	72	81	88	91
	Good	67	78	85	89
Small Grain (Wheat, oats, barley, etc.)	Poor	65	76	84	88
	Good	63	75	83	87
Vineyard		See Note 4			

Notes:

1. All runoff index (RI) numbers are for Antecedent Moisture Condition (AMC) II.

2. Quality of cover definitions:
   Poor-Heavily grazed or regularly burned areas. Less than 50 percent of the ground surface is protected by plant cover or brush and tree canopy.
   Fair-Moderate cover with 50 percent to 75 percent of the ground surface protected.
   Good-Heavy or dense cover with more than 75 percent of the ground surface protected.

3. See Plate C-2 for a detailed description of cover types.

4. Use runoff index numbers based on ground cover type. See discussion under "Cover Type Descriptions" on Plate C-2.

5. Reference Bibliography item 17.

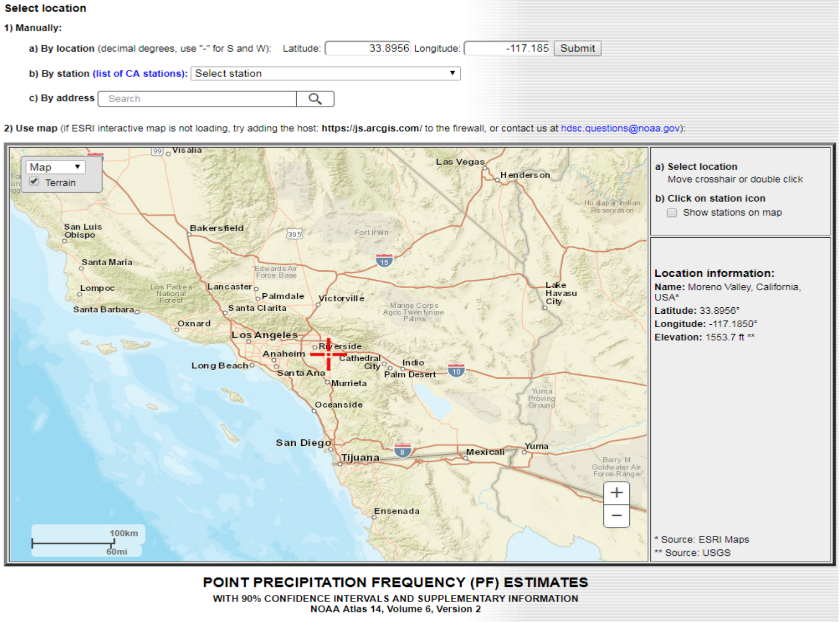
RCFC & WCD
HYDROLOGY MANUAL

RUNOFF INDEX NUMBERS
FOR
PERVIOUS AREA

Appendix A-5

HEC-HMS Synthetic Unit Hydrograph Method Calculations

Calculation Inputs for
HEC-HMS 4.2.1:
Using Synthetic Unit Hydrograph Method



Select location

1) Manually:

a) By location (decimal degrees, use "-" for S and W): Latitude: 33.8956 Longitude: -117.185 Submit

b) By station (list of CA stations): Select station ▾

c) By address Search

2) Use map (if ESRI interactive map is not loading, try adding the host: **https://js.arcgis.com/** to the firewall, or contact us at hdsc.questions@noaa.gov):

a) Select location
Move crosshair or double click

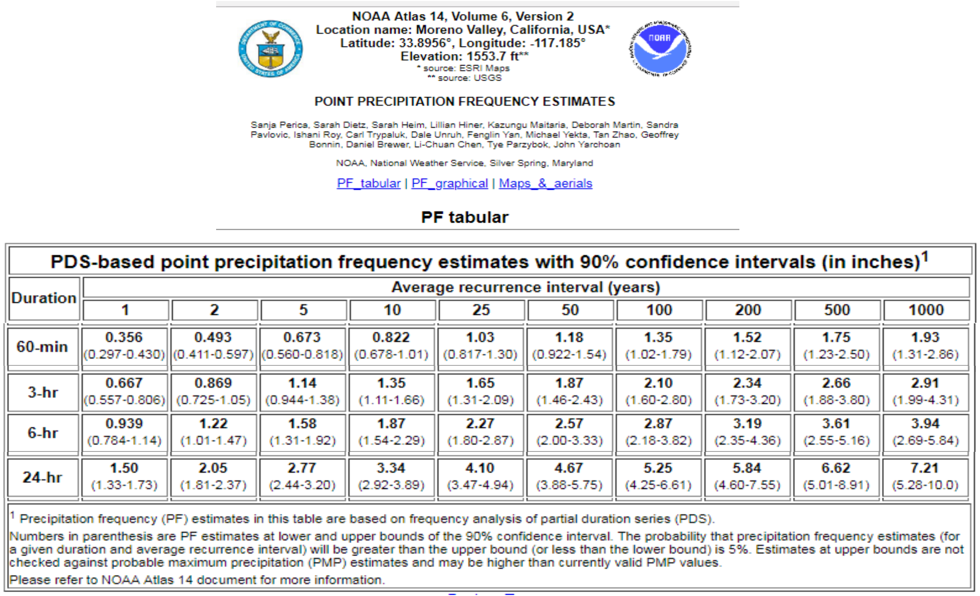
b) Click on station icon
☐ Show stations on map

Location information:
Name: Moreno Valley, California, USA*
Latitude: 33.8956°
Longitude: -117.1850°
Elevation: 1553.7 ft **

* Source: ESRI Maps
** Source: USGS

POINT PRECIPITATION FREQUENCY (PF) ESTIMATES
WITH 90% CONFIDENCE INTERVALS AND SUPPLEMENTARY INFORMATION
NOAA Atlas 14, Volume 6, Version 2

Inputs from HEC-HMS Preprocessor (RCFC&WCD):



NOAA Atlas 14, Volume 6, Version 2
Location name: Moreno Valley, California, USA*
Latitude: 33.8956°, Longitude: -117.185°
Elevation: 1553.7 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

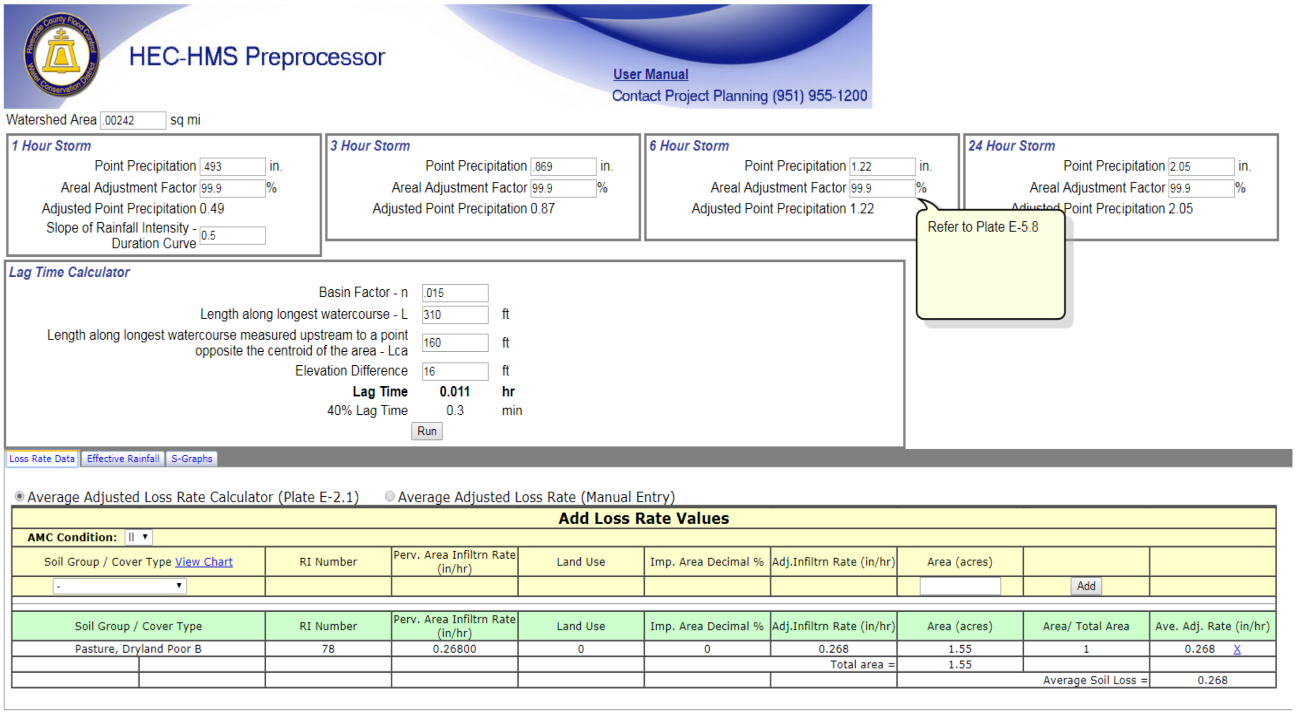
PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
60-min	0.356 (0.297-0.430)	0.493 (0.411-0.597)	0.673 (0.560-0.818)	0.822 (0.678-1.01)	1.03 (0.817-1.30)	1.18 (0.922-1.54)	1.35 (1.02-1.79)	1.52 (1.12-2.07)	1.75 (1.23-2.50)	1.93 (1.31-2.86)
3-hr	0.667 (0.557-0.806)	0.869 (0.725-1.05)	1.14 (0.944-1.38)	1.35 (1.11-1.66)	1.65 (1.31-2.09)	1.87 (1.46-2.43)	2.10 (1.60-2.80)	2.34 (1.73-3.20)	2.66 (1.88-3.80)	2.91 (1.99-4.31)
6-hr	0.939 (0.784-1.14)	1.22 (1.01-1.47)	1.58 (1.31-1.92)	1.87 (1.54-2.29)	2.27 (1.80-2.87)	2.57 (2.00-3.33)	2.87 (2.18-3.82)	3.19 (2.35-4.36)	3.61 (2.55-5.16)	3.94 (2.69-5.84)
24-hr	1.50 (1.33-1.73)	2.05 (1.81-2.37)	2.77 (2.44-3.20)	3.34 (2.92-3.89)	4.10 (3.47-4.94)	4.67 (3.88-5.75)	5.25 (4.25-6.61)	5.84 (4.60-7.55)	6.62 (5.01-8.91)	7.21 (5.28-10.0)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.



Watershed Area .00242 sq mi

1 Hour Storm

Point Precipitation .493 in.
Areal Adjustment Factor 99.9 %
Adjusted Point Precipitation 0.49
Slope of Rainfall Intensity - Duration Curve 0.5

3 Hour Storm

Point Precipitation .869 in.
Areal Adjustment Factor 99.9 %
Adjusted Point Precipitation 0.87

6 Hour Storm

Point Precipitation 1.22 in.
Areal Adjustment Factor 99.9 %
Adjusted Point Precipitation 1.22

24 Hour Storm

Point Precipitation 2.05 in.
Areal Adjustment Factor 99.9 %
Adjusted Point Precipitation 2.05

Refer to Plate E-5.8

Lag Time Calculator

Basin Factor - n .015
Length along longest watercourse - L 310 ft
Length along longest watercourse measured upstream to a point opposite the centroid of the area - Lca 160 ft
Elevation Difference 16 ft
Lag Time **0.011** **hr**
40% Lag Time 0.3 min

● Average Adjusted Loss Rate Calculator (Plate E-2.1) ○ Average Adjusted Loss Rate (Manual Entry)

Add Loss Rate Values

AMC Condition: II

Soil Group / Cover Type View Chart	RI Number	Perv. Area Infiltrn Rate (in/hr)	Land Use	Imp. Area Decimal %	Adj.Infiltrn Rate (in/hr)	Area (acres)		
-							Add	

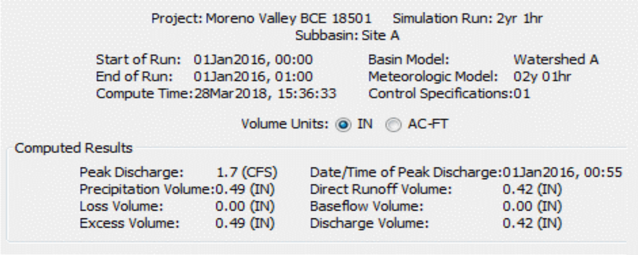
Soil Group / Cover Type	RI Number	Perv. Area Infiltrn Rate (in/hr)	Land Use	Imp. Area Decimal %	Adj.Infiltrn Rate (in/hr)	Area (acres)	Area/ Total Area	Ave. Adj. Rate (in/hr)
Pasture, Dryland Poor B	78	0.26800	0	0	0.268	1.55	1	0.268 X
					Total area =	1.55		
							Average Soil Loss =	0.268

Pre-Developed Site Storm Calculations
Calculations Per HEC-HMS 4.2.1:
Inputs from HEC-HMS Preprocessor (RCFC&WCD)

Hyd ID	Precipitation (inches)
2 yr 1 hr	0.493
2 yr 3 hr	0.869
2 yr 6 hr	1.22
2 yr 24 hr	2.05
5 yr 1 hr	0.673
5 yr 3 hr	1.14
5 yr 6 hr	1.58
5 yr 24 hr	2.77
10 yr 1 hr	0.822
10 yr 3 hr	1.35
10 yr 6 hr	1.87
10 yr 24 hr	3.34

Point Precipitation Frequency Estimates
Per NOAA Atlas 14, Volume 6, Version 2

2-year 1-hour storm for Developed Site:



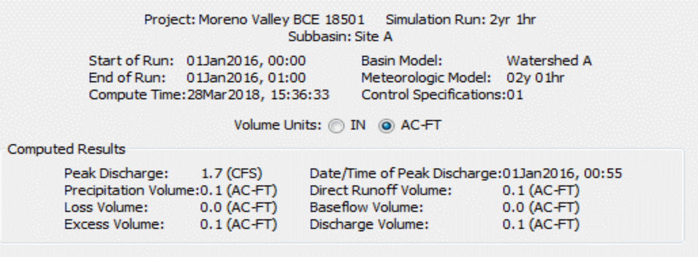
Project: Moreno Valley BCE 18501 Simulation Run: 2yr 1hr
Subbasin: Site A

Start of Run: 01Jan2016, 00:00 Basin Model: Watershed A
End of Run: 01Jan2016, 01:00 Meteorologic Model: 02y 01hr
Compute Time: 28Mar2018, 15:36:33 Control Specifications: 01

Volume Units: ● IN ○ AC-FT

Computed Results

Peak Discharge: 1.7 (CFS) Date/Time of Peak Discharge: 01Jan2016, 00:55
Precipitation Volume: 0.49 (IN) Direct Runoff Volume: 0.42 (IN)
Loss Volume: 0.00 (IN) Baseflow Volume: 0.00 (IN)
Excess Volume: 0.49 (IN) Discharge Volume: 0.42 (IN)



Project: Moreno Valley BCE 18501 Simulation Run: 2yr 1hr
Subbasin: Site A

Start of Run: 01Jan2016, 00:00 Basin Model: Watershed A
End of Run: 01Jan2016, 01:00 Meteorologic Model: 02y 01hr
Compute Time: 28Mar2018, 15:36:33 Control Specifications: 01

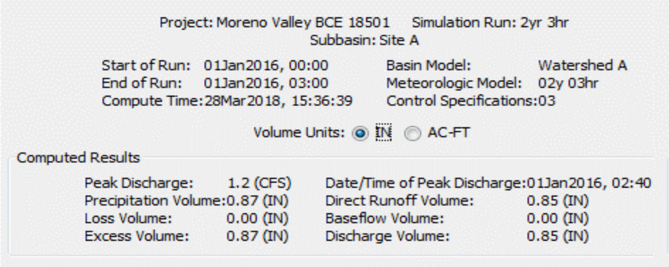
Volume Units: ○ IN ● AC-FT

Computed Results

Peak Discharge: 1.7 (CFS) Date/Time of Peak Discharge: 01Jan2016, 00:55
Precipitation Volume: 0.1 (AC-FT) Direct Runoff Volume: 0.1 (AC-FT)
Loss Volume: 0.0 (AC-FT) Baseflow Volume: 0.0 (AC-FT)
Excess Volume: 0.1 (AC-FT) Discharge Volume: 0.1 (AC-FT)

Date	Time	Precip (IN)	Loss (IN)	Excess (IN)	Direct Flow (CFS)	Baseflow (CFS)	Total Flow (CFS)
1-Jan-16	0:00				0	0	0
1-Jan-16	0:05	0.02	0	0.02	0.1	0	0.1
1-Jan-16	0:10	0.02	0	0.02	0.3	0	0.3
1-Jan-16	0:15	0.03	0	0.03	0.4	0	0.4
1-Jan-16	0:20	0.03	0	0.03	0.4	0	0.4
1-Jan-16	0:25	0.03	0	0.03	0.5	0	0.5
1-Jan-16	0:30	0.03	0	0.03	0.5	0	0.5
1-Jan-16	0:35	0.04	0	0.04	0.6	0	0.6
1-Jan-16	0:40	0.04	0	0.04	0.7	0	0.7
1-Jan-16	0:45	0.06	0	0.06	0.9	0	0.9
1-Jan-16	0:50	0.14	0	0.14	1.5	0	1.5
1-Jan-16	0:55	0.04	0	0.04	1.7	0	1.7
1-Jan-16	1:00	0.02	0	0.02	0.9	0	0.9

2-year 3-hour storm for Pre-Developed Site:



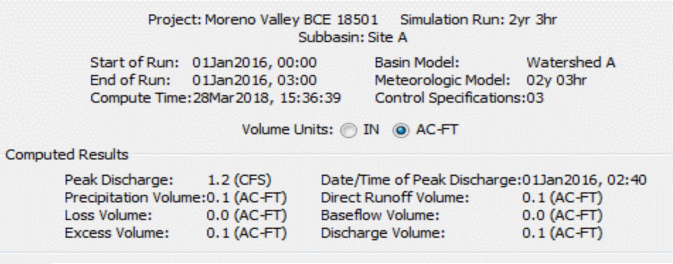
Project: Moreno Valley BCE 18501 Simulation Run: 2yr 3hr
Subbasin: Site A

Start of Run: 01Jan2016, 00:00 Basin Model: Watershed A
End of Run: 01Jan2016, 03:00 Meteorologic Model: 02y 03hr
Compute Time: 28Mar2018, 15:36:39 Control Specifications: 03

Volume Units: ● IN ○ AC-FT

Computed Results

Peak Discharge: 1.2 (CFS) Date/Time of Peak Discharge: 01Jan2016, 02:40
Precipitation Volume: 0.87 (IN) Direct Runoff Volume: 0.85 (IN)
Loss Volume: 0.00 (IN) Baseflow Volume: 0.00 (IN)
Excess Volume: 0.87 (IN) Discharge Volume: 0.85 (IN)



Project: Moreno Valley BCE 18501 Simulation Run: 2yr 3hr
Subbasin: Site A

Start of Run: 01Jan2016, 00:00 Basin Model: Watershed A
End of Run: 01Jan2016, 03:00 Meteorologic Model: 02y 03hr
Compute Time: 28Mar2018, 15:36:39 Control Specifications: 03

Volume Units: ○ IN ● AC-FT

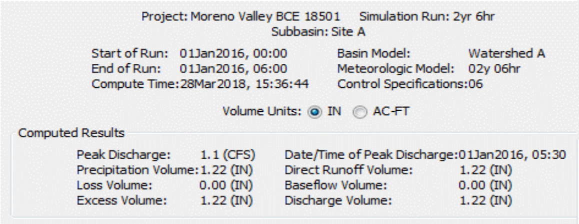
Computed Results

Peak Discharge: 1.2 (CFS) Date/Time of Peak Discharge: 01Jan2016, 02:40
Precipitation Volume: 0.1 (AC-FT) Direct Runoff Volume: 0.1 (AC-FT)
Loss Volume: 0.0 (AC-FT) Baseflow Volume: 0.0 (AC-FT)
Excess Volume: 0.1 (AC-FT) Discharge Volume: 0.1 (AC-FT)

Date	Time	Precip (IN)	Loss (IN)	Excess (IN)	Direct Flow (CFS)	Baseflow (CFS)	Total Flow (CFS)
1-Jan-16	0:00				0	0	0
1-Jan-16	0:05	0.01	0	0.01	0.1	0	0.1

1-Jan-16	0:10	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:15	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:20	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:25	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:30	0.02	0	0.02	0.3	0	0.3
1-Jan-16	0:35	0.01	0	0.01	0.3	0	0.3
1-Jan-16	0:40	0.02	0	0.02	0.3	0	0.3
1-Jan-16	0:45	0.02	0	0.02	0.3	0	0.3
1-Jan-16	0:50	0.01	0	0.01	0.3	0	0.3
1-Jan-16	0:55	0.01	0	0.01	0.3	0	0.3
1-Jan-16	1:00	0.02	0	0.02	0.3	0	0.3
1-Jan-16	1:05	0.02	0	0.02	0.3	0	0.3
1-Jan-16	1:10	0.02	0	0.02	0.3	0	0.3
1-Jan-16	1:15	0.02	0	0.02	0.3	0	0.3
1-Jan-16	1:20	0.02	0	0.02	0.3	0	0.3
1-Jan-16	1:25	0.02	0	0.02	0.4	0	0.4
1-Jan-16	1:30	0.02	0	0.02	0.4	0	0.4
1-Jan-16	1:35	0.02	0	0.02	0.4	0	0.4
1-Jan-16	1:40	0.02	0	0.02	0.4	0	0.4
1-Jan-16	1:45	0.03	0	0.03	0.5	0	0.5
1-Jan-16	1:50	0.03	0	0.03	0.5	0	0.5
1-Jan-16	1:55	0.03	0	0.03	0.5	0	0.5
1-Jan-16	2:00	0.03	0	0.03	0.5	0	0.5
1-Jan-16	2:05	0.03	0	0.03	0.5	0	0.5
1-Jan-16	2:10	0.04	0	0.04	0.5	0	0.5
1-Jan-16	2:15	0.04	0	0.04	0.7	0	0.7
1-Jan-16	2:20	0.03	0	0.03	0.7	0	0.7
1-Jan-16	2:25	0.06	0	0.06	0.8	0	0.8
1-Jan-16	2:30	0.06	0	0.06	1	0	1
1-Jan-16	2:35	0.07	0	0.07	1.2	0	1.2
1-Jan-16	2:40	0.05	0	0.05	1.2	0	1.2
1-Jan-16	2:45	0.02	0	0.02	0.8	0	0.8
1-Jan-16	2:50	0.02	0	0.02	0.5	0	0.5
1-Jan-16	2:55	0.02	0	0.02	0.4	0	0.4
1-Jan-16	3:00	0.01	0	0.01	0.3	0	0.3

2-year 6-hour storm for Pre-Developed Site:



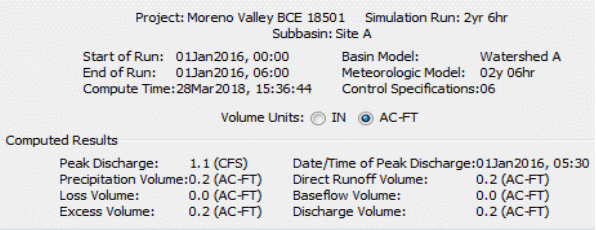
Project: Moreno Valley BCE 18501 Simulation Run: 2yr 6hr
Subbasin: Site A

Start of Run: 01Jan2016, 00:00
End of Run: 01Jan2016, 06:00
Compute Time: 28Mar2018, 15:36:44
Basin Model: Watershed A
Meteorologic Model: 02y 06hr
Control Specifications: 06

Volume Units: ● IN ○ AC-FT

Computed Results

Peak Discharge: 1.1 (CFS)
Precipitation Volume: 1.22 (IN)
Loss Volume: 0.00 (IN)
Excess Volume: 1.22 (IN)
Date/Time of Peak Discharge: 01Jan2016, 05:30
Direct Runoff Volume: 1.22 (IN)
Baseflow Volume: 0.00 (IN)
Discharge Volume: 1.22 (IN)



Project: Moreno Valley BCE 18501 Simulation Run: 2yr 6hr
Subbasin: Site A

Start of Run: 01Jan2016, 00:00
End of Run: 01Jan2016, 06:00
Compute Time: 28Mar2018, 15:36:44
Basin Model: Watershed A
Meteorologic Model: 02y 06hr
Control Specifications: 06

Volume Units: ○ IN ● AC-FT

Computed Results

Peak Discharge: 1.1 (CFS)
Precipitation Volume: 0.2 (AC-FT)
Loss Volume: 0.0 (AC-FT)
Excess Volume: 0.2 (AC-FT)
Date/Time of Peak Discharge: 01Jan2016, 05:30
Direct Runoff Volume: 0.2 (AC-FT)
Baseflow Volume: 0.0 (AC-FT)
Discharge Volume: 0.2 (AC-FT)

Date	Time	Precip (IN)	Loss (IN)	Excess (IN)	Direct Flow (CFS)	Baseflow (CFS)	Total Flow (CFS)
1-Jan-16	0:00				0	0	0
1-Jan-16	0:05	0.01	0	0.01	0	0	0
1-Jan-16	0:10	0.01	0	0.01	0.1	0	0.1
1-Jan-16	0:15	0.01	0	0.01	0.1	0	0.1
1-Jan-16	0:20	0.01	0	0.01	0.1	0	0.1
1-Jan-16	0:25	0.01	0	0.01	0.1	0	0.1
1-Jan-16	0:30	0.01	0	0.01	0.1	0	0.1
1-Jan-16	0:35	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:40	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:45	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:00	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:05	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:10	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:15	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:20	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:25	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:30	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:35	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:40	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:45	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	2:00	0.01	0	0.01	0.2	0	0.2
1-Jan-16	2:05	0.01	0	0.01	0.2	0	0.2
1-Jan-16	2:10	0.01	0	0.01	0.2	0	0.2
1-Jan-16	2:15	0.01	0	0.01	0.2	0	0.2
1-Jan-16	2:20	0.01	0	0.01	0.2	0	0.2
1-Jan-16	2:25	0.01	0	0.01	0.2	0	0.2
1-Jan-16	2:30	0.01	0	0.01	0.2	0	0.2
1-Jan-16	2:35	0.01	0	0.01	0.2	0	0.2
1-Jan-16	2:40	0.01	0	0.01	0.2	0	0.2
1-Jan-16	2:45	0.01	0	0.01	0.2	0	0.2
1-Jan-16	2:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	2:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	3:00	0.01	0	0.01	0.2	0	0.2
1-Jan-16	3:05	0.01	0	0.01	0.2	0	0.2

1-Jan-16	3:10	0.01	0	0.01	0.2	0	0.2
1-Jan-16	3:15	0.01	0	0.01	0.2	0	0.2
1-Jan-16	3:20	0.01	0	0.01	0.2	0	0.2
1-Jan-16	3:25	0.01	0	0.01	0.3	0	0.3
1-Jan-16	3:30	0.02	0	0.02	0.3	0	0.3
1-Jan-16	3:35	0.02	0	0.02	0.3	0	0.3
1-Jan-16	3:40	0.02	0	0.02	0.3	0	0.3
1-Jan-16	3:45	0.02	0	0.02	0.3	0	0.3
1-Jan-16	3:50	0.02	0	0.02	0.3	0	0.3
1-Jan-16	3:55	0.02	0	0.02	0.3	0	0.3
1-Jan-16	4:00	0.02	0	0.02	0.4	0	0.4
1-Jan-16	4:05	0.02	0	0.02	0.4	0	0.4
1-Jan-16	4:10	0.02	0	0.02	0.4	0	0.4
1-Jan-16	4:15	0.02	0	0.02	0.4	0	0.4
1-Jan-16	4:20	0.02	0	0.02	0.4	0	0.4
1-Jan-16	4:25	0.03	0	0.03	0.5	0	0.5
1-Jan-16	4:30	0.03	0	0.03	0.5	0	0.5
1-Jan-16	4:35	0.03	0	0.03	0.5	0	0.5
1-Jan-16	4:40	0.03	0	0.03	0.5	0	0.5
1-Jan-16	4:45	0.03	0	0.03	0.5	0	0.5
1-Jan-16	4:50	0.03	0	0.03	0.5	0	0.5
1-Jan-16	4:55	0.03	0	0.03	0.5	0	0.5
1-Jan-16	5:00	0.03	0	0.03	0.6	0	0.6
1-Jan-16	5:05	0.04	0	0.04	0.6	0	0.6
1-Jan-16	5:10	0.04	0	0.04	0.7	0	0.7
1-Jan-16	5:15	0.05	0	0.05	0.8	0	0.8
1-Jan-16	5:20	0.05	0	0.05	0.9	0	0.9
1-Jan-16	5:25	0.06	0	0.06	1	0	1
1-Jan-16	5:30	0.07	0	0.07	1.1	0	1.1
1-Jan-16	5:35	0.02	0	0.02	1	0	1
1-Jan-16	5:40	0.01	0	0.01	0.5	0	0.5
1-Jan-16	5:45	0.01	0	0.01	0.3	0	0.3
1-Jan-16	5:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	5:55	0	0	0	0.1	0	0.1
1-Jan-16	6:00	0	0	0	0.1	0	0.1

2-year 24-hour storm for Pre-Developed Site:

Project: Moreno Valley BCE 18501 Simulation Run: 2yr 24hr
Subbasin: Site A

Start of Run: 01Jan2016, 00:00
End of Run: 02Jan2016, 00:00
Compute Time: 28Mar2018, 15:36:36

Basin Model: Watershed A
Meteorologic Model: 02y 24hr
Control Specifications: 24

Volume Units: ● IN ○ AC-FT

Computed Results

Peak Discharge: 0.4 (CFS)
Precipitation Volume: 2.04 (IN)
Loss Volume: 0.00 (IN)
Excess Volume: 2.04 (IN)

Date/Time of Peak Discharge: 01Jan2016, 13:25
Direct Runoff Volume: 2.04 (IN)
Baseflow Volume: 0.00 (IN)
Discharge Volume: 2.04 (IN)

Project: Moreno Valley BCE 18501 Simulation Run: 2yr 24hr
Subbasin: Site A

Start of Run: 01Jan2016, 00:00
End of Run: 02Jan2016, 00:00
Compute Time: 28Mar2018, 15:36:36

Basin Model: Watershed A
Meteorologic Model: 02y 24hr
Control Specifications: 24

Volume Units: ○ IN ● AC-FT

Computed Results

Peak Discharge: 0.4 (CFS)
Precipitation Volume: 0.3 (AC-FT)
Loss Volume: 0.0 (AC-FT)
Excess Volume: 0.3 (AC-FT)

Date/Time of Peak Discharge: 01Jan2016, 13:25
Direct Runoff Volume: 0.3 (AC-FT)
Baseflow Volume: 0.0 (AC-FT)
Discharge Volume: 0.3 (AC-FT)

Date	Time	Precip (IN)	Loss (IN)	Excess (IN)	Direct Flow (CFS)	Baseflow (CFS)	Total Flow (CFS)
1-Jan-16	0:00				0	0	0
1-Jan-16	0:05	0	0	0	0	0	0
1-Jan-16	0:10	0	0	0	0	0	0
1-Jan-16	0:15	0	0	0	0	0	0
1-Jan-16	0:20	0	0	0	0	0	0
1-Jan-16	0:25	0	0	0	0	0	0
1-Jan-16	0:30	0	0	0	0	0	0
1-Jan-16	0:35	0	0	0	0	0	0
1-Jan-16	0:40	0	0	0	0	0	0
1-Jan-16	0:45	0	0	0	0	0	0
1-Jan-16	0:50	0	0	0	0.1	0	0.1
1-Jan-16	0:55	0	0	0	0.1	0	0.1
1-Jan-16	1:00	0	0	0	0.1	0	0.1
1-Jan-16	1:05	0	0	0	0	0	0
1-Jan-16	1:10	0	0	0	0	0	0
1-Jan-16	1:15	0	0	0	0	0	0
1-Jan-16	1:20	0	0	0	0	0	0
1-Jan-16	1:25	0	0	0	0	0	0
1-Jan-16	1:30	0	0	0	0	0	0
1-Jan-16	1:35	0	0	0	0	0	0
1-Jan-16	1:40	0	0	0	0	0	0
1-Jan-16	1:45	0	0	0	0	0	0
1-Jan-16	1:50	0	0	0	0.1	0	0.1
1-Jan-16	1:55	0	0	0	0.1	0	0.1
1-Jan-16	2:00	0	0	0	0.1	0	0.1
1-Jan-16	2:05	0	0	0	0.1	0	0.1
1-Jan-16	2:10	0	0	0	0.1	0	0.1
1-Jan-16	2:15	0	0	0	0.1	0	0.1
1-Jan-16	2:20	0	0	0	0.1	0	0.1
1-Jan-16	2:25	0	0	0	0.1	0	0.1
1-Jan-16	2:30	0	0	0	0.1	0	0.1
1-Jan-16	2:35	0	0	0	0.1	0	0.1
1-Jan-16	2:40	0	0	0	0.1	0	0.1
1-Jan-16	2:45	0	0	0	0.1	0	0.1
1-Jan-16	2:50	0	0	0	0.1	0	0.1
1-Jan-16	2:55	0	0	0	0.1	0	0.1

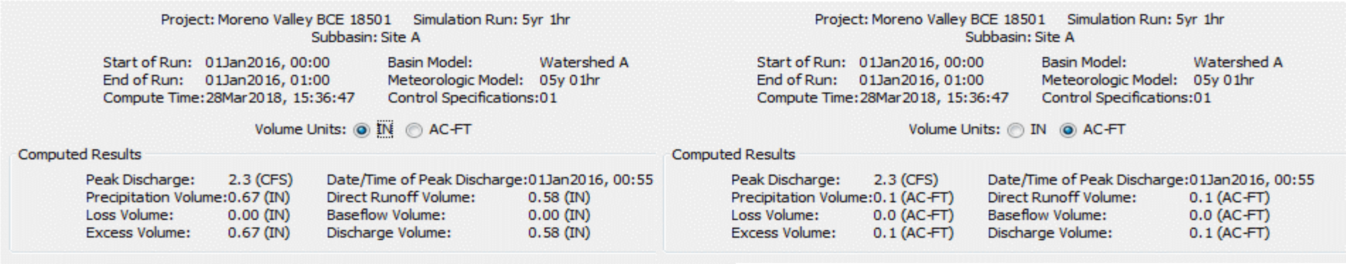
Attachment: Appendix H - Preliminary Drainage Report (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

1-Jan-16	3:00	0	0	0	0.1	0	0.1
1-Jan-16	3:05	0	0	0	0.1	0	0.1
1-Jan-16	3:10	0	0	0	0.1	0	0.1
1-Jan-16	3:15	0	0	0	0.1	0	0.1
1-Jan-16	3:20	0	0	0	0.1	0	0.1
1-Jan-16	3:25	0	0	0	0.1	0	0.1
1-Jan-16	3:30	0	0	0	0.1	0	0.1
1-Jan-16	3:35	0	0	0	0.1	0	0.1
1-Jan-16	3:40	0	0	0	0.1	0	0.1
1-Jan-16	3:45	0	0	0	0.1	0	0.1
1-Jan-16	3:50	0	0	0	0.1	0	0.1
1-Jan-16	3:55	0	0	0	0.1	0	0.1
1-Jan-16	4:00	0	0	0	0.1	0	0.1
1-Jan-16	4:05	0	0	0	0.1	0	0.1
1-Jan-16	4:10	0	0	0	0.1	0	0.1
1-Jan-16	4:15	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:20	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:25	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:30	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:35	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:40	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:45	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:50	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:55	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:00	0	0	0	0.1	0	0.1
1-Jan-16	5:05	0	0	0	0.1	0	0.1
1-Jan-16	5:10	0	0	0	0.1	0	0.1
1-Jan-16	5:15	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:20	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:25	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:30	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:35	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:40	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:45	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:50	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:55	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:00	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:05	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:10	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:15	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:20	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:25	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:30	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:35	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:40	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:45	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:50	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:55	0.01	0	0.01	0.1	0	0.1
1-Jan-16	7:00	0.01	0	0.01	0.1	0	0.1
1-Jan-16	7:05	0.01	0	0.01	0.1	0	0.1
1-Jan-16	7:10	0.01	0	0.01	0.1	0	0.1
1-Jan-16	7:15	0.01	0	0.01	0.1	0	0.1
1-Jan-16	7:20	0.01	0	0.01	0.1	0	0.1
1-Jan-16	7:25	0.01	0	0.01	0.1	0	0.1
1-Jan-16	7:30	0.01	0	0.01	0.1	0	0.1
1-Jan-16	7:35	0.01	0	0.01	0.1	0	0.1
1-Jan-16	7:40	0.01	0	0.01	0.1	0	0.1
1-Jan-16	7:45	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	8:00	0.01	0	0.01	0.2	0	0.2
1-Jan-16	8:05	0.01	0	0.01	0.2	0	0.2
1-Jan-16	8:10	0.01	0	0.01	0.2	0	0.2
1-Jan-16	8:15	0.01	0	0.01	0.2	0	0.2
1-Jan-16	8:20	0.01	0	0.01	0.2	0	0.2
1-Jan-16	8:25	0.01	0	0.01	0.2	0	0.2
1-Jan-16	8:30	0.01	0	0.01	0.2	0	0.2
1-Jan-16	8:35	0.01	0	0.01	0.2	0	0.2
1-Jan-16	8:40	0.01	0	0.01	0.2	0	0.2
1-Jan-16	8:45	0.01	0	0.01	0.2	0	0.2
1-Jan-16	8:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	8:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	9:00	0.01	0	0.01	0.2	0	0.2
1-Jan-16	9:05	0.01	0	0.01	0.2	0	0.2
1-Jan-16	9:10	0.01	0	0.01	0.2	0	0.2
1-Jan-16	9:15	0.01	0	0.01	0.2	0	0.2
1-Jan-16	9:20	0.01	0	0.01	0.3	0	0.3
1-Jan-16	9:25	0.01	0	0.01	0.3	0	0.3
1-Jan-16	9:30	0.01	0	0.01	0.3	0	0.3
1-Jan-16	9:35	0.01	0	0.01	0.3	0	0.3
1-Jan-16	9:40	0.01	0	0.01	0.3	0	0.3
1-Jan-16	9:45	0.01	0	0.01	0.3	0	0.3
1-Jan-16	9:50	0.01	0	0.01	0.3	0	0.3
1-Jan-16	9:55	0.01	0	0.01	0.3	0	0.3
1-Jan-16	10:00	0.01	0	0.01	0.3	0	0.3
1-Jan-16	10:05	0.01	0	0.01	0.2	0	0.2
1-Jan-16	10:10	0.01	0	0.01	0.2	0	0.2
1-Jan-16	10:15	0.01	0	0.01	0.2	0	0.2
1-Jan-16	10:20	0.01	0	0.01	0.2	0	0.2
1-Jan-16	10:25	0.01	0	0.01	0.2	0	0.2

1-Jan-16	10:30	0.01	0	0.01	0.2	0	0.2
1-Jan-16	10:35	0.01	0	0.01	0.2	0	0.2
1-Jan-16	10:40	0.01	0	0.01	0.3	0	0.3
1-Jan-16	10:45	0.01	0	0.01	0.3	0	0.3
1-Jan-16	10:50	0.01	0	0.01	0.3	0	0.3
1-Jan-16	10:55	0.01	0	0.01	0.3	0	0.3
1-Jan-16	11:00	0.01	0	0.01	0.3	0	0.3
1-Jan-16	11:05	0.01	0	0.01	0.2	0	0.2
1-Jan-16	11:10	0.01	0	0.01	0.2	0	0.2
1-Jan-16	11:15	0.01	0	0.01	0.2	0	0.2
1-Jan-16	11:20	0.01	0	0.01	0.2	0	0.2
1-Jan-16	11:25	0.01	0	0.01	0.2	0	0.2
1-Jan-16	11:30	0.01	0	0.01	0.2	0	0.2
1-Jan-16	11:35	0.01	0	0.01	0.2	0	0.2
1-Jan-16	11:40	0.01	0	0.01	0.2	0	0.2
1-Jan-16	11:45	0.01	0	0.01	0.2	0	0.2
1-Jan-16	11:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	11:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	12:00	0.02	0	0.02	0.3	0	0.3
1-Jan-16	12:05	0.02	0	0.02	0.3	0	0.3
1-Jan-16	12:10	0.02	0	0.02	0.3	0	0.3
1-Jan-16	12:15	0.02	0	0.02	0.3	0	0.3
1-Jan-16	12:20	0.02	0	0.02	0.3	0	0.3
1-Jan-16	12:25	0.02	0	0.02	0.3	0	0.3
1-Jan-16	12:30	0.02	0	0.02	0.3	0	0.3
1-Jan-16	12:35	0.02	0	0.02	0.4	0	0.4
1-Jan-16	12:40	0.02	0	0.02	0.4	0	0.4
1-Jan-16	12:45	0.02	0	0.02	0.4	0	0.4
1-Jan-16	12:50	0.02	0	0.02	0.4	0	0.4
1-Jan-16	12:55	0.02	0	0.02	0.4	0	0.4
1-Jan-16	13:00	0.02	0	0.02	0.4	0	0.4
1-Jan-16	13:05	0.02	0	0.02	0.4	0	0.4
1-Jan-16	13:10	0.02	0	0.02	0.4	0	0.4
1-Jan-16	13:15	0.02	0	0.02	0.4	0	0.4
1-Jan-16	13:20	0.02	0	0.02	0.4	0	0.4
1-Jan-16	13:25	0.02	0	0.02	0.4	0	0.4
1-Jan-16	13:30	0.02	0	0.02	0.4	0	0.4
1-Jan-16	13:35	0.02	0	0.02	0.3	0	0.3
1-Jan-16	13:40	0.02	0	0.02	0.3	0	0.3
1-Jan-16	13:45	0.02	0	0.02	0.3	0	0.3
1-Jan-16	13:50	0.02	0	0.02	0.3	0	0.3
1-Jan-16	13:55	0.02	0	0.02	0.3	0	0.3
1-Jan-16	14:00	0.02	0	0.02	0.3	0	0.3
1-Jan-16	14:05	0.02	0	0.02	0.3	0	0.3
1-Jan-16	14:10	0.02	0	0.02	0.3	0	0.3
1-Jan-16	14:15	0.02	0	0.02	0.3	0	0.3
1-Jan-16	14:20	0.02	0	0.02	0.3	0	0.3
1-Jan-16	14:25	0.02	0	0.02	0.3	0	0.3
1-Jan-16	14:30	0.02	0	0.02	0.3	0	0.3
1-Jan-16	14:35	0.02	0	0.02	0.3	0	0.3
1-Jan-16	14:40	0.02	0	0.02	0.3	0	0.3
1-Jan-16	14:45	0.02	0	0.02	0.3	0	0.3
1-Jan-16	14:50	0.02	0	0.02	0.3	0	0.3
1-Jan-16	14:55	0.02	0	0.02	0.3	0	0.3
1-Jan-16	15:00	0.02	0	0.02	0.3	0	0.3
1-Jan-16	15:05	0.02	0	0.02	0.3	0	0.3
1-Jan-16	15:10	0.02	0	0.02	0.3	0	0.3
1-Jan-16	15:15	0.02	0	0.02	0.3	0	0.3
1-Jan-16	15:20	0.02	0	0.02	0.3	0	0.3
1-Jan-16	15:25	0.02	0	0.02	0.3	0	0.3
1-Jan-16	15:30	0.01	0	0.01	0.3	0	0.3
1-Jan-16	15:35	0.01	0	0.01	0.3	0	0.3
1-Jan-16	15:40	0.01	0	0.01	0.3	0	0.3
1-Jan-16	15:45	0.01	0	0.01	0.2	0	0.2
1-Jan-16	15:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	15:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	16:00	0	0	0	0.2	0	0.2
1-Jan-16	16:05	0	0	0	0.1	0	0.1
1-Jan-16	16:10	0	0	0	0.1	0	0.1
1-Jan-16	16:15	0	0	0	0.1	0	0.1
1-Jan-16	16:20	0	0	0	0.1	0	0.1
1-Jan-16	16:25	0	0	0	0.1	0	0.1
1-Jan-16	16:30	0	0	0	0.1	0	0.1
1-Jan-16	16:35	0	0	0	0	0	0
1-Jan-16	16:40	0	0	0	0	0	0
1-Jan-16	16:45	0	0	0	0	0	0
1-Jan-16	16:50	0	0	0	0	0	0
1-Jan-16	16:55	0	0	0	0	0	0
1-Jan-16	17:00	0	0	0	0	0	0
1-Jan-16	17:05	0	0	0	0.1	0	0.1
1-Jan-16	17:10	0	0	0	0.1	0	0.1
1-Jan-16	17:15	0	0	0	0.1	0	0.1
1-Jan-16	17:20	0	0	0	0.1	0	0.1
1-Jan-16	17:25	0	0	0	0.1	0	0.1
1-Jan-16	17:30	0	0	0	0.1	0	0.1
1-Jan-16	17:35	0	0	0	0.1	0	0.1
1-Jan-16	17:40	0	0	0	0.1	0	0.1
1-Jan-16	17:45	0	0	0	0.1	0	0.1
1-Jan-16	17:50	0	0	0	0.1	0	0.1
1-Jan-16	17:55	0	0	0	0.1	0	0.1

1-Jan-16	18:00	0	0	0	0.1	0	0.1
1-Jan-16	18:05	0	0	0	0.1	0	0.1
1-Jan-16	18:10	0	0	0	0.1	0	0.1
1-Jan-16	18:15	0	0	0	0.1	0	0.1
1-Jan-16	18:20	0	0	0	0.1	0	0.1
1-Jan-16	18:25	0	0	0	0.1	0	0.1
1-Jan-16	18:30	0	0	0	0.1	0	0.1
1-Jan-16	18:35	0	0	0	0	0	0
1-Jan-16	18:40	0	0	0	0	0	0
1-Jan-16	18:45	0	0	0	0	0	0
1-Jan-16	18:50	0	0	0	0	0	0
1-Jan-16	18:55	0	0	0	0	0	0
1-Jan-16	19:00	0	0	0	0	0	0
1-Jan-16	19:05	0	0	0	0	0	0
1-Jan-16	19:10	0	0	0	0	0	0
1-Jan-16	19:15	0	0	0	0	0	0
1-Jan-16	19:20	0	0	0	0.1	0	0.1
1-Jan-16	19:25	0	0	0	0.1	0	0.1
1-Jan-16	19:30	0	0	0	0.1	0	0.1
1-Jan-16	19:35	0	0	0	0	0	0
1-Jan-16	19:40	0	0	0	0	0	0
1-Jan-16	19:45	0	0	0	0	0	0
1-Jan-16	19:50	0	0	0	0	0	0
1-Jan-16	19:55	0	0	0	0	0	0
1-Jan-16	20:00	0	0	0	0	0	0
1-Jan-16	20:05	0	0	0	0	0	0
1-Jan-16	20:10	0	0	0	0	0	0
1-Jan-16	20:15	0	0	0	0	0	0
1-Jan-16	20:20	0	0	0	0	0	0
1-Jan-16	20:25	0	0	0	0	0	0
1-Jan-16	20:30	0	0	0	0	0	0
1-Jan-16	20:35	0	0	0	0	0	0
1-Jan-16	20:40	0	0	0	0	0	0
1-Jan-16	20:45	0	0	0	0	0	0
1-Jan-16	20:50	0	0	0	0	0	0
1-Jan-16	20:55	0	0	0	0	0	0
1-Jan-16	21:00	0	0	0	0	0	0
1-Jan-16	21:05	0	0	0	0	0	0
1-Jan-16	21:10	0	0	0	0	0	0
1-Jan-16	21:15	0	0	0	0	0	0
1-Jan-16	21:20	0	0	0	0	0	0
1-Jan-16	21:25	0	0	0	0	0	0
1-Jan-16	21:30	0	0	0	0	0	0
1-Jan-16	21:35	0	0	0	0	0	0
1-Jan-16	21:40	0	0	0	0	0	0
1-Jan-16	21:45	0	0	0	0	0	0
1-Jan-16	21:50	0	0	0	0	0	0
1-Jan-16	21:55	0	0	0	0	0	0
1-Jan-16	22:00	0	0	0	0	0	0
1-Jan-16	22:05	0	0	0	0	0	0
1-Jan-16	22:10	0	0	0	0	0	0
1-Jan-16	22:15	0	0	0	0	0	0
1-Jan-16	22:20	0	0	0	0	0	0
1-Jan-16	22:25	0	0	0	0	0	0
1-Jan-16	22:30	0	0	0	0	0	0
1-Jan-16	22:35	0	0	0	0	0	0
1-Jan-16	22:40	0	0	0	0	0	0
1-Jan-16	22:45	0	0	0	0	0	0
1-Jan-16	22:50	0	0	0	0	0	0
1-Jan-16	22:55	0	0	0	0	0	0
1-Jan-16	23:00	0	0	0	0	0	0
1-Jan-16	23:05	0	0	0	0	0	0
1-Jan-16	23:10	0	0	0	0	0	0
1-Jan-16	23:15	0	0	0	0	0	0
1-Jan-16	23:20	0	0	0	0	0	0
1-Jan-16	23:25	0	0	0	0	0	0
1-Jan-16	23:30	0	0	0	0	0	0
1-Jan-16	23:35	0	0	0	0	0	0
1-Jan-16	23:40	0	0	0	0	0	0
1-Jan-16	23:45	0	0	0	0	0	0
1-Jan-16	23:50	0	0	0	0	0	0
1-Jan-16	23:55	0	0	0	0	0	0
2-Jan-16	0:00	0	0	0	0	0	0

5-year 1-hour storm for Pre-Developed Site:



Project: Moreno Valley BCE 18501 Simulation Run: 5yr 1hr
Subbasin: Site A

Start of Run: 01Jan2016, 00:00 Basin Model: Watershed A
End of Run: 01Jan2016, 01:00 Meteorologic Model: 05y 01hr
Compute Time: 28Mar2018, 15:36:47 Control Specifications: 01

Volume Units: ● IN ○ AC-FT

Computed Results

Peak Discharge: 2.3 (CFS) Date/Time of Peak Discharge: 01Jan2016, 00:55
Precipitation Volume: 0.67 (IN) Direct Runoff Volume: 0.58 (IN)
Loss Volume: 0.00 (IN) Baseflow Volume: 0.00 (IN)
Excess Volume: 0.67 (IN) Discharge Volume: 0.58 (IN)

Project: Moreno Valley BCE 18501 Simulation Run: 5yr 1hr
Subbasin: Site A

Start of Run: 01Jan2016, 00:00 Basin Model: Watershed A
End of Run: 01Jan2016, 01:00 Meteorologic Model: 05y 01hr
Compute Time: 28Mar2018, 15:36:47 Control Specifications: 01

Volume Units: ○ IN ● AC-FT

Computed Results

Peak Discharge: 2.3 (CFS) Date/Time of Peak Discharge: 01Jan2016, 00:55
Precipitation Volume: 0.1 (AC-FT) Direct Runoff Volume: 0.1 (AC-FT)
Loss Volume: 0.0 (AC-FT) Baseflow Volume: 0.0 (AC-FT)
Excess Volume: 0.1 (AC-FT) Discharge Volume: 0.1 (AC-FT)

Date	Time	Precip (IN)	Loss (IN)	Excess (IN)	Direct Flow (CFS)	Baseflow (CFS)	Total Flow (CFS)
1-Jan-16	0:00				0	0	0
1-Jan-16	0:05	0.03	0	0.03	0.2	0	0.2
1-Jan-16	0:10	0.03	0	0.03	0.4	0	0.4
1-Jan-16	0:15	0.03	0	0.03	0.5	0	0.5
1-Jan-16	0:20	0.03	0	0.03	0.6	0	0.6
1-Jan-16	0:25	0.04	0	0.04	0.6	0	0.6
1-Jan-16	0:30	0.04	0	0.04	0.7	0	0.7
1-Jan-16	0:35	0.05	0	0.05	0.8	0	0.8
1-Jan-16	0:40	0.06	0	0.06	1	0	1
1-Jan-16	0:45	0.08	0	0.08	1.2	0	1.2
1-Jan-16	0:50	0.19	0	0.19	2	0	2
1-Jan-16	0:55	0.05	0	0.05	2.3	0	2.3
1-Jan-16	1:00	0.03	0	0.03	1.2	0	1.2

5-year 3-hour storm for Pre-Developed Site:

Project: Moreno Valley BCE 18501 Simulation Run: 5yr 3hr
Subbasin: Site A

Start of Run: 01Jan2016, 00:00
End of Run: 01Jan2016, 03:00
Compute Time: 28Mar2018, 15:36:54
Basin Model: Watershed A
Meteorologic Model: 05y 03hr
Control Specifications: 03

Volume Units: ● IN ○ AC-FT

Computed Results

Peak Discharge: 1.5 (CFS)
Precipitation Volume: 1.14 (IN)
Loss Volume: 0.00 (IN)
Excess Volume: 1.14 (IN)
Date/Time of Peak Discharge: 01Jan2016, 02:40
Direct Runoff Volume: 1.11 (IN)
Baseflow Volume: 0.00 (IN)
Discharge Volume: 1.11 (IN)

Project: Moreno Valley BCE 18501 Simulation Run: 5yr 3hr
Subbasin: Site A

Start of Run: 01Jan2016, 00:00
End of Run: 01Jan2016, 03:00
Compute Time: 28Mar2018, 15:36:54
Basin Model: Watershed A
Meteorologic Model: 05y 03hr
Control Specifications: 03

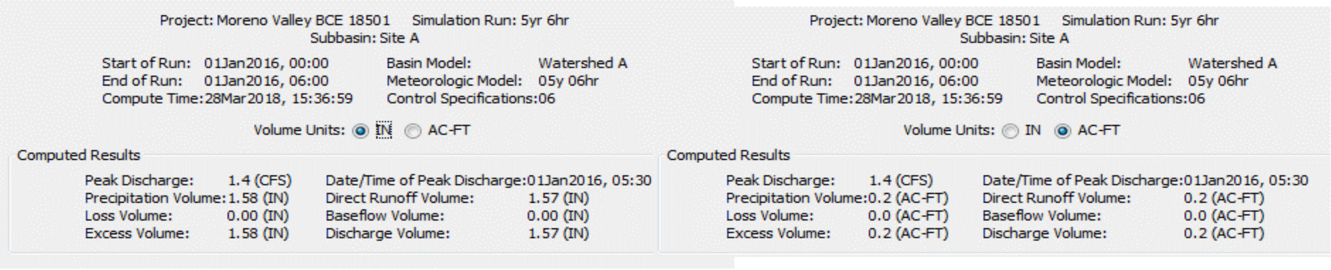
Volume Units: ○ IN ● AC-FT

Computed Results

Peak Discharge: 1.5 (CFS)
Precipitation Volume: 0.1 (AC-FT)
Loss Volume: 0.0 (AC-FT)
Excess Volume: 0.1 (AC-FT)
Date/Time of Peak Discharge: 01Jan2016, 02:40
Direct Runoff Volume: 0.1 (AC-FT)
Baseflow Volume: 0.0 (AC-FT)
Discharge Volume: 0.1 (AC-FT)

Date	Time	Precip (IN)	Loss (IN)	Excess (IN)	Direct Flow (CFS)	Baseflow (CFS)	Total Flow (CFS)
1-Jan-16	0:00				0	0	0
1-Jan-16	0:05	0.01	0	0.01	0.1	0	0.1
1-Jan-16	0:10	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:15	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:20	0.02	0	0.02	0.3	0	0.3
1-Jan-16	0:25	0.02	0	0.02	0.3	0	0.3
1-Jan-16	0:30	0.02	0	0.02	0.3	0	0.3
1-Jan-16	0:35	0.02	0	0.02	0.3	0	0.3
1-Jan-16	0:40	0.02	0	0.02	0.3	0	0.3
1-Jan-16	0:45	0.02	0	0.02	0.4	0	0.4
1-Jan-16	0:50	0.02	0	0.02	0.4	0	0.4
1-Jan-16	0:55	0.02	0	0.02	0.3	0	0.3
1-Jan-16	1:00	0.02	0	0.02	0.3	0	0.3
1-Jan-16	1:05	0.03	0	0.03	0.4	0	0.4
1-Jan-16	1:10	0.03	0	0.03	0.4	0	0.4
1-Jan-16	1:15	0.03	0	0.03	0.5	0	0.5
1-Jan-16	1:20	0.02	0	0.02	0.5	0	0.5
1-Jan-16	1:25	0.03	0	0.03	0.5	0	0.5
1-Jan-16	1:30	0.03	0	0.03	0.5	0	0.5
1-Jan-16	1:35	0.03	0	0.03	0.5	0	0.5
1-Jan-16	1:40	0.03	0	0.03	0.5	0	0.5
1-Jan-16	1:45	0.04	0	0.04	0.6	0	0.6
1-Jan-16	1:50	0.04	0	0.04	0.7	0	0.7
1-Jan-16	1:55	0.03	0	0.03	0.6	0	0.6
1-Jan-16	2:00	0.03	0	0.03	0.6	0	0.6
1-Jan-16	2:05	0.04	0	0.04	0.6	0	0.6
1-Jan-16	2:10	0.05	0	0.05	0.7	0	0.7
1-Jan-16	2:15	0.06	0	0.06	0.9	0	0.9
1-Jan-16	2:20	0.04	0	0.04	0.9	0	0.9
1-Jan-16	2:25	0.08	0	0.08	1	0	1
1-Jan-16	2:30	0.08	0	0.08	1.3	0	1.3
1-Jan-16	2:35	0.09	0	0.09	1.5	0	1.5
1-Jan-16	2:40	0.07	0	0.07	1.5	0	1.5
1-Jan-16	2:45	0.02	0	0.02	1.1	0	1.1
1-Jan-16	2:50	0.02	0	0.02	0.7	0	0.7
1-Jan-16	2:55	0.02	0	0.02	0.5	0	0.5
1-Jan-16	3:00	0.01	0	0.01	0.4	0	0.4

5-year 6-hour storm for Pre-Developed Site:



Project: Moreno Valley BCE 18501 Simulation Run: 5yr 6hr
Subbasin: Site A

Start of Run: 01Jan2016, 00:00
End of Run: 01Jan2016, 06:00
Compute Time: 28Mar2018, 15:36:59
Basin Model: Watershed A
Meteorologic Model: 05y 06hr
Control Specifications: 06

Volume Units: ● IN ○ AC-FT

Computed Results

Peak Discharge: 1.4 (CFS)
Precipitation Volume: 1.58 (IN)
Loss Volume: 0.00 (IN)
Excess Volume: 1.58 (IN)
Date/Time of Peak Discharge: 01Jan2016, 05:30
Direct Runoff Volume: 1.57 (IN)
Baseflow Volume: 0.00 (IN)
Discharge Volume: 1.57 (IN)

Project: Moreno Valley BCE 18501 Simulation Run: 5yr 6hr
Subbasin: Site A

Start of Run: 01Jan2016, 00:00
End of Run: 01Jan2016, 06:00
Compute Time: 28Mar2018, 15:36:59
Basin Model: Watershed A
Meteorologic Model: 05y 06hr
Control Specifications: 06

Volume Units: ○ IN ● AC-FT

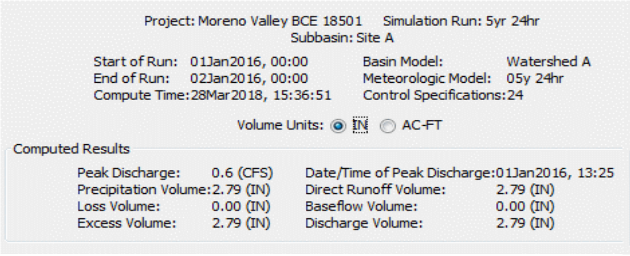
Computed Results

Peak Discharge: 1.4 (CFS)
Precipitation Volume: 0.2 (AC-FT)
Loss Volume: 0.0 (AC-FT)
Excess Volume: 0.2 (AC-FT)
Date/Time of Peak Discharge: 01Jan2016, 05:30
Direct Runoff Volume: 0.2 (AC-FT)
Baseflow Volume: 0.0 (AC-FT)
Discharge Volume: 0.2 (AC-FT)

Date	Time	Precip (IN)	Loss (IN)	Excess (IN)	Direct Flow (CFS)	Baseflow (CFS)	Total Flow (CFS)

1-Jan-16	0:00				0	0	0
1-Jan-16	0:05	0.01	0	0.01	0	0	0
1-Jan-16	0:10	0.01	0	0.01	0.1	0	0.1
1-Jan-16	0:15	0.01	0	0.01	0.1	0	0.1
1-Jan-16	0:20	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:25	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:30	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:35	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:40	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:45	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:00	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:05	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:10	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:15	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:20	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:25	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:30	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:35	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:40	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:45	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	2:00	0.01	0	0.01	0.2	0	0.2
1-Jan-16	2:05	0.01	0	0.01	0.3	0	0.3
1-Jan-16	2:10	0.01	0	0.01	0.3	0	0.3
1-Jan-16	2:15	0.01	0	0.01	0.3	0	0.3
1-Jan-16	2:20	0.01	0	0.01	0.3	0	0.3
1-Jan-16	2:25	0.01	0	0.01	0.3	0	0.3
1-Jan-16	2:30	0.01	0	0.01	0.3	0	0.3
1-Jan-16	2:35	0.01	0	0.01	0.3	0	0.3
1-Jan-16	2:40	0.01	0	0.01	0.3	0	0.3
1-Jan-16	2:45	0.02	0	0.02	0.3	0	0.3
1-Jan-16	2:50	0.02	0	0.02	0.3	0	0.3
1-Jan-16	2:55	0.02	0	0.02	0.3	0	0.3
1-Jan-16	3:00	0.02	0	0.02	0.3	0	0.3
1-Jan-16	3:05	0.02	0	0.02	0.3	0	0.3
1-Jan-16	3:10	0.02	0	0.02	0.3	0	0.3
1-Jan-16	3:15	0.02	0	0.02	0.3	0	0.3
1-Jan-16	3:20	0.02	0	0.02	0.3	0	0.3
1-Jan-16	3:25	0.02	0	0.02	0.3	0	0.3
1-Jan-16	3:30	0.02	0	0.02	0.4	0	0.4
1-Jan-16	3:35	0.02	0	0.02	0.4	0	0.4
1-Jan-16	3:40	0.02	0	0.02	0.4	0	0.4
1-Jan-16	3:45	0.02	0	0.02	0.4	0	0.4
1-Jan-16	3:50	0.02	0	0.02	0.4	0	0.4
1-Jan-16	3:55	0.03	0	0.03	0.5	0	0.5
1-Jan-16	4:00	0.03	0	0.03	0.5	0	0.5
1-Jan-16	4:05	0.03	0	0.03	0.5	0	0.5
1-Jan-16	4:10	0.03	0	0.03	0.5	0	0.5
1-Jan-16	4:15	0.03	0	0.03	0.5	0	0.5
1-Jan-16	4:20	0.03	0	0.03	0.6	0	0.6
1-Jan-16	4:25	0.03	0	0.03	0.6	0	0.6
1-Jan-16	4:30	0.03	0	0.03	0.6	0	0.6
1-Jan-16	4:35	0.04	0	0.04	0.6	0	0.6
1-Jan-16	4:40	0.04	0	0.04	0.7	0	0.7
1-Jan-16	4:45	0.04	0	0.04	0.7	0	0.7
1-Jan-16	4:50	0.04	0	0.04	0.7	0	0.7
1-Jan-16	4:55	0.04	0	0.04	0.7	0	0.7
1-Jan-16	5:00	0.04	0	0.04	0.7	0	0.7
1-Jan-16	5:05	0.05	0	0.05	0.8	0	0.8
1-Jan-16	5:10	0.06	0	0.06	0.9	0	0.9
1-Jan-16	5:15	0.06	0	0.06	1	0	1
1-Jan-16	5:20	0.07	0	0.07	1.1	0	1.1
1-Jan-16	5:25	0.07	0	0.07	1.2	0	1.2
1-Jan-16	5:30	0.09	0	0.09	1.4	0	1.4
1-Jan-16	5:35	0.03	0	0.03	1.3	0	1.3
1-Jan-16	5:40	0.01	0	0.01	0.7	0	0.7
1-Jan-16	5:45	0.01	0	0.01	0.4	0	0.4
1-Jan-16	5:50	0.01	0	0.01	0.3	0	0.3
1-Jan-16	5:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:00	0	0	0	0.1	0	0.1

5-year 24-hour storm for Pre-Developed Site:



Project: Moreno Valley BCE 18501 Simulation Run: 5yr 24hr
Subbasin: Site A

Start of Run: 01Jan2016, 00:00
End of Run: 02Jan2016, 00:00
Compute Time: 28Mar2018, 15:36:51

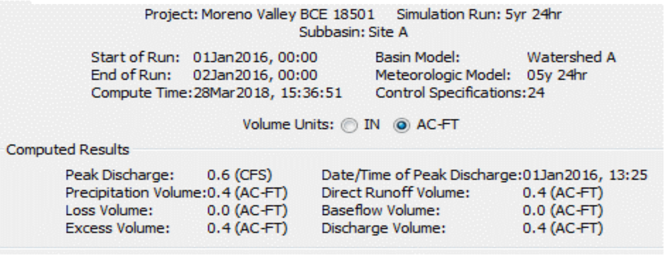
Basin Model: Watershed A
Meteorologic Model: 05y 24hr
Control Specifications: 24

Volume Units: ● IN ○ AC-FT

Computed Results

Peak Discharge: 0.6 (CFS)
Precipitation Volume: 2.79 (IN)
Loss Volume: 0.00 (IN)
Excess Volume: 2.79 (IN)

Date/Time of Peak Discharge: 01Jan2016, 13:25
Direct Runoff Volume: 2.79 (IN)
Baseflow Volume: 0.00 (IN)
Discharge Volume: 2.79 (IN)



Project: Moreno Valley BCE 18501 Simulation Run: 5yr 24hr
Subbasin: Site A

Start of Run: 01Jan2016, 00:00
End of Run: 02Jan2016, 00:00
Compute Time: 28Mar2018, 15:36:51

Basin Model: Watershed A
Meteorologic Model: 05y 24hr
Control Specifications: 24

Volume Units: ○ IN ● AC-FT

Computed Results

Peak Discharge: 0.6 (CFS)
Precipitation Volume: 0.4 (AC-FT)
Loss Volume: 0.0 (AC-FT)
Excess Volume: 0.4 (AC-FT)

Date/Time of Peak Discharge: 01Jan2016, 13:25
Direct Runoff Volume: 0.4 (AC-FT)
Baseflow Volume: 0.0 (AC-FT)
Discharge Volume: 0.4 (AC-FT)

Date	Time	Precip (IN)	Loss (IN)	Excess (IN)	Direct Flow (CFS)	Baseflow (CFS)	Total Flow (CFS)

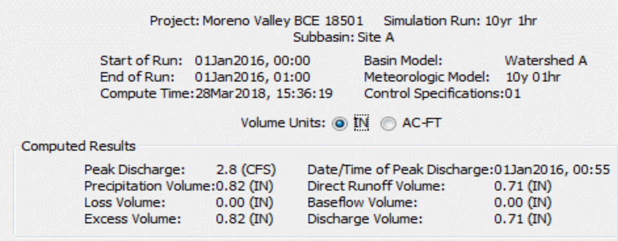
1-Jan-16	0:00				0	0	0
1-Jan-16	0:05	0	0	0	0	0	0
1-Jan-16	0:10	0	0	0	0	0	0
1-Jan-16	0:15	0	0	0	0	0	0
1-Jan-16	0:20	0	0	0	0	0	0
1-Jan-16	0:25	0	0	0	0.1	0	0.1
1-Jan-16	0:30	0	0	0	0.1	0	0.1
1-Jan-16	0:35	0	0	0	0.1	0	0.1
1-Jan-16	0:40	0	0	0	0.1	0	0.1
1-Jan-16	0:45	0	0	0	0.1	0	0.1
1-Jan-16	0:50	0	0	0	0.1	0	0.1
1-Jan-16	0:55	0	0	0	0.1	0	0.1
1-Jan-16	1:00	0	0	0	0.1	0	0.1
1-Jan-16	1:05	0	0	0	0.1	0	0.1
1-Jan-16	1:10	0	0	0	0.1	0	0.1
1-Jan-16	1:15	0	0	0	0.1	0	0.1
1-Jan-16	1:20	0	0	0	0.1	0	0.1
1-Jan-16	1:25	0	0	0	0.1	0	0.1
1-Jan-16	1:30	0	0	0	0.1	0	0.1
1-Jan-16	1:35	0	0	0	0.1	0	0.1
1-Jan-16	1:40	0	0	0	0.1	0	0.1
1-Jan-16	1:45	0	0	0	0.1	0	0.1
1-Jan-16	1:50	0	0	0	0.1	0	0.1
1-Jan-16	1:55	0	0	0	0.1	0	0.1
1-Jan-16	2:00	0	0	0	0.1	0	0.1
1-Jan-16	2:05	0	0	0	0.1	0	0.1
1-Jan-16	2:10	0	0	0	0.1	0	0.1
1-Jan-16	2:15	0	0	0	0.1	0	0.1
1-Jan-16	2:20	0	0	0	0.1	0	0.1
1-Jan-16	2:25	0	0	0	0.1	0	0.1
1-Jan-16	2:30	0.01	0	0.01	0.1	0	0.1
1-Jan-16	2:35	0.01	0	0.01	0.1	0	0.1
1-Jan-16	2:40	0.01	0	0.01	0.1	0	0.1
1-Jan-16	2:45	0.01	0	0.01	0.1	0	0.1
1-Jan-16	2:50	0.01	0	0.01	0.1	0	0.1
1-Jan-16	2:55	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:00	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:05	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:10	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:15	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:20	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:25	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:30	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:35	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:40	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:45	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:50	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:55	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:00	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:05	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:10	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:15	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:20	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:25	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:30	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:35	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:40	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:45	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:50	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:55	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:00	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:05	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:10	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:15	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:20	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:25	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:30	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:35	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:40	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:45	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:50	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:55	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:00	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:05	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:10	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:15	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:20	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:25	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:30	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:35	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:40	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:45	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:00	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:05	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:10	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:15	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:20	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:25	0.01	0	0.01	0.2	0	0.2

1-Jan-16	7:30	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:35	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:40	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:45	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	8:00	0.01	0	0.01	0.2	0	0.2
1-Jan-16	8:05	0.01	0	0.01	0.3	0	0.3
1-Jan-16	8:10	0.01	0	0.01	0.3	0	0.3
1-Jan-16	8:15	0.01	0	0.01	0.3	0	0.3
1-Jan-16	8:20	0.01	0	0.01	0.3	0	0.3
1-Jan-16	8:25	0.01	0	0.01	0.3	0	0.3
1-Jan-16	8:30	0.01	0	0.01	0.3	0	0.3
1-Jan-16	8:35	0.01	0	0.01	0.3	0	0.3
1-Jan-16	8:40	0.01	0	0.01	0.3	0	0.3
1-Jan-16	8:45	0.02	0	0.02	0.3	0	0.3
1-Jan-16	8:50	0.02	0	0.02	0.3	0	0.3
1-Jan-16	8:55	0.02	0	0.02	0.3	0	0.3
1-Jan-16	9:00	0.02	0	0.02	0.3	0	0.3
1-Jan-16	9:05	0.02	0	0.02	0.3	0	0.3
1-Jan-16	9:10	0.02	0	0.02	0.3	0	0.3
1-Jan-16	9:15	0.02	0	0.02	0.3	0	0.3
1-Jan-16	9:20	0.02	0	0.02	0.3	0	0.3
1-Jan-16	9:25	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:30	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:35	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:40	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:45	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:50	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:55	0.02	0	0.02	0.4	0	0.4
1-Jan-16	10:00	0.01	0	0.01	0.3	0	0.3
1-Jan-16	10:05	0.01	0	0.01	0.3	0	0.3
1-Jan-16	10:10	0.01	0	0.01	0.3	0	0.3
1-Jan-16	10:15	0.01	0	0.01	0.3	0	0.3
1-Jan-16	10:20	0.01	0	0.01	0.3	0	0.3
1-Jan-16	10:25	0.01	0	0.01	0.3	0	0.3
1-Jan-16	10:30	0.02	0	0.02	0.3	0	0.3
1-Jan-16	10:35	0.02	0	0.02	0.3	0	0.3
1-Jan-16	10:40	0.02	0	0.02	0.3	0	0.3
1-Jan-16	10:45	0.02	0	0.02	0.4	0	0.4
1-Jan-16	10:50	0.02	0	0.02	0.4	0	0.4
1-Jan-16	10:55	0.02	0	0.02	0.4	0	0.4
1-Jan-16	11:00	0.02	0	0.02	0.3	0	0.3
1-Jan-16	11:05	0.02	0	0.02	0.3	0	0.3
1-Jan-16	11:10	0.02	0	0.02	0.3	0	0.3
1-Jan-16	11:15	0.02	0	0.02	0.3	0	0.3
1-Jan-16	11:20	0.02	0	0.02	0.3	0	0.3
1-Jan-16	11:25	0.02	0	0.02	0.3	0	0.3
1-Jan-16	11:30	0.02	0	0.02	0.3	0	0.3
1-Jan-16	11:35	0.02	0	0.02	0.3	0	0.3
1-Jan-16	11:40	0.02	0	0.02	0.3	0	0.3
1-Jan-16	11:45	0.02	0	0.02	0.3	0	0.3
1-Jan-16	11:50	0.02	0	0.02	0.3	0	0.3
1-Jan-16	11:55	0.02	0	0.02	0.3	0	0.3
1-Jan-16	12:00	0.02	0	0.02	0.3	0	0.3
1-Jan-16	12:05	0.02	0	0.02	0.4	0	0.4
1-Jan-16	12:10	0.02	0	0.02	0.4	0	0.4
1-Jan-16	12:15	0.02	0	0.02	0.4	0	0.4
1-Jan-16	12:20	0.02	0	0.02	0.4	0	0.4
1-Jan-16	12:25	0.02	0	0.02	0.4	0	0.4
1-Jan-16	12:30	0.03	0	0.03	0.5	0	0.5
1-Jan-16	12:35	0.03	0	0.03	0.5	0	0.5
1-Jan-16	12:40	0.03	0	0.03	0.5	0	0.5
1-Jan-16	12:45	0.03	0	0.03	0.5	0	0.5
1-Jan-16	12:50	0.03	0	0.03	0.5	0	0.5
1-Jan-16	12:55	0.03	0	0.03	0.5	0	0.5
1-Jan-16	13:00	0.03	0	0.03	0.5	0	0.5
1-Jan-16	13:05	0.03	0	0.03	0.6	0	0.6
1-Jan-16	13:10	0.03	0	0.03	0.6	0	0.6
1-Jan-16	13:15	0.03	0	0.03	0.6	0	0.6
1-Jan-16	13:20	0.03	0	0.03	0.6	0	0.6
1-Jan-16	13:25	0.03	0	0.03	0.6	0	0.6
1-Jan-16	13:30	0.02	0	0.02	0.5	0	0.5
1-Jan-16	13:35	0.02	0	0.02	0.4	0	0.4
1-Jan-16	13:40	0.02	0	0.02	0.4	0	0.4
1-Jan-16	13:45	0.02	0	0.02	0.4	0	0.4
1-Jan-16	13:50	0.02	0	0.02	0.4	0	0.4
1-Jan-16	13:55	0.02	0	0.02	0.4	0	0.4
1-Jan-16	14:00	0.03	0	0.03	0.4	0	0.4
1-Jan-16	14:05	0.03	0	0.03	0.5	0	0.5
1-Jan-16	14:10	0.03	0	0.03	0.5	0	0.5
1-Jan-16	14:15	0.02	0	0.02	0.5	0	0.5
1-Jan-16	14:20	0.02	0	0.02	0.5	0	0.5
1-Jan-16	14:25	0.02	0	0.02	0.5	0	0.5
1-Jan-16	14:30	0.02	0	0.02	0.5	0	0.5
1-Jan-16	14:35	0.02	0	0.02	0.5	0	0.5
1-Jan-16	14:40	0.02	0	0.02	0.5	0	0.5
1-Jan-16	14:45	0.02	0	0.02	0.4	0	0.4
1-Jan-16	14:50	0.02	0	0.02	0.4	0	0.4
1-Jan-16	14:55	0.02	0	0.02	0.4	0	0.4

1-Jan-16	15:00	0.02	0	0.02	0.4	0	0.4
1-Jan-16	15:05	0.02	0	0.02	0.4	0	0.4
1-Jan-16	15:10	0.02	0	0.02	0.4	0	0.4
1-Jan-16	15:15	0.02	0	0.02	0.4	0	0.4
1-Jan-16	15:20	0.02	0	0.02	0.4	0	0.4
1-Jan-16	15:25	0.02	0	0.02	0.4	0	0.4
1-Jan-16	15:30	0.02	0	0.02	0.4	0	0.4
1-Jan-16	15:35	0.02	0	0.02	0.3	0	0.3
1-Jan-16	15:40	0.02	0	0.02	0.3	0	0.3
1-Jan-16	15:45	0.02	0	0.02	0.3	0	0.3
1-Jan-16	15:50	0.02	0	0.02	0.3	0	0.3
1-Jan-16	15:55	0.02	0	0.02	0.3	0	0.3
1-Jan-16	16:00	0	0	0	0.3	0	0.3
1-Jan-16	16:05	0	0	0	0.1	0	0.1
1-Jan-16	16:10	0	0	0	0.1	0	0.1
1-Jan-16	16:15	0	0	0	0.1	0	0.1
1-Jan-16	16:20	0	0	0	0.1	0	0.1
1-Jan-16	16:25	0	0	0	0.1	0	0.1
1-Jan-16	16:30	0	0	0	0.1	0	0.1
1-Jan-16	16:35	0	0	0	0.1	0	0.1
1-Jan-16	16:40	0	0	0	0.1	0	0.1
1-Jan-16	16:45	0	0	0	0.1	0	0.1
1-Jan-16	16:50	0	0	0	0.1	0	0.1
1-Jan-16	16:55	0	0	0	0.1	0	0.1
1-Jan-16	17:00	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:05	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:10	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:15	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:20	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:25	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:30	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:35	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:40	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:45	0	0	0	0.1	0	0.1
1-Jan-16	17:50	0	0	0	0.1	0	0.1
1-Jan-16	17:55	0	0	0	0.1	0	0.1
1-Jan-16	18:00	0	0	0	0.1	0	0.1
1-Jan-16	18:05	0	0	0	0.1	0	0.1
1-Jan-16	18:10	0	0	0	0.1	0	0.1
1-Jan-16	18:15	0	0	0	0.1	0	0.1
1-Jan-16	18:20	0	0	0	0.1	0	0.1
1-Jan-16	18:25	0	0	0	0.1	0	0.1
1-Jan-16	18:30	0	0	0	0.1	0	0.1
1-Jan-16	18:35	0	0	0	0.1	0	0.1
1-Jan-16	18:40	0	0	0	0.1	0	0.1
1-Jan-16	18:45	0	0	0	0.1	0	0.1
1-Jan-16	18:50	0	0	0	0	0	0
1-Jan-16	18:55	0	0	0	0	0	0
1-Jan-16	19:00	0	0	0	0	0	0
1-Jan-16	19:05	0	0	0	0.1	0	0.1
1-Jan-16	19:10	0	0	0	0.1	0	0.1
1-Jan-16	19:15	0	0	0	0.1	0	0.1
1-Jan-16	19:20	0	0	0	0.1	0	0.1
1-Jan-16	19:25	0	0	0	0.1	0	0.1
1-Jan-16	19:30	0	0	0	0.1	0	0.1
1-Jan-16	19:35	0	0	0	0.1	0	0.1
1-Jan-16	19:40	0	0	0	0.1	0	0.1
1-Jan-16	19:45	0	0	0	0.1	0	0.1
1-Jan-16	19:50	0	0	0	0	0	0
1-Jan-16	19:55	0	0	0	0	0	0
1-Jan-16	20:00	0	0	0	0	0	0
1-Jan-16	20:05	0	0	0	0.1	0	0.1
1-Jan-16	20:10	0	0	0	0.1	0	0.1
1-Jan-16	20:15	0	0	0	0.1	0	0.1
1-Jan-16	20:20	0	0	0	0.1	0	0.1
1-Jan-16	20:25	0	0	0	0.1	0	0.1
1-Jan-16	20:30	0	0	0	0.1	0	0.1
1-Jan-16	20:35	0	0	0	0.1	0	0.1
1-Jan-16	20:40	0	0	0	0.1	0	0.1
1-Jan-16	20:45	0	0	0	0.1	0	0.1
1-Jan-16	20:50	0	0	0	0	0	0
1-Jan-16	20:55	0	0	0	0	0	0
1-Jan-16	21:00	0	0	0	0	0	0
1-Jan-16	21:05	0	0	0	0.1	0	0.1
1-Jan-16	21:10	0	0	0	0.1	0	0.1
1-Jan-16	21:15	0	0	0	0.1	0	0.1
1-Jan-16	21:20	0	0	0	0	0	0
1-Jan-16	21:25	0	0	0	0	0	0
1-Jan-16	21:30	0	0	0	0	0	0
1-Jan-16	21:35	0	0	0	0.1	0	0.1
1-Jan-16	21:40	0	0	0	0.1	0	0.1
1-Jan-16	21:45	0	0	0	0.1	0	0.1
1-Jan-16	21:50	0	0	0	0	0	0
1-Jan-16	21:55	0	0	0	0	0	0
1-Jan-16	22:00	0	0	0	0	0	0
1-Jan-16	22:05	0	0	0	0.1	0	0.1
1-Jan-16	22:10	0	0	0	0.1	0	0.1
1-Jan-16	22:15	0	0	0	0.1	0	0.1
1-Jan-16	22:20	0	0	0	0	0	0
1-Jan-16	22:25	0	0	0	0	0	0

1-Jan-16	22:30	0	0	0	0	0	0
1-Jan-16	22:35	0	0	0	0	0	0
1-Jan-16	22:40	0	0	0	0	0	0
1-Jan-16	22:45	0	0	0	0	0	0
1-Jan-16	22:50	0	0	0	0	0	0
1-Jan-16	22:55	0	0	0	0	0	0
1-Jan-16	23:00	0	0	0	0	0	0
1-Jan-16	23:05	0	0	0	0	0	0
1-Jan-16	23:10	0	0	0	0	0	0
1-Jan-16	23:15	0	0	0	0	0	0
1-Jan-16	23:20	0	0	0	0	0	0
1-Jan-16	23:25	0	0	0	0	0	0
1-Jan-16	23:30	0	0	0	0	0	0
1-Jan-16	23:35	0	0	0	0	0	0
1-Jan-16	23:40	0	0	0	0	0	0
1-Jan-16	23:45	0	0	0	0	0	0
1-Jan-16	23:50	0	0	0	0	0	0
1-Jan-16	23:55	0	0	0	0	0	0
2-Jan-16	0:00	0	0	0	0	0	0

10-year 1-hour storm for Pre-Developed Site:



Project: Moreno Valley BCE 18501 Simulation Run: 10yr 1hr
Subbasin: Site A

Start of Run: 01Jan2016, 00:00
End of Run: 01Jan2016, 01:00
Compute Time: 28Mar2018, 15:36:19

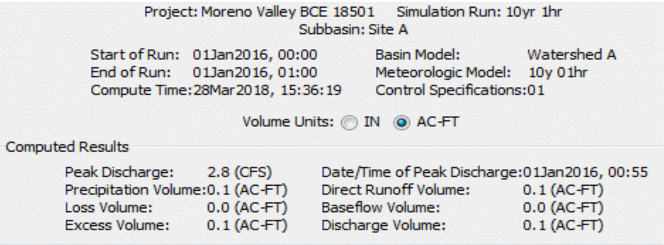
Basin Model: Watershed A
Meteorologic Model: 10y 01hr
Control Specifications: 01

Volume Units: ● IN ○ AC-FT

Computed Results

Peak Discharge: 2.8 (CFS)
Precipitation Volume: 0.82 (IN)
Loss Volume: 0.00 (IN)
Excess Volume: 0.82 (IN)

Date/Time of Peak Discharge: 01Jan2016, 00:55
Direct Runoff Volume: 0.71 (IN)
Baseflow Volume: 0.00 (IN)
Discharge Volume: 0.71 (IN)



Project: Moreno Valley BCE 18501 Simulation Run: 10yr 1hr
Subbasin: Site A

Start of Run: 01Jan2016, 00:00
End of Run: 01Jan2016, 01:00
Compute Time: 28Mar2018, 15:36:19

Basin Model: Watershed A
Meteorologic Model: 10y 01hr
Control Specifications: 01

Volume Units: ○ IN ● AC-FT

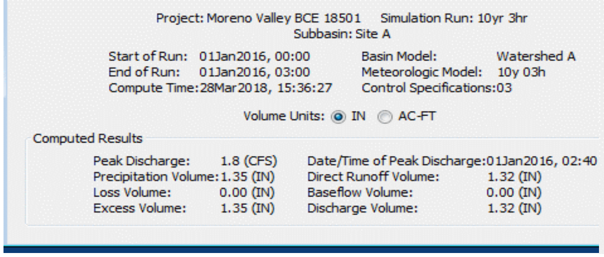
Computed Results

Peak Discharge: 2.8 (CFS)
Precipitation Volume: 0.1 (AC-FT)
Loss Volume: 0.0 (AC-FT)
Excess Volume: 0.1 (AC-FT)

Date/Time of Peak Discharge: 01Jan2016, 00:55
Direct Runoff Volume: 0.1 (AC-FT)
Baseflow Volume: 0.0 (AC-FT)
Discharge Volume: 0.1 (AC-FT)

Date	Time	Precip (IN)	Loss (IN)	Excess (IN)	Direct Flow (CFS)	Baseflow (CFS)	Total Flow (CFS)
1-Jan-16	0:00				0	0	0
1-Jan-16	0:05	0.03	0	0.03	0.2	0	0.2
1-Jan-16	0:10	0.04	0	0.04	0.5	0	0.5
1-Jan-16	0:15	0.04	0	0.04	0.6	0	0.6
1-Jan-16	0:20	0.04	0	0.04	0.7	0	0.7
1-Jan-16	0:25	0.04	0	0.04	0.8	0	0.8
1-Jan-16	0:30	0.05	0	0.05	0.9	0	0.9
1-Jan-16	0:35	0.06	0	0.06	1	0	1
1-Jan-16	0:40	0.07	0	0.07	1.1	0	1.1
1-Jan-16	0:45	0.1	0	0.1	1.4	0	1.4
1-Jan-16	0:50	0.23	0	0.23	2.4	0	2.4
1-Jan-16	0:55	0.06	0	0.06	2.8	0	2.8
1-Jan-16	1:00	0.04	0	0.04	1.5	0	1.5

10-year 3-hour storm for Pre-Developed Site:



Project: Moreno Valley BCE 18501 Simulation Run: 10yr 3hr
Subbasin: Site A

Start of Run: 01Jan2016, 00:00
End of Run: 01Jan2016, 03:00
Compute Time: 28Mar2018, 15:36:27

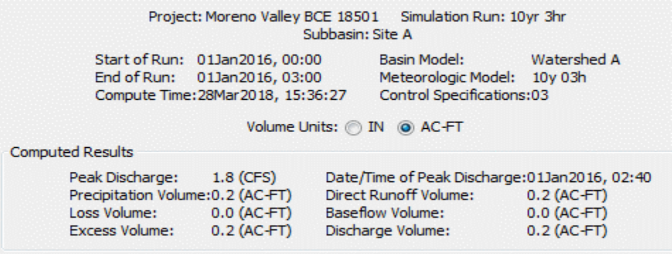
Basin Model: Watershed A
Meteorologic Model: 10y 03h
Control Specifications: 03

Volume Units: ● IN ○ AC-FT

Computed Results

Peak Discharge: 1.8 (CFS)
Precipitation Volume: 1.35 (IN)
Loss Volume: 0.00 (IN)
Excess Volume: 1.35 (IN)

Date/Time of Peak Discharge: 01Jan2016, 02:40
Direct Runoff Volume: 1.32 (IN)
Baseflow Volume: 0.00 (IN)
Discharge Volume: 1.32 (IN)



Project: Moreno Valley BCE 18501 Simulation Run: 10yr 3hr
Subbasin: Site A

Start of Run: 01Jan2016, 00:00
End of Run: 01Jan2016, 03:00
Compute Time: 28Mar2018, 15:36:27

Basin Model: Watershed A
Meteorologic Model: 10y 03h
Control Specifications: 03

Volume Units: ○ IN ● AC-FT

Computed Results

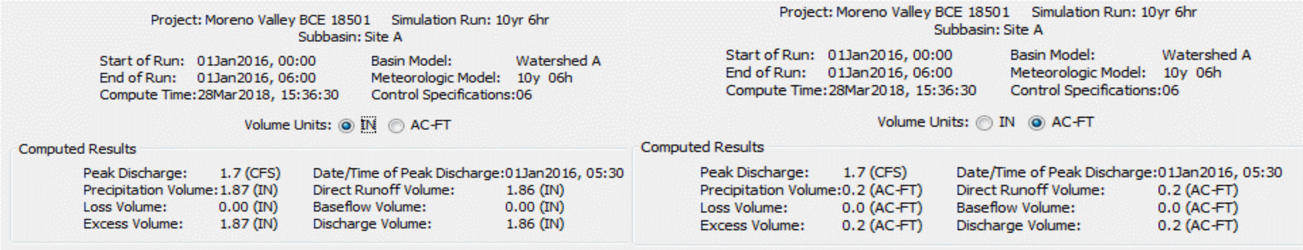
Peak Discharge: 1.8 (CFS)
Precipitation Volume: 0.2 (AC-FT)
Loss Volume: 0.0 (AC-FT)
Excess Volume: 0.2 (AC-FT)

Date/Time of Peak Discharge: 01Jan2016, 02:40
Direct Runoff Volume: 0.2 (AC-FT)
Baseflow Volume: 0.0 (AC-FT)
Discharge Volume: 0.2 (AC-FT)

Date	Time	Precip (IN)	Loss (IN)	Excess (IN)	Direct Flow (CFS)	Baseflow (CFS)	Total Flow (CFS)
1-Jan-16	0:00				0	0	0
1-Jan-16	0:05	0.02	0	0.02	0.1	0	0.1
1-Jan-16	0:10	0.02	0	0.02	0.3	0	0.3
1-Jan-16	0:15	0.01	0	0.01	0.3	0	0.3
1-Jan-16	0:20	0.02	0	0.02	0.3	0	0.3
1-Jan-16	0:25	0.02	0	0.02	0.4	0	0.4
1-Jan-16	0:30	0.02	0	0.02	0.4	0	0.4
1-Jan-16	0:35	0.02	0	0.02	0.4	0	0.4
1-Jan-16	0:40	0.02	0	0.02	0.4	0	0.4
1-Jan-16	0:45	0.02	0	0.02	0.4	0	0.4
1-Jan-16	0:50	0.02	0	0.02	0.4	0	0.4
1-Jan-16	0:55	0.02	0	0.02	0.4	0	0.4
1-Jan-16	1:00	0.02	0	0.02	0.4	0	0.4
1-Jan-16	1:05	0.03	0	0.03	0.5	0	0.5
1-Jan-16	1:10	0.03	0	0.03	0.5	0	0.5
1-Jan-16	1:15	0.03	0	0.03	0.5	0	0.5
1-Jan-16	1:20	0.03	0	0.03	0.5	0	0.5
1-Jan-16	1:25	0.04	0	0.04	0.6	0	0.6
1-Jan-16	1:30	0.04	0	0.04	0.6	0	0.6
1-Jan-16	1:35	0.03	0	0.03	0.6	0	0.6
1-Jan-16	1:40	0.04	0	0.04	0.6	0	0.6
1-Jan-16	1:45	0.04	0	0.04	0.7	0	0.7

1-Jan-16	1:50	0.04	0	0.04	0.8	0	0.8
1-Jan-16	1:55	0.04	0	0.04	0.8	0	0.8
1-Jan-16	2:00	0.04	0	0.04	0.7	0	0.7
1-Jan-16	2:05	0.04	0	0.04	0.8	0	0.8
1-Jan-16	2:10	0.06	0	0.06	0.9	0	0.9
1-Jan-16	2:15	0.07	0	0.07	1	0	1
1-Jan-16	2:20	0.05	0	0.05	1.1	0	1.1
1-Jan-16	2:25	0.09	0	0.09	1.2	0	1.2
1-Jan-16	2:30	0.1	0	0.1	1.6	0	1.6
1-Jan-16	2:35	0.11	0	0.11	1.8	0	1.8
1-Jan-16	2:40	0.08	0	0.08	1.8	0	1.8
1-Jan-16	2:45	0.03	0	0.03	1.3	0	1.3
1-Jan-16	2:50	0.02	0	0.02	0.8	0	0.8
1-Jan-16	2:55	0.02	0	0.02	0.6	0	0.6
1-Jan-16	3:00	0.01	0	0.01	0.4	0	0.4

10-year 6-hour storm for Pre-Developed Site:



Project: Moreno Valley BCE 18501   Simulation Run: 10yr 6hr
Subbasin: Site A

Start of Run: 01Jan2016, 00:00   Basin Model: Watershed A
End of Run: 01Jan2016, 06:00   Meteorologic Model: 10y 06h
Compute Time: 28Mar2018, 15:36:30   Control Specifications: 06

Volume Units: ● IN ○ AC-FT

Computed Results

Peak Discharge: 1.7 (CFS)   Date/Time of Peak Discharge: 01Jan2016, 05:30
Precipitation Volume: 1.87 (IN)   Direct Runoff Volume: 1.86 (IN)
Loss Volume: 0.00 (IN)   Baseflow Volume: 0.00 (IN)
Excess Volume: 1.87 (IN)   Discharge Volume: 1.86 (IN)

Project: Moreno Valley BCE 18501   Simulation Run: 10yr 6hr
Subbasin: Site A

Start of Run: 01Jan2016, 00:00   Basin Model: Watershed A
End of Run: 01Jan2016, 06:00   Meteorologic Model: 10y 06h
Compute Time: 28Mar2018, 15:36:30   Control Specifications: 06

Volume Units: ○ IN ● AC-FT

Computed Results

Peak Discharge: 1.7 (CFS)   Date/Time of Peak Discharge: 01Jan2016, 05:30
Precipitation Volume: 0.2 (AC-FT)   Direct Runoff Volume: 0.2 (AC-FT)
Loss Volume: 0.0 (AC-FT)   Baseflow Volume: 0.0 (AC-FT)
Excess Volume: 0.2 (AC-FT)   Discharge Volume: 0.2 (AC-FT)

Date	Time	Precip (IN)	Loss (IN)	Excess (IN)	Direct Flow (CFS)	Baseflow (CFS)	Total Flow (CFS)
1-Jan-16	0:00				0	0	0
1-Jan-16	0:05	0.01	0	0.01	0	0	0
1-Jan-16	0:10	0.01	0	0.01	0.1	0	0.1
1-Jan-16	0:15	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:20	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:25	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:30	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:35	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:40	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:45	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:00	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:05	0.01	0	0.01	0.3	0	0.3
1-Jan-16	1:10	0.01	0	0.01	0.3	0	0.3
1-Jan-16	1:15	0.01	0	0.01	0.3	0	0.3
1-Jan-16	1:20	0.01	0	0.01	0.3	0	0.3
1-Jan-16	1:25	0.01	0	0.01	0.3	0	0.3
1-Jan-16	1:30	0.01	0	0.01	0.3	0	0.3
1-Jan-16	1:35	0.01	0	0.01	0.3	0	0.3
1-Jan-16	1:40	0.01	0	0.01	0.3	0	0.3
1-Jan-16	1:45	0.01	0	0.01	0.3	0	0.3
1-Jan-16	1:50	0.01	0	0.01	0.3	0	0.3
1-Jan-16	1:55	0.01	0	0.01	0.3	0	0.3
1-Jan-16	2:00	0.02	0	0.02	0.3	0	0.3
1-Jan-16	2:05	0.02	0	0.02	0.3	0	0.3
1-Jan-16	2:10	0.02	0	0.02	0.3	0	0.3
1-Jan-16	2:15	0.02	0	0.02	0.3	0	0.3
1-Jan-16	2:20	0.02	0	0.02	0.3	0	0.3
1-Jan-16	2:25	0.02	0	0.02	0.3	0	0.3
1-Jan-16	2:30	0.02	0	0.02	0.3	0	0.3
1-Jan-16	2:35	0.02	0	0.02	0.3	0	0.3
1-Jan-16	2:40	0.02	0	0.02	0.3	0	0.3
1-Jan-16	2:45	0.02	0	0.02	0.3	0	0.3
1-Jan-16	2:50	0.02	0	0.02	0.3	0	0.3
1-Jan-16	2:55	0.02	0	0.02	0.4	0	0.4
1-Jan-16	3:00	0.02	0	0.02	0.4	0	0.4
1-Jan-16	3:05	0.02	0	0.02	0.4	0	0.4
1-Jan-16	3:10	0.02	0	0.02	0.4	0	0.4
1-Jan-16	3:15	0.02	0	0.02	0.4	0	0.4
1-Jan-16	3:20	0.02	0	0.02	0.4	0	0.4
1-Jan-16	3:25	0.02	0	0.02	0.4	0	0.4
1-Jan-16	3:30	0.02	0	0.02	0.4	0	0.4
1-Jan-16	3:35	0.03	0	0.03	0.4	0	0.4
1-Jan-16	3:40	0.03	0	0.03	0.5	0	0.5
1-Jan-16	3:45	0.03	0	0.03	0.5	0	0.5
1-Jan-16	3:50	0.03	0	0.03	0.5	0	0.5
1-Jan-16	3:55	0.03	0	0.03	0.5	0	0.5
1-Jan-16	4:00	0.03	0	0.03	0.6	0	0.6
1-Jan-16	4:05	0.03	0	0.03	0.6	0	0.6
1-Jan-16	4:10	0.03	0	0.03	0.6	0	0.6
1-Jan-16	4:15	0.04	0	0.04	0.6	0	0.6
1-Jan-16	4:20	0.04	0	0.04	0.7	0	0.7
1-Jan-16	4:25	0.04	0	0.04	0.7	0	0.7
1-Jan-16	4:30	0.04	0	0.04	0.7	0	0.7
1-Jan-16	4:35	0.04	0	0.04	0.7	0	0.7
1-Jan-16	4:40	0.04	0	0.04	0.8	0	0.8

1-Jan-16	4:45	0.04	0	0.04	0.8	0	0.8
1-Jan-16	4:50	0.04	0	0.04	0.8	0	0.8
1-Jan-16	4:55	0.05	0	0.05	0.8	0	0.8
1-Jan-16	5:00	0.05	0	0.05	0.9	0	0.9
1-Jan-16	5:05	0.06	0	0.06	1	0	1
1-Jan-16	5:10	0.07	0	0.07	1.1	0	1.1
1-Jan-16	5:15	0.07	0	0.07	1.2	0	1.2
1-Jan-16	5:20	0.08	0	0.08	1.3	0	1.3
1-Jan-16	5:25	0.09	0	0.09	1.5	0	1.5
1-Jan-16	5:30	0.1	0	0.1	1.7	0	1.7
1-Jan-16	5:35	0.04	0	0.04	1.5	0	1.5
1-Jan-16	5:40	0.02	0	0.02	0.8	0	0.8
1-Jan-16	5:45	0.01	0	0.01	0.5	0	0.5
1-Jan-16	5:50	0.01	0	0.01	0.3	0	0.3
1-Jan-16	5:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:00	0	0	0	0.1	0	0.1

10-year 24-hour storm for Pre-Developed Site:

Project: Moreno Valley BCE 18501 Simulation Run: 10yr 24hr
Subbasin: Site A

Start of Run: 01Jan2016, 00:00
End of Run: 02Jan2016, 00:00
Compute Time: 28Mar2018, 15:36:24
Basin Model: Watershed A
Meteorologic Model: 10y 24h
Control Specifications: 24

Volume Units: ● IN ○ AC-FT

Computed Results

Peak Discharge: 0.7 (CFS)
Precipitation Volume: 3.31 (IN)
Loss Volume: 0.00 (IN)
Excess Volume: 3.31 (IN)
Date/Time of Peak Discharge: 01Jan2016, 13:30
Direct Runoff Volume: 3.31 (IN)
Baseflow Volume: 0.00 (IN)
Discharge Volume: 3.31 (IN)

Project: Moreno Valley BCE 18501 Simulation Run: 10yr 24hr
Subbasin: Site A

Start of Run: 01Jan2016, 00:00
End of Run: 02Jan2016, 00:00
Compute Time: 28Mar2018, 15:36:24
Basin Model: Watershed A
Meteorologic Model: 10y 24h
Control Specifications: 24

Volume Units: ○ IN ● AC-FT

Computed Results

Peak Discharge: 0.7 (CFS)
Precipitation Volume: 0.4 (AC-FT)
Loss Volume: 0.0 (AC-FT)
Excess Volume: 0.4 (AC-FT)
Date/Time of Peak Discharge: 01Jan2016, 13:30
Direct Runoff Volume: 0.4 (AC-FT)
Baseflow Volume: 0.0 (AC-FT)
Discharge Volume: 0.4 (AC-FT)

Date	Time	Precip (IN)	Loss (IN)	Excess (IN)	Direct Flow (CFS)	Baseflow (CFS)	Total Flow (CFS)
1-Jan-16	0:00				0	0	0
1-Jan-16	0:05	0	0	0	0	0	0
1-Jan-16	0:10	0	0	0	0	0	0
1-Jan-16	0:15	0	0	0	0	0	0
1-Jan-16	0:20	0	0	0	0	0	0
1-Jan-16	0:25	0	0	0	0.1	0	0.1
1-Jan-16	0:30	0	0	0	0.1	0	0.1
1-Jan-16	0:35	0	0	0	0.1	0	0.1
1-Jan-16	0:40	0	0	0	0.1	0	0.1
1-Jan-16	0:45	0	0	0	0.1	0	0.1
1-Jan-16	0:50	0	0	0	0.1	0	0.1
1-Jan-16	0:55	0	0	0	0.1	0	0.1
1-Jan-16	1:00	0	0	0	0.1	0	0.1
1-Jan-16	1:05	0	0	0	0.1	0	0.1
1-Jan-16	1:10	0	0	0	0.1	0	0.1
1-Jan-16	1:15	0	0	0	0.1	0	0.1
1-Jan-16	1:20	0	0	0	0.1	0	0.1
1-Jan-16	1:25	0	0	0	0.1	0	0.1
1-Jan-16	1:30	0	0	0	0.1	0	0.1
1-Jan-16	1:35	0	0	0	0.1	0	0.1
1-Jan-16	1:40	0	0	0	0.1	0	0.1
1-Jan-16	1:45	0	0	0	0.1	0	0.1
1-Jan-16	1:50	0	0	0	0.1	0	0.1
1-Jan-16	1:55	0	0	0	0.1	0	0.1
1-Jan-16	2:00	0	0	0	0.1	0	0.1
1-Jan-16	2:05	0	0	0	0.1	0	0.1
1-Jan-16	2:10	0	0	0	0.1	0	0.1
1-Jan-16	2:15	0	0	0	0.1	0	0.1
1-Jan-16	2:20	0	0	0	0.1	0	0.1
1-Jan-16	2:25	0	0	0	0.1	0	0.1
1-Jan-16	2:30	0	0	0	0.1	0	0.1
1-Jan-16	2:35	0.01	0	0.01	0.1	0	0.1
1-Jan-16	2:40	0.01	0	0.01	0.1	0	0.1
1-Jan-16	2:45	0.01	0	0.01	0.1	0	0.1
1-Jan-16	2:50	0.01	0	0.01	0.1	0	0.1
1-Jan-16	2:55	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:00	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:05	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:10	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:15	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:20	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:25	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:30	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:35	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:40	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:45	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:50	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:55	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:00	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:05	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:10	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:15	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:20	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:25	0.01	0	0.01	0.1	0	0.1

1-Jan-16	4:30	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:35	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:40	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:45	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	4:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	5:00	0.01	0	0.01	0.2	0	0.2
1-Jan-16	5:05	0.01	0	0.01	0.2	0	0.2
1-Jan-16	5:10	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:15	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:20	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:25	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:30	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:35	0.01	0	0.01	0.2	0	0.2
1-Jan-16	5:40	0.01	0	0.01	0.2	0	0.2
1-Jan-16	5:45	0.01	0	0.01	0.2	0	0.2
1-Jan-16	5:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	5:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:00	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:05	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:10	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:15	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:20	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:25	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:30	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:35	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:40	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:45	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:00	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:05	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:10	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:15	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:20	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:25	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:30	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:35	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:40	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:45	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:55	0.01	0	0.01	0.3	0	0.3
1-Jan-16	8:00	0.01	0	0.01	0.3	0	0.3
1-Jan-16	8:05	0.02	0	0.02	0.3	0	0.3
1-Jan-16	8:10	0.02	0	0.02	0.3	0	0.3
1-Jan-16	8:15	0.02	0	0.02	0.3	0	0.3
1-Jan-16	8:20	0.02	0	0.02	0.3	0	0.3
1-Jan-16	8:25	0.02	0	0.02	0.3	0	0.3
1-Jan-16	8:30	0.02	0	0.02	0.3	0	0.3
1-Jan-16	8:35	0.02	0	0.02	0.3	0	0.3
1-Jan-16	8:40	0.02	0	0.02	0.3	0	0.3
1-Jan-16	8:45	0.02	0	0.02	0.3	0	0.3
1-Jan-16	8:50	0.02	0	0.02	0.3	0	0.3
1-Jan-16	8:55	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:00	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:05	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:10	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:15	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:20	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:25	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:30	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:35	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:40	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:45	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:50	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:55	0.02	0	0.02	0.4	0	0.4
1-Jan-16	10:00	0.02	0	0.02	0.4	0	0.4
1-Jan-16	10:05	0.02	0	0.02	0.4	0	0.4
1-Jan-16	10:10	0.02	0	0.02	0.4	0	0.4
1-Jan-16	10:15	0.02	0	0.02	0.3	0	0.3
1-Jan-16	10:20	0.02	0	0.02	0.3	0	0.3
1-Jan-16	10:25	0.02	0	0.02	0.3	0	0.3
1-Jan-16	10:30	0.02	0	0.02	0.3	0	0.3
1-Jan-16	10:35	0.02	0	0.02	0.3	0	0.3
1-Jan-16	10:40	0.02	0	0.02	0.4	0	0.4
1-Jan-16	10:45	0.02	0	0.02	0.4	0	0.4
1-Jan-16	10:50	0.02	0	0.02	0.4	0	0.4
1-Jan-16	10:55	0.02	0	0.02	0.4	0	0.4
1-Jan-16	11:00	0.02	0	0.02	0.4	0	0.4
1-Jan-16	11:05	0.02	0	0.02	0.4	0	0.4
1-Jan-16	11:10	0.02	0	0.02	0.4	0	0.4
1-Jan-16	11:15	0.02	0	0.02	0.4	0	0.4
1-Jan-16	11:20	0.02	0	0.02	0.4	0	0.4
1-Jan-16	11:25	0.02	0	0.02	0.4	0	0.4
1-Jan-16	11:30	0.02	0	0.02	0.4	0	0.4
1-Jan-16	11:35	0.02	0	0.02	0.4	0	0.4
1-Jan-16	11:40	0.02	0	0.02	0.4	0	0.4
1-Jan-16	11:45	0.02	0	0.02	0.4	0	0.4
1-Jan-16	11:50	0.02	0	0.02	0.4	0	0.4
1-Jan-16	11:55	0.02	0	0.02	0.4	0	0.4

1-Jan-16	12:00	0.02	0	0.02	0.4	0	0.4
1-Jan-16	12:05	0.03	0	0.03	0.4	0	0.4
1-Jan-16	12:10	0.03	0	0.03	0.5	0	0.5
1-Jan-16	12:15	0.03	0	0.03	0.5	0	0.5
1-Jan-16	12:20	0.03	0	0.03	0.5	0	0.5
1-Jan-16	12:25	0.03	0	0.03	0.5	0	0.5
1-Jan-16	12:30	0.03	0	0.03	0.5	0	0.5
1-Jan-16	12:35	0.03	0	0.03	0.6	0	0.6
1-Jan-16	12:40	0.03	0	0.03	0.6	0	0.6
1-Jan-16	12:45	0.03	0	0.03	0.6	0	0.6
1-Jan-16	12:50	0.03	0	0.03	0.6	0	0.6
1-Jan-16	12:55	0.03	0	0.03	0.6	0	0.6
1-Jan-16	13:00	0.03	0	0.03	0.6	0	0.6
1-Jan-16	13:05	0.04	0	0.04	0.6	0	0.6
1-Jan-16	13:10	0.04	0	0.04	0.7	0	0.7
1-Jan-16	13:15	0.04	0	0.04	0.7	0	0.7
1-Jan-16	13:20	0.04	0	0.04	0.7	0	0.7
1-Jan-16	13:25	0.04	0	0.04	0.7	0	0.7
1-Jan-16	13:30	0.04	0	0.04	0.7	0	0.7
1-Jan-16	13:35	0.03	0	0.03	0.6	0	0.6
1-Jan-16	13:40	0.03	0	0.03	0.5	0	0.5
1-Jan-16	13:45	0.03	0	0.03	0.5	0	0.5
1-Jan-16	13:50	0.03	0	0.03	0.5	0	0.5
1-Jan-16	13:55	0.03	0	0.03	0.5	0	0.5
1-Jan-16	14:00	0.03	0	0.03	0.5	0	0.5
1-Jan-16	14:05	0.03	0	0.03	0.5	0	0.5
1-Jan-16	14:10	0.03	0	0.03	0.5	0	0.5
1-Jan-16	14:15	0.03	0	0.03	0.6	0	0.6
1-Jan-16	14:20	0.03	0	0.03	0.6	0	0.6
1-Jan-16	14:25	0.03	0	0.03	0.5	0	0.5
1-Jan-16	14:30	0.03	0	0.03	0.5	0	0.5
1-Jan-16	14:35	0.03	0	0.03	0.5	0	0.5
1-Jan-16	14:40	0.03	0	0.03	0.5	0	0.5
1-Jan-16	14:45	0.03	0	0.03	0.5	0	0.5
1-Jan-16	14:50	0.03	0	0.03	0.5	0	0.5
1-Jan-16	14:55	0.03	0	0.03	0.5	0	0.5
1-Jan-16	15:00	0.03	0	0.03	0.5	0	0.5
1-Jan-16	15:05	0.03	0	0.03	0.5	0	0.5
1-Jan-16	15:10	0.03	0	0.03	0.5	0	0.5
1-Jan-16	15:15	0.03	0	0.03	0.5	0	0.5
1-Jan-16	15:20	0.03	0	0.03	0.5	0	0.5
1-Jan-16	15:25	0.03	0	0.03	0.5	0	0.5
1-Jan-16	15:30	0.03	0	0.03	0.5	0	0.5
1-Jan-16	15:35	0.02	0	0.02	0.5	0	0.5
1-Jan-16	15:40	0.02	0	0.02	0.4	0	0.4
1-Jan-16	15:45	0.02	0	0.02	0.4	0	0.4
1-Jan-16	15:50	0.02	0	0.02	0.4	0	0.4
1-Jan-16	15:55	0.02	0	0.02	0.4	0	0.4
1-Jan-16	16:00	0.02	0	0.02	0.4	0	0.4
1-Jan-16	16:05	0	0	0	0.3	0	0.3
1-Jan-16	16:10	0	0	0	0.2	0	0.2
1-Jan-16	16:15	0	0	0	0.1	0	0.1
1-Jan-16	16:20	0	0	0	0.1	0	0.1
1-Jan-16	16:25	0	0	0	0.1	0	0.1
1-Jan-16	16:30	0	0	0	0.1	0	0.1
1-Jan-16	16:35	0	0	0	0.1	0	0.1
1-Jan-16	16:40	0	0	0	0.1	0	0.1
1-Jan-16	16:45	0	0	0	0.1	0	0.1
1-Jan-16	16:50	0	0	0	0.1	0	0.1
1-Jan-16	16:55	0	0	0	0.1	0	0.1
1-Jan-16	17:00	0	0	0	0.1	0	0.1
1-Jan-16	17:05	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:10	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:15	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:20	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:25	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:30	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:35	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:40	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:45	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:50	0	0	0	0.1	0	0.1
1-Jan-16	17:55	0	0	0	0.1	0	0.1
1-Jan-16	18:00	0	0	0	0.1	0	0.1
1-Jan-16	18:05	0	0	0	0.1	0	0.1
1-Jan-16	18:10	0	0	0	0.1	0	0.1
1-Jan-16	18:15	0	0	0	0.1	0	0.1
1-Jan-16	18:20	0	0	0	0.1	0	0.1
1-Jan-16	18:25	0	0	0	0.1	0	0.1
1-Jan-16	18:30	0	0	0	0.1	0	0.1
1-Jan-16	18:35	0	0	0	0.1	0	0.1
1-Jan-16	18:40	0	0	0	0.1	0	0.1
1-Jan-16	18:45	0	0	0	0.1	0	0.1
1-Jan-16	18:50	0	0	0	0.1	0	0.1
1-Jan-16	18:55	0	0	0	0	0	0
1-Jan-16	19:00	0	0	0	0	0	0
1-Jan-16	19:05	0	0	0	0	0	0
1-Jan-16	19:10	0	0	0	0.1	0	0.1
1-Jan-16	19:15	0	0	0	0.1	0	0.1
1-Jan-16	19:20	0	0	0	0.1	0	0.1
1-Jan-16	19:25	0	0	0	0.1	0	0.1

1-Jan-16	19:30	0	0	0	0.1	0	0.1
1-Jan-16	19:35	0	0	0	0.1	0	0.1
1-Jan-16	19:40	0	0	0	0.1	0	0.1
1-Jan-16	19:45	0	0	0	0.1	0	0.1
1-Jan-16	19:50	0	0	0	0.1	0	0.1
1-Jan-16	19:55	0	0	0	0	0	0
1-Jan-16	20:00	0	0	0	0	0	0
1-Jan-16	20:05	0	0	0	0	0	0
1-Jan-16	20:10	0	0	0	0.1	0	0.1
1-Jan-16	20:15	0	0	0	0.1	0	0.1
1-Jan-16	20:20	0	0	0	0.1	0	0.1
1-Jan-16	20:25	0	0	0	0.1	0	0.1
1-Jan-16	20:30	0	0	0	0.1	0	0.1
1-Jan-16	20:35	0	0	0	0.1	0	0.1
1-Jan-16	20:40	0	0	0	0.1	0	0.1
1-Jan-16	20:45	0	0	0	0.1	0	0.1
1-Jan-16	20:50	0	0	0	0.1	0	0.1
1-Jan-16	20:55	0	0	0	0	0	0
1-Jan-16	21:00	0	0	0	0	0	0
1-Jan-16	21:05	0	0	0	0	0	0
1-Jan-16	21:10	0	0	0	0.1	0	0.1
1-Jan-16	21:15	0	0	0	0.1	0	0.1
1-Jan-16	21:20	0	0	0	0.1	0	0.1
1-Jan-16	21:25	0	0	0	0	0	0
1-Jan-16	21:30	0	0	0	0	0	0
1-Jan-16	21:35	0	0	0	0	0	0
1-Jan-16	21:40	0	0	0	0.1	0	0.1
1-Jan-16	21:45	0	0	0	0.1	0	0.1
1-Jan-16	21:50	0	0	0	0.1	0	0.1
1-Jan-16	21:55	0	0	0	0	0	0
1-Jan-16	22:00	0	0	0	0	0	0
1-Jan-16	22:05	0	0	0	0	0	0
1-Jan-16	22:10	0	0	0	0.1	0	0.1
1-Jan-16	22:15	0	0	0	0.1	0	0.1
1-Jan-16	22:20	0	0	0	0.1	0	0.1
1-Jan-16	22:25	0	0	0	0	0	0
1-Jan-16	22:30	0	0	0	0	0	0
1-Jan-16	22:35	0	0	0	0	0	0
1-Jan-16	22:40	0	0	0	0	0	0
1-Jan-16	22:45	0	0	0	0	0	0
1-Jan-16	22:50	0	0	0	0	0	0
1-Jan-16	22:55	0	0	0	0	0	0
1-Jan-16	23:00	0	0	0	0	0	0
1-Jan-16	23:05	0	0	0	0	0	0
1-Jan-16	23:10	0	0	0	0	0	0
1-Jan-16	23:15	0	0	0	0	0	0
1-Jan-16	23:20	0	0	0	0	0	0
1-Jan-16	23:25	0	0	0	0	0	0
1-Jan-16	23:30	0	0	0	0	0	0
1-Jan-16	23:35	0	0	0	0	0	0
1-Jan-16	23:40	0	0	0	0	0	0
1-Jan-16	23:45	0	0	0	0	0	0
1-Jan-16	23:50	0	0	0	0	0	0
1-Jan-16	23:55	0	0	0	0	0	0
2-Jan-16	0:00	0	0	0	0	0	0

Developed Site Storm Calculations

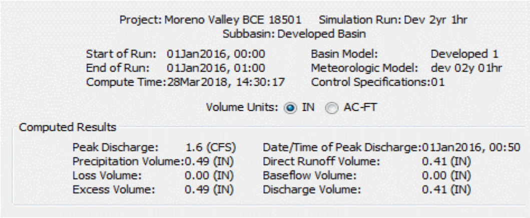
Calculations Per HEC-HMS 4.2.1:

Inputs from HEC-HMS Preprocessor (RCFC&WCD)

Hyd ID	Precipitation (inches)
2 yr 1 hr	0.493
2 yr 3 hr	0.869
2 yr 6 hr	1.22
2 yr 24 hr	2.05
5 yr 1 hr	0.673
5 yr 3 hr	1.14
5 yr 6 hr	1.58
5 yr 24 hr	2.77
10 yr 1 hr	0.822
10 yr 3 hr	1.35
10 yr 6 hr	1.87
10 yr 24 hr	3.34

Point Precipitation Frequency Estimates

Per NOAA Atlas 14, Volume 6, Version 2



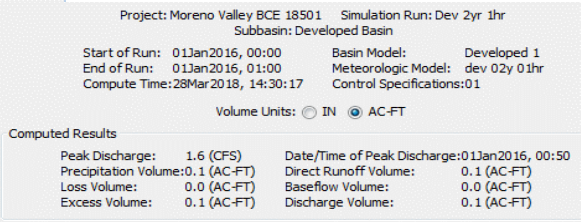
Project: Moreno Valley BCE 18501 Simulation Run: Dev 2yr 1hr
Subbasin: Developed Basin

Start of Run: 01Jan2016, 00:00
End of Run: 01Jan2016, 01:00
Compute Time: 28Mar2018, 14:30:17
Basin Model: Developed 1
Meteorologic Model: dev 02y 01hr
Control Specifications: 01

Volume Units: ● IN ○ AC-FT

Computed Results

Peak Discharge: 1.6 (CFS)
Precipitation Volume: 0.49 (IN)
Loss Volume: 0.00 (IN)
Excess Volume: 0.49 (IN)
Date/Time of Peak Discharge: 01Jan2016, 00:50
Direct Runoff Volume: 0.41 (IN)
Baseflow Volume: 0.00 (IN)
Discharge Volume: 0.41 (IN)



Project: Moreno Valley BCE 18501 Simulation Run: Dev 2yr 1hr
Subbasin: Developed Basin

Start of Run: 01Jan2016, 00:00
End of Run: 01Jan2016, 01:00
Compute Time: 28Mar2018, 14:30:17
Basin Model: Developed 1
Meteorologic Model: dev 02y 01hr
Control Specifications: 01

Volume Units: ○ IN ● AC-FT

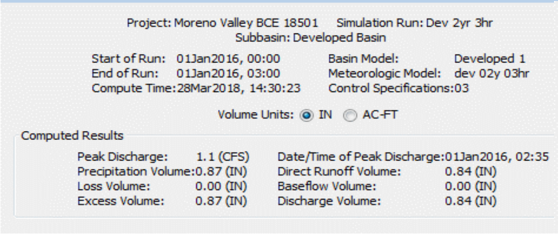
Computed Results

Peak Discharge: 1.6 (CFS)
Precipitation Volume: 0.1 (AC-FT)
Loss Volume: 0.0 (AC-FT)
Excess Volume: 0.1 (AC-FT)
Date/Time of Peak Discharge: 01Jan2016, 00:50
Direct Runoff Volume: 0.1 (AC-FT)
Baseflow Volume: 0.0 (AC-FT)
Discharge Volume: 0.1 (AC-FT)

2-year 1-hour storm for Developed Site:

Date	Time	Precip (IN)	Loss (IN)	Excess (IN)	Direct Flow (CFS)	Baseflow (CFS)	Total Flow (CFS)
1-Jan-16	0:00				0	0	0
1-Jan-16	0:05	0.02	0	0.02	0.2	0	0.2
1-Jan-16	0:10	0.02	0	0.02	0.3	0	0.3
1-Jan-16	0:15	0.03	0	0.03	0.4	0	0.4
1-Jan-16	0:20	0.03	0	0.03	0.4	0	0.4
1-Jan-16	0:25	0.03	0	0.03	0.5	0	0.5
1-Jan-16	0:30	0.03	0	0.03	0.5	0	0.5
1-Jan-16	0:35	0.04	0	0.04	0.6	0	0.6
1-Jan-16	0:40	0.04	0	0.04	0.7	0	0.7
1-Jan-16	0:45	0.06	0	0.06	0.9	0	0.9
1-Jan-16	0:50	0.14	0	0.14	1.6	0	1.6
1-Jan-16	0:55	0.04	0	0.04	1.4	0	1.4
1-Jan-16	1:00	0.02	0	0.02	0.8	0	0.8

2-year 3-hour storm for Developed Site:



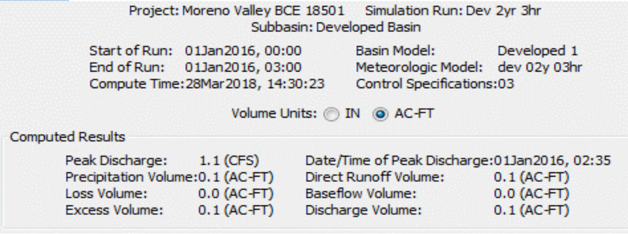
Project: Moreno Valley BCE 18501 Simulation Run: Dev 2yr 3hr
Subbasin: Developed Basin

Start of Run: 01Jan2016, 00:00
End of Run: 01Jan2016, 03:00
Compute Time: 28Mar2018, 14:30:23
Basin Model: Developed 1
Meteorologic Model: dev 02y 03hr
Control Specifications: 03

Volume Units: ● IN ○ AC-FT

Computed Results

Peak Discharge: 1.1 (CFS)
Precipitation Volume: 0.87 (IN)
Loss Volume: 0.00 (IN)
Excess Volume: 0.87 (IN)
Date/Time of Peak Discharge: 01Jan2016, 02:35
Direct Runoff Volume: 0.84 (IN)
Baseflow Volume: 0.00 (IN)
Discharge Volume: 0.84 (IN)



Project: Moreno Valley BCE 18501 Simulation Run: Dev 2yr 3hr
Subbasin: Developed Basin

Start of Run: 01Jan2016, 00:00
End of Run: 01Jan2016, 03:00
Compute Time: 28Mar2018, 14:30:23
Basin Model: Developed 1
Meteorologic Model: dev 02y 03hr
Control Specifications: 03

Volume Units: ○ IN ● AC-FT

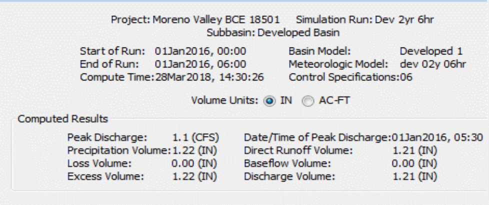
Computed Results

Peak Discharge: 1.1 (CFS)
Precipitation Volume: 0.1 (AC-FT)
Loss Volume: 0.0 (AC-FT)
Excess Volume: 0.1 (AC-FT)
Date/Time of Peak Discharge: 01Jan2016, 02:35
Direct Runoff Volume: 0.1 (AC-FT)
Baseflow Volume: 0.0 (AC-FT)
Discharge Volume: 0.1 (AC-FT)

Date	Time	Precip (IN)	Loss (IN)	Excess (IN)	Direct Flow (CFS)	Baseflow (CFS)	Total Flow (CFS)
1-Jan-16	0:00				0	0	0
1-Jan-16	0:05	0.01	0	0.01	0.1	0	0.1
1-Jan-16	0:10	0.01	0	0.01	0.1	0	0.1
1-Jan-16	0:15	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:20	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:25	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:30	0.02	0	0.02	0.3	0	0.3
1-Jan-16	0:35	0.01	0	0.01	0.3	0	0.3

1-Jan-16	0:40	0.02	0	0.02	0.3	0	0.3
1-Jan-16	0:45	0.02	0	0.02	0.3	0	0.3
1-Jan-16	0:50	0.01	0	0.01	0.3	0	0.3
1-Jan-16	0:55	0.01	0	0.01	0.3	0	0.3
1-Jan-16	1:00	0.02	0	0.02	0.3	0	0.3
1-Jan-16	1:05	0.02	0	0.02	0.3	0	0.3
1-Jan-16	1:10	0.02	0	0.02	0.3	0	0.3
1-Jan-16	1:15	0.02	0	0.02	0.3	0	0.3
1-Jan-16	1:20	0.02	0	0.02	0.3	0	0.3
1-Jan-16	1:25	0.02	0	0.02	0.4	0	0.4
1-Jan-16	1:30	0.02	0	0.02	0.4	0	0.4
1-Jan-16	1:35	0.02	0	0.02	0.4	0	0.4
1-Jan-16	1:40	0.02	0	0.02	0.4	0	0.4
1-Jan-16	1:45	0.03	0	0.03	0.5	0	0.5
1-Jan-16	1:50	0.03	0	0.03	0.5	0	0.5
1-Jan-16	1:55	0.03	0	0.03	0.5	0	0.5
1-Jan-16	2:00	0.03	0	0.03	0.5	0	0.5
1-Jan-16	2:05	0.03	0	0.03	0.5	0	0.5
1-Jan-16	2:10	0.04	0	0.04	0.6	0	0.6
1-Jan-16	2:15	0.04	0	0.04	0.7	0	0.7
1-Jan-16	2:20	0.03	0	0.03	0.6	0	0.6
1-Jan-16	2:25	0.06	0	0.06	0.8	0	0.8
1-Jan-16	2:30	0.06	0	0.06	1	0	1
1-Jan-16	2:35	0.07	0	0.07	1.1	0	1.1
1-Jan-16	2:40	0.05	0	0.05	1.1	0	1.1
1-Jan-16	2:45	0.02	0	0.02	0.8	0	0.8
1-Jan-16	2:50	0.02	0	0.02	0.5	0	0.5
1-Jan-16	2:55	0.02	0	0.02	0.4	0	0.4
1-Jan-16	3:00	0.01	0	0.01	0.3	0	0.3

2-year 6-hour storm for Developed Site:



Project: Moreno Valley BCE 18501 Simulation Run: Dev 2yr 6hr
Subbasin: Developed Basin

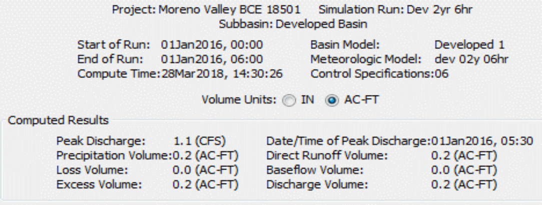
Start of Run: 01Jan2016, 00:00
End of Run: 01Jan2016, 06:00
Compute Time: 28Mar2018, 14:30:26

Basin Model: Developed 1
Meteorologic Model: dev 02y 06hr
Control Specifications: 06

Volume Units: ● IN ○ AC-FT

Computed Results

Peak Discharge: 1.1 (CFS)
Precipitation Volume: 1.22 (IN)
Loss Volume: 0.00 (IN)
Excess Volume: 1.22 (IN)
Date/Time of Peak Discharge: 01Jan2016, 05:30
Direct Runoff Volume: 1.21 (IN)
Baseflow Volume: 0.00 (IN)
Discharge Volume: 1.21 (IN)



Project: Moreno Valley BCE 18501 Simulation Run: Dev 2yr 6hr
Subbasin: Developed Basin

Start of Run: 01Jan2016, 00:00
End of Run: 01Jan2016, 06:00
Compute Time: 28Mar2018, 14:30:26

Basin Model: Developed 1
Meteorologic Model: dev 02y 06hr
Control Specifications: 06

Volume Units: ○ IN ● AC-FT

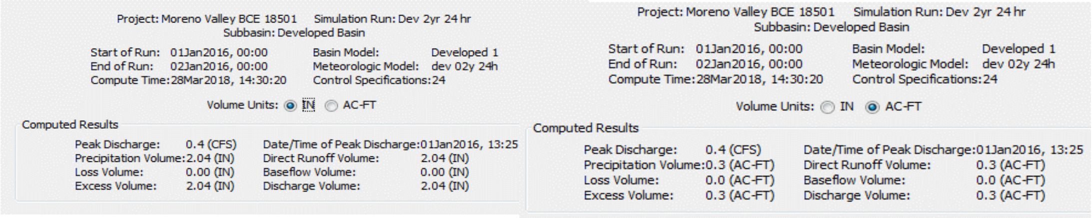
Computed Results

Peak Discharge: 1.1 (CFS)
Precipitation Volume: 0.2 (AC-FT)
Loss Volume: 0.0 (AC-FT)
Excess Volume: 0.2 (AC-FT)
Date/Time of Peak Discharge: 01Jan2016, 05:30
Direct Runoff Volume: 0.2 (AC-FT)
Baseflow Volume: 0.0 (AC-FT)
Discharge Volume: 0.2 (AC-FT)

Date	Time	Precip (IN)	Loss (IN)	Excess (IN)	Direct Flow (CFS)	Baseflow (CFS)	Total Flow (CFS)
1-Jan-16	0:00				0	0	0
1-Jan-16	0:05	0.01	0	0.01	0	0	0
1-Jan-16	0:10	0.01	0	0.01	0.1	0	0.1
1-Jan-16	0:15	0.01	0	0.01	0.1	0	0.1
1-Jan-16	0:20	0.01	0	0.01	0.1	0	0.1
1-Jan-16	0:25	0.01	0	0.01	0.1	0	0.1
1-Jan-16	0:30	0.01	0	0.01	0.1	0	0.1
1-Jan-16	0:35	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:40	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:45	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:00	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:05	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:10	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:15	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:20	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:25	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:30	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:35	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:40	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:45	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	2:00	0.01	0	0.01	0.2	0	0.2
1-Jan-16	2:05	0.01	0	0.01	0.2	0	0.2
1-Jan-16	2:10	0.01	0	0.01	0.2	0	0.2
1-Jan-16	2:15	0.01	0	0.01	0.2	0	0.2
1-Jan-16	2:20	0.01	0	0.01	0.2	0	0.2
1-Jan-16	2:25	0.01	0	0.01	0.2	0	0.2
1-Jan-16	2:30	0.01	0	0.01	0.2	0	0.2
1-Jan-16	2:35	0.01	0	0.01	0.2	0	0.2
1-Jan-16	2:40	0.01	0	0.01	0.2	0	0.2
1-Jan-16	2:45	0.01	0	0.01	0.2	0	0.2
1-Jan-16	2:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	2:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	3:00	0.01	0	0.01	0.2	0	0.2
1-Jan-16	3:05	0.01	0	0.01	0.2	0	0.2
1-Jan-16	3:10	0.01	0	0.01	0.2	0	0.2
1-Jan-16	3:15	0.01	0	0.01	0.2	0	0.2
1-Jan-16	3:20	0.01	0	0.01	0.2	0	0.2
1-Jan-16	3:25	0.01	0	0.01	0.3	0	0.3
1-Jan-16	3:30	0.02	0	0.02	0.3	0	0.3
1-Jan-16	3:35	0.02	0	0.02	0.3	0	0.3
1-Jan-16	3:40	0.02	0	0.02	0.3	0	0.3
1-Jan-16	3:45	0.02	0	0.02	0.3	0	0.3
1-Jan-16	3:50	0.02	0	0.02	0.3	0	0.3
1-Jan-16	3:55	0.02	0	0.02	0.3	0	0.3
1-Jan-16	4:00	0.02	0	0.02	0.4	0	0.4
1-Jan-16	4:05	0.02	0	0.02	0.4	0	0.4

1-Jan-16	4:10	0.02	0	0.02	0.4	0	0.4
1-Jan-16	4:15	0.02	0	0.02	0.4	0	0.4
1-Jan-16	4:20	0.02	0	0.02	0.4	0	0.4
1-Jan-16	4:25	0.03	0	0.03	0.5	0	0.5
1-Jan-16	4:30	0.03	0	0.03	0.5	0	0.5
1-Jan-16	4:35	0.03	0	0.03	0.5	0	0.5
1-Jan-16	4:40	0.03	0	0.03	0.5	0	0.5
1-Jan-16	4:45	0.03	0	0.03	0.5	0	0.5
1-Jan-16	4:50	0.03	0	0.03	0.5	0	0.5
1-Jan-16	4:55	0.03	0	0.03	0.5	0	0.5
1-Jan-16	5:00	0.03	0	0.03	0.6	0	0.6
1-Jan-16	5:05	0.04	0	0.04	0.6	0	0.6
1-Jan-16	5:10	0.04	0	0.04	0.7	0	0.7
1-Jan-16	5:15	0.05	0	0.05	0.8	0	0.8
1-Jan-16	5:20	0.05	0	0.05	0.9	0	0.9
1-Jan-16	5:25	0.06	0	0.06	1	0	1
1-Jan-16	5:30	0.07	0	0.07	1.1	0	1.1
1-Jan-16	5:35	0.02	0	0.02	0.9	0	0.9
1-Jan-16	5:40	0.01	0	0.01	0.5	0	0.5
1-Jan-16	5:45	0.01	0	0.01	0.3	0	0.3
1-Jan-16	5:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	5:55	0	0	0	0.2	0	0.2
1-Jan-16	6:00	0	0	0	0.1	0	0.1

2-year 24-hour storm for Developed Site:



Project: Moreno Valley BCE 18501 Simulation Run: Dev 2yr 24 hr
Subbasin: Developed Basin

Start of Run: 01Jan2016, 00:00
End of Run: 02Jan2016, 00:00
Compute Time: 28Mar2018, 14:30:20
Basin Model: Developed 1
Meteorologic Model: dev 02y 24h
Control Specifications: 24

Volume Units: ● IN ○ AC-FT

Computed Results

Peak Discharge: 0.4 (CFS)
Precipitation Volume: 2.04 (IN)
Loss Volume: 0.00 (IN)
Excess Volume: 2.04 (IN)
Date/Time of Peak Discharge: 01Jan2016, 13:25
Direct Runoff Volume: 2.04 (IN)
Baseflow Volume: 0.00 (IN)
Discharge Volume: 2.04 (IN)

Project: Moreno Valley BCE 18501 Simulation Run: Dev 2yr 24 hr
Subbasin: Developed Basin

Start of Run: 01Jan2016, 00:00
End of Run: 02Jan2016, 00:00
Compute Time: 28Mar2018, 14:30:20
Basin Model: Developed 1
Meteorologic Model: dev 02y 24h
Control Specifications: 24

Volume Units: ○ IN ● AC-FT

Computed Results

Peak Discharge: 0.4 (CFS)
Precipitation Volume: 0.3 (AC-FT)
Loss Volume: 0.0 (AC-FT)
Excess Volume: 0.3 (AC-FT)
Date/Time of Peak Discharge: 01Jan2016, 13:25
Direct Runoff Volume: 0.3 (AC-FT)
Baseflow Volume: 0.0 (AC-FT)
Discharge Volume: 0.3 (AC-FT)

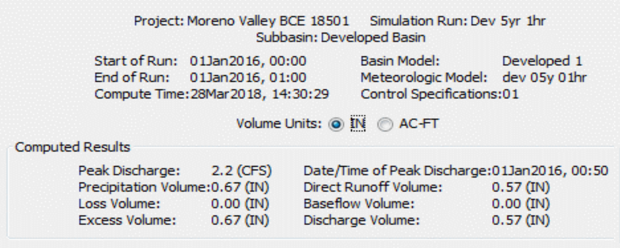
Date	Time	Precip (IN)	Loss (IN)	Excess (IN)	Direct Flow (CFS)	Baseflow (CFS)	Total Flow (CFS)
1-Jan-16	0:00				0	0	0
1-Jan-16	0:05	0	0	0	0	0	0
1-Jan-16	0:10	0	0	0	0	0	0
1-Jan-16	0:15	0	0	0	0	0	0
1-Jan-16	0:20	0	0	0	0	0	0
1-Jan-16	0:25	0	0	0	0	0	0
1-Jan-16	0:30	0	0	0	0	0	0
1-Jan-16	0:35	0	0	0	0	0	0
1-Jan-16	0:40	0	0	0	0	0	0
1-Jan-16	0:45	0	0	0	0	0	0
1-Jan-16	0:50	0	0	0	0.1	0	0.1
1-Jan-16	0:55	0	0	0	0.1	0	0.1
1-Jan-16	1:00	0	0	0	0	0	0
1-Jan-16	1:05	0	0	0	0	0	0
1-Jan-16	1:10	0	0	0	0	0	0
1-Jan-16	1:15	0	0	0	0	0	0
1-Jan-16	1:20	0	0	0	0	0	0
1-Jan-16	1:25	0	0	0	0	0	0
1-Jan-16	1:30	0	0	0	0	0	0
1-Jan-16	1:35	0	0	0	0	0	0
1-Jan-16	1:40	0	0	0	0	0	0
1-Jan-16	1:45	0	0	0	0	0	0
1-Jan-16	1:50	0	0	0	0.1	0	0.1
1-Jan-16	1:55	0	0	0	0.1	0	0.1
1-Jan-16	2:00	0	0	0	0.1	0	0.1
1-Jan-16	2:05	0	0	0	0.1	0	0.1
1-Jan-16	2:10	0	0	0	0.1	0	0.1
1-Jan-16	2:15	0	0	0	0.1	0	0.1
1-Jan-16	2:20	0	0	0	0.1	0	0.1
1-Jan-16	2:25	0	0	0	0.1	0	0.1
1-Jan-16	2:30	0	0	0	0.1	0	0.1
1-Jan-16	2:35	0	0	0	0.1	0	0.1
1-Jan-16	2:40	0	0	0	0.1	0	0.1
1-Jan-16	2:45	0	0	0	0.1	0	0.1
1-Jan-16	2:50	0	0	0	0.1	0	0.1
1-Jan-16	2:55	0	0	0	0.1	0	0.1
1-Jan-16	3:00	0	0	0	0.1	0	0.1
1-Jan-16	3:05	0	0	0	0.1	0	0.1
1-Jan-16	3:10	0	0	0	0.1	0	0.1
1-Jan-16	3:15	0	0	0	0.1	0	0.1
1-Jan-16	3:20	0	0	0	0.1	0	0.1
1-Jan-16	3:25	0	0	0	0.1	0	0.1
1-Jan-16	3:30	0	0	0	0.1	0	0.1
1-Jan-16	3:35	0	0	0	0.1	0	0.1
1-Jan-16	3:40	0	0	0	0.1	0	0.1
1-Jan-16	3:45	0	0	0	0.1	0	0.1
1-Jan-16	3:50	0	0	0	0.1	0	0.1
1-Jan-16	3:55	0	0	0	0.1	0	0.1
1-Jan-16	4:00	0	0	0	0.1	0	0.1
1-Jan-16	4:05	0	0	0	0.1	0	0.1
1-Jan-16	4:10	0	0	0	0.1	0	0.1
1-Jan-16	4:15	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:20	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:25	0.01	0	0.01	0.1	0	0.1

1-Jan-16	4:30	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:35	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:40	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:45	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:50	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:55	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:00	0	0	0	0.1	0	0.1
1-Jan-16	5:05	0	0	0	0.1	0	0.1
1-Jan-16	5:10	0	0	0	0.1	0	0.1
1-Jan-16	5:15	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:20	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:25	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:30	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:35	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:40	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:45	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:50	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:55	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:00	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:05	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:10	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:15	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:20	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:25	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:30	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:35	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:40	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:45	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:50	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:55	0.01	0	0.01	0.1	0	0.1
1-Jan-16	7:00	0.01	0	0.01	0.1	0	0.1
1-Jan-16	7:05	0.01	0	0.01	0.1	0	0.1
1-Jan-16	7:10	0.01	0	0.01	0.1	0	0.1
1-Jan-16	7:15	0.01	0	0.01	0.1	0	0.1
1-Jan-16	7:20	0.01	0	0.01	0.1	0	0.1
1-Jan-16	7:25	0.01	0	0.01	0.1	0	0.1
1-Jan-16	7:30	0.01	0	0.01	0.1	0	0.1
1-Jan-16	7:35	0.01	0	0.01	0.1	0	0.1
1-Jan-16	7:40	0.01	0	0.01	0.1	0	0.1
1-Jan-16	7:45	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	8:00	0.01	0	0.01	0.2	0	0.2
1-Jan-16	8:05	0.01	0	0.01	0.2	0	0.2
1-Jan-16	8:10	0.01	0	0.01	0.2	0	0.2
1-Jan-16	8:15	0.01	0	0.01	0.2	0	0.2
1-Jan-16	8:20	0.01	0	0.01	0.2	0	0.2
1-Jan-16	8:25	0.01	0	0.01	0.2	0	0.2
1-Jan-16	8:30	0.01	0	0.01	0.2	0	0.2
1-Jan-16	8:35	0.01	0	0.01	0.2	0	0.2
1-Jan-16	8:40	0.01	0	0.01	0.2	0	0.2
1-Jan-16	8:45	0.01	0	0.01	0.2	0	0.2
1-Jan-16	8:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	8:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	9:00	0.01	0	0.01	0.2	0	0.2
1-Jan-16	9:05	0.01	0	0.01	0.2	0	0.2
1-Jan-16	9:10	0.01	0	0.01	0.2	0	0.2
1-Jan-16	9:15	0.01	0	0.01	0.2	0	0.2
1-Jan-16	9:20	0.01	0	0.01	0.3	0	0.3
1-Jan-16	9:25	0.01	0	0.01	0.3	0	0.3
1-Jan-16	9:30	0.01	0	0.01	0.3	0	0.3
1-Jan-16	9:35	0.01	0	0.01	0.3	0	0.3
1-Jan-16	9:40	0.01	0	0.01	0.3	0	0.3
1-Jan-16	9:45	0.01	0	0.01	0.3	0	0.3
1-Jan-16	9:50	0.01	0	0.01	0.3	0	0.3
1-Jan-16	9:55	0.01	0	0.01	0.3	0	0.3
1-Jan-16	10:00	0.01	0	0.01	0.2	0	0.2
1-Jan-16	10:05	0.01	0	0.01	0.2	0	0.2
1-Jan-16	10:10	0.01	0	0.01	0.2	0	0.2
1-Jan-16	10:15	0.01	0	0.01	0.2	0	0.2
1-Jan-16	10:20	0.01	0	0.01	0.2	0	0.2
1-Jan-16	10:25	0.01	0	0.01	0.2	0	0.2
1-Jan-16	10:30	0.01	0	0.01	0.2	0	0.2
1-Jan-16	10:35	0.01	0	0.01	0.2	0	0.2
1-Jan-16	10:40	0.01	0	0.01	0.3	0	0.3
1-Jan-16	10:45	0.01	0	0.01	0.3	0	0.3
1-Jan-16	10:50	0.01	0	0.01	0.3	0	0.3
1-Jan-16	10:55	0.01	0	0.01	0.3	0	0.3
1-Jan-16	11:00	0.01	0	0.01	0.3	0	0.3
1-Jan-16	11:05	0.01	0	0.01	0.2	0	0.2
1-Jan-16	11:10	0.01	0	0.01	0.2	0	0.2
1-Jan-16	11:15	0.01	0	0.01	0.2	0	0.2
1-Jan-16	11:20	0.01	0	0.01	0.2	0	0.2
1-Jan-16	11:25	0.01	0	0.01	0.2	0	0.2
1-Jan-16	11:30	0.01	0	0.01	0.2	0	0.2
1-Jan-16	11:35	0.01	0	0.01	0.2	0	0.2
1-Jan-16	11:40	0.01	0	0.01	0.2	0	0.2
1-Jan-16	11:45	0.01	0	0.01	0.2	0	0.2
1-Jan-16	11:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	11:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	12:00	0.02	0	0.02	0.3	0	0.3
1-Jan-16	12:05	0.02	0	0.02	0.3	0	0.3
1-Jan-16	12:10	0.02	0	0.02	0.3	0	0.3
1-Jan-16	12:15	0.02	0	0.02	0.3	0	0.3
1-Jan-16	12:20	0.02	0	0.02	0.3	0	0.3
1-Jan-16	12:25	0.02	0	0.02	0.3	0	0.3

1-Jan-16	12:30	0.02	0	0.02	0.3	0	0.3
1-Jan-16	12:35	0.02	0	0.02	0.3	0	0.3
1-Jan-16	12:40	0.02	0	0.02	0.4	0	0.4
1-Jan-16	12:45	0.02	0	0.02	0.4	0	0.4
1-Jan-16	12:50	0.02	0	0.02	0.4	0	0.4
1-Jan-16	12:55	0.02	0	0.02	0.4	0	0.4
1-Jan-16	13:00	0.02	0	0.02	0.4	0	0.4
1-Jan-16	13:05	0.02	0	0.02	0.4	0	0.4
1-Jan-16	13:10	0.02	0	0.02	0.4	0	0.4
1-Jan-16	13:15	0.02	0	0.02	0.4	0	0.4
1-Jan-16	13:20	0.02	0	0.02	0.4	0	0.4
1-Jan-16	13:25	0.02	0	0.02	0.4	0	0.4
1-Jan-16	13:30	0.02	0	0.02	0.4	0	0.4
1-Jan-16	13:35	0.02	0	0.02	0.3	0	0.3
1-Jan-16	13:40	0.02	0	0.02	0.3	0	0.3
1-Jan-16	13:45	0.02	0	0.02	0.3	0	0.3
1-Jan-16	13:50	0.02	0	0.02	0.3	0	0.3
1-Jan-16	13:55	0.02	0	0.02	0.3	0	0.3
1-Jan-16	14:00	0.02	0	0.02	0.3	0	0.3
1-Jan-16	14:05	0.02	0	0.02	0.3	0	0.3
1-Jan-16	14:10	0.02	0	0.02	0.3	0	0.3
1-Jan-16	14:15	0.02	0	0.02	0.3	0	0.3
1-Jan-16	14:20	0.02	0	0.02	0.3	0	0.3
1-Jan-16	14:25	0.02	0	0.02	0.3	0	0.3
1-Jan-16	14:30	0.02	0	0.02	0.3	0	0.3
1-Jan-16	14:35	0.02	0	0.02	0.3	0	0.3
1-Jan-16	14:40	0.02	0	0.02	0.3	0	0.3
1-Jan-16	14:45	0.02	0	0.02	0.3	0	0.3
1-Jan-16	14:50	0.02	0	0.02	0.3	0	0.3
1-Jan-16	14:55	0.02	0	0.02	0.3	0	0.3
1-Jan-16	15:00	0.02	0	0.02	0.3	0	0.3
1-Jan-16	15:05	0.02	0	0.02	0.3	0	0.3
1-Jan-16	15:10	0.02	0	0.02	0.3	0	0.3
1-Jan-16	15:15	0.02	0	0.02	0.3	0	0.3
1-Jan-16	15:20	0.02	0	0.02	0.3	0	0.3
1-Jan-16	15:25	0.02	0	0.02	0.3	0	0.3
1-Jan-16	15:30	0.01	0	0.01	0.3	0	0.3
1-Jan-16	15:35	0.01	0	0.01	0.3	0	0.3
1-Jan-16	15:40	0.01	0	0.01	0.3	0	0.3
1-Jan-16	15:45	0.01	0	0.01	0.2	0	0.2
1-Jan-16	15:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	15:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	16:00	0	0	0	0.2	0	0.2
1-Jan-16	16:05	0	0	0	0.1	0	0.1
1-Jan-16	16:10	0	0	0	0.1	0	0.1
1-Jan-16	16:15	0	0	0	0.1	0	0.1
1-Jan-16	16:20	0	0	0	0.1	0	0.1
1-Jan-16	16:25	0	0	0	0.1	0	0.1
1-Jan-16	16:30	0	0	0	0.1	0	0.1
1-Jan-16	16:35	0	0	0	0	0	0
1-Jan-16	16:40	0	0	0	0	0	0
1-Jan-16	16:45	0	0	0	0	0	0
1-Jan-16	16:50	0	0	0	0	0	0
1-Jan-16	16:55	0	0	0	0	0	0
1-Jan-16	17:00	0	0	0	0	0	0
1-Jan-16	17:05	0	0	0	0.1	0	0.1
1-Jan-16	17:10	0	0	0	0.1	0	0.1
1-Jan-16	17:15	0	0	0	0.1	0	0.1
1-Jan-16	17:20	0	0	0	0.1	0	0.1
1-Jan-16	17:25	0	0	0	0.1	0	0.1
1-Jan-16	17:30	0	0	0	0.1	0	0.1
1-Jan-16	17:35	0	0	0	0.1	0	0.1
1-Jan-16	17:40	0	0	0	0.1	0	0.1
1-Jan-16	17:45	0	0	0	0.1	0	0.1
1-Jan-16	17:50	0	0	0	0.1	0	0.1
1-Jan-16	17:55	0	0	0	0.1	0	0.1
1-Jan-16	18:00	0	0	0	0.1	0	0.1
1-Jan-16	18:05	0	0	0	0.1	0	0.1
1-Jan-16	18:10	0	0	0	0.1	0	0.1
1-Jan-16	18:15	0	0	0	0.1	0	0.1
1-Jan-16	18:20	0	0	0	0.1	0	0.1
1-Jan-16	18:25	0	0	0	0.1	0	0.1
1-Jan-16	18:30	0	0	0	0	0	0
1-Jan-16	18:35	0	0	0	0	0	0
1-Jan-16	18:40	0	0	0	0	0	0
1-Jan-16	18:45	0	0	0	0	0	0
1-Jan-16	18:50	0	0	0	0	0	0
1-Jan-16	18:55	0	0	0	0	0	0
1-Jan-16	19:00	0	0	0	0	0	0
1-Jan-16	19:05	0	0	0	0	0	0
1-Jan-16	19:10	0	0	0	0	0	0
1-Jan-16	19:15	0	0	0	0	0	0
1-Jan-16	19:20	0	0	0	0.1	0	0.1
1-Jan-16	19:25	0	0	0	0.1	0	0.1
1-Jan-16	19:30	0	0	0	0	0	0
1-Jan-16	19:35	0	0	0	0	0	0
1-Jan-16	19:40	0	0	0	0	0	0
1-Jan-16	19:45	0	0	0	0	0	0
1-Jan-16	19:50	0	0	0	0	0	0
1-Jan-16	19:55	0	0	0	0	0	0
1-Jan-16	20:00	0	0	0	0	0	0
1-Jan-16	20:05	0	0	0	0	0	0
1-Jan-16	20:10	0	0	0	0	0	0
1-Jan-16	20:15	0	0	0	0	0	0
1-Jan-16	20:20	0	0	0	0	0	0
1-Jan-16	20:25	0	0	0	0	0	0

1-Jan-16	20:30	0	0	0	0	0	0
1-Jan-16	20:35	0	0	0	0	0	0
1-Jan-16	20:40	0	0	0	0	0	0
1-Jan-16	20:45	0	0	0	0	0	0
1-Jan-16	20:50	0	0	0	0	0	0
1-Jan-16	20:55	0	0	0	0	0	0
1-Jan-16	21:00	0	0	0	0	0	0
1-Jan-16	21:05	0	0	0	0	0	0
1-Jan-16	21:10	0	0	0	0	0	0
1-Jan-16	21:15	0	0	0	0	0	0
1-Jan-16	21:20	0	0	0	0	0	0
1-Jan-16	21:25	0	0	0	0	0	0
1-Jan-16	21:30	0	0	0	0	0	0
1-Jan-16	21:35	0	0	0	0	0	0
1-Jan-16	21:40	0	0	0	0	0	0
1-Jan-16	21:45	0	0	0	0	0	0
1-Jan-16	21:50	0	0	0	0	0	0
1-Jan-16	21:55	0	0	0	0	0	0
1-Jan-16	22:00	0	0	0	0	0	0
1-Jan-16	22:05	0	0	0	0	0	0
1-Jan-16	22:10	0	0	0	0	0	0
1-Jan-16	22:15	0	0	0	0	0	0
1-Jan-16	22:20	0	0	0	0	0	0
1-Jan-16	22:25	0	0	0	0	0	0
1-Jan-16	22:30	0	0	0	0	0	0
1-Jan-16	22:35	0	0	0	0	0	0
1-Jan-16	22:40	0	0	0	0	0	0
1-Jan-16	22:45	0	0	0	0	0	0
1-Jan-16	22:50	0	0	0	0	0	0
1-Jan-16	22:55	0	0	0	0	0	0
1-Jan-16	23:00	0	0	0	0	0	0
1-Jan-16	23:05	0	0	0	0	0	0
1-Jan-16	23:10	0	0	0	0	0	0
1-Jan-16	23:15	0	0	0	0	0	0
1-Jan-16	23:20	0	0	0	0	0	0
1-Jan-16	23:25	0	0	0	0	0	0
1-Jan-16	23:30	0	0	0	0	0	0
1-Jan-16	23:35	0	0	0	0	0	0
1-Jan-16	23:40	0	0	0	0	0	0
1-Jan-16	23:45	0	0	0	0	0	0
1-Jan-16	23:50	0	0	0	0	0	0
1-Jan-16	23:55	0	0	0	0	0	0
2-Jan-16	0:00	0	0	0	0	0	0

5-year 1-hour storm for Developed Site:



Project: Moreno Valley BCE 18501 Simulation Run: Dev 5yr 1hr
Subbasin: Developed Basin

Start of Run: 01Jan2016, 00:00
End of Run: 01Jan2016, 01:00
Compute Time: 28Mar2018, 14:30:29

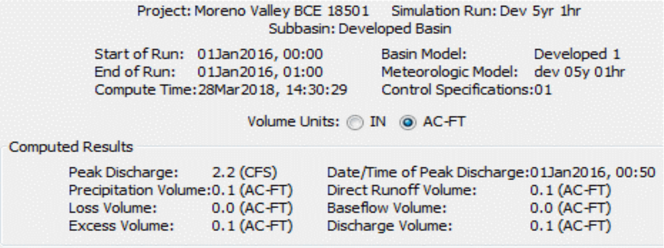
Basin Model: Developed 1
Meteorologic Model: dev 05y 01hr
Control Specifications: 01

Volume Units: ● IN ○ AC-FT

Computed Results

Peak Discharge: 2.2 (CFS)
Precipitation Volume: 0.67 (IN)
Loss Volume: 0.00 (IN)
Excess Volume: 0.67 (IN)

Date/Time of Peak Discharge: 01Jan2016, 00:50
Direct Runoff Volume: 0.57 (IN)
Baseflow Volume: 0.00 (IN)
Discharge Volume: 0.57 (IN)



Project: Moreno Valley BCE 18501 Simulation Run: Dev 5yr 1hr
Subbasin: Developed Basin

Start of Run: 01Jan2016, 00:00
End of Run: 01Jan2016, 01:00
Compute Time: 28Mar2018, 14:30:29

Basin Model: Developed 1
Meteorologic Model: dev 05y 01hr
Control Specifications: 01

Volume Units: ○ IN ● AC-FT

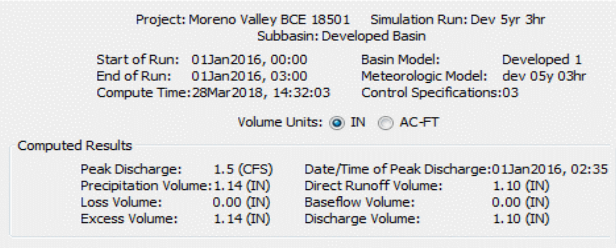
Computed Results

Peak Discharge: 2.2 (CFS)
Precipitation Volume: 0.1 (AC-FT)
Loss Volume: 0.0 (AC-FT)
Excess Volume: 0.1 (AC-FT)

Date/Time of Peak Discharge: 01Jan2016, 00:50
Direct Runoff Volume: 0.1 (AC-FT)
Baseflow Volume: 0.0 (AC-FT)
Discharge Volume: 0.1 (AC-FT)

Date	Time	Precip (IN)	Loss (IN)	Excess (IN)	Direct Flow (CFS)	Baseflow (CFS)	Total Flow (CFS)
1-Jan-16	0:00				0	0	0
1-Jan-16	0:05	0.03	0	0.03	0.2	0	0.2
1-Jan-16	0:10	0.03	0	0.03	0.4	0	0.4
1-Jan-16	0:15	0.03	0	0.03	0.5	0	0.5
1-Jan-16	0:20	0.03	0	0.03	0.5	0	0.5
1-Jan-16	0:25	0.04	0	0.04	0.6	0	0.6
1-Jan-16	0:30	0.04	0	0.04	0.7	0	0.7
1-Jan-16	0:35	0.05	0	0.05	0.8	0	0.8
1-Jan-16	0:40	0.06	0	0.06	1	0	1
1-Jan-16	0:45	0.08	0	0.08	1.2	0	1.2
1-Jan-16	0:50	0.19	0	0.19	2.2	0	2.2
1-Jan-16	0:55	0.05	0	0.05	1.9	0	1.9
1-Jan-16	1:00	0.03	0	0.03	1.1	0	1.1

5-year 3-hour storm for Developed Site:



Project: Moreno Valley BCE 18501 Simulation Run: Dev 5yr 3hr
Subbasin: Developed Basin

Start of Run: 01Jan2016, 00:00
End of Run: 01Jan2016, 03:00
Compute Time: 28Mar2018, 14:32:03

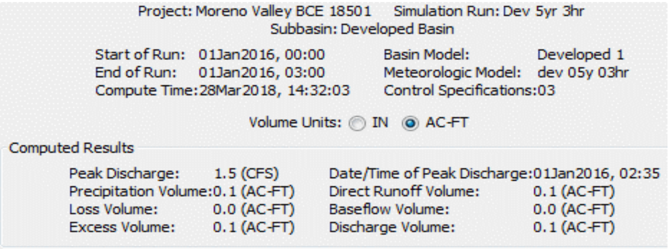
Basin Model: Developed 1
Meteorologic Model: dev 05y 03hr
Control Specifications: 03

Volume Units: ● IN ○ AC-FT

Computed Results

Peak Discharge: 1.5 (CFS)
Precipitation Volume: 1.14 (IN)
Loss Volume: 0.00 (IN)
Excess Volume: 1.14 (IN)

Date/Time of Peak Discharge: 01Jan2016, 02:35
Direct Runoff Volume: 1.10 (IN)
Baseflow Volume: 0.00 (IN)
Discharge Volume: 1.10 (IN)



Project: Moreno Valley BCE 18501 Simulation Run: Dev 5yr 3hr
Subbasin: Developed Basin

Start of Run: 01Jan2016, 00:00
End of Run: 01Jan2016, 03:00
Compute Time: 28Mar2018, 14:32:03

Basin Model: Developed 1
Meteorologic Model: dev 05y 03hr
Control Specifications: 03

Volume Units: ○ IN ● AC-FT

Computed Results

Peak Discharge: 1.5 (CFS)
Precipitation Volume: 0.1 (AC-FT)
Loss Volume: 0.0 (AC-FT)
Excess Volume: 0.1 (AC-FT)

Date/Time of Peak Discharge: 01Jan2016, 02:35
Direct Runoff Volume: 0.1 (AC-FT)
Baseflow Volume: 0.0 (AC-FT)
Discharge Volume: 0.1 (AC-FT)

Date	Time	Precip (IN)	Loss (IN)	Excess (IN)	Direct Flow (CFS)	Baseflow (CFS)	Total Flow (CFS)
1-Jan-16	0:00				0	0	0
1-Jan-16	0:05	0.01	0	0.01	0.1	0	0.1
1-Jan-16	0:10	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:15	0.01	0	0.01	0.2	0	0.2

1-Jan-16	0:20	0.02	0	0.02	0.3	0	0.3
1-Jan-16	0:25	0.02	0	0.02	0.3	0	0.3
1-Jan-16	0:30	0.02	0	0.02	0.3	0	0.3
1-Jan-16	0:35	0.02	0	0.02	0.3	0	0.3
1-Jan-16	0:40	0.02	0	0.02	0.3	0	0.3
1-Jan-16	0:45	0.02	0	0.02	0.4	0	0.4
1-Jan-16	0:50	0.02	0	0.02	0.3	0	0.3
1-Jan-16	0:55	0.02	0	0.02	0.3	0	0.3
1-Jan-16	1:00	0.02	0	0.02	0.4	0	0.4
1-Jan-16	1:05	0.03	0	0.03	0.4	0	0.4
1-Jan-16	1:10	0.03	0	0.03	0.4	0	0.4
1-Jan-16	1:15	0.03	0	0.03	0.5	0	0.5
1-Jan-16	1:20	0.02	0	0.02	0.4	0	0.4
1-Jan-16	1:25	0.03	0	0.03	0.5	0	0.5
1-Jan-16	1:30	0.03	0	0.03	0.5	0	0.5
1-Jan-16	1:35	0.03	0	0.03	0.5	0	0.5
1-Jan-16	1:40	0.03	0	0.03	0.5	0	0.5
1-Jan-16	1:45	0.04	0	0.04	0.6	0	0.6
1-Jan-16	1:50	0.04	0	0.04	0.6	0	0.6
1-Jan-16	1:55	0.03	0	0.03	0.6	0	0.6
1-Jan-16	2:00	0.03	0	0.03	0.6	0	0.6
1-Jan-16	2:05	0.04	0	0.04	0.6	0	0.6
1-Jan-16	2:10	0.05	0	0.05	0.7	0	0.7
1-Jan-16	2:15	0.06	0	0.06	0.9	0	0.9
1-Jan-16	2:20	0.04	0	0.04	0.9	0	0.9
1-Jan-16	2:25	0.08	0	0.08	1.1	0	1.1
1-Jan-16	2:30	0.08	0	0.08	1.3	0	1.3
1-Jan-16	2:35	0.09	0	0.09	1.5	0	1.5
1-Jan-16	2:40	0.07	0	0.07	1.4	0	1.4
1-Jan-16	2:45	0.02	0	0.02	1	0	1
1-Jan-16	2:50	0.02	0	0.02	0.7	0	0.7
1-Jan-16	2:55	0.02	0	0.02	0.5	0	0.5
1-Jan-16	3:00	0.01	0	0.01	0.4	0	0.4

5-year 6-hour storm for Developed Site:

Project: Moreno Valley BCE 18501 Simulation Run: Dev 5yr 6hr
Subbasin: Developed Basin

Start of Run: 01Jan2016, 00:00
End of Run: 01Jan2016, 06:00
Compute Time: 28Mar2018, 14:30:44

Basin Model: Developed 1
Meteorologic Model: dev 05y 06h
Control Specifications: 06

Volume Units: ● IN ○ AC-FT

Computed Results

Peak Discharge: 1.4 (CFS)
Precipitation Volume: 1.58 (IN)
Loss Volume: 0.00 (IN)
Excess Volume: 1.58 (IN)
Date/Time of Peak Discharge: 01Jan2016, 05:30
Direct Runoff Volume: 1.56 (IN)
Baseflow Volume: 0.00 (IN)
Discharge Volume: 1.56 (IN)

Project: Moreno Valley BCE 18501 Simulation Run: Dev 5yr 6hr
Subbasin: Developed Basin

Start of Run: 01Jan2016, 00:00
End of Run: 01Jan2016, 06:00
Compute Time: 28Mar2018, 14:30:44

Basin Model: Developed 1
Meteorologic Model: dev 05y 06h
Control Specifications: 06

Volume Units: ○ IN ● AC-FT

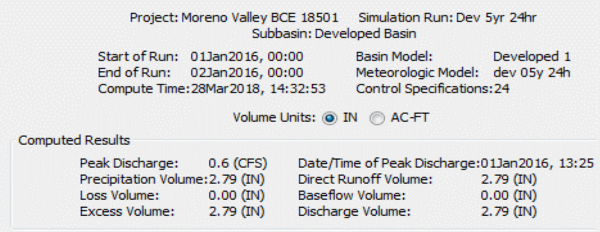
Computed Results

Peak Discharge: 1.4 (CFS)
Precipitation Volume: 0.2 (AC-FT)
Loss Volume: 0.0 (AC-FT)
Excess Volume: 0.2 (AC-FT)
Date/Time of Peak Discharge: 01Jan2016, 05:30
Direct Runoff Volume: 0.2 (AC-FT)
Baseflow Volume: 0.0 (AC-FT)
Discharge Volume: 0.2 (AC-FT)

Date	Time	Precip (IN)	Loss (IN)	Excess (IN)	Direct Flow (CFS)	Baseflow (CFS)	Total Flow (CFS)
1-Jan-16	0:00				0	0	0
1-Jan-16	0:05	0.01	0	0.01	0.1	0	0.1
1-Jan-16	0:10	0.01	0	0.01	0.1	0	0.1
1-Jan-16	0:15	0.01	0	0.01	0.1	0	0.1
1-Jan-16	0:20	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:25	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:30	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:35	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:40	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:45	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:00	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:05	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:10	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:15	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:20	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:25	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:30	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:35	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:40	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:45	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	2:00	0.01	0	0.01	0.3	0	0.3
1-Jan-16	2:05	0.01	0	0.01	0.3	0	0.3
1-Jan-16	2:10	0.01	0	0.01	0.3	0	0.3
1-Jan-16	2:15	0.01	0	0.01	0.3	0	0.3
1-Jan-16	2:20	0.01	0	0.01	0.3	0	0.3
1-Jan-16	2:25	0.01	0	0.01	0.3	0	0.3
1-Jan-16	2:30	0.01	0	0.01	0.3	0	0.3
1-Jan-16	2:35	0.01	0	0.01	0.3	0	0.3
1-Jan-16	2:40	0.01	0	0.01	0.3	0	0.3
1-Jan-16	2:45	0.02	0	0.02	0.3	0	0.3
1-Jan-16	2:50	0.02	0	0.02	0.3	0	0.3
1-Jan-16	2:55	0.02	0	0.02	0.3	0	0.3
1-Jan-16	3:00	0.02	0	0.02	0.3	0	0.3
1-Jan-16	3:05	0.02	0	0.02	0.3	0	0.3
1-Jan-16	3:10	0.02	0	0.02	0.3	0	0.3
1-Jan-16	3:15	0.02	0	0.02	0.3	0	0.3
1-Jan-16	3:20	0.02	0	0.02	0.3	0	0.3
1-Jan-16	3:25	0.02	0	0.02	0.3	0	0.3
1-Jan-16	3:30	0.02	0	0.02	0.4	0	0.4
1-Jan-16	3:35	0.02	0	0.02	0.4	0	0.4

1-Jan-16	3:40	0.02	0	0.02	0.4	0	0.4
1-Jan-16	3:45	0.02	0	0.02	0.4	0	0.4
1-Jan-16	3:50	0.02	0	0.02	0.4	0	0.4
1-Jan-16	3:55	0.03	0	0.03	0.4	0	0.4
1-Jan-16	4:00	0.03	0	0.03	0.5	0	0.5
1-Jan-16	4:05	0.03	0	0.03	0.5	0	0.5
1-Jan-16	4:10	0.03	0	0.03	0.5	0	0.5
1-Jan-16	4:15	0.03	0	0.03	0.5	0	0.5
1-Jan-16	4:20	0.03	0	0.03	0.6	0	0.6
1-Jan-16	4:25	0.03	0	0.03	0.6	0	0.6
1-Jan-16	4:30	0.03	0	0.03	0.6	0	0.6
1-Jan-16	4:35	0.04	0	0.04	0.6	0	0.6
1-Jan-16	4:40	0.04	0	0.04	0.6	0	0.6
1-Jan-16	4:45	0.04	0	0.04	0.7	0	0.7
1-Jan-16	4:50	0.04	0	0.04	0.7	0	0.7
1-Jan-16	4:55	0.04	0	0.04	0.7	0	0.7
1-Jan-16	5:00	0.04	0	0.04	0.7	0	0.7
1-Jan-16	5:05	0.05	0	0.05	0.8	0	0.8
1-Jan-16	5:10	0.06	0	0.06	0.9	0	0.9
1-Jan-16	5:15	0.06	0	0.06	1	0	1
1-Jan-16	5:20	0.07	0	0.07	1.1	0	1.1
1-Jan-16	5:25	0.07	0	0.07	1.2	0	1.2
1-Jan-16	5:30	0.09	0	0.09	1.4	0	1.4
1-Jan-16	5:35	0.03	0	0.03	1.1	0	1.1
1-Jan-16	5:40	0.01	0	0.01	0.7	0	0.7
1-Jan-16	5:45	0.01	0	0.01	0.4	0	0.4
1-Jan-16	5:50	0.01	0	0.01	0.3	0	0.3
1-Jan-16	5:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:00	0	0	0	0.2	0	0.2

5-year 24-hour storm for Developed Site:



Project: Moreno Valley BCE 18501 Simulation Run: Dev 5yr 24hr
Subbasin: Developed Basin

Start of Run: 01Jan2016, 00:00
End of Run: 02Jan2016, 00:00
Compute Time: 28Mar2018, 14:32:53

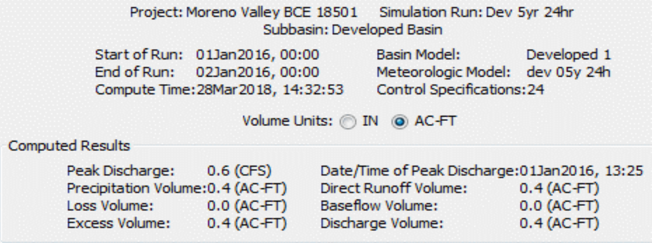
Basin Model: Developed 1
Meteorologic Model: dev 05y 24h
Control Specifications: 24

Volume Units: ● IN ○ AC-FT

Computed Results

Peak Discharge: 0.6 (CFS)
Precipitation Volume: 2.79 (IN)
Loss Volume: 0.00 (IN)
Excess Volume: 2.79 (IN)

Date/Time of Peak Discharge: 01Jan2016, 13:25
Direct Runoff Volume: 2.79 (IN)
Baseflow Volume: 0.00 (IN)
Discharge Volume: 2.79 (IN)



Project: Moreno Valley BCE 18501 Simulation Run: Dev 5yr 24hr
Subbasin: Developed Basin

Start of Run: 01Jan2016, 00:00
End of Run: 02Jan2016, 00:00
Compute Time: 28Mar2018, 14:32:53

Basin Model: Developed 1
Meteorologic Model: dev 05y 24h
Control Specifications: 24

Volume Units: ○ IN ● AC-FT

Computed Results

Peak Discharge: 0.6 (CFS)
Precipitation Volume: 0.4 (AC-FT)
Loss Volume: 0.0 (AC-FT)
Excess Volume: 0.4 (AC-FT)

Date/Time of Peak Discharge: 01Jan2016, 13:25
Direct Runoff Volume: 0.4 (AC-FT)
Baseflow Volume: 0.0 (AC-FT)
Discharge Volume: 0.4 (AC-FT)

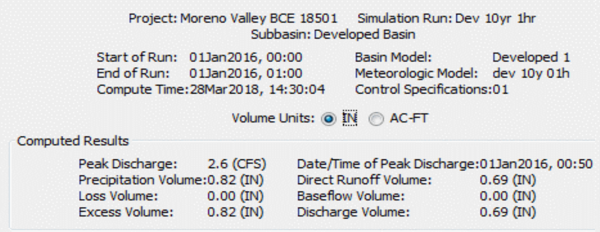
Date	Time	Precip (IN)	Loss (IN)	Excess (IN)	Direct Flow (CFS)	Baseflow (CFS)	Total Flow (CFS)
1-Jan-16	0:00				0	0	0
1-Jan-16	0:05	0	0	0	0	0	0
1-Jan-16	0:10	0	0	0	0	0	0
1-Jan-16	0:15	0	0	0	0	0	0
1-Jan-16	0:20	0	0	0	0	0	0
1-Jan-16	0:25	0	0	0	0.1	0	0.1
1-Jan-16	0:30	0	0	0	0.1	0	0.1
1-Jan-16	0:35	0	0	0	0.1	0	0.1
1-Jan-16	0:40	0	0	0	0.1	0	0.1
1-Jan-16	0:45	0	0	0	0.1	0	0.1
1-Jan-16	0:50	0	0	0	0.1	0	0.1
1-Jan-16	0:55	0	0	0	0.1	0	0.1
1-Jan-16	1:00	0	0	0	0.1	0	0.1
1-Jan-16	1:05	0	0	0	0.1	0	0.1
1-Jan-16	1:10	0	0	0	0.1	0	0.1
1-Jan-16	1:15	0	0	0	0.1	0	0.1
1-Jan-16	1:20	0	0	0	0.1	0	0.1
1-Jan-16	1:25	0	0	0	0.1	0	0.1
1-Jan-16	1:30	0	0	0	0.1	0	0.1
1-Jan-16	1:35	0	0	0	0.1	0	0.1
1-Jan-16	1:40	0	0	0	0.1	0	0.1
1-Jan-16	1:45	0	0	0	0.1	0	0.1
1-Jan-16	1:50	0	0	0	0.1	0	0.1
1-Jan-16	1:55	0	0	0	0.1	0	0.1
1-Jan-16	2:00	0	0	0	0.1	0	0.1
1-Jan-16	2:05	0	0	0	0.1	0	0.1
1-Jan-16	2:10	0	0	0	0.1	0	0.1
1-Jan-16	2:15	0	0	0	0.1	0	0.1
1-Jan-16	2:20	0	0	0	0.1	0	0.1
1-Jan-16	2:25	0	0	0	0.1	0	0.1
1-Jan-16	2:30	0.01	0	0.01	0.1	0	0.1
1-Jan-16	2:35	0.01	0	0.01	0.1	0	0.1
1-Jan-16	2:40	0.01	0	0.01	0.1	0	0.1
1-Jan-16	2:45	0.01	0	0.01	0.1	0	0.1
1-Jan-16	2:50	0.01	0	0.01	0.1	0	0.1
1-Jan-16	2:55	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:00	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:05	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:10	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:15	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:20	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:25	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:30	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:35	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:40	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:45	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:50	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:55	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:00	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:05	0.01	0	0.01	0.1	0	0.1

1-Jan-16	4:10	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:15	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:20	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:25	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:30	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:35	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:40	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:45	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:50	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:55	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:00	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:05	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:10	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:15	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:20	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:25	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:30	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:35	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:40	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:45	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:50	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:55	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:00	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:05	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:10	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:15	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:20	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:25	0.01	0	0.01	0.1	0	0.1
1-Jan-16	6:30	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:35	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:40	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:45	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:00	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:05	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:10	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:15	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:20	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:25	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:30	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:35	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:40	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:45	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	8:00	0.01	0	0.01	0.2	0	0.2
1-Jan-16	8:05	0.01	0	0.01	0.3	0	0.3
1-Jan-16	8:10	0.01	0	0.01	0.3	0	0.3
1-Jan-16	8:15	0.01	0	0.01	0.3	0	0.3
1-Jan-16	8:20	0.01	0	0.01	0.3	0	0.3
1-Jan-16	8:25	0.01	0	0.01	0.3	0	0.3
1-Jan-16	8:30	0.01	0	0.01	0.3	0	0.3
1-Jan-16	8:35	0.01	0	0.01	0.3	0	0.3
1-Jan-16	8:40	0.01	0	0.01	0.3	0	0.3
1-Jan-16	8:45	0.02	0	0.02	0.3	0	0.3
1-Jan-16	8:50	0.02	0	0.02	0.3	0	0.3
1-Jan-16	8:55	0.02	0	0.02	0.3	0	0.3
1-Jan-16	9:00	0.02	0	0.02	0.3	0	0.3
1-Jan-16	9:05	0.02	0	0.02	0.3	0	0.3
1-Jan-16	9:10	0.02	0	0.02	0.3	0	0.3
1-Jan-16	9:15	0.02	0	0.02	0.3	0	0.3
1-Jan-16	9:20	0.02	0	0.02	0.3	0	0.3
1-Jan-16	9:25	0.02	0	0.02	0.3	0	0.3
1-Jan-16	9:30	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:35	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:40	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:45	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:50	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:55	0.02	0	0.02	0.4	0	0.4
1-Jan-16	10:00	0.01	0	0.01	0.3	0	0.3
1-Jan-16	10:05	0.01	0	0.01	0.3	0	0.3
1-Jan-16	10:10	0.01	0	0.01	0.3	0	0.3
1-Jan-16	10:15	0.01	0	0.01	0.3	0	0.3
1-Jan-16	10:20	0.01	0	0.01	0.3	0	0.3
1-Jan-16	10:25	0.01	0	0.01	0.3	0	0.3
1-Jan-16	10:30	0.02	0	0.02	0.3	0	0.3
1-Jan-16	10:35	0.02	0	0.02	0.3	0	0.3
1-Jan-16	10:40	0.02	0	0.02	0.3	0	0.3
1-Jan-16	10:45	0.02	0	0.02	0.3	0	0.3
1-Jan-16	10:50	0.02	0	0.02	0.4	0	0.4
1-Jan-16	10:55	0.02	0	0.02	0.4	0	0.4
1-Jan-16	11:00	0.02	0	0.02	0.3	0	0.3
1-Jan-16	11:05	0.02	0	0.02	0.3	0	0.3
1-Jan-16	11:10	0.02	0	0.02	0.3	0	0.3
1-Jan-16	11:15	0.02	0	0.02	0.3	0	0.3
1-Jan-16	11:20	0.02	0	0.02	0.3	0	0.3
1-Jan-16	11:25	0.02	0	0.02	0.3	0	0.3
1-Jan-16	11:30	0.02	0	0.02	0.3	0	0.3
1-Jan-16	11:35	0.02	0	0.02	0.3	0	0.3
1-Jan-16	11:40	0.02	0	0.02	0.3	0	0.3
1-Jan-16	11:45	0.02	0	0.02	0.3	0	0.3
1-Jan-16	11:50	0.02	0	0.02	0.3	0	0.3
1-Jan-16	11:55	0.02	0	0.02	0.3	0	0.3
1-Jan-16	12:00	0.02	0	0.02	0.4	0	0.4
1-Jan-16	12:05	0.02	0	0.02	0.4	0	0.4

1-Jan-16	12:10	0.02	0	0.02	0.4	0	0.4
1-Jan-16	12:15	0.02	0	0.02	0.4	0	0.4
1-Jan-16	12:20	0.02	0	0.02	0.4	0	0.4
1-Jan-16	12:25	0.02	0	0.02	0.4	0	0.4
1-Jan-16	12:30	0.03	0	0.03	0.5	0	0.5
1-Jan-16	12:35	0.03	0	0.03	0.5	0	0.5
1-Jan-16	12:40	0.03	0	0.03	0.5	0	0.5
1-Jan-16	12:45	0.03	0	0.03	0.5	0	0.5
1-Jan-16	12:50	0.03	0	0.03	0.5	0	0.5
1-Jan-16	12:55	0.03	0	0.03	0.5	0	0.5
1-Jan-16	13:00	0.03	0	0.03	0.5	0	0.5
1-Jan-16	13:05	0.03	0	0.03	0.6	0	0.6
1-Jan-16	13:10	0.03	0	0.03	0.6	0	0.6
1-Jan-16	13:15	0.03	0	0.03	0.6	0	0.6
1-Jan-16	13:20	0.03	0	0.03	0.6	0	0.6
1-Jan-16	13:25	0.03	0	0.03	0.6	0	0.6
1-Jan-16	13:30	0.02	0	0.02	0.5	0	0.5
1-Jan-16	13:35	0.02	0	0.02	0.4	0	0.4
1-Jan-16	13:40	0.02	0	0.02	0.4	0	0.4
1-Jan-16	13:45	0.02	0	0.02	0.4	0	0.4
1-Jan-16	13:50	0.02	0	0.02	0.4	0	0.4
1-Jan-16	13:55	0.02	0	0.02	0.4	0	0.4
1-Jan-16	14:00	0.03	0	0.03	0.4	0	0.4
1-Jan-16	14:05	0.03	0	0.03	0.4	0	0.4
1-Jan-16	14:10	0.03	0	0.03	0.5	0	0.5
1-Jan-16	14:15	0.02	0	0.02	0.5	0	0.5
1-Jan-16	14:20	0.02	0	0.02	0.5	0	0.5
1-Jan-16	14:25	0.02	0	0.02	0.5	0	0.5
1-Jan-16	14:30	0.02	0	0.02	0.5	0	0.5
1-Jan-16	14:35	0.02	0	0.02	0.5	0	0.5
1-Jan-16	14:40	0.02	0	0.02	0.5	0	0.5
1-Jan-16	14:45	0.02	0	0.02	0.4	0	0.4
1-Jan-16	14:50	0.02	0	0.02	0.4	0	0.4
1-Jan-16	14:55	0.02	0	0.02	0.4	0	0.4
1-Jan-16	15:00	0.02	0	0.02	0.4	0	0.4
1-Jan-16	15:05	0.02	0	0.02	0.4	0	0.4
1-Jan-16	15:10	0.02	0	0.02	0.4	0	0.4
1-Jan-16	15:15	0.02	0	0.02	0.4	0	0.4
1-Jan-16	15:20	0.02	0	0.02	0.4	0	0.4
1-Jan-16	15:25	0.02	0	0.02	0.4	0	0.4
1-Jan-16	15:30	0.02	0	0.02	0.4	0	0.4
1-Jan-16	15:35	0.02	0	0.02	0.3	0	0.3
1-Jan-16	15:40	0.02	0	0.02	0.3	0	0.3
1-Jan-16	15:45	0.02	0	0.02	0.3	0	0.3
1-Jan-16	15:50	0.02	0	0.02	0.3	0	0.3
1-Jan-16	15:55	0.02	0	0.02	0.3	0	0.3
1-Jan-16	16:00	0	0	0	0.2	0	0.2
1-Jan-16	16:05	0	0	0	0.1	0	0.1
1-Jan-16	16:10	0	0	0	0.1	0	0.1
1-Jan-16	16:15	0	0	0	0.1	0	0.1
1-Jan-16	16:20	0	0	0	0.1	0	0.1
1-Jan-16	16:25	0	0	0	0.1	0	0.1
1-Jan-16	16:30	0	0	0	0.1	0	0.1
1-Jan-16	16:35	0	0	0	0.1	0	0.1
1-Jan-16	16:40	0	0	0	0.1	0	0.1
1-Jan-16	16:45	0	0	0	0.1	0	0.1
1-Jan-16	16:50	0	0	0	0.1	0	0.1
1-Jan-16	16:55	0	0	0	0.1	0	0.1
1-Jan-16	17:00	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:05	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:10	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:15	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:20	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:25	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:30	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:35	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:40	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:45	0	0	0	0.1	0	0.1
1-Jan-16	17:50	0	0	0	0.1	0	0.1
1-Jan-16	17:55	0	0	0	0.1	0	0.1
1-Jan-16	18:00	0	0	0	0.1	0	0.1
1-Jan-16	18:05	0	0	0	0.1	0	0.1
1-Jan-16	18:10	0	0	0	0.1	0	0.1
1-Jan-16	18:15	0	0	0	0.1	0	0.1
1-Jan-16	18:20	0	0	0	0.1	0	0.1
1-Jan-16	18:25	0	0	0	0.1	0	0.1
1-Jan-16	18:30	0	0	0	0.1	0	0.1
1-Jan-16	18:35	0	0	0	0.1	0	0.1
1-Jan-16	18:40	0	0	0	0.1	0	0.1
1-Jan-16	18:45	0	0	0	0.1	0	0.1
1-Jan-16	18:50	0	0	0	0	0	0
1-Jan-16	18:55	0	0	0	0	0	0
1-Jan-16	19:00	0	0	0	0	0	0
1-Jan-16	19:05	0	0	0	0.1	0	0.1
1-Jan-16	19:10	0	0	0	0.1	0	0.1
1-Jan-16	19:15	0	0	0	0.1	0	0.1
1-Jan-16	19:20	0	0	0	0.1	0	0.1
1-Jan-16	19:25	0	0	0	0.1	0	0.1
1-Jan-16	19:30	0	0	0	0.1	0	0.1
1-Jan-16	19:35	0	0	0	0.1	0	0.1
1-Jan-16	19:40	0	0	0	0.1	0	0.1
1-Jan-16	19:45	0	0	0	0.1	0	0.1
1-Jan-16	19:50	0	0	0	0	0	0
1-Jan-16	19:55	0	0	0	0	0	0
1-Jan-16	20:00	0	0	0	0	0	0
1-Jan-16	20:05	0	0	0	0.1	0	0.1

1-Jan-16	20:10	0	0	0	0.1	0	0.1
1-Jan-16	20:15	0	0	0	0.1	0	0.1
1-Jan-16	20:20	0	0	0	0.1	0	0.1
1-Jan-16	20:25	0	0	0	0.1	0	0.1
1-Jan-16	20:30	0	0	0	0.1	0	0.1
1-Jan-16	20:35	0	0	0	0.1	0	0.1
1-Jan-16	20:40	0	0	0	0.1	0	0.1
1-Jan-16	20:45	0	0	0	0	0	0
1-Jan-16	20:50	0	0	0	0	0	0
1-Jan-16	20:55	0	0	0	0	0	0
1-Jan-16	21:00	0	0	0	0	0	0
1-Jan-16	21:05	0	0	0	0.1	0	0.1
1-Jan-16	21:10	0	0	0	0.1	0	0.1
1-Jan-16	21:15	0	0	0	0	0	0
1-Jan-16	21:20	0	0	0	0	0	0
1-Jan-16	21:25	0	0	0	0	0	0
1-Jan-16	21:30	0	0	0	0	0	0
1-Jan-16	21:35	0	0	0	0.1	0	0.1
1-Jan-16	21:40	0	0	0	0.1	0	0.1
1-Jan-16	21:45	0	0	0	0	0	0
1-Jan-16	21:50	0	0	0	0	0	0
1-Jan-16	21:55	0	0	0	0	0	0
1-Jan-16	22:00	0	0	0	0	0	0
1-Jan-16	22:05	0	0	0	0.1	0	0.1
1-Jan-16	22:10	0	0	0	0.1	0	0.1
1-Jan-16	22:15	0	0	0	0	0	0
1-Jan-16	22:20	0	0	0	0	0	0
1-Jan-16	22:25	0	0	0	0	0	0
1-Jan-16	22:30	0	0	0	0	0	0
1-Jan-16	22:35	0	0	0	0	0	0
1-Jan-16	22:40	0	0	0	0	0	0
1-Jan-16	22:45	0	0	0	0	0	0
1-Jan-16	22:50	0	0	0	0	0	0
1-Jan-16	22:55	0	0	0	0	0	0
1-Jan-16	23:00	0	0	0	0	0	0
1-Jan-16	23:05	0	0	0	0	0	0
1-Jan-16	23:10	0	0	0	0	0	0
1-Jan-16	23:15	0	0	0	0	0	0
1-Jan-16	23:20	0	0	0	0	0	0
1-Jan-16	23:25	0	0	0	0	0	0
1-Jan-16	23:30	0	0	0	0	0	0
1-Jan-16	23:35	0	0	0	0	0	0
1-Jan-16	23:40	0	0	0	0	0	0
1-Jan-16	23:45	0	0	0	0	0	0
1-Jan-16	23:50	0	0	0	0	0	0
1-Jan-16	23:55	0	0	0	0	0	0
2-Jan-16	0:00	0	0	0	0	0	0

10-year 1-hour storm for Developed Site:



Project: Moreno Valley BCE 18501 Simulation Run: Dev 10yr 1hr
Subbasin: Developed Basin

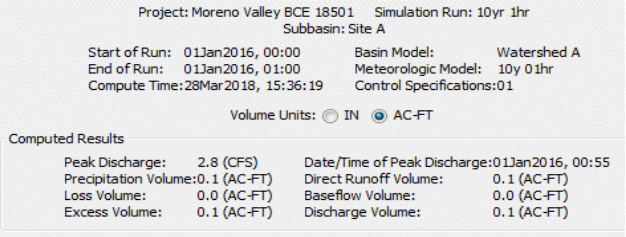
Start of Run: 01Jan2016, 00:00
End of Run: 01Jan2016, 01:00
Compute Time: 28Mar2018, 14:30:04

Basin Model: Developed 1
Meteorologic Model: dev 10y 01h
Control Specifications: 01

Volume Units: ● IN ○ AC-FT

Computed Results

Peak Discharge: 2.6 (CFS)
Precipitation Volume: 0.82 (IN)
Loss Volume: 0.00 (IN)
Excess Volume: 0.82 (IN)
Date/Time of Peak Discharge: 01Jan2016, 00:50
Direct Runoff Volume: 0.69 (IN)
Baseflow Volume: 0.00 (IN)
Discharge Volume: 0.69 (IN)



Project: Moreno Valley BCE 18501 Simulation Run: 10yr 1hr
Subbasin: Site A

Start of Run: 01Jan2016, 00:00
End of Run: 01Jan2016, 01:00
Compute Time: 28Mar2018, 15:36:19

Basin Model: Watershed A
Meteorologic Model: 10y 01hr
Control Specifications: 01

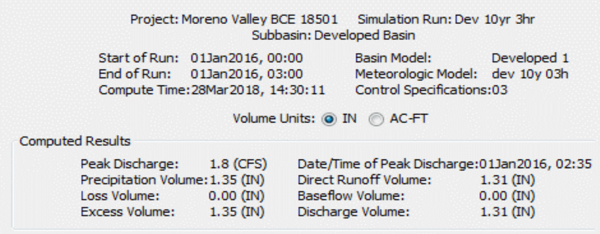
Volume Units: ○ IN ● AC-FT

Computed Results

Peak Discharge: 2.8 (CFS)
Precipitation Volume: 0.1 (AC-FT)
Loss Volume: 0.0 (AC-FT)
Excess Volume: 0.1 (AC-FT)
Date/Time of Peak Discharge: 01Jan2016, 00:55
Direct Runoff Volume: 0.1 (AC-FT)
Baseflow Volume: 0.0 (AC-FT)
Discharge Volume: 0.1 (AC-FT)

Date	Time	Precip (IN)	Loss (IN)	Excess (IN)	Direct Flow (CFS)	Baseflow (CFS)	Total Flow (CFS)
1-Jan-16	0:00				0	0	0
1-Jan-16	0:05	0.03	0	0.03	0.2	0	0.2
1-Jan-16	0:10	0.04	0	0.04	0.5	0	0.5
1-Jan-16	0:15	0.04	0	0.04	0.6	0	0.6
1-Jan-16	0:20	0.04	0	0.04	0.7	0	0.7
1-Jan-16	0:25	0.04	0	0.04	0.8	0	0.8
1-Jan-16	0:30	0.05	0	0.05	0.9	0	0.9
1-Jan-16	0:35	0.06	0	0.06	1	0	1
1-Jan-16	0:40	0.07	0	0.07	1.1	0	1.1
1-Jan-16	0:45	0.1	0	0.1	1.5	0	1.5
1-Jan-16	0:50	0.23	0	0.23	2.6	0	2.6
1-Jan-16	0:55	0.06	0	0.06	2.3	0	2.3
1-Jan-16	1:00	0.04	0	0.04	1.4	0	1.4

10-year 3-hour storm for Developed Site:



Project: Moreno Valley BCE 18501 Simulation Run: Dev 10yr 3hr
Subbasin: Developed Basin

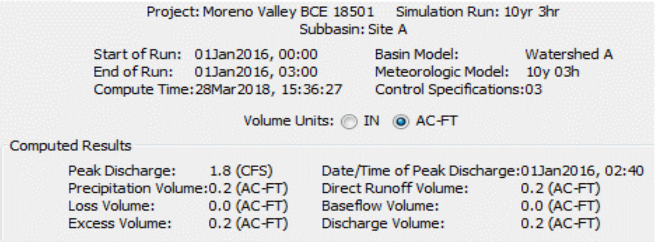
Start of Run: 01Jan2016, 00:00
End of Run: 01Jan2016, 03:00
Compute Time: 28Mar2018, 14:30:11

Basin Model: Developed 1
Meteorologic Model: dev 10y 03h
Control Specifications: 03

Volume Units: ● IN ○ AC-FT

Computed Results

Peak Discharge: 1.8 (CFS)
Precipitation Volume: 1.35 (IN)
Loss Volume: 0.00 (IN)
Excess Volume: 1.35 (IN)
Date/Time of Peak Discharge: 01Jan2016, 02:35
Direct Runoff Volume: 1.31 (IN)
Baseflow Volume: 0.00 (IN)
Discharge Volume: 1.31 (IN)



Project: Moreno Valley BCE 18501 Simulation Run: 10yr 3hr
Subbasin: Site A

Start of Run: 01Jan2016, 00:00
End of Run: 01Jan2016, 03:00
Compute Time: 28Mar2018, 15:36:27

Basin Model: Watershed A
Meteorologic Model: 10y 03h
Control Specifications: 03

Volume Units: ○ IN ● AC-FT

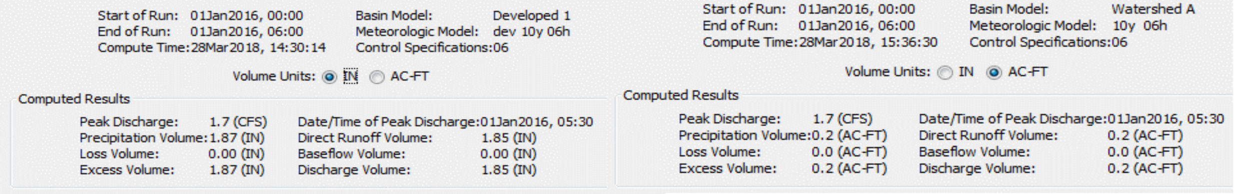
Computed Results

Peak Discharge: 1.8 (CFS)
Precipitation Volume: 0.2 (AC-FT)
Loss Volume: 0.0 (AC-FT)
Excess Volume: 0.2 (AC-FT)
Date/Time of Peak Discharge: 01Jan2016, 02:40
Direct Runoff Volume: 0.2 (AC-FT)
Baseflow Volume: 0.0 (AC-FT)
Discharge Volume: 0.2 (AC-FT)

Date	Time	Precip (IN)	Loss (IN)	Excess (IN)	Direct Flow (CFS)	Baseflow (CFS)	Total Flow (CFS)
1-Jan-16	0:00				0	0	0

1-Jan-16	0:05	0.02	0	0.02	0.1	0	0.1
1-Jan-16	0:10	0.02	0	0.02	0.2	0	0.2
1-Jan-16	0:15	0.01	0	0.01	0.3	0	0.3
1-Jan-16	0:20	0.02	0	0.02	0.3	0	0.3
1-Jan-16	0:25	0.02	0	0.02	0.3	0	0.3
1-Jan-16	0:30	0.02	0	0.02	0.4	0	0.4
1-Jan-16	0:35	0.02	0	0.02	0.4	0	0.4
1-Jan-16	0:40	0.02	0	0.02	0.4	0	0.4
1-Jan-16	0:45	0.02	0	0.02	0.4	0	0.4
1-Jan-16	0:50	0.02	0	0.02	0.4	0	0.4
1-Jan-16	0:55	0.02	0	0.02	0.4	0	0.4
1-Jan-16	1:00	0.02	0	0.02	0.4	0	0.4
1-Jan-16	1:05	0.03	0	0.03	0.5	0	0.5
1-Jan-16	1:10	0.03	0	0.03	0.5	0	0.5
1-Jan-16	1:15	0.03	0	0.03	0.5	0	0.5
1-Jan-16	1:20	0.03	0	0.03	0.5	0	0.5
1-Jan-16	1:25	0.04	0	0.04	0.6	0	0.6
1-Jan-16	1:30	0.04	0	0.04	0.6	0	0.6
1-Jan-16	1:35	0.03	0	0.03	0.6	0	0.6
1-Jan-16	1:40	0.04	0	0.04	0.6	0	0.6
1-Jan-16	1:45	0.04	0	0.04	0.7	0	0.7
1-Jan-16	1:50	0.04	0	0.04	0.8	0	0.8
1-Jan-16	1:55	0.04	0	0.04	0.7	0	0.7
1-Jan-16	2:00	0.04	0	0.04	0.7	0	0.7
1-Jan-16	2:05	0.04	0	0.04	0.8	0	0.8
1-Jan-16	2:10	0.06	0	0.06	0.9	0	0.9
1-Jan-16	2:15	0.07	0	0.07	1.1	0	1.1
1-Jan-16	2:20	0.05	0	0.05	1	0	1
1-Jan-16	2:25	0.09	0	0.09	1.3	0	1.3
1-Jan-16	2:30	0.1	0	0.1	1.6	0	1.6
1-Jan-16	2:35	0.11	0	0.11	1.8	0	1.8
1-Jan-16	2:40	0.08	0	0.08	1.7	0	1.7
1-Jan-16	2:45	0.03	0	0.03	1.2	0	1.2
1-Jan-16	2:50	0.02	0	0.02	0.8	0	0.8
1-Jan-16	2:55	0.02	0	0.02	0.6	0	0.6
1-Jan-16	3:00	0.01	0	0.01	0.5	0	0.5

10-year 6-hour storm for Developed Site:



Project: Moreno Valley BCE 18501 Simulation Run: Dev 10yr 6hr
Subbasin: Developed Basin

Start of Run: 01Jan2016, 00:00
End of Run: 01Jan2016, 06:00
Compute Time: 28Mar2018, 14:30:14
Basin Model: Developed 1
Meteorologic Model: dev 10y 06h
Control Specifications: 06

Volume Units: ● IN ○ AC-FT

Computed Results

Peak Discharge: 1.7 (CFS)
Precipitation Volume: 1.87 (IN)
Loss Volume: 0.00 (IN)
Excess Volume: 1.87 (IN)
Date/Time of Peak Discharge: 01Jan2016, 05:30
Direct Runoff Volume: 1.85 (IN)
Baseflow Volume: 0.00 (IN)
Discharge Volume: 1.85 (IN)

Project: Moreno Valley BCE 18501 Simulation Run: 10yr 6hr
Subbasin: Site A

Start of Run: 01Jan2016, 00:00
End of Run: 01Jan2016, 06:00
Compute Time: 28Mar2018, 15:36:30
Basin Model: Watershed A
Meteorologic Model: 10y 06h
Control Specifications: 06

Volume Units: ○ IN ● AC-FT

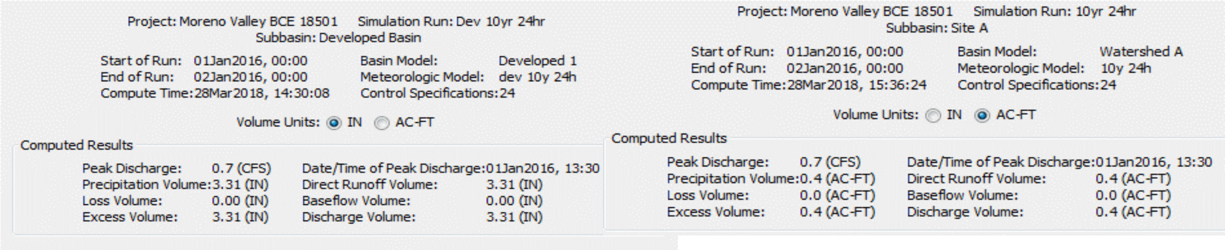
Computed Results

Peak Discharge: 1.7 (CFS)
Precipitation Volume: 0.2 (AC-FT)
Loss Volume: 0.0 (AC-FT)
Excess Volume: 0.2 (AC-FT)
Date/Time of Peak Discharge: 01Jan2016, 05:30
Direct Runoff Volume: 0.2 (AC-FT)
Baseflow Volume: 0.0 (AC-FT)
Discharge Volume: 0.2 (AC-FT)

Date	Time	Precip (IN)	Loss (IN)	Excess (IN)	Direct Flow (CFS)	Baseflow (CFS)	Total Flow (CFS)
1-Jan-16	0:00				0	0	0
1-Jan-16	0:05	0.01	0	0.01	0.1	0	0.1
1-Jan-16	0:10	0.01	0	0.01	0.1	0	0.1
1-Jan-16	0:15	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:20	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:25	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:30	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:35	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:40	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:45	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	0:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:00	0.01	0	0.01	0.2	0	0.2
1-Jan-16	1:05	0.01	0	0.01	0.3	0	0.3
1-Jan-16	1:10	0.01	0	0.01	0.3	0	0.3
1-Jan-16	1:15	0.01	0	0.01	0.3	0	0.3
1-Jan-16	1:20	0.01	0	0.01	0.3	0	0.3
1-Jan-16	1:25	0.01	0	0.01	0.3	0	0.3
1-Jan-16	1:30	0.01	0	0.01	0.3	0	0.3
1-Jan-16	1:35	0.01	0	0.01	0.3	0	0.3
1-Jan-16	1:40	0.01	0	0.01	0.3	0	0.3
1-Jan-16	1:45	0.01	0	0.01	0.3	0	0.3
1-Jan-16	1:50	0.01	0	0.01	0.3	0	0.3
1-Jan-16	1:55	0.01	0	0.01	0.3	0	0.3
1-Jan-16	2:00	0.02	0	0.02	0.3	0	0.3
1-Jan-16	2:05	0.02	0	0.02	0.3	0	0.3
1-Jan-16	2:10	0.02	0	0.02	0.3	0	0.3
1-Jan-16	2:15	0.02	0	0.02	0.3	0	0.3
1-Jan-16	2:20	0.02	0	0.02	0.3	0	0.3
1-Jan-16	2:25	0.02	0	0.02	0.3	0	0.3
1-Jan-16	2:30	0.02	0	0.02	0.3	0	0.3
1-Jan-16	2:35	0.02	0	0.02	0.3	0	0.3
1-Jan-16	2:40	0.02	0	0.02	0.3	0	0.3
1-Jan-16	2:45	0.02	0	0.02	0.3	0	0.3
1-Jan-16	2:50	0.02	0	0.02	0.3	0	0.3
1-Jan-16	2:55	0.02	0	0.02	0.4	0	0.4
1-Jan-16	3:00	0.02	0	0.02	0.4	0	0.4
1-Jan-16	3:05	0.02	0	0.02	0.4	0	0.4
1-Jan-16	3:10	0.02	0	0.02	0.4	0	0.4
1-Jan-16	3:15	0.02	0	0.02	0.4	0	0.4
1-Jan-16	3:20	0.02	0	0.02	0.4	0	0.4
1-Jan-16	3:25	0.02	0	0.02	0.4	0	0.4

1-Jan-16	3:30	0.02	0	0.02	0.4	0	0.4
1-Jan-16	3:35	0.03	0	0.03	0.4	0	0.4
1-Jan-16	3:40	0.03	0	0.03	0.5	0	0.5
1-Jan-16	3:45	0.03	0	0.03	0.5	0	0.5
1-Jan-16	3:50	0.03	0	0.03	0.5	0	0.5
1-Jan-16	3:55	0.03	0	0.03	0.5	0	0.5
1-Jan-16	4:00	0.03	0	0.03	0.5	0	0.5
1-Jan-16	4:05	0.03	0	0.03	0.6	0	0.6
1-Jan-16	4:10	0.03	0	0.03	0.6	0	0.6
1-Jan-16	4:15	0.04	0	0.04	0.6	0	0.6
1-Jan-16	4:20	0.04	0	0.04	0.7	0	0.7
1-Jan-16	4:25	0.04	0	0.04	0.7	0	0.7
1-Jan-16	4:30	0.04	0	0.04	0.7	0	0.7
1-Jan-16	4:35	0.04	0	0.04	0.7	0	0.7
1-Jan-16	4:40	0.04	0	0.04	0.8	0	0.8
1-Jan-16	4:45	0.04	0	0.04	0.8	0	0.8
1-Jan-16	4:50	0.04	0	0.04	0.8	0	0.8
1-Jan-16	4:55	0.05	0	0.05	0.8	0	0.8
1-Jan-16	5:00	0.05	0	0.05	0.9	0	0.9
1-Jan-16	5:05	0.06	0	0.06	1	0	1
1-Jan-16	5:10	0.07	0	0.07	1.1	0	1.1
1-Jan-16	5:15	0.07	0	0.07	1.2	0	1.2
1-Jan-16	5:20	0.08	0	0.08	1.3	0	1.3
1-Jan-16	5:25	0.09	0	0.09	1.5	0	1.5
1-Jan-16	5:30	0.1	0	0.1	1.7	0	1.7
1-Jan-16	5:35	0.04	0	0.04	1.3	0	1.3
1-Jan-16	5:40	0.02	0	0.02	0.8	0	0.8
1-Jan-16	5:45	0.01	0	0.01	0.5	0	0.5
1-Jan-16	5:50	0.01	0	0.01	0.4	0	0.4
1-Jan-16	5:55	0.01	0	0.01	0.3	0	0.3
1-Jan-16	6:00	0	0	0	0.2	0	0.2

10-year 24-hour storm for Developed Site:



Project: Moreno Valley BCE 18501 Simulation Run: Dev 10yr 24hr
Subbasin: Developed Basin

Start of Run: 01Jan2016, 00:00
End of Run: 02Jan2016, 00:00
Compute Time: 28Mar2018, 14:30:08

Basin Model: Developed 1
Meteorologic Model: dev 10y 24h
Control Specifications: 24

Volume Units: ● IN ○ AC-FT

Computed Results

Peak Discharge: 0.7 (CFS)
Precipitation Volume: 3.31 (IN)
Loss Volume: 0.00 (IN)
Excess Volume: 3.31 (IN)

Date/Time of Peak Discharge: 01Jan2016, 13:30
Direct Runoff Volume: 3.31 (IN)
Baseflow Volume: 0.00 (IN)
Discharge Volume: 3.31 (IN)

Project: Moreno Valley BCE 18501 Simulation Run: 10yr 24hr
Subbasin: Site A

Start of Run: 01Jan2016, 00:00
End of Run: 02Jan2016, 00:00
Compute Time: 28Mar2018, 15:36:24

Basin Model: Watershed A
Meteorologic Model: 10y 24h
Control Specifications: 24

Volume Units: ○ IN ● AC-FT

Computed Results

Peak Discharge: 0.7 (CFS)
Precipitation Volume: 0.4 (AC-FT)
Loss Volume: 0.0 (AC-FT)
Excess Volume: 0.4 (AC-FT)

Date/Time of Peak Discharge: 01Jan2016, 13:30
Direct Runoff Volume: 0.4 (AC-FT)
Baseflow Volume: 0.0 (AC-FT)
Discharge Volume: 0.4 (AC-FT)

Date	Time	Precip (IN)	Loss (IN)	Excess (IN)	Direct Flow (CFS)	Baseflow (CFS)	Total Flow (CFS)
1-Jan-16	0:00				0	0	0
1-Jan-16	0:05	0	0	0	0	0	0
1-Jan-16	0:10	0	0	0	0	0	0
1-Jan-16	0:15	0	0	0	0	0	0
1-Jan-16	0:20	0	0	0	0	0	0
1-Jan-16	0:25	0	0	0	0	0	0
1-Jan-16	0:30	0	0	0	0.1	0	0.1
1-Jan-16	0:35	0	0	0	0.1	0	0.1
1-Jan-16	0:40	0	0	0	0.1	0	0.1
1-Jan-16	0:45	0	0	0	0.1	0	0.1
1-Jan-16	0:50	0	0	0	0.1	0	0.1
1-Jan-16	0:55	0	0	0	0.1	0	0.1
1-Jan-16	1:00	0	0	0	0.1	0	0.1
1-Jan-16	1:05	0	0	0	0.1	0	0.1
1-Jan-16	1:10	0	0	0	0.1	0	0.1
1-Jan-16	1:15	0	0	0	0.1	0	0.1
1-Jan-16	1:20	0	0	0	0.1	0	0.1
1-Jan-16	1:25	0	0	0	0.1	0	0.1
1-Jan-16	1:30	0	0	0	0.1	0	0.1
1-Jan-16	1:35	0	0	0	0.1	0	0.1
1-Jan-16	1:40	0	0	0	0.1	0	0.1
1-Jan-16	1:45	0	0	0	0.1	0	0.1
1-Jan-16	1:50	0	0	0	0.1	0	0.1
1-Jan-16	1:55	0	0	0	0.1	0	0.1
1-Jan-16	2:00	0	0	0	0.1	0	0.1
1-Jan-16	2:05	0	0	0	0.1	0	0.1
1-Jan-16	2:10	0	0	0	0.1	0	0.1
1-Jan-16	2:15	0	0	0	0.1	0	0.1
1-Jan-16	2:20	0	0	0	0.1	0	0.1
1-Jan-16	2:25	0	0	0	0.1	0	0.1
1-Jan-16	2:30	0	0	0	0.1	0	0.1
1-Jan-16	2:35	0.01	0	0.01	0.1	0	0.1
1-Jan-16	2:40	0.01	0	0.01	0.1	0	0.1
1-Jan-16	2:45	0.01	0	0.01	0.1	0	0.1
1-Jan-16	2:50	0.01	0	0.01	0.1	0	0.1
1-Jan-16	2:55	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:00	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:05	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:10	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:15	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:20	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:25	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:30	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:35	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:40	0.01	0	0.01	0.1	0	0.1

Attachment: Appendix H - Preliminary Drainage Report (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

1-Jan-16	3:45	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:50	0.01	0	0.01	0.1	0	0.1
1-Jan-16	3:55	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:00	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:05	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:10	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:15	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:20	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:25	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:30	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:35	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:40	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:45	0.01	0	0.01	0.1	0	0.1
1-Jan-16	4:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	4:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	5:00	0.01	0	0.01	0.2	0	0.2
1-Jan-16	5:05	0.01	0	0.01	0.2	0	0.2
1-Jan-16	5:10	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:15	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:20	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:25	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:30	0.01	0	0.01	0.1	0	0.1
1-Jan-16	5:35	0.01	0	0.01	0.2	0	0.2
1-Jan-16	5:40	0.01	0	0.01	0.2	0	0.2
1-Jan-16	5:45	0.01	0	0.01	0.2	0	0.2
1-Jan-16	5:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	5:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:00	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:05	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:10	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:15	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:20	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:25	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:30	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:35	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:40	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:45	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	6:55	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:00	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:05	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:10	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:15	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:20	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:25	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:30	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:35	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:40	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:45	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:50	0.01	0	0.01	0.2	0	0.2
1-Jan-16	7:55	0.01	0	0.01	0.3	0	0.3
1-Jan-16	8:00	0.01	0	0.01	0.3	0	0.3
1-Jan-16	8:05	0.02	0	0.02	0.3	0	0.3
1-Jan-16	8:10	0.02	0	0.02	0.3	0	0.3
1-Jan-16	8:15	0.02	0	0.02	0.3	0	0.3
1-Jan-16	8:20	0.02	0	0.02	0.3	0	0.3
1-Jan-16	8:25	0.02	0	0.02	0.3	0	0.3
1-Jan-16	8:30	0.02	0	0.02	0.3	0	0.3
1-Jan-16	8:35	0.02	0	0.02	0.3	0	0.3
1-Jan-16	8:40	0.02	0	0.02	0.3	0	0.3
1-Jan-16	8:45	0.02	0	0.02	0.3	0	0.3
1-Jan-16	8:50	0.02	0	0.02	0.3	0	0.3
1-Jan-16	8:55	0.02	0	0.02	0.3	0	0.3
1-Jan-16	9:00	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:05	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:10	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:15	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:20	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:25	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:30	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:35	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:40	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:45	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:50	0.02	0	0.02	0.4	0	0.4
1-Jan-16	9:55	0.02	0	0.02	0.4	0	0.4
1-Jan-16	10:00	0.02	0	0.02	0.4	0	0.4
1-Jan-16	10:05	0.02	0	0.02	0.4	0	0.4
1-Jan-16	10:10	0.02	0	0.02	0.4	0	0.4
1-Jan-16	10:15	0.02	0	0.02	0.3	0	0.3
1-Jan-16	10:20	0.02	0	0.02	0.3	0	0.3
1-Jan-16	10:25	0.02	0	0.02	0.3	0	0.3
1-Jan-16	10:30	0.02	0	0.02	0.3	0	0.3
1-Jan-16	10:35	0.02	0	0.02	0.4	0	0.4
1-Jan-16	10:40	0.02	0	0.02	0.4	0	0.4
1-Jan-16	10:45	0.02	0	0.02	0.4	0	0.4
1-Jan-16	10:50	0.02	0	0.02	0.4	0	0.4
1-Jan-16	10:55	0.02	0	0.02	0.4	0	0.4
1-Jan-16	11:00	0.02	0	0.02	0.4	0	0.4
1-Jan-16	11:05	0.02	0	0.02	0.4	0	0.4
1-Jan-16	11:10	0.02	0	0.02	0.4	0	0.4
1-Jan-16	11:15	0.02	0	0.02	0.4	0	0.4
1-Jan-16	11:20	0.02	0	0.02	0.4	0	0.4
1-Jan-16	11:25	0.02	0	0.02	0.4	0	0.4
1-Jan-16	11:30	0.02	0	0.02	0.4	0	0.4
1-Jan-16	11:35	0.02	0	0.02	0.4	0	0.4
1-Jan-16	11:40	0.02	0	0.02	0.4	0	0.4

1-Jan-16	11:45	0.02	0	0.02	0.4	0	0.4
1-Jan-16	11:50	0.02	0	0.02	0.4	0	0.4
1-Jan-16	11:55	0.02	0	0.02	0.4	0	0.4
1-Jan-16	12:00	0.02	0	0.02	0.4	0	0.4
1-Jan-16	12:05	0.03	0	0.03	0.4	0	0.4
1-Jan-16	12:10	0.03	0	0.03	0.5	0	0.5
1-Jan-16	12:15	0.03	0	0.03	0.5	0	0.5
1-Jan-16	12:20	0.03	0	0.03	0.5	0	0.5
1-Jan-16	12:25	0.03	0	0.03	0.5	0	0.5
1-Jan-16	12:30	0.03	0	0.03	0.5	0	0.5
1-Jan-16	12:35	0.03	0	0.03	0.6	0	0.6
1-Jan-16	12:40	0.03	0	0.03	0.6	0	0.6
1-Jan-16	12:45	0.03	0	0.03	0.6	0	0.6
1-Jan-16	12:50	0.03	0	0.03	0.6	0	0.6
1-Jan-16	12:55	0.03	0	0.03	0.6	0	0.6
1-Jan-16	13:00	0.03	0	0.03	0.6	0	0.6
1-Jan-16	13:05	0.04	0	0.04	0.6	0	0.6
1-Jan-16	13:10	0.04	0	0.04	0.7	0	0.7
1-Jan-16	13:15	0.04	0	0.04	0.7	0	0.7
1-Jan-16	13:20	0.04	0	0.04	0.7	0	0.7
1-Jan-16	13:25	0.04	0	0.04	0.7	0	0.7
1-Jan-16	13:30	0.04	0	0.04	0.7	0	0.7
1-Jan-16	13:35	0.03	0	0.03	0.6	0	0.6
1-Jan-16	13:40	0.03	0	0.03	0.5	0	0.5
1-Jan-16	13:45	0.03	0	0.03	0.5	0	0.5
1-Jan-16	13:50	0.03	0	0.03	0.5	0	0.5
1-Jan-16	13:55	0.03	0	0.03	0.5	0	0.5
1-Jan-16	14:00	0.03	0	0.03	0.5	0	0.5
1-Jan-16	14:05	0.03	0	0.03	0.5	0	0.5
1-Jan-16	14:10	0.03	0	0.03	0.5	0	0.5
1-Jan-16	14:15	0.03	0	0.03	0.6	0	0.6
1-Jan-16	14:20	0.03	0	0.03	0.5	0	0.5
1-Jan-16	14:25	0.03	0	0.03	0.5	0	0.5
1-Jan-16	14:30	0.03	0	0.03	0.5	0	0.5
1-Jan-16	14:35	0.03	0	0.03	0.5	0	0.5
1-Jan-16	14:40	0.03	0	0.03	0.5	0	0.5
1-Jan-16	14:45	0.03	0	0.03	0.5	0	0.5
1-Jan-16	14:50	0.03	0	0.03	0.5	0	0.5
1-Jan-16	14:55	0.03	0	0.03	0.5	0	0.5
1-Jan-16	15:00	0.03	0	0.03	0.5	0	0.5
1-Jan-16	15:05	0.03	0	0.03	0.5	0	0.5
1-Jan-16	15:10	0.03	0	0.03	0.5	0	0.5
1-Jan-16	15:15	0.03	0	0.03	0.5	0	0.5
1-Jan-16	15:20	0.03	0	0.03	0.5	0	0.5
1-Jan-16	15:25	0.03	0	0.03	0.5	0	0.5
1-Jan-16	15:30	0.03	0	0.03	0.5	0	0.5
1-Jan-16	15:35	0.02	0	0.02	0.5	0	0.5
1-Jan-16	15:40	0.02	0	0.02	0.4	0	0.4
1-Jan-16	15:45	0.02	0	0.02	0.4	0	0.4
1-Jan-16	15:50	0.02	0	0.02	0.4	0	0.4
1-Jan-16	15:55	0.02	0	0.02	0.4	0	0.4
1-Jan-16	16:00	0.02	0	0.02	0.4	0	0.4
1-Jan-16	16:05	0	0	0	0.3	0	0.3
1-Jan-16	16:10	0	0	0	0.2	0	0.2
1-Jan-16	16:15	0	0	0	0.1	0	0.1
1-Jan-16	16:20	0	0	0	0.1	0	0.1
1-Jan-16	16:25	0	0	0	0.1	0	0.1
1-Jan-16	16:30	0	0	0	0.1	0	0.1
1-Jan-16	16:35	0	0	0	0.1	0	0.1
1-Jan-16	16:40	0	0	0	0.1	0	0.1
1-Jan-16	16:45	0	0	0	0.1	0	0.1
1-Jan-16	16:50	0	0	0	0.1	0	0.1
1-Jan-16	16:55	0	0	0	0.1	0	0.1
1-Jan-16	17:00	0	0	0	0.1	0	0.1
1-Jan-16	17:05	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:10	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:15	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:20	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:25	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:30	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:35	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:40	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:45	0.01	0	0.01	0.1	0	0.1
1-Jan-16	17:50	0	0	0	0.1	0	0.1
1-Jan-16	17:55	0	0	0	0.1	0	0.1
1-Jan-16	18:00	0	0	0	0.1	0	0.1
1-Jan-16	18:05	0	0	0	0.1	0	0.1
1-Jan-16	18:10	0	0	0	0.1	0	0.1
1-Jan-16	18:15	0	0	0	0.1	0	0.1
1-Jan-16	18:20	0	0	0	0.1	0	0.1
1-Jan-16	18:25	0	0	0	0.1	0	0.1
1-Jan-16	18:30	0	0	0	0.1	0	0.1
1-Jan-16	18:35	0	0	0	0.1	0	0.1
1-Jan-16	18:40	0	0	0	0.1	0	0.1
1-Jan-16	18:45	0	0	0	0.1	0	0.1
1-Jan-16	18:50	0	0	0	0.1	0	0.1
1-Jan-16	18:55	0	0	0	0	0	0
1-Jan-16	19:00	0	0	0	0	0	0
1-Jan-16	19:05	0	0	0	0	0	0
1-Jan-16	19:10	0	0	0	0.1	0	0.1
1-Jan-16	19:15	0	0	0	0.1	0	0.1
1-Jan-16	19:20	0	0	0	0.1	0	0.1
1-Jan-16	19:25	0	0	0	0.1	0	0.1
1-Jan-16	19:30	0	0	0	0.1	0	0.1
1-Jan-16	19:35	0	0	0	0.1	0	0.1
1-Jan-16	19:40	0	0	0	0.1	0	0.1

1-Jan-16	19:45	0	0	0	0.1	0	0.1
1-Jan-16	19:50	0	0	0	0.1	0	0.1
1-Jan-16	19:55	0	0	0	0	0	0
1-Jan-16	20:00	0	0	0	0	0	0
1-Jan-16	20:05	0	0	0	0	0	0
1-Jan-16	20:10	0	0	0	0.1	0	0.1
1-Jan-16	20:15	0	0	0	0.1	0	0.1
1-Jan-16	20:20	0	0	0	0.1	0	0.1
1-Jan-16	20:25	0	0	0	0.1	0	0.1
1-Jan-16	20:30	0	0	0	0.1	0	0.1
1-Jan-16	20:35	0	0	0	0.1	0	0.1
1-Jan-16	20:40	0	0	0	0.1	0	0.1
1-Jan-16	20:45	0	0	0	0.1	0	0.1
1-Jan-16	20:50	0	0	0	0	0	0
1-Jan-16	20:55	0	0	0	0	0	0
1-Jan-16	21:00	0	0	0	0	0	0
1-Jan-16	21:05	0	0	0	0	0	0
1-Jan-16	21:10	0	0	0	0.1	0	0.1
1-Jan-16	21:15	0	0	0	0.1	0	0.1
1-Jan-16	21:20	0	0	0	0	0	0
1-Jan-16	21:25	0	0	0	0	0	0
1-Jan-16	21:30	0	0	0	0	0	0
1-Jan-16	21:35	0	0	0	0	0	0
1-Jan-16	21:40	0	0	0	0.1	0	0.1
1-Jan-16	21:45	0	0	0	0.1	0	0.1
1-Jan-16	21:50	0	0	0	0	0	0
1-Jan-16	21:55	0	0	0	0	0	0
1-Jan-16	22:00	0	0	0	0	0	0
1-Jan-16	22:05	0	0	0	0	0	0
1-Jan-16	22:10	0	0	0	0.1	0	0.1
1-Jan-16	22:15	0	0	0	0.1	0	0.1
1-Jan-16	22:20	0	0	0	0	0	0
1-Jan-16	22:25	0	0	0	0	0	0
1-Jan-16	22:30	0	0	0	0	0	0
1-Jan-16	22:35	0	0	0	0	0	0
1-Jan-16	22:40	0	0	0	0	0	0
1-Jan-16	22:45	0	0	0	0	0	0
1-Jan-16	22:50	0	0	0	0	0	0
1-Jan-16	22:55	0	0	0	0	0	0
1-Jan-16	23:00	0	0	0	0	0	0
1-Jan-16	23:05	0	0	0	0	0	0
1-Jan-16	23:10	0	0	0	0	0	0
1-Jan-16	23:15	0	0	0	0	0	0
1-Jan-16	23:20	0	0	0	0	0	0
1-Jan-16	23:25	0	0	0	0	0	0
1-Jan-16	23:30	0	0	0	0	0	0
1-Jan-16	23:35	0	0	0	0	0	0
1-Jan-16	23:40	0	0	0	0	0	0
1-Jan-16	23:45	0	0	0	0	0	0
1-Jan-16	23:50	0	0	0	0	0	0
1-Jan-16	23:55	0	0	0	0	0	0
2-Jan-16	0:00	0	0	0	0	0	0

NOISE AND VIBRATION IMPACT ANALYSIS

AM/PM GASOLINE SERVICE STATION

CITY OF MORENO VALLEY, RIVERSIDE COUNTY, CALIFORNIA

LSA

November 2017

NOISE AND VIBRATION IMPACT ANALYSIS

AM/PM GASOLINE SERVICE STATION

CITY OF MORENO VALLEY, RIVERSIDE COUNTY, CALIFORNIA

Prepared for:

Eric LeVaughn
Sater Oil International
683 Cliffside Drive
San Dimas, CA 91773

Prepared by:

LSA
7086 N. Maple, Suite 104
Fresno, California 93720
(559) 490-1210

Project No. SAT1701

LSA

November 2017

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LIST OF ABBREVIATIONS AND ACRONYMS

µin/sec	microinches per second
APN	Accessor's Parcel Number
ADT	average daily traffic
CEQA	California Environmental Quality Act
City	City of Moreno Valley
CNEL	Community Noise Equivalent Level
dB	decibels
dBA	A-weighted decibels
FHWA	Federal Highway Administration
ft	foot/feet
FTA	Federal Transit Administration
HP	horsepower
HVAC	heating, ventilation, and air conditioning
Hz	Hertz
in/sec	inches per second
kVA	kilovolt-amperes
L_{dn}	day-night average noise level
L_{eq}	equivalent continuous sound level
L_{max}	maximum instantaneous noise level
L_{min}	minimum instantaneous noise level
LSA	LSA Associates, Inc.
L_v	velocity in decibels
MPDs	multiple product dispensers
PPV	peak particle velocity
project	Sater ARCO AM/PM Gas Station
RCNM	Roadway Construction Noise Model
RIV	March Air Force Base
RMS	root-mean-square (velocity)
sf	square feet
Spec.	specification
U.S. EPA	U.S. Environmental Protection Agency
VdB	vibration velocity decibels
VMS	variable message sign
V_{ref}	reference velocity amplitude

INTRODUCTION

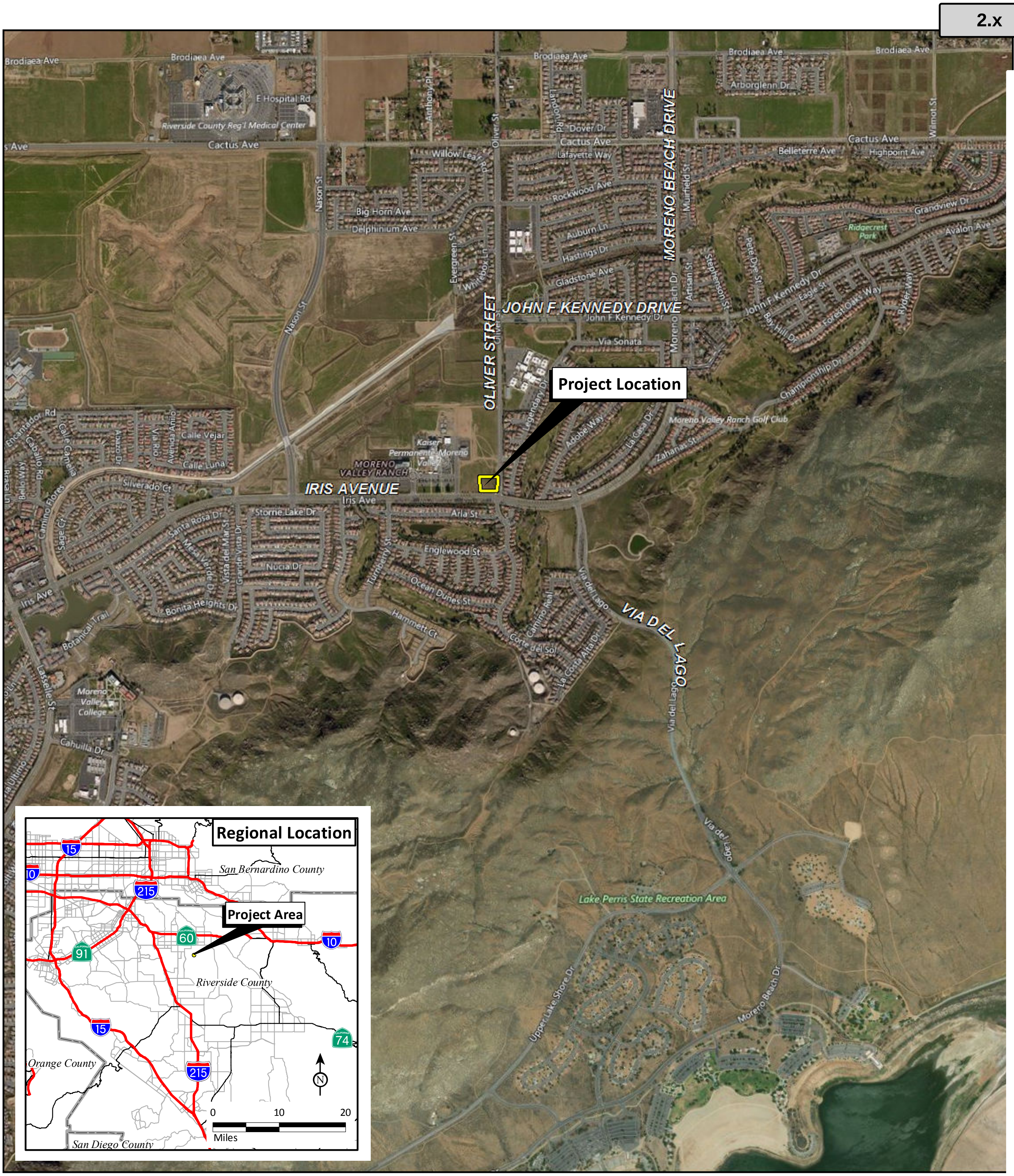
LSA Associates, Inc. (LSA) has completed a Noise Impact Analysis for the proposed Sater ARCO AM/PM Gas Station (project) in the City of Moreno Valley (City), Riverside County, California. This Noise Impact Analysis examines potential impacts from noise sources in the project vicinity, including local roadways, through noise monitoring and analysis. Noise modeling was conducted using the Federal Highway Administration (FHWA) highway traffic noise prediction model (FHWA RD-77- 108) to assess the existing roadway traffic noise levels in the project vicinity. Construction and operational noise levels were analyzed. Once operational, the project would generate noise through stationary sources, such as heating, ventilation, and air conditioning (HVAC) equipment and parking lot activities.

REGIONAL PROJECT LOCATION

The project site is 1.58 acres of undeveloped land located on the northwest corner of Iris Avenue and Oliver Street in the southern part of the City. The project site is approximately 3 miles south of State Route 60 (SR-60) and approximately 5.2 miles east of Interstate 215 (I-215). In addition, the Upland Game Hunting Area is located approximately 0.4 miles south of the project site. Figure 1 shows the Regional and Project Location while Figure 2 shows the Conceptual Site Plan. The project site is located within a commercial land use zone, while land uses surrounding the area are commercial and office zones to the west and north, and residential uses to the east and south. The project's accessor's parcel number (APN) is 486-310-038.

PROJECT DESCRIPTION

The proposed project would include a 3,800-square-foot (sf) AM/PM convenience store with 19 parking spaces. The project would also include a 42-foot by 116-foot canopy with eight multiple product dispensers (MPDs), two underground storage tanks between the fuel island and Oliver street, and a 24-foot by 100-foot drive-through car wash building with nine outdoor vacuum stalls. The car wash will be located on the western side of the project site operating from north to south with the exit facing Iris Avenue. The project proposes two 35-foot-wide access driveways. The centerline of one driveway would be located on the western border of the project site on Iris Avenue, approximately 261 feet west of Oliver Street, and would be a shared access driveway. The centerline of the second driveway would be on Oliver Street, approximately 138 feet north of Iris Avenue. For the purpose of this analysis, these access driveways will be referred to as Driveway 1 and Driveway 2, respectively, as shown in Figure 2.



LSA

LEGEND

▭ Project Boundary

FIGURE

N

0 1000 2000

FEET

ARCO Iris and Olive
Moreno Valle

Regional and Project Location

SOURCE: Bing Aerial, 2015; Riverside County, 2015.

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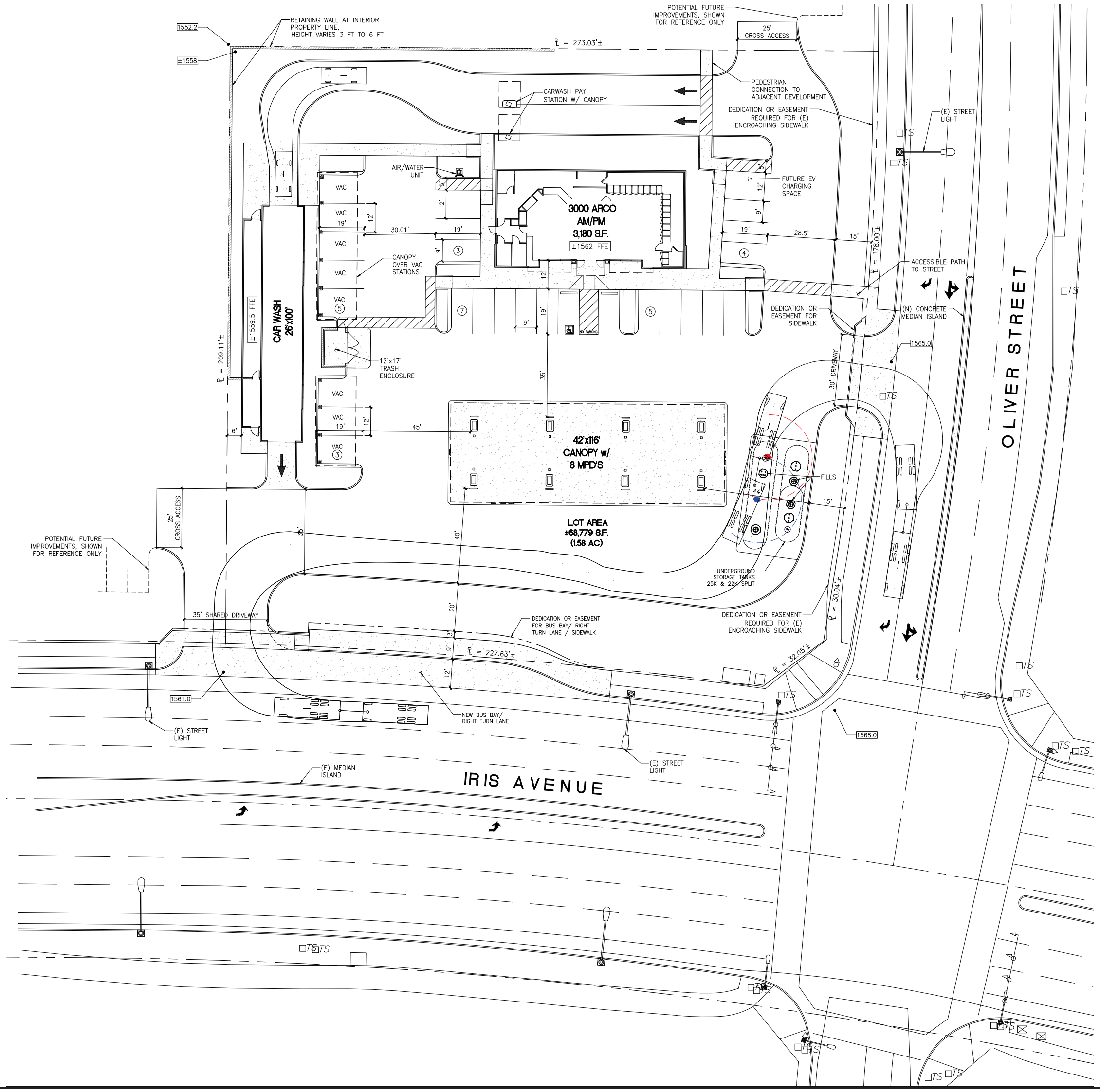
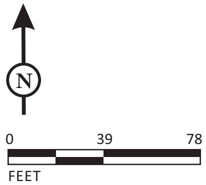


LSA

FIGURE 4



SOURCE: Barghausen Consulting Engineers, 2017.

ARCO Iris and Oliver
Moreno Valley

Conceptual Site Plan

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CHARACTERISTICS OF SOUND

Sound is increasing to such disagreeable levels in the environment that it can threaten quality of life. Noise is usually defined as unwanted sound. Noise consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation, and sleep.

To the human ear, sound has two significant characteristics: pitch and loudness. Pitch is generally an annoyance, while loudness can affect the ability to hear. Pitch is the number of complete vibrations, or cycles per second, of a wave resulting in the tone's range from high to low. Loudness is the strength of a sound that describes a noisy or quiet environment and is measured by the amplitude of the sound wave. Loudness is determined by the intensity of the sound waves combined with the reception characteristics of the human ear. Sound intensity refers to how hard the sound wave strikes an object, which in turn produces the sound's effect. This characteristic of sound can be precisely measured with instruments. The analysis of a project defines the noise environment of the project area in terms of sound intensity and its effect on adjacent sensitive land uses.

Measurement of Sound

Sound intensity is measured through the A-weighted scale to correct for the relative frequency response of the human ear. That is, an A-weighted noise level de-emphasizes low and very high frequencies of sound similar to the human ear's de-emphasis of these frequencies. Unlike linear units (e.g., inches or pounds), decibels are measured on a logarithmic scale representing points on a sharply rising curve.

For example, 10 decibels (dB) is 10 times more intense than 1 dB, 20 dB is 100 times more intense than 1 dB, and 30 dB is 1,000 times more intense than 1 dB. Thirty decibels (30 dB) represents a 1,000 times as much acoustic energy as 1 dB. The decibel scale increases on a logarithmic scale, representing the sound pressure energy. A sound as soft as human breathing is about 10 times greater than 0 dB. The decibel system of measuring sound gives a rough connection between the physical intensity of sound and its perceived loudness to the human ear. A 10 dB increase in sound level is perceived by the human ear as only a doubling of the loudness of the sound. Ambient sounds generally range from 30 dB (very quiet) to 100 dB (very loud).

Sound levels are generated from a source, and their decibel level decreases as the distance from that source increases. Sound dissipates exponentially with increasing distance from the noise source. For a single point source, sound levels decrease approximately 6 dB for each doubling of distance from the source. This drop-off rate is appropriate for noise generated by stationary equipment. If noise is produced by a line source (e.g., highway traffic or railroad operations) the sound decreases 3 dB for each doubling of distance in a hard site environment. Line source (noise in a relatively flat environment with absorptive vegetation) decreases 4.5 dB for each doubling of distance.

There are many ways to rate noise for various time periods, but an appropriate rating of ambient noise affecting humans also accounts for the annoying effects of sound. The equivalent continuous sound level (L_{eq}) is the total sound energy of time-varying noise over a sample period. However, the predominant rating scales for human communities in the State of California are the L_{eq} and

Attachment: Appendix I - Noise and Vibration Impact Analysis Study (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Community Noise Equivalent Level (CNEL) or the day-night average noise level (L_{dn}) based on A-weighted decibels (dBA). CNEL is the time-varying noise over a 24-hour period, with a 5 dBA weighting factor applied to the hourly L_{eq} for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as relaxation hours), and a 10 dBA weighting factor applied to noises occurring from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours). L_{dn} is similar to the CNEL scale but without the adjustment for events occurring during the evening hours. CNEL and L_{dn} are within 1 dBA of each other and are normally interchangeable. The City uses the CNEL noise scale for long-term noise impact assessment.

Other noise rating scales of importance when assessing the annoyance factor include the maximum instantaneous noise level (L_{max}), which is the highest exponential time-averaged sound level that occurs during a stated time period. The noise environments discussed in this analysis for short-term noise impacts are specified in terms of maximum levels denoted by L_{max}, which reflects peak operating conditions and addresses the annoying aspects of intermittent noise. It is often used together with another noise scale, or noise standards in terms of percentile noise levels, in noise ordinances for enforcement purposes. For example, the L_{10} noise level represents the noise level exceeded 10 percent of the time during a stated period. The L_{50} noise level represents the median noise level. Half the time the noise level exceeds this level, and half the time it is less than this level. The L_{90} noise level represents the noise level exceeded 90 percent of the time and is considered the background noise level during a monitoring period. For a relatively constant noise source, the L_{eq} and L_{50} are approximately the same.

Noise impacts can be described in three categories. The first category includes audible impacts that refer to increases in noise levels noticeable to humans. Audible increases in noise levels generally refer to a change of 3 dB or greater because this level has been found to be barely perceptible in exterior environments. The second category, potentially audible, refers to a change in the noise level between 1 dB and 3 dB. This range of noise levels has been found to be noticeable only in laboratory environments. The last category includes changes in noise levels of less than 1 dB, which are inaudible to the human ear. Only audible changes in existing ambient or background noise levels are considered potentially significant.

Physiological Effects of Noise

Physical damage to human hearing begins at prolonged exposure to noise levels higher than 85 dBA. Exposure to high noise levels affects the entire system, with prolonged noise exposure in excess of 75 dBA increasing body tensions, thereby affecting blood pressure and functions of the heart and the nervous system. In comparison, extended periods of noise exposure above 90 dBA would result in permanent cell damage. When the noise level reaches 120 dBA, a tickling sensation occurs in the human ear, even with short-term exposure. This level of noise is called the threshold of feeling. As the sound reaches 140 dBA, the tickling sensation is replaced by the feeling of pain in the ear (the threshold of pain). A sound level of 160–165 dBA will result in dizziness or loss of equilibrium. The ambient or background noise problem is widespread and generally more concentrated in urban areas than in outlying, less developed area. Table A lists definitions of acoustical terms, and Table B shows common sound levels and their sources.

Attachment: Appendix I - Noise and Vibration Impact Analysis Study (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Table A: Definitions of Acoustical Terms

Term	Definitions
Decibel, dB	A unit of measurement that denotes the ratio between two quantities that are proportional to power; the number of decibels is 10 times the logarithm (to the base 10) of this ratio.
Frequency, Hz	Of a function periodic in time, the number of times that the quantity repeats itself in 1 second (i.e., number of cycles per second).
A-Weighted Sound Level, dBA	The sound level obtained by use of A-weighting. The A-weighting filter deemphasizes the very low- and very high-frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. (All sound levels in this report are A-weighted, unless reported otherwise.)
L_{01}, L_{10}, L_{50}, L_{90}	The fast A-weighted noise levels that are equaled or exceeded by a fluctuating sound level 1%, 10%, 50%, and 90% of a stated time period.
Equivalent Continuous Noise Level, L_{eq}	The level of a steady sound that, in a stated time period and at a stated location, has the same A-weighted sound energy as the time-varying sound.
Community Noise Equivalent Level, CNEL	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 5 dBA to sound levels occurring in the evening from 7:00 PM to 10:00 PM and after the addition of 10 dBA to sound levels occurring in the night between 10:00 PM and 7:00 AM.
Day/Night Noise Level, L_{dn}	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 10 dBA to sound levels occurring in the night between 10:00 PM and 7:00 AM.
L_{max}, L_{min}	The maximum and minimum A-weighted sound levels measured on a sound level meter, during a designated time interval, using fast time averaging.
Ambient Noise Level	The all-encompassing noise associated with a given environment at a specified time; usually a composite of sound from many sources at many directions, near and far; no particular sound is dominant.
Intrusive	The noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content, as well as the prevailing ambient noise level.

Source: *Handbook of Acoustical Measurements and Noise Control* (Harris 1991).

CHARACTERISTICS OF GROUND-BORNE VIBRATION

Vibrating objects in contact with the ground radiate vibration waves through various soil and rock strata to the foundations of nearby buildings. As the vibration propagates from the foundation throughout the remainder of the building, the vibration of floors and walls may be perceptible from the rattling of windows or a rumbling noise. The rumbling sound caused by the vibration of room surfaces is called ground-borne noise. When assessing annoyance from ground-borne noise, vibration is typically expressed as root mean square (rms) velocity in units of decibels of 1 micro-inch per second.

To distinguish vibration levels from noise levels, the unit is written as “VdB.” Human perception to vibration starts at levels as low as 67 VdB and sometimes lower. Annoyances due to vibration in residential settings starts at approximately 70 VdB. Ground-borne vibrations are almost never annoying to people who are outdoors. Although the motion of the ground may be perceived, without the effects associated with the shaking of the building, the motion does not provoke the same adverse human reaction.

Table B: Common Sound Levels and Their Noise Sources

Noise Source	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Evaluations
Near Jet Engine	140	Deafening	128 times as loud
Civil Defense Siren	130	Threshold of Pain	64 times as loud
Hard Rock Band	120	Threshold of Feeling	32 times as loud
Accelerating Motorcycle at a Few Feet Away	110	Very Loud	16 times as loud
Pile Driver; Noisy Urban Street/Heavy City Traffic	100	Very Loud	8 times as loud
Ambulance Siren; Food Blender	95	Very Loud	—
Garbage Disposal	90	Very Loud	4 times as loud
Freight Cars; Living Room Music	85	Loud	—
Pneumatic Drill; Vacuum Cleaner	80	Loud	2 times as loud
Busy Restaurant	75	Moderately Loud	—
Near Freeway Auto Traffic	70	Moderately Loud	—
Average Office	60	Quiet	One-half as loud
Suburban Street	55	Quiet	—
Light Traffic; Soft Radio Music in Apartment	50	Quiet	One-quarter as loud
Large Transformer	45	Quiet	—
Average Residence without Stereo Playing	40	Faint	One-eighth as loud
Soft Whisper	30	Faint	—
Rustling Leaves	20	Very Faint	—
Human Breathing	10	Very Faint	Threshold of Hearing
—	0	Very Faint	—

Source: Compiled by LSA (2015).

Common sources of ground-borne vibration include trains and construction activities such as blasting, pile driving and operating heavy earthmoving equipment. Typical vibration source levels from construction equipment are shown in Table C. Although the table gives one level for each piece of equipment, it should be noted that there is a considerable variation in reported ground vibration levels from construction activities. The data provides a reasonable estimate for a wide range of soil conditions. In extreme cases, excessive ground-borne vibration has the potential to cause structural damage to buildings. For buildings considered of particular historical significance or that are particularly fragile structures, the damage threshold is approximately 96 VdB; the damage threshold for other structures is 100 VdB.[1]

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[1] Harris, C.M., 1998. *Handbook of Acoustical Measurements and Noise Control.*

REGULATORY FRAMEWORK

Federal Regulations

The federal, State, and local framework for noise standards is outlined below. The City of Moreno Valley has established standards in the General Plan and in the Municipal Code for land use projects that could potentially expose sensitive receptors to excessive noise levels.

U.S. Environmental Protection Agency

In 1972 Congress enacted the Noise Control Act. This act authorized the U.S. Environmental Protection Agency (U.S. EPA) to publish descriptive data on the effects of noise and establish levels of sound requisite to protect the public welfare with an adequate margin of safety. These levels are separated into health (hearing loss levels) and welfare (annoyance levels), as shown in Table D. The U.S. EPA cautions that these identified levels are not standards because they do not take into account the cost or feasibility of the levels.

For protection against hearing loss, 96 percent of the population would be protected if sound levels are less than or equal to an $L_{eq(24)}$ of 70 dBA. The "(24)" signifies an L_{eq} duration of 24 hours. The U.S. EPA activity and interference guidelines are designed to ensure reliable speech communication at about 5 feet in the outdoor environment. For outdoor and indoor environments, interference with activity and annoyance should not occur if levels are below 55 dBA and 45 dBA, respectively.

Table C: Typical Vibration Source Levels for Construction Equipment

Equipment		PPV at 25 feet (in/sec)	Approximate VdB at 25 feet
Pile Driver	Upper range	1.518	112
(impact)	Typical	0.644	104
Pile Driver	Upper range	0.734	105
(sonic)	Typical	0.170	93
Clam shovel drop (slurry wall)		0.202	94
Hydromill	In soil	0.008	66
(slurry wall)	In rock	0.017	75
Vibratory roller		0.210	94
Hoe ram		0.089	87
Large bulldozer		0.089	87
Caisson drilling		0.089	87
Loaded trucks		0.076	86
Jackhammer		0.035	79
Small bulldozer		0.003	58

Source: Federal Transit Administration, 2006. *Transit Noise and Vibration Impact Assessment*. May.

Notes: PPV= peak particle velocity; in/sec= inches per second

Table D: Summary of U.S. EPA Noise Levels

Effect	Level	Area
Hearing loss	$L_{eq}(24) \leq 70$ dB	All areas.
Outdoor activity interference and annoyance	$L_{dn} \leq 55$ dB	Outdoors in residential areas and farms and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use.
	$L_{eq}(24) \leq 55$ dB	Outdoor areas where people spend limited amounts of time, such as school yards, playgrounds, etc.
Indoor activity interference and annoyance	$L_{eq} \leq 45$ dB	Indoor residential areas.
	$L_{eq}(24) \leq 45$ dB	Other indoor areas with human activities such as schools, etc.

Source: U.S. Environmental Protection Agency, 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. March.

The noise effects associated with an outdoor L_{dn} of 55 dBA are summarized in Table E. At 55 dBA L_{dn}, 95 percent sentence clarity (intelligibility) may be expected at 11 feet, and no community reaction. However, 1 percent of the population may complain about noise at this level and 17 percent may indicate annoyance.

State of California

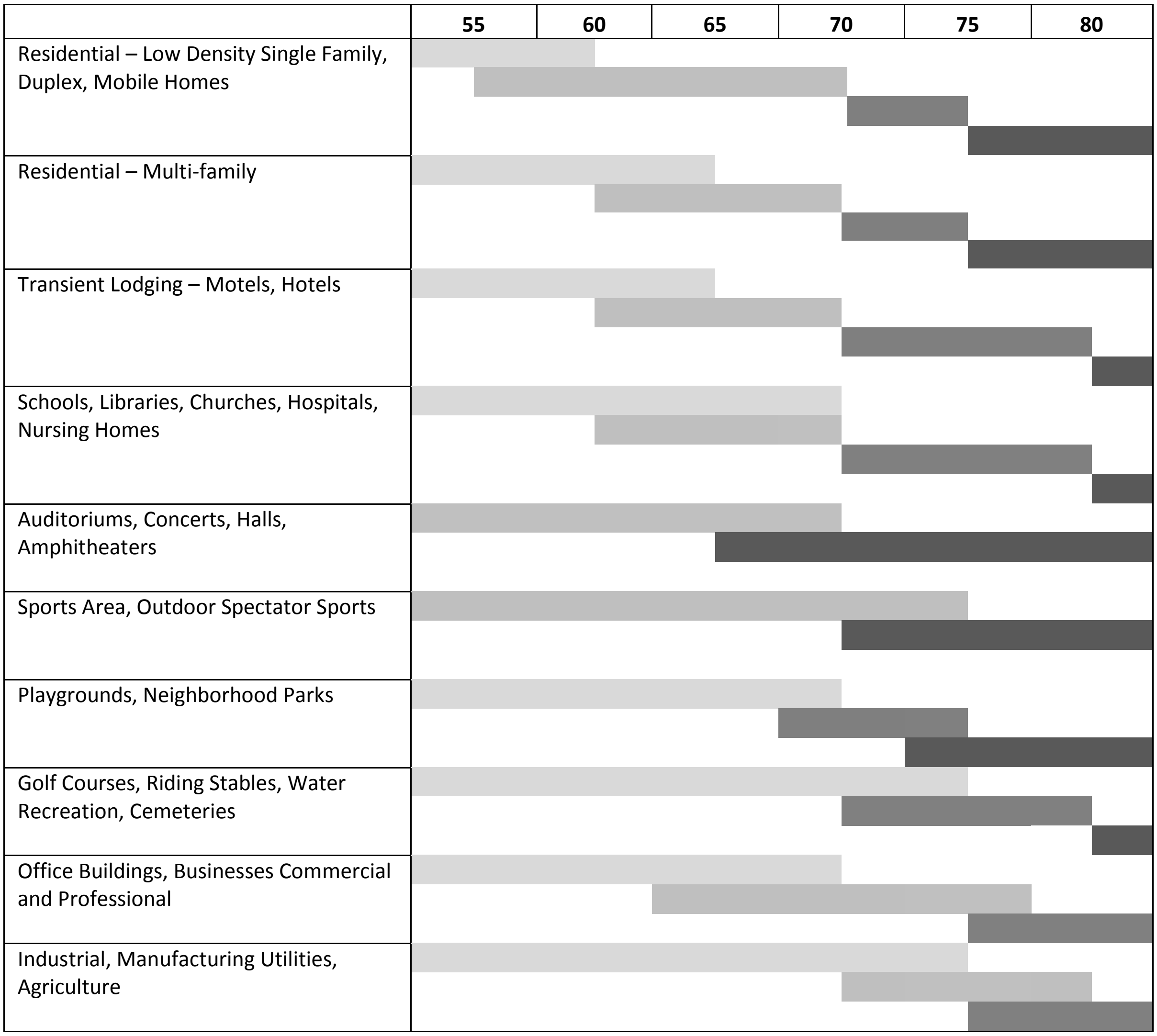
The State of California has established regulations that help prevent adverse impacts to occupants of buildings located near noise sources. Referred to as the *State Noise Insulation Standard*, it requires buildings to meet performance standards through design and/or building materials that would offset any noise source in the vicinity of the receptor. State regulations include requirements for the construction of new hotels, motels, apartment houses, and dwellings other than detached single-family dwellings that are intended to limit the extent of noise transmitted into habitable spaces. These requirements are found in the California Code of Regulations, Title 24 (known as the Building Standards Administrative Code), Part 2 (known as the California Building Code), Appendix Chapters 12 and 12A. For limiting noise transmitted between adjacent dwelling units, the noise insulation standards specify the extent to which walls, doors, and floor ceiling assemblies must block or absorb sound. For limiting noise from exterior noise sources, the noise insulation standards set an interior standard of 45 dBA CNEL in any habitable room with all doors and windows closed. In addition, the standards require preparation of an acoustical analysis demonstrating the manner in which dwelling units have been designed to meet this interior standard, where such units are proposed in an area with exterior noise levels greater than 60 dBA CNEL. The State has also established land use compatibility guidelines for determining acceptable noise levels for specified land uses, as shown in Table F.

Table E: Summary of Human Effects in Areas Exposed to 55 dBA L_{dn}

Type of Effects	Magnitude of Effect
Speech – Indoors	100 percent sentence intelligibility (average) with a 5 dB margin of safety
Speech – Outdoors	100 percent sentence intelligibility (average) at 1.4 feet 99 percent sentence intelligibility (average) at 3.2 feet 95 percent sentence intelligibility (average) at 11.5 feet
Average Community Reaction	None evident; 7 dB below level of significant complaints and threats of legal action and at least 16 dB below “vigorous action”
Complaints	1 percent dependent on attitude and other non-level related factors
Annoyance	17 percent dependent on attitude and other non-level related factors
Attitude Towards Area	Noise essentially the least important of various factors

Source: U.S. Environmental Protection Agency, 1974. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. March.

Table F: Community Noise Exposure L_{dn} or CNEL, dB



Normally Acceptable	░	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
Conditionally Acceptable	▒	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with windows closed and fresh air supply systems or air conditioning will normally suffice.
Normally Unacceptable	▓	New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
Clearly Unacceptable	█	New construction or development should generally not be undertaken.

Source: Office of Planning and Research, 2003.

Local Regulations

City of Moreno General Plan

The City of Moreno Valley addresses noise in the City's Safety Element of the General Plan.[2] The goals, objectives, and policies in the City's General Plan are designed to provide noise compatible land use relationships by establishing noise standards utilized for design and siting purposes and minimize noise impacts from significant noise generators. The following policies are applicable to the proposed project:

- Policy 6.4.1: Site, landscape and architectural design features shall be encouraged to mitigate noise impacts for new developments, with a preference for noise barriers that avoid freeway sound barrier walls.

- Policy 6.4.2: Construction activities shall be operated in a manner that limits noise impacts on surrounding uses.

- Policy 6.5.1: New commercial and industrial activities (including the placement of mechanical equipment) shall be evaluated and designed to mitigate noise impacts on adjacent uses.

City of Moreno Valley Municipal Code

The City of Moreno Valley addresses stationary and construction noise in chapter 11.80 of the Municipal Code.[3]

General Sound Level Standards. Section 11.80 of the City's Municipal Code defines and regulates noise standards for public health and safety. No person shall create any sound, or allow the creation of any sound, on any property that causes a disturbance on another property or may cause permanent hearing loss. Table G shows the City's maximum sound levels for source land uses. No person shall create a non-impulsive sound exceeding the limits shown in Table G when the source is on public right-of-way, public space, or other publicly owned property. If the source occurs on privately owned property, the sound emitted may not exceed the limits in Table G when measured 200 feet from the real property line of the source of the sound.

Table G: Maximum Sound Levels for Source Land Uses

Residential		Commercial	
Daytime	**Nighttime**	**Daytime**	**Nighttime**
60 dBA	55 dBA	65 dBA	60 dBA

Source: City of Moreno Valley, *Municipal Code Chapter 11.80.030*, September 2017
dBA = A-weighted decibels

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[2] Moreno Valley, City of, 2006. *Moreno Valley General Plan*. July 11.

[3] City of Moreno Valley municipal codes are accessible via their website: qcode.us/codes/morenovalley, accessed September 2017.

Construction Hours. Section 11.80.030(D)(9) of the City's Municipal Code limits construction and demolition activities to between the hours of 7:00 a.m. and 8:00 p.m. every day. No person shall operate or allow the operation of any electrical, mechanical, or gasoline motor driven power tool during night time hours to prevent noise disturbances across residential properties.

THRESHOLDS OF SIGNIFICANCE

Based on *Guidelines for the Implementation of the California Environmental Quality Act* (CEQA), Appendix G, Public Resource Code Sections 15000–15387, a project will normally have a significant effect on the environment related to noise if it will substantially increase the ambient noise levels for adjoining areas or conflict with adopted environmental plans and the goals of the community in which it is located. The applicable noise standards governing the project site are the criteria in the Noise Element of the Moreno Valley General Plan and Chapter 11.80 of the City's Municipal Code.

OVERVIEW OF THE EXISTING NOISE ENVIRONMENT

In Moreno Valley, vehicle traffic is the primary source of noise. Other significant local noise sources include railroad noise, airport noise, industrial noise, construction noise, mechanical equipment noise, portable power noise, and amplified sound.

This section describes the existing noise environment in the project site vicinity. Noise monitoring, traffic modeling, and noise modeling were used to quantify existing and future noise levels at the project site.

Ambient Noise Levels

To assess existing noise levels, LSA conducted four short-term noise measurements on and around the project site on October 10, 2017. The short-term (20-minute) noise measurements were recorded at different locations between 10:16 a.m. and 12:04 p.m.. Noise measurements at these times show the typical baseline ambient noise level. Noise measurement data collected during the short-term noise monitoring is summarized in Table H.

Table H: Ambient Noise Monitoring Results, dBA

Location Number	Location Description	Start Time	L_{eq} [a]	L_{max} [b]	L_{min} [c]	Primary Noise Sources
ST-1	South side of project site. Northeast of bus stop.	11:13 a.m.	59.9	87.2	37.4	Traffic on Iris Avenue.
ST-2	East edge of project site.	11:44 a.m.	53.9	71.5	37.4	Traffic on Iris Avenue and Oliver Street.
ST-3	Next to backyards of 15465 Legendary Drive and 15455 Legendary Drive. Northeast of intersection of Iris Avenue and Oliver Street.	10:45 a.m.	60.0	76.9	34.6	Traffic on Iris Avenue and Oliver Street.
ST-4	Southeast of intersection of Iris Avenue and Oliver Street. North of backyard of 15555 Oliver Street.	10:16 a.m.	61.8	75.6	36.4	Traffic on Iris Avenue.

[a] L_{eq} represents the average of the sound energy occurring over the measurement time period for the short-term noise measurements.
[b] L_{max} is the highest sound level measured during the measurement time period.
[c] L_{min} is the lowest sound level measured during the measurement time period.
Source: LSA, October 2017.

As shown in Table H, the short-term noise measurements indicate that ambient noise in the project site vicinity ranges from approximately 53.9 dBA to 61.8 dBA L_{eq}. Traffic on Iris Avenue and Oliver Street was reported as the primary noise source. The meteorological conditions at the time of the noise monitoring are shown in Table I.

Table I: Meteorological Conditions During Ambient Noise Monitoring

Location Number	Maximum Wind Speed (mph)	Average Wind Speed (mph)	Temperature (˚F)	Relative Humidity (%)	Sky Conditions
ST-1	6.2	2.2	81.4	5.1	Sunny and clear
ST-2	10.2	2.6	88.4	6.8	Sunny and clear
ST-3	2.6	0.6	81.6	7.9	Sunny and clear
ST-4	5.6	1.2	80.8	7.9	Sunny and clear

Source: LSA, October 2017.

Sensitive Receptors

Certain land uses are considered more sensitive to noise than others. Examples of these include residential areas, educational facilities, hospitals, childcare facilities, and senior housing. The project site is located within a commercial zone adjacent to offices. The nearest sensitive receptors are single family residences located approximately 85 feet east of the project site across Oliver Street and the single family residences located approximately 150 feet south of the project site across Iris Avenue. The residences to the east are bordered by a concrete fence and the residences to the south are either raised in elevation or bordered by a concrete fence, reducing potential noise exposure. In addition, Kaiser Permanente, a medical center, is located approximately 700 feet to the northwest, and Landmark Middle School is approximately a quarter mile to the north on Oliver Street.

Aircraft Noise

Airport related noise levels are primarily associated with aircraft engine noise made while aircraft are taking off, landing, or running their engines while still on the ground. The closest airport to the proposed project site is March Air Force Base (RIV) located approximately 3.5 miles west of the program's site. Aircraft noise is rarely audible at the project site; and, no portion of the project site lies within the 55 dBA CNEL noise contours of the airport.

Vehicular Traffic Noise

Motor vehicles with their distinctive noise characteristics are a major source of noise in the city of Moreno Valley. The amount of noise varies according to many factors, such as volume of traffic, vehicle mix (percentage of cars and trucks), average traffic speed, and distance from the observer. Major contributing roadway noise sources in the project vicinity include Iris Avenue and Oliver Street, as well as other arterial and collector roadways throughout the City.

Existing roadway traffic noise levels in the project vicinity were assessed using the FHWA highway traffic noise prediction model (FHWA RD-77- 108). This model uses a typical vehicle mix for urban/suburban areas in California and requires parameters, including traffic volumes, vehicle speed, and roadway geometry, to compute typical equivalent noise levels during daytime, evening, and nighttime hours. The resultant noise levels are weighted and summed over 24-hour periods to determine the CNEL values. Existing traffic noise contours along modeled roadway segments are shown in Table J. These noise levels represent the worst-case scenario, which assumes that no shielding is provided between the traffic and the location where the noise contours are drawn. Appendix A provides the specific assumptions used in developing these noise levels and model printouts.

Table J: Existing Traffic Noise Levels Without Project

Roadway Segment	ADT	Centerline to 70 dBA CNEL (feet)	Centerline to 65 dBA CNEL (feet)	Centerline to 60 dBA CNEL (feet)	CNEL (dBA) 50 feet from Centerline of Outermost Lane
Oliver Street - John F. Kennedy Drive to Project Driveway 2	2,700	< 50	< 50	< 50	57.4
Oliver Street - Driveway 2 to Iris Avenue	2,700	< 50	< 50	< 50	57.4
Iris Avenue - Nason Street to Kaiser Hospital Entrance	20,300	75	146	307	68.9
Iris Avenue - Kaiser Hospital Entrance to Project Driveway 1	17,000	69	131	274	68.1
Iris Avenue - Project Driveway 1 to Oliver Street	17,000	69	131	274	68.1
Iris Avenue - Oliver Street to Via Del Lago	14,200	63	117	243	67.3

Source: LSA, October 2017.

Notes: Traffic noise within 50 feet of the roadway centerline should be evaluated with site-specific information.

Shaded cells indicate road segments directly adjacent to the project.

ADT rounded to nearest hundred.

ADT = average daily traffic

CNEL = Community Noise Equivalent Level

dBA = A-weighted decibels

IMPACTS

Short-Term Construction Noise Impacts

Construction activities associated with the proposed project could result in substantial temporary or periodic increases in ambient noise levels. Maximum construction noise would be short-term, generally intermittent depending on the construction phase, and variable depending on receiver distance from the active construction zone. The duration of noise impacts generally would be from one day to several days depending on the phase of construction. The level and types of noise impacts that would occur during construction are described below.

Short-term noise impacts would occur during grading and site preparation activities. Table K lists typical construction equipment noise levels (L_{max}) recommended for noise impact assessments, based on a distance of 50 feet between the equipment and a noise receptor, obtained from the FHWA Roadway Construction Noise Model. Construction-related short-term noise levels would be higher than existing ambient noise levels currently in the project area but would no longer occur once construction of the project is completed.

Attachment: Appendix I - Noise and Vibration Impact Analysis Study (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Table K: Noise Emission Reference Levels and Usage Factors

Equipment Description	Acoustical Usage Factor[1]	Predicted L_{max} at 50 feet (dBA, slow)[2]	Actual Measured L_{max} at 50 feet (dBA, slow)[3]
All Other Equipment > 5 HP	50	85	N/A[4]
Auger Drill Rig	20	85	84
Backhoe	40	80	78
Boring Jack Power Unit	50	80	83
Chain Saw	20	85	84
Clam Shovel (dropping)	20	93	87
Compactor (ground)	20	80	83
Compressor (air)	40	80	78
Concrete Batch Plant	15	83	N/A
Concrete Mixer Truck	40	85	79
Concrete Pump Truck	20	82	81
Concrete Saw	20	90	90
Crane	16	85	81
Dozer	40	85	82
Drill Rig Truck	20	84	79
Dump Truck	40	84	76
Excavator	40	85	81
Flat Bed Truck	40	84	74
Front-End Loader	40	80	79
Generator	50	82	81
Grader	40	85	N/A
Grapple (on backhoe)	40	85	87
Jackhammer	20	85	89
Man Lift	20	85	75
Mounted Impact Hammer (hoe ram)	20	90	90
Pavement Scarifier	20	85	90
Paver	50	85	77
Pickup Truck	40	55	75
Pneumatic Tools	50	85	85
Pumps	50	77	81
Roller	20	85	80
Scraper	40	85	84
Sheers (on backhoe)	40	85	96
Soil Mix Drill Rig	50	80	N/A
Tractor	40	84	N/A
Vacuum Excavator (Vac-Truck)	40	85	85
Vacuum Street Sweeper	10	80	82
Vibratory Concrete Mixer	20	80	80
Vibratory Pile Driver	20	95	101
Warning Horn	5	85	83
Welder/Torch	40	73	74

Source: *FHWA Highway Construction Noise Handbook*, Table 9.1, FHWA 2006.

Note: Noise levels reported in this table are rounded to the nearest whole number.

[1] Usage factor is the percentage of time during a construction noise operation that a piece of construction equipment is operating at full power.

[2] Maximum noise levels were developed based on Specification (Spec.) 721.560 from the Central Artery/Tunnel (CA/T) program to be consistent with the City of Boston's Noise Code for the "Big Dig" project.

[3] The maximum noise level was developed based on the average noise level measured for each piece of equipment during the CA/T program in Boston, Massachusetts.

[4] Since the maximum noise level based on the average noise level measured for this piece of equipment was not available, the maximum noise level developed based on Spec 721.560 would be used.

dBA = A-weighted decibels; HP = horsepower; L_{max} = maximum instantaneous noise level; kVA = kilovolt-amperes; N/A = not applicable; RCNM = Roadway Construction Noise Model ; VMS = variable message sign

Two types of short-term noise impacts could occur during construction of the proposed project. The first type involves construction crew commutes and the transport of construction equipment and materials (using trucks) to the site for the proposed project, which would incrementally increase noise levels on roads leading to the site. As shown in Table K, there would be a relatively high single-event noise exposure potential at a maximum level of 84 dBA L_{max} with trucks passing at 50 feet.

The second type of short-term noise impact is related to noise generated during excavation, grading, and construction on the project site. Construction is performed in discrete steps, or phases, each with its own mix of equipment and, consequently, its own noise characteristics. These various sequential phases would change the character of the noise generated on site. Therefore, the noise levels vary as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase.

Typical maximum noise levels range up to 86 dBA L_{max} at 50 feet during the noisiest construction phases. The site preparation phase, including excavation and grading of the site, tends to generate the highest noise levels because earthmoving machinery is the noisiest construction equipment. Earthmoving equipment includes excavating machinery such as back fillers, bulldozers, draglines, and front loaders. Earthmoving and compacting equipment includes compactors, scrapers, and graders. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full-power operation followed by 3 or 4 minutes at lower power settings.

The nearest sensitive receptors that may be subject to construction noise include the single family residences located approximately 85 feet east of the project site across Oliver Street. At 85 feet, noise levels would attenuate approximately 5 dBA from the increased distance compared to the noise level measured at 50 feet from the active construction area. In addition to distance damping, for a conservative analysis, the current concrete fence bordering the residents to the east may reduce noise exposure by 5 to 10 dBA. Therefore, the closest sensitive receptors may be subject to short-term construction noise reaching 76 dBA L_{max} when construction occurs at the project site boundary. However, when LSA conducted ambient noise monitoring for the project on site, at location ST-3, which was monitored on the outer border of the residencies to the east, LSA measured an L_{max} of 76.9 dBA. Therefore, the closest sensitive receptor would not be exposed to a temporary increase in noise levels. In addition, construction noise is permitted by the City when activities occur between the hours of 7:00 a.m. and 8:00 p.m. daily, however mitigation measures should be implemented to reduce impacts to the extent feasible.

As discussed above, construction noise would result in a temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. Implementation of best management practices for project construction, as identified as Mitigation Measure NOISE-1 below, would reduce potential construction period noise impacts for the indicated sensitive receptors.

Short-Term Construction Vibration Impacts

Vibration refers to ground-borne noise and perceptible motion. Ground-borne vibration is almost exclusively a concern inside buildings and is rarely perceived as a problem outdoors. Vibration energy propagates from a source, through intervening soil and rock layers, to the foundations of nearby buildings. The vibration then propagates from the foundation throughout the remainder of the structure. Building vibration may be perceived by the occupants as the motion of building surfaces, rattling of items on shelves or hanging on walls, or as a low-frequency rumbling noise. The rumbling noise is caused by the vibrating walls, floors, and ceilings radiating sound waves. Annoyance from vibration often occurs when the vibration exceeds the threshold of perception by 10 dB or less. This is an order of magnitude below the damage threshold for normal buildings.

Typical sources of ground-borne vibration are construction activities (e.g., pavement breaking and operating heavy-duty earthmoving equipment), and occasional traffic on rough roads. In general, ground-borne vibration from standard construction practices is only a potential issue when it occurs within 25 feet of sensitive uses. Ground-borne vibration levels from construction activities very rarely reach levels that can damage structures; however, these levels are perceptible near the active construction site. With the exception of old buildings built prior to the 1950s or buildings of historic significance, potential structural damage from heavy construction activities rarely occurs. When roadways are smooth, vibration from traffic (even heavy trucks) is rarely perceptible.

The nearest sensitive receptors that may be subject to vibration impacts during construction include the single family residences located approximately 85 feet east of the project site across Oliver Street. Vibration levels calculated in RMS are best for characterizing human response to building vibration, while vibration levels in PPV are best used to characterize potential for building damage. Therefore, this construction vibration impact analysis discusses the level of human annoyance using vibration levels in VdB and will assess the potential for building damages using vibration levels in PPV (in/sec). The Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment*[4] guidelines indicate that a vibration level up to 102 VdB (an equivalent to 0.5 in/sec in PPV) is considered safe for buildings consisting of reinforced concrete, steel, or timber (no plaster), and would not result in any construction vibration damage. For a non-engineered timber and masonry building, the construction vibration damage criterion is 94 VdB (0.2 in/sec in PPV).

Table L shows the PPV and VdB values at 25 feet from a construction vibration source. As shown in Table L, bulldozers and other heavy-tracked construction equipment (except for pile drivers and vibratory rollers) generate approximately 87 VdB of ground-borne vibration when measured at 25 feet, based on the Transit Noise and Vibration Impact Assessment. At this level, ground-borne vibration would result in potential annoyance to residences and workers, but would not cause any damage to the buildings. Construction vibration, similar to vibration from other sources, would not have any significant effects on outdoor activities (e.g., those outside of residences and commercial/ office buildings in the project vicinity). Outdoor site preparation for the project is expected to use a bulldozer and loaded truck. The greatest levels of vibration are anticipated to occur during the site preparation phase. All other phases are expected to result in lower vibration levels. The distance to the nearest buildings for vibration impact analysis is measured between the nearest off-site

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[4] Federal Transit Administration, 2006. Office of Planning and Environment. *Transit Noise and Vibration Impact Assessment*. FTA-VA-90-1003-06. May.

buildings and the project boundary (assuming the construction equipment would be used at or near the project boundary) because vibration impacts occur normally within the buildings. The formula for vibration transmission is provided below, where D is the distance between the vibration source and receiver.

$$L_v dB\ (D) = L_v dB\ (25\ ft) – 30\ Log\ (D/25)$$

$$PPV_{equip} = PPV_{ref}\ x\ (25/D)^{1.5}$$

Table L: Vibration Source Amplitudes for Construction Equipment

Equipment	Reference PPV/L_V at 25 feet	
	PPV (in/sec)	L_V (VdB)[1]
Pile Driver (Impact), Typical	0.644	104
Pile Driver (Sonic), Typical	0.170	93
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large Bulldozer[2]	**0.089**	**87**
Caisson Drilling	0.089	87
Loaded Trucks	**0.076**	**86**
Jackhammer	0.035	79
Small Bulldozer	0.003	58

Sources: *Transit Noise and Vibration Impact Assessment* (FTA 2006).

[1] RMS vibration velocity in decibels (VdB) is 1 μin/sec.

[2] Equipment shown in **bold** is expected to be used on site.

μin/sec = micro-inches per second
FTA = Federal Transit Administration
in/sec = inches per second
L_V = velocity in decibels
PPV = peak particle velocity
RMS = root-mean-square
VdB = vibration velocity decibels

For typical construction activity, the equipment with the highest vibration generation potential is the large bulldozer, which would generate 87 VdB at 25 feet. The closest residential structures are located 85 feet from the project construction boundary. Based on distance attenuation, the closest residences would experience vibration levels of up to 71 VdB (0.014 PPV [in/sec]). This vibration level at the closest residential structures from construction equipment would not exceed the FTA threshold of 94 VdB (0.2 in/sec PPV) for building damage. This level is also below the FTA's "barely perceptible" human response criteria of 0.04 PPV for transient sources of vibration events. Therefore, ground-borne vibration impacts from project-related construction activities would be considered less-than-significant.

Long-Term Noise Impacts

The proposed project would include a convenience store, fueling stations, and a car wash in a developed area of the City. Operational noise can be categorized as mobile source noise and stationary source noise. Mobile source noise would be attributable to the additional trips that would be a result of the proposed project. Stationary source noise includes noise generated by the proposed project, such as parking lot activities and the car wash.

Long-Term Traffic Noise Impacts

To assess traffic noise impacts, the traffic noise levels along major roadway segments within the project vicinity were projected using FHWA modeling to predict traffic noise level conditions with and without the proposed project. FWHA modeling was based on existing traffic conditions, FWHA modeling results are summarized in Table M and Table N below. The table includes projected traffic noise levels as measured at 50 feet from the centerline of the outermost traveled lane along the modeled roadway segments. The model does not account for existing sound walls or terrain features that could reduce traffic noise levels at adjacent land uses, but rather assumes a reasonable worst-case direct line-of-sight over hard surface to the modeled traffic noise sources. Appendix A provides the specific assumptions used in developing these noise levels and model printouts.

Tables M and N show a minor change in the traffic noise levels associated with the implementation of the proposed project. The largest increase in traffic-related noise as a result of the project would occur on the east side of the project site on Oliver Street between Driveway 2 and Iris Avenue. This increase in traffic would occur due to the addition of an AM/PM convenience store, eight fueling stations, and a drive through car wash adjacent to residences. Oliver Street could result in an up to 1.2 dBA increase over existing conditions. This noise level would not exceed the 3 dBA increase considered to be perceptible by the human ear in an outdoor environment. The resulting noise level along Oliver Street would be approximately 58.6 dBA CNEL, which would be lower than existing noise associated with other surrounding roadways (i.e. Iris Avenue) and would be in the normally acceptable range for residential and commercial land uses. Noise along the southern border of the project site adjacent to Iris Avenue would result in an increase of 0.2 dBA from baseline conditions. This noise level increase is less than the 3 dBA increase considered to be perceptible by the human ear in an outdoor environment and the resulting noise level would be 68.3 dBA CNEL, which would remain conditionally acceptable for residential land uses and normally acceptable for commercial land uses. Therefore, no significant traffic noise impacts would occur for off-site land uses. As a result, no mitigation is required to address traffic-related noise.

Table M: Existing Traffic Noise Levels Without and With Project (2017)

Roadway Segment	Existing Traffic Volumes (2017)										
	Without Project					With Project					
	ADT	Centerline to 70 CNEL (feet)	Centerline to 65 CNEL (feet)	Centerline to 60 CNEL (feet)	CNEL (dBA) 50 feet from Centerline of Outermost Lane	ADT	Increase in ADT	Centerline to 70 CNEL (feet)	Centerline to 65 CNEL (feet)	Centerline to 60 CNEL (feet)	CNEL (dBA) 50 feet from Centerline of Outermost Lane	Increase from Baseline Conditions
Oliver Street - John F. Kennedy Drive to Project Driveway 2	2,700	< 50	< 50	< 50	57.4	2,900	200	< 50	< 50	< 50	57.7	0.3
Oliver Street - Driveway 2 to Iris Avenue	2,700	< 50	< 50	< 50	57.4	3,500	800	< 50	< 50	56	58.6	1.2
Iris Avenue - Nason Street to Kaiser Hospital Entrance	20,300	75	146	307	68.9	21,100	800	77	150	315	69.1	0.2
Iris Avenue - Kaiser Hospital Entrance to Project Driveway 1	17,000	69	131	274	68.1	17,800	800	70	135	282	68.3	0.2
Iris Avenue - Project Driveway 1 to Oliver Street	17,000	69	131	274	68.1	17,800	800	70	135	282	68.3	0.2
Iris Avenue - Oliver Street to Via Del Lago	14,200	63	117	243	67.3	14,900	700	65	121	251	67.5	0.2

Source: LSA, October 2017.
Notes: Traffic noise within 50 feet of the roadway centerline should be evaluated with site-specific information.
Shaded cells indicate road segments directly adjacent to the project.
ADT rounded to nearest hundred.
ADT = average daily traffic
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels

Table N: Future Traffic Noise Levels Without and With Project (2022)

Roadway Segment	Opening Year Traffic Volumes (2022)										
	Without Project					With Project					
	ADT	Centerline to 70 CNEL (feet)	Centerline to 65 CNEL (feet)	Centerline to 60 CNEL (feet)	CNEL (dBA) 50 feet from Centerline of Outermost Lane	ADT	Increase in ADT	Centerline to 70 CNEL (feet)	Centerline to 65 CNEL (feet)	Centerline to 60 CNEL (feet)	CNEL (dBA) 50 feet from Centerline of Outermost Lane	Increase from Baseline Conditions
Oliver Street - John F. Kennedy Drive to Project Driveway 2	3,000	< 50	< 50	< 50	57.9	3,200	200	< 50	< 50	< 50	58.2	0.3
Oliver Street - Driveway 2 to Iris Avenue	3,000	< 50	< 50	< 50	57.9	3,800	800	< 50	< 50	58	58.9	1.0
Iris Avenue - Nason Street to Kaiser Hospital Entrance	22,400	79	156	328	69.3	23,200	800	80	159	336	69.5	0.2
Iris Avenue - Kaiser Hospital Entrance to Project Driveway 1	18,800	72	139	292	68.6	19,600	800	74	143	300	68.7	0.1
Iris Avenue - Project Driveway 1 to Oliver Street	18,800	72	139	292	68.6	19,600	800	74	143	300	68.7	0.1
Iris Avenue - Oliver Street to Via Del Lago	15,600	66	124	259	67.7	16,400	800	67	128	267	68.0	0.3

Source: LSA, October 2017.
Note: Traffic noise within 50 feet of the roadway centerline should be evaluated with site-specific information.
Shaded cells indicate road segments directly adjacent to the project.
ADT rounded to nearest hundred.
ADT = average daily traffic
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels

Long-Term Stationary Noise Impacts

The Moreno Valley Municipal Code establishes permissible noise levels from stationary sources measured 200 feet from the real property line of the source of the sound. The daytime (8:00 a.m. to 10:00 p.m.) standard is 60 dBA L_{max} and the nighttime (10:00 p.m. to 8:00 a.m.) standard is 55 dBA L_{max} at receiving residential land uses. The proposed project would generate stationary noise associated with parking lot activity and the car wash.

Parking Lot Activity

Parking lot noise, including engine sounds, car doors slamming, car alarms, loud music, and people conversing, would occur as a result of the proposed project at the project site and on nearby streets. Typical parking lot activities, such as people conversing or doors slamming, generates approximately 60 dBA to 70 dBA L_{max} at 50 feet.

The nearest sensitive receptors that may be affected by parking lot activity are the single family residences located approximately 85 feet east of the project boundary. Based on current project plans, the nearest proposed parking and fueling station would be located approximately 120 feet from the existing sensitive receptors. Therefore, adjusted for a distance of 120 feet, the nearest sensitive receptors would be exposed to a noise level of 52 to 62 dBA L_{max} generated by parking lot activities. This noise level could exceed the City's maximum sound level at residential land uses of 60 dBA during the daytime (8:00 a.m. to 10:00 p.m.) and 55 dBA during the nighttime (10:00 p.m. to 8:00 a.m.). However, LSA conducted ambient noise monitoring for the project at location ST-3, located adjacent to the residences east of the project site, an L_{max} of 76.9 dBA was measured. Therefore, the closest sensitive receptor would not be exposed to a maximum level in excess of the existing noise environment. In addition, due to the intermittent nature of parking activity, when averaged over a 24-hour period, this noise level would not cause an increase in noise levels of more than 3 dBA. Also, the nearest residential receptors would be surrounded by a solid concrete fence, acting also as a noise barrier. Based on LSA's previous experience and calculations, this concrete fence may reduce noise levels by approximately 5 to 10 dBA. Therefore, parking lot noise associated with the proposed project would not be expected to substantially increase noise levels, and therefore, the proposed project would not result in significant parking lot noise.

Car Wash Noise

The proposed car wash is located near the western border of the project site. Typical car wash noises include the sprayers and blowers within the washing building and the vacuum stations located outside. Car wash noise levels near the exit of the blower area could reach up to 101 dBA L_{max}.[5] Shop vacuum cleaners can produce noise levels approximately 65 dBA L_{max}.[6] The car wash equipment is enclosed providing additional noise attenuation barriers. The car wash exit would be located approximately 195 feet from the property line of the closest sensitive receptor. At this distance, the combined car wash noise, including both the car wash and the vacuum noise, would be approximately 69 dBA L_{max} at the nearest receiving sensitive receptor. This noise exposure would exceed the City's maximum sound level at residential land uses of 60 dBA during the daytime

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[5] Tommy Car Wash Systems, 2008. *Tommy Car Wash Blower System Noise Study*.

[6] Tommy Car Wash Systems, 2008. *Tommy Vacuum System Manual*.

(8:00 a.m. to 10:00 p.m.). However, the closest sensitive receptors to the car wash have either a bordering concrete wall and/or the property is raised in elevation when compared to the car wash exit. The existing noise barrier in place would reduce noise by approximately 5-10 dBA, resulting in a 59-64 dBA noise exposure from the car wash. In addition, LSA's traffic study models existing noise conditions to be 68.1 dBA along Iris Avenue between the car wash exit and the adjacent receptors. The resulting noise level from the car wash would be lower than the existing noise associated with traffic on Iris Avenue. The addition of a noise level of 64 dBA under 68.1 dBA CNEL conditions would not result in a substantial increase in noise. The resulting noise level would not exceed the 3 dBA increase considered to be perceptible by the human ear in an outdoor environment. The car wash would not operate during nighttime hours and therefore would not exceed the nighttime standard of 55 dBA (10:00 p.m. to 8:00 a.m.). In addition, because the drying cycle is a small part of the overall wash, the dryers along with the vacuums would be anticipated to operate no more than 30 minutes in any hour. The calculated hourly L_{eq} from the car wash given a usage factor of 0.5 would be approximately 68 dBA during operating hours before any noise reduction, therefore the car wash would be operating within existing noise conditions. Therefore, no mitigation measures would be required.

Long-Term Vibration Impacts

The streets surrounding the project area are paved, smooth, and unlikely to cause significant ground-borne vibration. In addition, the rubber tires and suspension systems of buses and other on-road vehicles make it unusual for on-road vehicles to cause ground-borne noise or vibration problems. It is, therefore, assumed that no such vehicular vibration impacts would occur and, therefore, no vibration impact analysis of on-road vehicles is necessary. Additionally, once constructed, the proposed project would not contain uses that would generate ground-borne vibration.

Land Use Compatibility

The dominant source of noise in the project vicinity is traffic on Iris Avenue and Oliver Street. As shown in Table M, the traffic noise levels range from 58.6 dBA to 68.3 dBA CNEL on the project site, 50 feet from the centerline of the outermost lane on the adjacent roads to the project. The State sets forth normally acceptable noise level standards for land use compatibility and outdoor exposure of new development. The normally acceptable exterior noise level for commercial land uses is up to 70 dBA CNEL. Noise levels of 62.5 dBA to 77.5 dBA CNEL are considered conditionally acceptable when a detailed analysis of noise reduction requirements and noise insulation features are included in the design to meet the interior noise standard. As identified above, the traffic noise analysis indicates noise levels would reach up to 68.3 dBA CNEL, which indicates noise levels on the site would be below 70 dBA CNEL. Therefore, the project noise environment is consistent with the City's noise standards.

Excessive Airport Noise

The proposed project is approximately 3.7 miles from the nearest airport. Aircraft noise is rarely audible at the project site; however, no portion of the project site lies within the 55 dBA CNEL noise contours of any public airport nor does any portion of the project site lie within 2 miles of any private airfield or heliport. Therefore, no noise impacts from aircraft noise would occur and no mitigation measures are required.

MITIGATION MEASURES

The following mitigation measures would apply to the project and will help to reduce and avoid potential impacts related to noise.

Mitigation Measure NOISE-1: The project contractor shall implement the following best management practice measures during construction of the project:

- Equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers consistent with manufacturers' standards.
- Place all stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the active project site.
- Locate equipment staging in areas that would create the greatest possible distance between construction-related noise sources and noise-sensitive receptors nearest the active project site during all project construction.
- Prohibit extended idling time of internal combustion engines.
- All noise producing construction activities shall be limited to the hours of 7:00 a.m. and 8:00 p.m.
- Designate a "disturbance coordinator" who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaint (e.g., starting too early, bad muffler) and would determine and implement reasonable measures warranted to correct the problem.

Level of Significance after Mitigation

Implementation of mitigation measures for construction noise would result in a less-than--significant impact.

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APPENDIX A

FHWA HIGHWAY TRAFFIC NOISE MODEL PRINTOUTS

```
                             TABLE Existing Peak Hour Traffic
Volumes-01
                 FHWA ROADWAY NOISE LEVEL ANALYSIS


RUN DATE: 10/24/2017
ROADWAY SEGMENT: Olive Street - John F. Kennedy Drive to Project
Driveway 2
NOTES: Arco Gas Station - Existing Peak Hour Traffic Volumes
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                       * * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2700    SPEED (MPH): 35     GRADE: .5

       TRAFFIC DISTRIBUTION PERCENTAGES
       DAY        EVENING      NIGHT
       ---        -------      -----
AUTOS
       75.51       12.57        9.34
M-TRUCKS
        1.56        0.09        0.19
H-TRUCKS
        0.64        0.02        0.08

ACTIVE HALF-WIDTH (FT): 18      SITE CHARACTERISTICS: SOFT

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                  * * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) =  57.43

    DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL
   70 CNEL      65 CNEL      60 CNEL      55 CNEL
   -------      -------      -------      -------
      0.0          0.0          0.0         96.9

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Attachment: Appendix I - Noise and Vibration Impact Analysis Study (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

```
                             TABLE Existing Peak Hour Traffic
Volumes-02
                 FHWA ROADWAY NOISE LEVEL ANALYSIS


RUN DATE: 10/24/2017
ROADWAY SEGMENT: Olive Street - Driveway 2 to Iris Avenue
NOTES: Arco Gas Station - Existing Peak Hour Traffic Volumes
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                       * * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2700    SPEED (MPH): 35     GRADE: .5

       TRAFFIC DISTRIBUTION PERCENTAGES
       DAY        EVENING      NIGHT
       ---        -------      -----
AUTOS
       75.51       12.57        9.34
M-TRUCKS
        1.56        0.09        0.19
H-TRUCKS
        0.64        0.02        0.08

ACTIVE HALF-WIDTH (FT): 18      SITE CHARACTERISTICS: SOFT

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                  * * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) =  57.43

    DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL
   70 CNEL      65 CNEL      60 CNEL      55 CNEL
   -------      -------      -------      -------
      0.0          0.0          0.0         96.9

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Attachment: Appendix I - Noise and Vibration Impact Analysis Study (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

```
                             TABLE Existing Peak Hour Traffic
Volumes-03
                 FHWA ROADWAY NOISE LEVEL ANALYSIS


RUN DATE: 10/24/2017
ROADWAY SEGMENT: Iris Avenue - Nason Street to Kaiser Hospital
Entrance
NOTES: Arco Gas Station - Existing Peak Hour Traffic Volumes
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                       * * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 20300    SPEED (MPH): 50     GRADE: .5

       TRAFFIC DISTRIBUTION PERCENTAGES
       DAY         EVENING      NIGHT
       ---         -------      -----
AUTOS
       75.51        12.57        9.34
M-TRUCKS
        1.56         0.09        0.19
H-TRUCKS
        0.64         0.02        0.08

ACTIVE HALF-WIDTH (FT): 36      SITE CHARACTERISTICS: SOFT

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                  * * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) =  68.89

    DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL
   70 CNEL      65 CNEL      60 CNEL      55 CNEL
   -------      -------      -------      -------
     75.0        146.2        307.4        658.6

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                             TABLE Existing Peak Hour Traffic
Volumes-04
                 FHWA ROADWAY NOISE LEVEL ANALYSIS


RUN DATE: 10/24/2017
ROADWAY SEGMENT: Iris Avenue - Kaiser Hospital Entrance to
Project Driveway 1
NOTES: Arco Gas Station - Existing Peak Hour Traffic Volumes
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                         * * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 17000    SPEED (MPH): 50     GRADE: .5

       TRAFFIC DISTRIBUTION PERCENTAGES
       DAY        EVENING      NIGHT
       ---        -------      -----
AUTOS
       75.51       12.57        9.34
M-TRUCKS
        1.56        0.09        0.19
H-TRUCKS
        0.64        0.02        0.08

ACTIVE HALF-WIDTH (FT): 36      SITE CHARACTERISTICS: SOFT

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                    * * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) =  68.12

    DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL
   70 CNEL      65 CNEL      60 CNEL      55 CNEL
   -------      -------      -------      -------
     68.7        131.0        273.6        585.4

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                             TABLE Existing Peak Hour Traffic
Volumes-05
                  FHWA ROADWAY NOISE LEVEL ANALYSIS


RUN DATE: 10/24/2017
ROADWAY SEGMENT: Iris Avenue - Project Driveway 1 to Oliver
Street
NOTES: Arco Gas Station - Existing Peak Hour Traffic Volumes
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                       * * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 17000    SPEED (MPH): 50     GRADE: .5

       TRAFFIC DISTRIBUTION PERCENTAGES
       DAY         EVENING      NIGHT
       ---         -------      -----
AUTOS
       75.51        12.57        9.34
M-TRUCKS
        1.56         0.09        0.19
H-TRUCKS
        0.64         0.02        0.08

ACTIVE HALF-WIDTH (FT): 36      SITE CHARACTERISTICS: SOFT

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                  * * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) =  68.12

    DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL
   70 CNEL      65 CNEL      60 CNEL      55 CNEL
   -------      -------      -------      -------
     68.7        131.0        273.6        585.4

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                             TABLE Existing Peak Hour Traffic
Volumes-06
                 FHWA ROADWAY NOISE LEVEL ANALYSIS


RUN DATE: 10/24/2017
ROADWAY SEGMENT: Iris Avenue - Oliver Street to Via Del Lago
NOTES: Arco Gas Station - Existing Peak Hour Traffic Volumes
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                       * * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 14200    SPEED (MPH): 50     GRADE: .5

       TRAFFIC DISTRIBUTION PERCENTAGES
       DAY        EVENING      NIGHT
       ---        -------      -----
AUTOS
       75.51       12.57        9.34
M-TRUCKS
        1.56        0.09        0.19
H-TRUCKS
        0.64        0.02        0.08

ACTIVE HALF-WIDTH (FT): 36      SITE CHARACTERISTICS: SOFT

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                  * * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) =  67.33

    DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL
   70 CNEL      65 CNEL      60 CNEL      55 CNEL
   -------      -------      -------      -------
     63.1        117.4        243.3        519.5

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Attachment: Appendix I - Noise and Vibration Impact Analysis Study (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

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                             TABLE Existing Plus Project Peak
Traffic Volumes-01
                 FHWA ROADWAY NOISE LEVEL ANALYSIS


RUN DATE: 10/24/2017
ROADWAY SEGMENT: Olive Street - John F. Kennedy Drive to Project
Driveway 2
NOTES: Arco Gas Station - Existing Plus Project Peak Traffic
Volumes
_________________________________________________________________
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                       * * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2900    SPEED (MPH): 35     GRADE: .5

       TRAFFIC DISTRIBUTION PERCENTAGES
       DAY        EVENING      NIGHT
       ---        -------      -----
AUTOS
       75.51       12.57        9.34
M-TRUCKS
        1.56        0.09        0.19
H-TRUCKS
        0.64        0.02        0.08

ACTIVE HALF-WIDTH (FT): 18      SITE CHARACTERISTICS: SOFT

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                  * * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) =  57.74

    DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL
   70 CNEL      65 CNEL      60 CNEL      55 CNEL
   -------      -------      -------      -------
      0.0          0.0          0.0        101.5

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Attachment: Appendix I - Noise and Vibration Impact Analysis Study (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

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                             TABLE Existing Plus Project Peak
Traffic Volumes-02
                 FHWA ROADWAY NOISE LEVEL ANALYSIS


RUN DATE: 10/24/2017
ROADWAY SEGMENT: Olive Street - Driveway 2 to Iris Avenue
NOTES: Arco Gas Station - Existing Plus Project Peak Traffic
Volumes
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                       * * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3500    SPEED (MPH): 35     GRADE: .5

       TRAFFIC DISTRIBUTION PERCENTAGES
       DAY        EVENING      NIGHT
       ---        -------      -----
AUTOS
       75.51       12.57        9.34
M-TRUCKS
        1.56        0.09        0.19
H-TRUCKS
        0.64        0.02        0.08

ACTIVE HALF-WIDTH (FT): 18      SITE CHARACTERISTICS: SOFT

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                  * * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) =  58.56

    DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL
   70 CNEL      65 CNEL      60 CNEL      55 CNEL
   -------      -------      -------      -------
      0.0          0.0         55.5        114.6

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                             TABLE Existing Plus Project Peak
Traffic Volumes-03
                 FHWA ROADWAY NOISE LEVEL ANALYSIS


RUN DATE: 10/24/2017
ROADWAY SEGMENT: Iris Avenue - Nason Street to Kaiser Hospital
Entrance
NOTES: Arco Gas Station - Existing Plus Project Peak Traffic
Volumes
_________________________________________________________________
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                       * * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 21100    SPEED (MPH): 50     GRADE: .5

       TRAFFIC DISTRIBUTION PERCENTAGES
       DAY        EVENING      NIGHT
       ---        -------      -----
AUTOS
       75.51       12.57        9.34
M-TRUCKS
        1.56        0.09        0.19
H-TRUCKS
        0.64        0.02        0.08

ACTIVE HALF-WIDTH (FT): 36      SITE CHARACTERISTICS: SOFT

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                  * * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) =  69.05

    DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL
   70 CNEL      65 CNEL      60 CNEL      55 CNEL
   -------      -------      -------      -------
     76.5        149.8        315.3        675.8

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                             TABLE Existing Plus Project Peak
Traffic Volumes-04
                 FHWA ROADWAY NOISE LEVEL ANALYSIS


RUN DATE: 10/24/2017
ROADWAY SEGMENT: Iris Avenue - Kaiser Hospital Entrance to
Project Driveway 1
NOTES: Arco Gas Station - Existing Plus Project Peak Traffic
Volumes
_________________________________________________________________
_____

                       * * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 17800    SPEED (MPH): 50     GRADE: .5

       TRAFFIC DISTRIBUTION PERCENTAGES
       DAY        EVENING      NIGHT
       ---        -------      -----
AUTOS
       75.51       12.57        9.34
M-TRUCKS
        1.56        0.09        0.19
H-TRUCKS
        0.64        0.02        0.08

ACTIVE HALF-WIDTH (FT): 36      SITE CHARACTERISTICS: SOFT

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                  * * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) =  68.31

    DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL
   70 CNEL      65 CNEL      60 CNEL      55 CNEL
   -------      -------      -------      -------
     70.2        134.7        282.0        603.6

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                             TABLE Existing Plus Project Peak
Traffic Volumes-05
                 FHWA ROADWAY NOISE LEVEL ANALYSIS


RUN DATE: 10/24/2017
ROADWAY SEGMENT: Iris Avenue - Project Driveway 1 to Oliver
Street
NOTES: Arco Gas Station - Existing Plus Project Peak Traffic
Volumes
_________________________________________________________________
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                       * * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 17800    SPEED (MPH): 50     GRADE: .5

       TRAFFIC DISTRIBUTION PERCENTAGES
       DAY         EVENING      NIGHT
       ---         -------      -----
AUTOS
       75.51        12.57        9.34
M-TRUCKS
        1.56         0.09        0.19
H-TRUCKS
        0.64         0.02        0.08

ACTIVE HALF-WIDTH (FT): 36      SITE CHARACTERISTICS: SOFT

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                  * * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) =  68.31

    DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL
   70 CNEL      65 CNEL      60 CNEL      55 CNEL
   -------      -------      -------      -------
     70.2        134.7        282.0        603.6

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                             TABLE Existing Plus Project Peak
Traffic Volumes-06
                 FHWA ROADWAY NOISE LEVEL ANALYSIS


RUN DATE: 10/24/2017
ROADWAY SEGMENT: Iris Avenue - Oliver Street to Via Del Lago
NOTES: Arco Gas Station - Existing Plus Project Peak Traffic
Volumes
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                       * * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 14900    SPEED (MPH): 50     GRADE: .5

       TRAFFIC DISTRIBUTION PERCENTAGES
       DAY         EVENING      NIGHT
       ---         -------      -----
AUTOS
       75.51        12.57        9.34
M-TRUCKS
        1.56         0.09        0.19
H-TRUCKS
        0.64         0.02        0.08

ACTIVE HALF-WIDTH (FT): 36      SITE CHARACTERISTICS: SOFT

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                  * * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) =  67.54

    DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL
   70 CNEL      65 CNEL      60 CNEL      55 CNEL
   -------      -------      -------      -------
     64.5        120.8        251.0        536.3

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                             TABLE Opening Year Peak Hour Traffic
Volumes-01
                 FHWA ROADWAY NOISE LEVEL ANALYSIS


RUN DATE: 10/24/2017
ROADWAY SEGMENT: Olive Street - John F. Kennedy Drive to Project
Driveway 2
NOTES: Arco Gas Station - Opening Year Peak Hour Traffic Volumes
_________________________________________________________________
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                         * * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3000    SPEED (MPH): 35     GRADE: .5

       TRAFFIC DISTRIBUTION PERCENTAGES
       DAY         EVENING      NIGHT
       ---         -------      -----
AUTOS
       75.51        12.57        9.34
M-TRUCKS
        1.56         0.09        0.19
H-TRUCKS
        0.64         0.02        0.08

ACTIVE HALF-WIDTH (FT): 18      SITE CHARACTERISTICS: SOFT

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                    * * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) =  57.89

    DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL
   70 CNEL      65 CNEL      60 CNEL      55 CNEL
   -------      -------      -------      -------
      0.0          0.0          0.0        103.7

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                             TABLE Opening Year Peak Hour Traffic
Volumes-02
                 FHWA ROADWAY NOISE LEVEL ANALYSIS


RUN DATE: 10/24/2017
ROADWAY SEGMENT: Olive Street - Driveway 2 to Iris Avenue
NOTES: Arco Gas Station - Opening Year Peak Hour Traffic Volumes
_________________________________________________________________
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                       * * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3000    SPEED (MPH): 35     GRADE: .5

       TRAFFIC DISTRIBUTION PERCENTAGES
       DAY         EVENING      NIGHT
       ---         -------      -----
AUTOS
       75.51        12.57        9.34
M-TRUCKS
        1.56         0.09        0.19
H-TRUCKS
        0.64         0.02        0.08

ACTIVE HALF-WIDTH (FT): 18      SITE CHARACTERISTICS: SOFT

_________________________________________________________________
_____

                  * * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) =  57.89

    DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL
   70 CNEL      65 CNEL      60 CNEL      55 CNEL
   -------      -------      -------      -------
      0.0          0.0          0.0        103.7

_________________________________________________________________
_____
```

```
                             TABLE Opening Year Peak Hour Traffic
Volumes-03
                 FHWA ROADWAY NOISE LEVEL ANALYSIS


RUN DATE: 10/24/2017
ROADWAY SEGMENT: Iris Avenue - Nason Street to Kaiser Hospital
Entrance
NOTES: Arco Gas Station - Opening Year Peak Hour Traffic Volumes
_________________________________________________________________
_____

                       * * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 22400    SPEED (MPH): 50     GRADE: .5

       TRAFFIC DISTRIBUTION PERCENTAGES
       DAY        EVENING      NIGHT
       ---        -------      -----
AUTOS
       75.51       12.57        9.34
M-TRUCKS
        1.56        0.09        0.19
H-TRUCKS
        0.64        0.02        0.08

ACTIVE HALF-WIDTH (FT): 36      SITE CHARACTERISTICS: SOFT

_________________________________________________________________
_____

                  * * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) =  69.31

    DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL
   70 CNEL      65 CNEL      60 CNEL      55 CNEL
   -------      -------      -------      -------
     78.9        155.6        328.0        703.2

_________________________________________________________________
_____
```

```
                             TABLE Opening Year Peak Hour Traffic
Volumes-04
                 FHWA ROADWAY NOISE LEVEL ANALYSIS


RUN DATE: 10/24/2017
ROADWAY SEGMENT: Iris Avenue - Kaiser Hospital Entrance to
Project Driveway 1
NOTES: Arco Gas Station - Opening Year Peak Hour Traffic Volumes
_________________________________________________________________
_____

                       * * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 18800    SPEED (MPH): 50     GRADE: .5

       TRAFFIC DISTRIBUTION PERCENTAGES
       DAY        EVENING      NIGHT
       ---        -------      -----
AUTOS
       75.51       12.57        9.34
M-TRUCKS
        1.56        0.09        0.19
H-TRUCKS
        0.64        0.02        0.08

ACTIVE HALF-WIDTH (FT): 36      SITE CHARACTERISTICS: SOFT

_________________________________________________________________
_____

                  * * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) =  68.55

    DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL
   70 CNEL      65 CNEL      60 CNEL      55 CNEL
   -------      -------      -------      -------
     72.1        139.4        292.3        625.9

_________________________________________________________________
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```

```
                             TABLE Opening Year Peak Hour Traffic
Volumes-05
                 FHWA ROADWAY NOISE LEVEL ANALYSIS


RUN DATE: 10/24/2017
ROADWAY SEGMENT: Iris Avenue - Project Driveway 1 to Oliver
Street
NOTES: Arco Gas Station - Opening Year Peak Hour Traffic Volumes
_________________________________________________________________
_____

                       * * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 18800    SPEED (MPH): 50     GRADE: .5

       TRAFFIC DISTRIBUTION PERCENTAGES
       DAY        EVENING      NIGHT
       ---        -------      -----
AUTOS
       75.51       12.57        9.34
M-TRUCKS
        1.56        0.09        0.19
H-TRUCKS
        0.64        0.02        0.08

ACTIVE HALF-WIDTH (FT): 36      SITE CHARACTERISTICS: SOFT

_________________________________________________________________
_____

                  * * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) =  68.55

    DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL
   70 CNEL      65 CNEL      60 CNEL      55 CNEL
   -------      -------      -------      -------
     72.1        139.4        292.3        625.9

_________________________________________________________________
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```

```
                             TABLE Opening Year Peak Hour Traffic
Volumes-06
                 FHWA ROADWAY NOISE LEVEL ANALYSIS


RUN DATE: 10/24/2017
ROADWAY SEGMENT: Iris Avenue - Oliver Street to Via Del Lago
NOTES: Arco Gas Station - Opening Year Peak Hour Traffic Volumes
_________________________________________________________________
_____

                       * * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 15600    SPEED (MPH): 50     GRADE: .5

       TRAFFIC DISTRIBUTION PERCENTAGES
       DAY        EVENING      NIGHT
       ---        -------      -----
AUTOS
       75.51       12.57        9.34
M-TRUCKS
        1.56        0.09        0.19
H-TRUCKS
        0.64        0.02        0.08

ACTIVE HALF-WIDTH (FT): 36      SITE CHARACTERISTICS: SOFT

_________________________________________________________________
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                  * * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) =  67.74

    DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL
   70 CNEL      65 CNEL      60 CNEL      55 CNEL
   -------      -------      -------      -------
     65.9        124.2        258.7        552.9

_________________________________________________________________
_____
```

```
                             TABLE Opening Year with Project Peak
Hour Traffic Volumes-01
                 FHWA ROADWAY NOISE LEVEL ANALYSIS


RUN DATE: 10/24/2017
ROADWAY SEGMENT: Olive Street - John F. Kennedy Drive to Project
Driveway 2
NOTES: Arco Gas Station - Opening Year with Project Peak Hour
Traffic Volumes
_________________________________________________________________
_____

                       * * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3200    SPEED (MPH): 35     GRADE: .5

       TRAFFIC DISTRIBUTION PERCENTAGES
       DAY         EVENING      NIGHT
       ---         -------      -----
AUTOS
       75.51        12.57        9.34
M-TRUCKS
        1.56         0.09        0.19
H-TRUCKS
        0.64         0.02        0.08

ACTIVE HALF-WIDTH (FT): 18      SITE CHARACTERISTICS: SOFT

_________________________________________________________________
_____

                  * * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) =  58.17

    DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL
   70 CNEL      65 CNEL      60 CNEL      55 CNEL
   -------      -------      -------      -------
      0.0          0.0          0.0        108.2

_________________________________________________________________
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Attachment: Appendix I - Noise and Vibration Impact Analysis Study (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

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                             TABLE Opening Year with Project Peak
Hour Traffic Volumes-02
                 FHWA ROADWAY NOISE LEVEL ANALYSIS


RUN DATE: 10/24/2017
ROADWAY SEGMENT: Olive Street - Driveway 2 to Iris Avenue
NOTES: Arco Gas Station - Opening Year with Project Peak Hour
Traffic Volumes
_________________________________________________________________
_____

                       * * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3800    SPEED (MPH): 35     GRADE: .5

       TRAFFIC DISTRIBUTION PERCENTAGES
       DAY        EVENING      NIGHT
       ---        -------      -----
AUTOS
       75.51       12.57        9.34
M-TRUCKS
        1.56        0.09        0.19
H-TRUCKS
        0.64        0.02        0.08

ACTIVE HALF-WIDTH (FT): 18      SITE CHARACTERISTICS: SOFT

_________________________________________________________________
_____

                  * * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) =  58.92

    DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL
   70 CNEL      65 CNEL      60 CNEL      55 CNEL
   -------      -------      -------      -------
      0.0          0.0         58.4        120.9

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```
                             TABLE Opening Year with Project Peak
Hour Traffic Volumes-03
                 FHWA ROADWAY NOISE LEVEL ANALYSIS


RUN DATE: 10/24/2017
ROADWAY SEGMENT: Iris Avenue - Nason Street to Kaiser Hospital
Entrance
NOTES: Arco Gas Station - Opening Year with Project Peak Hour
Traffic Volumes
_________________________________________________________________
_____

                       * * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 23200    SPEED (MPH): 50     GRADE: .5

       TRAFFIC DISTRIBUTION PERCENTAGES
       DAY        EVENING      NIGHT
       ---        -------      -----
AUTOS
       75.51       12.57        9.34
M-TRUCKS
        1.56        0.09        0.19
H-TRUCKS
        0.64        0.02        0.08

ACTIVE HALF-WIDTH (FT): 36      SITE CHARACTERISTICS: SOFT

_________________________________________________________________
_____

                  * * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) =  69.47

    DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL
   70 CNEL      65 CNEL      60 CNEL      55 CNEL
   -------      -------      -------      -------
     80.4        159.1        335.7        719.8

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                             TABLE Opening Year with Project Peak
Hour Traffic Volumes-04
                 FHWA ROADWAY NOISE LEVEL ANALYSIS


RUN DATE: 10/24/2017
ROADWAY SEGMENT: Iris Avenue - Kaiser Hospital Entrance to
Project Driveway 1
NOTES: Arco Gas Station - Opening Year with Project Peak Hour
Traffic Volumes
_________________________________________________________________
_____

                       * * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 19600    SPEED (MPH): 50     GRADE: .5

       TRAFFIC DISTRIBUTION PERCENTAGES
       DAY        EVENING      NIGHT
       ---        -------      -----
AUTOS
       75.51       12.57        9.34
M-TRUCKS
        1.56        0.09        0.19
H-TRUCKS
        0.64        0.02        0.08

ACTIVE HALF-WIDTH (FT): 36      SITE CHARACTERISTICS: SOFT

_________________________________________________________________
_____

                  * * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) =  68.73

    DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL
   70 CNEL      65 CNEL      60 CNEL      55 CNEL
   -------      -------      -------      -------
     73.7        143.1        300.4        643.4

_________________________________________________________________
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                             TABLE Opening Year with Project Peak
Hour Traffic Volumes-05
                 FHWA ROADWAY NOISE LEVEL ANALYSIS


RUN DATE: 10/24/2017
ROADWAY SEGMENT: Iris Avenue - Project Driveway 1 to Oliver
Street
NOTES: Arco Gas Station - Opening Year with Project Peak Hour
Traffic Volumes
_________________________________________________________________
_____

                       * * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 19600    SPEED (MPH): 50     GRADE: .5

       TRAFFIC DISTRIBUTION PERCENTAGES
       DAY         EVENING      NIGHT
       ---         -------      -----
AUTOS
       75.51        12.57        9.34
M-TRUCKS
        1.56         0.09        0.19
H-TRUCKS
        0.64         0.02        0.08

ACTIVE HALF-WIDTH (FT): 36      SITE CHARACTERISTICS: SOFT

_________________________________________________________________
_____

                  * * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) =  68.73

    DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL
   70 CNEL      65 CNEL      60 CNEL      55 CNEL
   -------      -------      -------      -------
     73.7        143.1        300.4        643.4

_________________________________________________________________
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```
                             TABLE Opening Year with Project Peak
Hour Traffic Volumes-06
                 FHWA ROADWAY NOISE LEVEL ANALYSIS


RUN DATE: 10/24/2017
ROADWAY SEGMENT: Iris Avenue - Oliver Street to Via Del Lago
NOTES: Arco Gas Station - Opening Year with Project Peak Hour
Traffic Volumes
_________________________________________________________________
_____

                      * * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 16400    SPEED (MPH): 50     GRADE: .5

       TRAFFIC DISTRIBUTION PERCENTAGES
       DAY         EVENING      NIGHT
       ---         -------      -----
AUTOS
       75.51        12.57        9.34
M-TRUCKS
        1.56         0.09        0.19
H-TRUCKS
        0.64         0.02        0.08

ACTIVE HALF-WIDTH (FT): 36      SITE CHARACTERISTICS: SOFT

_________________________________________________________________
_____

                 * * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) =  67.96

    DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL
   70 CNEL      65 CNEL      60 CNEL      55 CNEL
   -------      -------      -------      -------
     67.5        128.1        267.3        571.6

_________________________________________________________________
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TRAFFIC IMPACT ANALYSIS

AM/PM GASOLINE SERVICE STATION
CITY OF MORENO VALLEY
RIVERSIDE COUNTY, CALIFORNIA

LSA

July 2018

TRAFFIC IMPACT ANALYSIS

AM/PM GASOLINE SERVICE STATION
CITY OF MORENO VALLEY
RIVERSIDE COUNTY, CALIFORNIA

Prepared for:

Eric Lewis, P.E., T.E.
City Traffic Engineer
City of Moreno Valley
14177 Frederick Street
Moreno Valley, California 92552

Prepared by:

LSA Associates, Inc.
1500 Iowa Avenue, Suite 200
Riverside, California 92507
(951) 781-9310

Project No. SAT1701

LSA

July 2018

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Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

APPENDICES

FIGURES AND TABLES

FIGURES

TABLES

1.0 INTRODUCTION

This Traffic Impact Analysis (TIA) has been prepared to assess the potential circulation impacts associated with the proposed ARCO AM/PM Gasoline Service Station (Case No. PPA17-0008) to be located at the northwest corner of Oliver Street/Iris Avenue in the City of Moreno Valley (City), Riverside County. Figure 1-1 illustrates the regional and project location. (Figures and tables are located at the end of each chapter.)

This report is intended to satisfy the requirements established by the City of Moreno Valley "Traffic Impact Analysis Preparation Guide," dated August 2007, as well as the requirements for the disclosure of potential impacts and mitigation measures pursuant to the California Environmental Quality Act (CEQA). The scope of work for this TIA, including trip generation, trip distribution, study area, and analysis methodologies, has been approved by City staff via the Scoping Agreement process. A copy of the Scoping Agreement is included as Appendix A.

This study examines traffic operations in the vicinity of the proposed project under the following six scenarios:

- Existing (2017) Conditions;
- Existing (2017) with Project Conditions;
- Project Completion Year (2022) without Project Conditions;
- Project Completion Year (2022) with Project Conditions;
- Cumulative (2018) without Project Conditions; and
- Cumulative (2018) with Project Conditions.

Traffic conditions were examined for the weekday daily, a.m., and p.m. peak hour conditions. The a.m. peak hour is defined as the one hour of highest traffic volumes occurring between 7:00 and 9:00 a.m. The p.m. peak hour is the one hour of highest traffic volumes occurring between 4:00 and 6:00 p.m. For roadway segments, segments will be analyzed using daily volume counts and compared to the daily service volume standards provided by the City.

1.1 PROJECT DESCRIPTION

The proposed project will consist of a gasoline station with 16 fueling stations, a 3,800-square foot convenience store, and a drive-through car wash. The project site is located on the northwest corner of the intersection of Oliver Street and Iris Avenue. Figure 1-2 illustrates the conceptual site plan.

As shown in the site plan, access to the project would be provided via two driveways: one driveway on Oliver Street and one driveway on Iris Avenue. Both driveways will be restricted by raised medians. Therefore, both driveways will operate as right-in/right-out (RIRO) driveways.

Additionally, the City requires that the project driveways meet the driveway spacing standards per City Municipal Code Section 9.11.080. Oliver Street is classified as a minor arterial in the City's

Circulation Element while Iris Avenue is classified as a Divided Major as per the City's Circulation Element. There is an existing raised media currently on Iris Avenue along the project frontage. The driveway along Iris Avenue meets the requirements per the City's standards of having limited access on a Divided Major. The project shall to construct a raised median on Oliver Street along the project frontage, thereby restricting access at the project driveway to RIRO. Therefore, this driveway will also meet the requirements per the City's standards of having limited access on a Minor Arterial.

The City's TIA guidelines require a minimum of five years from existing conditions to the project opening year. Therefore, for purposes of this analysis, the project opening year has been considered as year 2022.

1.2 STUDY AREA

The study area was approved by City staff via the City's scoping agreement process (Appendix A). Based on the TIA Guidelines, the TIA is required to analyze all intersections of Collector or higher classification streets where the project would contribute 50 or more peak hour project trips. Additionally, the City recommended inclusion of additional intersections in this analysis during the scoping agreement process. Therefore, the following intersections were included in the analysis:

1. Nason Street/Iris Avenue;
2. Kaiser Hospital Entrance/Iris Avenue;
3. Project Driveway 1/Iris Avenue;
4. Oliver Street/John F Kennedy Drive;
5. Oliver Street/Project Driveway 2;
6. Oliver Street/Iris Avenue; and
7. Via Del Lago/Iris Avenue.

Figure 1-3 illustrates the locations of all analysis intersections.

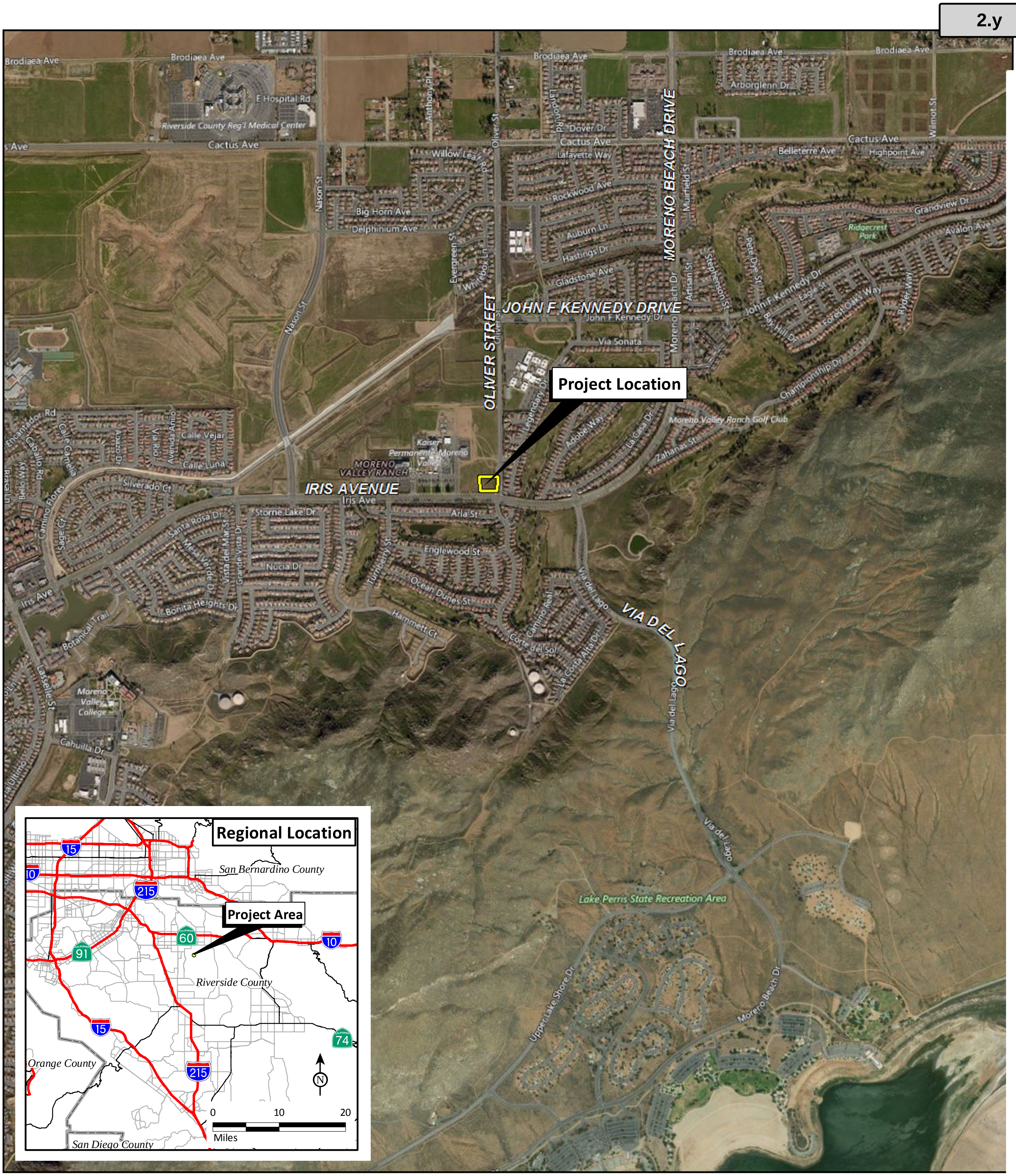
City staff also requested daily roadway segment capacity analysis at the following roadway segments:

1. Oliver Street, from John F Kennedy Drive to Project Driveway 2;
2. Oliver Street, from Project Driveway 2 to Iris Avenue;
3. Iris Avenue, from Nason Street to Kaiser Hospital Entrance;
4. Iris Avenue, from Kaiser Hospital Entrance to Project Driveway 1;
5. Iris Avenue, from Project Driveway 1 to Oliver Street; and
6. Iris Avenue, from Oliver Street to Via Del Lago.

1.3 LIST OF CHAPTER 1.0 FIGURES

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

- Figure 1-2: Conceptual Site Plan
- Figure 1-3: Study Area Intersections



LSA

LEGEND

▭ Project Boundary

FIGURE 1-

N

0 1000 2000

FEET

AM/PM Gasoline Service Statio

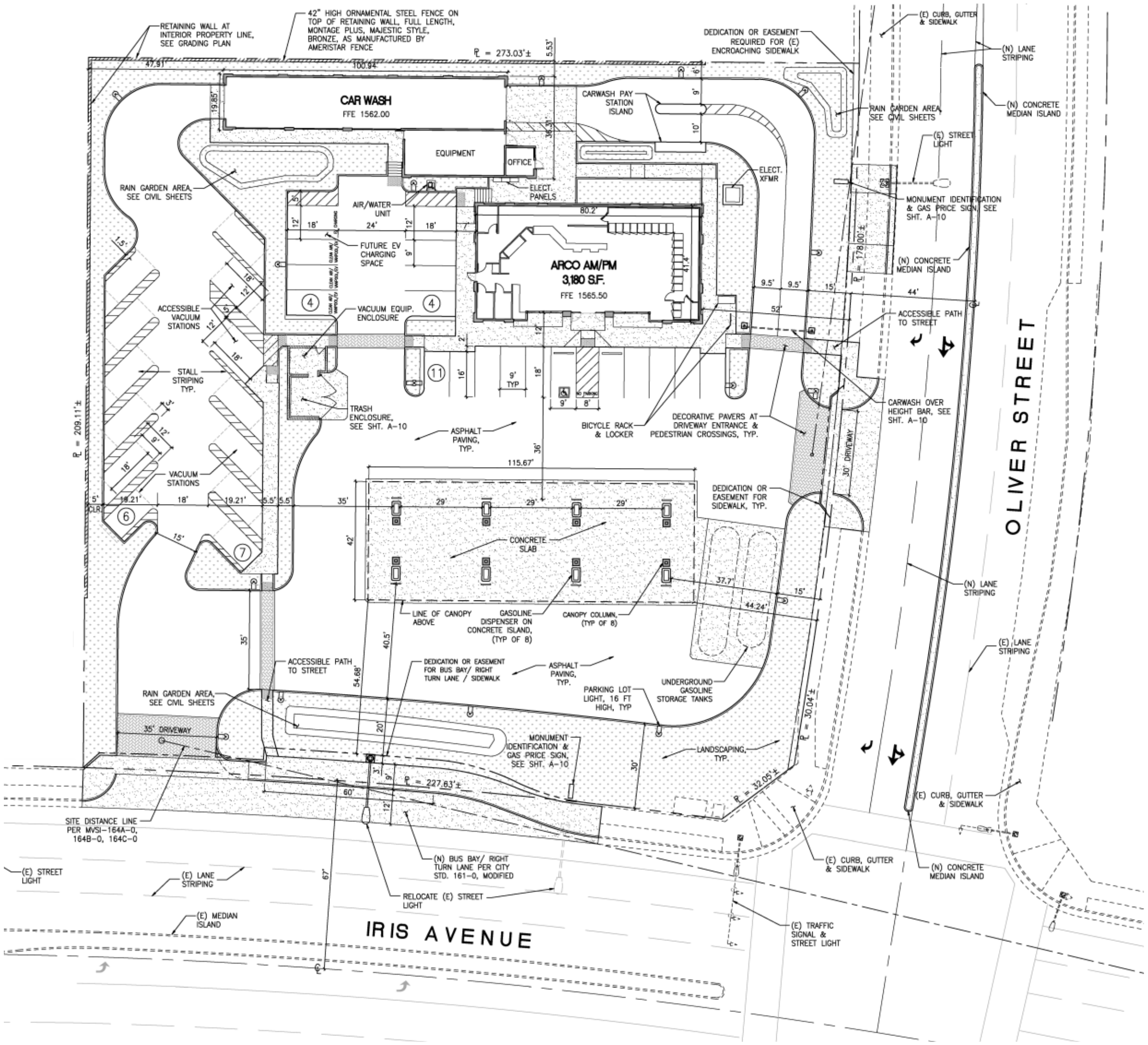
Traffic Impact Analysi

Regional and Project Location

SOURCE: Bing Aerial, 2015; Riverside County, 2015.

I:\SAT1701\Reports\Traffic\fig1-1_RegLoc.mxd (10/19/2017)

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)



LSA

FIGURE 1-2

N

0 39 78

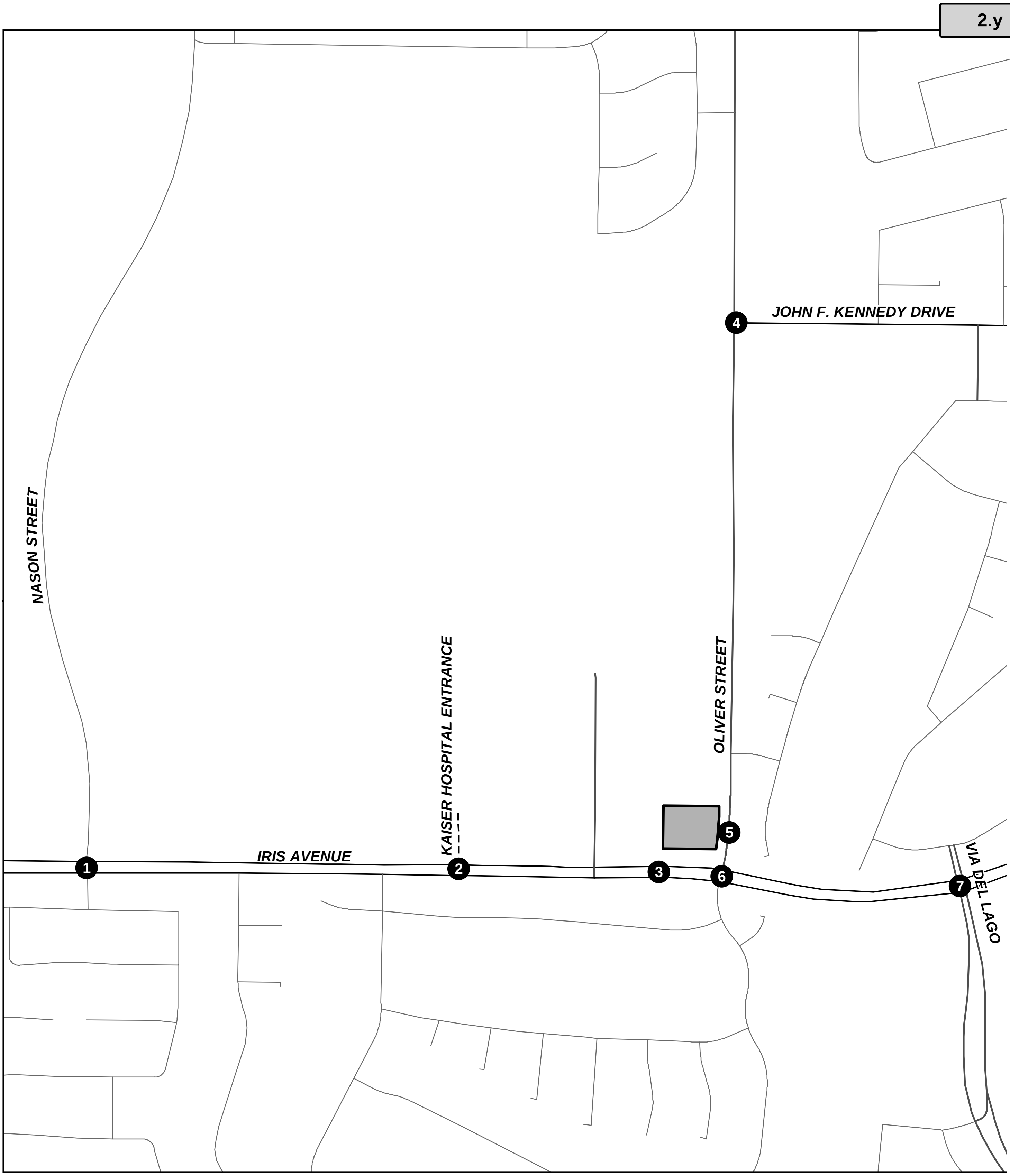
FEET

SOURCE: Barghausen Consulting Engineers, 2018.

I:\SAT1701\Reports\Traffic\fig1-2_SitePlan.cdr (07/30/2018)

AM/PM Gasoline Service Station
Traffic Impact Analysis

Conceptual Site Plan



LSA

LEGEND

▨ Project Location

---- Driveway

● Study Area Intersections

N

0 325 650
FEET

SOURCE: Google Earth, 2016.

I:\SAT1701\Reports\Traffic\fig1-3_Intersections.mxd (10/19/2017)

FIGURE 1-

AM/PM Gasoline Service Statio
Traffic Impact Analysi

Study Area Intersections

2.0 ANALYSIS METHODOLOGY

2.1 LEVEL OF SERVICE DEFINITIONS

Roadway operations and the relationship between capacity and traffic volumes are generally expressed in terms of levels of service (which are defined using the letter grades A through F). These levels recognize that, while an absolute limit exists as to the amount of traffic traveling through a given intersection (the absolute capacity), the conditions that motorists experience rapidly deteriorate as traffic approaches the absolute capacity. Under such conditions, congestion is experienced. There is general instability in the traffic flow, which means that relatively small incidents (e.g., momentary engine stall) can cause considerable fluctuations in speeds and delays. This near-capacity situation is labeled Level of Service (LOS) E. Beyond LOS E, capacity has been exceeded, and arriving traffic will exceed the ability of the intersection to accommodate it. An upstream queue will then form and continue to expand in length until the demand volume again declines.

A complete description of the meaning of level of service can be found in the Transportation Research Board Special Report 209, *Highway Capacity Manual* (HCM). The HCM establishes levels of service A through F for intersections as shown in Table 2-A. Table 2-B provides brief descriptions of the six levels of service, as abstracted from the HCM 2010 for roadway segments. Table 2-C summarizes the HCM 2010 level of service criteria for unsignalized and signalized intersections. Table 2-D summarizes the LOS criteria used to evaluate roadway segments based on the daily capacity for each functional classification as per the City’s TIA guidelines. The daily traffic volumes represent the total vehicles (both directions) traveling on a roadway segment within 24 hours.

Consistent with the City’s guidelines, the *2010 Highway Capacity Manual* (HCM 2010) analysis methodologies were used to determine intersection levels of service for all study area intersections. Intersection LOS was calculated using Synchro 9.1 software, which uses the HCM 2010 methodologies.

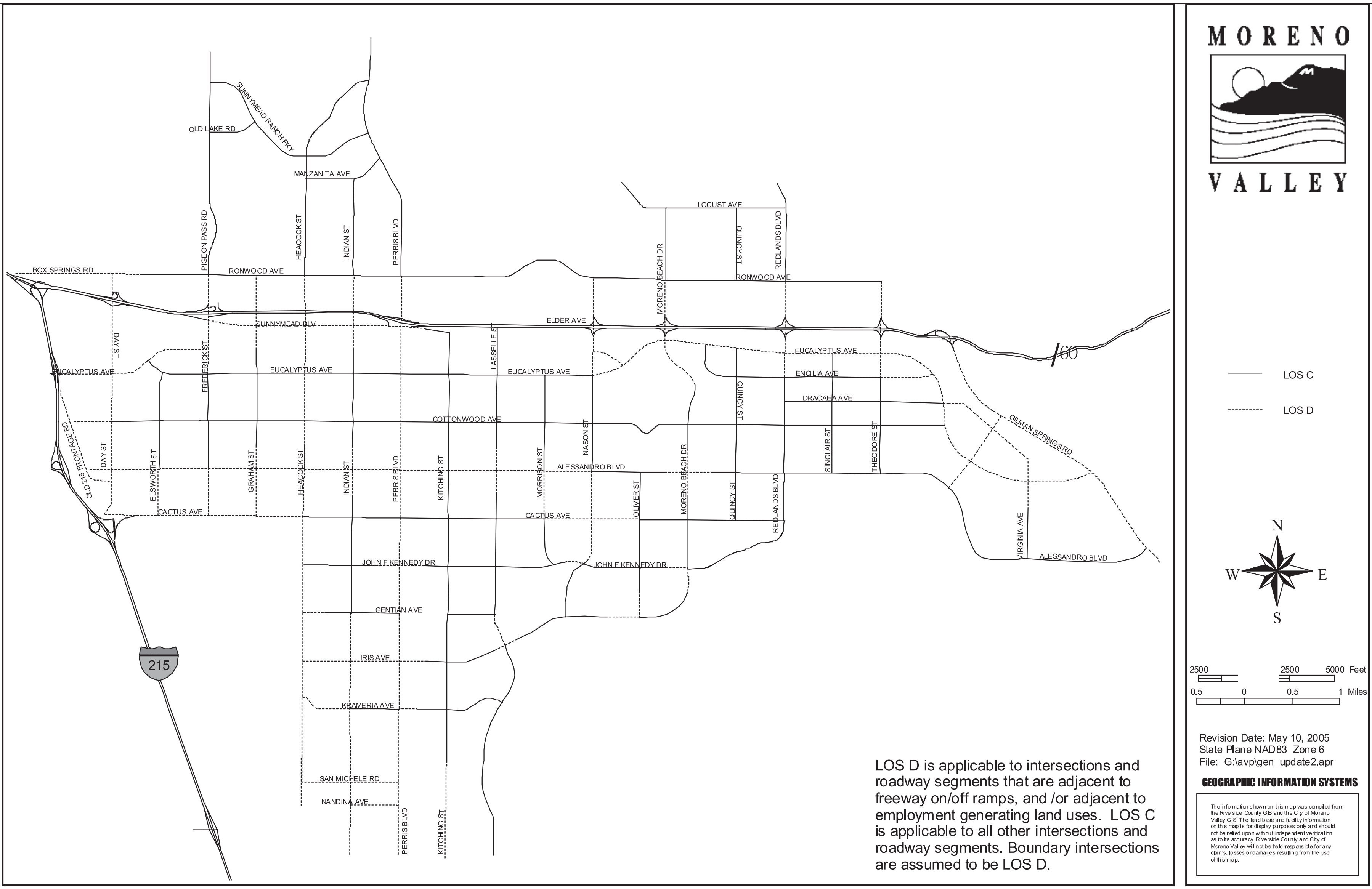
2.2 LEVEL OF SERVICE PROCEDURES AND THRESHOLDS

Study intersections analyzed in this report are under the jurisdiction of the City of Moreno Valley. The City uses both LOS C and LOS D as its minimum level of service criteria for intersections and roadway segments. As stated in both the City’s General Plan and TIA Guidelines, LOS D is applicable to intersections and roadway segments adjacent to employment-generating land uses while LOS C is applicable to all other areas. Figure 2-1 illustrates the LOS standards for intersections and roadway segments within the City.

2.3 PROJECT SIGNIFICANCE THRESHOLD

At study intersections and roadway segments under the jurisdiction of the City, the determination of a significant circulation impact is based on the impact criteria contained in the City’s TIA Guidelines, which state that, for projects in conformance with the General Plan, a significant impact occurs at a study intersection or roadway segment when the peak hour LOS falls below the target LOS of C or D with the addition of project traffic or when a project contributes to an unsatisfactory condition (LOS D, E, or F).

2.4 LIST OF CHAPTER 2.0 FIGURES AND TABLES



LOS D is applicable to intersections and roadway segments that are adjacent to freeway on/off ramps, and /or adjacent to employment generating land uses. LOS C is applicable to all other intersections and roadway segments. Boundary intersections are assumed to be LOS D.

Revision Date: May 10, 2005
State Plane NAD83 Zone 6
File: G:\avp\gen_update2.apr

The information shown on this map was compiled from the Riverside County GIS and the City of Moreno Valley GIS. The land base and facility information on this map is for display purposes only and should not be relied upon without independent verification as to its accuracy. Riverside County and City of Moreno Valley will not be held responsible for any claims, losses or damages resulting from the use of this map.

Source: Urban Crossroads, June 2004.

LSA

FIGURE 2-1

AM/PM Gasoline Service Station
Traffic Impact Analysis

City of Moreno Valley LOS Standards

SOURCE: Moreno Valley General Plan Final Program EIR, 2006

I:\SAT1701\Reports\Traffic\fig2-1_LOS_Standards.cdr (10/19/2017)

Table 2-A: Intersection Level of Service Definitions

LOS	Description
A	No approach phase is fully utilized by traffic and no vehicle waits longer than one red indication. Typically, the approach appears quite open, turns are made easily and nearly all drivers find freedom of operation.
B	This service level represents stable operation, where an occasional approach phase is fully utilized and a substantial number are approaching full use. Many drivers begin to feel restricted within platoons of vehicles.
C	This level still represents stable operating conditions. Occasionally drivers may have to wait through more than one red signal indication, and backups may develop behind turning vehicles. Most drivers feel somewhat restricted, but not objectionably so.
D	This level encompasses a zone of increasing restriction approaching instability at the intersection. Delays to approaching vehicles may be substantial during short peaks within the peak period; however, enough cycles with lower demand occur to permit periodic clearance of developing queues, thus preventing excessive backups.
E	Capacity occurs at the upper end of this service level. It represents the most vehicles that any particular intersection approach can accommodate. Full utilization of every signal cycle is seldom attained no matter how great the demand.
F	This level describes forced flow operations at low speeds, where volumes exceed capacity. These conditions usually result from queues of vehicles backing up from a restriction downstream. Speeds are reduced substantially and stoppages may occur for short or long periods of time due to the congestion. In the extreme case, both speed and volume can drop to zero.

Table 2-B: Roadway Segments/Urban Segments Level of Service Definitions

LOS	Description
A	Describes primarily free-flow operation. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Control Delay at the boundary intersection is minimal. The travel speed exceeds 85% of the base free-flow speed, and the volume-to-capacity ratio is no greater than 1.0.
B	Describes reasonably unimpeded operation. The ability to maneuver within the traffic stream is only slightly restricted, and control delay at the boundary is not significant. The travel speed is between 67% and 85% of the base free-flow speed, and the volume-to-capacity ratio is no greater than 1.0.
C	Describes stable operation. The ability to maneuver and change lanes at mid-segment locations may be more restricted than at LOS B. Longer queues at the boundary intersection may contribute to lower travel speeds. The travel speed is between 50% and 67% of the base free-flow speed, and the volume-to-capacity ratio is no greater than 1.0.
D	Indicates a less stable condition in which small increases in flow may cause substantial increases in delay and decreases in travel speed. This operation may be due to adverse signal progression, high volume, or inappropriate signal timing at the boundary intersection. The travel speed is between 40% and 50% of the base free-flow speed, and the volume-to-capacity ratio is no greater than 1.0.
E	Characterized by unstable operation and significant delay. Such operations may be due to some combination of adverse progression, high volume, and inappropriate signal timing at the boundary intersection. The travel speed is between 30% and 40% of the base free-flow speed, and the volume-to-capacity ratio is no greater than 1.0.
F	Characterized by flow at extremely low speed. Congestion is likely occurring at the boundary intersection, as indicated by high delay and extensive queuing. The travel speed is between 30% or less of the base free-flow speed, and the volume-to-capacity ratio is greater than 1.0.

Table 2-C: Level of Service Criteria for Unsignalized and Signalized Intersections

Level of Service	Unsignalized Intersection Average Delay per Vehicle (sec.)	Signalized Intersection Average Delay per Vehicle (sec.)
A	≤ 10	≤ 10
B	> 10 and ≤ 15	> 10 and ≤ 20
C	> 15 and ≤ 25	> 20 and ≤ 35
D	> 25 and ≤ 35	> 35 and ≤ 55
E	> 35 and ≤ 50	> 55 and ≤ 80
F	> 50	> 80

Table 2-D: Roadway Segment Capacity and Levels of Service

Type of Roadway	Level of Service				
	A	B	C	D	E
Six-Lane Divided Arterial	33,900	39,400	45,000	50,600	56,300
Four-Lane Divided Arterial	22,500	26,300	30,000	33,800	37,500
Four-Lane Undivided Arterial	15,000	17,500	20,000	22,500	25,000
Two-Lane Industrial Collector	7,500	8,800	10,000	11,300	12,500
Two-Lane Undivided Residential	N/A	N/A	N/A	N/A	2,000

Source: City of Moreno Valley *Traffic Impact Analysis Preparation Guide*, August 2007

3.0 CIRCULATION NETWORK SETTING

3.1 EXISTING CIRCULATION NETWORK

The previously referenced Figure 1-3 illustrates the study area intersections for the project. Existing and future study intersection geometrics and stop control are illustrated in Figure 3-1. Following are the three major roadways within the project study area:

- **Iris Avenue** – Iris Avenue is a six lane divided major arterial with a posted speed limit of 50 miles per hour.
- **Oliver Street** – Oliver Street is a four lane minor arterial with a posted speed limit of 35 miles per hour.
- **Nason Street** – Nason Street is a four lane divided arterial with a posted speed limit of 45 miles per hour.

3.2 BICYCLE AND PEDESTRIAN FACILITIES

The City of Moreno Valley considers other methods and modes of transportation to improve mobility around the region while creating environmental benefits, health benefits, and economic benefits for the City. Figure 3-2 illustrates the existing pedestrian sidewalk network around the study area. Figure 3-3 illustrates the master plan of trails within the City and surrounding region. These trails include bikeways and multiuse trails readily available and planned for both pedestrian and cyclist use. Figure 3-4 illustrates the Moreno Valley bicycle lane network plan and shows there are existing Class 2 bike lanes around the study area along Nason Street and Iris Avenue. Class 2 bike lanes are lanes striped along the road next to vehicular lanes.

3.3 LIST OF CHAPTER 3.0 FIGURES

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

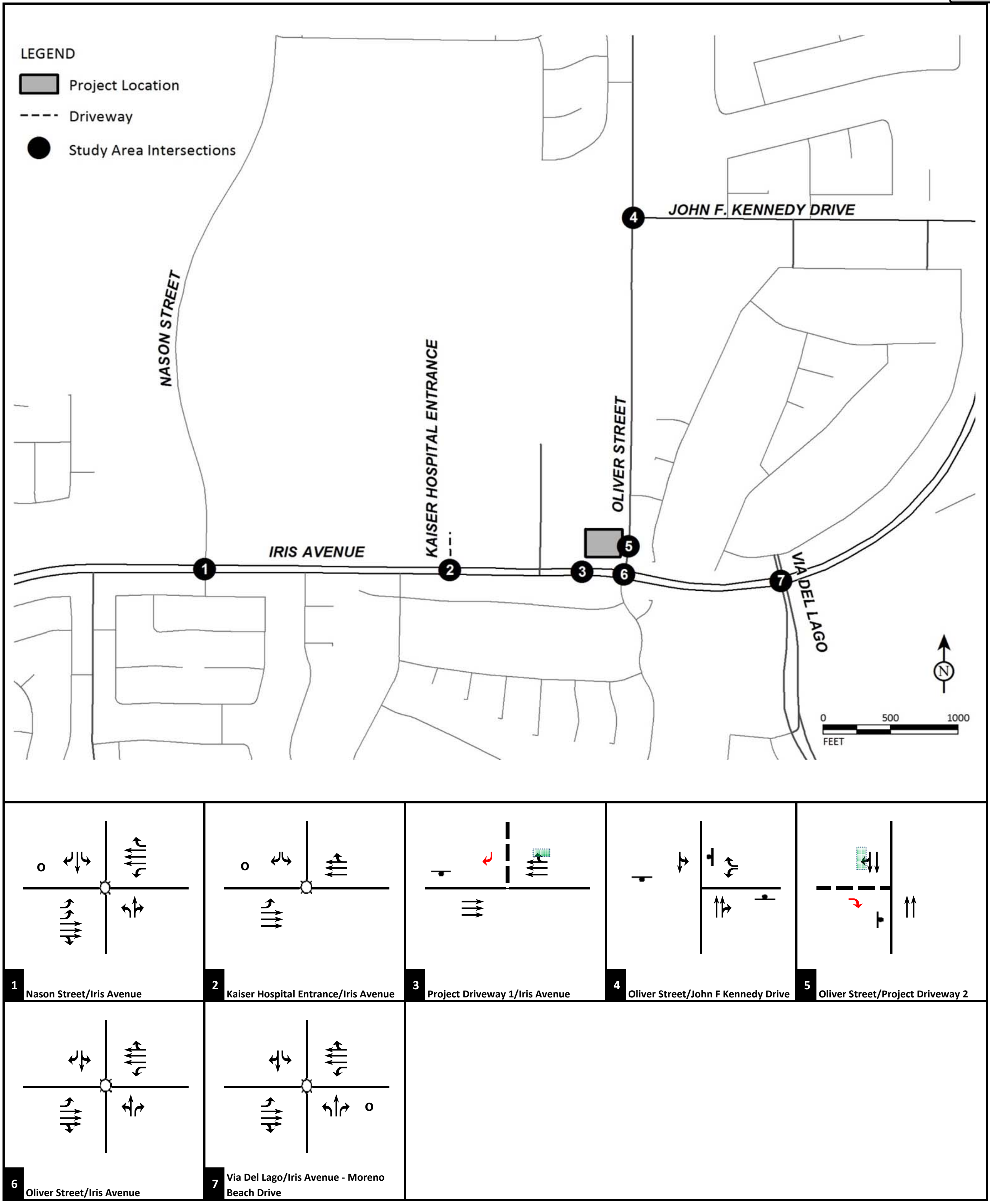


FIGURE 3-1

LSA

Legend

¤ Signal
┴ Stop Sign
↱ Project Driveway
o Right-Turn Overlap
🟩 Future Right Turns
¦ Future Leg

AM/PM Gasoline Service Station

Traffic Impact Analysis

Existing (2017) and Future Intersection Geometrics and Stop Control

R:\SAT1701_Sater Gas Station MoVal\Technical Studies\Traffic\g30- Geo_Exist\Figure (11/22/2017)

LSA

FIGURE 3-

LEGEND

🟨 Project Location

— Sidewalks

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SOURCE: Google Earth, 2016.

AM/PM Gasoline Service Statio

Traffic Impact Analysi

Existing Pedestrian Sidewalk Network

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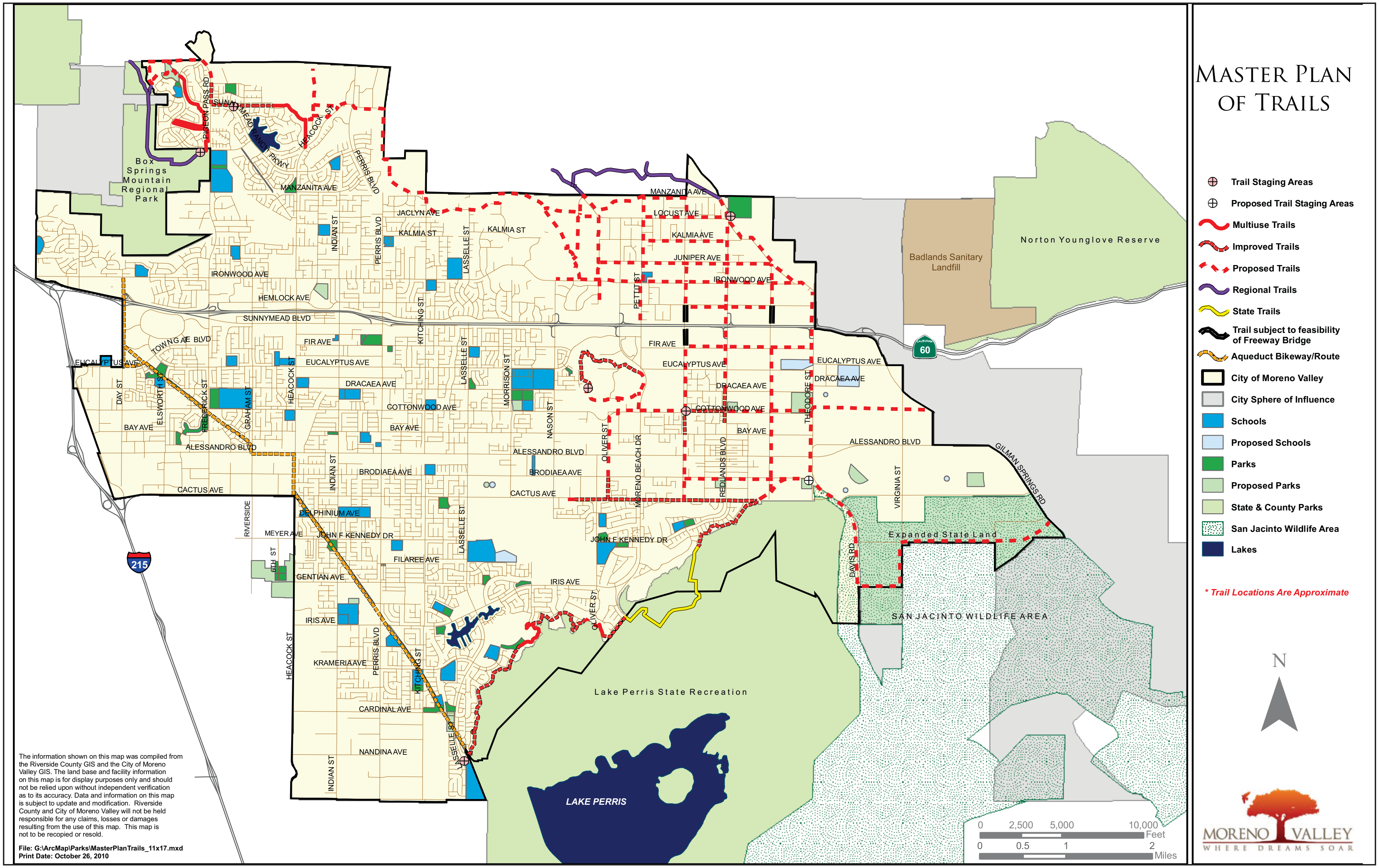

The information shown on this map was compiled from the Riverside County GIS and the City of Moreno Valley GIS. The land base and facility information on this map is for display purposes only and should not be relied upon without independent verification as to its accuracy. Data and information on this map is subject to update and modification. Riverside County and City of Moreno Valley will not be held responsible for any claims, losses or damages resulting from the use of this map. This map is not to be recopied or resold.

File: G:\ArcMap\Parks\MasterPlanTrails_11x17.mxd
Print Date: October 26, 2010

LSA

FIGURE 3-3

AM/PM Gasoline Service Station
Traffic Impact Analysis

City of Moreno Valley Master Plan of Trails

SOURCE: Moreno Valley Master Plan Trails Map, 2010

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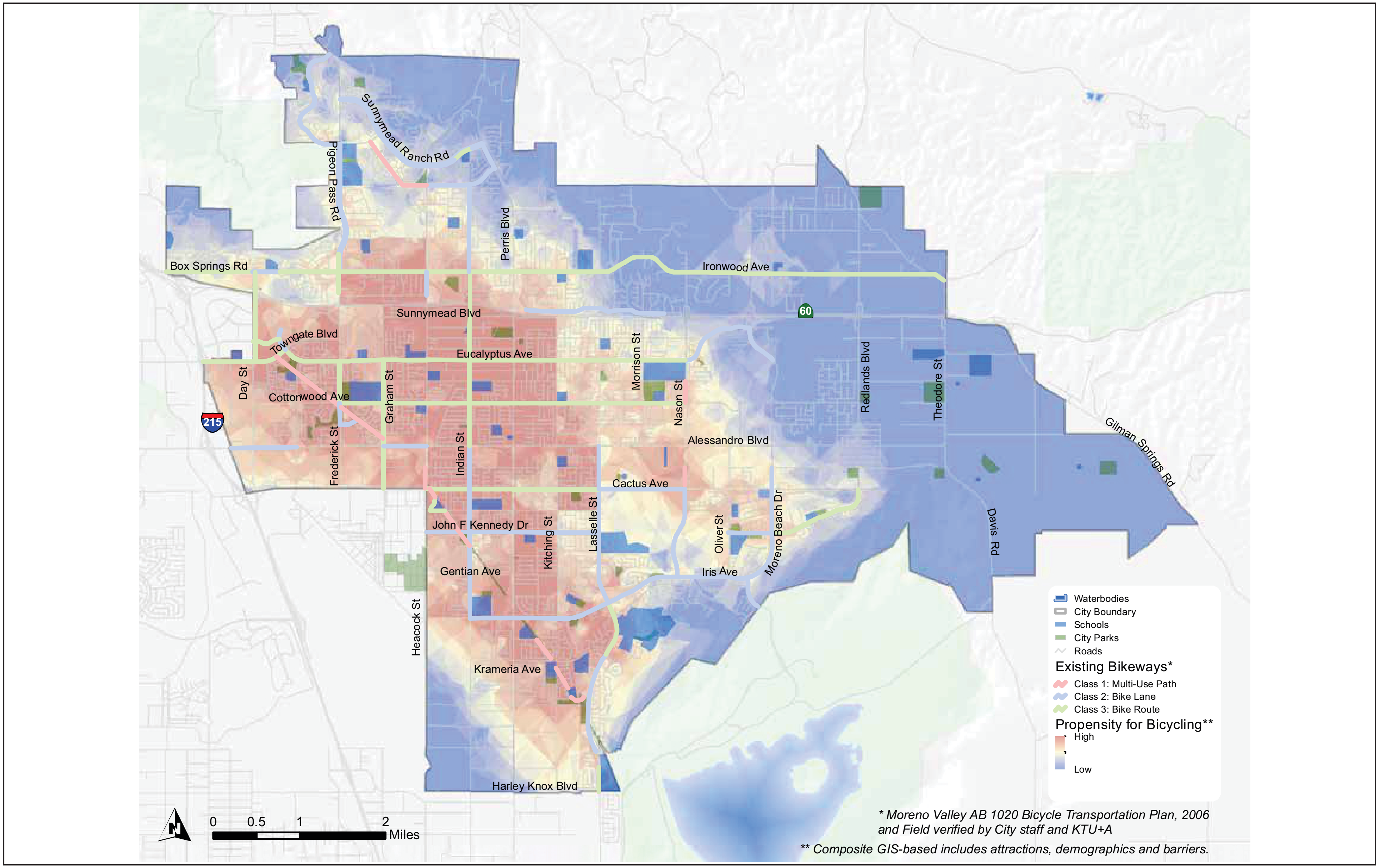
Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS



* Moreno Valley AB 1020 Bicycle Transportation Plan, 2006 and Field verified by City staff and KTU+A

** Composite GIS-based includes attractions, demographics and barriers.

LSA

FIGURE 3-4

AM/PM Gasoline Service Station
Traffic Impact Analysis

Bicycle Lane Network Plan

SOURCE: Moreno Valley Bicycle Master Plan, 2014

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4.0 TRAFFIC VOLUMES WITHOUT PROJECT SCENARIOS

4.1 EXISTING (2017) TRAFFIC VOLUMES

For all intersections and roadway segments, existing traffic volumes are based on counts collected by National Data and Surveying Services (NDS) in September 2017. Daily tube counts were collected for roadway segments while a.m. and p.m. peak hour turning movement counts were collected at study intersections. Vehicle classification counts were conducted at the intersections of Nason Street/Iris Avenue and Oliver Street/Iris Avenue and along the roadway segment of Iris Avenue, between Nason Street and Kaiser Hospital Entrance. The percentage of trucks at the remaining study area intersections and roadway segments without classification counts was determined from classification counts at nearby intersections and roadway segments.

Passenger car equivalents (PCE) account for the larger impact of trucks on traffic operations. It does so by assigning each type of truck a PCE factor that represents the number of passenger vehicles that could travel through an intersection in the same time that a particular type of truck could. PCE volumes at study intersections were computed using a factor of 1.5 for 2-axle trucks, 2.0 for 3-axle trucks, and 3.0 for trucks with four or more axles. The percentage of trucks at the remaining intersections was determined from the counts at nearby intersections. At these locations, truck PCE volumes were computed using a PCE factor of 2.0 for all trucks, consistent with the HCM 2010 methodologies. Detailed count sheets are included in Appendix B.

Figure 4-1 illustrates existing peak hour PCE volumes at study intersections. Table 4-A summarizes the existing roadway segment daily traffic volumes (in PCEs).

Detailed volume development worksheets are included in Appendix C.

4.2 PROJECT COMPLETION YEAR (2022) WITHOUT PROJECT TRAFFIC VOLUMES

As approved during the City's scoping agreement process (Appendix A), traffic volumes for project completion year (2022) without project conditions were developed by applying a 2.0 percent compounded annual growth rate (10.41 percent aggregate growth for the period from 2017 to 2022) to the existing without project traffic volumes for all the study intersections. The growth rate was determined through the City's scoping agreement process.

Figure 4-2 illustrates peak hour traffic volumes at study intersections for project completion year (2022) conditions. Table 4-B summarizes the project completion year roadway segment daily traffic volumes (in PCEs).

Detailed volume development worksheets are included in Appendix C.

4.3 CUMULATIVE (2022) WITHOUT PROJECT TRAFFIC VOLUMES

Information concerning cumulative projects in the vicinity of the proposed project was obtained from the City of Moreno Valley Economic Development website. Figure 4-3 illustrates the cumulative project locations.

The trip generation for cumulative projects was developed using rates from the Institute of Transportation Engineers (ITE) *Trip Generation*, 9th Edition, and from traffic studies of cumulative projects. Table 4-C lists the cumulative projects included in this analysis and shows the cumulative projects are expected to generate 4,066 a.m. peak hour trips, 4,934 p.m. peak hour trips, and 62,227 daily trips.

Cumulative project trips were added to the project completion year (2022) traffic volumes to develop cumulative (2022) traffic volumes for intersections and roadway segments. Project trips for these cumulative projects were assigned to the roadway network based on their locations in relation to surrounding land uses and regional arterials. Figure 4-4 illustrates the total peak hour cumulative project trip assignment at study area intersections. Figure 4-5 illustrates the peak hour PCE traffic volumes at study intersections for cumulative (2022) conditions. Table 4-D summarizes the cumulative (2022) roadway segment daily traffic volumes (in PCEs).

Detailed volume development worksheets are included in Appendix C.

4.4 LIST OF CHAPTER 4.0 FIGURES AND TABLES

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

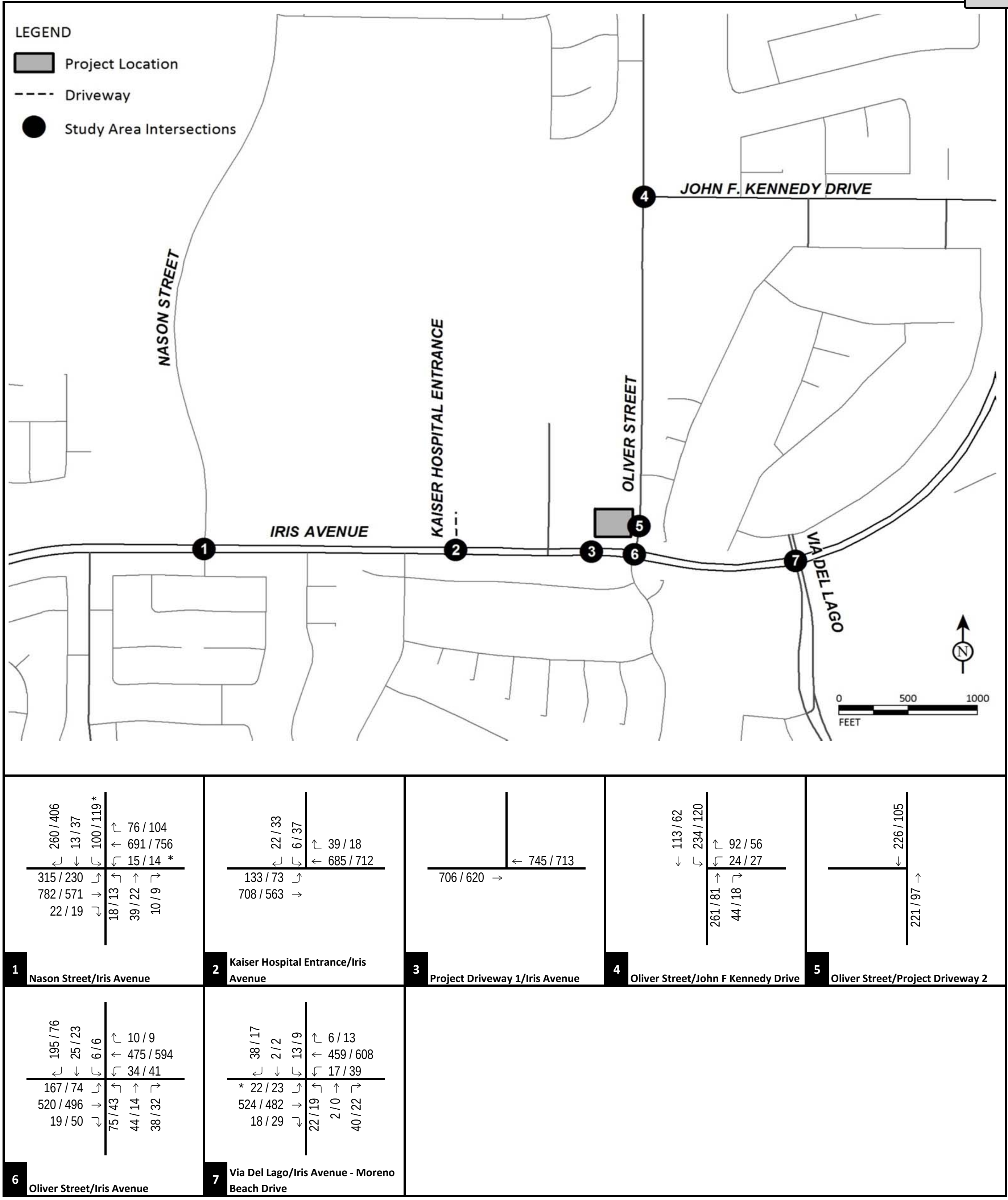

FIGURE 4-1

LSA

XXX / YYY
AM / PM Peak Hour PCE Volumes
* Includes U-Turn movements

AM/PM Gasoline Service Station
Traffic Impact Analysis
Existing (2017) Peak Hour Traffic Volumes

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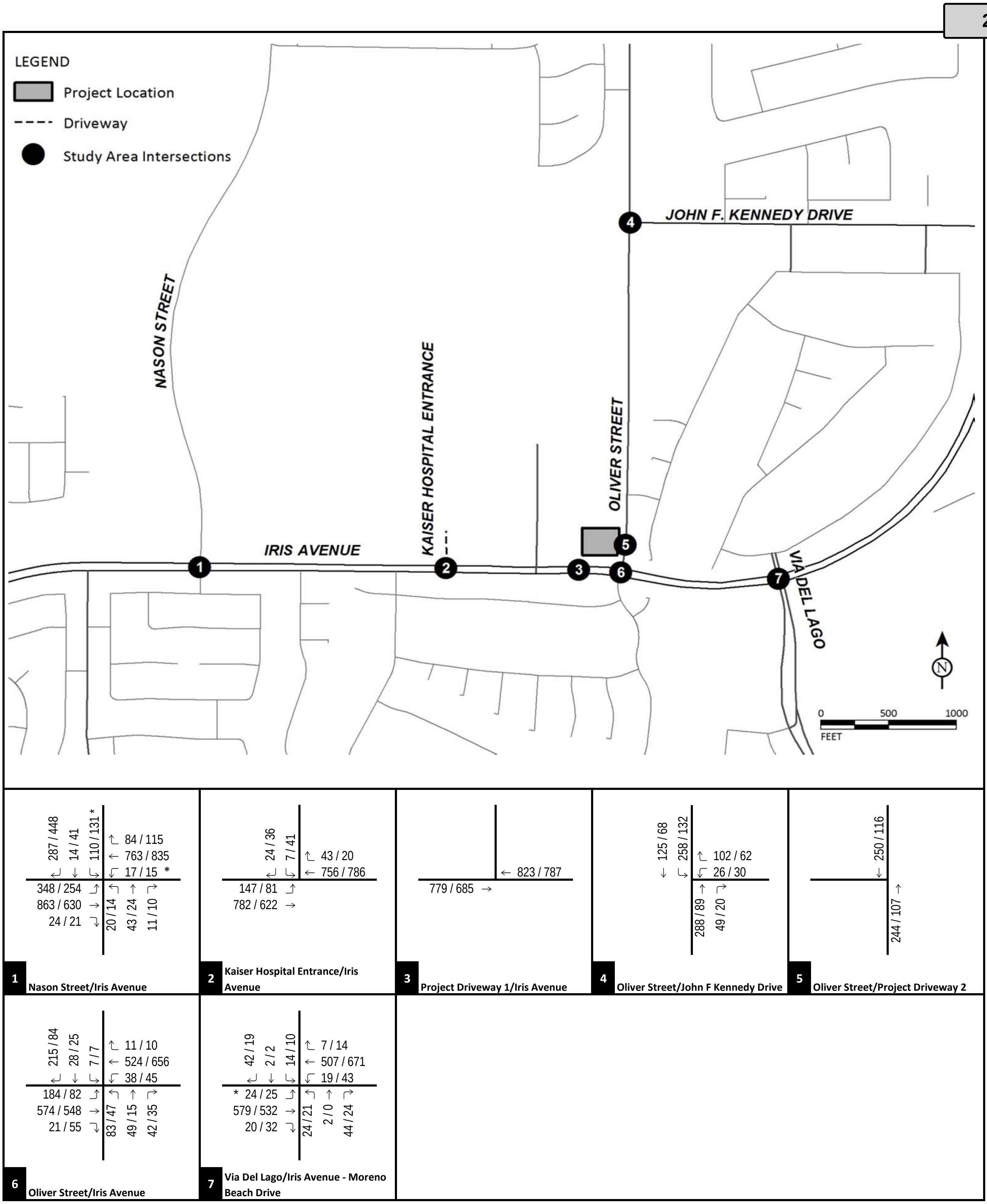

FIGURE 4-2

XXX / YYY
AM / PM Peak Hour PCE Volumes
* Includes U-Turn movements

AM/PM Gasoline Service Station
Traffic Impact Analysis
Project Completion Year (2022) Peak Hour Traffic Volumes

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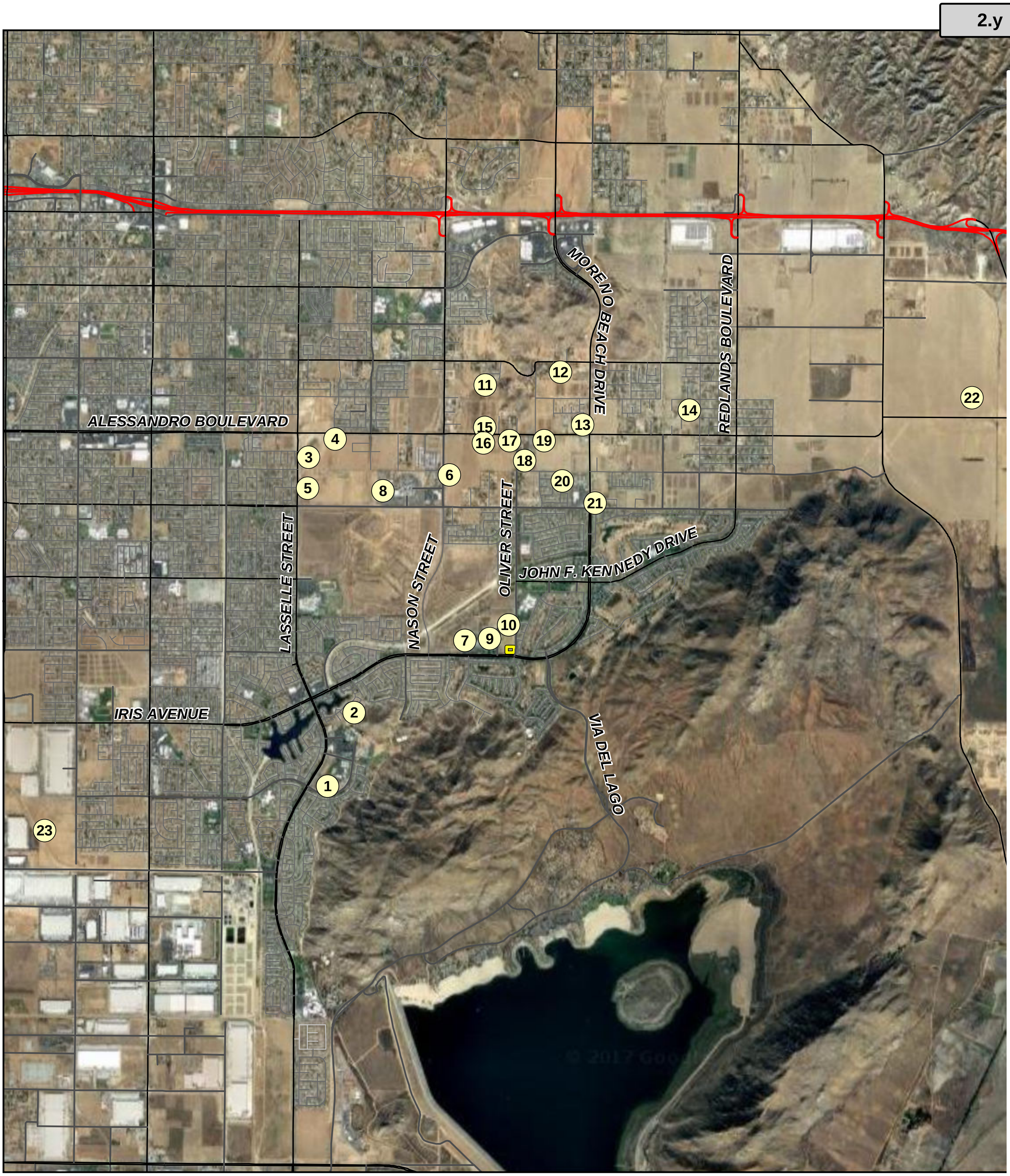

LSA

LEGEND

▭ Project Location

○ Cumulative Projects

N

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SOURCE: Google Earth, 2016.

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FIGURE 4-

AM/PM Gasoline Service Statio
Traffic Impact Analysi

Cumulative Projects

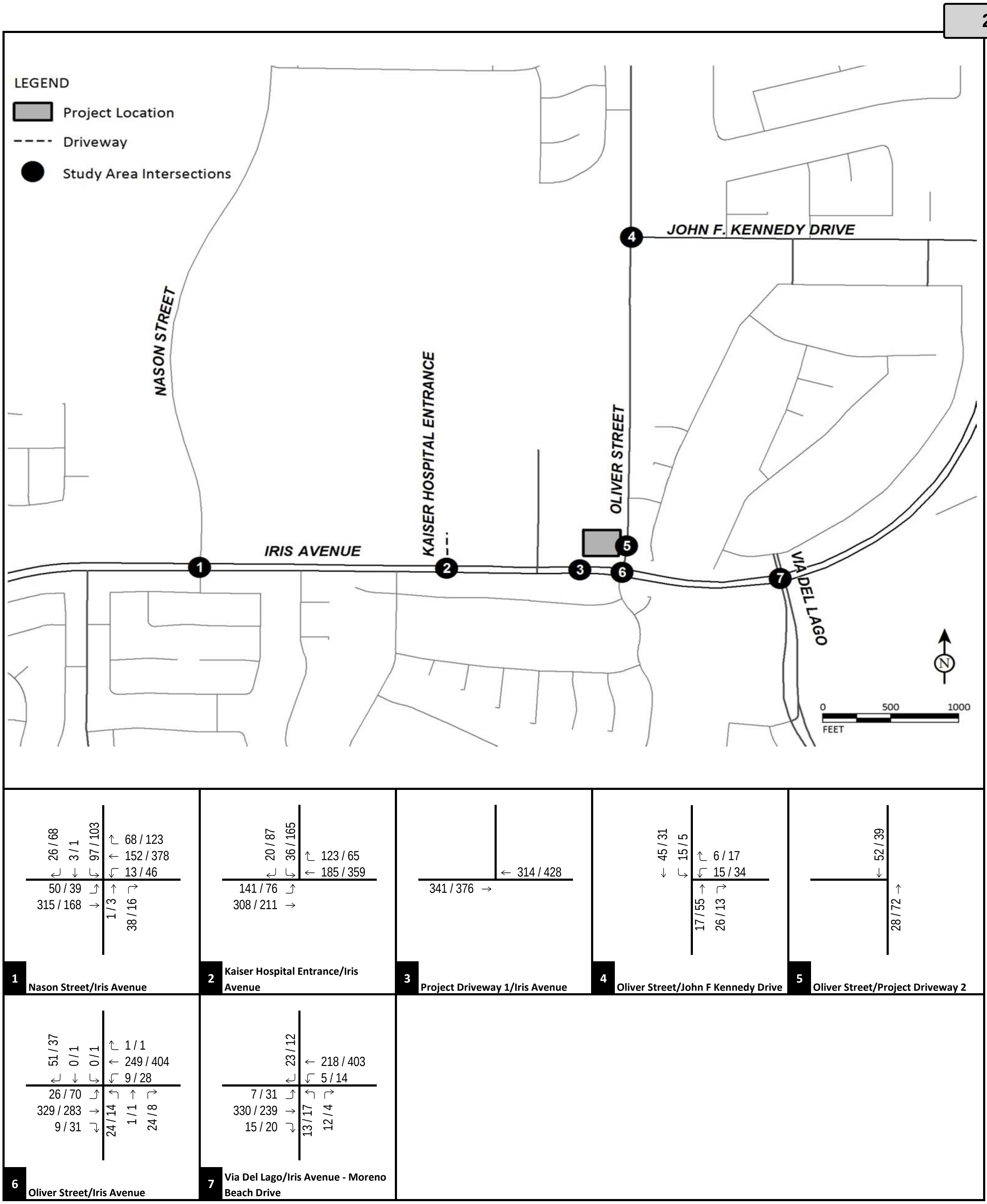

FIGURE 4-4

XXX / YYY
AM / PM Peak Hour PCE Volumes

AM/PM Gasoline Service Station
Traffic Impact Analysis
Cumulative Projects Trip Assignment

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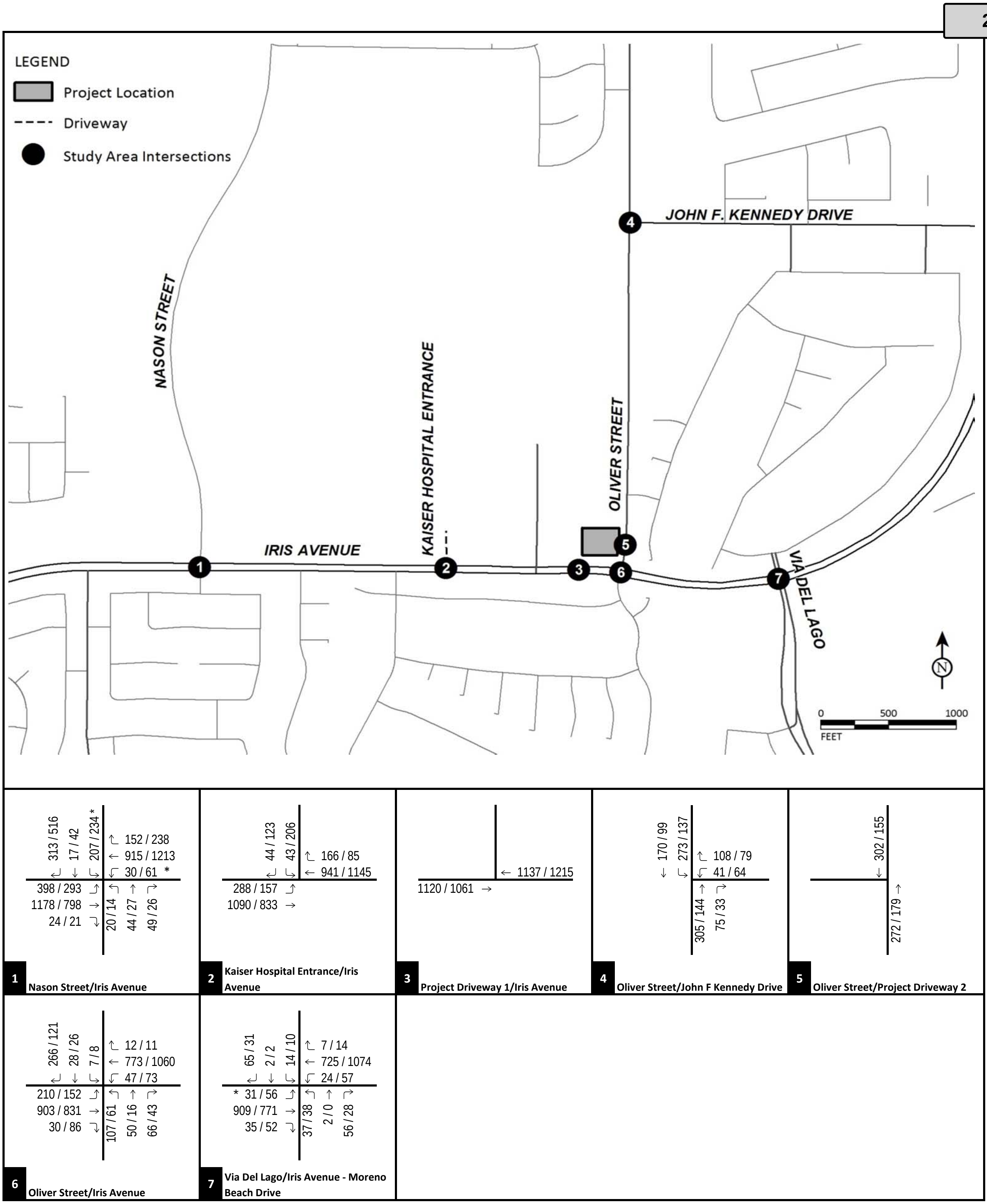

FIGURE 4-5

LSA

XXXX / YYYY
AM / PM Peak Hour PCE Volumes
* Includes U-Turn movements

AM/PM Gasoline Service Station
Traffic Impact Analysis
Cumulative (2022) Peak Hour Traffic Volumes

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Table 4-A - Existing (2017) Roadway Segment Levels of Service

Roadway Segment	Functional Classification[1]	LOS Standard[2]	LOS Standard Threshold Volume[1]	Without Project		With Project	
				Daily Volume	LOS	Daily Volume	LOS
Segments on Oliver Street							
From John F Kennedy Drive to Project Driveway 2	4-Lane Undivided Arterial	D	22,500	2,679	A	2,873	A
From Project Driveway 2 to Iris Avenue	4-Lane Undivided Arterial	D	22,500	2,679	A	3,464	A
Segments on Iris Avenue							
From Nason Street to Kaiser Hospital Entrance	6-Lane Divided Arterial	C	45,000	20,289	A	21,074	A
From Kaiser Hospital Entrance to Project Driveway 1	6-Lane Divided Arterial	D	50,600	16,994	A	17,779	A
From Project Driveway 1 to Oliver Street	6-Lane Divided Arterial	D	50,600	16,994	A	17,779	A
From Oliver Street to Via Del Lago	6-Lane Divided Arterial	C	45,000	14,114	A	14,899	A

Notes:

LOS = Level of Service

[1] Based on City of Moreno Valley *Traffic Impact Analysis Preparation Guide* , dated August 2007.

[2] LOS Standard based on *Moreno Valley General Plan: Final Program EIR - 5.2 Traffic/Circulation* , dated July 2006.

* Exceeds LOS Standard

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Table 4-B - Project Completion Year (2022) Roadway Segment Levels of Service

Roadway Segment	Functional Classification[1]	LOS Standard[2]	LOS Standard Threshold Volume[1]	Without Project		With Project	
				Daily Volume	LOS	Daily Volume	LOS
Segments on Oliver Street							
From John F Kennedy Drive to Project Driveway 2	4-Lane Undivided Arterial	D	22,500	2,958	A	3,152	A
From Project Driveway 2 to Iris Avenue	4-Lane Undivided Arterial	D	22,500	2,958	A	3,743	A
Segments on Iris Avenue							
From Nason Street to Kaiser Hospital Entrance	6-Lane Divided Arterial	C	45,000	22,401	A	23,186	A
From Kaiser Hospital Entrance to Project Driveway 1	6-Lane Divided Arterial	D	50,600	18,763	A	19,548	A
From Project Driveway 1 to Oliver Street	6-Lane Divided Arterial	D	50,600	18,763	A	19,548	A
From Oliver Street to Via Del Lago	6-Lane Divided Arterial	C	45,000	15,583	A	16,368	A

Notes:

LOS = Level of Service

[1] Based on City of Moreno Valley *Traffic Impact Analysis Preparation Guide* , dated August 2007.

[2] LOS Standard based on *Moreno Valley General Plan: Final Program EIR - 5.2 Traffic/Circulation* , dated July 2006.

* Exceeds LOS Standard

LSA

Table 4-C - Cumulative Projects Trip Generation

Project No.	Land Use/Builder/Applicant	Units		A.M. Peak Hour In	A.M. Peak Hour Out	A.M. Peak Hour Total	P.M. Peak Hour In	P.M. Peak Hour Out	P.M. Peak Hour Total	Daily
1 .	**MFD - Continental East**	125	DU							
	Trips/Unit[1]			0.10	0.41	0.51	0.40	0.22	0.62	6.65
	Trip Generation			**13**	**51**	**64**	**50**	**27**	**77**	**831**
2 .	**MFD - GHA**	62	DU							
	Trips/Unit[1]			0.10	0.41	0.51	0.40	0.22	0.62	6.65
	Trip Generation			**6**	**25**	**31**	**25**	**13**	**38**	**412**
3 .	**MFD - La Jolla Development/Rochas Grandes**	426	DU							
	Trips/Unit[1]			0.10	0.41	0.51	0.40	0.22	0.62	6.65
	Trip Generation			**43**	**174**	**217**	**172**	**92**	**264**	**2,833**
4 .	**MFD - Rancho Belago Developers, Inc.**	141	DU							
	Trips/Unit[1]			0.10	0.41	0.51	0.40	0.22	0.62	6.65
	Trip Generation			**14**	**58**	**72**	**57**	**31**	**88**	**938**
5 .	**MFD - MV Bella Vista GP, LLC**	220	DU							
	Trips/Unit[1]			0.10	0.41	0.51	0.40	0.22	0.62	6.65
	Trip Generation			**22**	**90**	**112**	**89**	**48**	**137**	**1,463**
6 .	**Moreno Valley Medical Plaza**	217.00	TSF							
	Trips/Unit[2]			1.89	0.50	2.39	1.00	2.57	3.57	36.13
	Trip Generation			**410**	**109**	**519**	**217**	**558**	**775**	**7,840**
7 .	**Moreno Valley Medical Overlay Area**	122.25	TSF							
	Trips/Unit[2]			1.89	0.50	2.39	1.00	2.57	3.57	36.13
	Trip Generation			**231**	**61**	**292**	**122**	**314**	**436**	**4,417**
8 .	**Riverside University Health System Expansion**	34.75	TSF							
	Trips/Unit[3]			0.60	0.35	0.95	0.35	0.58	0.93	13.22
	Trip Generation			**21**	**12**	**33**	**12**	**20**	**32**	**459**
9 .	**Kaiser Permanente Moreno Valley Emergency Room Expansion**									
	Hospital	74.00	TSF							
	Trips/Unit[3]			0.60	0.35	0.95	0.35	0.58	0.93	13.22
	Trip Generation			**44**	**26**	**70**	**26**	**43**	**69**	**978**
10 .	**Mainstreet Post-Acute Care**	57.00	TSF							
	Trips/Unit[4]			0.39	0.16	0.55	0.38	0.36	0.74	7.60
	Trip Generation			**22**	**9**	**31**	**22**	**20**	**42**	**433**

LSA

Table 4-C - Cumulative Projects Trip Generation

Project No.	Land Use/Builder/Applicant	Units		A.M. Peak Hour			P.M. Peak Hour			Daily
				In	Out	Total	In	Out	Total	
11 .	**SFD - Winchester Associates**	52	DU							
	Trips/Unit[5]			0.19	0.56	0.75	0.63	0.37	1.00	9.52
	Trip Generation			**10**	**29**	**39**	**33**	**19**	**52**	**495**
12 .	**SFD - Dev West Engineering**	80	DU							
	Trips/Unit[5]			0.19	0.56	0.75	0.63	0.37	1.00	9.52
	Trip Generation			**15**	**45**	**60**	**50**	**30**	**80**	**762**
13 .	**SFD - Frontier Homes**	56	DU							
	Trips/Unit[5]			0.19	0.56	0.75	0.63	0.37	1.00	9.52
	Trip Generation			**11**	**32**	**43**	**35**	**21**	**56**	**533**
14 .	**SFD - Motlagh Family Trust**	25	DU							
	Trips/Unit[5]			0.19	0.56	0.75	0.63	0.37	1.00	9.52
	Trip Generation			**5**	**14**	**19**	**16**	**9**	**25**	**238**
15 .	**SFD - Winchester Associates**	54	DU							
	Trips/Unit[5]			0.19	0.56	0.75	0.63	0.37	1.00	9.52
	Trip Generation			**10**	**30**	**40**	**34**	**20**	**54**	**514**
16 .	**SFD - Gabel, Cook, and Associates**	107	DU							
	Trips/Unit[5]			0.19	0.56	0.75	0.63	0.37	1.00	9.52
	Trip Generation			**20**	**60**	**80**	**67**	**40**	**107**	**1,019**
17 .	**SFD - Winchester Associates**	63	DU							
	Trips/Unit[5]			0.19	0.56	0.75	0.63	0.37	1.00	9.52
	Trip Generation			**12**	**35**	**47**	**40**	**23**	**63**	**600**
18 .	**SFD - Joe Anderson**	32	DU							
	Trips/Unit[5]			0.19	0.56	0.75	0.63	0.37	1.00	9.52
	Trip Generation			**6**	**18**	**24**	**20**	**12**	**32**	**305**
19 .	**SFD - Mike McKnight Planning Const.**	96	DU							
	Trips/Unit[5]			0.19	0.56	0.75	0.63	0.37	1.00	9.52
	Trip Generation			**18**	**54**	**72**	**60**	**36**	**96**	**914**
20 .	**SFD - Frontier Homes**	40	DU							
	Trips/Unit[5]			0.19	0.56	0.75	0.63	0.37	1.00	9.52
	Trip Generation			**8**	**23**	**31**	**25**	**15**	**40**	**381**

Table 4-C - Cumulative Projects Trip Generation

Project No.	Land Use/Builder/Applicant	Units		A.M. Peak Hour In	A.M. Peak Hour Out	A.M. Peak Hour Total	P.M. Peak Hour In	P.M. Peak Hour Out	P.M. Peak Hour Total	Daily
21 .	**SFD - KB Homes**	159	DU							
	Trips/Unit[5]			0.19	0.56	0.75	0.63	0.37	1.00	9.52
	Trip Generation			**30**	**89**	**119**	**100**	**59**	**159**	**1,514**
22 .	**World Logistics Center**	21,450.00	TSF							
	Trip Generation[6]			**1,197**	**466**	**1,663**	**412**	**1,396**	**1,808**	**30,879**
23 .	**Moreno Valley Logistics Center**	1737.52	TSF							
	Trip Generation[7]			**321**	**67**	**388**	**71**	**333**	**404**	**3,519**
	Total Net Trip Generation			**2,489**	**1,577**	**4,066**	**1,755**	**3,179**	**4,934**	**62,277**

Notes:

DU = Dwelling Units; TSF = Thousand Square Feet; MFD = Multi-Family Development; SFD = Single-Family Development

[1] Rates based on Land Use 220 "Apartment" from the Institute of Transportation Engineers (ITE) *Trip Generation*, 9th Edition.

[2] Rates based on Land Use 720 "Medical-Dental Office Building" from ITE *Trip Generation,* 9th Edition.

[3] Rates based on Land Use 610 "Hospital" from ITE *Trip Generation,* 9th Edition.

[4] Rates based on Land Use 620 "Nursing Home" from ITE *Trip Generation,* 9th Edition.

[5] Rates based on Land Use 210 "Single-Family Detached Housing" from ITE *Trip Generation,* 9th Edition.

[6] The Phase 1 (Year 2022) project trip generation was extracted from the *Traffic Impact Analysis Report for The World Logistics Center*, dated May 2014. Only passenger vehicle trip generation is reported. All truck trips were sent to the nearest freeway and did not pass through any study intersections.

[7] The project trip generation was extracted from the *Moreno Valley Logistics Center Traffic Impact Analysis*, dated June 17, 2016. Only passenger vehicle trip generation is reported. All truck trips were sent to the nearest freeway and did not pass through any study intersections.

Table 4-D - Cumulative (2022) Roadway Segment Levels of Service

Roadway Segment	Functional Classification[1]	LOS Standard[2]	LOS Standard Threshold Volume[1]	Without Project		With Project	
				Daily Volume	LOS	Daily Volume	LOS
Segments on Oliver Street							
From John F Kennedy Drive to Project Driveway 2	4-Lane Undivided Arterial	D	22,500	4,536	A	4,730	A
From Project Driveway 2 to Iris Avenue	4-Lane Undivided Arterial	D	22,500	4,076	A	4,861	A
Segments on Iris Avenue							
From Nason Street to Kaiser Hospital Entrance	6-Lane Divided Arterial	C	45,000	33,459	A	34,244	B
From Kaiser Hospital Entrance to Project Driveway 1	6-Lane Divided Arterial	D	50,600	29,411	A	30,196	A
From Project Driveway 1 to Oliver Street	6-Lane Divided Arterial	D	50,600	29,999	A	30,784	A
From Oliver Street to Via Del Lago	6-Lane Divided Arterial	C	45,000	25,951	A	26,736	A

Notes:

LOS = Level of Service

[1] Based on City of Moreno Valley *Traffic Impact Analysis Preparation Guide*, dated August 2007.

[2] LOS Standard based on *Moreno Valley General Plan: Final Program EIR - 5.2 Traffic/Circulation*, dated July 2006.

* Exceeds LOS Standard

5.0 PROJECT TRAFFIC

5.1 PROJECT TRIP GENERATION

The project site includes a gas station with 16 fueling stations, a 3,800-square foot convenience store, and a drive-through car wash. The trip generation for the proposed project was developed using rates from the ITE *Trip Generation*, 9th Edition, for Land Use 946 – "Gasoline/Service Station with Convenience Market." Table 5-A summarizes the a.m. and p.m. peak hours and daily net project trip generation. The project is forecast to generate 88 net a.m. peak hour trips, 101 net p.m. peak hour trips, and 1,111 net daily trips.

Gas stations will typically draw some trips from the traffic passing the site on an adjacent street or from traffic on other roadways within the vicinity. These trips are not "new" trips made for the sole purpose of visiting the site, but are trips made as an intermediate stop en route to an ultimate destination. Trips on adjacent streets passing the site are referred to as "pass-by" trips and only affect traffic at project driveways and on streets adjacent to the project. Pass-by trips were developed and applied using rates from the ITE *Trip Generation Handbook* (2nd Edition). Figure 5-1 illustrates the pass-by trip assignment for the proposed project.

5.2 PROJECT TRIP DISTRIBUTION AND ASSIGNMENT

The distribution of project trips was developed in consultation with City staff by examining the regional roadway network and the location of the proposed project in relation to the surrounding areas. Figures 5-2 and 5-3 illustrate the outbound and inbound trip distribution for the proposed project at the study intersections, respectively. Trip assignment for project trips is the product of the project trip generation and the trip distribution percentages. Figure 5-4 illustrates the net project trip assignment at the study intersections.

5.3 LIST OF CHAPTER 5.0 FIGURES AND TABLES

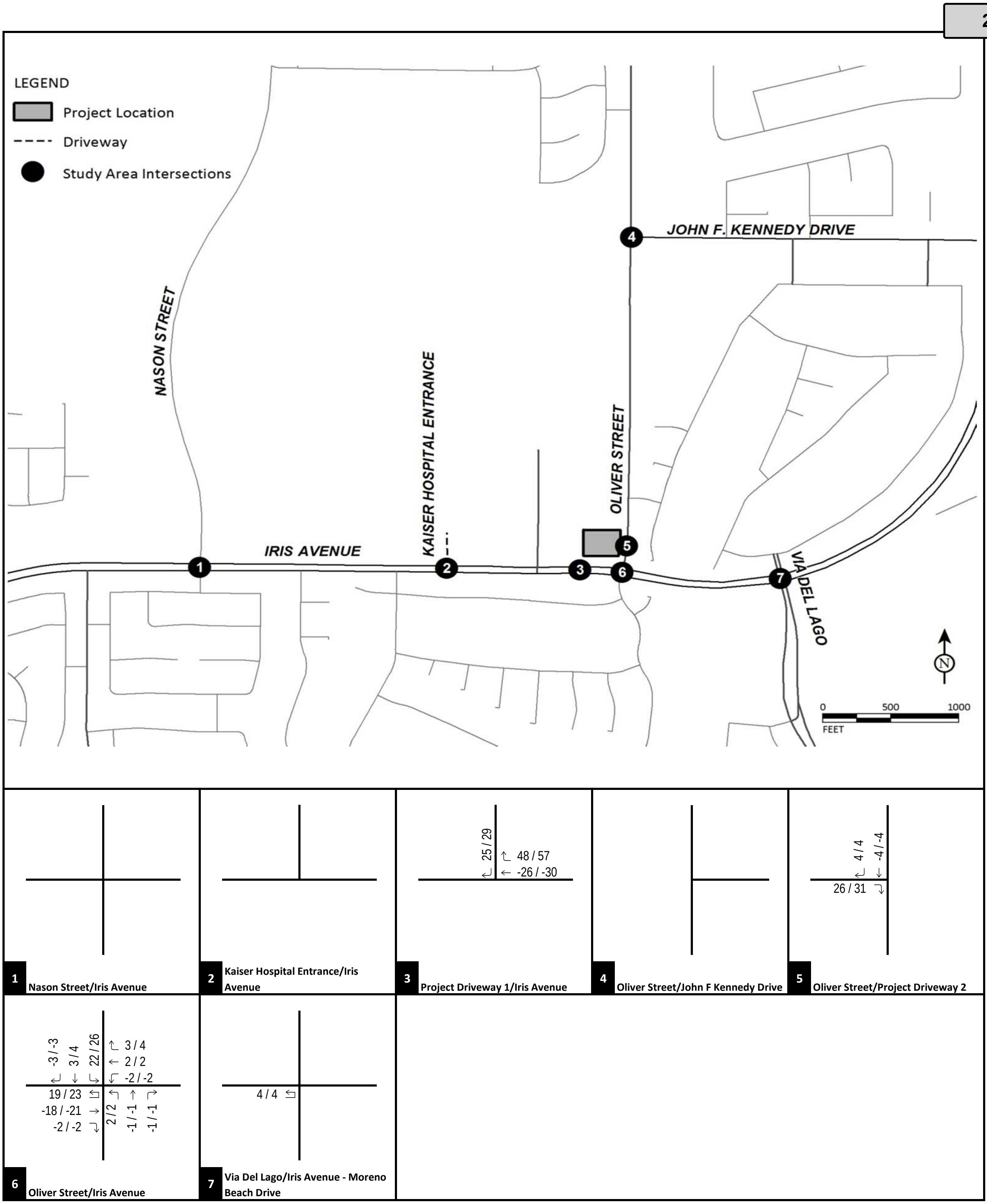

FIGURE 5-1

LSA

XX / YY
AM / PM Peak Hour PCE Volumes

AM/PM Gasoline Service Station
Traffic Impact Analysis
Pass-By Trips Assignment

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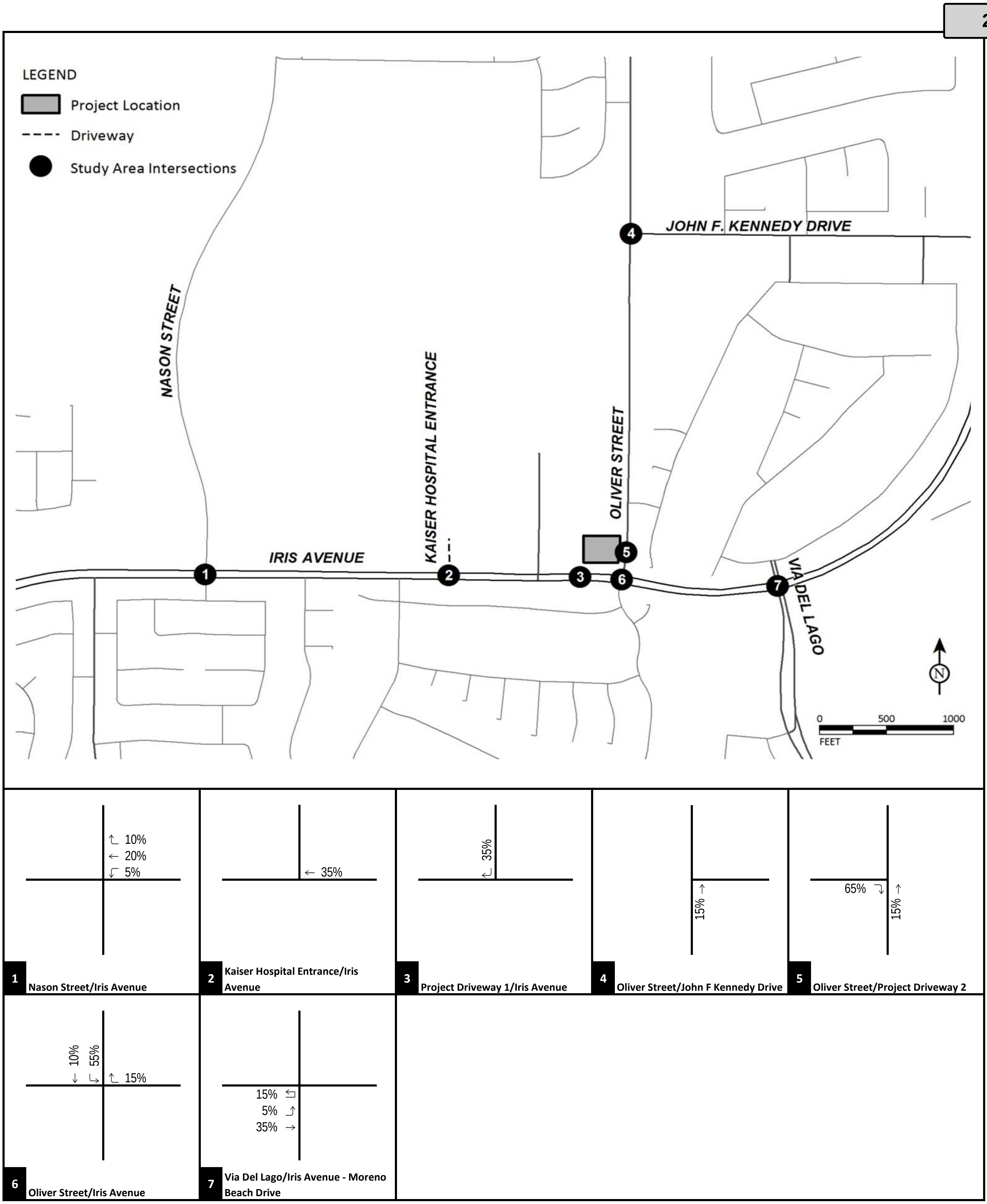

FIGURE 5-2

XX%
Outbound Trip Distribution

AM/PM Gasoline Service Station
Traffic Impact Analysis
Project Trip Distribution (Outbound)

R:\SAT1701_Sater Gas Station MoVal\Technical Studies\Traffic\z30_Dist_Out\Figure (10/20/2017)

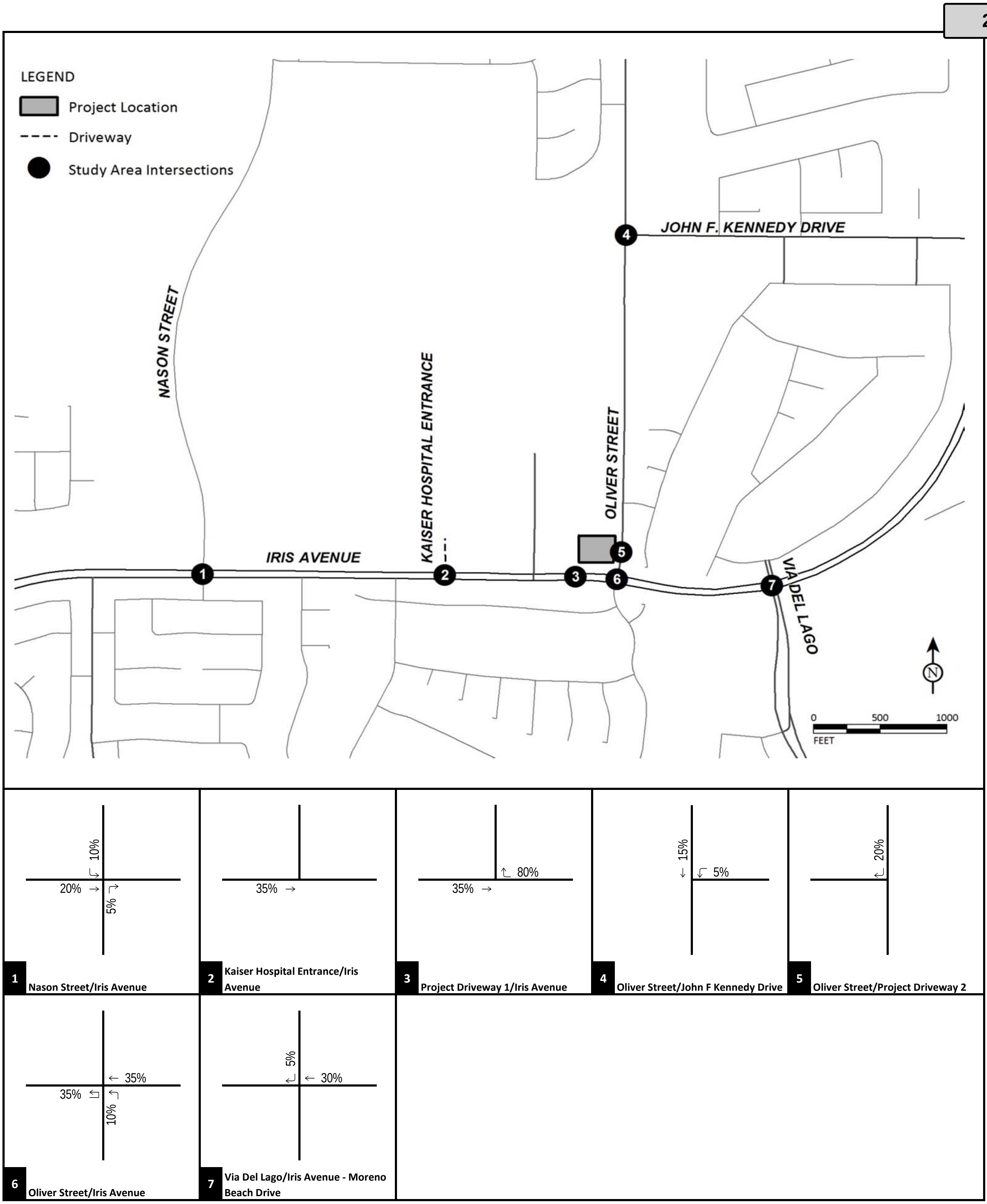

FIGURE 5-3

LSA

XX%
Inbound Trip Distribution

AM/PM Gasoline Service Station
Traffic Impact Analysis
Project Trip Distribution (Inbound)

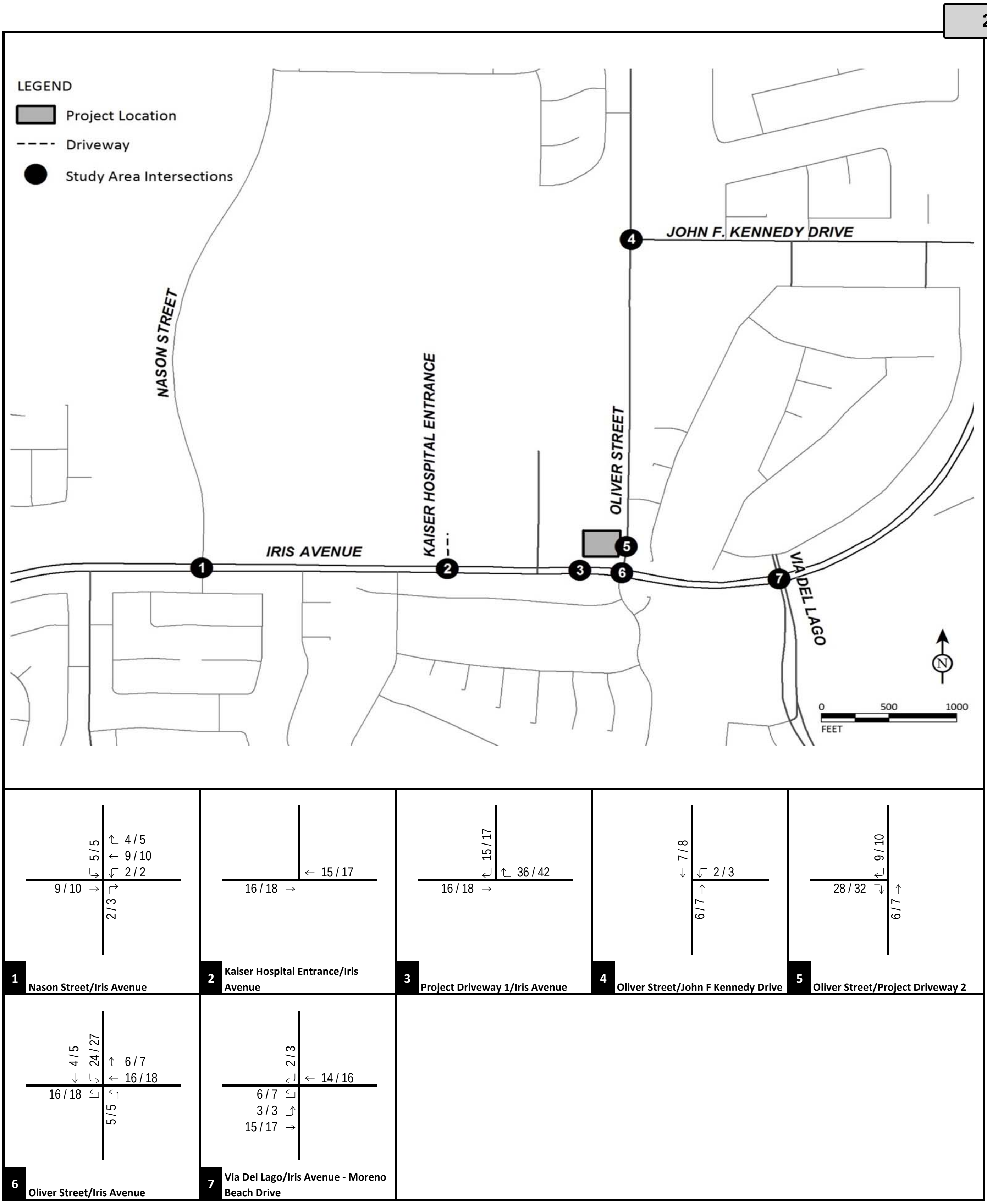

FIGURE 5-4

LSA

XX / YY
AM / PM Peak Hour Traffic Volumes

AM/PM Gasoline Service Station
Traffic Impact Analysis
Net Project Trip Assignment

R:\SAT1701_Sater Gas Station MoVal\Technical Studies\Traffic\z30_Assn\Figure (10/20/2017)

Table 5-A - Project Trip Generation

Land Use	Units	A.M. Peak Hour In	A.M. Peak Hour Out	A.M. Peak Hour Total	P.M. Peak Hour In	P.M. Peak Hour Out	P.M. Peak Hour Total	Daily
Gasoline Station with Convenience Market and Car Wash	16 Fueling Stations							
Trips/Unit[1]		6.04	5.80	11.84	7.07	6.79	13.86	152.84
Trip Generation		97	93	190	113	109	222	2,445
Pass By Trips[2]		(52)	(50)	(102)	(61)	(60)	(121)	(1,334)
Total Net New Trips		45	43	88	52	49	101	1,111
	Total Trip Generation	**97**	**93**	**190**	**113**	**109**	**222**	**2,445**
	Pass-By Trips	**(52)**	**(50)**	**(102)**	**(61)**	**(60)**	**(121)**	**(1,334)**
	Net New Trips	**45**	**43**	**88**	**52**	**49**	**101**	**1,111**

Notes:

[1] Rates based on Land Use 946 - "Gasoline/Service Station with Convenience Market and Car Wash" from the Institute of Transportation Engineers (ITE) *Trip Generation* Manual, 9th Edition.

[2] Pass-by rates for Land Use 945 - "Gasoline/Service Station with Convenience Market" were factored. A pass-by rate of 53% was used in the the a.m. peak hour, while 54.6% was used in the p.m. peak hour. Since there is no data available for daily pass-by trips, the p.m. pass-by rate has been applied to the daily trip generation.

6.0 TRAFFIC VOLUMES WITH PROJECT SCENARIOS

Existing (2017), project completion year (2022), and cumulative (2022) with project traffic volumes were developed by adding project traffic to the corresponding without project scenarios. Figures 6-1, 6-2, and 6-3 illustrate "with project" peak hour PCE volumes at study intersections under existing, project completion year (2022), and cumulative (2022) conditions, respectively. Previously referenced Tables 4-A, 4-B, and 4-C summarize the "with project" roadway segment daily PCE traffic volumes under existing, project completion year (2022), and cumulative (2022) conditions.

Detailed volume development worksheets are included in Appendix C.

6.1 LIST OF CHAPTER 6.0 FIGURES

- Figure 6-1: Existing (2017) with Project Peak Hour Traffic Volumes
- Figure 6-2: Project Completion Year (2022) with Project Peak Hour Traffic Volumes
- Figure 6-3: Cumulative (2022) with Project Peak Hour Traffic Volumes

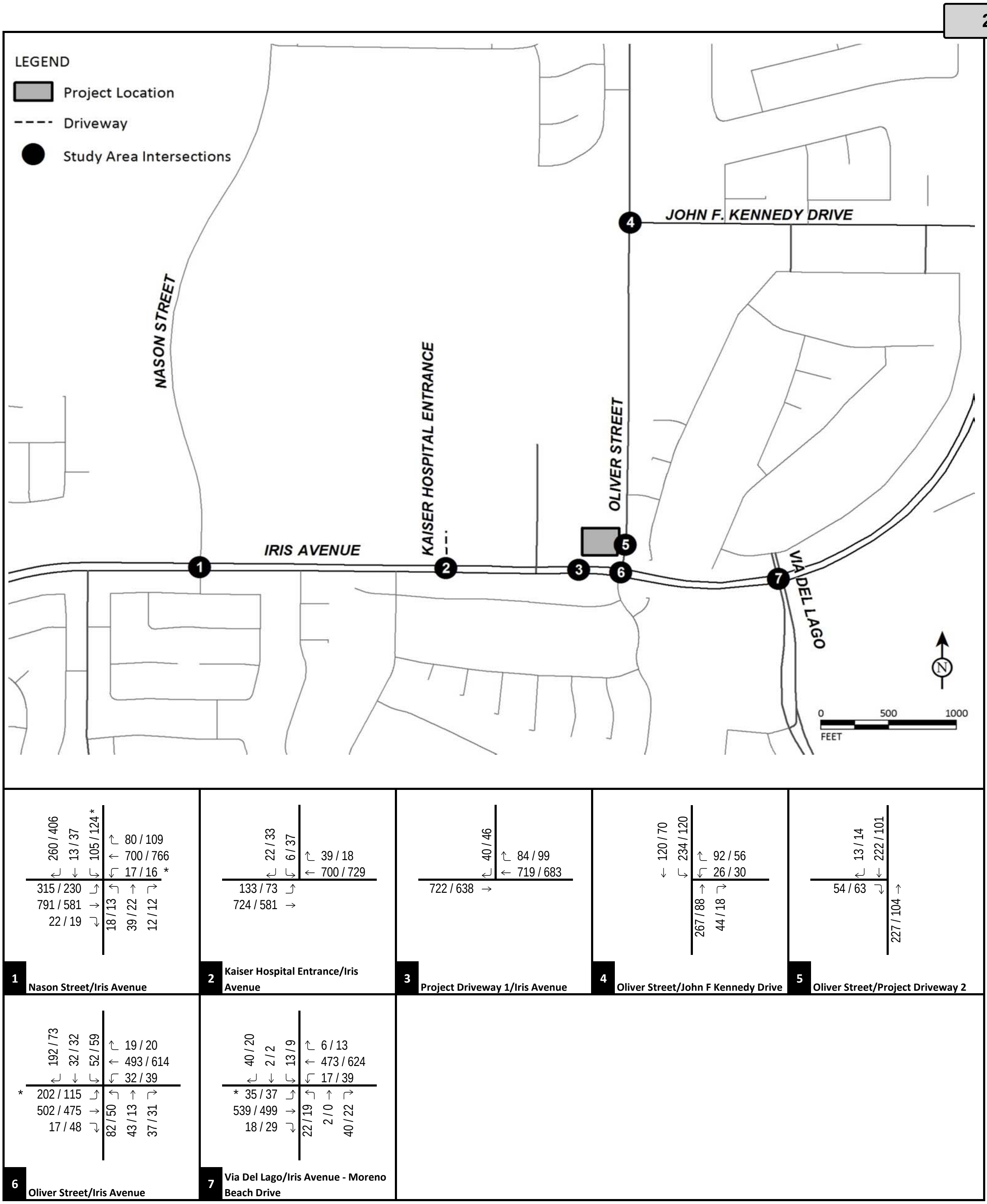

FIGURE 6-1

XXX / YYY
AM / PM Peak Hour PCE Volumes
* Includes U-Turn movements

AM/PM Gasoline Service Station
Traffic Impact Analysis
Existing (2017) with Project Peak Hour Traffic Volumes

R:\SAT1701_Sater Gas Station MoVal\Technical Studies\Traffic\z30-Vol-2017 Exist P\Figure (11/17/2017)

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

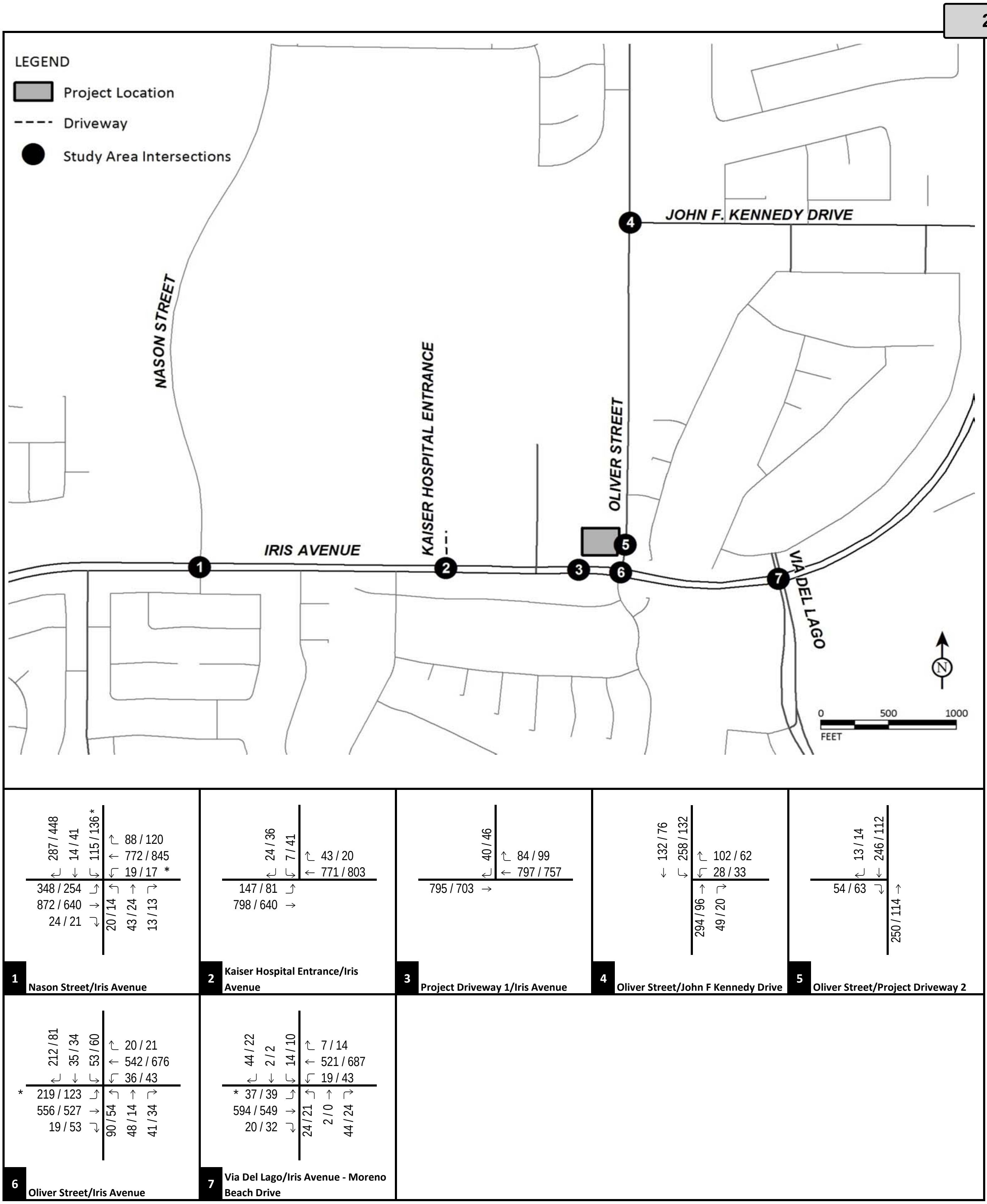

FIGURE 6-2

XXX / YYY
AM / PM Peak Hour PCE Volumes
* Includes U-Turn movements

AM/PM Gasoline Service Station
Traffic Impact Analysis
Project Completion Year (2022) with Project Peak Hour Traffic Volumes

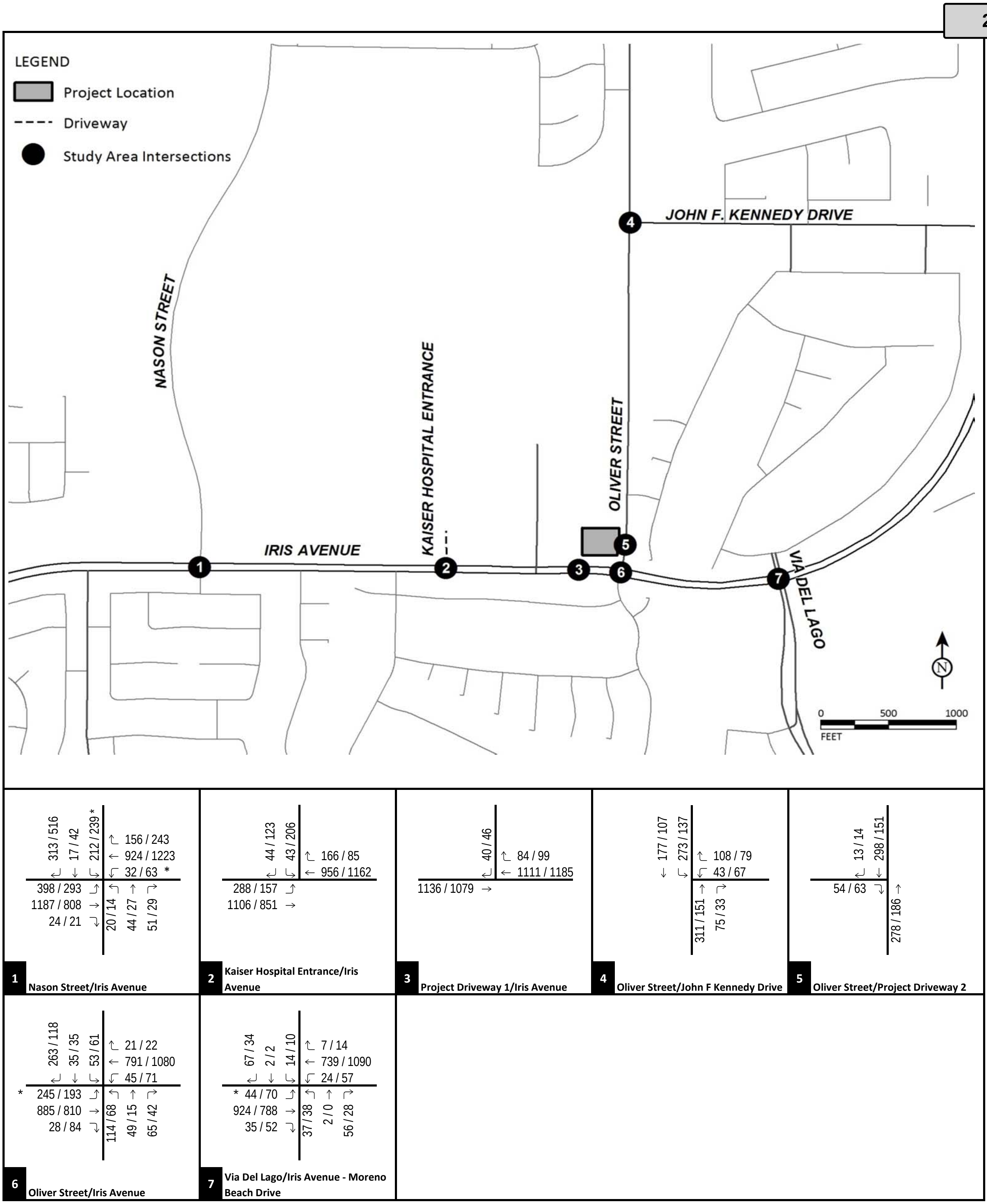

FIGURE 6-3

LSA

XXXX / YYYY
AM / PM Peak Hour PCE Volumes
* Includes U-Turn movements

AM/PM Gasoline Service Station
Traffic Impact Analysis
Cumulative (2022) with Project Peak Hour Traffic Volumes

R:\SAT1701_Sater Gas Station MoVal\Technical Studies\Traffic\z30-Vol-2022 zCumul P\Figure (11/17/2017)

7.0 INTERSECTION AND ROADWAY LEVELS OF SERVICE

7.1 EXISTING (2017) LEVELS OF SERVICE

7.1.1 Study Intersections

Previously referenced Figure 3-1 illustrates existing geometrics and stop control. An intersection LOS analysis was conducted for existing (2017) conditions using the methodologies previously discussed. Table 7-A summarizes the results of this analysis and shows that all study intersections are currently operating at a satisfactory LOS.

Detailed Level of Service Worksheets are included in Appendix D.

7.1.2 Roadway Segments

A roadway segment LOS analysis was conducted for existing (2017) conditions using the methodologies previously discussed. The levels of service were calculated using the criteria contained in the "Analysis Methodology" section of this report. Previously referenced Table 4-A summarizes the results of this analysis and shows that all roadway segments are currently operating at satisfactory levels of service.

Detailed Level of Service Worksheets are included in Appendix D.

7.2 EXISTING (2017) WITH PROJECT LEVELS OF SERVICE

Analysis of the existing with project scenario is provided for CEQA compliance to identify direct project impacts if the project were to be built and in operation today. This scenario eliminates the effects of ambient growth and other cumulative projects and deals specifically with project impacts.

7.2.1 Study Intersections

An intersection LOS analysis was conducted for existing (2017) with project conditions using the methodologies previously discussed. Table 7-A summarizes the results of this analysis and shows that all study intersections are projected to operate at satisfactory levels of service.

Detailed Level of Service Worksheets are included in Appendix D.

7.2.2 Roadway Segments

A roadway segment LOS analysis was conducted for existing (2017) with project conditions using the methodologies previously discussed. The levels of service were calculated using the criteria contained in the "Analysis Methodology" section of this report. Previously referenced Table 4-A summarizes the results of this analysis and shows that all roadway segments are projected to operate at satisfactory levels of service.

Detailed Level of Service Worksheets are included in Appendix D.

7.3 PROJECT COMPLETION YEAR (2022) WITHOUT PROJECT LEVELS OF SERVICE

7.3.1 Study Intersections

An intersection LOS analysis was conducted for project completion year (2022) conditions using the methodologies previously discussed. Table 7-B summarizes the results of this analysis and shows that all study intersections are projected to operate at satisfactory levels of service.

Detailed Level of Service Worksheets are included in Appendix D.

7.3.2 Roadway Segments

A roadway segment LOS analysis was conducted for project completion year (2022) using the methodologies previously discussed. The levels of service were calculated using the criteria contained in the “Analysis Methodology” section of this report. Previously referenced Table 4-B summarizes the results of this analysis and shows that all roadway segments are projected to operate at satisfactory levels of service.

Detailed Level of Service Worksheets are included in Appendix D.

7.4 PROJECT COMPLETION YEAR (2022) WITH PROJECT LEVELS OF SERVICE

7.4.1 Study Intersections

An intersection LOS analysis was conducted for project completion year (2022) with project conditions using the methodologies previously discussed. Table 7-B summarizes the results of this analysis and shows that all study intersections are projected to operate at satisfactory levels of service.

Detailed Level of Service Worksheets are included in Appendix D.

7.4.2 Roadway Segments

A roadway segment LOS analysis was conducted for project completion year (2022) with project using the methodologies previously discussed. The levels of service were calculated using the criteria contained in the “Analysis Methodology” section of this report. Previously referenced Table 4-B summarizes the results of this analysis and shows that all roadway segments are projected to operate at satisfactory levels of service.

Detailed Level of Service Worksheets are included in Appendix D.

7.5 CUMULATIVE (2022) WITHOUT PROJECT LEVELS OF SERVICE

7.5.1 Study Intersections

An intersection LOS analysis was conducted for cumulative (2022) conditions using the methodologies previously discussed. Table 7-C summarizes the results of this analysis and shows that all study intersections are projected to operate at satisfactory levels of service.

Detailed Level of Service Worksheets are included in Appendix D.

7.5.2 Roadway Segments

A roadway segment LOS analysis was conducted for cumulative (2022) conditions using the methodologies previously discussed. The levels of service were calculated using the criteria contained in the "Analysis Methodology" section of this report. Previously referenced Table 4-D summarizes the results of this analysis and shows that all roadway segments are projected to operate at satisfactory levels of service.

Detailed Level of Service Worksheets are included in Appendix D.

7.6 CUMULATIVE (2022) WITH PROJECT LEVELS OF SERVICE

7.6.1 Study Intersections

An intersection LOS analysis was conducted for cumulative (2022) with project conditions using the methodologies previously discussed. Table 7-C summarizes the results of this analysis and shows that all study intersections are projected to operate at satisfactory levels of service.

Detailed Level of Service Worksheets are included in Appendix D.

7.6.2 Roadway Segments

A roadway segment LOS analysis was conducted for cumulative (2022) with project conditions using the methodologies previously discussed. The levels of service were calculated using the criteria contained in the "Analysis Methodology" section of this report. Previously referenced Table 4-D summarizes the results of this analysis and shows that all roadway segments are projected to operate at satisfactory levels of service.

Detailed Level of Service Worksheets are included in Appendix D.

7.7 LIST OF CHAPTER 7.0 TABLES

Table 7-A - Existing (2017) Intersection Levels of Service

			Without Project				With Project				
			AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		
Intersection	Control	LOS Standard[1]	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Project Impact
1 . Nason Street/Iris Avenue	Signal	C	20.9	C	24.9	C	21.3	C	25.1	C	No
2 . Kaiser Hospital Entrance/Iris Avenue	Signal	D	7.2	A	3.3	A	7.2	A	3.2	A	No
3 . Project Driveway 1/Iris Avenue	OWSC	D	*Does Not Exist*		*Does Not Exist*		10.0	A	9.8	A	No
4 . Oliver Street/John F Kennedy Drive	AWSC	C	12.7	B	8.6	A	13.0	B	8.8	A	No
5 . Oliver Street/Project Driveway 2	OWSC	D	*Does Not Exist*		*Does Not Exist*		9.2	A	8.8	A	No
6 . Oliver Street/Iris Avenue	Signal	D	24.3	C	17.9	B	41.5	D	23.0	C	No
7 . Via Del Lago/Iris Avenue - Moreno Beach Drive	Signal	C	24.6	C	22.9	C	24.7	C	23.0	C	No

Notes:

OWSC = One-Way Stop Control; AWSC = All-Way Stop Control

Delay = Average control delay in seconds

LOS = Level of Service

[1] LOS Standard based on *Moreno Valley General Plan: Final Program EIR - 5.2 Traffic/Circulation*, dated July 2006.

* Exceeds LOS Standard

Table 7-B - Project Completion Year (2022) Intersection Levels of Service

Intersection	Control	LOS Standard[1]	Without Project AM Peak Hour Delay (sec.)	Without Project AM Peak Hour LOS	Without Project PM Peak Hour Delay (sec.)	Without Project PM Peak Hour LOS	With Project AM Peak Hour Delay (sec.)	With Project AM Peak Hour LOS	With Project PM Peak Hour Delay (sec.)	With Project PM Peak Hour LOS	Project Impact
1 . Nason Street/Iris Avenue	Signal	C	23.3	C	26.3	C	24.2	C	26.5	C	No
2 . Kaiser Hospital Entrance/Iris Avenue	Signal	D	7.5	A	3.4	A	7.5	A	3.4	A	No
3 . Project Driveway 1/Iris Avenue	OWSC	D	*Does Not Exist*		*Does Not Exist*		10.0	A	10.0	A	No
4 . Oliver Street/John F Kennedy Drive	AWSC	C	14.4	B	8.9	A	14.8	B	9.0	A	No
5 . Oliver Street/Project Driveway 2	OWSC	D	*Does Not Exist*		*Does Not Exist*		9.2	A	8.9	A	No
6 . Oliver Street/Iris Avenue	Signal	D	24.9	C	18.3	B	45.1	D	23.8	C	No
7 . Via Del Lago/Iris Avenue - Moreno Beach Drive	Signal	C	25.1	C	23.5	C	25.2	C	23.7	C	No

Notes:

OWSC = One-Way Stop Control; AWSC = All-Way Stop Control

Delay = Average control delay in seconds

LOS = Level of Service

[1] LOS Standard based on *Moreno Valley General Plan: Final Program EIR - 5.2 Traffic/Circulation*, dated July 2006.

* Exceeds LOS Standard

Table 7-C - Cumulative (2022) Intersection Levels of Service

Intersection	Control	LOS Standard[1]	Without Project				With Project				Project Impact
			AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		
			Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	
1 . Nason Street/Iris Avenue	Signal	C	31.8	C	33.8	C	32.2	C	34.5	C	No
2 . Kaiser Hospital Entrance/Iris Avenue	Signal	D	9.3	A	6.5	A	9.4	A	6.5	A	No
3 . Project Driveway 1/Iris Avenue	OWSC	D	*Does Not Exist*		*Does Not Exist*		10.6	B	11.0	B	No
4 . Oliver Street/John F Kennedy Drive	AWSC	C	13.4	B	9.3	A	13.7	B	9.4	A	No
5 . Oliver Street/Project Driveway 2	OWSC	D	*Does Not Exist*		*Does Not Exist*		9.4	A	9.0	A	No
6 . Oliver Street/Iris Avenue	Signal	D	38.9	D	21.5	C	42.3	D	25.6	C	No
7 . Via Del Lago/Iris Avenue - Moreno Beach Drive	Signal	C	25.7	C	28.1	C	25.9	C	28.4	C	No

Notes:

OWSC = One-Way Stop Control; AWSC = All-Way Stop Control

Delay = Average control delay in seconds

LOS = Level of Service

[1] LOS Standard based on *Moreno Valley General Plan: Final Program EIR - 5.2 Traffic/Circulation* , dated July 2006.

* Exceeds LOS Standard

R:\SAT1701_Sater Gas Station MoVal\Technical Studies\Traffic\LOS\2022 Cumul Summary (10/20/2017)

8.0 CIRCULATION IMPROVEMENTS AND FUNDING SOURCES

8.1 RECOMMENDED IMPROVEMENTS BASED ON LOS ANALYSIS

At intersections where the level of service is forecast to be unsatisfactory or where the project would have an impact, the City requires that improvements be identified to maintain conformance with City level of service standards. There are no impacts for any scenarios for either the intersection or roadway segment LOS analyses.

8.2 RECOMMENDED IMPROVEMENTS BASED ON INTERSECTION QUEUE ANALYSIS

City staff required an intersection queueing analysis in addition to the LOS analysis. The intersection queueing analysis was conducted at intersections to determine if vehicle stacking at dedicated and shared-turn lanes would conflict with traffic operations. The analysis was performed using the Synchro 9.1 and SimTraffic software. Since Synchro does not report queues at unsignalized intersections, SimTraffic queues have been reported for unsignalized intersections for purposes of this analysis. Table 8-A summarizes the 95th percentile queues forecast at the intersections requested by the City. As shown in Table 8-A, the queue exceeds storage capacity at:

- Cumulative (2022) with Project Conditions:
  - Oliver Street/Iris Avenue: Eastbound Left-Turn (a.m. peak hour).

It should be noted that this intersection is projected to operate at a satisfactory LOS under cumulative (2022) with project conditions. As shown in Table 8-A, the available storage for the eastbound left-turn is 240 feet. Under cumulative with the project conditions the 95th percentile queue exceeds the available storage by only 1 foot (less than 1 vehicle). Additionally, there is enough space within the transition (approximately 80 feet) to accommodate queues without affecting the eastbound through movement. Therefore, no improvement is recommended for the eastbound left-turn pocket.

8.3 FUNDING SOURCES AND MECHANISMS

Infrastructure improvements are needed to accommodate the projected population growth in the project region. As part of the infrastructure improvements, roadway segments and intersections may have to be improved to accommodate the corresponding growth in traffic in the future. Several funding mechanisms/programs, both regional and local, have been developed by jurisdictions to address the long-term transportation infrastructure needs for the region. Typically, these programs collect a mitigation fee for a listed set of improvements along roadway segments and intersections. The following are the fee programs that include the roadway segments and intersections in the study area for the proposed project:

- The Western Riverside Council of Government (WRCOG) Transportation Uniform Mitigation Fee (TUMF) Program; and
- City of Moreno Valley Development Impact Fee (DIF) Program.

8.3.1 Transportation Uniform Mitigation Fee (TUMF) Program

The underlying purpose of the TUMF program is “the need to establish a comprehensive funding source to mitigate the cumulative regional transportation impacts of new development on regional arterial highways.” As new development occurs in western Riverside County, the cumulative transportation impacts of this new development are reflected in increased demand for transportation infrastructure leading to decreased levels of service, increased delay and increased congestion on regional transportation facilities, and an overall decline in regional mobility. Therefore, the need to invest in additional transportation infrastructure to meet the increased travel demand and to sustain pre-development traffic conditions to “keep traffic flowing” represents the fundamental premise of the TUMF program.

8.3.2 City of Moreno Valley Development Impact Fee (DIF) Program

The City of Moreno Valley has its own DIF program to impose and collect fees for new developments within the City for the purpose of collection funds for roadway and intersections improvements to accommodate the growth of the City as stated in the City’s General Plan Circulation Element. The DIF program may include facilities that are not included and covered in the TUMF program.

8.4 PROJECT FAIR SHARE

In the absence of any established fee mechanism for circulation improvements, the project is required to pay its fair-share contribution for the required improvements. The fair-share contribution of the project is the project increment traffic to the total new traffic that is determined for all study intersections. There are no recommended improvements based on the LOS analysis and intersection queue analysis.

8.5 LIST OF CHAPTER 8.0 FIGURES AND TABLES

Table 8-A - Intersection Queue Analysis

			Existing (2017)		Existing (2017) with Project		Project Completion Year (2022)		Project Completion Year (2022) with Project		Cumulative (2022)		Cumulative (2022) with Project	
			95th % Queue		95th % Queue		95th % Queue		95th % Queue		95th % Queue		95th % Queue	
Intersection	Movement	Storage Length (ft/ln)	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1. Nason Street/Iris Avenue	WBL	170	12	17	13	18	11	15	13	17	16	34	17	36
3. Project Driveway 1/Iris Avenue	WBTR	60	-	-	-	-	-	-	-	-	-	-	22	-
4. Oliver Street/John F Kennedy Drive	WBL	100	45	47	47	47	41	45	45	44	44	47	47	47
6. Oliver Street/Iris Avenue	NBTL	120	89	48	94	53	98	52	103	56	106	58	112	62
	NBR	50	0	0	0	0	0	0	0	0	0	0	0	0
	SBTL	490	30	29	67	69	33	32	69	72	32	31	64	69
	SBR	100	40	2	40	0	42	6	41	4	51	20	51	19
	EBL	240	107	65	187	94	114	69	211	117	121	94	**241**	218
	EBTR	530	21	100	21	97	26	110	27	106	47	120	46	117
	WBL	250	45	20	44	20	48	24	47	24	54	44	52	39
	WBTR	1100	15	9	17	11	16	9	19	12	20	13	22	15
7. Via Del Lago/Iris Avenue - Moreno Beach Drive	NBL	95	30	27	30	27	32	28	32	28	41	42	41	42
	SBL	50	21	17	21	17	22	18	22	18	21	17	21	17
	EBL	110	35	29	48	42	36	32	50	43	38	50	53	83
	WBL	300	26	44	26	44	27	47	27	47	30	55	30	55

Notes:
Bold = Queue exceeds available storage.
All queues reported are 95th percentile queues.

9.0 SUMMARY AND CONCLUSIONS

The proposed AM/PM Gasoline Service Station Project consists of 16 fueling stations, a 3,800-square foot convenience store, and a drive-through car wash. The project is forecast to generate 88 net a.m. peak hour trips, 101 net p.m. peak hour trips, and 1,111 daily trips.

9.1 EXISTING (2017) CONDITIONS SUMMARY

Based on the significance criteria as discussed in the "Significance Threshold" section of this report, all study intersections and roadway segments will operate at a satisfactory LOS under existing (2017) without and with project conditions. There are no intersection queueing conflicts under existing (2017) without and with project conditions.

9.2 PROJECT COMPLETION YEAR (2022) CONDITIONS SUMMARY

Based on the significance criteria as discussed in the "Significance Threshold" section of this report, all study intersections and roadway segments will operate at a satisfactory LOS under project completion year (2022) without and with project conditions. There are no intersection queueing conflicts under project completion year (2022) without and with project conditions.

9.3 CUMULATIVE (2022) CONDITIONS SUMMARY

Based on the significance criteria as discussed in the "Significance Threshold" section of this report, all study intersections and roadway segments will operate at a satisfactory LOS under project completion year (2022) without and with project conditions. The eastbound left-turn queue exceeds storage capacity at the intersection of Oliver Street/Iris Avenue under cumulative (2022) conditions with project conditions in the a.m. peak hour. It should be noted that there is enough space within the transition to accommodate the eastbound left queues without affecting the eastbound through movement. Therefore, no improvement is required at this intersection.

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

APPENDIX A:

SCOPING AGREEMENT

LSA

BERKELEY
CARLSB
FRES
IRV
LOS ANGE
PALM SPRIN
POINT RICHMO
RIVERS
ROSEV
SAN LUIS OBIS

Date: August 29, 2017

This letter acknowledges the City of Moreno Valley Transportation Engineering Division requirements for the traffic impact analysis of the following project:

Case No.	PPA17-0008
Project Name:	AM/PM Gasoline Service Station (LSA Project No. SAT1701)
Project Address:	Northwest Corner of Iris Avenue and Oliver Street, Moreno Valley, CA 92555
Project Description:	Gasoline Station with Convenience Store and Car Wash
Related Cases:	N/A

	<u>Consultant</u>	<u>Developer</u>
Name:	LSA Associates, Inc. Attn: Ambarish Mukherjee	Sater Oil International Attn: Eric LeVaughn
Address:	1500 Iowa Avenue, Suite 200 Riverside, CA 92507	683 Cliffside Drive, San Dimas, CA 91773-2957
Telephone:	(951) 781-9310	

I. BACKGROUND

LSA will be preparing a traffic impact analysis (TIA) for the proposed AM/PM Gasoline Service Station in the City of Moreno Valley (City). The gasoline station will include 16 fueling stations, a 3,800 square foot convenience store, and a drive-through car wash. The project will be located on the northwest corner of Iris Avenue and Oliver Street in the City. Figure 1 illustrates the regional and project location (All figures and tables attached). Figure 2 illustrates the conceptual site plan.

As shown in the site plan, access to the project would be provided via two driveways: one driveway along Iris Avenue and one driveway along Oliver Street. Because of an existing median on Iris Avenue, the driveway would operate as a right-in/right-out driveway. The driveway on Oliver Street would operate as a right-in/right-out driveway.

The traffic study shall follow the City of Moreno Valley's (City) *Transportation Engineering Division Traffic Impact Analysis Preparation Guidelines,* dated August 2007, for preparation of TIAs. Based on these guidelines the following scope of work is being proposed for the preparation of this TIA.

II. TRIP GEOGRAPHIC DISTRIBUTION AND ASSIGNMENT

Project Trip Distribution

Generalized trip distribution patterns were developed based on the location of the proposed project in relation to surrounding land uses and the regional roadway network. Figure 3 illustrates the study area intersections. Figure 4 illustrates the inbound trip distribution for the project. Figure 5 illustrates the outbound trip distribution for the project. As shown in Figure 5, approximately 35 percent of project trips will travel eastwards along Iris Avenue, 35 percent will travel westwards along Iris Avenue, 20 percent northwards along Oliver Street, and 10 percent southwards along Oliver Street.

N: 15% **S:** 10% **E:** 40% **W:** 35%

Project Pass-By Trip Assignment

Gas stations typically draw some of their trips from the adjacent street traffic, so that some of the project trips are not actually "new" trips to the surrounding circulation system. These trips are referred to as "pass-by" trips and are made as intermediate stops on the way from an origin to a primary trip destination without route diversion. For the proposed project, pass-by trips would occur on Iris Avenue and Oliver Street en route to a final destination. The Institute of Transportation Engineers (ITE) has conducted research on the percentage of pass-by trips for various land uses and are included in the ITE *Trip Generation Handbook* (2nd Edition). Project pass-by trip assignment will be developed based on traffic counts collected on the adjacent street system and will be provided in the TIA.

Net Project Trip Assignment

The trip assignment for project trips is the product of the net project trip generation and the trip distribution percentages. Figure 6 illustrates the net project trip assignment.

III. SITE TRIP GENERATION FORECAST

A. The trip generation for the proposed project was developed using rates from the Institute of Transportation Engineers (ITE) *Trip Generation* Manual (9th Edition) for Land Use 946 – "Gasoline/Service Station with Convenience Market and Car Wash."

B. The pass-by rates for the proposed project were factored using rates based on Land Use 945 – "Gasoline/Service Station with Convenience Market."

C. The a.m. peak hour is defined as the one hour of highest traffic volumes occurring between 7:00 and 9:00 a.m. (based upon existing 24-hour traffic counts)

D. The p.m. peak hour is defined as the one hour of highest traffic volume occurring between 4:00 and 6:00 p.m. (based upon existing 24-hour traffic counts)

E. Intersection and link acceptable Level of Service "D" for some intersections and links and Level of Service "C" for others based upon the current city policy. (Use Highway Capacity Manual 2010 (HCM 2010) operations procedures; parameters per County of Riverside Traffic Impact Analysis Guidelines.)

Proposed Use Rates[1]

Gasoline/Service Station with Convenience Market and Car Wash (per Vehicle Fueling Station)	Daily: 152.84	AM: 11.840	PM: 13.860
Internal Trip Allowance:	Yes:________	No: X	Percentage:______%
Pass-by Trip Allowance:	Yes: X	No:________	Percentage: 53%(AM)/54.6%(PM & Daily)

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[1] Institute of Transportation Engineers (ITE) *Trip Generation* Manual (9th Edition).

Table A shows the estimated project trips for the proposed project.

IV. SPECIFIC PROJECT ISSUES TO BE ANALYZED

A. The traffic study will address the adequacy of site access and identify specific near-term circulation improvements required at study area intersections and roadways to maintain acceptable peak hour and daily levels of service (LOS).

- Levels of service with the project will be compared to levels of service without the project for each of the analysis scenarios to determine potential project impacts at study locations. At study intersections, the determination of significant project impacts will be made based on City's LOS standards and threshold of significance criteria.

B. The traffic study shall address the project traffic impacts at all study intersections listed in Section VI of this scope and provide appropriate mitigation measures if applicable. Peak-hour traffic signal warrants shall be evaluated for all intersections that are not currently signalized.

- Prior to the preparation of the TIA, LSA will coordinate with City staff to finalize any future roadway improvements within the study area.
- Mitigation measures will be recommended at locations operating at an unsatisfactory LOS or where the project causes significant impacts. Mitigation measures may include intersection turn lanes, signalization, and segment lane additions. The LOS with mitigation will be calculated and summarized, along with a comparison of the LOS without mitigation. LSA will provide the Synchro files to the City for review.

C. The traffic study shall address a qualitative assessment of existing and planned non-motorized facilities (e.g. pedestrians, bike routes, trails, etc.) within the study area.

D. The traffic study shall provide a Queuing Analysis section to determine the 95th percentile queues for the following turning movements based on forecasted Existing (2017) with Project Conditions, Project Completion Year (2022) with Project Conditions, and Cumulative (2022) with Project Conditions traffic volumes using Synchro at the following locations:

- All left-turn, right-turn, and U-turn movements at Oliver Street/Iris Avenue;
- Westbound U-turn movements at Nason Street/Iris Avenue;
- All left-turn movements at Via Del Lago/Iris Avenue-Moreno Beach Drive;
- Westbound left-turn movements at Oliver Street/John F Kennedy Drive;
- Southbound right-turn movements at Oliver Street/Project Driveway; and
- Westbound right-turn movements at Project Driveway/Iris Avenue.

If there is not sufficient queuing storage length available, the traffic study shall provide mitigation measures for such issues.

E. The traffic study shall provide a detailed analysis of each driveway location based on Table 9.11.080-14 of the City of Moreno Valley Municipal Code – Design Guidelines, by preparing a table or an exhibit to show the required minimum spacing distance from the adjacent intersection and driveways and whether each proposed driveway location can meet this minimum distance.

V. STUDY OF HORIZON YEARS

The TIA will be prepared to satisfy the requirements established by the TIA Guidelines, as well as the requirements for the disclosure of potential impacts and mitigation measures pursuant to the

California Environmental Quality Act (CEQA). Based on the TIA Guidelines, the TIA will address existing traffic conditions, future traffic forecasts, project-related impacts and mitigations under the following scenarios:

A. Existing (2017) Conditions;

B. Existing (2017) with Project Conditions;

C. Project Completion Year (2022) without Project Conditions*;

D. Project Completion Year (2022) with Project Conditions;

E. Cumulative (2022) without Project Conditions; and

F. Cumulative (2022) with Project Conditions.

*Opening year should have a minimum five (5) year horizon as per Moreno Valley traffic study guidelines.

Volume Development

Traffic volumes for existing conditions will be developed by collecting existing AM and PM peak hour traffic counts at study intersections and 24 hour traffic volume counts at roadway segments converting the counts to Passenger Car Equivalents (PCEs) based on SBCTA PCE conversion factors. Opening year without project traffic conditions will be developed by applying a 2% compounded annual growth rate to existing traffic volumes. Cumulative conditions traffic volumes will be developed by adding traffic volumes from approved projects to the opening year without project traffic volumes. Information regarding cumulative projects will be obtained from the City of Moreno Valley Economic Development website. Existing, opening year, and cumulative with project traffic volumes will be developed by adding project traffic volumes to the corresponding without project scenarios.

VI. FACILITIES TO BE STUDIED

Study Area Intersections

Based on the TIA Guidelines, the TIA is required to analyze all intersections of Collector or higher classification streets where the project will contribute 50 or more peak hour trips, not exceeding a 10-mile radius from the project site. Based on the guidelines, an operational analysis of the following intersections is proposed during the a.m. and p.m. peak hours.

LSA proposes to include the following intersections:

1. Nason Street/Iris Avenue;
2. Kaiser Hospital Entrance/Iris Avenue;
3. Driveway 1/Iris Avenue;
4. Oliver Street/John F Kennedy Drive;

5. Oliver Street/Driveway 2;
6. Oliver Street/Iris Avenue; and
7. Via Del Lago/Iris Avenue – Moreno Beach Drive.

All study intersections will be analyzed during the a.m. and p.m. peak hours. Levels of service for all analysis intersections will be based on the Highway Capacity Manual (2010) for signalized and unsignalized intersections, using the Synchro 9.1 software.

Roadways

All roadway segments adjacent to intersection analysis locations will be analyzed.

LSA proposes to include the following roadway segments:

1. Oliver Street, from John F Kennedy Drive to Project Driveway 2;
2. Oliver Street, from Project Driveway 2 to Iris Avenue;
3. Iris Avenue, from Nason Street to Kaiser Hospital Entrance;
4. Iris Avenue, from Kaiser Hospital Entrance to Project Driveway 1;
5. Iris Avenue, from Project Driveway 1 to Oliver Street; and
6. Iris Avenue, from Oliver Street to Via Del Lago.

VII. DELIVERABLES

A. Draft traffic impact study (2 hard copies and Electronic PDF)

B. Final traffic impact study (4 hard copies and Electronic PDF)

C. All draft and final traffic impact studies shall be delivered with a review fee of $3,118 to the Permit Technician Land Development Division at Moreno Valley City Hall, 14177 Frederick Street, Moreno Valley.

D. A signed copy of this ***Scoping Agreement*** must be included in the submitted draft and final traffic impact studies.

If you have any questions regarding this *Scoping Agreement*, please contact Eric Lewis at (951) 413-3140.

Recommended by:

A. Mukherjee

Ambarish Mukherjee, AICP
Associate
LSA Associates, Inc.

Approved By:

Eric Lewis, P.E., T.E.
City Traffic Engineer

> NOTE: This scoping agreement was reviewed and approved based on the information submitted by LSA Associates on 8/29/2017. LSA Associates and the project applicant acknowledge that any changes to the project (zoning, size, type of use, number or location of access points,etc.) after 8/29/2017may require this scoping agreement to be revised and resubmitted for review and approval by the City of Moreno valley.

Attachments

Table A: Project Trip Generation
Figure 1: Regional and Project Location
Figure 2: Conceptual Site Plan
Figure 3: Study Area Intersections
Figure 4: Project Trip Distribution (Inbound)
Figure 5: Project Trip Distribution (Outbound)
Figure 6: Net Project Trip Assignment

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

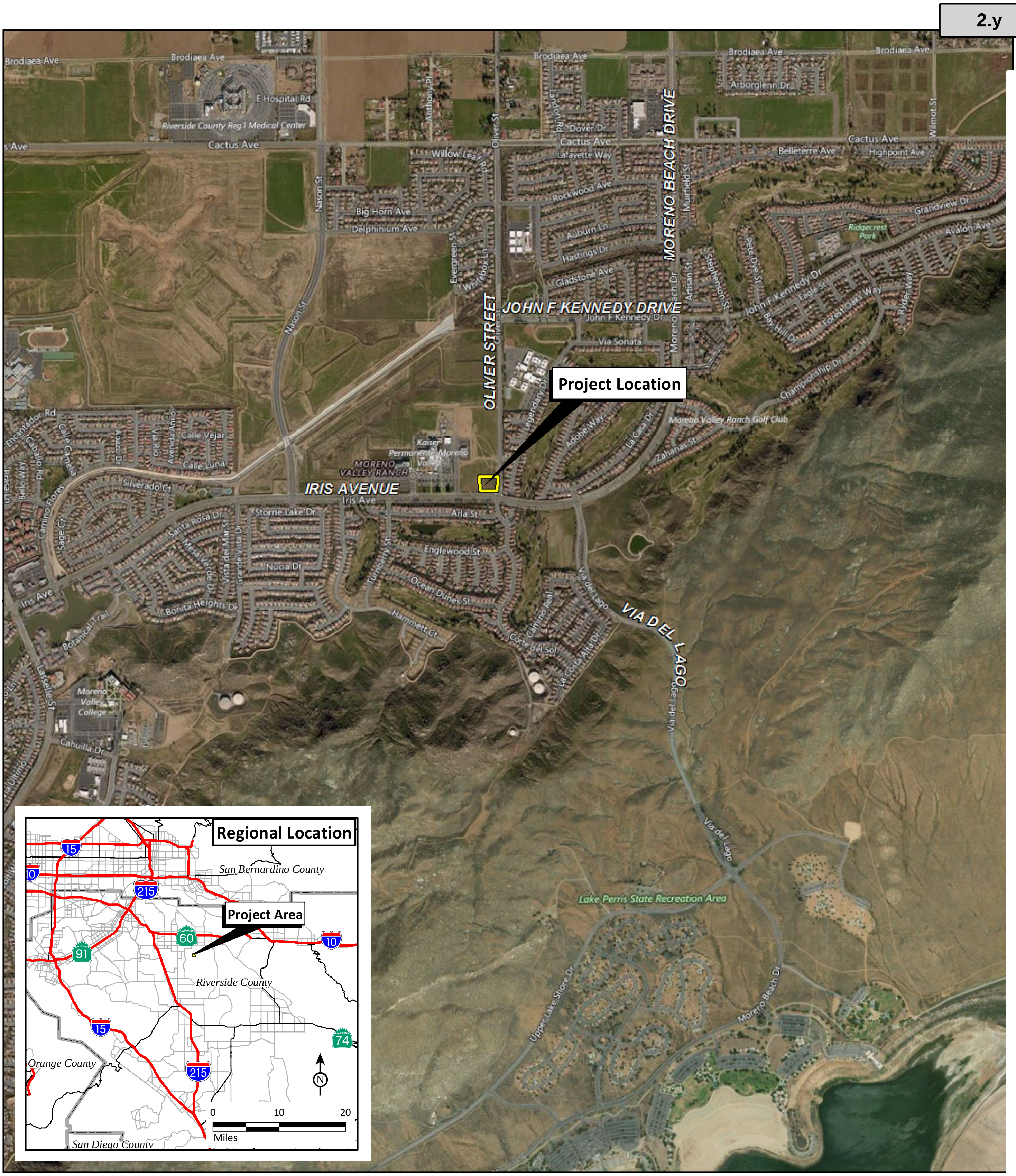
Table A - Project Trip Generation

Land Use	Units	A.M. Peak Hour In	A.M. Peak Hour Out	A.M. Peak Hour Total	P.M. Peak Hour In	P.M. Peak Hour Out	P.M. Peak Hour Total	Daily
Gasoline Station with Convenience Market and Car Wash	16 Fueling Stations							
Trips/Unit[1]		6.04	5.80	11.84	7.07	6.79	13.86	152.84
Trip Generation		97	93	190	113	109	222	2,445
Pass By Trips[2]		(52)	(50)	(102)	(61)	(60)	(121)	(1,334)
Total Net New Trips		45	43	88	52	49	101	1,111
	Total Trip Generation	**97**	**93**	**190**	**113**	**109**	**222**	**2,445**
	Pass-By Trips	**(52)**	**(50)**	**(102)**	**(61)**	**(60)**	**(121)**	**(1,334)**
	Net New Trips	**45**	**43**	**88**	**52**	**49**	**101**	**1,111**

Notes:

[1] Rates based on Land Use 946 - "Gasoline/Service Station with Convenience Market and Car Wash" from the Institute of Transportation Engineers (ITE) *Trip Generation* Manual, 9th Edition.

[2] Pass-by rates for Land Use 945 - "Gasoline/Service Station with Convenience Market" were factored. A pass-by rate of 53% was used in the the a.m. peak hour, while 54.6% was used in the p.m. peak hour. Since there is no data available for daily pass-by trips, the p.m. pass-by rate has been applied to the daily trip generation.



FIGURE

LSA

LEGEND

▭ Project Boundary

N

0 1000 2000
FEET

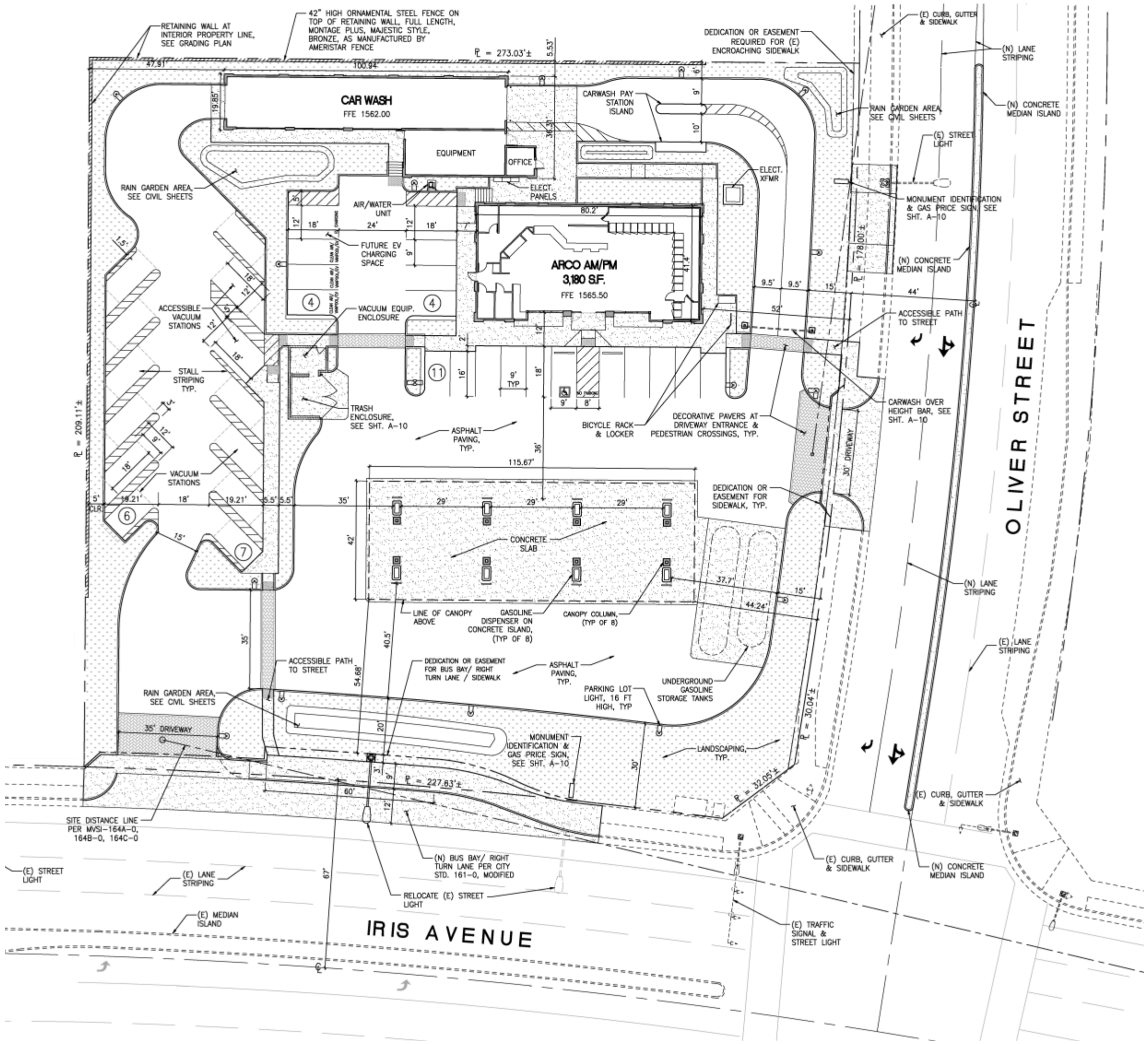
SOURCE: Bing Aerial, 2015; Riverside County, 2015.

AM/PM Gasoline Service Statio
Traffic Impact Analysi

Regional and Project Location

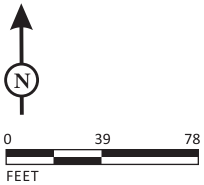
I:\SAT1701\Reports\Traffic\fig1_RegLoc.mxd (8/25/2017)

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)



LSA

FIGURE 2



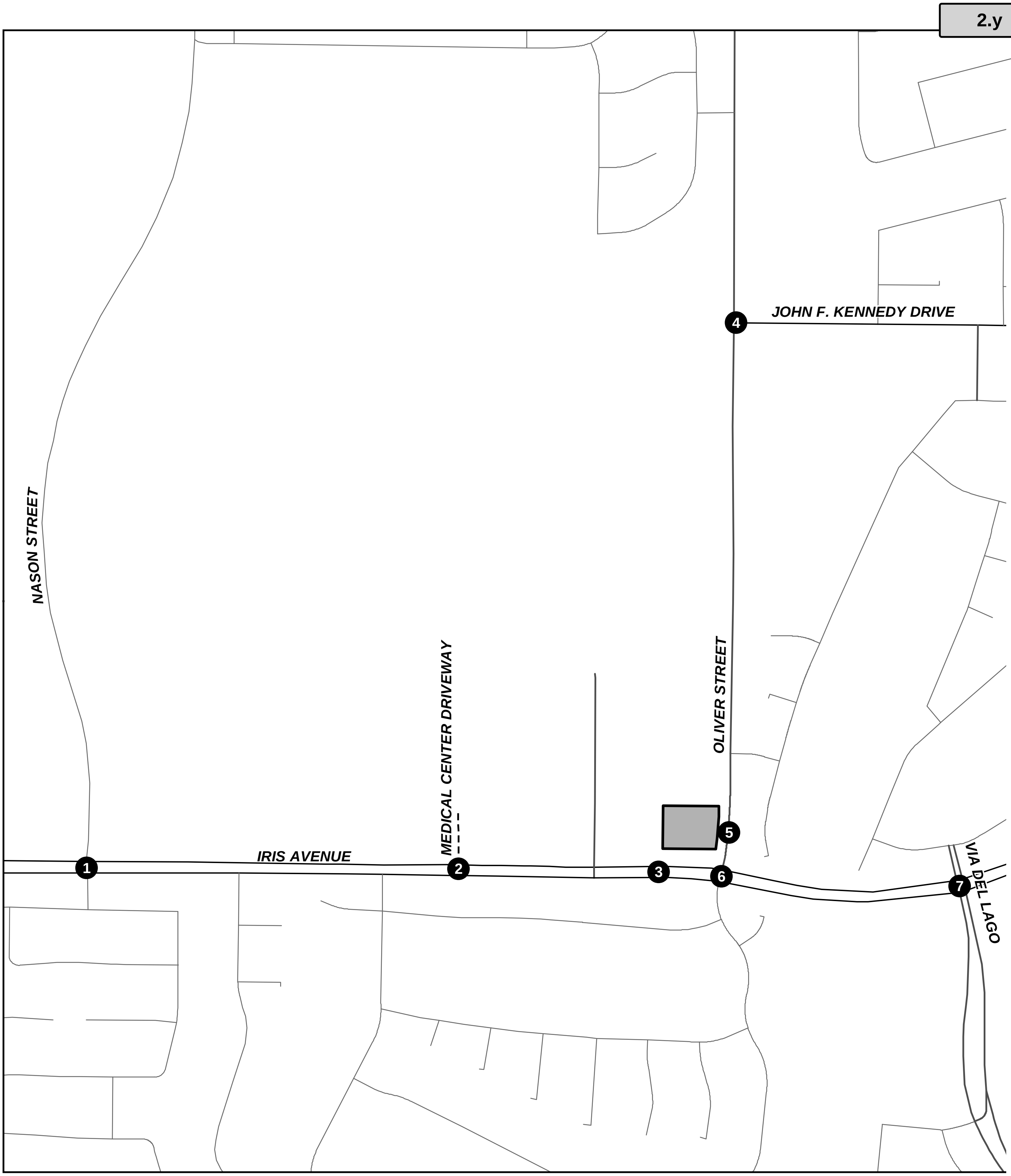
SOURCE: Barghausen Consulting Engineers, 2018.

AM/PM Gasoline Service Station
Traffic Impact Analysis

Conceptual Site Plan

I:\SAT1701\Reports\Traffic\fig1-2_SitePlan.cdr (07/30/2018)

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS



LSA

FIGURE

LEGEND

▨ Project Location

- - - - Driveway

● Study Area Intersections

N

0 325 650

FEET

SOURCE: Google Earth, 2016.

AM/PM Gasoline Service Statio
Traffic Impact Analysi

Study Area Intersections

I:\SAT1701\Reports\Traffic\fig3_Intersections.mxd (9/28/2017)

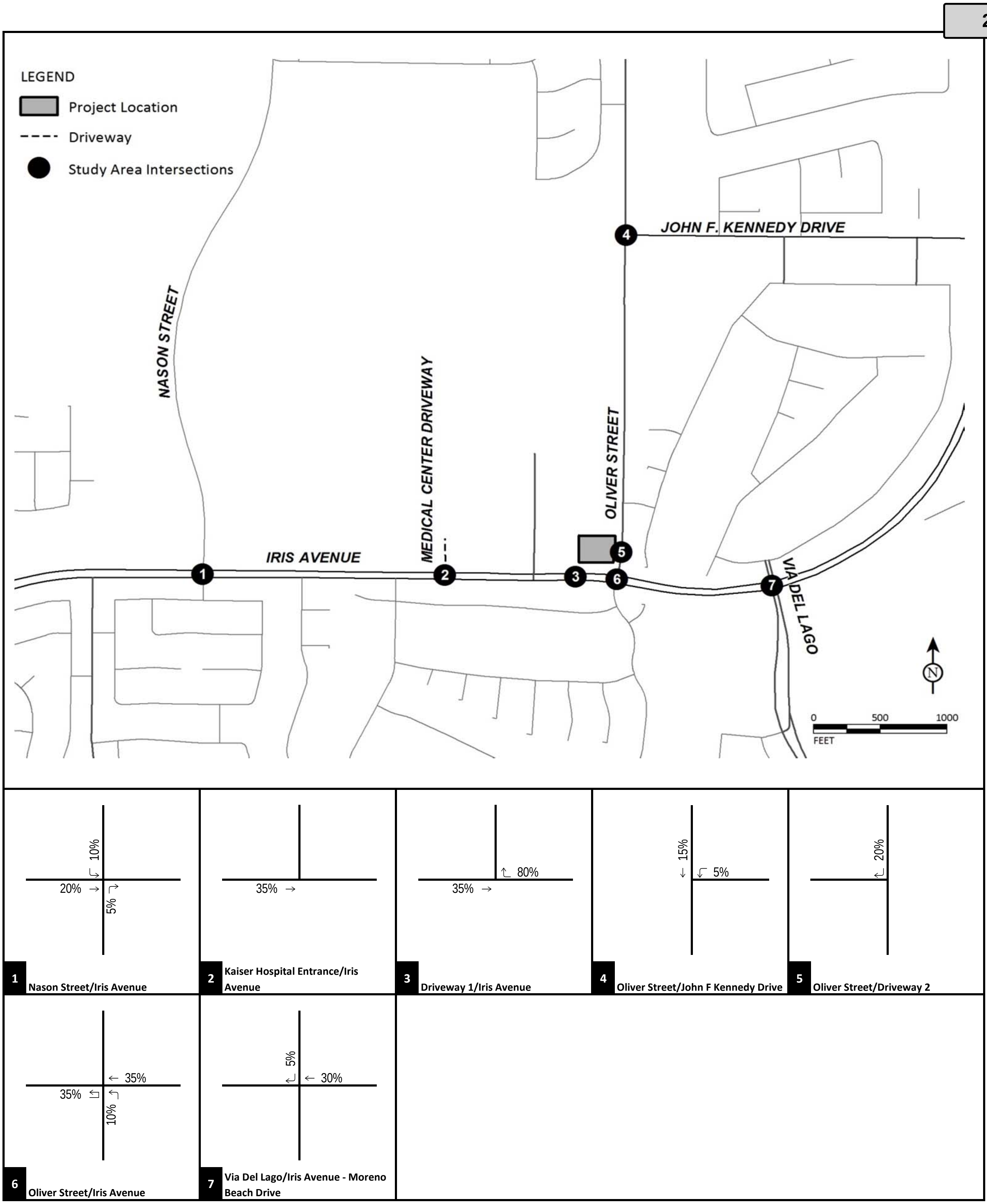


FIGURE 4

XX%
Inbound Trip Distribution

AM/PM Gasoline Service Station
Traffic Impact Analysis

Project Trip Distribution (Inbound)

R:\SAT1701_Sater Gas Station MoVal\Technical Studies\Traffic\z30_Dist_In\Figure (10/2/2017)

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

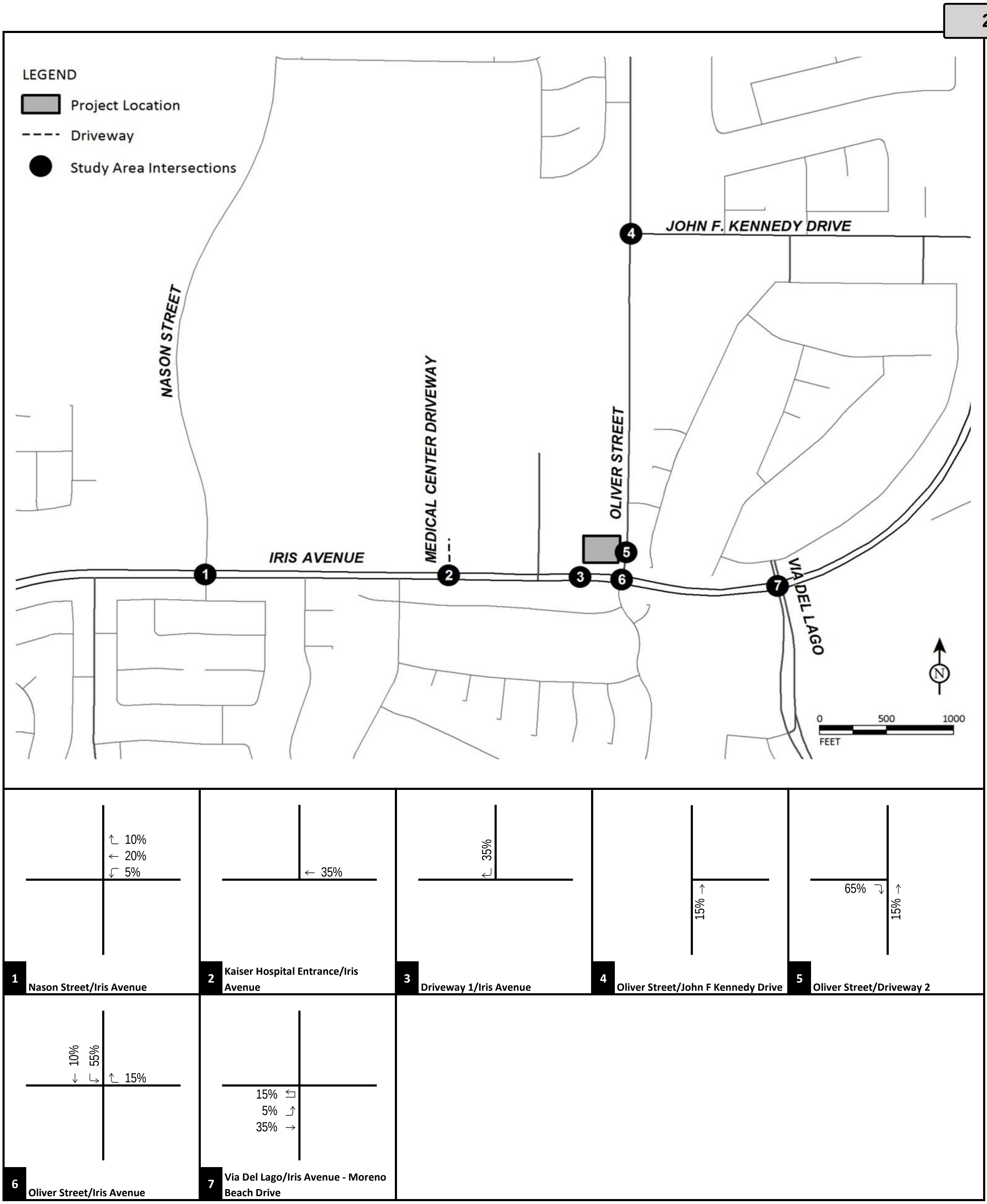


FIGURE 5

XX%
Outbound Trip Distribution

AM/PM Gasoline Service Station
Traffic Impact Analysis

Project Trip Distribution (Outbound)

R:\SAT1701_Sater Gas Station MoVal\Technical Studies\Traffic\z30_Dist_Out\Figure (10/2/2017)

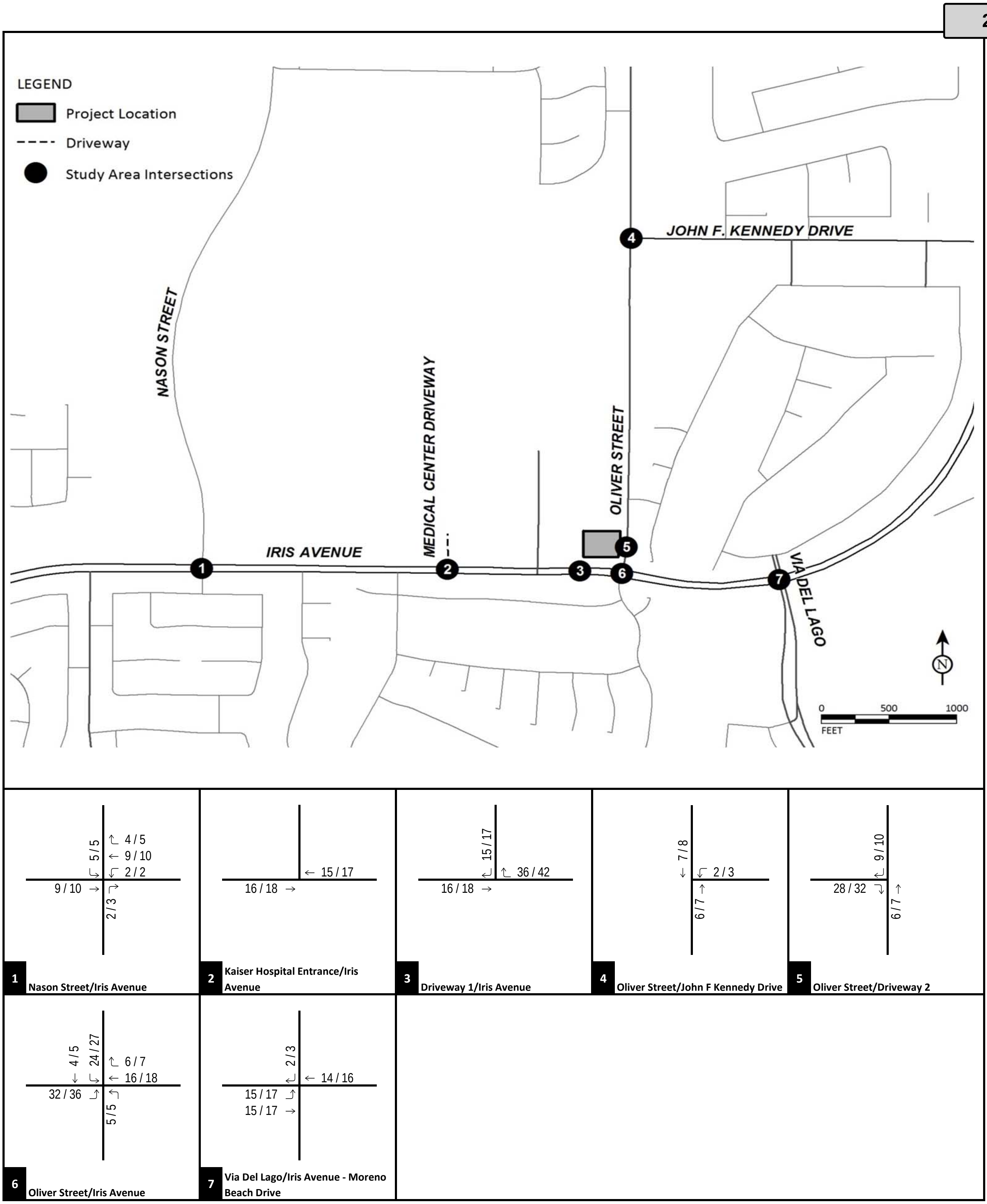


FIGURE 6

LSA

XX / YY
AM / PM Peak Hour Traffic Volumes

AM/PM Gasoline Service Station

Traffic Impact Analysis
Net Project Trip Assignment

R:\SAT1701_Sater Gas Station MoVal\Technical Studies\Traffic\z30_Assn\Figure (10/2/2017)

APPENDIX B:

TRAFFIC COUNT SHEETS

Prepared by National Data & Surveying Services

Nason St & Iris Ave

Peak Hour Turning Movement Count

ID: 17-06143-001
City: Moreno Valley

Day: Thursday
Date: 09/14/2017

PEAK HOURS		COUNT PERIODS
AM	07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

Nason St — SOUTHBOUND

	↲	↓	↳	⤸	⇧
AM	259	13	98	1	430
NOON	0	0	0	0	0
PM	406	36	119	0	354
	1	1	1	0	

Iris Ave — EASTBOUND

	AM	NOON	PM	
⇦	960	0	1172	
⤺	0	0	0	0
↱	315	0	229	2
→	767	0	565	3
↴	22	0	19	0

Iris Ave — WESTBOUND

		PM	NOON	AM
1	↰	104	0	75
3	←	753	0	683
1	↙	14	0	6
0	⤹	0	0	9
	⇨	693	0	884

CONTROL

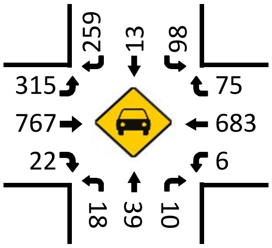
Signalized

	AM	NOON	PM
TEV	2315	0	2288
PHF	0.82		0.92

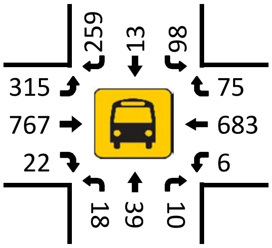
Nason St — NORTHBOUND

	⇩	⤺	↰	↑	↱
		0	1	1	0
PM	69	0	13	21	9
NOON	0	0	0	0	0
AM	41	0	18	39	10

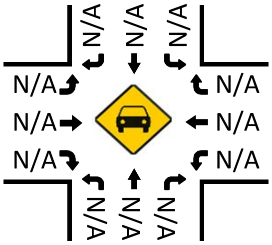
Total Vehicles (AM)



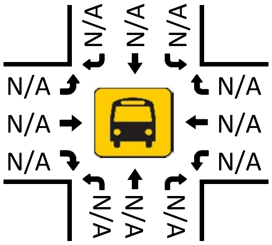
Total Vehicles (AM)



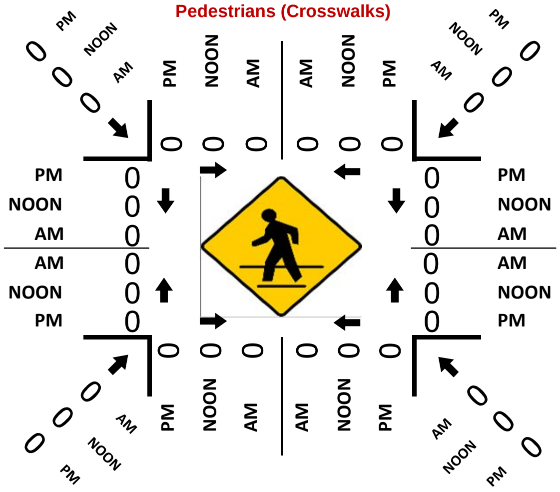
Total Vehicles (NOON)



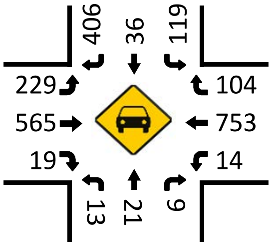
Total Vehicles (NOON)



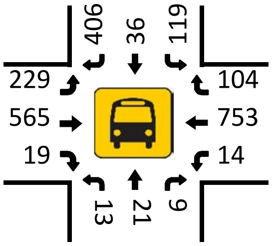
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Prepared by National Data & Surveying Services

Kaiser Hospital Dwy & Iris Ave

Peak Hour Turning Movement Count

ID: 17-06143-002
City: Moreno Valley

Day: Thursday
Date: 09/14/2017

	PEAK HOURS	COUNT PERIODS
AM	07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

Kaiser Hospital Dwy
SOUTHBOUND

AM	22	0	6	0	172
NOON	0	0	0	0	0
PM	33	0	37	0	91
	1	0	1	0	

Iris Ave
EASTBOUND

AM	NOON	PM	
696	0	741	
0	0	0	0
133	0	73	1
697	0	560	3
0	0	0	0
AM	NOON	PM	

CONTROL

Signalized

	AM	NOON	PM
TEV	1571	0	1429
PHF	0.89		0.93

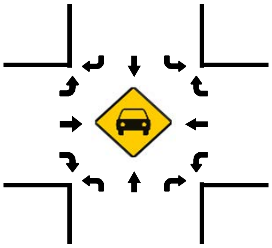
Iris Ave
WESTBOUND

	PM	NOON	AM
0	18	0	39
3	708	0	674
0	0	0	0
0	0	0	0
	597	0	703
	PM	NOON	AM

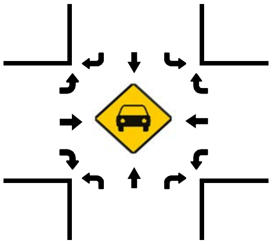
NORTHBOUND
Kaiser Hospital Dwy

		0	0	0	0
PM	0	0	0	0	0
NOON	0	0	0	0	0
AM	0	0	0	0	0

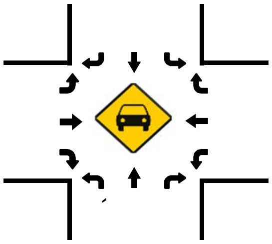
Total Vehicles (AM)



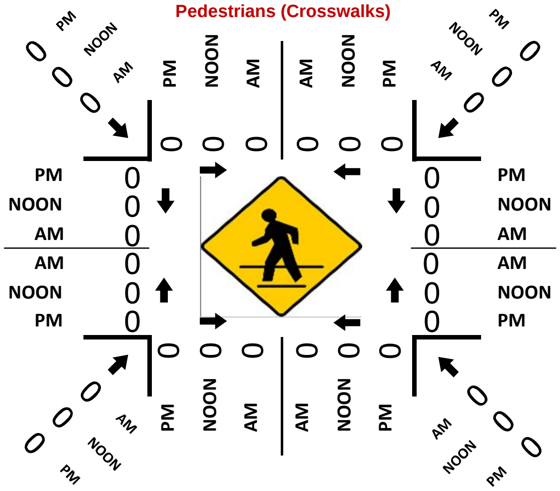
Total Vehicles (NOON)



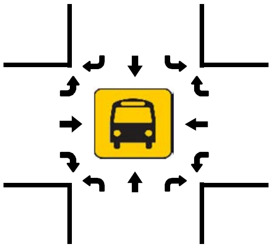
Total Vehicles (PM)



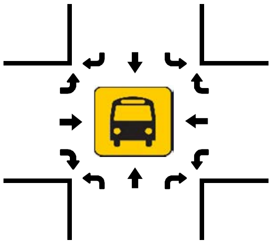
Pedestrians (Crosswalks)



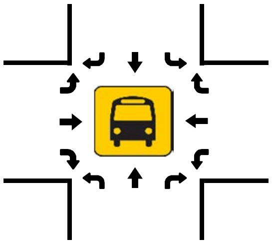
Total Vehicles (AM)



Total Vehicles (NOON)



Total Vehicles (PM)



Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

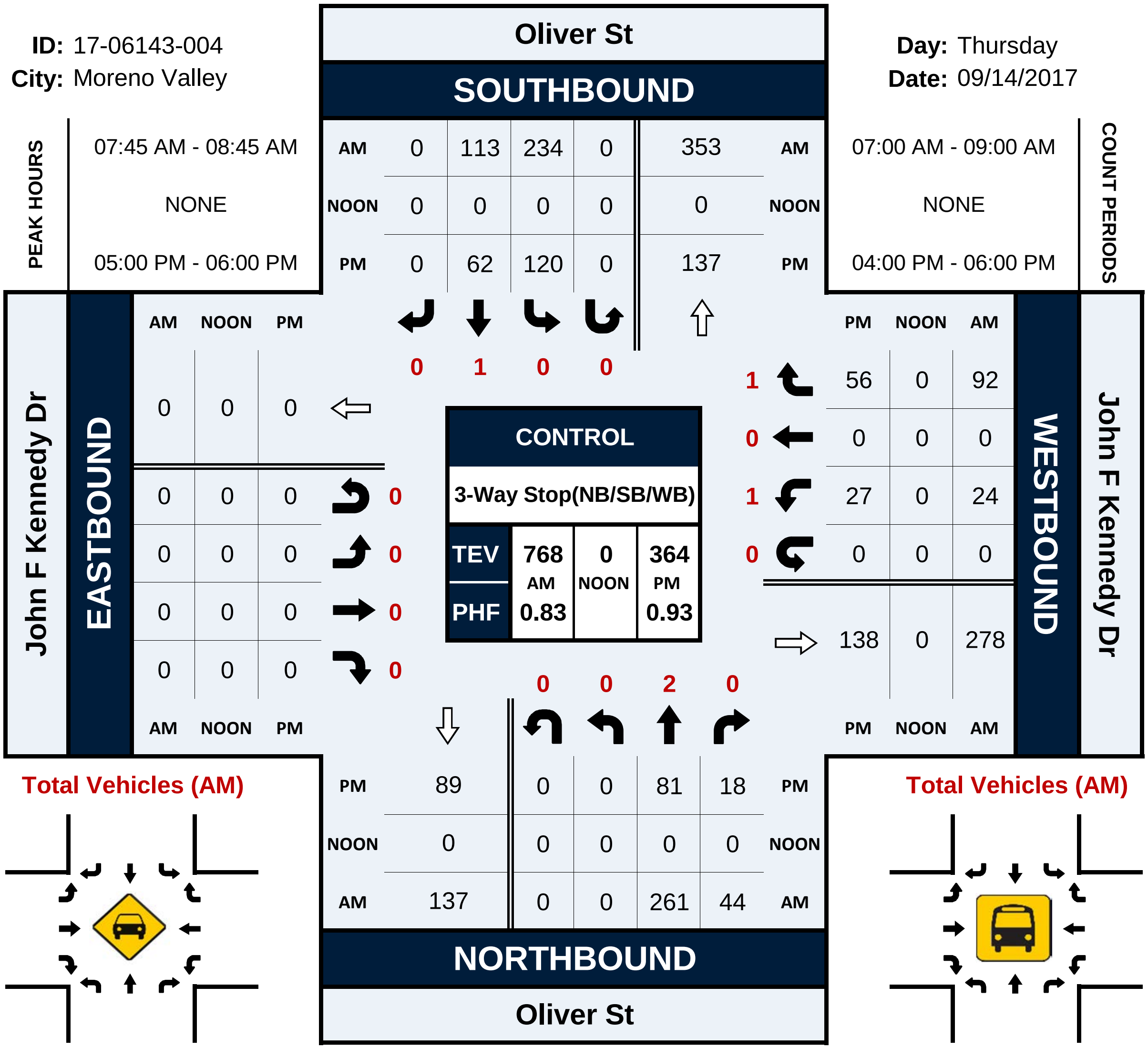
Prepared by National Data & Surveying Services

Oliver St & John F Kennedy Dr

Peak Hour Turning Movement Count

ID: 17-06143-004
City: Moreno Valley

Day: Thursday
Date: 09/14/2017



PEAK HOURS	
AM	07:45 AM - 08:45 AM
NOON	NONE
PM	05:00 PM - 06:00 PM

COUNT PERIODS	
AM	07:00 AM - 09:00 AM
NOON	NONE
PM	04:00 PM - 06:00 PM

Oliver St

SOUTHBOUND

AM	0	113	234	0	353
NOON	0	0	0	0	0
PM	0	62	120	0	137
	0	1	0	0	

John F Kennedy Dr

EASTBOUND

AM	NOON	PM	
0	0	0	
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

CONTROL

3-Way Stop(NB/SB/WB)

	AM	NOON	PM
TEV	768	0	364
PHF	0.83		0.93

John F Kennedy Dr

WESTBOUND

	PM	NOON	AM
1	56	0	92
0	0	0	0
1	27	0	24
0	0	0	0
	138	0	278

NORTHBOUND

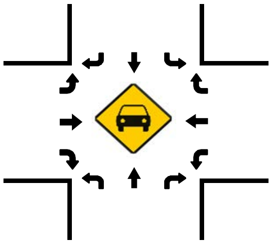
Oliver St

		0	0	2	0
PM	89	0	0	81	18
NOON	0	0	0	0	0
AM	137	0	0	261	44

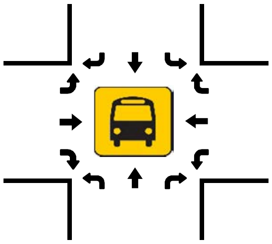
Total Vehicles (AM)

Total Vehicles (AM)

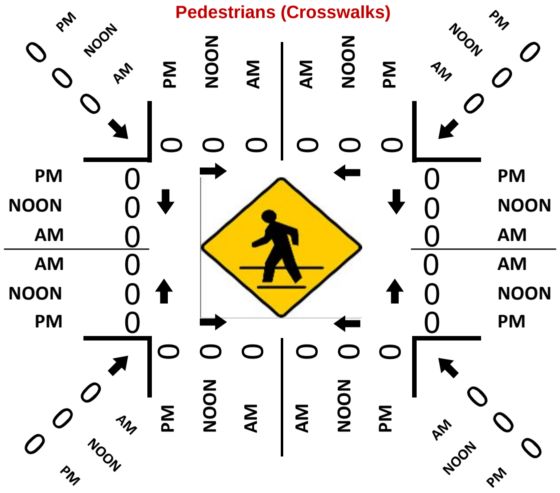
Total Vehicles (NOON)



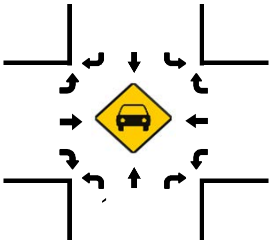
Total Vehicles (NOON)



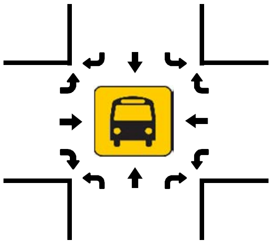
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



Prepared by National Data & Surveying Services

Oliver St & Iris Ave

Peak Hour Turning Movement Count

ID: 17-06143-006
City: Moreno Valley

Day: Thursday
Date: 09/14/2017

PEAK HOURS		COUNT PERIODS
07:30 AM - 08:30 AM	AM	07:00 AM - 09:00 AM
NONE	NOON	NONE
05:00 PM - 06:00 PM	PM	04:00 PM - 06:00 PM

Oliver St
SOUTHBOUND

AM	194	25	6	0	219	AM
NOON	0	0	0	0	0	NOON
PM	76	22	6	0	95	PM
	1	0.5	0.5	0		

Iris Ave
EASTBOUND

AM	NOON	PM	
735	0	709	⇦
0	0	0	0
166	0	73	1
504	0	491	3
19	0	50	0
AM	NOON	PM	

CONTROL

Signalized

	AM	NOON	PM
TEV	1578	0	1446
PHF	0.85		0.93

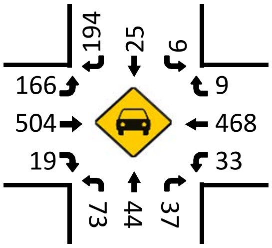
Iris Ave
WESTBOUND

	PM	NOON	AM
0	9	0	9
3	590	0	468
1	41	0	33
0	0	0	0
⇨	529	0	547
	PM	NOON	AM

NORTHBOUND
Oliver St

		0	0	1	1	
PM	113	0	43	13	32	PM
NOON	0	0	0	0	0	NOON
AM	77	0	73	44	37	AM

Total Vehicles (AM)



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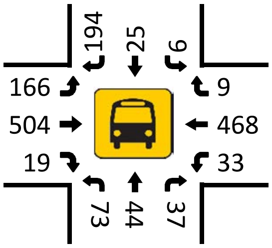
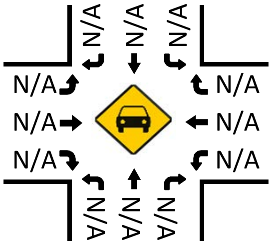
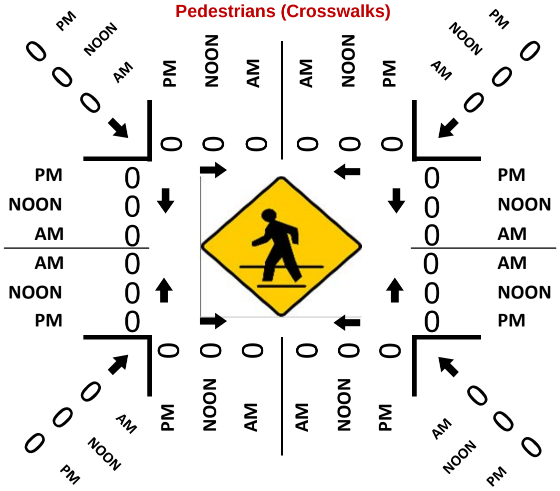


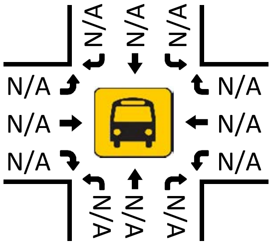
Total Vehicles (NOON)



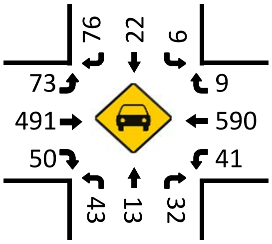
Pedestrians (Crosswalks)



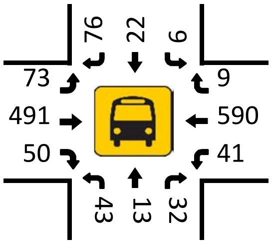
Total Vehicles (NOON)



Total Vehicles (PM)



Total Vehicles (PM)



Prepared by National Data & Surveying Services

Via Del Lago & Moreno Beach Dr

Peak Hour Turning Movement Count

ID: 17-06143-007
City: Moreno Valley

Day: Thursday
Date: 09/14/2017

PEAK HOURS	
AM	07:15 AM - 08:15 AM
NOON	NONE
PM	05:00 PM - 06:00 PM

COUNT PERIODS	
AM	07:00 AM - 09:00 AM
NOON	NONE
PM	04:00 PM - 06:00 PM

Via Del Lago

SOUTHBOUND

AM	39	2	13	0	27	AM
NOON	0	0	0	0	0	NOON
PM	17	2	9	0	36	PM
	↲	↓	↳	↶	⇧	
	0	1	1	0		

Moreno Beach Dr

EASTBOUND

AM	NOON	PM		
521	0	634	⇦	
2	0	0	↶	0
19	0	23	↱	1
490	0	477	→	3
17	0	29	↴	0
AM	NOON	PM		

Moreno Beach Dr

WESTBOUND

		PM	NOON	AM
0	↰	13	0	6
3	←	598	0	458
1	↙	39	0	16
0	↷	0	0	1
	⇨	508	0	544
		PM	NOON	AM

CONTROL

Signalized

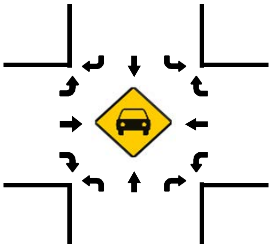
	AM	NOON	PM
TEV	1127	0	1248
PHF	0.87		0.95

NORTHBOUND

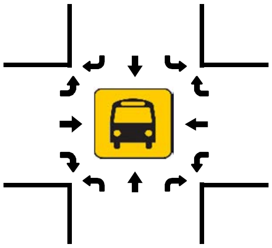
Via Del Lago

		0	1	1	1	
	⇩	↶	↰	↑	↱	
PM	70	0	19	0	22	PM
NOON	0	0	0	0	0	NOON
AM	35	0	22	2	40	AM

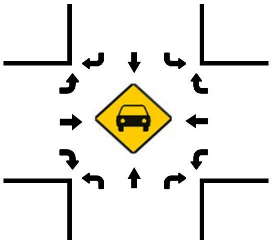
Total Vehicles (AM)



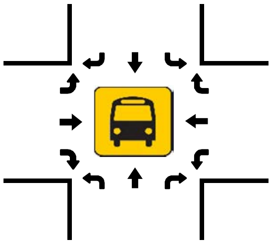
Total Vehicles (AM)



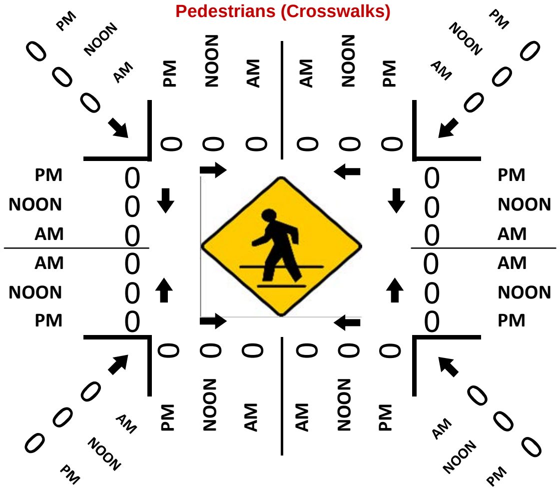
Total Vehicles (NOON)



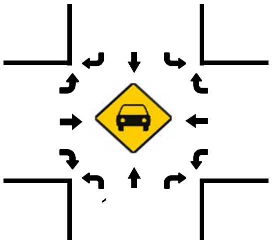
Total Vehicles (NOON)



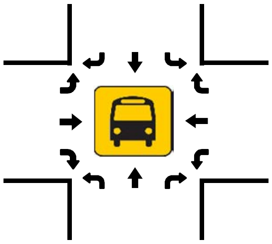
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



Prepared by National Data & Surveying Services

CLASSIFICATION

Iris Ave Bet. Nason St & Kaiser Hospital Dwy

Day: Thursday
Date: 9/14/2017

City: Moreno Valley
Project #: CA17_6142_001

Summary

Time	# 1	# 2	# 3	# 4	# 5	# 6	# 7	# 8	# 9	# 10	# 11	# 12	# 13	Total
00:00 AM	1	137	17	0	0	0	0	0	0	0	0	0	0	155
01:00	0	94	9	0	0	0	0	0	1	0	0	0	0	104
02:00	0	84	10	0	0	0	0	0	0	0	0	0	0	94
03:00	1	102	14	0	0	0	0	0	0	0	0	0	0	117
04:00	0	210	31	3	1	0	0	0	0	0	0	0	0	245
05:00	0	394	47	4	6	0	0	0	0	0	0	0	0	451
06:00	0	763	86	13	13	5	0	1	0	0	0	0	0	881
07:00	0	1296	148	15	21	1	0	0	0	0	0	0	0	1481
08:00	0	1202	143	18	20	0	0	0	0	0	0	0	0	1383
09:00	1	744	91	14	12	1	0	3	0	0	0	0	0	866
10:00	1	746	87	11	13	0	1	2	0	0	0	0	0	861
11:00	1	796	103	13	13	0	0	0	0	0	0	0	0	926
12:00 PM	0	807	100	11	13	2	1	1	0	0	0	0	0	935
13:00	0	868	121	10	13	2	1	0	0	0	0	0	0	1015
14:00	1	1147	136	15	16	3	0	0	0	0	0	0	0	1318
15:00	0	1424	179	15	19	0	0	1	0	0	0	0	0	1638
16:00	0	1347	148	13	20	0	1	0	0	1	0	0	0	1530
17:00	0	1302	139	10	17	1	0	1	1	0	0	0	0	1471
18:00	1	1151	126	12	16	0	0	0	0	0	0	0	0	1306
19:00	0	888	83	11	11	2	0	0	0	0	0	0	0	995
20:00	1	749	75	11	10	0	0	0	0	0	0	0	0	846
21:00	0	561	63	7	7	0	0	1	1	0	0	0	0	640
22:00	1	321	40	3	4	0	0	0	0	0	0	0	0	369
23:00	0	250	26	0	1	0	0	0	0	0	0	0	0	277
Totals	**9**	**17383**	**2022**	**209**	**246**	**17**	**4**	**10**	**3**	**1**				**19904**
% of Totals	0%	87%	10%	1%	1%	0%	0%	0%	0%	0%				100%

AM Volumes	5	6568	786	91	99	7	1	6	1	0	0	0	0	7564
% AM	0%	33%	4%	0%	0%	0%	0%	0%	0%					38%
AM Peak Hour		07:00	07:00	08:00	07:00	06:00	10:00	09:00	01:00					07:00
Volume	1	1296	148	18	21	5	1	3	1					1481
PM Volumes	4	10815	1236	118	147	10	3	4	2	1	0	0	0	12340
% PM	0%	54%	6%	1%	1%	0%	0%	0%	0%	0%				62%
PM Peak Hour	14:00	15:00	15:00	14:00	16:00	14:00	12:00	12:00	17:00	16:00				15:00
Volume	1	1424	179	15	20	3	1	1	1	1				1638

Directional Peak Periods	**AM 7-9**			**NOON 12-2**			**PM 4-6**			**Off Peak Volumes**		
All Classes	Volume	⟷	%	Volume	⟷	%	Volume	⟷	%	Volume	⟷	%
	2864		14%	1950		10%	3001		15%	12089		61%

Classification Definitions

1 Motorcycles
2 Passenger Cars
3 2-Axle, 4-Tire Single Units
4 Buses
5 2-Axle, 6-Tire Single Units
6 3-Axle Single Units
7 > =4-Axle Single Units
8 <=4-Axle Single Trailers
9 5-Axle Single Trailers
10 >=6-Axle Single Trailers
11 <=5-Axle Multi-Trailers
12 6-Axle Multi-Trailers
13 >=7-Axle Multi-Trailers

Prepared by NDS/ATD

VOLUME

Iris Ave Bet. Kaiser Hospital Dwy & Oliver St

Day: Thursday
Date: 9/14/2017

City: Moreno Valley
Project #: CA17_6142_002

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	8,103	8,483	16,586

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			14		14		28		12:00			80		84		164	
00:15			16		11		27		12:15			82		86		168	
00:30			15		21		36		12:30			108		83		191	
00:45			10	55	14	60	24	115	12:45			106	376	104	357	210	733
01:00			7		11		18		13:00			86		98		184	
01:15			14		14		28		13:15			89		83		172	
01:30			15		10		25		13:30			84		139		223	
01:45			10	46	6	41	16	87	13:45			89	348	142	462	231	810
02:00			2		12		14		14:00			107		100		207	
02:15			9		11		20		14:15			171		88		259	
02:30			9		12		21		14:30			158		164		322	
02:45			4	24	6	41	10	65	14:45			163	599	157	509	320	110
03:00			9		9		18		15:00			152		286		438	
03:15			15		9		24		15:15			180		164		344	
03:30			13		19		32		15:30			140		141		281	
03:45			15	52	10	47	25	99	15:45			165	637	148	739	313	137
04:00			20		19		39		16:00			149		148		297	
04:15			28		28		56		16:15			149		138		287	
04:30			29		34		63		16:30			155		147		302	
04:45			53	130	23	104	76	234	16:45			146	599	166	599	312	119
05:00			46		32		78		17:00			160		173		333	
05:15			33		52		85		17:15			144		157		301	
05:30			47		74		121		17:30			142		209		351	
05:45			57	183	53	211	110	394	17:45			150	596	187	726	337	132
06:00			79		46		125		18:00			161		169		330	
06:15			81		88		169		18:15			116		137		253	
06:30			113		94		207		18:30			125		134		259	
06:45			146	419	112	340	258	759	18:45			116	518	99	539	215	105
07:00			120		138		258		19:00			87		127		214	
07:15			168		133		301		19:15			76		116		192	
07:30			185		210		395		19:30			100		102		202	
07:45			195	668	206	687	401	1355	19:45			79	342	114	459	193	801
08:00			157		162		319		20:00			91		107		198	
08:15			170		136		306		20:15			95		87		182	
08:30			174		153		327		20:30			78		75		153	
08:45			144	645	172	623	316	1268	20:45			89	353	77	346	166	699
09:00			71		91		162		21:00			80		85		165	
09:15			87		77		164		21:15			72		68		140	
09:30			95		81		176		21:30			56		68		124	
09:45			63	316	92	341	155	657	21:45			46	254	60	281	106	535
10:00			89		75		164		22:00			38		33		71	
10:15			85		95		180		22:15			30		52		82	
10:30			76		88		164		22:30			34		45		79	
10:45			74	324	76	334	150	658	22:45			36	138	37	167	73	305
11:00			102		81		183		23:00			28		47		75	
11:15			93		80		173		23:15			19		30		49	
11:30			96		99		195		23:30			27		19		46	
11:45			87	378	90	350	177	728	23:45			29	103	24	120	53	223
TOTALS				3240		3179		**6419**	**TOTALS**				4863		5304		**1016**
SPLIT %				50.5%		49.5%		**38.7%**	**SPLIT %**				47.8%		52.2%		**61.3**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	8,103	8,483	16,586

	NB	SB	EB	WB	TOTAL		NB	SB	EB	WB	TOTAL
AM Peak Hour			07:30	07:30	**07:30**	**PM Peak Hour**			14:30	14:30	**14:3**
AM Pk Volume			707	714	**1421**	**PM Pk Volume**			653	771	**142**
Pk Hr Factor			0.906	0.850	**0.886**	**Pk Hr Factor**			0.907	0.674	**0.81**
7 - 9 Volume	0	0	1313	1310	**2623**	**4 - 6 Volume**	0	0	1195	1325	**252**
7 - 9 Peak Hour			07:30	07:30	**07:30**	**4 - 6 Peak Hour**			16:15	17:00	**17:0**
7 - 9 Pk Volume	0	0	707	714	**1421**	**4 - 6 Pk Volume**	0	0	610	726	**132**
Pk Hr Factor	0.000	0.000	0.906	0.850	**0.886**	**Pk Hr Factor**	0.000	0.000	0.953	0.868	**0.94**

Prepared by NDS/ATD

VOLUME

Iris Ave Bet. Oliver St & Via Del Lago

Day: Thursday
Date: 9/14/2017

City: Moreno Valley
Project #: CA17_6142_003

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	6,877	6,898	13,775

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			22		14		36		12:00			74		70		144	
00:15			6		7		13		12:15			76		68		144	
00:30			12		18		30		12:30			104		70		174	
00:45			10	50	2	41	12	91	12:45			95	349	85	293	180	642
01:00			5		9		14		13:00			73		88		161	
01:15			10		7		17		13:15			83		62		145	
01:30			12		10		22		13:30			76		124		200	
01:45			9	36	7	33	16	69	13:45			78	310	116	390	194	700
02:00			2		11		13		14:00			83		83		166	
02:15			11		9		20		14:15			128		78		206	
02:30			10		9		19		14:30			109		150		259	
02:45			4	27	8	37	12	64	14:45			107	427	128	439	235	866
03:00			8		5		13		15:00			104		148		252	
03:15			16		8		24		15:15			142		114		256	
03:30			12		16		28		15:30			125		125		250	
03:45			17	53	8	37	25	90	15:45			142	513	123	510	265	102
04:00			24		14		38		16:00			124		128		252	
04:15			26		18		44		16:15			141		120		261	
04:30			27		28		55		16:30			140		127		267	
04:45			51	128	16	76	67	204	16:45			137	542	131	506	268	104
05:00			41		22		63		17:00			130		149		279	
05:15			29		37		66		17:15			137		151		288	
05:30			54		65		119		17:30			135		183		318	
05:45			49	173	53	177	102	350	17:45			127	529	154	637	281	116
06:00			74		36		110		18:00			122		159		281	
06:15			74		78		152		18:15			120		122		242	
06:30			108		71		179		18:30			104		111		215	
06:45			127	383	102	287	229	670	18:45			98	444	105	497	203	941
07:00			100		112		212		19:00			75		98		173	
07:15			133		105		238		19:15			60		98		158	
07:30			147		150		297		19:30			87		80		167	
07:45			155	535	158	525	313	1060	19:45			74	296	98	374	172	670
08:00			123		115		238		20:00			77		82		159	
08:15			121		89		210		20:15			79		82		161	
08:30			84		88		172		20:30			63		70		133	
08:45			98	426	82	374	180	800	20:45			79	298	64	298	143	596
09:00			67		75		142		21:00			69		67		136	
09:15			75		67		142		21:15			59		71		130	
09:30			78		66		144		21:30			45		59		104	
09:45			64	284	66	274	130	558	21:45			44	217	62	259	106	476
10:00			78		65		143		22:00			33		32		65	
10:15			72		83		155		22:15			31		51		82	
10:30			81		73		154		22:30			30		33		63	
10:45			62	293	65	286	127	579	22:45			34	128	38	154	72	282
11:00			94		68		162		23:00			26		42		68	
11:15			88		60		148		23:15			20		22		42	
11:30			86		83		169		23:30			23		17		40	
11:45			74	342	83	294	157	636	23:45			25	94	19	100	44	194
TOTALS				2730		2441		**5171**	**TOTALS**				4147		4457		**860**
SPLIT %				52.8%		47.2%		**37.5%**	**SPLIT %**				48.2%		51.8%		**62.5**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	6,877	6,898	13,775

AM Peak Hour			07:15	07:15	**07:15**	**PM Peak Hour**			16:15	17:15	**17:1**
AM Pk Volume			558	528	**1086**	**PM Pk Volume**			548	647	**116**
Pk Hr Factor			0.900	0.835	**0.867**	**Pk Hr Factor**			0.972	0.884	**0.91**
7 - 9 Volume	0	0	961	899	**1860**	**4 - 6 Volume**	0	0	1071	1143	**221**
7 - 9 Peak Hour			07:15	07:15	**07:15**	**4 - 6 Peak Hour**			16:15	17:00	**17:0**
7 - 9 Pk Volume	0	0	558	528	**1086**	**4 - 6 Pk Volume**	0	0	548	637	**116**
Pk Hr Factor	0.000	0.000	0.900	0.835	**0.867**	**Pk Hr Factor**	0.000	0.000	0.972	0.870	**0.91**

Prepared by NDS/ATD

VOLUME

Oliver St Bet. John F Kennedy Dr & Iris Ave

Day: Thursday
Date: 9/14/2017

City: Moreno Valley
Project #: CA17_6142_004

DAILY TOTALS	NB	SB	EB	WB	Total
	1,548	1,131	0	0	2,679

AM Period	NB		SB		EB	WB	TOTAL	
00:00	5		4				9	
00:15	2		1				3	
00:30	2		0				2	
00:45	1	10	0	5			1	15
01:00	0		1				1	
01:15	3		1				4	
01:30	0		2				2	
01:45	0	3	1	5			1	8
02:00	1		0				1	
02:15	1		1				2	
02:30	0		1				1	
02:45	0	2	1	3			1	5
03:00	1		2				3	
03:15	2		2				4	
03:30	1		1				2	
03:45	0	4	2	7			2	11
04:00	1		1				2	
04:15	1		3				4	
04:30	1		0				1	
04:45	0	3	3	7			3	10
05:00	4		6				10	
05:15	5		3				8	
05:30	3		5				8	
05:45	3	15	6	20			9	35
06:00	8		1				9	
06:15	5		8				13	
06:30	14		8				22	
06:45	16	43	14	31			30	74
07:00	17		14				31	
07:15	19		32				51	
07:30	56		47				103	
07:45	75	167	57	150			132	317
08:00	52		25				77	
08:15	51		23				74	
08:30	87		25				112	
08:45	96	286	20	93			116	379
09:00	16		8				24	
09:15	11		9				20	
09:30	12		10				22	
09:45	13	52	11	38			24	90
10:00	10		16				26	
10:15	13		12				25	
10:30	15		3				18	
10:45	11	49	21	52			32	101
11:00	19		23				42	
11:15	15		9				24	
11:30	16		21				37	
11:45	10	60	11	64			21	124
TOTALS		694		475				**1169**
SPLIT %		59.4%		40.6%				**43.6%**

PM Period	NB		SB		EB	WB	TOTAL	
12:00	11		6				17	
12:15	15		6				21	
12:30	5		11				16	
12:45	8	39	13	36			21	75
13:00	14		8				22	
13:15	13		13				26	
13:30	14		10				24	
13:45	12	53	9	40			21	93
14:00	11		25				36	
14:15	10		49				59	
14:30	27		37				64	
14:45	63	111	43	154			106	265
15:00	98		47				145	
15:15	41		21				62	
15:30	30		17				47	
15:45	25	194	18	103			43	297
16:00	24		12				36	
16:15	20		21				41	
16:30	31		15				46	
16:45	25	100	13	61			38	161
17:00	26		23				49	
17:15	11		13				24	
17:30	30		17				47	
17:45	32	99	20	73			52	172
18:00	20		23				43	
18:15	26		13				39	
18:30	17		11				28	
18:45	16	79	16	63			32	142
19:00	25		8				33	
19:15	10		16				26	
19:30	12		8				20	
19:45	15	62	5	37			20	99
20:00	16		5				21	
20:15	14		8				22	
20:30	10		8				18	
20:45	14	54	11	32			25	86
21:00	10		10				20	
21:15	10		9				19	
21:30	6		9				15	
21:45	9	35	9	37			18	72
22:00	2		4				6	
22:15	5		1				6	
22:30	9		2				11	
22:45	4	20	2	9			6	29
23:00	0		4				4	
23:15	4		1				5	
23:30	2		3				5	
23:45	2	8	3	11			5	19
TOTALS		854		656				**151**
SPLIT %		56.6%		43.4%				**56.4**

DAILY TOTALS	NB	SB	EB	WB	Total
	1,548	1,131	0	0	2,679

	NB	SB	EB	WB	TOTAL
AM Peak Hour	08:00	07:15			**07:45**
AM Pk Volume	286	161			**395**
Pk Hr Factor	0.745	0.706			**0.748**
7 - 9 Volume	453	243	0	0	**696**
7 - 9 Peak Hour	08:00	07:15			**07:45**
7 - 9 Pk Volume	286	161	0	0	**395**
Pk Hr Factor	0.745	0.706	0.000	0.000	**0.748**

	NB	SB	EB	WB	TOTAL
PM Peak Hour	14:45	14:15			**14:3**
PM Pk Volume	232	176			**377**
Pk Hr Factor	0.592	0.898			**0.65**
4 - 6 Volume	199	134	0	0	**333**
4 - 6 Peak Hour	16:15	17:00			**16:1**
4 - 6 Pk Volume	102	73	0	0	**174**
Pk Hr Factor	0.823	0.793	0.000	0.000	**0.88**

APPENDIX C:

VOLUME DEVELOPMENT WORKSHEETS

LSA

Table C-1 - Existing (2017) Peak Hour PCE Volume Summary

	A.M. Peak Hour				P.M. Peak Hour			
	Existing Without Project	Net Project Trips	Pass-By Trips	Existing With Project	Existing Without Project	Net Project Trips	Pass-By Trips	Existing With Project
1 Nason Street/Iris Avenue								
NBL	18	0	0	18	13	0	0	13
NBT	39	0	0	39	22	0	0	22
NBR	10	2	0	12	9	3	0	12
SBL	100	5	0	105	119	5	0	124
SBT	13	0	0	13	37	0	0	37
SBR	260	0	0	260	406	0	0	406
EBL	315	0	0	315	230	0	0	230
EBT	782	9	0	791	571	10	0	581
EBR	22	0	0	22	19	0	0	19
WBL	15	2	0	17	14	2	0	16
WBT	691	9	0	700	756	10	0	766
WBR	76	4	0	80	104	5	0	109
North Leg								
Approach	373	5	0	378	562	5	0	567
Departure	430	4	0	434	356	5	0	361
Total	803	9	0	812	918	10	0	928
South Leg								
Approach	67	2	0	69	44	3	0	47
Departure	50	2	0	52	70	2	0	72
Total	117	4	0	121	114	5	0	119
East Leg								
Approach	782	15	0	797	874	17	0	891
Departure	892	16	0	908	699	18	0	717
Total	1,674	31	0	1,705	1,573	35	0	1,608
West Leg								
Approach	1,119	9	0	1,128	820	10	0	830
Departure	969	9	0	978	1,175	10	0	1,185
Total	2,088	18	0	2,106	1,995	20	0	2,015
Total Approaches								
Approach	2,341	31	0	2,372	2,300	35	0	2,335
Departure	2,341	31	0	2,372	2,300	35	0	2,335
Total	4,682	62	0	4,744	4,600	70	0	4,670

Table C-1 - Existing (2017) Peak Hour PCE Volume Summary

	A.M. Peak Hour				P.M. Peak Hour			
	Existing Without Project	Net Project Trips	Pass-By Trips	Existing With Project	Existing Without Project	Net Project Trips	Pass-By Trips	Existing With Project
2 Kaiser Hospital Entrance/Iris Avenue								
NBL	0	0	0	0	0	0	0	0
NBT	0	0	0	0	0	0	0	0
NBR	0	0	0	0	0	0	0	0
SBL	6	0	0	6	37	0	0	37
SBT	0	0	0	0	0	0	0	0
SBR	22	0	0	22	33	0	0	33
EBL	133	0	0	133	73	0	0	73
EBT	708	16	0	724	563	18	0	581
EBR	0	0	0	0	0	0	0	0
WBL	0	0	0	0	0	0	0	0
WBT	685	15	0	700	712	17	0	729
WBR	39	0	0	39	18	0	0	18
North Leg								
Approach	28	0	0	28	70	0	0	70
Departure	172	0	0	172	91	0	0	91
Total	200	0	0	200	161	0	0	161
South Leg								
Approach	0	0	0	0	0	0	0	0
Departure	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0
East Leg								
Approach	724	15	0	739	730	17	0	747
Departure	714	16	0	730	600	18	0	618
Total	1,438	31	0	1,469	1,330	35	0	1,365
West Leg								
Approach	841	16	0	857	636	18	0	654
Departure	707	15	0	722	745	17	0	762
Total	1,548	31	0	1,579	1,381	35	0	1,416
Total Approaches								
Approach	1,593	31	0	1,624	1,436	35	0	1,471
Departure	1,593	31	0	1,624	1,436	35	0	1,471
Total	3,186	62	0	3,248	2,872	70	0	2,942

Table C-1 - Existing (2017) Peak Hour PCE Volume Summary

	A.M. Peak Hour				P.M. Peak Hour			
	Existing Without Project	Net Project Trips	Pass-By Trips	Existing With Project	Existing Without Project	Net Project Trips	Pass-By Trips	Existing With Project
3 Project Driveway 1/Iris Avenue								
NBL	0	0	0	0	0	0	0	0
NBT	0	0	0	0	0	0	0	0
NBR	0	0	0	0	0	0	0	0
SBL	0	0	0	0	0	0	0	0
SBT	0	0	0	0	0	0	0	0
SBR	0	15	25	40	0	17	29	46
EBL	0	0	0	0	0	0	0	0
EBT	706	16	0	722	620	18	0	638
EBR	0	0	0	0	0	0	0	0
WBL	0	0	0	0	0	0	0	0
WBT	745	0	-26	719	713	0	-30	683
WBR	0	36	48	84	0	42	57	99
North Leg								
Approach	0	15	25	40	0	17	29	46
Departure	0	36	48	84	0	42	57	99
Total	0	51	73	124	0	59	86	145
South Leg								
Approach	0	0	0	0	0	0	0	0
Departure	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0
East Leg								
Approach	745	36	22	803	713	42	27	782
Departure	706	16	0	722	620	18	0	638
Total	1,451	52	22	1,525	1,333	60	27	1,420
West Leg								
Approach	706	16	0	722	620	18	0	638
Departure	745	15	-1	759	713	17	-1	729
Total	1,451	31	-1	1,481	1,333	35	-1	1,367
Total Approaches								
Approach	1,451	67	47	1,565	1,333	77	56	1,466
Departure	1,451	67	47	1,565	1,333	77	56	1,466
Total	2,902	134	94	3,130	2,666	154	112	2,932

Table C-1 - Existing (2017) Peak Hour PCE Volume Summary

	A.M. Peak Hour				P.M. Peak Hour			
	Existing Without Project	Net Project Trips	Pass-By Trips	Existing With Project	Existing Without Project	Net Project Trips	Pass-By Trips	Existing With Project
4 Oliver Street/John F Kennedy Drive								
NBL	0	0	0	0	0	0	0	0
NBT	261	6	0	267	81	7	0	88
NBR	44	0	0	44	18	0	0	18
SBL	234	0	0	234	120	0	0	120
SBT	113	7	0	120	62	8	0	70
SBR	0	0	0	0	0	0	0	0
EBL	0	0	0	0	0	0	0	0
EBT	0	0	0	0	0	0	0	0
EBR	0	0	0	0	0	0	0	0
WBL	24	2	0	26	27	3	0	30
WBT	0	0	0	0	0	0	0	0
WBR	92	0	0	92	56	0	0	56
North Leg								
Approach	347	7	0	354	182	8	0	190
Departure	353	6	0	359	137	7	0	144
Total	700	13	0	713	319	15	0	334
South Leg								
Approach	305	6	0	311	99	7	0	106
Departure	137	9	0	146	89	11	0	100
Total	442	15	0	457	188	18	0	206
East Leg								
Approach	116	2	0	118	83	3	0	86
Departure	278	0	0	278	138	0	0	138
Total	394	2	0	396	221	3	0	224
West Leg								
Approach	0	0	0	0	0	0	0	0
Departure	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0
Total Approaches								
Approach	768	15	0	783	364	18	0	382
Departure	768	15	0	783	364	18	0	382
Total	1,536	30	0	1,566	728	36	0	764

Table C-1 - Existing (2017) Peak Hour PCE Volume Summary

	A.M. Peak Hour				P.M. Peak Hour			
	Existing Without Project	Net Project Trips	Pass-By Trips	Existing With Project	Existing Without Project	Net Project Trips	Pass-By Trips	Existing With Project
5 Oliver Street/Project Driveway 2								
NBL	0	0	0	0	0	0	0	0
NBT	221	6	0	227	97	7	0	104
NBR	0	0	0	0	0	0	0	0
SBL	0	0	0	0	0	0	0	0
SBT	226	0	-4	222	105	0	-4	101
SBR	0	9	4	13	0	10	4	14
EBL	0	0	0	0	0	0	0	0
EBT	0	0	0	0	0	0	0	0
EBR	0	28	26	54	0	32	31	63
WBL	0	0	0	0	0	0	0	0
WBT	0	0	0	0	0	0	0	0
WBR	0	0	0	0	0	0	0	0
North Leg								
Approach	226	9	0	235	105	10	0	115
Departure	221	6	0	227	97	7	0	104
Total	447	15	0	462	202	17	0	219
South Leg								
Approach	221	6	0	227	97	7	0	104
Departure	226	28	22	276	105	32	27	164
Total	447	34	22	503	202	39	27	268
East Leg								
Approach	0	0	0	0	0	0	0	0
Departure	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0
West Leg								
Approach	0	28	26	54	0	32	31	63
Departure	0	9	4	13	0	10	4	14
Total	0	37	30	67	0	42	35	77
Total Approaches								
Approach	447	43	26	516	202	49	31	282
Departure	447	43	26	516	202	49	31	282
Total	894	86	52	1,032	404	98	62	564

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Table C-1 - Existing (2017) Peak Hour PCE Volume Summary

	A.M. Peak Hour				P.M. Peak Hour			
	Existing Without Project	Net Project Trips	Pass-By Trips	Existing With Project	Existing Without Project	Net Project Trips	Pass-By Trips	Existing With Project
6 Oliver Street/Iris Avenue								
NBL	75	5	2	82	43	5	2	50
NBT	44	0	-1	43	14	0	-1	13
NBR	38	0	-1	37	32	0	-1	31
SBL	6	24	22	52	6	27	26	59
SBT	25	4	3	32	23	5	4	32
SBR	195	0	-3	192	76	0	-3	73
EBL	167	16	19	202	74	18	23	115
EBT	520	0	-18	502	496	0	-21	475
EBR	19	0	-2	17	50	0	-2	48
WBL	34	0	-2	32	41	0	-2	39
WBT	475	16	2	493	594	18	2	614
WBR	10	6	3	19	9	7	4	20
North Leg								
Approach	226	28	22	276	105	32	27	164
Departure	221	22	21	264	97	25	26	148
Total	447	50	43	540	202	57	53	312
South Leg								
Approach	157	5	0	162	89	5	0	94
Departure	78	4	-1	81	114	5	0	119
Total	235	9	-1	243	203	10	0	213
East Leg								
Approach	519	22	3	544	644	25	4	673
Departure	564	24	3	591	534	27	4	565
Total	1,083	46	6	1,135	1,178	52	8	1,238
West Leg								
Approach	706	16	-1	721	620	18	0	638
Departure	745	21	1	767	713	23	1	737
Total	1,451	37	0	1,488	1,333	41	1	1,375
Total Approaches								
Approach	1,608	71	24	1,703	1,458	80	31	1,569
Departure	1,608	71	24	1,703	1,458	80	31	1,569
Total	3,216	142	48	3,406	2,916	160	62	3,138

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

LSA

Table C-1 - Existing (2017) Peak Hour PCE Volume Summary

	A.M. Peak Hour				P.M. Peak Hour			
	Existing Without Project	Net Project Trips	Pass-By Trips	Existing With Project	Existing Without Project	Net Project Trips	Pass-By Trips	Existing With Project
7 Via Del Lago/Iris Avenue - Moreno Beach Drive								
NBL	22	0	0	22	19	0	0	19
NBT	2	0	0	2	0	0	0	0
NBR	40	0	0	40	22	0	0	22
SBL	13	0	0	13	9	0	0	9
SBT	2	0	0	2	2	0	0	2
SBR	38	2	0	40	17	3	0	20
EBL	22	9	4	35	23	10	4	37
EBT	524	15	0	539	482	17	0	499
EBR	18	0	0	18	29	0	0	29
WBL	17	0	0	17	39	0	0	39
WBT	459	14	0	473	608	16	0	624
WBR	6	0	0	6	13	0	0	13
North Leg								
Approach	53	2	0	55	28	3	0	31
Departure	30	9	4	43	36	10	4	50
Total	83	11	4	98	64	13	4	81
South Leg								
Approach	64	0	0	64	41	0	0	41
Departure	37	0	0	37	70	0	0	70
Total	101	0	0	101	111	0	0	111
East Leg								
Approach	482	14	0	496	660	16	0	676
Departure	577	15	0	592	513	17	0	530
Total	1,059	29	0	1,088	1,173	33	0	1,206
West Leg								
Approach	564	24	4	592	534	27	4	565
Departure	519	16	0	535	644	19	0	663
Total	1,083	40	4	1,127	1,178	46	4	1,228
Total Approaches								
Approach	1,163	40	4	1,207	1,263	46	4	1,313
Departure	1,163	40	4	1,207	1,263	46	4	1,313
Total	2,326	80	8	2,414	2,526	92	8	2,626

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Table C-2 - Project Compl. Year Peak Hour PCE Vol. Summary

	AM Peak Hour					
	Existing (2017) PCE	2017-2019 Growth	OY Without Project	Net Project Trips	Pass-By Trips	OY With Project
1 Nason Street/Iris Avenue						
NBL	18	2	20	0	0	20
NBT	39	4	43	0	0	43
NBR	10	1	11	2	0	13
SBL	100	10	110	5	0	115
SBT	13	1	14	0	0	14
SBR	260	27	287	0	0	287
EBL	315	33	348	0	0	348
EBT	782	81	863	9	0	872
EBR	22	2	24	0	0	24
WBL	15	2	17	2	0	19
WBT	691	72	763	9	0	772
WBR	76	8	84	4	0	88
North Leg						
Approach	373	38	411	5	0	416
Departure	430	45	475	4	0	479
Total	803	83	886	9	0	895
South Leg						
Approach	67	7	74	2	0	76
Departure	50	5	55	2	0	57
Total	117	12	129	4	0	133
East Leg						
Approach	782	82	864	15	0	879
Departure	892	92	984	16	0	1,000
Total	1,674	174	1,848	31	0	1,879
West Leg						
Approach	1,119	116	1,235	9	0	1,244
Departure	969	101	1,070	9	0	1,079
Total	2,088	217	2,305	18	0	2,323
Total Approaches						
Approach	2,341	243	2,584	31	0	2,615
Departure	2,341	243	2,584	31	0	2,615
Total	4,682	486	5,168	62	0	5,230

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Table C-2 - Project Compl. Year Peak Hour PCE Vol. Summary

	AM Peak Hour					
	Existing (2017) PCE	2017-2019 Growth	OY Without Project	Net Project Trips	Pass-By Trips	OY With Project
2 Kaiser Hospital Entrance/Iris Avenue						
NBL	0	0	0	0	0	0
NBT	0	0	0	0	0	0
NBR	0	0	0	0	0	0
SBL	6	1	7	0	0	7
SBT	0	0	0	0	0	0
SBR	22	2	24	0	0	24
EBL	133	14	147	0	0	147
EBT	708	74	782	16	0	798
EBR	0	0	0	0	0	0
WBL	0	0	0	0	0	0
WBT	685	71	756	15	0	771
WBR	39	4	43	0	0	43
North Leg						
Approach	28	3	31	0	0	31
Departure	172	18	190	0	0	190
Total	200	21	221	0	0	221
South Leg						
Approach	0	0	0	0	0	0
Departure	0	0	0	0	0	0
Total	0	0	0	0	0	0
East Leg						
Approach	724	75	799	15	0	814
Departure	714	75	789	16	0	805
Total	1,438	150	1,588	31	0	1,619
West Leg						
Approach	841	88	929	16	0	945
Departure	707	73	780	15	0	795
Total	1,548	161	1,709	31	0	1,740
Total Approaches						
Approach	1,593	166	1,759	31	0	1,790
Departure	1,593	166	1,759	31	0	1,790
Total	3,186	332	3,518	62	0	3,580

Table C-2 - Project Compl. Year Peak Hour PCE Vol. Summary

		AM Peak Hour				
	Existing (2017) PCE	2017-2019 Growth	OY Without Project	Net Project Trips	Pass-By Trips	OY With Project
3 Project Driveway 1/Iris Avenue						
NBL	0	0	0	0	0	0
NBT	0	0	0	0	0	0
NBR	0	0	0	0	0	0
SBL	0	0	0	0	0	0
SBT	0	0	0	0	0	0
SBR	0	0	0	15	25	40
EBL	0	0	0	0	0	0
EBT	706	73	779	16	0	795
EBR	0	0	0	0	0	0
WBL	0	0	0	0	0	0
WBT	745	78	823	0	-26	797
WBR	0	0	0	36	48	84
North Leg						
Approach	0	0	0	15	25	40
Departure	0	0	0	36	48	84
Total	0	0	0	51	73	124
South Leg						
Approach	0	0	0	0	0	0
Departure	0	0	0	0	0	0
Total	0	0	0	0	0	0
East Leg						
Approach	745	78	823	36	22	881
Departure	706	73	779	16	0	795
Total	1,451	151	1,602	52	22	1,676
West Leg						
Approach	706	73	779	16	0	795
Departure	745	78	823	15	-1	837
Total	1,451	151	1,602	31	-1	1,632
Total Approaches						
Approach	1,451	151	1,602	67	47	1,716
Departure	1,451	151	1,602	67	47	1,716
Total	2,902	302	3,204	134	94	3,432

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Table C-2 - Project Compl. Year Peak Hour PCE Vol. Summary

	AM Peak Hour					
	Existing (2017) PCE	2017-2019 Growth	OY Without Project	Net Project Trips	Pass-By Trips	OY With Project
4 Oliver Street/John F Kennedy Drive						
NBL	0	0	0	0	0	0
NBT	261	27	288	6	0	294
NBR	44	5	49	0	0	49
SBL	234	24	258	0	0	258
SBT	113	12	125	7	0	132
SBR	0	0	0	0	0	0
EBL	0	0	0	0	0	0
EBT	0	0	0	0	0	0
EBR	0	0	0	0	0	0
WBL	24	2	26	2	0	28
WBT	0	0	0	0	0	0
WBR	92	10	102	0	0	102
North Leg						
Approach	347	36	383	7	0	390
Departure	353	37	390	6	0	396
Total	700	73	773	13	0	786
South Leg						
Approach	305	32	337	6	0	343
Departure	137	14	151	9	0	160
Total	442	46	488	15	0	503
East Leg						
Approach	116	12	128	2	0	130
Departure	278	29	307	0	0	307
Total	394	41	435	2	0	437
West Leg						
Approach	0	0	0	0	0	0
Departure	0	0	0	0	0	0
Total	0	0	0	0	0	0
Total Approaches						
Approach	768	80	848	15	0	863
Departure	768	80	848	15	0	863
Total	1,536	160	1,696	30	0	1,726

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

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Table C-2 - Project Compl. Year Peak Hour PCE Vol. Summary

		AM Peak Hour					
		Existing (2017) PCE	2017-2019 Growth	OY Without Project	Net Project Trips	Pass-By Trips	OY With Project
5	**Oliver Street/Project Driveway 2**						
NBL		0	0	0	0	0	0
NBT		221	23	244	6	0	250
NBR		0	0	0	0	0	0
SBL		0	0	0	0	0	0
SBT		226	24	250	0	-4	246
SBR		0	0	0	9	4	13
EBL		0	0	0	0	0	0
EBT		0	0	0	0	0	0
EBR		0	0	0	28	26	54
WBL		0	0	0	0	0	0
WBT		0	0	0	0	0	0
WBR		0	0	0	0	0	0
North Leg							
	Approach	226	24	250	9	0	259
	Departure	221	23	244	6	0	250
	Total	447	47	494	15	0	509
South Leg							
	Approach	221	23	244	6	0	250
	Departure	226	24	250	28	22	300
	Total	447	47	494	34	22	550
East Leg							
	Approach	0	0	0	0	0	0
	Departure	0	0	0	0	0	0
	Total	0	0	0	0	0	0
West Leg							
	Approach	0	0	0	28	26	54
	Departure	0	0	0	9	4	13
	Total	0	0	0	37	30	67
Total Approaches							
	Approach	447	47	494	43	26	563
	Departure	447	47	494	43	26	563
	Total	894	94	988	86	52	1,126

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Table C-2 - Project Compl. Year Peak Hour PCE Vol. Summary

	AM Peak Hour					
	Existing (2017) PCE	2017-2019 Growth	OY Without Project	Net Project Trips	Pass-By Trips	OY With Project
6 Oliver Street/Iris Avenue						
NBL	75	8	83	5	2	90
NBT	44	5	49	0	-1	48
NBR	38	4	42	0	-1	41
SBL	6	1	7	24	22	53
SBT	25	3	28	4	3	35
SBR	195	20	215	0	-3	212
EBL	167	17	184	16	19	219
EBT	520	54	574	0	-18	556
EBR	19	2	21	0	-2	19
WBL	34	4	38	0	-2	36
WBT	475	49	524	16	2	542
WBR	10	1	11	6	3	20
North Leg						
Approach	226	24	250	28	22	300
Departure	221	23	244	22	21	287
Total	447	47	494	50	43	587
South Leg						
Approach	157	17	174	5	0	179
Departure	78	9	87	4	-1	90
Total	235	26	261	9	-1	269
East Leg						
Approach	519	54	573	22	3	598
Departure	564	59	623	24	3	650
Total	1,083	113	1,196	46	6	1,248
West Leg						
Approach	706	73	779	16	-1	794
Departure	745	77	822	21	1	844
Total	1,451	150	1,601	37	0	1,638
Total Approaches						
Approach	1,608	168	1,776	71	24	1,871
Departure	1,608	168	1,776	71	24	1,871
Total	3,216	336	3,552	142	48	3,742

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Table C-2 - Project Compl. Year Peak Hour PCE Vol. Summary

		AM Peak Hour					
		Existing (2017) PCE	**2017-2019 Growth**	**OY Without Project**	**Net Project Trips**	**Pass-By Trips**	**OY With Project**
7	**Via Del Lago/Iris Avenue - Moreno Beach Drive**						
NBL		22	2	24	0	0	24
NBT		2	0	2	0	0	2
NBR		40	4	44	0	0	44
SBL		13	1	14	0	0	14
SBT		2	0	2	0	0	2
SBR		38	4	42	2	0	44
EBL		22	2	24	9	4	37
EBT		524	55	579	15	0	594
EBR		18	2	20	0	0	20
WBL		17	2	19	0	0	19
WBT		459	48	507	14	0	521
WBR		6	1	7	0	0	7
North Leg							
	Approach	53	5	58	2	0	60
	Departure	30	3	33	9	4	46
	Total	83	8	91	11	4	106
South Leg							
	Approach	64	6	70	0	0	70
	Departure	37	4	41	0	0	41
	Total	101	10	111	0	0	111
East Leg							
	Approach	482	51	533	14	0	547
	Departure	577	60	637	15	0	652
	Total	1,059	111	1,170	29	0	1,199
West Leg							
	Approach	564	59	623	24	4	651
	Departure	519	54	573	16	0	589
	Total	1,083	113	1,196	40	4	1,240
Total Approaches							
	Approach	1,163	121	1,284	40	4	1,328
	Departure	1,163	121	1,284	40	4	1,328
	Total	2,326	242	2,568	80	8	2,656

Table C-2 - Project Compl. Year Peak Hour PCE Vol. Summary

		PM Peak Hour					
		Existing (2017) PCE	2017-2019 Growth	OY Without Project	Net Project Trips	Pass-By Trips	OY With Project
1	**Nason Street/Iris Avenue**						
NBL		13	1	14	0	0	14
NBT		22	2	24	0	0	24
NBR		9	1	10	3	0	13
SBL		119	12	131	5	0	136
SBT		37	4	41	0	0	41
SBR		406	42	448	0	0	448
EBL		230	24	254	0	0	254
EBT		571	59	630	10	0	640
EBR		19	2	21	0	0	21
WBL		14	1	15	2	0	17
WBT		756	79	835	10	0	845
WBR		104	11	115	5	0	120
North Leg							
	Approach	562	58	620	5	0	625
	Departure	356	37	393	5	0	398
	Total	918	95	1,013	10	0	1,023
South Leg							
	Approach	44	4	48	3	0	51
	Departure	70	7	77	2	0	79
	Total	114	11	125	5	0	130
East Leg							
	Approach	874	91	965	17	0	982
	Departure	699	72	771	18	0	789
	Total	1,573	163	1,736	35	0	1,771
West Leg							
	Approach	820	85	905	10	0	915
	Departure	1,175	122	1,297	10	0	1,307
	Total	1,995	207	2,202	20	0	2,222
Total Approaches							
	Approach	2,300	238	2,538	35	0	2,573
	Departure	2,300	238	2,538	35	0	2,573
	Total	4,600	476	5,076	70	0	5,146

Table C-2 - Project Compl. Year Peak Hour PCE Vol. Summary

	PM Peak Hour					
	Existing (2017) PCE	2017-2019 Growth	OY Without Project	Net Project Trips	Pass-By Trips	OY With Project
2 Kaiser Hospital Entrance/Iris Avenue						
NBL	0	0	0	0	0	0
NBT	0	0	0	0	0	0
NBR	0	0	0	0	0	0
SBL	37	4	41	0	0	41
SBT	0	0	0	0	0	0
SBR	33	3	36	0	0	36
EBL	73	8	81	0	0	81
EBT	563	59	622	18	0	640
EBR	0	0	0	0	0	0
WBL	0	0	0	0	0	0
WBT	712	74	786	17	0	803
WBR	18	2	20	0	0	20
North Leg						
Approach	70	7	77	0	0	77
Departure	91	10	101	0	0	101
Total	161	17	178	0	0	178
South Leg						
Approach	0	0	0	0	0	0
Departure	0	0	0	0	0	0
Total	0	0	0	0	0	0
East Leg						
Approach	730	76	806	17	0	823
Departure	600	63	663	18	0	681
Total	1,330	139	1,469	35	0	1,504
West Leg						
Approach	636	67	703	18	0	721
Departure	745	77	822	17	0	839
Total	1,381	144	1,525	35	0	1,560
Total Approaches						
Approach	1,436	150	1,586	35	0	1,621
Departure	1,436	150	1,586	35	0	1,621
Total	2,872	300	3,172	70	0	3,242

Table C-2 - Project Compl. Year Peak Hour PCE Vol. Summary

	PM Peak Hour					
	Existing (2017) PCE	2017-2019 Growth	OY Without Project	Net Project Trips	Pass-By Trips	OY With Project
3 Project Driveway 1/Iris Avenue						
NBL	0	0	0	0	0	0
NBT	0	0	0	0	0	0
NBR	0	0	0	0	0	0
SBL	0	0	0	0	0	0
SBT	0	0	0	0	0	0
SBR	0	0	0	17	29	46
EBL	0	0	0	0	0	0
EBT	620	65	685	18	0	703
EBR	0	0	0	0	0	0
WBL	0	0	0	0	0	0
WBT	713	74	787	0	-30	757
WBR	0	0	0	42	57	99
North Leg						
Approach	0	0	0	17	29	46
Departure	0	0	0	42	57	99
Total	0	0	0	59	86	145
South Leg						
Approach	0	0	0	0	0	0
Departure	0	0	0	0	0	0
Total	0	0	0	0	0	0
East Leg						
Approach	713	74	787	42	27	856
Departure	620	65	685	18	0	703
Total	1,333	139	1,472	60	27	1,559
West Leg						
Approach	620	65	685	18	0	703
Departure	713	74	787	17	-1	803
Total	1,333	139	1,472	35	-1	1,506
Total Approaches						
Approach	1,333	139	1,472	77	56	1,605
Departure	1,333	139	1,472	77	56	1,605
Total	2,666	278	2,944	154	112	3,210

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Table C-2 - Project Compl. Year Peak Hour PCE Vol. Summary

	PM Peak Hour					
	Existing (2017) PCE	2017-2019 Growth	OY Without Project	Net Project Trips	Pass-By Trips	OY With Project
4 Oliver Street/John F Kennedy Drive						
NBL	0	0	0	0	0	0
NBT	81	8	89	7	0	96
NBR	18	2	20	0	0	20
SBL	120	12	132	0	0	132
SBT	62	6	68	8	0	76
SBR	0	0	0	0	0	0
EBL	0	0	0	0	0	0
EBT	0	0	0	0	0	0
EBR	0	0	0	0	0	0
WBL	27	3	30	3	0	33
WBT	0	0	0	0	0	0
WBR	56	6	62	0	0	62
North Leg						
Approach	182	18	200	8	0	208
Departure	137	14	151	7	0	158
Total	319	32	351	15	0	366
South Leg						
Approach	99	10	109	7	0	116
Departure	89	9	98	11	0	109
Total	188	19	207	18	0	225
East Leg						
Approach	83	9	92	3	0	95
Departure	138	14	152	0	0	152
Total	221	23	244	3	0	247
West Leg						
Approach	0	0	0	0	0	0
Departure	0	0	0	0	0	0
Total	0	0	0	0	0	0
Total Approaches						
Approach	364	37	401	18	0	419
Departure	364	37	401	18	0	419
Total	728	74	802	36	0	838

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Table C-2 - Project Compl. Year Peak Hour PCE Vol. Summary

		PM Peak Hour					
		Existing (2017) PCE	2017-2019 Growth	OY Without Project	Net Project Trips	Pass-By Trips	OY With Project
5	**Oliver Street/Project Driveway 2**						
NBL		0	0	0	0	0	0
NBT		97	10	107	7	0	114
NBR		0	0	0	0	0	0
SBL		0	0	0	0	0	0
SBT		105	11	116	0	-4	112
SBR		0	0	0	10	4	14
EBL		0	0	0	0	0	0
EBT		0	0	0	0	0	0
EBR		0	0	0	32	31	63
WBL		0	0	0	0	0	0
WBT		0	0	0	0	0	0
WBR		0	0	0	0	0	0
North Leg							
	Approach	105	11	116	10	0	126
	Departure	97	10	107	7	0	114
	Total	202	21	223	17	0	240
South Leg							
	Approach	97	10	107	7	0	114
	Departure	105	11	116	32	27	175
	Total	202	21	223	39	27	289
East Leg							
	Approach	0	0	0	0	0	0
	Departure	0	0	0	0	0	0
	Total	0	0	0	0	0	0
West Leg							
	Approach	0	0	0	32	31	63
	Departure	0	0	0	10	4	14
	Total	0	0	0	42	35	77
Total Approaches							
	Approach	202	21	223	49	31	303
	Departure	202	21	223	49	31	303
	Total	404	42	446	98	62	606

Table C-2 - Project Compl. Year Peak Hour PCE Vol. Summary

		PM Peak Hour					
		Existing (2017) PCE	2017-2019 Growth	OY Without Project	Net Project Trips	Pass-By Trips	OY With Project
6	**Oliver Street/Iris Avenue**						
NBL		43	4	47	5	2	54
NBT		14	1	15	0	-1	14
NBR		32	3	35	0	-1	34
SBL		6	1	7	27	26	60
SBT		23	2	25	5	4	34
SBR		76	8	84	0	-3	81
EBL		74	8	82	18	23	123
EBT		496	52	548	0	-21	527
EBR		50	5	55	0	-2	53
WBL		41	4	45	0	-2	43
WBT		594	62	656	18	2	676
WBR		9	1	10	7	4	21
North Leg							
	Approach	105	11	116	32	27	175
	Departure	97	10	107	25	26	158
	Total	202	21	223	57	53	333
South Leg							
	Approach	89	8	97	5	0	102
	Departure	114	11	125	5	0	130
	Total	203	19	222	10	0	232
East Leg							
	Approach	644	67	711	25	4	740
	Departure	534	56	590	27	4	621
	Total	1,178	123	1,301	52	8	1,361
West Leg							
	Approach	620	65	685	18	0	703
	Departure	713	74	787	23	1	811
	Total	1,333	139	1,472	41	1	1,514
Total Approaches							
	Approach	1,458	151	1,609	80	31	1,720
	Departure	1,458	151	1,609	80	31	1,720
	Total	2,916	302	3,218	160	62	3,440

Table C-2 - Project Compl. Year Peak Hour PCE Vol. Summary

	PM Peak Hour					
	Existing (2017) PCE	2017-2019 Growth	OY Without Project	Net Project Trips	Pass-By Trips	OY With Project
7 Via Del Lago/Iris Avenue - Moreno Beach Drive						
NBL	19	2	21	0	0	21
NBT	0	0	0	0	0	0
NBR	22	2	24	0	0	24
SBL	9	1	10	0	0	10
SBT	2	0	2	0	0	2
SBR	17	2	19	3	0	22
EBL	23	2	25	10	4	39
EBT	482	50	532	17	0	549
EBR	29	3	32	0	0	32
WBL	39	4	43	0	0	43
WBT	608	63	671	16	0	687
WBR	13	1	14	0	0	14
North Leg						
Approach	28	3	31	3	0	34
Departure	36	3	39	10	4	53
Total	64	6	70	13	4	87
South Leg						
Approach	41	4	45	0	0	45
Departure	70	7	77	0	0	77
Total	111	11	122	0	0	122
East Leg						
Approach	660	68	728	16	0	744
Departure	513	53	566	17	0	583
Total	1,173	121	1,294	33	0	1,327
West Leg						
Approach	534	55	589	27	4	620
Departure	644	67	711	19	0	730
Total	1,178	122	1,300	46	4	1,350
Total Approaches						
Approach	1,263	130	1,393	46	4	1,443
Departure	1,263	130	1,393	46	4	1,443
Total	2,526	260	2,786	92	8	2,886

Table C-3- Cumulative (2022) Peak Hour PCE Volume Summary

	AM Peak Hour					
	Opening Year 2018	Cumulative Project Trips	Cumulative Without Project	Net Project Trips	Pass-By Trips	Cumulative With Project
1 Nason Street/Iris Avenue						
NBL	20	0	20	0	0	20
NBT	43	1	44	0	0	44
NBR	11	38	49	2	0	51
SBL	110	97	207	5	0	212
SBT	14	3	17	0	0	17
SBR	287	26	313	0	0	313
EBL	348	50	398	0	0	398
EBT	863	315	1,178	9	0	1,187
EBR	24	0	24	0	0	24
WBL	17	13	30	2	0	32
WBT	763	152	915	9	0	924
WBR	84	68	152	4	0	156
North Leg						
Approach	411	126	537	5	0	542
Departure	475	119	594	4	0	598
Total	886	245	1,131	9	0	1,140
South Leg						
Approach	74	39	113	2	0	115
Departure	55	16	71	2	0	73
Total	129	55	184	4	0	188
East Leg						
Approach	864	233	1,097	15	0	1,112
Departure	984	450	1,434	16	0	1,450
Total	1,848	683	2,531	31	0	2,562
West Leg						
Approach	1,235	365	1,600	9	0	1,609
Departure	1,070	178	1,248	9	0	1,257
Total	2,305	543	2,848	18	0	2,866
Total Approaches						
Approach	2,584	763	3,347	31	0	3,378
Departure	2,584	763	3,347	31	0	3,378
Total	5,168	1,526	6,694	62	0	6,756

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Table C-3- Cumulative (2022) Peak Hour PCE Volume Summary

	AM Peak Hour					
	Opening Year 2018	Cumulative Project Trips	Cumulative Without Project	Net Project Trips	Pass-By Trips	Cumulative With Project
2 Kaiser Hospital Entrance/Iris Avenue						
NBL	0	0	0	0	0	0
NBT	0	0	0	0	0	0
NBR	0	0	0	0	0	0
SBL	7	36	43	0	0	43
SBT	0	0	0	0	0	0
SBR	24	20	44	0	0	44
EBL	147	141	288	0	0	288
EBT	782	308	1,090	16	0	1,106
EBR	0	0	0	0	0	0
WBL	0	0	0	0	0	0
WBT	756	185	941	15	0	956
WBR	43	123	166	0	0	166
North Leg						
Approach	31	56	87	0	0	87
Departure	190	264	454	0	0	454
Total	221	320	541	0	0	541
South Leg						
Approach	0	0	0	0	0	0
Departure	0	0	0	0	0	0
Total	0	0	0	0	0	0
East Leg						
Approach	799	308	1,107	15	0	1,122
Departure	789	344	1,133	16	0	1,149
Total	1,588	652	2,240	31	0	2,271
West Leg						
Approach	929	449	1,378	16	0	1,394
Departure	780	205	985	15	0	1,000
Total	1,709	654	2,363	31	0	2,394
Total Approaches						
Approach	1,759	813	2,572	31	0	2,603
Departure	1,759	813	2,572	31	0	2,603
Total	3,518	1,626	5,144	62	0	5,206

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Table C-3- Cumulative (2022) Peak Hour PCE Volume Summary

		AM Peak Hour					
		Opening Year 2018	Cumulative Project Trips	Cumulative Without Project	Net Project Trips	Pass-By Trips	Cumulative With Project
3	**Project Driveway 1/Iris Avenue**						
NBL		0	0	0	0	0	0
NBT		0	0	0	0	0	0
NBR		0	0	0	0	0	0
SBL		0	0	0	0	0	0
SBT		0	0	0	0	0	0
SBR		0	0	0	15	25	40
EBL		0	0	0	0	0	0
EBT		779	341	1,120	16	0	1,136
EBR		0	0	0	0	0	0
WBL		0	0	0	0	0	0
WBT		823	314	1,137	0	-26	1,111
WBR		0	0	0	36	48	84
North Leg							
	Approach	0	0	0	15	25	40
	Departure	0	0	0	36	48	84
	Total	0	0	0	51	73	124
South Leg							
	Approach	0	0	0	0	0	0
	Departure	0	0	0	0	0	0
	Total	0	0	0	0	0	0
East Leg							
	Approach	823	314	1,137	36	22	1,195
	Departure	779	341	1,120	16	0	1,136
	Total	1,602	655	2,257	52	22	2,331
West Leg							
	Approach	779	341	1,120	16	0	1,136
	Departure	823	314	1,137	15	-1	1,151
	Total	1,602	655	2,257	31	-1	2,287
Total Approaches							
	Approach	1,602	655	2,257	67	47	2,371
	Departure	1,602	655	2,257	67	47	2,371
	Total	3,204	1,310	4,514	134	94	4,742

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Table C-3- Cumulative (2022) Peak Hour PCE Volume Summary

	AM Peak Hour					
	Opening Year 2018	Cumulative Project Trips	Cumulative Without Project	Net Project Trips	Pass-By Trips	Cumulative With Project
4 Oliver Street/John F Kennedy Drive						
NBL	0	0	0	0	0	0
NBT	288	17	305	6	0	311
NBR	49	26	75	0	0	75
SBL	258	15	273	0	0	273
SBT	125	45	170	7	0	177
SBR	0	0	0	0	0	0
EBL	0	0	0	0	0	0
EBT	0	0	0	0	0	0
EBR	0	0	0	0	0	0
WBL	26	15	41	2	0	43
WBT	0	0	0	0	0	0
WBR	102	6	108	0	0	108
North Leg						
Approach	383	60	443	7	0	450
Departure	390	23	413	6	0	419
Total	773	83	856	13	0	869
South Leg						
Approach	337	43	380	6	0	386
Departure	151	60	211	9	0	220
Total	488	103	591	15	0	606
East Leg						
Approach	128	21	149	2	0	151
Departure	307	41	348	0	0	348
Total	435	62	497	2	0	499
West Leg						
Approach	0	0	0	0	0	0
Departure	0	0	0	0	0	0
Total	0	0	0	0	0	0
Total Approaches						
Approach	848	124	972	15	0	987
Departure	848	124	972	15	0	987
Total	1,696	248	1,944	30	0	1,974

Table C-3- Cumulative (2022) Peak Hour PCE Volume Summary

	AM Peak Hour					
	Opening Year 2018	Cumulative Project Trips	Cumulative Without Project	Net Project Trips	Pass-By Trips	Cumulative With Project
5 Oliver Street/Project Driveway 2						
NBL	0	0	0	0	0	0
NBT	244	28	272	6	0	278
NBR	0	0	0	0	0	0
SBL	0	0	0	0	0	0
SBT	250	52	302	0	-4	298
SBR	0	0	0	9	4	13
EBL	0	0	0	0	0	0
EBT	0	0	0	0	0	0
EBR	0	0	0	28	26	54
WBL	0	0	0	0	0	0
WBT	0	0	0	0	0	0
WBR	0	0	0	0	0	0
North Leg						
Approach	250	52	302	9	0	311
Departure	244	28	272	6	0	278
Total	494	80	574	15	0	589
South Leg						
Approach	244	28	272	6	0	278
Departure	250	52	302	28	22	352
Total	494	80	574	34	22	630
East Leg						
Approach	0	0	0	0	0	0
Departure	0	0	0	0	0	0
Total	0	0	0	0	0	0
West Leg						
Approach	0	0	0	28	26	54
Departure	0	0	0	9	4	13
Total	0	0	0	37	30	67
Total Approaches						
Approach	494	80	574	43	26	643
Departure	494	80	574	43	26	643
Total	988	160	1,148	86	52	1,286

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Table C-3- Cumulative (2022) Peak Hour PCE Volume Summary

	AM Peak Hour					
	Opening Year 2018	**Cumulative Project Trips**	**Cumulative Without Project**	**Net Project Trips**	**Pass-By Trips**	**Cumulative With Project**
6 Oliver Street/Iris Avenue						
NBL	83	24	107	5	2	114
NBT	49	1	50	0	-1	49
NBR	42	24	66	0	-1	65
SBL	7	0	7	24	22	53
SBT	28	0	28	4	3	35
SBR	215	51	266	0	-3	263
EBL	184	26	210	16	19	245
EBT	574	329	903	0	-18	885
EBR	21	9	30	0	-2	28
WBL	38	9	47	0	-2	45
WBT	524	249	773	16	2	791
WBR	11	1	12	6	3	21
North Leg						
Approach	250	51	301	28	22	351
Departure	244	28	272	22	21	315
Total	494	79	573	50	43	666
South Leg						
Approach	174	49	223	5	0	228
Departure	87	18	105	4	-1	108
Total	261	67	328	9	-1	336
East Leg						
Approach	573	259	832	22	3	857
Departure	623	353	976	24	3	1,003
Total	1,196	612	1,808	46	6	1,860
West Leg						
Approach	779	364	1,143	16	-1	1,158
Departure	822	324	1,146	21	1	1,168
Total	1,601	688	2,289	37	0	2,326
Total Approaches						
Approach	1,776	723	2,499	71	24	2,594
Departure	1,776	723	2,499	71	24	2,594
Total	3,552	1,446	4,998	142	48	5,188

Table C-3- Cumulative (2022) Peak Hour PCE Volume Summary

	AM Peak Hour					
	Opening Year 2018	Cumulative Project Trips	Cumulative Without Project	Net Project Trips	Pass-By Trips	Cumulative With Project
7 Via Del Lago/Iris Avenue - Moreno Beach Drive						
NBL	24	13	37	0	0	37
NBT	2	0	2	0	0	2
NBR	44	12	56	0	0	56
SBL	14	0	14	0	0	14
SBT	2	0	2	0	0	2
SBR	42	23	65	2	0	67
EBL	24	7	31	9	4	44
EBT	579	330	909	15	0	924
EBR	20	15	35	0	0	35
WBL	19	5	24	0	0	24
WBT	507	218	725	14	0	739
WBR	7	0	7	0	0	7
North Leg						
Approach	58	23	81	2	0	83
Departure	33	7	40	9	4	53
Total	91	30	121	11	4	136
South Leg						
Approach	70	25	95	0	0	95
Departure	41	20	61	0	0	61
Total	111	45	156	0	0	156
East Leg						
Approach	533	223	756	14	0	770
Departure	637	342	979	15	0	994
Total	1,170	565	1,735	29	0	1,764
West Leg						
Approach	623	352	975	24	4	1,003
Departure	573	254	827	16	0	843
Total	1,196	606	1,802	40	4	1,846
Total Approaches						
Approach	1,284	623	1,907	40	4	1,951
Departure	1,284	623	1,907	40	4	1,951
Total	2,568	1,246	3,814	80	8	3,902

Table C-3- Cumulative (2022) Peak Hour PCE Volume Summary

	PM Peak Hour					
	Opening Year 2018	Cumulative Project Trips	Cumulative Without Project	Net Project Trips	Pass-By Trips	Cumulative With Project
1 Nason Street/Iris Avenue						
NBL	14	0	14	0	0	14
NBT	24	3	27	0	0	27
NBR	10	16	26	3	0	29
SBL	131	103	234	5	0	239
SBT	41	1	42	0	0	42
SBR	448	68	516	0	0	516
EBL	254	39	293	0	0	293
EBT	630	168	798	10	0	808
EBR	21	0	21	0	0	21
WBL	15	46	61	2	0	63
WBT	835	378	1,213	10	0	1,223
WBR	115	123	238	5	0	243
North Leg						
	620	172	792	5	0	797
	393	165	558	5	0	563
	1,013	337	1,350	10	0	1,360
South Leg						
	48	19	67	3	0	70
	77	47	124	2	0	126
	125	66	191	5	0	196
East Leg						
	965	547	1,512	17	0	1,529
	771	287	1,058	18	0	1,076
	1,736	834	2,570	35	0	2,605
West Leg						
	905	207	1,112	10	0	1,122
	1,297	446	1,743	10	0	1,753
	2,202	653	2,855	20	0	2,875
Total Approaches						
	2,538	945	3,483	35	0	3,518
	2,538	945	3,483	35	0	3,518
	5,076	1,890	6,966	70	0	7,036

Table C-3- Cumulative (2022) Peak Hour PCE Volume Summary

	PM Peak Hour					
	Opening Year 2018	Cumulative Project Trips	Cumulative Without Project	Net Project Trips	Pass-By Trips	Cumulative With Project
2 Kaiser Hospital Entrance/Iris Avenue						
NBL	0	0	0	0	0	0
NBT	0	0	0	0	0	0
NBR	0	0	0	0	0	0
SBL	41	165	206	0	0	206
SBT	0	0	0	0	0	0
SBR	36	87	123	0	0	123
EBL	81	76	157	0	0	157
EBT	622	211	833	18	0	851
EBR	0	0	0	0	0	0
WBL	0	0	0	0	0	0
WBT	786	359	1,145	17	0	1,162
WBR	20	65	85	0	0	85
North Leg						
	77	252	329	0	0	329
	101	141	242	0	0	242
	178	393	571	0	0	571
South Leg						
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0
East Leg						
	806	424	1,230	17	0	1,247
	663	376	1,039	18	0	1,057
	1,469	800	2,269	35	0	2,304
West Leg						
	703	287	990	18	0	1,008
	822	446	1,268	17	0	1,285
	1,525	733	2,258	35	0	2,293
Total Approaches						
	1,586	963	2,549	35	0	2,584
	1,586	963	2,549	35	0	2,584
	3,172	1,926	5,098	70	0	5,168

Table C-3- Cumulative (2022) Peak Hour PCE Volume Summary

	PM Peak Hour					
	Opening Year 2018	Cumulative Project Trips	Cumulative Without Project	Net Project Trips	Pass-By Trips	Cumulative With Project
3 Project Driveway 1/Iris Avenue						
NBL	0	0	0	0	0	0
NBT	0	0	0	0	0	0
NBR	0	0	0	0	0	0
SBL	0	0	0	0	0	0
SBT	0	0	0	0	0	0
SBR	0	0	0	17	29	46
EBL	0	0	0	0	0	0
EBT	685	376	1,061	18	0	1,079
EBR	0	0	0	0	0	0
WBL	0	0	0	0	0	0
WBT	787	428	1,215	0	-30	1,185
WBR	0	0	0	42	57	99
North Leg						
	0	0	0	17	29	46
	0	0	0	42	57	99
	0	0	0	59	86	145
South Leg						
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0
East Leg						
	787	428	1,215	42	27	1,284
	685	376	1,061	18	0	1,079
	1,472	804	2,276	60	27	2,363
West Leg						
	685	376	1,061	18	0	1,079
	787	428	1,215	17	-1	1,231
	1,472	804	2,276	35	-1	2,310
Total Approaches						
	1,472	804	2,276	77	56	2,409
	1,472	804	2,276	77	56	2,409
	2,944	1,608	4,552	154	112	4,818

Table C-3- Cumulative (2022) Peak Hour PCE Volume Summary

	PM Peak Hour					
	Opening Year 2018	Cumulative Project Trips	Cumulative Without Project	Net Project Trips	Pass-By Trips	Cumulative With Project
4 Oliver Street/John F Kennedy Drive						
NBL	0	0	0	0	0	0
NBT	89	55	144	7	0	151
NBR	20	13	33	0	0	33
SBL	132	5	137	0	0	137
SBT	68	31	99	8	0	107
SBR	0	0	0	0	0	0
EBL	0	0	0	0	0	0
EBT	0	0	0	0	0	0
EBR	0	0	0	0	0	0
WBL	30	34	64	3	0	67
WBT	0	0	0	0	0	0
WBR	62	17	79	0	0	79
North Leg						
	200	36	236	8	0	244
	151	72	223	7	0	230
	351	108	459	15	0	474
South Leg						
	109	68	177	7	0	184
	98	65	163	11	0	174
	207	133	340	18	0	358
East Leg						
	92	51	143	3	0	146
	152	18	170	0	0	170
	244	69	313	3	0	316
West Leg						
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0
Total Approaches						
	401	155	556	18	0	574
	401	155	556	18	0	574
	802	310	1,112	36	0	1,148

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Table C-3- Cumulative (2022) Peak Hour PCE Volume Summary

	PM Peak Hour					
	Opening Year 2018	**Cumulative Project Trips**	**Cumulative Without Project**	**Net Project Trips**	**Pass-By Trips**	**Cumulative With Project**
5 Oliver Street/Project Driveway 2						
NBL	0	0	0	0	0	0
NBT	107	72	179	7	0	186
NBR	0	0	0	0	0	0
SBL	0	0	0	0	0	0
SBT	116	39	155	0	-4	151
SBR	0	0	0	10	4	14
EBL	0	0	0	0	0	0
EBT	0	0	0	0	0	0
EBR	0	0	0	32	31	63
WBL	0	0	0	0	0	0
WBT	0	0	0	0	0	0
WBR	0	0	0	0	0	0
North Leg						
	116	39	155	10	0	165
	107	72	179	7	0	186
	223	111	334	17	0	351
South Leg						
	107	72	179	7	0	186
	116	39	155	32	27	214
	223	111	334	39	27	400
East Leg						
	0	0	0	0	0	0
	0	0	0	0	0	0
	0	0	0	0	0	0
West Leg						
	0	0	0	32	31	63
	0	0	0	10	4	14
	0	0	0	42	35	77
Total Approaches						
	223	111	334	49	31	414
	223	111	334	49	31	414
	446	222	668	98	62	828

Table C-3- Cumulative (2022) Peak Hour PCE Volume Summary

	PM Peak Hour					
	Opening Year 2018	Cumulative Project Trips	Cumulative Without Project	Net Project Trips	Pass-By Trips	Cumulative With Project
6 Oliver Street/Iris Avenue						
NBL	47	14	61	5	2	68
NBT	15	1	16	0	-1	15
NBR	35	8	43	0	-1	42
SBL	7	1	8	27	26	61
SBT	25	1	26	5	4	35
SBR	84	37	121	0	-3	118
EBL	82	70	152	18	23	193
EBT	548	283	831	0	-21	810
EBR	55	31	86	0	-2	84
WBL	45	28	73	0	-2	71
WBT	656	404	1,060	18	2	1,080
WBR	10	1	11	7	4	22
North Leg						
	116	39	155	32	27	214
	107	72	179	25	26	230
	223	111	334	57	53	444
South Leg						
	97	23	120	5	0	125
	125	60	185	5	0	190
	222	83	305	10	0	315
East Leg						
	711	433	1,144	25	4	1,173
	590	292	882	27	4	913
	1,301	725	2,026	52	8	2,086
West Leg						
	685	384	1,069	18	0	1,087
	787	455	1,242	23	1	1,266
	1,472	839	2,311	41	1	2,353
Total Approaches						
	1,609	879	2,488	80	31	2,599
	1,609	879	2,488	80	31	2,599
	3,218	1,758	4,976	160	62	5,198

Table C-3- Cumulative (2022) Peak Hour PCE Volume Summary

	PM Peak Hour					
	Opening Year 2018	Cumulative Project Trips	Cumulative Without Project	Net Project Trips	Pass-By Trips	Cumulative With Project
7 Via Del Lago/Iris Avenue - Moreno Beach Drive						
NBL	21	17	38	0	0	38
NBT	0	0	0	0	0	0
NBR	24	4	28	0	0	28
SBL	10	0	10	0	0	10
SBT	2	0	2	0	0	2
SBR	19	12	31	3	0	34
EBL	25	31	56	10	4	70
EBT	532	239	771	17	0	788
EBR	32	20	52	0	0	52
WBL	43	14	57	0	0	57
WBT	671	403	1,074	16	0	1,090
WBR	14	0	14	0	0	14
North Leg						
	31	12	43	3	0	46
	39	31	70	10	4	84
	70	43	113	13	4	130
South Leg						
	45	21	66	0	0	66
	77	34	111	0	0	111
	122	55	177	0	0	177
East Leg						
	728	417	1,145	16	0	1,161
	566	243	809	17	0	826
	1,294	660	1,954	33	0	1,987
West Leg						
	589	290	879	27	4	910
	711	432	1,143	19	0	1,162
	1,300	722	2,022	46	4	2,072
Total Approaches						
	1,393	740	2,133	46	4	2,183
	1,393	740	2,133	46	4	2,183
	2,786	1,480	4,266	92	8	4,366

Table C-4 - Existing (2017) Daily PCE Volume Summary

		Existing ADT	Project Trips	Existing With Project ADT
1	**Oliver Street, from John F Kennedy Drive to Project Driveway 2**	2,679	194	2,873
2	**Oliver Street, from Project Driveway 2 to Iris Avenue**	2,679	785	3,464
3	**Iris Avenue, from Nason Street to Kaiser Hospital Entrance**	20,289	785	21,074
4	**Iris Avenue, from Kaiser Hospital Entrance to Project Driveway 1**	16,994	785	17,779
5	**Iris Avenue, from Project Driveway 1 to Oliver Street**	16,994	785	17,779
6	**Iris Avenue, from Oliver Street to Via Del Lago**	14,114	785	14,899

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Table C-5 - Project Completion Year (2022) Daily PCE Volume Summary

		Existing	Growth	Opening Year	Project Trips	Opening Year With Project
1	**Oliver Street, from John F Kennedy Drive to Project Driveway 2**					
		2,679	279	2,958	194	3,152
2	**Oliver Street, from Project Driveway 2 to Iris Avenue**					
		2,679	279	2,958	785	3,743
3	**Iris Avenue, from Nason Street to Kaiser Hospital Entrance**					
		20,289	2,112	22,401	785	23,186
4	**Iris Avenue, from Kaiser Hospital Entrance to Project Driveway 1**					
		16,994	1,769	18,763	785	19,548
5	**Iris Avenue, from Project Driveway 1 to Oliver Street**					
		16,994	1,769	18,763	785	19,548
6	**Iris Avenue, from Oliver Street to Via Del Lago**					
		14,114	1,469	15,583	785	16,368

Table C-6 - Cumulative (2022) Daily PCE Volume Summary

		Project Completion	Cumulative Trips	Cumulative Without Project	Project Trips	Cumulative With Project
1	Oliver Street, from John F Kennedy Drive to Project Driveway 2	2,958	1,578	4,536	194	4,730
2	Oliver Street, from Project Driveway 2 to Iris Avenue	2,958	1,118	4,076	785	4,861
3	Iris Avenue, from Nason Street to Kaiser Hospital Entrance	22,401	11,058	33,459	785	34,244
4	Iris Avenue, from Kaiser Hospital Entrance to Project Driveway 1	18,763	10,648	29,411	785	30,196
5	Iris Avenue, from Project Driveway 1 to Oliver Street	18,763	11,236	29,999	785	30,784
6	Iris Avenue, from Oliver Street to Via Del Lago	15,583	10,368	25,951	785	26,736

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

APPENDIX D:

LEVEL OF SERVICE AND QUEUEING ANALYSIS WORKSHEETS

HCM 2010 Signalized Intersection Summary
1: Hillrose Lane/Nason Street & Iris Avenue

AM/PM Gasoline Service Station
Existing (2017) NP - AM Peak Hour

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL
Lane Configurations	↰↰	↑↑↱			↶	↑↑↑	↱	↰	↱			↶
Traffic Volume (veh/h)	315	782	22	9	6	691	76	18	39	10	1	99
Future Volume (veh/h)	315	782	22	9	6	691	76	18	39	10	1	99
Number	5	2	12		1	6	16	3	8	18		7
Initial Q (Qb), veh	0	0	0		0	0	0	0	0	0		0
Ped-Bike Adj(A_pbT)	1.00		1.00		1.00		1.00	1.00		1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900		1900	1900	1900	1900	1900	1900		1900
Adj Flow Rate, veh/h	384	954	27		7	843	93	22	48	12		121
Adj No. of Lanes	2	3	0		1	3	1	1	1	0		1
Peak Hour Factor	0.82	0.82	0.82		0.82	0.82	0.82	0.82	0.82	0.82		0.82
Percent Heavy Veh, %	0	0	0		0	0	0	0	0	0		0
Cap, veh/h	498	2040	58		36	1408	438	76	388	97		170
Arrive On Green	0.14	0.39	0.39		0.03	0.36	0.36	0.04	0.26	0.26		0.09
Sat Flow, veh/h	3510	5186	147		1810	5187	1615	1810	1468	367		1810
Grp Volume(v), veh/h	384	636	345		7	843	93	22	0	60		121
Grp Sat Flow(s),veh/h/ln	1755	1729	1874		1810	1729	1615	1810	0	1835		1810
Q Serve(g_s), s	7.4	9.6	9.6		0.3	9.3	2.8	0.8	0.0	1.7		4.5
Cycle Q Clear(g_c), s	7.4	9.6	9.6		0.3	9.3	2.8	0.8	0.0	1.7		4.5
Prop In Lane	1.00		0.08		1.00		1.00	1.00		0.20		1.00
Lane Grp Cap(c), veh/h	498	1361	737		36	1408	438	76	0	485		170
V/C Ratio(X)	0.77	0.47	0.47		0.19	0.60	0.21	0.29	0.00	0.12		0.71
Avail Cap(c_a), veh/h	498	1361	737		194	1408	438	194	0	485		233
HCM Platoon Ratio	1.00	1.00	1.00		1.33	1.33	1.33	1.00	1.00	1.00		1.00
Upstream Filter(I)	1.00	1.00	1.00		0.91	0.91	0.91	1.00	0.00	1.00		1.00
Uniform Delay (d), s/veh	28.9	15.8	15.8		33.5	19.3	17.2	32.5	0.0	19.6		30.8
Incr Delay (d2), s/veh	7.3	1.2	2.1		2.4	1.7	1.0	2.1	0.0	0.5		6.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0
%ile BackOfQ(50%),veh/ln	4.1	4.7	5.3		0.2	4.5	1.3	0.5	0.0	1.0		2.5
LnGrp Delay(d),s/veh	36.2	16.9	17.9		35.9	21.0	18.2	34.6	0.0	20.1		37.0
LnGrp LOS	D	B	B		D	C	B	C		C		D
Approach Vol, veh/h		1365				943			82			
Approach Delay, s/veh		22.6				20.8			24.0			
Approach LOS		C				C			C			

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.4	31.5	6.9	26.1	13.9	23.0	10.6	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.0	18.5	7.0	19.5	7.0	18.5	8.5	18.0
Max Q Clear Time (g_c+I1), s	2.3	11.6	2.8	3.6	9.4	11.3	6.5	3.7
Green Ext Time (p_c), s	0.0	4.2	0.0	1.4	0.0	3.4	0.1	0.2

Intersection Summary	
HCM 2010 Ctrl Delay	20.9
HCM 2010 LOS	C

Notes

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

	↓	↙
Movement	SBT	SBR
Lane Configurations	↑	↱
Traffic Volume (veh/h)	13	260
Future Volume (veh/h)	13	260
Number	4	14
Initial Q (Qb), veh	0	0
Ped-Bike Adj(A_pbT)		1.00
Parking Bus, Adj	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900
Adj Flow Rate, veh/h	16	317
Adj No. of Lanes	1	1
Peak Hour Factor	0.82	0.82
Percent Heavy Veh, %	0	0
Cap, veh/h	601	740
Arrive On Green	0.32	0.32
Sat Flow, veh/h	1900	1615
Grp Volume(v), veh/h	16	317
Grp Sat Flow(s),veh/h/ln	1900	1615
Q Serve(g_s), s	0.4	1.6
Cycle Q Clear(g_c), s	0.4	1.6
Prop In Lane		1.00
Lane Grp Cap(c), veh/h	601	740
V/C Ratio(X)	0.03	0.43
Avail Cap(c_a), veh/h	601	740
HCM Platoon Ratio	1.00	1.00
Upstream Filter(I)	1.00	1.00
Uniform Delay (d), s/veh	16.5	4.9
Incr Delay (d2), s/veh	0.1	1.8
Initial Q Delay(d3),s/veh	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	2.7
LnGrp Delay(d),s/veh	16.6	6.7
LnGrp LOS	B	A
Approach Vol, veh/h	454	
Approach Delay, s/veh	15.1	
Approach LOS	B	
Timer		

HCM 2010 Signalized Intersection Summary
2: Iris Avenue & Kaiser Hospital Entrance

AM/PM Gasoline Service Station
Existing (2017) NP - AM Peak Hour

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑↑	↑↑↱		↰	↱
Traffic Volume (veh/h)	133	708	685	39	6	22
Future Volume (veh/h)	133	708	685	39	6	22
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	149	796	770	44	7	25
Adj No. of Lanes	1	3	3	0	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	465	3223	1542	88	478	842
Arrive On Green	0.51	1.00	0.61	0.61	0.26	0.26
Sat Flow, veh/h	1810	5358	5193	286	1810	1615
Grp Volume(v), veh/h	149	796	529	285	7	25
Grp Sat Flow(s),veh/h/ln	1810	1729	1729	1850	1810	1615
Q Serve(g_s), s	3.4	0.0	6.0	6.0	0.2	0.0
Cycle Q Clear(g_c), s	3.4	0.0	6.0	6.0	0.2	0.0
Prop In Lane	1.00			0.15	1.00	1.00
Lane Grp Cap(c), veh/h	465	3223	1062	568	478	842
V/C Ratio(X)	0.32	0.25	0.50	0.50	0.01	0.03
Avail Cap(c_a), veh/h	465	3223	1062	568	478	842
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.86	0.86	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.4	0.0	10.5	10.5	19.0	8.1
Incr Delay (d2), s/veh	0.3	0.2	1.7	3.1	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	3.0	3.5	0.1	0.5
LnGrp Delay(d),s/veh	13.8	0.2	12.2	13.6	19.1	8.2
LnGrp LOS	B	A	B	B	B	A
Approach Vol, veh/h		945	814		32	
Approach Delay, s/veh		2.3	12.7		10.6	
Approach LOS		A	B		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		47.5		22.5	22.0	25.5		
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		
Max Green Setting (Gmax), s		43.0		18.0	17.5	21.0		
Max Q Clear Time (g_c+I1), s		2.0		2.2	5.4	8.0		
Green Ext Time (p_c), s		7.2		0.0	4.7	4.4		

Intersection Summary			
HCM 2010 Ctrl Delay			7.2
HCM 2010 LOS			A

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Intersection	
Intersection Delay, s/veh	12.7
Intersection LOS	B

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Lane Configurations		↰	↱		↑↱				↰↑
Traffic Vol, veh/h	0	24	92	0	261	44	0	234	113
Future Vol, veh/h	0	24	92	0	261	44	0	234	113
Peak Hour Factor	1.00	0.83	0.83	1.00	0.83	0.83	1.00	0.83	0.83
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	29	111	0	314	53	0	282	136
Number of Lanes	0	1	1	0	2	0	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	2
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	2	0
HCM Control Delay	9.7	9.9	16.1
HCM LOS	A	A	C

Lane	NBLn1	NBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	0%	100%	0%	67%
Vol Thru, %	100%	66%	0%	0%	33%
Vol Right, %	0%	34%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	174	131	24	92	347
LT Vol	0	0	24	0	234
Through Vol	174	87	0	0	113
RT Vol	0	44	0	92	0
Lane Flow Rate	210	158	29	111	418
Geometry Grp	7	7	7	7	4
Degree of Util (X)	0.308	0.221	0.055	0.173	0.607
Departure Headway (Hd)	5.284	5.047	6.834	5.617	5.224
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	675	706	520	632	686
Service Time	3.059	2.821	4.628	3.41	3.292
HCM Lane V/C Ratio	0.311	0.224	0.056	0.176	0.609
HCM Control Delay	10.4	9.3	10	9.6	16.1
HCM Lane LOS	B	A	A	A	C
HCM 95th-tile Q	1.3	0.8	0.2	0.6	4.1

HCM 2010 Signalized Intersection Summary
6: Oliver Street & Iris Avenue

AM/PM Gasoline Service Station
Existing (2017) NP - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	167	520	19	34	475	10	75	44	38	6	25	195
Future Volume (veh/h)	167	520	19	34	475	10	75	44	38	6	25	195
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	196	612	22	40	559	12	88	52	45	7	29	229
Adj No. of Lanes	1	3	0	1	3	0	0	1	1	0	1	1
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	543	2350	84	194	1381	30	292	155	427	117	423	427
Arrive On Green	0.10	0.15	0.15	0.04	0.09	0.09	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	1810	5141	184	1810	5226	112	787	587	1615	209	1600	1615
Grp Volume(v), veh/h	196	411	223	40	369	202	140	0	45	36	0	229
Grp Sat Flow(s),veh/h/ln	1810	1729	1868	1810	1729	1880	1374	0	1615	1808	0	1615
Q Serve(g_s), s	7.1	7.4	7.4	1.5	7.1	7.1	4.3	0.0	1.5	0.0	0.0	8.5
Cycle Q Clear(g_c), s	7.1	7.4	7.4	1.5	7.1	7.1	5.5	0.0	1.5	1.0	0.0	8.5
Prop In Lane	1.00		0.10	1.00		0.06	0.63		1.00	0.19		1.00
Lane Grp Cap(c), veh/h	543	1581	854	194	914	497	447	0	427	539	0	427
V/C Ratio(X)	0.36	0.26	0.26	0.21	0.40	0.41	0.31	0.00	0.11	0.07	0.00	0.54
Avail Cap(c_a), veh/h	543	1581	854	194	914	497	447	0	427	539	0	427
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.98	0.98	0.98	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.3	19.3	19.3	30.9	26.7	26.7	20.8	0.0	19.5	19.3	0.0	22.1
Incr Delay (d2), s/veh	0.4	0.4	0.7	0.5	1.3	2.4	1.8	0.0	0.5	0.2	0.0	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	3.6	4.0	0.8	3.6	4.0	2.4	0.0	0.7	0.6	0.0	4.4
LnGrp Delay(d),s/veh	25.7	19.7	20.0	31.4	28.0	29.1	22.6	0.0	20.0	19.5	0.0	26.8
LnGrp LOS	C	B	C	C	C	C	C		B	B		C
Approach Vol, veh/h		830			611			185			265	
Approach Delay, s/veh		21.2			28.6			22.0			25.9	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	11.5	36.0		22.5	25.0	22.5		22.5
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	7.0	31.5		18.0	20.5	18.0		18.0
Max Q Clear Time (g_c+I1), s	3.5	9.4		10.5	9.1	9.1		7.5
Green Ext Time (p_c), s	0.2	4.1		1.2	0.5	2.4		1.5

Intersection Summary			
HCM 2010 Ctrl Delay			24.3
HCM 2010 LOS			C

Notes

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↑↑↱		↰	↑↑↱		↰	↑	↱	↰	↱	
Traffic Volume (veh/h)	2	20	524	18	17	459	6	22	2	40	13	2	38
Future Volume (veh/h)	2	20	524	18	17	459	6	22	2	40	13	2	38
Number		5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh		0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln		1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h		23	602	21	20	528	7	25	2	46	15	2	44
Adj No. of Lanes		1	3	0	1	3	0	1	1	1	1	1	0
Peak Hour Factor		0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %		0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h		344	1507	52	305	1432	19	83	502	699	83	19	411
Arrive On Green		0.06	0.10	0.10	0.17	0.27	0.27	0.05	0.26	0.26	0.05	0.26	0.26
Sat Flow, veh/h		1810	5148	179	1810	5276	70	1810	1900	1615	1810	71	1555
Grp Volume(v), veh/h		23	404	219	20	346	189	25	2	46	15	0	46
Grp Sat Flow(s),veh/h/ln		1810	1729	1868	1810	1729	1888	1810	1900	1615	1810	0	1626
Q Serve(g_s), s		0.8	7.7	7.7	0.7	5.7	5.7	0.9	0.1	0.0	0.6	0.0	1.5
Cycle Q Clear(g_c), s		0.8	7.7	7.7	0.7	5.7	5.7	0.9	0.1	0.0	0.6	0.0	1.5
Prop In Lane		1.00		0.10	1.00		0.04	1.00		1.00	1.00		0.96
Lane Grp Cap(c), veh/h		344	1013	547	305	939	512	83	502	699	83	0	430
V/C Ratio(X)		0.07	0.40	0.40	0.07	0.37	0.37	0.30	0.00	0.07	0.18	0.00	0.11
Avail Cap(c_a), veh/h		344	1013	547	305	939	512	194	502	699	194	0	430
HCM Platoon Ratio		0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		0.98	0.98	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh		27.0	25.8	25.8	24.5	20.6	20.6	32.3	19.0	11.6	32.1	0.0	19.5
Incr Delay (d2), s/veh		0.1	1.1	2.1	0.1	1.1	2.0	2.0	0.0	0.2	1.0	0.0	0.5
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		0.4	3.8	4.3	0.3	2.8	3.2	0.5	0.0	0.5	0.3	0.0	0.7
LnGrp Delay(d),s/veh		27.0	27.0	28.0	24.6	21.8	22.7	34.4	19.0	11.8	33.2	0.0	20.0
LnGrp LOS		C	C	C	C	C	C	C	B	B	C		B
Approach Vol, veh/h			646			555			73			61	
Approach Delay, s/veh			27.3			22.2			19.7			23.2	
Approach LOS			C			C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.8	24.5	7.2	22.5	17.3	23.0	7.2	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.0	20.0	7.0	18.0	8.5	18.5	7.0	18.0
Max Q Clear Time (g_c+I1), s	2.7	9.7	2.9	3.5	2.8	7.7	2.6	2.1
Green Ext Time (p_c), s	0.0	2.9	0.0	0.1	0.0	2.5	0.0	0.1

Intersection Summary	
HCM 2010 Ctrl Delay	24.6
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
1: Hillrose Lane/Nason Street & Iris Avenue

AM/PM Gasoline Service Station
Existing (2017) NP - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑↱		↰	↑↑↑	↱	↰	↱		↰	↑	↱
Traffic Volume (veh/h)	230	571	19	14	756	104	13	22	9	119	37	406
Future Volume (veh/h)	230	571	19	14	756	104	13	22	9	119	37	406
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	250	621	21	15	822	113	14	24	10	129	40	441
Adj No. of Lanes	2	3	0	1	3	1	1	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	373	1384	47	253	1565	487	135	337	140	179	548	638
Arrive On Green	0.11	0.27	0.27	0.05	0.10	0.10	0.07	0.26	0.26	0.10	0.29	0.29
Sat Flow, veh/h	3510	5154	174	1810	5187	1615	1810	1275	531	1810	1900	1615
Grp Volume(v), veh/h	250	416	226	15	822	113	14	0	34	129	40	441
Grp Sat Flow(s),veh/h/ln	1755	1729	1869	1810	1729	1615	1810	0	1806	1810	1900	1615
Q Serve(g_s), s	4.8	7.0	7.0	0.6	10.5	4.5	0.5	0.0	1.0	4.8	1.1	9.2
Cycle Q Clear(g_c), s	4.8	7.0	7.0	0.6	10.5	4.5	0.5	0.0	1.0	4.8	1.1	9.2
Prop In Lane	1.00		0.09	1.00		1.00	1.00		0.29	1.00		1.00
Lane Grp Cap(c), veh/h	373	929	502	253	1565	487	135	0	477	179	548	638
V/C Ratio(X)	0.67	0.45	0.45	0.06	0.53	0.23	0.10	0.00	0.07	0.72	0.07	0.69
Avail Cap(c_a), veh/h	381	929	502	253	1565	487	194	0	477	238	548	638
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.96	0.96	0.96	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.1	21.3	21.3	29.0	26.7	24.0	30.2	0.0	19.3	30.6	18.1	6.7
Incr Delay (d2), s/veh	4.4	1.6	2.9	0.1	1.2	1.1	0.3	0.0	0.3	6.9	0.3	6.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	3.6	4.0	0.3	5.2	2.2	0.3	0.0	0.5	2.7	0.6	5.1
LnGrp Delay(d),s/veh	34.5	22.8	24.2	29.1	28.0	25.1	30.5	0.0	19.6	37.5	18.4	12.8
LnGrp LOS	C	C	C	C	C	C	C		B	D	B	B
Approach Vol, veh/h		892			950			48			610	
Approach Delay, s/veh		26.4			27.6			22.8			18.4	
Approach LOS		C			C			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.8	22.8	9.2	24.2	11.4	25.1	10.9	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.0	18.3	7.0	19.7	7.1	18.2	8.7	18.0
Max Q Clear Time (g_c+I1), s	2.6	9.0	2.5	11.2	6.8	12.5	6.8	3.0
Green Ext Time (p_c), s	2.3	2.8	0.0	1.3	0.0	2.8	0.1	0.1

Intersection Summary	
HCM 2010 Ctrl Delay	24.9
HCM 2010 LOS	C

HCM 2010 Signalized Intersection Summary
2: Iris Avenue & Kaiser Hospital Entrance

AM/PM Gasoline Service Station
Existing (2017) NP - PM Peak Hour

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑↑	↑↑↱		↰	↱
Traffic Volume (veh/h)	73	563	712	18	37	33
Future Volume (veh/h)	73	563	712	18	37	33
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	78	605	766	19	40	35
Adj No. of Lanes	1	3	3	0	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	154	3186	2457	61	491	576
Arrive On Green	0.17	1.00	0.94	0.94	0.27	0.27
Sat Flow, veh/h	1810	5358	5377	129	1810	1615
Grp Volume(v), veh/h	78	605	508	277	40	35
Grp Sat Flow(s),veh/h/ln	1810	1729	1729	1877	1810	1615
Q Serve(g_s), s	2.7	0.0	0.8	0.8	1.2	1.0
Cycle Q Clear(g_c), s	2.7	0.0	0.8	0.8	1.2	1.0
Prop In Lane	1.00			0.07	1.00	1.00
Lane Grp Cap(c), veh/h	154	3186	1632	886	491	576
V/C Ratio(X)	0.51	0.19	0.31	0.31	0.08	0.06
Avail Cap(c_a), veh/h	336	3186	1632	886	491	576
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.94	0.94	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.7	0.0	1.1	1.1	19.0	14.8
Incr Delay (d2), s/veh	2.4	0.1	0.5	0.9	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	0.4	0.5	0.6	1.1
LnGrp Delay(d),s/veh	30.1	0.1	1.6	2.0	19.3	15.0
LnGrp LOS	C	A	A	A	B	B
Approach Vol, veh/h		683	785		75	
Approach Delay, s/veh		3.5	1.7		17.3	
Approach LOS		A	A		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		47.0		23.0	10.0	37.0		
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		
Max Green Setting (Gmax), s		42.5		18.5	12.5	25.5		
Max Q Clear Time (g_c+I1), s		2.0		3.2	4.7	2.8		
Green Ext Time (p_c), s		12.6		0.1	0.1	10.2		

Intersection Summary	
HCM 2010 Ctrl Delay	3.3
HCM 2010 LOS	A

Intersection	
Intersection Delay, s/veh	8.6
Intersection LOS	A

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Lane Configurations		↰	↱		↑↱				↰
Traffic Vol, veh/h	0	27	56	0	81	18	0	120	62
Future Vol, veh/h	0	27	56	0	81	18	0	120	62
Peak Hour Factor	1.00	0.93	0.93	1.00	0.93	0.93	1.00	0.93	0.93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	29	60	0	87	19	0	129	67
Number of Lanes	0	1	1	0	2	0	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	2
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	2	0
HCM Control Delay	8	7.8	9.4
HCM LOS	A	A	A

Lane	NBLn1	NBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	0%	100%	0%	66%
Vol Thru, %	100%	60%	0%	0%	34%
Vol Right, %	0%	40%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	54	45	27	56	182
LT Vol	0	0	27	0	120
Through Vol	54	27	0	0	62
RT Vol	0	18	0	56	0
Lane Flow Rate	58	48	29	60	196
Geometry Grp	7	7	7	7	4
Degree of Util (X)	0.079	0.062	0.046	0.076	0.259
Departure Headway (Hd)	4.881	4.6	5.731	4.526	4.77
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	736	781	627	794	755
Service Time	2.597	2.315	3.448	2.242	2.785
HCM Lane V/C Ratio	0.079	0.061	0.046	0.076	0.26
HCM Control Delay	8	7.6	8.7	7.6	9.4
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.3	0.2	0.1	0.2	1

HCM 2010 Signalized Intersection Summary
6: Oliver Street & Iris Avenue

AM/PM Gasoline Service Station
Existing (2017) NP - PM Peak Hour

	↰	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱			↰	↱		↰	↱
Traffic Volume (veh/h)	74	496	50	41	594	9	43	14	32	6	23	76
Future Volume (veh/h)	74	496	50	41	594	9	43	14	32	6	23	76
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	80	533	54	44	639	10	46	15	34	6	25	82
Adj No. of Lanes	1	3	0	1	3	0	0	1	1	0	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	543	2395	240	117	1390	22	359	105	427	117	426	427
Arrive On Green	0.10	0.16	0.16	0.13	0.53	0.53	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	1810	4793	480	1810	5261	82	1018	399	1615	209	1611	1615
Grp Volume(v), veh/h	80	383	204	44	420	229	61	0	34	31	0	82
Grp Sat Flow(s),veh/h/ln	1810	1729	1815	1810	1729	1885	1417	0	1615	1821	0	1615
Q Serve(g_s), s	2.8	6.7	6.8	1.6	5.3	5.3	1.4	0.0	1.1	0.0	0.0	2.8
Cycle Q Clear(g_c), s	2.8	6.7	6.8	1.6	5.3	5.3	2.3	0.0	1.1	0.9	0.0	2.8
Prop In Lane	1.00		0.26	1.00		0.04	0.75		1.00	0.19		1.00
Lane Grp Cap(c), veh/h	543	1728	907	117	914	498	465	0	427	543	0	427
V/C Ratio(X)	0.15	0.22	0.23	0.38	0.46	0.46	0.13	0.00	0.08	0.06	0.00	0.19
Avail Cap(c_a), veh/h	543	1728	907	194	914	498	465	0	427	543	0	427
HCM Platoon Ratio	0.33	0.33	0.33	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.98	0.98	0.98	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.3	17.4	17.5	29.2	13.4	13.4	19.8	0.0	19.4	19.3	0.0	20.0
Incr Delay (d2), s/veh	0.1	0.3	0.6	1.9	1.6	3.0	0.6	0.0	0.4	0.2	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	3.3	3.6	0.8	2.7	3.1	1.0	0.0	0.5	0.5	0.0	1.3
LnGrp Delay(d),s/veh	23.5	17.7	18.1	31.1	15.0	16.4	20.3	0.0	19.7	19.5	0.0	21.0
LnGrp LOS	C	B	B	C	B	B	C		B	B		C
Approach Vol, veh/h		667			693			95			113	
Approach Delay, s/veh		18.5			16.5			20.1			20.5	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.5	39.0		22.5	25.0	22.5		22.5
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	7.0	31.5		18.0	20.5	18.0		18.0
Max Q Clear Time (g_c+I1), s	3.6	8.8		4.8	4.8	7.3		4.3
Green Ext Time (p_c), s	0.0	4.1		0.7	3.6	3.1		0.7

Intersection Summary			
HCM 2010 Ctrl Delay			17.9
HCM 2010 LOS			B

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱		↰	↑	↱	↰	↱	
Traffic Volume (veh/h)	23	482	29	39	608	13	19	0	22	9	2	17
Future Volume (veh/h)	23	482	29	39	608	13	19	0	22	9	2	17
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	24	513	31	41	647	14	20	0	23	10	2	18
Adj No. of Lanes	1	3	0	1	3	0	1	1	1	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	360	2030	122	112	1403	30	71	502	527	71	43	390
Arrive On Green	0.07	0.13	0.13	0.06	0.27	0.27	0.04	0.00	0.26	0.04	0.26	0.26
Sat Flow, veh/h	1810	5005	300	1810	5225	113	1810	1900	1615	1810	164	1476
Grp Volume(v), veh/h	24	353	191	41	428	233	20	0	23	10	0	20
Grp Sat Flow(s),veh/h/ln	1810	1729	1847	1810	1729	1880	1810	1900	1615	1810	0	1640
Q Serve(g_s), s	0.9	6.4	6.5	1.5	7.2	7.3	0.8	0.0	0.5	0.4	0.0	0.6
Cycle Q Clear(g_c), s	0.9	6.4	6.5	1.5	7.2	7.3	0.8	0.0	0.5	0.4	0.0	0.6
Prop In Lane	1.00		0.16	1.00		0.06	1.00		1.00	1.00		0.90
Lane Grp Cap(c), veh/h	360	1403	749	112	929	505	71	502	527	71	0	433
V/C Ratio(X)	0.07	0.25	0.25	0.36	0.46	0.46	0.28	0.00	0.04	0.14	0.00	0.05
Avail Cap(c_a), veh/h	360	1403	749	194	929	505	194	502	527	194	0	433
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.99	0.99	0.99	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.6	20.8	20.8	31.5	21.4	21.4	32.7	0.0	7.7	32.5	0.0	19.2
Incr Delay (d2), s/veh	0.1	0.4	0.8	2.0	1.6	3.0	2.1	0.0	0.2	0.9	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	3.2	3.5	0.8	3.7	4.2	0.4	0.0	0.2	0.2	0.0	0.3
LnGrp Delay(d),s/veh	26.7	21.2	21.6	33.5	23.0	24.4	34.8	0.0	7.8	33.4	0.0	19.4
LnGrp LOS	C	C	C	C	C	C	C		A	C		B
Approach Vol, veh/h		568			702			43			30	
Approach Delay, s/veh		21.6			24.1			20.4			24.0	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.3	32.4	6.8	22.5	17.9	22.8	6.8	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.0	20.0	7.0	18.0	8.7	18.3	7.0	18.0
Max Q Clear Time (g_c+I1), s	3.5	8.5	2.8	2.6	2.9	9.3	2.4	2.5
Green Ext Time (p_c), s	0.0	2.7	0.0	0.0	1.7	2.8	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	22.9
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
1: Hillrose Lane/Nason Street & Iris Avenue

AM/PM Gasoline Service Station
Existing (2017) WP - AM Peak Hour

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL
Lane Configurations	↰↰	↑↑↱			↶	↑↑↑	↱	↰	↱			↶
Traffic Volume (veh/h)	315	791	22	9	8	700	80	18	39	12	1	104
Future Volume (veh/h)	315	791	22	9	8	700	80	18	39	12	1	104
Number	5	2	12		1	6	16	3	8	18		7
Initial Q (Qb), veh	0	0	0		0	0	0	0	0	0		0
Ped-Bike Adj(A_pbT)	1.00		1.00		1.00		1.00	1.00		1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900		1900	1900	1900	1900	1900	1900		1900
Adj Flow Rate, veh/h	384	965	27		10	854	98	22	48	15		127
Adj No. of Lanes	2	3	0		1	3	1	1	1	0		1
Peak Hour Factor	0.82	0.82	0.82		0.82	0.82	0.82	0.82	0.82	0.82		0.82
Percent Heavy Veh, %	0	0	0		0	0	0	0	0	0		0
Cap, veh/h	488	2001	56		45	1408	438	76	367	115		175
Arrive On Green	0.14	0.39	0.39		0.03	0.36	0.36	0.04	0.26	0.26		0.10
Sat Flow, veh/h	3510	5187	145		1810	5187	1615	1810	1389	434		1810
Grp Volume(v), veh/h	384	643	349		10	854	98	22	0	63		127
Grp Sat Flow(s),veh/h/ln	1755	1729	1874		1810	1729	1615	1810	0	1823		1810
Q Serve(g_s), s	7.4	9.8	9.8		0.4	9.4	3.0	0.8	0.0	1.8		4.8
Cycle Q Clear(g_c), s	7.4	9.8	9.8		0.4	9.4	3.0	0.8	0.0	1.8		4.8
Prop In Lane	1.00		0.08		1.00		1.00	1.00		0.24		1.00
Lane Grp Cap(c), veh/h	488	1334	723		45	1408	438	76	0	482		175
V/C Ratio(X)	0.79	0.48	0.48		0.22	0.61	0.22	0.29	0.00	0.13		0.73
Avail Cap(c_a), veh/h	488	1334	723		194	1408	438	194	0	482		233
HCM Platoon Ratio	1.00	1.00	1.00		1.33	1.33	1.33	1.00	1.00	1.00		1.00
Upstream Filter(I)	1.00	1.00	1.00		0.91	0.91	0.91	1.00	0.00	1.00		1.00
Uniform Delay (d), s/veh	29.1	16.2	16.2		33.2	19.3	17.2	32.5	0.0	19.6		30.7
Incr Delay (d2), s/veh	8.3	1.2	2.3		2.2	1.8	1.1	2.1	0.0	0.6		7.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0
%ile BackOfQ(50%),veh/ln	4.1	4.9	5.5		0.2	4.7	1.4	0.5	0.0	1.0		2.8
LnGrp Delay(d),s/veh	37.4	17.5	18.5		35.4	21.1	18.3	34.6	0.0	20.2		38.2
LnGrp LOS	D	B	B		D	C	B	C		C		D
Approach Vol, veh/h		1376				962			85			
Approach Delay, s/veh		23.3				20.9			23.9			
Approach LOS		C				C			C			

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.7	31.0	6.9	26.3	13.7	23.0	10.8	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.0	18.5	7.0	19.5	7.0	18.5	8.5	18.0
Max Q Clear Time (g_c+I1), s	2.4	11.8	2.8	3.6	9.4	11.4	6.8	3.8
Green Ext Time (p_c), s	0.0	4.1	0.0	1.4	0.0	3.4	0.1	0.2

Intersection Summary			
HCM 2010 Ctrl Delay			21.3
HCM 2010 LOS			C

Notes

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

	↓	↲
Movement	SBT	SBR
Lane Configurations	↑	↱
Traffic Volume (veh/h)	13	260
Future Volume (veh/h)	13	260
Number	4	14
Initial Q (Qb), veh	0	0
Ped-Bike Adj(A_pbT)		1.00
Parking Bus, Adj	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900
Adj Flow Rate, veh/h	16	317
Adj No. of Lanes	1	1
Peak Hour Factor	0.82	0.82
Percent Heavy Veh, %	0	0
Cap, veh/h	606	740
Arrive On Green	0.32	0.32
Sat Flow, veh/h	1900	1615
Grp Volume(v), veh/h	16	317
Grp Sat Flow(s),veh/h/ln	1900	1615
Q Serve(g_s), s	0.4	1.6
Cycle Q Clear(g_c), s	0.4	1.6
Prop In Lane		1.00
Lane Grp Cap(c), veh/h	606	740
V/C Ratio(X)	0.03	0.43
Avail Cap(c_a), veh/h	606	740
HCM Platoon Ratio	1.00	1.00
Upstream Filter(I)	1.00	1.00
Uniform Delay (d), s/veh	16.4	4.9
Incr Delay (d2), s/veh	0.1	1.8
Initial Q Delay(d3),s/veh	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	2.7
LnGrp Delay(d),s/veh	16.5	6.7
LnGrp LOS	B	A
Approach Vol, veh/h	460	
Approach Delay, s/veh	15.7	
Approach LOS	B	
Timer		

HCM 2010 Signalized Intersection Summary
2: Iris Avenue & Kaiser Hospital Entrance

AM/PM Gasoline Service Station
Existing (2017) WP - AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑↑	↑↑↱		↰	↱
Traffic Volume (veh/h)	133	724	700	39	6	22
Future Volume (veh/h)	133	724	700	39	6	22
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	149	813	787	44	7	25
Adj No. of Lanes	1	3	3	0	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	465	3223	1544	86	478	842
Arrive On Green	0.51	1.00	0.61	0.61	0.26	0.26
Sat Flow, veh/h	1810	5358	5199	280	1810	1615
Grp Volume(v), veh/h	149	813	540	291	7	25
Grp Sat Flow(s),veh/h/ln	1810	1729	1729	1851	1810	1615
Q Serve(g_s), s	3.4	0.0	6.1	6.2	0.2	0.0
Cycle Q Clear(g_c), s	3.4	0.0	6.1	6.2	0.2	0.0
Prop In Lane	1.00			0.15	1.00	1.00
Lane Grp Cap(c), veh/h	465	3223	1062	568	478	842
V/C Ratio(X)	0.32	0.25	0.51	0.51	0.01	0.03
Avail Cap(c_a), veh/h	465	3223	1062	568	478	842
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.85	0.85	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.4	0.0	10.5	10.5	19.0	8.1
Incr Delay (d2), s/veh	0.3	0.2	1.7	3.3	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	3.1	3.6	0.1	0.5
LnGrp Delay(d),s/veh	13.8	0.2	12.3	13.8	19.1	8.2
LnGrp LOS	B	A	B	B	B	A
Approach Vol, veh/h		962	831		32	
Approach Delay, s/veh		2.3	12.8		10.6	
Approach LOS		A	B		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		47.5		22.5	22.0	25.5		
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		
Max Green Setting (Gmax), s		43.0		18.0	17.5	21.0		
Max Q Clear Time (g_c+I1), s		2.0		2.2	5.4	8.2		
Green Ext Time (p_c), s		7.3		0.0	4.8	4.4		

Intersection Summary	
HCM 2010 Ctrl Delay	7.2
HCM 2010 LOS	A

HCM 2010 TWSC
3: Iris Avenue & Project Driveway 1

AM/PM Gasoline Service Station
Existing (2017) WP - AM Peak Hour

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↱			↱
Traffic Vol, veh/h	0	722	719	84	0	40
Future Vol, veh/h	0	722	719	84	0	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	722	719	84	0	40

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	402
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.9
Pot Cap-1 Maneuver	0	-	-	-	0	*759
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		1
Mov Cap-1 Maneuver	-	-	-	-	-	*759
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	759
HCM Lane V/C Ratio	-	-	-	0.053
HCM Control Delay (s)	-	-	-	10
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.2

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Intersection Delay, s/veh	13
Intersection LOS	B

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Lane Configurations		↰	↱		↑↱				↰↑
Traffic Vol, veh/h	0	26	92	0	267	44	0	234	120
Future Vol, veh/h	0	26	92	0	267	44	0	234	120
Peak Hour Factor	1.00	0.83	0.83	1.00	0.83	0.83	1.00	0.83	0.83
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	31	111	0	322	53	0	282	145
Number of Lanes	0	1	1	0	2	0	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	2
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	2	0
HCM Control Delay	9.8	10	16.6
HCM LOS	A	A	C

Lane	NBLn1	NBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	0%	100%	0%	66%
Vol Thru, %	100%	67%	0%	0%	34%
Vol Right, %	0%	33%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	178	133	26	92	354
LT Vol	0	0	26	0	234
Through Vol	178	89	0	0	120
RT Vol	0	44	0	92	0
Lane Flow Rate	214	160	31	111	427
Geometry Grp	7	7	7	7	4
Degree of Util (X)	0.316	0.226	0.06	0.174	0.621
Departure Headway (Hd)	5.305	5.071	6.867	5.65	5.24
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	671	702	517	627	682
Service Time	3.081	2.847	4.667	3.449	3.309
HCM Lane V/C Ratio	0.319	0.228	0.06	0.177	0.626
HCM Control Delay	10.5	9.3	10.1	9.7	16.6
HCM Lane LOS	B	A	B	A	C
HCM 95th-tile Q	1.4	0.9	0.2	0.6	4.3

HCM 2010 TWSC
5: Oliver Street & Project Driveway 2

AM/PM Gasoline Service Station
Existing (2017) WP - AM Peak Hour

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↱		↑↑	↑↱	
Traffic Vol, veh/h	0	54	0	227	222	13
Future Vol, veh/h	0	54	0	227	222	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	54	0	227	222	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	118	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	918	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	918	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	918	-	-
HCM Lane V/C Ratio	-	0.059	-	-
HCM Control Delay (s)	-	9.2	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0.2	-	-

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

HCM 2010 Signalized Intersection Summary
6: Oliver Street & Iris Avenue

AM/PM Gasoline Service Station
Existing (2017) WP - AM Peak Hour

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↰	↑↑↱		↰	↑↑↱			↰	↱		↰
Traffic Volume (veh/h)	35	167	502	17	32	493	19	82	43	37	52	32
Future Volume (veh/h)	35	167	502	17	32	493	19	82	43	37	52	32
Number		5	2	12	1	6	16	3	8	18	7	4
Initial Q (Qb), veh		0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln		1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h		196	591	20	38	580	22	96	51	44	61	38
Adj No. of Lanes		1	3	0	1	3	0	0	1	1	0	1
Peak Hour Factor		0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %		0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h		543	2356	79	194	1356	51	85	29	427	83	34
Arrive On Green		0.10	0.15	0.15	0.04	0.09	0.09	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h		1810	5154	174	1810	5130	194	0	109	1615	0	128
Grp Volume(v), veh/h		196	396	215	38	390	212	147	0	44	99	0
Grp Sat Flow(s),veh/h/ln		1810	1729	1869	1810	1729	1866	109	0	1615	128	0
Q Serve(g_s), s		7.1	7.1	7.1	1.4	7.5	7.5	0.0	0.0	1.4	0.0	0.0
Cycle Q Clear(g_c), s		7.1	7.1	7.1	1.4	7.5	7.5	18.5	0.0	1.4	18.5	0.0
Prop In Lane		1.00		0.09	1.00		0.10	0.65		1.00	0.62	
Lane Grp Cap(c), veh/h		543	1581	855	194	914	493	114	0	427	117	0
V/C Ratio(X)		0.36	0.25	0.25	0.20	0.43	0.43	1.29	0.00	0.10	0.85	0.00
Avail Cap(c_a), veh/h		543	1581	855	194	914	493	114	0	427	117	0
HCM Platoon Ratio		0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00	0.98	0.98	0.98	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh		25.3	19.1	19.2	30.8	26.9	26.9	30.4	0.0	19.5	28.9	0.0
Incr Delay (d2), s/veh		0.4	0.4	0.7	0.5	1.4	2.7	181.6	0.0	0.5	49.5	0.0
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		3.6	3.5	3.9	0.7	3.8	4.3	7.9	0.0	0.7	3.5	0.0
LnGrp Delay(d),s/veh		25.7	19.5	19.9	31.3	28.3	29.6	212.0	0.0	20.0	78.4	0.0
LnGrp LOS		C	B	B	C	C	C	F		B	E	
Approach Vol, veh/h			807			640			191			325
Approach Delay, s/veh			21.1			28.9			167.8			42.4
Approach LOS			C			C			F			D

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	11.5	36.0		22.5	25.0	22.5		22.5
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	7.0	31.5		18.0	20.5	18.0		18.0
Max Q Clear Time (g_c+I1), s	3.4	9.1		20.5	9.1	9.5		20.5
Green Ext Time (p_c), s	0.2	4.0		0.0	0.5	2.5		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	41.5
HCM 2010 LOS	D

Notes

	↲
Movement	SBR
Lane Configurations	↱
Traffic Volume (veh/h)	192
Future Volume (veh/h)	192
Number	14
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Adj Sat Flow, veh/h/ln	1900
Adj Flow Rate, veh/h	226
Adj No. of Lanes	1
Peak Hour Factor	0.85
Percent Heavy Veh, %	0
Cap, veh/h	427
Arrive On Green	0.26
Sat Flow, veh/h	1615
Grp Volume(v), veh/h	226
Grp Sat Flow(s),veh/h/ln	1615
Q Serve(g_s), s	8.4
Cycle Q Clear(g_c), s	8.4
Prop In Lane	1.00
Lane Grp Cap(c), veh/h	427
V/C Ratio(X)	0.53
Avail Cap(c_a), veh/h	427
HCM Platoon Ratio	1.00
Upstream Filter(I)	1.00
Uniform Delay (d), s/veh	22.0
Incr Delay (d2), s/veh	4.6
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(50%),veh/ln	4.3
LnGrp Delay(d),s/veh	26.7
LnGrp LOS	C
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer	

HCM 2010 Signalized Intersection Summary
7: Via Del Lago & Iris Avenue/Moreno Beach Drive

AM/PM Gasoline Service Station
Existing (2017) WP - AM Peak Hour

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↑↑↱		↰	↑↑↱		↰	↑	↱	↰	↱	
Traffic Volume (veh/h)	12	23	539	18	17	473	6	22	2	40	13	2	40
Future Volume (veh/h)	12	23	539	18	17	473	6	22	2	40	13	2	40
Number		5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh		0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln		1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h		26	620	21	20	544	7	25	2	46	15	2	46
Adj No. of Lanes		1	3	0	1	3	0	1	1	1	1	1	0
Peak Hour Factor		0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %		0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h		344	1509	51	305	1433	18	83	502	699	83	18	412
Arrive On Green		0.06	0.10	0.10	0.17	0.27	0.27	0.05	0.26	0.26	0.05	0.26	0.26
Sat Flow, veh/h		1810	5153	174	1810	5278	68	1810	1900	1615	1810	68	1557
Grp Volume(v), veh/h		26	415	226	20	356	195	25	2	46	15	0	48
Grp Sat Flow(s),veh/h/ln		1810	1729	1869	1810	1729	1888	1810	1900	1615	1810	0	1625
Q Serve(g_s), s		0.9	7.9	8.0	0.7	5.9	5.9	0.9	0.1	0.0	0.6	0.0	1.6
Cycle Q Clear(g_c), s		0.9	7.9	8.0	0.7	5.9	5.9	0.9	0.1	0.0	0.6	0.0	1.6
Prop In Lane		1.00		0.09	1.00		0.04	1.00		1.00	1.00		0.96
Lane Grp Cap(c), veh/h		344	1013	547	305	939	512	83	502	699	83	0	430
V/C Ratio(X)		0.08	0.41	0.41	0.07	0.38	0.38	0.30	0.00	0.07	0.18	0.00	0.11
Avail Cap(c_a), veh/h		344	1013	547	305	939	512	194	502	699	194	0	430
HCM Platoon Ratio		0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		0.99	0.99	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh		27.0	25.9	25.9	24.5	20.7	20.7	32.3	19.0	11.6	32.1	0.0	19.5
Incr Delay (d2), s/veh		0.1	1.2	2.3	0.1	1.2	2.1	2.0	0.0	0.2	1.0	0.0	0.5
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		0.5	4.0	4.5	0.3	2.9	3.3	0.5	0.0	0.5	0.3	0.0	0.8
LnGrp Delay(d),s/veh		27.1	27.1	28.2	24.6	21.9	22.9	34.4	19.0	11.8	33.2	0.0	20.0
LnGrp LOS		C	C	C	C	C	C	C	B	B	C		C
Approach Vol, veh/h			667			571			73			63	
Approach Delay, s/veh			27.5			22.3			19.7			23.2	
Approach LOS			C			C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.8	24.5	7.2	22.5	17.3	23.0	7.2	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.0	20.0	7.0	18.0	8.5	18.5	7.0	18.0
Max Q Clear Time (g_c+I1), s	2.7	10.0	2.9	3.6	2.9	7.9	2.6	2.1
Green Ext Time (p_c), s	0.0	2.9	0.0	0.1	0.0	2.6	0.0	0.1

Intersection Summary	
HCM 2010 Ctrl Delay	24.7
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
1: Hillrose Lane/Nason Street & Iris Avenue

AM/PM Gasoline Service Station
Existing (2017) WP - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑↱		↰	↑↑↑	↱	↰	↱		↰	↑	↱
Traffic Volume (veh/h)	230	581	19	16	766	109	13	22	12	124	37	406
Future Volume (veh/h)	230	581	19	16	766	109	13	22	12	124	37	406
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	250	632	21	17	833	118	14	24	13	135	40	441
Adj No. of Lanes	2	3	0	1	3	1	1	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	373	1385	46	248	1552	483	140	307	166	184	548	638
Arrive On Green	0.11	0.27	0.27	0.05	0.10	0.10	0.08	0.26	0.26	0.10	0.29	0.29
Sat Flow, veh/h	3510	5157	171	1810	5187	1615	1810	1160	629	1810	1900	1615
Grp Volume(v), veh/h	250	423	230	17	833	118	14	0	37	135	40	441
Grp Sat Flow(s),veh/h/ln	1755	1729	1870	1810	1729	1615	1810	0	1789	1810	1900	1615
Q Serve(g_s), s	4.8	7.1	7.2	0.6	10.7	4.7	0.5	0.0	1.1	5.1	1.1	9.2
Cycle Q Clear(g_c), s	4.8	7.1	7.2	0.6	10.7	4.7	0.5	0.0	1.1	5.1	1.1	9.2
Prop In Lane	1.00		0.09	1.00		1.00	1.00		0.35	1.00		1.00
Lane Grp Cap(c), veh/h	373	929	502	248	1552	483	140	0	473	184	548	638
V/C Ratio(X)	0.67	0.46	0.46	0.07	0.54	0.24	0.10	0.00	0.08	0.74	0.07	0.69
Avail Cap(c_a), veh/h	381	929	502	248	1552	483	194	0	473	238	548	638
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.95	0.95	0.95	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.1	21.3	21.3	29.1	26.9	24.2	30.0	0.0	19.3	30.5	18.1	6.7
Incr Delay (d2), s/veh	4.4	1.6	3.0	0.1	1.3	1.1	0.3	0.0	0.3	8.2	0.3	6.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	3.6	4.1	0.3	5.3	2.3	0.3	0.0	0.6	2.9	0.6	5.0
LnGrp Delay(d),s/veh	34.5	22.9	24.3	29.2	28.2	25.4	30.3	0.0	19.7	38.7	18.4	12.7
LnGrp LOS	C	C	C	C	C	C	C		B	D	B	B
Approach Vol, veh/h		903			968			51			616	
Approach Delay, s/veh		26.5			27.9			22.6			18.8	
Approach LOS		C			C			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.6	22.8	9.4	24.2	11.4	24.9	11.1	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.0	18.3	7.0	19.7	7.1	18.2	8.7	18.0
Max Q Clear Time (g_c+I1), s	2.6	9.2	2.5	11.2	6.8	12.7	7.1	3.1
Green Ext Time (p_c), s	2.3	2.8	0.0	1.3	0.0	2.8	0.0	0.1

Intersection Summary			
HCM 2010 Ctrl Delay			25.1
HCM 2010 LOS			C

HCM 2010 Signalized Intersection Summary
2: Iris Avenue & Kaiser Hospital Entrance

AM/PM Gasoline Service Station
Existing (2017) WP - PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑↑	↑↑↱		↰	↱
Traffic Volume (veh/h)	73	581	729	18	37	33
Future Volume (veh/h)	73	581	729	18	37	33
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	78	625	784	19	40	35
Adj No. of Lanes	1	3	3	0	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	154	3186	2459	59	491	576
Arrive On Green	0.17	1.00	0.94	0.94	0.27	0.27
Sat Flow, veh/h	1810	5358	5381	126	1810	1615
Grp Volume(v), veh/h	78	625	520	283	40	35
Grp Sat Flow(s),veh/h/ln	1810	1729	1729	1878	1810	1615
Q Serve(g_s), s	2.7	0.0	0.8	0.8	1.2	1.0
Cycle Q Clear(g_c), s	2.7	0.0	0.8	0.8	1.2	1.0
Prop In Lane	1.00			0.07	1.00	1.00
Lane Grp Cap(c), veh/h	154	3186	1632	886	491	576
V/C Ratio(X)	0.51	0.20	0.32	0.32	0.08	0.06
Avail Cap(c_a), veh/h	336	3186	1632	886	491	576
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.94	0.94	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.7	0.0	1.1	1.1	19.0	14.8
Incr Delay (d2), s/veh	2.4	0.1	0.5	1.0	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	0.4	0.5	0.6	1.1
LnGrp Delay(d),s/veh	30.1	0.1	1.6	2.0	19.3	15.0
LnGrp LOS	C	A	A	A	B	B
Approach Vol, veh/h		703	803		75	
Approach Delay, s/veh		3.5	1.7		17.3	
Approach LOS		A	A		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		47.0		23.0	10.0	37.0		
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		
Max Green Setting (Gmax), s		42.5		18.5	12.5	25.5		
Max Q Clear Time (g_c+I1), s		2.0		3.2	4.7	2.8		
Green Ext Time (p_c), s		13.1		0.1	0.1	10.5		

Intersection Summary			
HCM 2010 Ctrl Delay			3.2
HCM 2010 LOS			A

HCM 2010 TWSC
3: Iris Avenue & Project Driveway 1

AM/PM Gasoline Service Station
Existing (2017) WP - PM Peak Hour

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↱			↱
Traffic Vol, veh/h	0	638	683	99	0	46
Future Vol, veh/h	0	638	683	99	0	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	638	683	99	0	46

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	391
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.9
Pot Cap-1 Maneuver	0	-	-	-	0	*797
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		1
Mov Cap-1 Maneuver	-	-	-	-	-	*797
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	797
HCM Lane V/C Ratio	-	-	-	0.058
HCM Control Delay (s)	-	-	-	9.8
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0.2

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Intersection Delay, s/veh	8.8
Intersection LOS	A

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Lane Configurations		↰	↱		↑↱				↰↑
Traffic Vol, veh/h	0	30	56	0	88	18	0	120	70
Future Vol, veh/h	0	30	56	0	88	18	0	120	70
Peak Hour Factor	1.00	0.93	0.93	1.00	0.93	0.93	1.00	0.93	0.93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	32	60	0	95	19	0	129	75
Number of Lanes	0	1	1	0	2	0	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	2
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	2	0
HCM Control Delay	8.1	7.9	9.6
HCM LOS	A	A	A

Lane	NBLn1	NBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	0%	100%	0%	63%
Vol Thru, %	100%	62%	0%	0%	37%
Vol Right, %	0%	38%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	59	47	30	56	190
LT Vol	0	0	30	0	120
Through Vol	59	29	0	0	70
RT Vol	0	18	0	56	0
Lane Flow Rate	63	51	32	60	204
Geometry Grp	7	7	7	7	4
Degree of Util (X)	0.086	0.066	0.052	0.076	0.272
Departure Headway (Hd)	4.9	4.633	5.771	4.565	4.785
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	733	775	622	786	754
Service Time	2.617	2.35	3.49	2.284	2.8
HCM Lane V/C Ratio	0.086	0.066	0.051	0.076	0.271
HCM Control Delay	8.1	7.7	8.8	7.7	9.6
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.3	0.2	0.2	0.2	1.1

Intersection						
Int Delay, s/veh	2					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↱		↑↑	↑↱	
Traffic Vol, veh/h	0	63	0	104	101	14
Future Vol, veh/h	0	63	0	104	101	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	63	0	104	101	14

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	58	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	1002	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	1002	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	1002	-	-
HCM Lane V/C Ratio	-	0.063	-	-
HCM Control Delay (s)	-	8.8	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0.2	-	-

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (veh/h)	41	74	475	48	39	614	20	50	13	31	59	32
Future Volume (veh/h)	41	74	475	48	39	614	20	50	13	31	59	32
Number		5	2	12	1	6	16	3	8	18	7	4
Initial Q (Qb), veh		0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln		1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h		80	511	52	42	660	22	54	14	33	63	34
Adj No. of Lanes		1	3	0	1	3	0	0	1	1	0	1
Peak Hour Factor		0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %		0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h		543	2402	241	114	1363	45	92	14	427	85	29
Arrive On Green		0.10	0.17	0.17	0.13	0.53	0.53	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h		1810	4791	482	1810	5156	171	0	53	1615	0	111
Grp Volume(v), veh/h		80	367	196	42	442	240	68	0	33	97	0
Grp Sat Flow(s),veh/h/ln		1810	1729	1815	1810	1729	1870	53	0	1615	111	0
Q Serve(g_s), s		2.8	6.4	6.5	1.5	5.7	5.7	0.0	0.0	1.1	0.0	0.0
Cycle Q Clear(g_c), s		2.8	6.4	6.5	1.5	5.7	5.7	18.5	0.0	1.1	18.5	0.0
Prop In Lane		1.00		0.27	1.00		0.09	0.79		1.00	0.65	
Lane Grp Cap(c), veh/h		543	1734	910	114	914	494	106	0	427	114	0
V/C Ratio(X)		0.15	0.21	0.22	0.37	0.48	0.49	0.64	0.00	0.08	0.85	0.00
Avail Cap(c_a), veh/h		543	1734	910	194	914	494	106	0	427	114	0
HCM Platoon Ratio		0.33	0.33	0.33	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00	0.98	0.98	0.98	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh		23.3	17.2	17.3	29.3	13.5	13.5	31.2	0.0	19.3	29.6	0.0
Incr Delay (d2), s/veh		0.1	0.3	0.5	1.9	1.8	3.3	25.9	0.0	0.4	50.9	0.0
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		1.4	3.2	3.4	0.8	2.8	3.3	2.1	0.0	0.5	3.5	0.0
LnGrp Delay(d),s/veh		23.5	17.5	17.8	31.3	15.3	16.8	57.1	0.0	19.7	80.5	0.0
LnGrp LOS		C	B	B	C	B	B	E		B	F	
Approach Vol, veh/h			643			724			101			175
Approach Delay, s/veh			18.4			16.7			44.9			53.9
Approach LOS			B			B			D			D

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.4	39.1		22.5	25.0	22.5		22.5
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	7.0	31.5		18.0	20.5	18.0		18.0
Max Q Clear Time (g_c+I1), s	3.5	8.5		20.5	4.8	7.7		20.5
Green Ext Time (p_c), s	0.0	3.9		0.0	3.4	3.2		0.0

Intersection Summary		
HCM 2010 Ctrl Delay		23.0
HCM 2010 LOS		C

Notes

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

6: Oliver Street & Iris Avenue

Movement	SBR
Lane Configurations	↱
Traffic Volume (veh/h)	73
Future Volume (veh/h)	73
Number	14
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Adj Sat Flow, veh/h/ln	1900
Adj Flow Rate, veh/h	78
Adj No. of Lanes	1
Peak Hour Factor	0.93
Percent Heavy Veh, %	0
Cap, veh/h	427
Arrive On Green	0.26
Sat Flow, veh/h	1615
Grp Volume(v), veh/h	78
Grp Sat Flow(s),veh/h/ln	1615
Q Serve(g_s), s	2.6
Cycle Q Clear(g_c), s	2.6
Prop In Lane	1.00
Lane Grp Cap(c), veh/h	427
V/C Ratio(X)	0.18
Avail Cap(c_a), veh/h	427
HCM Platoon Ratio	1.00
Upstream Filter(I)	1.00
Uniform Delay (d), s/veh	19.9
Incr Delay (d2), s/veh	0.9
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(50%),veh/ln	1.3
LnGrp Delay(d),s/veh	20.8
LnGrp LOS	C
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer	

	⮌	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↑↑↱		↰	↑↑↱		↰	↑	↱	↰	↱	
Traffic Volume (veh/h)	11	26	499	29	39	624	13	19	0	22	9	2	20
Future Volume (veh/h)	11	26	499	29	39	624	13	19	0	22	9	2	20
Number		5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh		0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln		1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h		28	531	31	41	664	14	20	0	23	10	2	21
Adj No. of Lanes		1	3	0	1	3	0	1	1	1	1	1	0
Peak Hour Factor		0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %		0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h		360	2035	118	112	1404	30	71	502	527	71	38	395
Arrive On Green		0.07	0.13	0.13	0.06	0.27	0.27	0.04	0.00	0.26	0.04	0.26	0.26
Sat Flow, veh/h		1810	5016	291	1810	5229	110	1810	1900	1615	1810	142	1494
Grp Volume(v), veh/h		28	365	197	41	439	239	20	0	23	10	0	23
Grp Sat Flow(s),veh/h/ln		1810	1729	1849	1810	1729	1881	1810	1900	1615	1810	0	1636
Q Serve(g_s), s		1.0	6.6	6.7	1.5	7.4	7.5	0.8	0.0	0.5	0.4	0.0	0.7
Cycle Q Clear(g_c), s		1.0	6.6	6.7	1.5	7.4	7.5	0.8	0.0	0.5	0.4	0.0	0.7
Prop In Lane		1.00		0.16	1.00		0.06	1.00		1.00	1.00		0.91
Lane Grp Cap(c), veh/h		360	1403	750	112	929	505	71	502	527	71	0	432
V/C Ratio(X)		0.08	0.26	0.26	0.36	0.47	0.47	0.28	0.00	0.04	0.14	0.00	0.05
Avail Cap(c_a), veh/h		360	1403	750	194	929	505	194	502	527	194	0	432
HCM Platoon Ratio		0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		0.99	0.99	0.99	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh		26.7	20.9	20.9	31.5	21.4	21.5	32.7	0.0	7.7	32.5	0.0	19.2
Incr Delay (d2), s/veh		0.1	0.4	0.8	2.0	1.7	3.2	2.1	0.0	0.2	0.9	0.0	0.2
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		0.5	3.3	3.6	0.8	3.8	4.3	0.4	0.0	0.2	0.2	0.0	0.4
LnGrp Delay(d),s/veh		26.8	21.3	21.8	33.5	23.2	24.6	34.8	0.0	7.8	33.4	0.0	19.4
LnGrp LOS		C	C	C	C	C	C	C		A	C		B
Approach Vol, veh/h			590			719			43			33	
Approach Delay, s/veh			21.7			24.2			20.4			23.7	
Approach LOS			C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.3	32.4	6.8	22.5	17.9	22.8	6.8	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.0	20.0	7.0	18.0	8.7	18.3	7.0	18.0
Max Q Clear Time (g_c+I1), s	3.5	8.7	2.8	2.7	3.0	9.5	2.4	2.5
Green Ext Time (p_c), s	0.0	2.8	0.0	0.0	1.8	2.9	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	23.0
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
1: Hillrose Lane/Nason Street & Iris Avenue

AM/PM Gasoline Service Station
Project Completion Year (2022) NP - AM Peak Hour

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL
Lane Configurations	↰↰	↑↑↱			↰	↑↑↑	↱	↰	↱			↰
Traffic Volume (veh/h)	348	863	24	10	7	763	84	20	43	11	1	109
Future Volume (veh/h)	348	863	24	10	7	763	84	20	43	11	1	109
Number	5	2	12		1	6	16	3	8	18		7
Initial Q (Qb), veh	0	0	0		0	0	0	0	0	0		0
Ped-Bike Adj(A_pbT)	1.00		1.00		1.00		1.00	1.00		1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900		1900	1900	1900	1900	1900	1900		1900
Adj Flow Rate, veh/h	424	1052	29		9	930	102	24	52	13		133
Adj No. of Lanes	2	3	0		1	3	1	1	1	0		1
Peak Hour Factor	0.82	0.82	0.82		0.82	0.82	0.82	0.82	0.82	0.82		0.82
Percent Heavy Veh, %	0	0	0		0	0	0	0	0	0		0
Cap, veh/h	475	1991	55		42	1408	438	80	388	97		182
Arrive On Green	0.14	0.38	0.38		0.03	0.36	0.36	0.04	0.26	0.26		0.10
Sat Flow, veh/h	3510	5190	143		1810	5187	1615	1810	1468	367		1810
Grp Volume(v), veh/h	424	701	380		9	930	102	24	0	65		133
Grp Sat Flow(s),veh/h/ln	1755	1729	1875		1810	1729	1615	1810	0	1835		1810
Q Serve(g_s), s	8.3	11.0	11.0		0.3	10.5	3.1	0.9	0.0	1.9		5.0
Cycle Q Clear(g_c), s	8.3	11.0	11.0		0.3	10.5	3.1	0.9	0.0	1.9		5.0
Prop In Lane	1.00		0.08		1.00		1.00	1.00		0.20		1.00
Lane Grp Cap(c), veh/h	475	1326	719		42	1408	438	80	0	485		182
V/C Ratio(X)	0.89	0.53	0.53		0.21	0.66	0.23	0.30	0.00	0.13		0.73
Avail Cap(c_a), veh/h	475	1326	719		194	1408	438	194	0	485		233
HCM Platoon Ratio	1.00	1.00	1.00		1.33	1.33	1.33	1.00	1.00	1.00		1.00
Upstream Filter(I)	1.00	1.00	1.00		0.82	0.82	0.82	1.00	0.00	1.00		1.00
Uniform Delay (d), s/veh	29.8	16.7	16.7		33.3	19.7	17.3	32.4	0.0	19.6		30.6
Incr Delay (d2), s/veh	18.8	1.5	2.8		2.1	2.0	1.0	2.0	0.0	0.6		8.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0
%ile BackOfQ(50%),veh/ln	5.2	5.4	6.2		0.2	5.3	1.5	0.5	0.0	1.0		2.9
LnGrp Delay(d),s/veh	48.6	18.2	19.5		35.4	21.7	18.3	34.4	0.0	20.2		38.9
LnGrp LOS	D	B	B		D	C	B	C		C		D
Approach Vol, veh/h		1505				1041			89			
Approach Delay, s/veh		27.1				21.5			24.0			
Approach LOS		C				C			C			

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.6	30.8	7.1	26.4	13.5	23.0	11.0	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.0	18.5	7.0	19.5	7.0	18.5	8.5	18.0
Max Q Clear Time (g_c+I1), s	2.3	13.0	2.9	3.8	10.3	12.5	7.0	3.9
Green Ext Time (p_c), s	0.0	3.7	0.0	1.6	0.0	3.2	0.1	0.2

Intersection Summary	
HCM 2010 Ctrl Delay	23.3
HCM 2010 LOS	C

Notes

	↓	↙
Movement	SBT	SBR
Lane Configurations	↑	↱
Traffic Volume (veh/h)	14	287
Future Volume (veh/h)	14	287
Number	4	14
Initial Q (Qb), veh	0	0
Ped-Bike Adj(A_pbT)		1.00
Parking Bus, Adj	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900
Adj Flow Rate, veh/h	17	350
Adj No. of Lanes	1	1
Peak Hour Factor	0.82	0.82
Percent Heavy Veh, %	0	0
Cap, veh/h	608	736
Arrive On Green	0.32	0.32
Sat Flow, veh/h	1900	1615
Grp Volume(v), veh/h	17	350
Grp Sat Flow(s),veh/h/ln	1900	1615
Q Serve(g_s), s	0.4	1.8
Cycle Q Clear(g_c), s	0.4	1.8
Prop In Lane		1.00
Lane Grp Cap(c), veh/h	608	736
V/C Ratio(X)	0.03	0.48
Avail Cap(c_a), veh/h	608	736
HCM Platoon Ratio	1.00	1.00
Upstream Filter(I)	1.00	1.00
Uniform Delay (d), s/veh	16.3	5.0
Incr Delay (d2), s/veh	0.1	2.2
Initial Q Delay(d3),s/veh	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	3.1
LnGrp Delay(d),s/veh	16.4	7.2
LnGrp LOS	B	A
Approach Vol, veh/h	500	
Approach Delay, s/veh	16.0	
Approach LOS	B	
Timer		

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑↑	↑↑↱		↰	↱
Traffic Volume (veh/h)	147	782	756	43	7	24
Future Volume (veh/h)	147	782	756	43	7	24
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	165	879	849	48	8	27
Adj No. of Lanes	1	3	3	0	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	465	3223	1543	87	478	842
Arrive On Green	0.51	1.00	0.61	0.61	0.26	0.26
Sat Flow, veh/h	1810	5358	5196	283	1810	1615
Grp Volume(v), veh/h	165	879	584	313	8	27
Grp Sat Flow(s),veh/h/ln	1810	1729	1729	1850	1810	1615
Q Serve(g_s), s	3.8	0.0	6.9	6.9	0.2	0.0
Cycle Q Clear(g_c), s	3.8	0.0	6.9	6.9	0.2	0.0
Prop In Lane	1.00			0.15	1.00	1.00
Lane Grp Cap(c), veh/h	465	3223	1062	568	478	842
V/C Ratio(X)	0.35	0.27	0.55	0.55	0.02	0.03
Avail Cap(c_a), veh/h	465	3223	1062	568	478	842
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.82	0.82	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.5	0.0	10.7	10.7	19.0	8.2
Incr Delay (d2), s/veh	0.4	0.2	2.0	3.8	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.1	3.4	3.9	0.1	0.5
LnGrp Delay(d),s/veh	13.9	0.2	12.7	14.5	19.1	8.2
LnGrp LOS	B	A	B	B	B	A
Approach Vol, veh/h		1044	897		35	
Approach Delay, s/veh		2.3	13.4		10.7	
Approach LOS		A	B		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		47.5		22.5	22.0	25.5		
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		
Max Green Setting (Gmax), s		43.0		18.0	17.5	21.0		
Max Q Clear Time (g_c+I1), s		2.0		2.2	5.8	8.9		
Green Ext Time (p_c), s		8.2		0.0	5.1	4.7		

Intersection Summary	
HCM 2010 Ctrl Delay	7.5
HCM 2010 LOS	A

Intersection	
Intersection Delay, s/veh	14.4
Intersection LOS	B

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Lane Configurations		↰	↱		↑↱				↰
Traffic Vol, veh/h	0	26	102	0	288	49	0	258	125
Future Vol, veh/h	0	26	102	0	288	49	0	258	125
Peak Hour Factor	1.00	0.83	0.83	1.00	0.83	0.83	1.00	0.83	0.83
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	31	123	0	347	59	0	311	151
Number of Lanes	0	1	1	0	2	0	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	2
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	2	0
HCM Control Delay	10.1	10.6	19.2
HCM LOS	B	B	C

Lane	NBLn1	NBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	0%	100%	0%	67%
Vol Thru, %	100%	66%	0%	0%	33%
Vol Right, %	0%	34%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	192	145	26	102	383
LT Vol	0	0	26	0	258
Through Vol	192	96	0	0	125
RT Vol	0	49	0	102	0
Lane Flow Rate	231	175	31	123	461
Geometry Grp	7	7	7	7	4
Degree of Util (X)	0.353	0.255	0.062	0.202	0.681
Departure Headway (Hd)	5.493	5.254	7.128	5.908	5.417
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	659	688	505	610	674
Service Time	3.193	2.954	4.842	3.622	3.417
HCM Lane V/C Ratio	0.351	0.254	0.061	0.202	0.684
HCM Control Delay	11.2	9.7	10.3	10.1	19.2
HCM Lane LOS	B	A	B	B	C
HCM 95th-tile Q	1.6	1	0.2	0.8	5.3

HCM 2010 Signalized Intersection Summary

6: Oliver Street & Iris Avenue

AM/PM Gasoline Service Station

Project Completion Year (2022) NP - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑↱		↰↰	↑↑↱			↰↑	↱		↰↑	↱
Traffic Volume (veh/h)	184	574	21	38	524	11	83	49	42	7	28	215
Future Volume (veh/h)	184	574	21	38	524	11	83	49	42	7	28	215
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	216	675	25	45	616	13	98	58	49	8	33	253
Adj No. of Lanes	1	3	0	1	3	0	0	1	1	0	1	1
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	543	2347	87	194	1382	29	288	153	427	117	422	427
Arrive On Green	0.10	0.15	0.15	0.04	0.09	0.09	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	1810	5135	190	1810	5228	110	772	579	1615	209	1596	1615
Grp Volume(v), veh/h	216	454	246	45	407	222	156	0	49	41	0	253
Grp Sat Flow(s),veh/h/ln	1810	1729	1867	1810	1729	1881	1351	0	1615	1805	0	1615
Q Serve(g_s), s	7.8	8.2	8.2	1.7	7.8	7.9	5.2	0.0	1.6	0.0	0.0	9.6
Cycle Q Clear(g_c), s	7.8	8.2	8.2	1.7	7.8	7.9	6.3	0.0	1.6	1.1	0.0	9.6
Prop In Lane	1.00		0.10	1.00		0.06	0.63		1.00	0.20		1.00
Lane Grp Cap(c), veh/h	543	1581	853	194	914	497	441	0	427	539	0	427
V/C Ratio(X)	0.40	0.29	0.29	0.23	0.45	0.45	0.35	0.00	0.11	0.08	0.00	0.59
Avail Cap(c_a), veh/h	543	1581	853	194	914	497	441	0	427	539	0	427
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.97	0.97	0.97	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.6	19.6	19.6	31.0	27.1	27.1	21.1	0.0	19.5	19.4	0.0	22.5
Incr Delay (d2), s/veh	0.5	0.5	0.9	0.6	1.5	2.8	2.2	0.0	0.5	0.3	0.0	5.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	4.0	4.4	0.9	3.9	4.5	2.7	0.0	0.8	0.6	0.0	5.0
LnGrp Delay(d),s/veh	26.1	20.1	20.5	31.6	28.6	29.9	23.3	0.0	20.1	19.6	0.0	28.4
LnGrp LOS	C	C	C	C	C	C	C		C	B		C
Approach Vol, veh/h		916			674			205			294	
Approach Delay, s/veh		21.6			29.2			22.6			27.2	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	11.5	36.0		22.5	25.0	22.5		22.5
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	7.0	31.5		18.0	20.5	18.0		18.0
Max Q Clear Time (g_c+I1), s	3.7	10.2		11.6	9.8	9.9		8.3
Green Ext Time (p_c), s	0.2	4.6		1.3	0.5	2.5		1.7

Intersection Summary	
HCM 2010 Ctrl Delay	24.9
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
7: Via Del Lago & Iris Avenue/Moreno Beach Drive

AM/PM Gasoline Service Station
Project Completion Year (2022) NP - AM Peak Hour

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⮌	↑↑↱		↰	↑↑↱		↰	↑	↱	↰	↱	
Traffic Volume (veh/h)	2	22	579	20	19	507	7	24	2	44	14	2	42
Future Volume (veh/h)	2	22	579	20	19	507	7	24	2	44	14	2	42
Number		5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh		0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln		1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h		25	666	23	22	583	8	28	2	51	16	2	48
Adj No. of Lanes		1	3	0	1	3	0	1	1	1	1	1	0
Peak Hour Factor		0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %		0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h		338	1508	52	299	1431	20	89	502	694	89	17	412
Arrive On Green		0.06	0.10	0.10	0.17	0.27	0.27	0.05	0.26	0.26	0.05	0.26	0.26
Sat Flow, veh/h		1810	5149	177	1810	5273	72	1810	1900	1615	1810	65	1560
Grp Volume(v), veh/h		25	447	242	22	382	209	28	2	51	16	0	50
Grp Sat Flow(s),veh/h/ln		1810	1729	1869	1810	1729	1887	1810	1900	1615	1810	0	1625
Q Serve(g_s), s		0.9	8.5	8.6	0.7	6.3	6.4	1.0	0.1	0.0	0.6	0.0	1.6
Cycle Q Clear(g_c), s		0.9	8.5	8.6	0.7	6.3	6.4	1.0	0.1	0.0	0.6	0.0	1.6
Prop In Lane		1.00		0.09	1.00		0.04	1.00		1.00	1.00		0.96
Lane Grp Cap(c), veh/h		338	1013	547	299	939	512	89	502	694	89	0	429
V/C Ratio(X)		0.07	0.44	0.44	0.07	0.41	0.41	0.31	0.00	0.07	0.18	0.00	0.12
Avail Cap(c_a), veh/h		338	1013	547	299	939	512	194	502	694	194	0	429
HCM Platoon Ratio		0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		0.97	0.97	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh		27.1	26.2	26.2	24.7	20.9	20.9	32.1	19.0	11.8	31.9	0.0	19.5
Incr Delay (d2), s/veh		0.1	1.4	2.5	0.1	1.3	2.4	2.0	0.0	0.2	1.0	0.0	0.6
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		0.5	4.3	4.8	0.4	3.2	3.7	0.6	0.0	0.6	0.3	0.0	0.8
LnGrp Delay(d),s/veh		27.2	27.6	28.7	24.8	22.2	23.3	34.1	19.0	12.0	32.9	0.0	20.1
LnGrp LOS		C	C	C	C	C	C	C	B	B	C		C
Approach Vol, veh/h			714			613			81			66	
Approach Delay, s/veh			28.0			22.7			19.8			23.2	
Approach LOS			C			C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.6	24.5	7.4	22.5	17.1	23.0	7.4	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.0	20.0	7.0	18.0	8.5	18.5	7.0	18.0
Max Q Clear Time (g_c+I1), s	2.7	10.6	3.0	3.6	2.9	8.4	2.6	2.1
Green Ext Time (p_c), s	0.0	3.0	0.0	0.1	0.0	2.7	0.0	0.1

Intersection Summary	
HCM 2010 Ctrl Delay	25.1
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
1: Hillrose Lane/Nason Street & Iris Avenue

AM/PM Gasoline Service Station
Project Completion Year (2022) NP - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑↱		↰	↑↑↑	↱	↰	↱		↰	↑	↱
Traffic Volume (veh/h)	254	630	21	15	835	115	14	24	10	131	41	448
Future Volume (veh/h)	254	630	21	15	835	115	14	24	10	131	41	448
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	276	685	23	16	908	125	15	26	11	142	45	487
Adj No. of Lanes	2	3	0	1	3	1	1	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	381	1384	46	240	1518	473	148	335	142	192	548	641
Arrive On Green	0.11	0.27	0.27	0.04	0.10	0.10	0.08	0.26	0.26	0.11	0.29	0.29
Sat Flow, veh/h	3510	5155	173	1810	5187	1615	1810	1269	537	1810	1900	1615
Grp Volume(v), veh/h	276	459	249	16	908	125	15	0	37	142	45	487
Grp Sat Flow(s),veh/h/ln	1755	1729	1870	1810	1729	1615	1810	0	1805	1810	1900	1615
Q Serve(g_s), s	5.3	7.8	7.9	0.6	11.7	5.0	0.5	0.0	1.1	5.3	1.2	10.4
Cycle Q Clear(g_c), s	5.3	7.8	7.9	0.6	11.7	5.0	0.5	0.0	1.1	5.3	1.2	10.4
Prop In Lane	1.00		0.09	1.00		1.00	1.00		0.30	1.00		1.00
Lane Grp Cap(c), veh/h	381	929	502	240	1518	473	148	0	477	192	548	641
V/C Ratio(X)	0.72	0.49	0.50	0.07	0.60	0.26	0.10	0.00	0.08	0.74	0.08	0.76
Avail Cap(c_a), veh/h	381	929	502	240	1518	473	194	0	477	238	548	641
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.94	0.94	0.94	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.2	21.6	21.6	29.3	27.7	24.6	29.8	0.0	19.3	30.4	18.1	6.8
Incr Delay (d2), s/veh	6.7	1.9	3.5	0.1	1.6	1.3	0.3	0.0	0.3	9.2	0.3	8.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	3.9	4.5	0.3	5.9	2.4	0.3	0.0	0.6	3.1	0.7	5.9
LnGrp Delay(d),s/veh	36.9	23.5	25.1	29.4	29.3	25.9	30.1	0.0	19.7	39.6	18.4	15.0
LnGrp LOS	D	C	C	C	C	C	C		B	D	B	B
Approach Vol, veh/h		984			1049			52			674	
Approach Delay, s/veh		27.6			28.9			22.7			20.4	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.3	22.8	9.7	24.2	11.6	24.5	11.4	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.0	18.3	7.0	19.7	7.1	18.2	8.7	18.0
Max Q Clear Time (g_c+I1), s	2.6	9.9	2.5	12.4	7.3	13.7	7.3	3.1
Green Ext Time (p_c), s	2.5	2.9	0.0	1.3	0.0	2.5	0.0	0.1

Intersection Summary	
HCM 2010 Ctrl Delay	26.3
HCM 2010 LOS	C

HCM 2010 Signalized Intersection Summary
2: Iris Avenue & Kaiser Hospital Entrance

AM/PM Gasoline Service Station
Project Completion Year (2022) NP - PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑↑	↑↑↱		↰	↱
Traffic Volume (veh/h)	81	622	786	20	41	36
Future Volume (veh/h)	81	622	786	20	41	36
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	87	669	845	22	44	39
Adj No. of Lanes	1	3	3	0	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	161	3186	2435	63	491	582
Arrive On Green	0.18	1.00	0.94	0.94	0.27	0.27
Sat Flow, veh/h	1810	5358	5370	135	1810	1615
Grp Volume(v), veh/h	87	669	562	305	44	39
Grp Sat Flow(s),veh/h/ln	1810	1729	1729	1876	1810	1615
Q Serve(g_s), s	3.1	0.0	1.1	1.1	1.3	1.1
Cycle Q Clear(g_c), s	3.1	0.0	1.1	1.1	1.3	1.1
Prop In Lane	1.00			0.07	1.00	1.00
Lane Grp Cap(c), veh/h	161	3186	1620	879	491	582
V/C Ratio(X)	0.54	0.21	0.35	0.35	0.09	0.07
Avail Cap(c_a), veh/h	336	3186	1620	879	491	582
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.5	0.0	1.2	1.2	19.0	14.7
Incr Delay (d2), s/veh	2.6	0.1	0.6	1.1	0.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	0.6	0.8	0.7	1.3
LnGrp Delay(d),s/veh	30.1	0.1	1.8	2.3	19.4	14.9
LnGrp LOS	C	A	A	A	B	B
Approach Vol, veh/h		756	867		83	
Approach Delay, s/veh		3.6	2.0		17.3	
Approach LOS		A	A		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		47.0		23.0	10.2	36.8		
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		
Max Green Setting (Gmax), s		42.5		18.5	12.5	25.5		
Max Q Clear Time (g_c+I1), s		2.0		3.3	5.1	3.1		
Green Ext Time (p_c), s		14.5		0.2	0.1	11.3		

Intersection Summary	
HCM 2010 Ctrl Delay	3.4
HCM 2010 LOS	A

Intersection	
Intersection Delay, s/veh	8.9
Intersection LOS	A

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Lane Configurations		↰	↱		↑↱				↰
Traffic Vol, veh/h	0	30	62	0	89	20	0	132	68
Future Vol, veh/h	0	30	62	0	89	20	0	132	68
Peak Hour Factor	1.00	0.93	0.93	1.00	0.93	0.93	1.00	0.93	0.93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	32	67	0	96	22	0	142	73
Number of Lanes	0	1	1	0	2	0	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	2
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	2	0
HCM Control Delay	8.1	7.9	9.8
HCM LOS	A	A	A

Lane	NBLn1	NBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	0%	100%	0%	66%
Vol Thru, %	100%	60%	0%	0%	34%
Vol Right, %	0%	40%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	59	50	30	62	200
LT Vol	0	0	30	0	132
Through Vol	59	30	0	0	68
RT Vol	0	20	0	62	0
Lane Flow Rate	64	53	32	67	215
Geometry Grp	7	7	7	7	4
Degree of Util (X)	0.087	0.069	0.052	0.085	0.287
Departure Headway (Hd)	4.928	4.645	5.805	4.599	4.811
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	729	773	618	781	748
Service Time	2.645	2.362	3.525	2.318	2.826
HCM Lane V/C Ratio	0.088	0.069	0.052	0.086	0.287
HCM Control Delay	8.1	7.7	8.8	7.7	9.8
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.3	0.2	0.2	0.3	1.2

HCM 2010 Signalized Intersection Summary
6: Oliver Street & Iris Avenue

AM/PM Gasoline Service Station
Project Completion Year (2022) NP - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱			↰↑	↱		↰↑	↱
Traffic Volume (veh/h)	82	548	55	45	656	10	47	15	35	7	25	84
Future Volume (veh/h)	82	548	55	45	656	10	47	15	35	7	25	84
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	88	589	59	48	705	11	51	16	38	8	27	90
Adj No. of Lanes	1	3	0	1	3	0	0	1	1	0	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	543	2382	236	123	1391	22	358	101	427	134	404	427
Arrive On Green	0.10	0.16	0.16	0.14	0.53	0.53	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	1810	4798	476	1810	5262	82	1011	382	1615	267	1531	1615
Grp Volume(v), veh/h	88	423	225	48	463	253	67	0	38	35	0	90
Grp Sat Flow(s),veh/h/ln	1810	1729	1816	1810	1729	1886	1393	0	1615	1797	0	1615
Q Serve(g_s), s	3.1	7.5	7.6	1.7	6.0	6.1	1.7	0.0	1.2	0.0	0.0	3.0
Cycle Q Clear(g_c), s	3.1	7.5	7.6	1.7	6.0	6.1	2.7	0.0	1.2	1.0	0.0	3.0
Prop In Lane	1.00		0.26	1.00		0.04	0.76		1.00	0.23		1.00
Lane Grp Cap(c), veh/h	543	1717	902	123	914	498	459	0	427	538	0	427
V/C Ratio(X)	0.16	0.25	0.25	0.39	0.51	0.51	0.15	0.00	0.09	0.07	0.00	0.21
Avail Cap(c_a), veh/h	543	1717	902	194	914	498	459	0	427	538	0	427
HCM Platoon Ratio	0.33	0.33	0.33	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.97	0.97	0.97	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.5	17.9	17.9	28.9	13.6	13.6	19.9	0.0	19.4	19.3	0.0	20.1
Incr Delay (d2), s/veh	0.1	0.3	0.7	2.0	1.9	3.5	0.7	0.0	0.4	0.2	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	3.7	4.0	0.9	3.1	3.6	1.1	0.0	0.6	0.5	0.0	1.5
LnGrp Delay(d),s/veh	23.6	18.2	18.6	30.9	15.5	17.1	20.6	0.0	19.8	19.5	0.0	21.2
LnGrp LOS	C	B	B	C	B	B	C		B	B		C
Approach Vol, veh/h		736			764			105			125	
Approach Delay, s/veh		19.0			17.0			20.3			20.7	
Approach LOS		B			B			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.7	38.8		22.5	25.0	22.5		22.5
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	7.0	31.5		18.0	20.5	18.0		18.0
Max Q Clear Time (g_c+I1), s	3.7	9.6		5.0	5.1	8.1		4.7
Green Ext Time (p_c), s	0.0	4.5		0.8	4.0	3.3		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	18.3
HCM 2010 LOS	B

Notes

HCM 2010 Signalized Intersection Summary
7: Via Del Lago & Iris Avenue/Moreno Beach Drive

AM/PM Gasoline Service Station
Project Completion Year (2022) NP - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱		↰	↑	↱	↰	↱	
Traffic Volume (veh/h)	25	532	32	43	671	14	21	0	24	10	2	19
Future Volume (veh/h)	25	532	32	43	671	14	21	0	24	10	2	19
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	27	566	34	46	714	15	22	0	26	11	2	20
Adj No. of Lanes	1	3	0	1	3	0	1	1	1	1	1	0
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	356	1997	119	120	1404	29	76	502	534	76	39	393
Arrive On Green	0.06	0.13	0.13	0.07	0.27	0.27	0.04	0.00	0.26	0.04	0.26	0.26
Sat Flow, veh/h	1810	5007	299	1810	5229	110	1810	1900	1615	1810	149	1488
Grp Volume(v), veh/h	27	390	210	46	472	257	22	0	26	11	0	22
Grp Sat Flow(s),veh/h/ln	1810	1729	1847	1810	1729	1881	1810	1900	1615	1810	0	1637
Q Serve(g_s), s	1.0	7.1	7.2	1.7	8.1	8.1	0.8	0.0	0.5	0.4	0.0	0.7
Cycle Q Clear(g_c), s	1.0	7.1	7.2	1.7	8.1	8.1	0.8	0.0	0.5	0.4	0.0	0.7
Prop In Lane	1.00		0.16	1.00		0.06	1.00		1.00	1.00		0.91
Lane Grp Cap(c), veh/h	356	1380	737	120	929	505	76	502	534	76	0	433
V/C Ratio(X)	0.08	0.28	0.29	0.38	0.51	0.51	0.29	0.00	0.05	0.14	0.00	0.05
Avail Cap(c_a), veh/h	356	1380	737	194	929	505	194	502	534	194	0	433
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.98	0.98	0.98	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.8	21.4	21.4	31.3	21.7	21.7	32.5	0.0	7.5	32.3	0.0	19.2
Incr Delay (d2), s/veh	0.1	0.5	1.0	2.0	2.0	3.6	2.1	0.0	0.2	0.9	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	3.5	3.9	0.9	4.1	4.7	0.5	0.0	0.3	0.2	0.0	0.3
LnGrp Delay(d),s/veh	26.8	21.9	22.3	33.3	23.7	25.3	34.6	0.0	7.6	33.2	0.0	19.4
LnGrp LOS	C	C	C	C	C	C	C		A	C		B
Approach Vol, veh/h		627			775			48			33	
Approach Delay, s/veh		22.2			24.8			20.0			24.0	
Approach LOS		C			C			B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.6	31.9	6.9	22.5	17.8	22.8	6.9	22.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	7.0	20.0	7.0	18.0	8.7	18.3	7.0	18.0				
Max Q Clear Time (g_c+I1), s	3.7	9.2	2.8	2.7	3.0	10.1	2.4	2.5				
Green Ext Time (p_c), s	0.0	2.9	0.0	0.0	1.9	2.9	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			23.5									
HCM 2010 LOS			C									
Notes												

HCM 2010 Signalized Intersection Summary
1: Hillrose Lane/Nason Street & Iris Avenue

AM/PM Gasoline Service Station
Project Completion Year (2022) WP - AM Peak Hour

	↗	→	↘	↺	↙	←	↖	↖	↑	↗	↺	↘
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL
Lane Configurations	↰↰	↑↑↱			↰	↑↑↑	↱	↰	↱			↰
Traffic Volume (veh/h)	348	872	24	10	9	772	88	20	43	13	1	114
Future Volume (veh/h)	348	872	24	10	9	772	88	20	43	13	1	114
Number	5	2	12		1	6	16	3	8	18		7
Initial Q (Qb), veh	0	0	0		0	0	0	0	0	0		0
Ped-Bike Adj(A_pbT)	1.00		1.00		1.00		1.00	1.00		1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900		1900	1900	1900	1900	1900	1900		1900
Adj Flow Rate, veh/h	424	1063	29		11	941	107	24	52	16		139
Adj No. of Lanes	2	3	0		1	3	1	1	1	0		1
Peak Hour Factor	0.82	0.82	0.82		0.82	0.82	0.82	0.82	0.82	0.82		0.82
Percent Heavy Veh, %	0	0	0		0	0	0	0	0	0		0
Cap, veh/h	462	1955	53		48	1408	438	80	369	113		188
Arrive On Green	0.13	0.38	0.38		0.04	0.36	0.36	0.04	0.26	0.26		0.10
Sat Flow, veh/h	3510	5191	142		1810	5187	1615	1810	1395	429		1810
Grp Volume(v), veh/h	424	708	384		11	941	107	24	0	68		139
Grp Sat Flow(s),veh/h/ln	1755	1729	1875		1810	1729	1615	1810	0	1824		1810
Q Serve(g_s), s	8.4	11.2	11.2		0.4	10.7	3.2	0.9	0.0	2.0		5.2
Cycle Q Clear(g_c), s	8.4	11.2	11.2		0.4	10.7	3.2	0.9	0.0	2.0		5.2
Prop In Lane	1.00		0.08		1.00		1.00	1.00		0.24		1.00
Lane Grp Cap(c), veh/h	462	1302	706		48	1408	438	80	0	482		188
V/C Ratio(X)	0.92	0.54	0.54		0.23	0.67	0.24	0.30	0.00	0.14		0.74
Avail Cap(c_a), veh/h	462	1302	706		194	1408	438	194	0	482		233
HCM Platoon Ratio	1.00	1.00	1.00		1.33	1.33	1.33	1.00	1.00	1.00		1.00
Upstream Filter(I)	1.00	1.00	1.00		0.81	0.81	0.81	1.00	0.00	1.00		1.00
Uniform Delay (d), s/veh	30.0	17.1	17.1		33.1	19.7	17.3	32.4	0.0	19.7		30.4
Incr Delay (d2), s/veh	23.3	1.6	3.0		2.0	2.1	1.1	2.0	0.0	0.6		9.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0
%ile BackOfQ(50%),veh/ln	5.6	5.6	6.4		0.2	5.3	1.6	0.5	0.0	1.1		3.1
LnGrp Delay(d),s/veh	53.3	18.7	20.1		35.0	21.8	18.4	34.4	0.0	20.3		39.6
LnGrp LOS	D	B	C		D	C	B	C		C		D
Approach Vol, veh/h		1516				1059			92			
Approach Delay, s/veh		28.8				21.6			24.0			
Approach LOS		C				C			C			

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.8	30.4	7.1	26.7	13.2	23.0	11.3	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.0	18.5	7.0	19.5	7.0	18.5	8.5	18.0
Max Q Clear Time (g_c+I1), s	2.4	13.2	2.9	3.8	10.4	12.7	7.2	4.0
Green Ext Time (p_c), s	0.0	3.6	0.0	1.6	0.0	3.2	0.1	0.2

Intersection Summary	
HCM 2010 Ctrl Delay	24.2
HCM 2010 LOS	C

Notes

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

	↓	↙
Movement	SBT	SBR
Lane Configurations	↑	↱
Traffic Volume (veh/h)	14	287
Future Volume (veh/h)	14	287
Number	4	14
Initial Q (Qb), veh	0	0
Ped-Bike Adj(A_pbT)		1.00
Parking Bus, Adj	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900
Adj Flow Rate, veh/h	17	350
Adj No. of Lanes	1	1
Peak Hour Factor	0.82	0.82
Percent Heavy Veh, %	0	0
Cap, veh/h	616	736
Arrive On Green	0.32	0.32
Sat Flow, veh/h	1900	1615
Grp Volume(v), veh/h	17	350
Grp Sat Flow(s),veh/h/ln	1900	1615
Q Serve(g_s), s	0.4	1.8
Cycle Q Clear(g_c), s	0.4	1.8
Prop In Lane		1.00
Lane Grp Cap(c), veh/h	616	736
V/C Ratio(X)	0.03	0.48
Avail Cap(c_a), veh/h	616	736
HCM Platoon Ratio	1.00	1.00
Upstream Filter(I)	1.00	1.00
Uniform Delay (d), s/veh	16.1	5.0
Incr Delay (d2), s/veh	0.1	2.2
Initial Q Delay(d3),s/veh	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	3.2
LnGrp Delay(d),s/veh	16.2	7.2
LnGrp LOS	B	A
Approach Vol, veh/h	506	
Approach Delay, s/veh	16.4	
Approach LOS	B	
Timer		

HCM 2010 Signalized Intersection Summary
2: Iris Avenue & Kaiser Hospital Entrance

AM/PM Gasoline Service Station
Project Completion Year (2022) WP - AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑↑	↑↑↱		↰	↱
Traffic Volume (veh/h)	147	798	771	43	7	24
Future Volume (veh/h)	147	798	771	43	7	24
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	165	897	866	48	8	27
Adj No. of Lanes	1	3	3	0	1	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	465	3223	1545	85	478	842
Arrive On Green	0.51	1.00	0.61	0.61	0.26	0.26
Sat Flow, veh/h	1810	5358	5202	278	1810	1615
Grp Volume(v), veh/h	165	897	595	319	8	27
Grp Sat Flow(s),veh/h/ln	1810	1729	1729	1851	1810	1615
Q Serve(g_s), s	3.8	0.0	7.1	7.1	0.2	0.0
Cycle Q Clear(g_c), s	3.8	0.0	7.1	7.1	0.2	0.0
Prop In Lane	1.00			0.15	1.00	1.00
Lane Grp Cap(c), veh/h	465	3223	1062	568	478	842
V/C Ratio(X)	0.35	0.28	0.56	0.56	0.02	0.03
Avail Cap(c_a), veh/h	465	3223	1062	568	478	842
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.81	0.81	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.5	0.0	10.7	10.7	19.0	8.2
Incr Delay (d2), s/veh	0.4	0.2	2.1	4.0	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.1	3.6	4.2	0.1	0.5
LnGrp Delay(d),s/veh	13.9	0.2	12.9	14.7	19.1	8.2
LnGrp LOS	B	A	B	B	B	A
Approach Vol, veh/h		1062	914		35	
Approach Delay, s/veh		2.3	13.5		10.7	
Approach LOS		A	B		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		47.5		22.5	22.0	25.5		
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		
Max Green Setting (Gmax), s		43.0		18.0	17.5	21.0		
Max Q Clear Time (g_c+I1), s		2.0		2.2	5.8	9.1		
Green Ext Time (p_c), s		8.4		0.0	5.2	4.7		

Intersection Summary		
HCM 2010 Ctrl Delay		7.5
HCM 2010 LOS		A

HCM 2010 TWSC
3: Iris Avenue & Project Driveway 1

AM/PM Gasoline Service Station
Project Completion Year (2022) WP - AM Peak Hour

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↱			↱
Traffic Vol, veh/h	0	795	797	84	0	40
Future Vol, veh/h	0	795	797	84	0	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	795	797	84	0	40

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	441
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.9
Pot Cap-1 Maneuver	0	-	-	-	0	*759
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		1
Mov Cap-1 Maneuver	-	-	-	-	-	*759
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	759
HCM Lane V/C Ratio	-	-	-	0.053
HCM Control Delay (s)	-	-	-	10
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.2

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Intersection Delay, s/veh	14.8
Intersection LOS	B

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Lane Configurations		↰	↱		↑↱				↰↑
Traffic Vol, veh/h	0	28	102	0	294	49	0	258	132
Future Vol, veh/h	0	28	102	0	294	49	0	258	132
Peak Hour Factor	1.00	0.83	0.83	1.00	0.83	0.83	1.00	0.83	0.83
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	34	123	0	354	59	0	311	159
Number of Lanes	0	1	1	0	2	0	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	2
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	2	0
HCM Control Delay	10.2	10.7	19.9
HCM LOS	B	B	C

Lane	NBLn1	NBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	0%	100%	0%	66%
Vol Thru, %	100%	67%	0%	0%	34%
Vol Right, %	0%	33%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	196	147	28	102	390
LT Vol	0	0	28	0	258
Through Vol	196	98	0	0	132
RT Vol	0	49	0	102	0
Lane Flow Rate	236	177	34	123	470
Geometry Grp	7	7	7	7	4
Degree of Util (X)	0.362	0.26	0.067	0.203	0.696
Departure Headway (Hd)	5.517	5.281	7.168	5.948	5.435
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	656	684	502	606	667
Service Time	3.217	2.981	4.882	3.662	3.435
HCM Lane V/C Ratio	0.36	0.259	0.068	0.203	0.705
HCM Control Delay	11.3	9.8	10.4	10.2	19.9
HCM Lane LOS	B	A	B	B	C
HCM 95th-tile Q	1.6	1	0.2	0.8	5.6

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↱		↑↑	↑↱	
Traffic Vol, veh/h	0	54	0	250	246	13
Future Vol, veh/h	0	54	0	250	246	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	54	0	250	246	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	130	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	902	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	902	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.2	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	902	-	-
HCM Lane V/C Ratio	-	0.06	-	-
HCM Control Delay (s)	-	9.2	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0.2	-	-

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

HCM 2010 Signalized Intersection Summary
6: Oliver Street & Iris Avenue

AM/PM Gasoline Service Station
Project Completion Year (2022) WP - AM Peak Hour

	↶	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓
Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↰	↑↑↱		↰	↑↑↱			↰↑	↱		↰↑
Traffic Volume (veh/h)	35	184	556	19	36	542	20	90	48	41	53	35
Future Volume (veh/h)	35	184	556	19	36	542	20	90	48	41	53	35
Number		5	2	12	1	6	16	3	8	18	7	4
Initial Q (Qb), veh		0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln		1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h		216	654	22	42	638	24	106	56	48	62	41
Adj No. of Lanes		1	3	0	1	3	0	0	1	1	0	1
Peak Hour Factor		0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %		0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h		543	2356	79	194	1356	51	85	29	427	82	36
Arrive On Green		0.10	0.15	0.15	0.07	0.18	0.18	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h		1810	5155	173	1810	5132	192	0	109	1615	0	136
Grp Volume(v), veh/h		216	438	238	42	429	233	162	0	48	103	0
Grp Sat Flow(s),veh/h/ln		1810	1729	1869	1810	1729	1866	109	0	1615	136	0
Q Serve(g_s), s		7.8	7.9	7.9	1.5	7.8	7.8	0.0	0.0	1.6	0.0	0.0
Cycle Q Clear(g_c), s		7.8	7.9	7.9	1.5	7.8	7.8	18.5	0.0	1.6	18.5	0.0
Prop In Lane		1.00		0.09	1.00		0.10	0.65		1.00	0.60	
Lane Grp Cap(c), veh/h		543	1581	855	194	914	493	114	0	427	118	0
V/C Ratio(X)		0.40	0.28	0.28	0.22	0.47	0.47	1.42	0.00	0.11	0.87	0.00
Avail Cap(c_a), veh/h		543	1581	855	194	914	493	114	0	427	118	0
HCM Platoon Ratio		0.33	0.33	0.33	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00	0.96	0.96	0.96	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh		25.6	19.5	19.5	29.7	24.4	24.4	30.5	0.0	19.5	28.8	0.0
Incr Delay (d2), s/veh		0.5	0.4	0.8	0.5	1.7	3.1	234.1	0.0	0.5	53.5	0.0
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		4.0	3.9	4.3	0.8	3.9	4.5	9.6	0.0	0.8	3.7	0.0
LnGrp Delay(d),s/veh		26.1	19.9	20.3	30.3	26.1	27.5	264.6	0.0	20.1	82.2	0.0
LnGrp LOS		C	B	C	C	C	C	F		C	F	
Approach Vol, veh/h			892			704			210			352
Approach Delay, s/veh			21.5			26.8			208.7			44.0
Approach LOS			C			C			F			D

Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.5	36.0		22.5	25.0	22.5		22.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	7.0	31.5		18.0	20.5	18.0		18.0				
Max Q Clear Time (g_c+I1), s	3.5	9.9		20.5	9.8	9.8		20.5				
Green Ext Time (p_c), s	0.2	4.4		0.0	0.5	2.7		0.0				

Intersection Summary			
HCM 2010 Ctrl Delay			45.1
HCM 2010 LOS			D

Notes

	↲
Movement	SBR
Lane Configurations	↱
Traffic Volume (veh/h)	212
Future Volume (veh/h)	212
Number	14
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Adj Sat Flow, veh/h/ln	1900
Adj Flow Rate, veh/h	249
Adj No. of Lanes	1
Peak Hour Factor	0.85
Percent Heavy Veh, %	0
Cap, veh/h	427
Arrive On Green	0.26
Sat Flow, veh/h	1615
Grp Volume(v), veh/h	249
Grp Sat Flow(s),veh/h/ln	1615
Q Serve(g_s), s	9.4
Cycle Q Clear(g_c), s	9.4
Prop In Lane	1.00
Lane Grp Cap(c), veh/h	427
V/C Ratio(X)	0.58
Avail Cap(c_a), veh/h	427
HCM Platoon Ratio	1.00
Upstream Filter(I)	1.00
Uniform Delay (d), s/veh	22.4
Incr Delay (d2), s/veh	5.7
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(50%),veh/ln	4.9
LnGrp Delay(d),s/veh	28.1
LnGrp LOS	C
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer	

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↑↑↱		↰	↑↑↱		↰	↑	↱	↰	↱	
Traffic Volume (veh/h)	12	25	594	20	19	521	7	24	2	44	14	2	44
Future Volume (veh/h)	12	25	594	20	19	521	7	24	2	44	14	2	44
Number		5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh		0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln		1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h		29	683	23	22	599	8	28	2	51	16	2	51
Adj No. of Lanes		1	3	0	1	3	0	1	1	1	1	1	0
Peak Hour Factor		0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %		0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h		338	1509	51	299	1432	19	89	502	694	89	16	413
Arrive On Green		0.06	0.10	0.10	0.17	0.27	0.27	0.05	0.26	0.26	0.05	0.26	0.26
Sat Flow, veh/h		1810	5154	173	1810	5275	70	1810	1900	1615	1810	61	1563
Grp Volume(v), veh/h		29	458	248	22	392	215	28	2	51	16	0	53
Grp Sat Flow(s),veh/h/ln		1810	1729	1869	1810	1729	1888	1810	1900	1615	1810	0	1624
Q Serve(g_s), s		1.1	8.7	8.8	0.7	6.5	6.5	1.0	0.1	0.0	0.6	0.0	1.7
Cycle Q Clear(g_c), s		1.1	8.7	8.8	0.7	6.5	6.5	1.0	0.1	0.0	0.6	0.0	1.7
Prop In Lane		1.00		0.09	1.00		0.04	1.00		1.00	1.00		0.96
Lane Grp Cap(c), veh/h		338	1013	547	299	939	512	89	502	694	89	0	429
V/C Ratio(X)		0.09	0.45	0.45	0.07	0.42	0.42	0.31	0.00	0.07	0.18	0.00	0.12
Avail Cap(c_a), veh/h		338	1013	547	299	939	512	194	502	694	194	0	429
HCM Platoon Ratio		0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		0.98	0.98	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh		27.2	26.3	26.3	24.7	21.0	21.0	32.1	19.0	11.8	31.9	0.0	19.6
Incr Delay (d2), s/veh		0.1	1.4	2.6	0.1	1.4	2.5	2.0	0.0	0.2	1.0	0.0	0.6
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		0.5	4.4	5.0	0.4	3.3	3.8	0.6	0.0	0.6	0.3	0.0	0.9
LnGrp Delay(d),s/veh		27.3	27.7	29.0	24.8	22.3	23.5	34.1	19.0	12.0	32.9	0.0	20.2
LnGrp LOS		C	C	C	C	C	C	C	B	B	C		C
Approach Vol, veh/h			735			629			81			69	
Approach Delay, s/veh			28.1			22.8			19.8			23.1	
Approach LOS			C			C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.6	24.5	7.4	22.5	17.1	23.0	7.4	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.0	20.0	7.0	18.0	8.5	18.5	7.0	18.0
Max Q Clear Time (g_c+I1), s	2.7	10.8	3.0	3.7	3.1	8.5	2.6	2.1
Green Ext Time (p_c), s	0.0	3.1	0.0	0.2	0.0	2.7	0.0	0.1

Intersection Summary			
HCM 2010 Ctrl Delay			25.2
HCM 2010 LOS			C

Notes

HCM 2010 Signalized Intersection Summary
1: Hillrose Lane/Nason Street & Iris Avenue

AM/PM Gasoline Service Station
Project Completion Year (2022) WP - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑↱		↰	↑↑↑	↱	↰	↑↱		↰	↑	↱
Traffic Volume (veh/h)	254	640	21	17	845	120	14	24	13	136	41	448
Future Volume (veh/h)	254	640	21	17	845	120	14	24	13	136	41	448
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	276	696	23	18	918	130	15	26	14	148	45	487
Adj No. of Lanes	2	3	0	1	3	1	1	1	0	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	381	1385	46	234	1499	467	154	307	166	198	548	641
Arrive On Green	0.11	0.27	0.27	0.04	0.10	0.10	0.09	0.26	0.26	0.11	0.29	0.29
Sat Flow, veh/h	3510	5158	170	1810	5187	1615	1810	1163	626	1810	1900	1615
Grp Volume(v), veh/h	276	466	253	18	918	130	15	0	40	148	45	487
Grp Sat Flow(s),veh/h/ln	1755	1729	1870	1810	1729	1615	1810	0	1789	1810	1900	1615
Q Serve(g_s), s	5.3	8.0	8.0	0.7	11.9	5.2	0.5	0.0	1.2	5.6	1.2	10.2
Cycle Q Clear(g_c), s	5.3	8.0	8.0	0.7	11.9	5.2	0.5	0.0	1.2	5.6	1.2	10.2
Prop In Lane	1.00		0.09	1.00		1.00	1.00		0.35	1.00		1.00
Lane Grp Cap(c), veh/h	381	929	502	234	1499	467	154	0	473	198	548	641
V/C Ratio(X)	0.72	0.50	0.50	0.08	0.61	0.28	0.10	0.00	0.08	0.75	0.08	0.76
Avail Cap(c_a), veh/h	381	929	502	234	1499	467	194	0	473	238	548	641
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.94	0.94	0.94	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.2	21.6	21.7	29.5	27.9	24.9	29.5	0.0	19.4	30.2	18.1	6.7
Incr Delay (d2), s/veh	6.7	1.9	3.6	0.1	1.8	1.4	0.3	0.0	0.4	10.0	0.3	8.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	4.1	4.6	0.3	5.9	2.5	0.3	0.0	0.6	3.3	0.7	5.9
LnGrp Delay(d),s/veh	36.9	23.6	25.2	29.6	29.7	26.3	29.8	0.0	19.7	40.3	18.4	14.9
LnGrp LOS	D	C	C	C	C	C	C		B	D	B	B
Approach Vol, veh/h		995			1066			55			680	
Approach Delay, s/veh		27.7			29.2			22.5			20.7	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	22.8	10.0	24.2	11.6	24.2	11.7	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.0	18.3	7.0	19.7	7.1	18.2	8.7	18.0
Max Q Clear Time (g_c+I1), s	2.7	10.0	2.5	12.2	7.3	13.9	7.6	3.2
Green Ext Time (p_c), s	2.5	2.9	0.0	1.3	0.0	2.5	0.0	0.1

Intersection Summary			
HCM 2010 Ctrl Delay			26.5
HCM 2010 LOS			C

HCM 2010 Signalized Intersection Summary
2: Iris Avenue & Kaiser Hospital Entrance

AM/PM Gasoline Service Station
Project Completion Year (2022) WP - PM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑↑	↑↑↱		↰	↱
Traffic Volume (veh/h)	81	640	803	20	41	36
Future Volume (veh/h)	81	640	803	20	41	36
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	87	688	863	22	44	39
Adj No. of Lanes	1	3	3	0	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	161	3186	2437	62	491	582
Arrive On Green	0.18	1.00	0.94	0.94	0.27	0.27
Sat Flow, veh/h	1810	5358	5373	132	1810	1615
Grp Volume(v), veh/h	87	688	573	312	44	39
Grp Sat Flow(s),veh/h/ln	1810	1729	1729	1877	1810	1615
Q Serve(g_s), s	3.1	0.0	1.1	1.1	1.3	1.1
Cycle Q Clear(g_c), s	3.1	0.0	1.1	1.1	1.3	1.1
Prop In Lane	1.00			0.07	1.00	1.00
Lane Grp Cap(c), veh/h	161	3186	1620	879	491	582
V/C Ratio(X)	0.54	0.22	0.35	0.35	0.09	0.07
Avail Cap(c_a), veh/h	336	3186	1620	879	491	582
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.5	0.0	1.2	1.2	19.0	14.7
Incr Delay (d2), s/veh	2.6	0.1	0.6	1.1	0.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	0.6	0.8	0.7	1.3
LnGrp Delay(d),s/veh	30.1	0.1	1.8	2.3	19.4	14.9
LnGrp LOS	C	A	A	A	B	B
Approach Vol, veh/h		775	885		83	
Approach Delay, s/veh		3.5	2.0		17.3	
Approach LOS		A	A		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		47.0		23.0	10.2	36.8		
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		
Max Green Setting (Gmax), s		42.5		18.5	12.5	25.5		
Max Q Clear Time (g_c+I1), s		2.0		3.3	5.1	3.1		
Green Ext Time (p_c), s		15.0		0.2	0.1	11.6		

Intersection Summary	
HCM 2010 Ctrl Delay	3.4
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↱			↱
Traffic Vol, veh/h	0	703	757	99	0	46
Future Vol, veh/h	0	703	757	99	0	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	703	757	99	0	46

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	428
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.9
Pot Cap-1 Maneuver	0	-	-	-	0	*759
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		1
Mov Cap-1 Maneuver	-	-	-	-	-	*759
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	759
HCM Lane V/C Ratio	-	-	-	0.061
HCM Control Delay (s)	-	-	-	10
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.2

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

HCM 2010 AWSC
4: John F Kennedy Drive & Oliver Street

AM/PM Gasoline Service Station
Project Completion Year (2022) WP - PM Peak Hour

Intersection	
Intersection Delay, s/veh	9
Intersection LOS	A

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Lane Configurations		↰	↱		↑↑↱				↰↑
Traffic Vol, veh/h	0	33	62	0	96	20	0	132	76
Future Vol, veh/h	0	33	62	0	96	20	0	132	76
Peak Hour Factor	1.00	0.93	0.93	1.00	0.93	0.93	1.00	0.93	0.93
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	35	67	0	103	22	0	142	82
Number of Lanes	0	1	1	0	2	0	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	2
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	2	0
HCM Control Delay	8.2	8	9.9
HCM LOS	A	A	A

Lane	NBLn1	NBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	0%	100%	0%	63%
Vol Thru, %	100%	62%	0%	0%	37%
Vol Right, %	0%	38%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	64	52	33	62	208
LT Vol	0	0	33	0	132
Through Vol	64	32	0	0	76
RT Vol	0	20	0	62	0
Lane Flow Rate	69	56	35	67	224
Geometry Grp	7	7	7	7	4
Degree of Util (X)	0.095	0.073	0.058	0.086	0.3
Departure Headway (Hd)	4.946	4.676	5.844	4.637	4.824
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	725	767	614	773	747
Service Time	2.668	2.397	3.569	2.362	2.844
HCM Lane V/C Ratio	0.095	0.073	0.057	0.087	0.3
HCM Control Delay	8.2	7.8	8.9	7.8	9.9
HCM Lane LOS	A	A	A	A	A
HCM 95th-tile Q	0.3	0.2	0.2	0.3	1.3

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↱		↑↑	↑↱	
Traffic Vol, veh/h	0	63	0	114	112	14
Future Vol, veh/h	0	63	0	114	112	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	63	0	114	112	14

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	63	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	995	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	995	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	995	-	-
HCM Lane V/C Ratio	-	0.063	-	-
HCM Control Delay (s)	-	8.9	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0.2	-	-

HCM 2010 Signalized Intersection Summary
6: Oliver Street & Iris Avenue

AM/PM Gasoline Service Station
Project Completion Year (2022) WP - PM Peak Hour

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↰↰	↑↑↱		↰↰	↑↑↱			↰	↱		↰
Traffic Volume (veh/h)	41	82	527	53	43	676	21	54	14	34	60	34
Future Volume (veh/h)	41	82	527	53	43	676	21	54	14	34	60	34
Number		5	2	12	1	6	16	3	8	18	7	4
Initial Q (Qb), veh		0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln		1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h		88	567	57	46	727	23	58	15	37	65	37
Adj No. of Lanes		1	3	0	1	3	0	0	1	1	0	1
Peak Hour Factor		0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %		0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h		543	2389	238	120	1365	43	92	14	427	84	31
Arrive On Green		0.10	0.16	0.16	0.13	0.53	0.53	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h		1810	4797	477	1810	5166	163	0	53	1615	0	117
Grp Volume(v), veh/h		88	407	217	46	486	264	73	0	37	102	0
Grp Sat Flow(s),veh/h/ln		1810	1729	1816	1810	1729	1871	53	0	1615	117	0
Q Serve(g_s), s		3.1	7.2	7.3	1.6	6.5	6.5	0.0	0.0	1.2	0.0	0.0
Cycle Q Clear(g_c), s		3.1	7.2	7.3	1.6	6.5	6.5	18.5	0.0	1.2	18.5	0.0
Prop In Lane		1.00		0.26	1.00		0.09	0.79		1.00	0.64	
Lane Grp Cap(c), veh/h		543	1722	904	120	914	495	106	0	427	115	0
V/C Ratio(X)		0.16	0.24	0.24	0.38	0.53	0.53	0.69	0.00	0.09	0.89	0.00
Avail Cap(c_a), veh/h		543	1722	904	194	914	495	106	0	427	115	0
HCM Platoon Ratio		0.33	0.33	0.33	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00	0.96	0.96	0.96	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh		23.5	17.7	17.7	29.1	13.7	13.7	31.5	0.0	19.4	29.6	0.0
Incr Delay (d2), s/veh		0.1	0.3	0.6	1.9	2.1	3.9	30.5	0.0	0.4	57.4	0.0
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		1.6	3.5	3.8	0.9	3.2	3.8	2.3	0.0	0.6	3.8	0.0
LnGrp Delay(d),s/veh		23.6	18.0	18.3	31.0	15.8	17.6	62.0	0.0	19.8	87.0	0.0
LnGrp LOS		C	B	B	C	B	B	E		B	F	
Approach Vol, veh/h			712			796			110			189
Approach Delay, s/veh			18.8			17.3			47.8			56.7
Approach LOS			B			B			D			E

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.6	38.9		22.5	25.0	22.5		22.5
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	7.0	31.5		18.0	20.5	18.0		18.0
Max Q Clear Time (g_c+I1), s	3.6	9.3		20.5	5.1	8.5		20.5
Green Ext Time (p_c), s	0.0	4.4		0.0	3.8	3.3		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	23.8
HCM 2010 LOS	C

Notes

Movement	SBR
Lane Configurations	↱
Traffic Volume (veh/h)	81
Future Volume (veh/h)	81
Number	14
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Adj Sat Flow, veh/h/ln	1900
Adj Flow Rate, veh/h	87
Adj No. of Lanes	1
Peak Hour Factor	0.93
Percent Heavy Veh, %	0
Cap, veh/h	427
Arrive On Green	0.26
Sat Flow, veh/h	1615
Grp Volume(v), veh/h	87
Grp Sat Flow(s),veh/h/ln	1615
Q Serve(g_s), s	2.9
Cycle Q Clear(g_c), s	2.9
Prop In Lane	1.00
Lane Grp Cap(c), veh/h	427
V/C Ratio(X)	0.20
Avail Cap(c_a), veh/h	427
HCM Platoon Ratio	1.00
Upstream Filter(I)	1.00
Uniform Delay (d), s/veh	20.0
Incr Delay (d2), s/veh	1.1
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(50%),veh/ln	1.4
LnGrp Delay(d),s/veh	21.1
LnGrp LOS	C
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer	

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↑↑↱		↰	↑↑↱		↰	↑	↱	↰	↱	
Traffic Volume (veh/h)	11	28	549	32	43	687	14	21	0	24	10	2	22
Future Volume (veh/h)	11	28	549	32	43	687	14	21	0	24	10	2	22
Number		5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh		0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln		1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h		30	584	34	46	731	15	22	0	26	11	2	23
Adj No. of Lanes		1	3	0	1	3	0	1	1	1	1	1	0
Peak Hour Factor		0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %		0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h		356	2001	116	120	1405	29	76	502	534	76	35	397
Arrive On Green		0.06	0.13	0.13	0.07	0.27	0.27	0.04	0.00	0.26	0.04	0.26	0.26
Sat Flow, veh/h		1810	5017	290	1810	5232	107	1810	1900	1615	1810	131	1504
Grp Volume(v), veh/h		30	401	217	46	483	263	22	0	26	11	0	25
Grp Sat Flow(s),veh/h/ln		1810	1729	1849	1810	1729	1881	1810	1900	1615	1810	0	1635
Q Serve(g_s), s		1.1	7.3	7.4	1.7	8.3	8.3	0.8	0.0	0.5	0.4	0.0	0.8
Cycle Q Clear(g_c), s		1.1	7.3	7.4	1.7	8.3	8.3	0.8	0.0	0.5	0.4	0.0	0.8
Prop In Lane		1.00		0.16	1.00		0.06	1.00		1.00	1.00		0.92
Lane Grp Cap(c), veh/h		356	1380	738	120	929	505	76	502	534	76	0	432
V/C Ratio(X)		0.08	0.29	0.29	0.38	0.52	0.52	0.29	0.00	0.05	0.14	0.00	0.06
Avail Cap(c_a), veh/h		356	1380	738	194	929	505	194	502	534	194	0	432
HCM Platoon Ratio		0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		0.98	0.98	0.98	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh		26.8	21.5	21.5	31.3	21.8	21.8	32.5	0.0	7.5	32.3	0.0	19.2
Incr Delay (d2), s/veh		0.1	0.5	1.0	2.0	2.1	3.8	2.1	0.0	0.2	0.9	0.0	0.3
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		0.6	3.6	4.0	0.9	4.2	4.8	0.5	0.0	0.3	0.2	0.0	0.4
LnGrp Delay(d),s/veh		26.9	22.0	22.5	33.3	23.8	25.6	34.6	0.0	7.6	33.2	0.0	19.5
LnGrp LOS		C	C	C	C	C	C	C		A	C		B
Approach Vol, veh/h			648			792			48			36	
Approach Delay, s/veh			22.4			25.0			20.0			23.7	
Approach LOS			C			C			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.6	31.9	6.9	22.5	17.8	22.8	6.9	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.0	20.0	7.0	18.0	8.7	18.3	7.0	18.0
Max Q Clear Time (g_c+I1), s	3.7	9.4	2.8	2.8	3.1	10.3	2.4	2.5
Green Ext Time (p_c), s	0.0	3.0	0.0	0.1	1.9	3.0	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	23.7
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
1: Hillrose Lane/Nason Street & Iris Avenue

AM/PM Gasoline Service Station
Cumulative (2022) NP - AM Peak Hour

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL
Lane Configurations	↰↰	↑↑↱			↰	↑↑↑	↱	↰	↱			↰
Traffic Volume (veh/h)	398	1178	24	10	20	915	152	20	44	49	1	206
Future Volume (veh/h)	398	1178	24	10	20	915	152	20	44	49	1	206
Number	5	2	12		1	6	16	3	8	18		7
Initial Q (Qb), veh	0	0	0		0	0	0	0	0	0		0
Ped-Bike Adj(A_pbT)	1.00		1.00		1.00		1.00	1.00		1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900		1900	1900	1900	1900	1900	1900		1900
Adj Flow Rate, veh/h	398	1178	24		20	915	152	20	44	49		206
Adj No. of Lanes	2	3	0		1	3	1	1	1	0		1
Peak Hour Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00
Percent Heavy Veh, %	0	0	0		0	0	0	0	0	0		0
Cap, veh/h	376	1775	36		71	1408	438	71	217	242		233
Arrive On Green	0.11	0.34	0.34		0.05	0.36	0.36	0.04	0.26	0.26		0.13
Sat Flow, veh/h	3510	5233	107		1810	5187	1615	1810	822	916		1810
Grp Volume(v), veh/h	398	778	424		20	915	152	20	0	93		206
Grp Sat Flow(s),veh/h/ln	1755	1729	1881		1810	1729	1615	1810	0	1738		1810
Q Serve(g_s), s	7.5	13.4	13.4		0.7	10.3	4.8	0.8	0.0	2.9		7.8
Cycle Q Clear(g_c), s	7.5	13.4	13.4		0.7	10.3	4.8	0.8	0.0	2.9		7.8
Prop In Lane	1.00		0.06		1.00		1.00	1.00		0.53		1.00
Lane Grp Cap(c), veh/h	376	1173	638		71	1408	438	71	0	459		233
V/C Ratio(X)	1.06	0.66	0.66		0.28	0.65	0.35	0.28	0.00	0.20		0.89
Avail Cap(c_a), veh/h	376	1173	638		194	1408	438	194	0	459		233
HCM Platoon Ratio	1.00	1.00	1.00		1.33	1.33	1.33	1.00	1.00	1.00		1.00
Upstream Filter(I)	1.00	1.00	1.00		0.69	0.69	0.69	1.00	0.00	1.00		1.00
Uniform Delay (d), s/veh	31.2	19.7	19.7		32.2	19.6	17.8	32.7	0.0	20.0		30.0
Incr Delay (d2), s/veh	62.6	3.0	5.4		1.5	1.6	1.5	2.1	0.0	1.0		30.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0
%ile BackOfQ(50%),veh/ln	6.9	6.9	7.9		0.4	5.1	2.3	0.4	0.0	1.5		5.9
LnGrp Delay(d),s/veh	93.8	22.7	25.1		33.7	21.2	19.3	34.8	0.0	21.0		60.7
LnGrp LOS	F	C	C		C	C	B	C		C		E
Approach Vol, veh/h		1600				1087			113			
Approach Delay, s/veh		41.0				21.2			23.4			
Approach LOS		D				C			C			

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.8	27.7	6.8	28.7	11.5	23.0	13.0	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.0	18.5	7.0	19.5	7.0	18.5	8.5	18.0
Max Q Clear Time (g_c+I1), s	2.7	15.4	2.8	3.5	9.5	12.3	9.8	4.9
Green Ext Time (p_c), s	0.0	2.3	0.0	1.7	0.0	3.4	0.0	0.3

Intersection Summary	
HCM 2010 Ctrl Delay	31.8
HCM 2010 LOS	C

Notes

	↓	↙
Movement	SBT	SBR
Lane Configurations	↑	↱
Traffic Volume (veh/h)	17	313
Future Volume (veh/h)	17	313
Number	4	14
Initial Q (Qb), veh	0	0
Ped-Bike Adj(A_pbT)		1.00
Parking Bus, Adj	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900
Adj Flow Rate, veh/h	17	313
Adj No. of Lanes	1	1
Peak Hour Factor	1.00	1.00
Percent Heavy Veh, %	0	0
Cap, veh/h	672	744
Arrive On Green	0.35	0.35
Sat Flow, veh/h	1900	1615
Grp Volume(v), veh/h	17	313
Grp Sat Flow(s),veh/h/ln	1900	1615
Q Serve(g_s), s	0.4	1.5
Cycle Q Clear(g_c), s	0.4	1.5
Prop In Lane		1.00
Lane Grp Cap(c), veh/h	672	744
V/C Ratio(X)	0.03	0.42
Avail Cap(c_a), veh/h	672	744
HCM Platoon Ratio	1.00	1.00
Upstream Filter(I)	1.00	1.00
Uniform Delay (d), s/veh	14.8	4.8
Incr Delay (d2), s/veh	0.1	1.7
Initial Q Delay(d3),s/veh	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	2.7
LnGrp Delay(d),s/veh	14.8	6.6
LnGrp LOS	B	A
Approach Vol, veh/h	536	
Approach Delay, s/veh	27.7	
Approach LOS	C	
Timer		

HCM 2010 Signalized Intersection Summary
2: Iris Avenue & Kaiser Hospital Entrance

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑↑	↑↑↱		↰	↱
Traffic Volume (veh/h)	288	1090	941	166	43	44
Future Volume (veh/h)	288	1090	941	166	43	44
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	288	1090	941	166	43	44
Adj No. of Lanes	1	3	3	0	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	465	3223	1364	240	478	842
Arrive On Green	0.51	1.00	0.61	0.61	0.26	0.26
Sat Flow, veh/h	1810	5358	4611	781	1810	1615
Grp Volume(v), veh/h	288	1090	732	375	43	44
Grp Sat Flow(s),veh/h/ln	1810	1729	1729	1762	1810	1615
Q Serve(g_s), s	7.9	0.0	9.9	10.0	1.3	0.0
Cycle Q Clear(g_c), s	7.9	0.0	9.9	10.0	1.3	0.0
Prop In Lane	1.00			0.44	1.00	1.00
Lane Grp Cap(c), veh/h	465	3223	1062	541	478	842
V/C Ratio(X)	0.62	0.34	0.69	0.69	0.09	0.05
Avail Cap(c_a), veh/h	465	3223	1062	541	478	842
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.63	0.63	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.6	0.0	11.3	11.3	19.4	8.2
Incr Delay (d2), s/veh	1.6	0.2	3.7	7.1	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	0.1	5.0	5.7	0.7	0.9
LnGrp Delay(d),s/veh	16.1	0.2	14.9	18.4	19.8	8.4
LnGrp LOS	B	A	B	B	B	A
Approach Vol, veh/h		1378	1107		87	
Approach Delay, s/veh		3.5	16.1		14.0	
Approach LOS		A	B		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		47.5		22.5	22.0	25.5		
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		
Max Green Setting (Gmax), s		43.0		18.0	17.5	21.0		
Max Q Clear Time (g_c+I1), s		2.0		3.3	9.9	12.0		
Green Ext Time (p_c), s		11.4		0.2	4.7	4.8		

Intersection Summary	
HCM 2010 Ctrl Delay	9.3
HCM 2010 LOS	A

Intersection	
Intersection Delay, s/veh	13.4
Intersection LOS	B

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Lane Configurations		↰	↱		↑↱				↰↑
Traffic Vol, veh/h	0	41	108	0	305	75	0	273	170
Future Vol, veh/h	0	41	108	0	305	75	0	273	170
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	41	108	0	305	75	0	273	170
Number of Lanes	0	1	1	0	2	0	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	2
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	2	0
HCM Control Delay	9.9	10	17.6
HCM LOS	A	A	C

Lane	NBLn1	NBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	0%	100%	0%	62%
Vol Thru, %	100%	58%	0%	0%	38%
Vol Right, %	0%	42%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	203	177	41	108	443
LT Vol	0	0	41	0	273
Through Vol	203	102	0	0	170
RT Vol	0	75	0	108	0
Lane Flow Rate	203	177	41	108	443
Geometry Grp	7	7	7	7	4
Degree of Util (X)	0.302	0.248	0.08	0.174	0.647
Departure Headway (Hd)	5.35	5.05	7.017	5.798	5.259
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	665	703	514	622	682
Service Time	3.141	2.841	4.717	3.498	3.34
HCM Lane V/C Ratio	0.305	0.252	0.08	0.174	0.65
HCM Control Delay	10.5	9.5	10.3	9.7	17.6
HCM Lane LOS	B	A	B	A	C
HCM 95th-tile Q	1.3	1	0.3	0.6	4.7

HCM 2010 Signalized Intersection Summary
6: Oliver Street & Iris Avenue

AM/PM Gasoline Service Station
Cumulative (2022) NP - AM Peak Hour

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑↱		↰	↑↑↑↱			↰↑	↱		↰↑	↱
Traffic Volume (veh/h)	210	903	30	47	773	12	107	50	66	7	28	266
Future Volume (veh/h)	210	903	30	47	773	12	107	50	66	7	28	266
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	210	903	30	47	773	12	107	50	66	7	28	266
Adj No. of Lanes	1	3	0	1	3	0	0	1	1	0	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	543	2357	78	194	1391	22	86	25	427	62	190	427
Arrive On Green	0.10	0.15	0.15	0.11	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	1810	5157	171	1810	5262	82	0	96	1615	0	717	1615
Grp Volume(v), veh/h	210	605	328	47	508	277	157	0	66	35	0	266
Grp Sat Flow(s),veh/h/ln	1810	1729	1870	1810	1729	1886	96	0	1615	717	0	1615
Q Serve(g_s), s	7.6	11.0	11.1	1.7	8.9	8.9	0.0	0.0	2.2	0.0	0.0	10.2
Cycle Q Clear(g_c), s	7.6	11.0	11.1	1.7	8.9	8.9	18.5	0.0	2.2	18.5	0.0	10.2
Prop In Lane	1.00		0.09	1.00		0.04	0.68		1.00	0.20		1.00
Lane Grp Cap(c), veh/h	543	1581	855	194	914	498	112	0	427	251	0	427
V/C Ratio(X)	0.39	0.38	0.38	0.24	0.56	0.56	1.40	0.00	0.15	0.14	0.00	0.62
Avail Cap(c_a), veh/h	543	1581	855	194	914	498	112	0	427	251	0	427
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.95	0.95	0.95	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.5	20.8	20.8	28.6	22.2	22.2	30.9	0.0	19.8	20.2	0.0	22.7
Incr Delay (d2), s/veh	0.5	0.7	1.3	0.6	2.3	4.2	226.5	0.0	0.8	1.2	0.0	6.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	5.4	6.1	0.9	4.5	5.2	9.2	0.0	1.1	0.6	0.0	5.3
LnGrp Delay(d),s/veh	26.0	21.5	22.1	29.3	24.5	26.4	257.5	0.0	20.5	21.4	0.0	29.4
LnGrp LOS	C	C	C	C	C	C	F		C	C		C
Approach Vol, veh/h		1143			832			223			301	
Approach Delay, s/veh		22.5			25.4			187.3			28.5	
Approach LOS		C			C			F			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	11.5	36.0		22.5	25.0	22.5		22.5
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	7.0	31.5		18.0	20.5	18.0		18.0
Max Q Clear Time (g_c+I1), s	3.7	13.1		20.5	9.6	10.9		20.5
Green Ext Time (p_c), s	0.2	6.0		0.0	0.5	2.9		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	38.9
HCM 2010 LOS	D

Notes

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↶↰	↑↑↱		↰	↑↑↱		↰	↑	↱	↰	↱	
Traffic Volume (veh/h)	2	29	909	35	24	725	7	37	2	56	14	2	65
Future Volume (veh/h)	2	29	909	35	24	725	7	37	2	56	14	2	65
Number		5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh		0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln		1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h		29	909	35	24	725	7	37	2	56	14	2	65
Adj No. of Lanes		1	3	0	1	3	0	1	1	1	1	1	0
Peak Hour Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %		0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h		321	1501	58	282	1438	14	106	502	679	106	13	416
Arrive On Green		0.12	0.20	0.20	0.16	0.27	0.27	0.06	0.26	0.26	0.06	0.26	0.26
Sat Flow, veh/h		1810	5126	197	1810	5298	51	1810	1900	1615	1810	48	1574
Grp Volume(v), veh/h		29	613	331	24	473	259	37	2	56	14	0	67
Grp Sat Flow(s),veh/h/ln		1810	1729	1865	1810	1729	1891	1810	1900	1615	1810	0	1622
Q Serve(g_s), s		1.0	11.3	11.3	0.8	8.1	8.1	1.4	0.1	0.0	0.5	0.0	2.2
Cycle Q Clear(g_c), s		1.0	11.3	11.3	0.8	8.1	8.1	1.4	0.1	0.0	0.5	0.0	2.2
Prop In Lane		1.00		0.11	1.00		0.03	1.00		1.00	1.00		0.97
Lane Grp Cap(c), veh/h		321	1013	546	282	939	513	106	502	679	106	0	429
V/C Ratio(X)		0.09	0.61	0.61	0.09	0.50	0.50	0.35	0.00	0.08	0.13	0.00	0.16
Avail Cap(c_a), veh/h		321	1013	546	282	939	513	194	502	679	194	0	429
HCM Platoon Ratio		0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		0.94	0.94	0.94	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh		25.8	24.4	24.5	25.3	21.5	21.5	31.7	19.0	12.2	31.3	0.0	19.8
Incr Delay (d2), s/veh		0.1	2.5	4.6	0.1	1.9	3.5	2.0	0.0	0.2	0.6	0.0	0.8
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		0.5	5.7	6.5	0.4	4.1	4.7	0.7	0.0	0.7	0.3	0.0	1.1
LnGrp Delay(d),s/veh		25.9	27.0	29.1	25.4	23.5	25.0	33.6	19.0	12.4	31.8	0.0	20.5
LnGrp LOS		C	C	C	C	C	C	C	B	B	C		C
Approach Vol, veh/h			973			756			95			81	
Approach Delay, s/veh			27.6			24.1			20.8			22.5	
Approach LOS			C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.9	24.5	8.1	22.5	16.4	23.0	8.1	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.0	20.0	7.0	18.0	8.5	18.5	7.0	18.0
Max Q Clear Time (g_c+I1), s	12.8	13.3	3.4	4.2	3.0	10.1	2.5	2.1
Green Ext Time (p_c), s	0.0	3.3	0.0	0.2	0.0	3.0	0.0	0.1

Intersection Summary	
HCM 2010 Ctrl Delay	25.7
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary
1: Hillrose Lane/Nason Street & Iris Avenue

AM/PM Gasoline Service Station
Cumulative (2022) NP - PM Peak Hour

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑↑↱		↰	↑↑↑	↱	↰	↱		↰	↑	↱
Traffic Volume (veh/h)	293	798	21	61	1213	238	14	27	26	234	42	516
Future Volume (veh/h)	293	798	21	61	1213	238	14	27	26	234	42	516
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	293	798	21	61	1213	238	14	27	26	234	42	516
Adj No. of Lanes	2	3	0	1	3	1	1	1	0	1	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	381	1396	37	194	1386	431	194	235	227	238	548	641
Arrive On Green	0.11	0.27	0.27	0.04	0.09	0.09	0.11	0.26	0.26	0.13	0.29	0.29
Sat Flow, veh/h	3510	5197	137	1810	5187	1615	1810	891	858	1810	1900	1615
Grp Volume(v), veh/h	293	531	288	61	1213	238	14	0	53	234	42	516
Grp Sat Flow(s),veh/h/ln	1755	1729	1876	1810	1729	1615	1810	0	1749	1810	1900	1615
Q Serve(g_s), s	5.7	9.3	9.3	2.3	16.2	9.9	0.5	0.0	1.6	9.0	1.1	10.4
Cycle Q Clear(g_c), s	5.7	9.3	9.3	2.3	16.2	9.9	0.5	0.0	1.6	9.0	1.1	10.4
Prop In Lane	1.00		0.07	1.00		1.00	1.00		0.49	1.00		1.00
Lane Grp Cap(c), veh/h	381	929	504	194	1386	431	194	0	462	238	548	641
V/C Ratio(X)	0.77	0.57	0.57	0.31	0.88	0.55	0.07	0.00	0.11	0.98	0.08	0.80
Avail Cap(c_a), veh/h	381	929	504	194	1386	431	194	0	462	238	548	641
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.81	0.81	0.81	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.3	22.1	22.1	31.3	30.8	27.9	28.1	0.0	19.5	30.3	18.1	6.4
Incr Delay (d2), s/veh	9.2	2.5	4.7	0.7	6.6	4.1	0.2	0.0	0.5	53.7	0.3	10.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	4.7	5.5	1.2	8.6	4.9	0.2	0.0	0.8	8.0	0.6	6.3
LnGrp Delay(d),s/veh	39.5	24.7	26.8	32.0	37.4	32.0	28.3	0.0	20.0	84.0	18.4	16.8
LnGrp LOS	D	C	C	C	D	C	C		C	F	B	B
Approach Vol, veh/h		1112			1512			67			792	
Approach Delay, s/veh		29.1			36.3			21.8			36.7	
Approach LOS		C			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.5	22.8	11.5	24.2	11.6	22.7	13.2	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.0	18.3	7.0	19.7	7.1	18.2	8.7	18.0
Max Q Clear Time (g_c+I1), s	4.3	11.3	2.5	12.4	7.7	18.2	11.0	3.6
Green Ext Time (p_c), s	2.1	3.0	0.1	1.4	0.0	0.0	0.0	0.2

Intersection Summary	
HCM 2010 Ctrl Delay	33.8
HCM 2010 LOS	C

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

HCM 2010 Signalized Intersection Summary
2: Iris Avenue & Kaiser Hospital Entrance

AM/PM Gasoline Service Station
Cumulative (2022) NP - PM Peak Hour

	↗	→	←	↖	↘	↙
Movement	**EBL**	**EBT**	**WBT**	**WBR**	**SBL**	**SBR**
Lane Configurations	↰	↑↑↑	↑↑↱		↰	↱
Traffic Volume (veh/h)	157	833	1145	85	206	123
Future Volume (veh/h)	157	833	1145	85	206	123
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	157	833	1145	85	206	123
Adj No. of Lanes	1	3	3	0	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	206	3186	2185	162	491	622
Arrive On Green	0.23	1.00	0.89	0.89	0.27	0.27
Sat Flow, veh/h	1810	5358	5099	366	1810	1615
Grp Volume(v), veh/h	157	833	803	427	206	123
Grp Sat Flow(s),veh/h/ln	1810	1729	1729	1835	1810	1615
Q Serve(g_s), s	5.7	0.0	3.4	3.4	6.6	3.5
Cycle Q Clear(g_c), s	5.7	0.0	3.4	3.4	6.6	3.5
Prop In Lane	1.00			0.20	1.00	1.00
Lane Grp Cap(c), veh/h	206	3186	1533	814	491	622
V/C Ratio(X)	0.76	0.26	0.52	0.52	0.42	0.20
Avail Cap(c_a), veh/h	336	3186	1533	814	491	622
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.78	0.78	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.1	0.0	2.4	2.4	21.0	14.3
Incr Delay (d2), s/veh	4.5	0.2	1.3	2.4	2.6	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	0.0	1.6	2.0	3.6	4.0
LnGrp Delay(d),s/veh	30.7	0.2	3.7	4.8	23.6	15.0
LnGrp LOS	C	A	A	A	C	B
Approach Vol, veh/h		990	1230		329	
Approach Delay, s/veh		5.0	4.1		20.4	
Approach LOS		A	A		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		47.0		23.0	12.0	35.0		
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		
Max Green Setting (Gmax), s		42.5		18.5	12.5	25.5		
Max Q Clear Time (g_c+I1), s		2.0		8.6	7.7	5.4		
Green Ext Time (p_c), s		22.0		0.7	0.2	14.1		

Intersection Summary	
HCM 2010 Ctrl Delay	6.5
HCM 2010 LOS	A

Intersection	
Intersection Delay, s/veh	9.3
Intersection LOS	A

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Lane Configurations		↰	↱		↑↱				↰↑
Traffic Vol, veh/h	0	64	79	0	144	33	0	137	99
Future Vol, veh/h	0	64	79	0	144	33	0	137	99
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	64	79	0	144	33	0	137	99
Number of Lanes	0	1	1	0	2	0	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	2
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	2	0
HCM Control Delay	8.7	8.4	10.4
HCM LOS	A	A	B

Lane	NBLn1	NBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	0%	100%	0%	58%
Vol Thru, %	100%	59%	0%	0%	42%
Vol Right, %	0%	41%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	96	81	64	79	236
LT Vol	0	0	64	0	137
Through Vol	96	48	0	0	99
RT Vol	0	33	0	79	0
Lane Flow Rate	96	81	64	79	236
Geometry Grp	7	7	7	7	4
Degree of Util (X)	0.136	0.108	0.107	0.105	0.327
Departure Headway (Hd)	5.09	4.803	6	4.792	4.989
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	704	745	597	746	720
Service Time	2.825	2.538	3.741	2.533	3.022
HCM Lane V/C Ratio	0.136	0.109	0.107	0.106	0.328
HCM Control Delay	8.6	8.1	9.5	8.1	10.4
HCM Lane LOS	A	A	A	A	B
HCM 95th-tile Q	0.5	0.4	0.4	0.4	1.4

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

HCM 2010 Signalized Intersection Summary
6: Oliver Street & Iris Avenue

AM/PM Gasoline Service Station
Cumulative (2022) NP - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱			↰↑	↱		↰↑	↱
Traffic Volume (veh/h)	152	831	86	73	1060	11	61	16	43	8	26	121
Future Volume (veh/h)	152	831	86	73	1060	11	61	16	43	8	26	121
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	152	831	86	73	1060	11	61	16	43	8	26	121
Adj No. of Lanes	1	3	0	1	3	0	0	1	1	0	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	543	2300	237	150	1399	15	362	85	427	137	400	427
Arrive On Green	0.10	0.16	0.16	0.17	0.53	0.53	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	1810	4779	492	1810	5293	55	1019	321	1615	278	1514	1615
Grp Volume(v), veh/h	152	600	317	73	692	379	77	0	43	34	0	121
Grp Sat Flow(s),veh/h/ln	1810	1729	1813	1810	1729	1890	1340	0	1615	1791	0	1615
Q Serve(g_s), s	5.4	10.8	10.9	2.6	11.0	11.0	2.4	0.0	1.4	0.0	0.0	4.2
Cycle Q Clear(g_c), s	5.4	10.8	10.9	2.6	11.0	11.0	3.3	0.0	1.4	0.9	0.0	4.2
Prop In Lane	1.00		0.27	1.00		0.03	0.79		1.00	0.24		1.00
Lane Grp Cap(c), veh/h	543	1664	873	150	914	500	446	0	427	537	0	427
V/C Ratio(X)	0.28	0.36	0.36	0.49	0.76	0.76	0.17	0.00	0.10	0.06	0.00	0.28
Avail Cap(c_a), veh/h	543	1664	873	194	914	500	446	0	427	537	0	427
HCM Platoon Ratio	0.33	0.33	0.33	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.88	0.88	0.88	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.5	19.8	19.9	27.8	14.7	14.7	20.2	0.0	19.5	19.3	0.0	20.5
Incr Delay (d2), s/veh	0.3	0.6	1.2	2.1	5.2	9.2	0.8	0.0	0.5	0.2	0.0	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	5.4	5.8	1.3	5.7	6.7	1.3	0.0	0.7	0.5	0.0	2.1
LnGrp Delay(d),s/veh	24.8	20.4	21.0	30.0	19.9	23.9	21.0	0.0	19.9	19.5	0.0	22.1
LnGrp LOS	C	C	C	C	B	C	C		B	B		C
Approach Vol, veh/h		1069			1144			120			155	
Approach Delay, s/veh		21.2			21.9			20.6			21.6	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.8	37.7		22.5	25.0	22.5		22.5
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	7.0	31.5		18.0	20.5	18.0		18.0
Max Q Clear Time (g_c+I1), s	4.6	12.9		6.2	7.4	13.0		5.3
Green Ext Time (p_c), s	0.0	6.4		0.9	5.4	2.9		0.9

Intersection Summary	
HCM 2010 Ctrl Delay	21.5
HCM 2010 LOS	C

Notes

HCM 2010 Signalized Intersection Summary

AM/PM Gasoline Service Station

7: Via Del Lago & Iris Avenue/Moreno Beach Drive

Cumulative (2022) NP - PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↱		↰	↑↑↱		↰	↑	↱	↰	↱	
Traffic Volume (veh/h)	56	771	52	57	1074	14	38	0	28	10	2	31
Future Volume (veh/h)	56	771	52	57	1074	14	38	0	28	10	2	31
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	56	771	52	57	1074	14	38	0	28	10	2	31
Adj No. of Lanes	1	3	0	1	3	0	1	1	1	1	1	0
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	324	1855	125	134	1417	18	107	502	547	107	26	405
Arrive On Green	0.06	0.12	0.12	0.07	0.27	0.27	0.06	0.00	0.26	0.06	0.26	0.26
Sat Flow, veh/h	1810	4966	334	1810	5277	69	1810	1900	1615	1810	99	1531
Grp Volume(v), veh/h	56	536	287	57	704	384	38	0	28	10	0	33
Grp Sat Flow(s),veh/h/ln	1810	1729	1841	1810	1729	1888	1810	1900	1615	1810	0	1630
Q Serve(g_s), s	2.1	10.0	10.1	2.1	13.1	13.1	1.4	0.0	0.5	0.4	0.0	1.1
Cycle Q Clear(g_c), s	2.1	10.0	10.1	2.1	13.1	13.1	1.4	0.0	0.5	0.4	0.0	1.1
Prop In Lane	1.00		0.18	1.00		0.04	1.00		1.00	1.00		0.94
Lane Grp Cap(c), veh/h	324	1292	688	134	929	507	107	502	547	107	0	431
V/C Ratio(X)	0.17	0.41	0.42	0.42	0.76	0.76	0.35	0.00	0.05	0.09	0.00	0.08
Avail Cap(c_a), veh/h	324	1292	688	194	929	507	194	502	547	194	0	431
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.95	0.95	0.95	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.0	23.6	23.6	31.0	23.5	23.5	31.6	0.0	6.8	31.1	0.0	19.3
Incr Delay (d2), s/veh	0.2	0.9	1.8	2.1	5.8	10.2	2.0	0.0	0.2	0.4	0.0	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	5.0	5.5	1.1	7.0	8.3	0.8	0.0	0.3	0.2	0.0	0.5
LnGrp Delay(d),s/veh	28.2	24.5	25.4	33.1	29.3	33.7	33.6	0.0	7.0	31.5	0.0	19.7
LnGrp LOS	C	C	C	C	C	C	C		A	C		B
Approach Vol, veh/h		879			1145			66			43	
Approach Delay, s/veh		25.1			30.9			22.3			22.4	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.2	30.2	8.2	22.5	16.5	22.8	8.2	22.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	7.0	20.0	7.0	18.0	8.7	18.3	7.0	18.0				
Max Q Clear Time (g_c+I1), s	4.1	12.1	3.4	3.1	4.1	15.1	2.4	2.5				
Green Ext Time (p_c), s	0.0	3.4	0.0	0.1	2.2	2.0	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			28.1									
HCM 2010 LOS			C									
Notes												

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

HCM 2010 Signalized Intersection Summary
1: Hillrose Lane/Nason Street & Iris Avenue

AM/PM Gasoline Service Station
Cumulative (2022) WP - AM Peak Hour

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL
Lane Configurations	↰↰	↑↑↱			↰	↑↑↑	↱	↰	↱			↰
Traffic Volume (veh/h)	398	1187	24	10	22	924	156	20	44	51	1	211
Future Volume (veh/h)	398	1187	24	10	22	924	156	20	44	51	1	211
Number	5	2	12		1	6	16	3	8	18		7
Initial Q (Qb), veh	0	0	0		0	0	0	0	0	0		0
Ped-Bike Adj(A_pbT)	1.00		1.00		1.00		1.00	1.00		1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900		1900	1900	1900	1900	1900	1900		1900
Adj Flow Rate, veh/h	398	1187	24		22	924	156	20	44	51		211
Adj No. of Lanes	2	3	0		1	3	1	1	1	0		1
Peak Hour Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00		1.00
Percent Heavy Veh, %	0	0	0		0	0	0	0	0	0		0
Cap, veh/h	376	1762	36		76	1408	438	71	212	246		233
Arrive On Green	0.11	0.34	0.34		0.06	0.36	0.36	0.04	0.26	0.26		0.13
Sat Flow, veh/h	3510	5234	106		1810	5187	1615	1810	804	932		1810
Grp Volume(v), veh/h	398	784	427		22	924	156	20	0	95		211
Grp Sat Flow(s),veh/h/ln	1755	1729	1881		1810	1729	1615	1810	0	1736		1810
Q Serve(g_s), s	7.5	13.6	13.6		0.8	10.4	5.0	0.8	0.0	3.0		8.1
Cycle Q Clear(g_c), s	7.5	13.6	13.6		0.8	10.4	5.0	0.8	0.0	3.0		8.1
Prop In Lane	1.00		0.06		1.00		1.00	1.00		0.54		1.00
Lane Grp Cap(c), veh/h	376	1164	633		76	1408	438	71	0	459		233
V/C Ratio(X)	1.06	0.67	0.67		0.29	0.66	0.36	0.28	0.00	0.21		0.91
Avail Cap(c_a), veh/h	376	1164	633		194	1408	438	194	0	459		233
HCM Platoon Ratio	1.00	1.00	1.00		1.33	1.33	1.33	1.00	1.00	1.00		1.00
Upstream Filter(I)	1.00	1.00	1.00		0.68	0.68	0.68	1.00	0.00	1.00		1.00
Uniform Delay (d), s/veh	31.2	19.9	19.9		32.0	19.6	17.9	32.7	0.0	20.0		30.1
Incr Delay (d2), s/veh	62.6	3.1	5.7		1.4	1.6	1.5	2.1	0.0	1.0		35.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0
%ile BackOfQ(50%),veh/ln	6.9	6.9	8.0		0.4	5.2	2.4	0.4	0.0	1.6		6.3
LnGrp Delay(d),s/veh	93.8	23.0	25.6		33.5	21.3	19.4	34.8	0.0	21.1		65.1
LnGrp LOS	F	C	C		C	C	B	C		C		E
Approach Vol, veh/h		1609				1102			115			
Approach Delay, s/veh		41.2				21.2			23.4			
Approach LOS		D				C			C			

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.9	27.6	6.8	28.7	11.5	23.0	13.0	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.0	18.5	7.0	19.5	7.0	18.5	8.5	18.0
Max Q Clear Time (g_c+I1), s	2.8	15.6	2.8	3.5	9.5	12.4	10.1	5.0
Green Ext Time (p_c), s	0.0	2.2	0.0	1.7	0.0	3.3	0.0	0.3

Intersection Summary	
HCM 2010 Ctrl Delay	32.2
HCM 2010 LOS	C

Notes

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

	↓	↙
Movement	SBT	SBR
Lane Configurations	↑	↱
Traffic Volume (veh/h)	17	313
Future Volume (veh/h)	17	313
Number	4	14
Initial Q (Qb), veh	0	0
Ped-Bike Adj(A_pbT)		1.00
Parking Bus, Adj	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900
Adj Flow Rate, veh/h	17	313
Adj No. of Lanes	1	1
Peak Hour Factor	1.00	1.00
Percent Heavy Veh, %	0	0
Cap, veh/h	672	744
Arrive On Green	0.35	0.35
Sat Flow, veh/h	1900	1615
Grp Volume(v), veh/h	17	313
Grp Sat Flow(s),veh/h/ln	1900	1615
Q Serve(g_s), s	0.4	1.5
Cycle Q Clear(g_c), s	0.4	1.5
Prop In Lane		1.00
Lane Grp Cap(c), veh/h	672	744
V/C Ratio(X)	0.03	0.42
Avail Cap(c_a), veh/h	672	744
HCM Platoon Ratio	1.00	1.00
Upstream Filter(I)	1.00	1.00
Uniform Delay (d), s/veh	14.8	4.8
Incr Delay (d2), s/veh	0.1	1.7
Initial Q Delay(d3),s/veh	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	2.7
LnGrp Delay(d),s/veh	14.8	6.6
LnGrp LOS	B	A
Approach Vol, veh/h	541	
Approach Delay, s/veh	29.7	
Approach LOS	C	
Timer		

HCM 2010 Signalized Intersection Summary
2: Iris Avenue & Kaiser Hospital Entrance

AM/PM Gasoline Service Station
Cumulative (2022) WP - AM Peak Hour

Movement	EBL	EBT	WBT	WBR	SBL	SBR
	↗	→	←	↖	↘	↙
Lane Configurations	↰	↑↑↑	↑↑↱		↰	↱
Traffic Volume (veh/h)	288	1106	956	166	43	44
Future Volume (veh/h)	288	1106	956	166	43	44
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	288	1106	956	166	43	44
Adj No. of Lanes	1	3	3	0	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	465	3223	1367	237	478	842
Arrive On Green	0.51	1.00	0.61	0.61	0.26	0.26
Sat Flow, veh/h	1810	5358	4622	771	1810	1615
Grp Volume(v), veh/h	288	1106	742	380	43	44
Grp Sat Flow(s),veh/h/ln	1810	1729	1729	1764	1810	1615
Q Serve(g_s), s	7.9	0.0	10.1	10.2	1.3	0.0
Cycle Q Clear(g_c), s	7.9	0.0	10.1	10.2	1.3	0.0
Prop In Lane	1.00			0.44	1.00	1.00
Lane Grp Cap(c), veh/h	465	3223	1062	542	478	842
V/C Ratio(X)	0.62	0.34	0.70	0.70	0.09	0.05
Avail Cap(c_a), veh/h	465	3223	1062	542	478	842
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.62	0.62	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.6	0.0	11.3	11.3	19.4	8.2
Incr Delay (d2), s/veh	1.5	0.2	3.8	7.4	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	0.1	5.1	5.8	0.7	0.9
LnGrp Delay(d),s/veh	16.1	0.2	15.1	18.7	19.8	8.4
LnGrp LOS	B	A	B	B	B	A
Approach Vol, veh/h		1394	1122		87	
Approach Delay, s/veh		3.5	16.3		14.0	
Approach LOS		A	B		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		47.5		22.5	22.0	25.5		
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		
Max Green Setting (Gmax), s		43.0		18.0	17.5	21.0		
Max Q Clear Time (g_c+I1), s		2.0		3.3	9.9	12.2		
Green Ext Time (p_c), s		11.6		0.2	4.7	4.7		

Intersection Summary		
HCM 2010 Ctrl Delay		9.4
HCM 2010 LOS		A

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↱			↱
Traffic Vol, veh/h	0	1136	1111	84	0	40
Future Vol, veh/h	0	1136	1111	84	0	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	1136	1111	84	0	40

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	598
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.9
Pot Cap-1 Maneuver	0	-	-	-	0	*683
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		1
Mov Cap-1 Maneuver	-	-	-	-	-	*683
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.6
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	683
HCM Lane V/C Ratio	-	-	-	0.059
HCM Control Delay (s)	-	-	-	10.6
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.2

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Intersection	
Intersection Delay, s/veh	13.7
Intersection LOS	B

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Lane Configurations		↰	↱		↑↱				↰
Traffic Vol, veh/h	0	43	108	0	311	75	0	273	177
Future Vol, veh/h	0	43	108	0	311	75	0	273	177
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	43	108	0	311	75	0	273	177
Number of Lanes	0	1	1	0	2	0	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	2
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	2	0
HCM Control Delay	10	10.1	18.1
HCM LOS	A	B	C

Lane	NBLn1	NBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	0%	100%	0%	61%
Vol Thru, %	100%	58%	0%	0%	39%
Vol Right, %	0%	42%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	207	179	43	108	450
LT Vol	0	0	43	0	273
Through Vol	207	104	0	0	177
RT Vol	0	75	0	108	0
Lane Flow Rate	207	179	43	108	450
Geometry Grp	7	7	7	7	4
Degree of Util (X)	0.309	0.252	0.084	0.175	0.659
Departure Headway (Hd)	5.365	5.068	7.05	5.83	5.27
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	661	700	511	619	680
Service Time	3.161	2.863	4.75	3.53	3.355
HCM Lane V/C Ratio	0.313	0.256	0.084	0.174	0.662
HCM Control Delay	10.6	9.6	10.4	9.8	18.1
HCM Lane LOS	B	A	B	A	C
HCM 95th-tile Q	1.3	1	0.3	0.6	4.9

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↱		↑↑	↑↱	
Traffic Vol, veh/h	0	54	0	278	298	13
Future Vol, veh/h	0	54	0	278	298	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	54	0	278	298	13

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	156	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	868	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	868	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	868	-	-
HCM Lane V/C Ratio	-	0.062	-	-
HCM Control Delay (s)	-	9.4	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0.2	-	-

HCM 2010 Signalized Intersection Summary
6: Oliver Street & Iris Avenue

AM/PM Gasoline Service Station
Cumulative (2022) WP - AM Peak Hour

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↰	↑↑↱		↰	↑↑↱			↰	↱		↰
Traffic Volume (veh/h)	35	210	885	28	45	791	21	114	49	65	53	35
Future Volume (veh/h)	35	210	885	28	45	791	21	114	49	65	53	35
Number		5	2	12	1	6	16	3	8	18	7	4
Initial Q (Qb), veh		0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln		1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h		210	885	28	45	791	21	114	49	65	53	35
Adj No. of Lanes		1	3	0	1	3	0	0	1	1	0	1
Peak Hour Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %		0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h		543	2362	75	194	1373	36	87	23	427	82	36
Arrive On Green		0.10	0.15	0.15	0.11	0.26	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h		1810	5166	163	1810	5196	138	0	88	1615	0	136
Grp Volume(v), veh/h		210	592	321	45	526	286	163	0	65	88	0
Grp Sat Flow(s),veh/h/ln		1810	1729	1871	1810	1729	1876	88	0	1615	136	0
Q Serve(g_s), s		7.6	10.8	10.8	1.6	9.2	9.3	0.0	0.0	2.2	0.0	0.0
Cycle Q Clear(g_c), s		7.6	10.8	10.8	1.6	9.2	9.3	18.5	0.0	2.2	18.5	0.0
Prop In Lane		1.00		0.09	1.00		0.07	0.70		1.00	0.60	
Lane Grp Cap(c), veh/h		543	1581	855	194	914	496	111	0	427	118	0
V/C Ratio(X)		0.39	0.37	0.38	0.23	0.58	0.58	1.47	0.00	0.15	0.74	0.00
Avail Cap(c_a), veh/h		543	1581	855	194	914	496	111	0	427	118	0
HCM Platoon Ratio		0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00	0.94	0.94	0.94	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh		25.5	20.7	20.7	28.6	22.3	22.4	31.2	0.0	19.7	27.7	0.0
Incr Delay (d2), s/veh		0.5	0.7	1.3	0.6	2.5	4.5	254.7	0.0	0.8	34.2	0.0
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		3.9	5.3	5.9	0.8	4.7	5.4	10.0	0.0	1.1	2.8	0.0
LnGrp Delay(d),s/veh		26.0	21.4	22.0	29.2	24.8	26.9	285.9	0.0	20.5	61.9	0.0
LnGrp LOS		C	C	C	C	C	C	F		C	E	
Approach Vol, veh/h			1123			857			228			351
Approach Delay, s/veh			22.4			25.7			210.2			37.4
Approach LOS			C			C			F			D

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	11.5	36.0		22.5	25.0	22.5		22.5
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	7.0	31.5		18.0	20.5	18.0		18.0
Max Q Clear Time (g_c+I1), s	3.6	12.8		20.5	9.6	11.3		20.5
Green Ext Time (p_c), s	0.2	5.9		0.0	0.5	2.8		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	42.3
HCM 2010 LOS	D

Notes

Movement	SBR
Lane Configurations	↱
Traffic Volume (veh/h)	263
Future Volume (veh/h)	263
Number	14
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Adj Sat Flow, veh/h/ln	1900
Adj Flow Rate, veh/h	263
Adj No. of Lanes	1
Peak Hour Factor	1.00
Percent Heavy Veh, %	0
Cap, veh/h	427
Arrive On Green	0.26
Sat Flow, veh/h	1615
Grp Volume(v), veh/h	263
Grp Sat Flow(s),veh/h/ln	1615
Q Serve(g_s), s	10.0
Cycle Q Clear(g_c), s	10.0
Prop In Lane	1.00
Lane Grp Cap(c), veh/h	427
V/C Ratio(X)	0.62
Avail Cap(c_a), veh/h	427
HCM Platoon Ratio	1.00
Upstream Filter(I)	1.00
Uniform Delay (d), s/veh	22.6
Incr Delay (d2), s/veh	6.5
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(50%),veh/ln	5.2
LnGrp Delay(d),s/veh	29.2
LnGrp LOS	C
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer	

HCM 2010 Signalized Intersection Summary

7: Via Del Lago & Iris Avenue/Moreno Beach Drive

AM/PM Gasoline Service Station
Cumulative (2022) WP - AM Peak Hour

	↶	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↶	↑↑↱		↰	↑↑↱		↰	↑	↱	↰	↱	
Traffic Volume (veh/h)	12	32	924	35	24	739	7	37	2	56	14	2	67
Future Volume (veh/h)	12	32	924	35	24	739	7	37	2	56	14	2	67
Number		5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh		0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln		1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h		32	924	35	24	739	7	37	2	56	14	2	67
Adj No. of Lanes		1	3	0	1	3	0	1	1	1	1	1	0
Peak Hour Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %		0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h		321	1502	57	282	1438	14	106	502	679	106	12	416
Arrive On Green		0.12	0.20	0.20	0.16	0.27	0.27	0.06	0.26	0.26	0.06	0.26	0.26
Sat Flow, veh/h		1810	5130	194	1810	5299	50	1810	1900	1615	1810	47	1575
Grp Volume(v), veh/h		32	622	337	24	482	264	37	2	56	14	0	69
Grp Sat Flow(s),veh/h/ln		1810	1729	1866	1810	1729	1891	1810	1900	1615	1810	0	1622
Q Serve(g_s), s		1.1	11.5	11.5	0.8	8.3	8.3	1.4	0.1	0.0	0.5	0.0	2.3
Cycle Q Clear(g_c), s		1.1	11.5	11.5	0.8	8.3	8.3	1.4	0.1	0.0	0.5	0.0	2.3
Prop In Lane		1.00		0.10	1.00		0.03	1.00		1.00	1.00		0.97
Lane Grp Cap(c), veh/h		321	1013	546	282	939	513	106	502	679	106	0	429
V/C Ratio(X)		0.10	0.61	0.62	0.09	0.51	0.51	0.35	0.00	0.08	0.13	0.00	0.16
Avail Cap(c_a), veh/h		321	1013	546	282	939	513	194	502	679	194	0	429
HCM Platoon Ratio		0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		0.96	0.96	0.96	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh		25.9	24.5	24.5	25.3	21.6	21.6	31.7	19.0	12.2	31.3	0.0	19.8
Incr Delay (d2), s/veh		0.1	2.7	4.9	0.1	2.0	3.7	2.0	0.0	0.2	0.6	0.0	0.8
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		0.6	5.8	6.7	0.4	4.2	4.8	0.7	0.0	0.7	0.3	0.0	1.1
LnGrp Delay(d),s/veh		26.0	27.2	29.4	25.4	23.6	25.2	33.6	19.0	12.4	31.8	0.0	20.6
LnGrp LOS		C	C	C	C	C	C	C	B	B	C		C
Approach Vol, veh/h			991			770			95			83	
Approach Delay, s/veh			27.9			24.2			20.8			22.5	
Approach LOS			C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.9	24.5	8.1	22.5	16.4	23.0	8.1	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.0	20.0	7.0	18.0	8.5	18.5	7.0	18.0
Max Q Clear Time (g_c+I1), s	2.8	13.5	3.4	4.3	3.1	10.3	2.5	2.1
Green Ext Time (p_c), s	0.0	3.2	0.0	0.2	0.0	3.0	0.0	0.1

Intersection Summary	
HCM 2010 Ctrl Delay	25.9
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑↱		↰	↑↑↑	↱	↰	↱		↰	↑	↱
Traffic Volume (veh/h)	293	808	21	63	1223	243	14	27	29	239	42	516
Future Volume (veh/h)	293	808	21	63	1223	243	14	27	29	239	42	516
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	293	808	21	63	1223	243	14	27	29	239	42	516
Adj No. of Lanes	2	3	0	1	3	1	1	1	0	1	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	381	1396	36	194	1386	431	194	222	238	238	548	641
Arrive On Green	0.11	0.27	0.27	0.04	0.09	0.09	0.11	0.26	0.26	0.13	0.29	0.29
Sat Flow, veh/h	3510	5199	135	1810	5187	1615	1810	839	902	1810	1900	1615
Grp Volume(v), veh/h	293	537	292	63	1223	243	14	0	56	239	42	516
Grp Sat Flow(s),veh/h/ln	1755	1729	1876	1810	1729	1615	1810	0	1741	1810	1900	1615
Q Serve(g_s), s	5.7	9.4	9.4	2.4	16.3	10.1	0.5	0.0	1.7	9.2	1.1	10.4
Cycle Q Clear(g_c), s	5.7	9.4	9.4	2.4	16.3	10.1	0.5	0.0	1.7	9.2	1.1	10.4
Prop In Lane	1.00		0.07	1.00		1.00	1.00		0.52	1.00		1.00
Lane Grp Cap(c), veh/h	381	929	504	194	1386	431	194	0	460	238	548	641
V/C Ratio(X)	0.77	0.58	0.58	0.32	0.88	0.56	0.07	0.00	0.12	1.00	0.08	0.80
Avail Cap(c_a), veh/h	381	929	504	194	1386	431	194	0	460	238	548	641
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.80	0.80	0.80	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.3	22.2	22.2	31.3	30.8	28.0	28.1	0.0	19.6	30.4	18.1	6.4
Incr Delay (d2), s/veh	9.2	2.6	4.8	0.8	6.9	4.2	0.2	0.0	0.5	59.6	0.3	10.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	4.8	5.5	1.2	8.7	5.0	0.2	0.0	0.9	8.5	0.6	6.3
LnGrp Delay(d),s/veh	39.5	24.8	27.0	32.1	37.8	32.2	28.3	0.0	20.1	90.0	18.4	16.8
LnGrp LOS	D	C	C	C	D	C	C		C	F	B	B
Approach Vol, veh/h		1122			1529			70			797	
Approach Delay, s/veh		29.2			36.6			21.7			38.8	
Approach LOS		C			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.5	22.8	11.5	24.2	11.6	22.7	13.2	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.0	18.3	7.0	19.7	7.1	18.2	8.7	18.0
Max Q Clear Time (g_c+I1), s	4.4	11.4	2.5	12.4	7.7	18.3	11.2	3.7
Green Ext Time (p_c), s	2.0	2.9	0.1	1.4	0.0	0.0	0.0	0.2

Intersection Summary	
HCM 2010 Ctrl Delay	34.5
HCM 2010 LOS	C

HCM 2010 Signalized Intersection Summary
2: Iris Avenue & Kaiser Hospital Entrance

AM/PM Gasoline Service Station
Cumulative (2022) WP - PM Peak Hour

	↗	→	←	↖	↘	↙
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑↑	↑↑↱		↰	↱
Traffic Volume (veh/h)	157	851	1162	85	206	123
Future Volume (veh/h)	157	851	1162	85	206	123
Number	5	2	6	16	7	14
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	157	851	1162	85	206	123
Adj No. of Lanes	1	3	3	0	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	206	3186	2187	160	491	622
Arrive On Green	0.23	1.00	0.89	0.89	0.27	0.27
Sat Flow, veh/h	1810	5358	5105	361	1810	1615
Grp Volume(v), veh/h	157	851	814	433	206	123
Grp Sat Flow(s),veh/h/ln	1810	1729	1729	1836	1810	1615
Q Serve(g_s), s	5.7	0.0	3.5	3.5	6.6	3.5
Cycle Q Clear(g_c), s	5.7	0.0	3.5	3.5	6.6	3.5
Prop In Lane	1.00			0.20	1.00	1.00
Lane Grp Cap(c), veh/h	206	3186	1533	814	491	622
V/C Ratio(X)	0.76	0.27	0.53	0.53	0.42	0.20
Avail Cap(c_a), veh/h	336	3186	1533	814	491	622
HCM Platoon Ratio	2.00	2.00	2.00	2.00	1.00	1.00
Upstream Filter(I)	0.77	0.77	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.1	0.0	2.4	2.4	21.0	14.3
Incr Delay (d2), s/veh	4.5	0.2	1.3	2.5	2.6	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	0.0	1.6	2.0	3.6	4.0
LnGrp Delay(d),s/veh	30.6	0.2	3.7	4.9	23.6	15.0
LnGrp LOS	C	A	A	A	C	B
Approach Vol, veh/h		1008	1247		329	
Approach Delay, s/veh		4.9	4.1		20.4	
Approach LOS		A	A		C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4	5	6		
Phs Duration (G+Y+Rc), s		47.0		23.0	12.0	35.0		
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5		
Max Green Setting (Gmax), s		42.5		18.5	12.5	25.5		
Max Q Clear Time (g_c+I1), s		2.0		8.6	7.7	5.5		
Green Ext Time (p_c), s		22.5		0.7	0.2	14.2		

Intersection Summary	
HCM 2010 Ctrl Delay	6.5
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑↱			↱
Traffic Vol, veh/h	0	1079	1185	99	0	46
Future Vol, veh/h	0	1079	1185	99	0	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	1079	1185	99	0	46

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	642
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.1
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.9
Pot Cap-1 Maneuver	0	-	-	-	0	*645
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		1
Mov Cap-1 Maneuver	-	-	-	-	-	*645
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	645
HCM Lane V/C Ratio	-	-	-	0.071
HCM Control Delay (s)	-	-	-	11
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.2

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Intersection Delay, s/veh	9.4
Intersection LOS	A

Movement	WBU	WBL	WBR	NBU	NBT	NBR	SBU	SBL	SBT
Lane Configurations		↰	↱		↑↱				↰
Traffic Vol, veh/h	0	67	79	0	151	33	0	137	107
Future Vol, veh/h	0	67	79	0	151	33	0	137	107
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0
Mvmt Flow	0	67	79	0	151	33	0	137	107
Number of Lanes	0	1	1	0	2	0	0	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	2
Conflicting Approach Left	NB		WB
Conflicting Lanes Left	2	0	2
Conflicting Approach Right	SB	WB	
Conflicting Lanes Right	1	2	0
HCM Control Delay	8.7	8.5	10.6
HCM LOS	A	A	B

Lane	NBLn1	NBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	0%	0%	100%	0%	56%
Vol Thru, %	100%	60%	0%	0%	44%
Vol Right, %	0%	40%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	101	83	67	79	244
LT Vol	0	0	67	0	137
Through Vol	101	50	0	0	107
RT Vol	0	33	0	79	0
Lane Flow Rate	101	83	67	79	244
Geometry Grp	7	7	7	7	4
Degree of Util (X)	0.143	0.112	0.112	0.106	0.339
Departure Headway (Hd)	5.109	4.83	6.038	4.829	5.005
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	702	741	593	740	717
Service Time	2.845	2.566	3.78	2.572	3.038
HCM Lane V/C Ratio	0.144	0.112	0.113	0.107	0.34
HCM Control Delay	8.7	8.2	9.5	8.1	10.6
HCM Lane LOS	A	A	A	A	B
HCM 95th-tile Q	0.5	0.4	0.4	0.4	1.5

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

HCM 2010 TWSC
5: Oliver Street & Project Driveway 2

AM/PM Gasoline Service Station
Cumulative (2022) WP - PM Peak Hour

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↱		↑↑	↑↱	
Traffic Vol, veh/h	0	63	0	186	151	14
Future Vol, veh/h	0	63	0	186	151	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	0	63	0	186	151	14

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	83	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.9	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	966	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	966	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	966	-	-
HCM Lane V/C Ratio	-	0.065	-	-
HCM Control Delay (s)	-	9	-	-
HCM Lane LOS	-	A	-	-
HCM 95th %tile Q(veh)	-	0.2	-	-

HCM 2010 Signalized Intersection Summary
6: Oliver Street & Iris Avenue

AM/PM Gasoline Service Station
Cumulative (2022) WP - PM Peak Hour

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations		↶	↑↑↱		↶	↑↑↱			↰	↱		↰
Traffic Volume (veh/h)	41	152	810	84	71	1080	22	68	15	42	61	35
Future Volume (veh/h)	41	152	810	84	71	1080	22	68	15	42	61	35
Number		5	2	12	1	6	16	3	8	18	7	4
Initial Q (Qb), veh		0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln		1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h		152	810	84	71	1080	22	68	15	42	61	35
Adj No. of Lanes		1	3	0	1	3	0	0	1	1	0	1
Peak Hour Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %		0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h		543	2304	238	148	1383	28	94	12	427	84	31
Arrive On Green		0.10	0.16	0.16	0.16	0.53	0.53	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h		1810	4778	493	1810	5233	107	0	45	1615	0	118
Grp Volume(v), veh/h		152	585	309	71	714	388	83	0	42	96	0
Grp Sat Flow(s),veh/h/ln		1810	1729	1813	1810	1729	1881	45	0	1615	118	0
Q Serve(g_s), s		5.4	10.5	10.6	2.5	11.6	11.6	0.0	0.0	1.4	0.0	0.0
Cycle Q Clear(g_c), s		5.4	10.5	10.6	2.5	11.6	11.6	18.5	0.0	1.4	18.5	0.0
Prop In Lane		1.00		0.27	1.00		0.06	0.82		1.00	0.64	
Lane Grp Cap(c), veh/h		543	1668	874	148	914	497	106	0	427	115	0
V/C Ratio(X)		0.28	0.35	0.35	0.48	0.78	0.78	0.79	0.00	0.10	0.83	0.00
Avail Cap(c_a), veh/h		543	1668	874	194	914	497	106	0	427	115	0
HCM Platoon Ratio		0.33	0.33	0.33	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00	0.85	0.85	0.85	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh		24.5	19.7	19.7	27.9	14.9	14.9	32.4	0.0	19.5	29.2	0.0
Incr Delay (d2), s/veh		0.3	0.6	1.1	2.0	5.6	9.9	43.3	0.0	0.5	47.7	0.0
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		2.8	5.2	5.6	1.3	6.1	7.2	2.9	0.0	0.7	3.4	0.0
LnGrp Delay(d),s/veh		24.8	20.3	20.8	29.9	20.5	24.8	75.7	0.0	19.9	76.8	0.0
LnGrp LOS		C	C	C	C	C	C	E		B	E	
Approach Vol, veh/h			1046			1173			125			214
Approach Delay, s/veh			21.1			22.5			56.9			46.6
Approach LOS			C			C			E			D

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.7	37.8		22.5	25.0	22.5		22.5
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	7.0	31.5		18.0	20.5	18.0		18.0
Max Q Clear Time (g_c+I1), s	4.5	12.6		20.5	7.4	13.6		20.5
Green Ext Time (p_c), s	0.0	6.3		0.0	5.3	2.7		0.0

Intersection Summary			
HCM 2010 Ctrl Delay			25.6
HCM 2010 LOS			C

Notes

HCM 2010 Signalized Intersection Summary
6: Oliver Street & Iris Avenue

AM/PM Gasoline Service Station
Cumulative (2022) WP - PM Peak Hour

	↲
Movement	SBR
Lane Configurations	↱
Traffic Volume (veh/h)	118
Future Volume (veh/h)	118
Number	14
Initial Q (Qb), veh	0
Ped-Bike Adj(A_pbT)	1.00
Parking Bus, Adj	1.00
Adj Sat Flow, veh/h/ln	1900
Adj Flow Rate, veh/h	118
Adj No. of Lanes	1
Peak Hour Factor	1.00
Percent Heavy Veh, %	0
Cap, veh/h	427
Arrive On Green	0.26
Sat Flow, veh/h	1615
Grp Volume(v), veh/h	118
Grp Sat Flow(s),veh/h/ln	1615
Q Serve(g_s), s	4.1
Cycle Q Clear(g_c), s	4.1
Prop In Lane	1.00
Lane Grp Cap(c), veh/h	427
V/C Ratio(X)	0.28
Avail Cap(c_a), veh/h	427
HCM Platoon Ratio	1.00
Upstream Filter(I)	1.00
Uniform Delay (d), s/veh	20.4
Incr Delay (d2), s/veh	1.6
Initial Q Delay(d3),s/veh	0.0
%ile BackOfQ(50%),veh/ln	2.0
LnGrp Delay(d),s/veh	22.0
LnGrp LOS	C
Approach Vol, veh/h	
Approach Delay, s/veh	
Approach LOS	
Timer	

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

HCM 2010 Signalized Intersection Summary

AM/PM Gasoline Service Station

7: Via Del Lago & Iris Avenue/Moreno Beach Drive

Cumulative (2022) WP - PM Peak Hour

	↩	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↑↑↱		↰	↑↑↱		↰	↑	↱	↰	↱	
Traffic Volume (veh/h)	11	59	788	52	57	1090	14	38	0	28	10	2	34
Future Volume (veh/h)	11	59	788	52	57	1090	14	38	0	28	10	2	34
Number		5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh		0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln		1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h		59	788	52	57	1090	14	38	0	28	10	2	34
Adj No. of Lanes		1	3	0	1	3	0	1	1	1	1	1	0
Peak Hour Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %		0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h		324	1858	122	134	1418	18	107	502	547	107	24	406
Arrive On Green		0.06	0.12	0.12	0.07	0.27	0.27	0.06	0.00	0.26	0.06	0.26	0.26
Sat Flow, veh/h		1810	4973	327	1810	5278	68	1810	1900	1615	1810	90	1538
Grp Volume(v), veh/h		59	547	293	57	714	390	38	0	28	10	0	36
Grp Sat Flow(s),veh/h/ln		1810	1729	1842	1810	1729	1888	1810	1900	1615	1810	0	1629
Q Serve(g_s), s		2.2	10.2	10.3	2.1	13.3	13.3	1.4	0.0	0.5	0.4	0.0	1.2
Cycle Q Clear(g_c), s		2.2	10.2	10.3	2.1	13.3	13.3	1.4	0.0	0.5	0.4	0.0	1.2
Prop In Lane		1.00		0.18	1.00		0.04	1.00		1.00	1.00		0.94
Lane Grp Cap(c), veh/h		324	1292	688	134	929	507	107	502	547	107	0	430
V/C Ratio(X)		0.18	0.42	0.43	0.42	0.77	0.77	0.35	0.00	0.05	0.09	0.00	0.08
Avail Cap(c_a), veh/h		324	1292	688	194	929	507	194	502	547	194	0	430
HCM Platoon Ratio		0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		0.96	0.96	0.96	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh		28.1	23.7	23.7	31.0	23.6	23.6	31.6	0.0	6.8	31.1	0.0	19.4
Incr Delay (d2), s/veh		0.3	1.0	1.8	2.1	6.1	10.7	2.0	0.0	0.2	0.4	0.0	0.4
Initial Q Delay(d3),s/veh		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		1.1	5.1	5.6	1.1	7.1	8.4	0.8	0.0	0.3	0.2	0.0	0.6
LnGrp Delay(d),s/veh		28.3	24.7	25.6	33.1	29.7	34.3	33.6	0.0	7.0	31.5	0.0	19.8
LnGrp LOS		C	C	C	C	C	C	C		A	C		B
Approach Vol, veh/h			899			1161			66			46	
Approach Delay, s/veh			25.2			31.4			22.3			22.3	
Approach LOS			C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.2	30.2	8.2	22.5	16.5	22.8	8.2	22.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	7.0	20.0	7.0	18.0	8.7	18.3	7.0	18.0
Max Q Clear Time (g_c+I1), s	4.1	12.3	3.4	3.2	4.2	15.3	2.4	2.5
Green Ext Time (p_c), s	0.0	3.4	0.0	0.1	2.2	1.9	0.0	0.0

Intersection Summary	
HCM 2010 Ctrl Delay	28.4
HCM 2010 LOS	C

Notes

Queues
1: Hillrose Lane/Nason Street & Iris Avenue

AM/PM Gasoline Service Station
Existing (2017) NP - AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	384	981	16	843	93	22	60	122	16	317
v/c Ratio	1.02	0.47	0.08	0.60	0.15	0.11	0.11	0.72	0.02	0.32
Control Delay	87.1	17.1	30.1	8.3	0.5	29.8	17.2	55.1	17.1	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.1	17.1	30.1	8.3	0.5	29.8	17.2	55.1	17.1	2.4
Queue Length 50th (ft)	~89	102	4	24	0	9	16	51	4	4
Queue Length 95th (ft)	#149	160	m12	27	0	26	38	#109	16	23
Internal Link Dist (ft)		469		1782			117		826	
Turn Bay Length (ft)	260		170		160	100		210		
Base Capacity (vph)	375	2084	203	1407	608	193	563	175	730	986
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.47	0.08	0.60	0.15	0.11	0.11	0.70	0.02	0.32

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
2: Iris Avenue & Kaiser Hospital Entrance

	↗	→	←	↘	↙
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	149	796	814	7	25
v/c Ratio	0.36	0.25	0.43	0.01	0.03
Control Delay	10.2	0.6	7.9	19.2	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.2	0.6	7.9	19.2	2.9
Queue Length 50th (ft)	55	3	42	2	0
Queue Length 95th (ft)	m17	4	60	11	8
Internal Link Dist (ft)		1782	966	165	
Turn Bay Length (ft)	190			110	
Base Capacity (vph)	464	3223	1912	477	944
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.32	0.25	0.43	0.01	0.03

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	196	634	40	571	140	45	36	229
v/c Ratio	0.45	0.27	0.21	0.42	0.28	0.07	0.06	0.34
Control Delay	19.6	2.8	36.9	9.7	21.6	0.2	19.4	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.6	2.8	36.9	9.7	21.6	0.2	19.4	4.9
Queue Length 50th (ft)	82	19	19	75	49	0	12	0
Queue Length 95th (ft)	107	21	45	15	89	0	30	40
Internal Link Dist (ft)		213		1171	331		132	
Turn Bay Length (ft)	240		250			50		
Base Capacity (vph)	541	2391	193	1369	501	635	590	679
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.27	0.21	0.42	0.28	0.07	0.06	0.34

Intersection Summary

	↗	→	↙	←	↖	↑	↗	↘	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	25	623	20	535	25	2	46	15	46
v/c Ratio	0.11	0.31	0.10	0.25	0.13	0.00	0.06	0.08	0.08
Control Delay	23.8	3.9	29.7	15.5	30.1	17.0	0.8	29.3	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.8	3.9	29.7	15.5	30.1	17.0	0.8	29.3	7.8
Queue Length 50th (ft)	12	4	8	30	10	1	0	6	1
Queue Length 95th (ft)	35	35	26	92	30	5	4	21	22
Internal Link Dist (ft)		1171		556		319			124
Turn Bay Length (ft)	110		300		95			50	
Base Capacity (vph)	244	2024	193	2154	193	689	795	193	566
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.31	0.10	0.25	0.13	0.00	0.06	0.08	0.08

Intersection Summary

Queues
1: Hillrose Lane/Nason Street & Iris Avenue

AM/PM Gasoline Service Station
Existing (2017) NP - PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	250	642	15	822	113	14	34	129	40	441
v/c Ratio	0.66	0.31	0.08	0.59	0.19	0.07	0.06	0.57	0.05	0.41
Control Delay	39.2	15.6	14.2	10.1	1.0	29.2	15.6	39.1	14.4	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.2	15.6	14.2	10.1	1.0	29.2	15.6	39.1	14.4	3.4
Queue Length 50th (ft)	54	62	6	41	0	6	8	53	9	18
Queue Length 95th (ft)	#92	115	m17	54	0	21	27	104	34	53
Internal Link Dist (ft)		469		1782			117		826	
Turn Bay Length (ft)	260		170		160	100		210		
Base Capacity (vph)	380	2068	193	1385	602	193	555	237	798	1065
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.31	0.08	0.59	0.19	0.07	0.06	0.54	0.05	0.41

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
2: Iris Avenue & Kaiser Hospital Entrance

	↗	→	←	↘	↙
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	78	605	785	40	35
v/c Ratio	0.33	0.19	0.33	0.08	0.05
Control Delay	37.2	4.1	3.5	19.6	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	37.2	4.1	3.5	19.6	3.8
Queue Length 50th (ft)	37	34	19	13	0
Queue Length 95th (ft)	m77	17	27	34	13
Internal Link Dist (ft)		1782	966	165	
Turn Bay Length (ft)	190			110	
Base Capacity (vph)	335	3186	2372	489	847
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.23	0.19	0.33	0.08	0.04

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Queues
6: Oliver Street & Iris Avenue

AM/PM Gasoline Service Station
Existing (2017) NP - PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	80	587	44	649	61	34	31	82
v/c Ratio	0.17	0.22	0.23	0.37	0.15	0.06	0.06	0.15
Control Delay	18.0	7.8	22.5	10.2	21.0	0.2	19.8	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.0	7.8	22.5	10.2	21.0	0.2	19.8	0.6
Queue Length 50th (ft)	26	60	18	86	20	0	10	0
Queue Length 95th (ft)	65	100	20	9	48	0	29	2
Internal Link Dist (ft)		213		1171	331		132	
Turn Bay Length (ft)	240		250			50		
Base Capacity (vph)	541	2689	193	1740	407	547	484	547
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.22	0.23	0.37	0.15	0.06	0.06	0.15

Intersection Summary

Queues
7: Via Del Lago & Iris Avenue/Moreno Beach Drive

AM/PM Gasoline Service Station
Existing (2017) NP - PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	24	544	41	661	20	23	10	20
v/c Ratio	0.11	0.22	0.21	0.25	0.10	0.03	0.05	0.04
Control Delay	18.8	4.6	31.2	12.1	29.7	0.0	28.9	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.8	4.6	31.2	12.1	29.7	0.0	28.9	10.4
Queue Length 50th (ft)	8	4	17	39	8	0	4	1
Queue Length 95th (ft)	29	104	44	119	27	0	17	16
Internal Link Dist (ft)		1171		556				124
Turn Bay Length (ft)	110		300		95		50	
Base Capacity (vph)	237	2512	198	2655	193	895	193	447
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.22	0.21	0.25	0.10	0.03	0.05	0.04

Intersection Summary

	↗	→	↙	←	↖	↖	↑	↘	↓	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	384	992	19	854	98	22	63	128	16	317
v/c Ratio	1.02	0.48	0.09	0.61	0.16	0.11	0.13	0.74	0.02	0.32
Control Delay	87.1	17.2	30.0	8.2	0.5	29.8	16.8	56.4	17.1	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.1	17.2	30.0	8.2	0.5	29.8	16.8	56.4	17.1	2.4
Queue Length 50th (ft)	~89	104	4	24	0	9	16	54	4	4
Queue Length 95th (ft)	#149	162	m13	27	0	26	38	#116	16	23
Internal Link Dist (ft)		469		1782			117		826	
Turn Bay Length (ft)	260		170		160	100		210		
Base Capacity (vph)	375	2084	203	1407	608	193	495	174	730	986
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.48	0.09	0.61	0.16	0.11	0.13	0.74	0.02	0.32

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
2: Iris Avenue & Kaiser Hospital Entrance

AM/PM Gasoline Service Station
Existing (2017) WP - AM Peak Hour

	↗	→	←	↘	↙
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	149	813	831	7	25
v/c Ratio	0.36	0.25	0.43	0.01	0.03
Control Delay	10.3	0.7	9.6	19.2	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.3	0.7	9.6	19.2	2.9
Queue Length 50th (ft)	55	3	51	2	0
Queue Length 95th (ft)	m18	4	m69	11	8
Internal Link Dist (ft)		1782	966	165	
Turn Bay Length (ft)	190			110	
Base Capacity (vph)	464	3223	1912	477	944
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.32	0.25	0.43	0.01	0.03

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	237	611	38	602	147	44	99	226
v/c Ratio	1.01	0.21	0.20	0.44	0.39	0.08	0.26	0.38
Control Delay	88.4	2.3	36.3	10.5	24.8	0.3	22.5	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.4	2.3	36.3	10.5	24.8	0.3	22.5	5.4
Queue Length 50th (ft)	~115	16	18	79	52	0	34	0
Queue Length 95th (ft)	#187	21	44	17	94	0	67	40
Internal Link Dist (ft)		213		1171	331		132	
Turn Bay Length (ft)	240		250			50		
Base Capacity (vph)	235	2872	193	1369	380	547	387	593
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.01	0.21	0.20	0.44	0.39	0.08	0.26	0.38

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	40	641	20	551	25	2	46	15	48
v/c Ratio	0.18	0.32	0.10	0.26	0.13	0.00	0.06	0.08	0.08
Control Delay	27.5	6.1	29.7	15.5	30.1	17.0	0.8	29.3	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.5	6.1	29.7	15.5	30.1	17.0	0.8	29.3	7.6
Queue Length 50th (ft)	19	15	8	31	10	1	0	6	1
Queue Length 95th (ft)	48	45	26	95	30	5	4	21	22
Internal Link Dist (ft)		1171		556		319			124
Turn Bay Length (ft)	110		300		95			50	
Base Capacity (vph)	244	2024	193	2154	193	689	795	193	567
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.32	0.10	0.26	0.13	0.00	0.06	0.08	0.08

Intersection Summary

1: Hillrose Lane/Nason Street & Iris Avenue

Existing (2017) WP - PM Peak Hour

	↗	→	↙	←	↖	↖	↑	↘	↓	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	250	653	17	833	118	14	37	135	40	441
v/c Ratio	0.66	0.32	0.09	0.60	0.20	0.07	0.07	0.59	0.05	0.41
Control Delay	39.2	15.7	14.9	10.8	1.4	29.2	14.8	40.3	14.4	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.2	15.7	14.9	10.8	1.4	29.2	14.8	40.3	14.4	3.4
Queue Length 50th (ft)	54	63	7	51	0	6	8	56	9	18
Queue Length 95th (ft)	#92	117	m18	66	0	21	28	#116	34	53
Internal Link Dist (ft)		469		1782			117		826	
Turn Bay Length (ft)	260		170		160	100		210		
Base Capacity (vph)	380	2068	193	1385	602	193	552	237	798	1065
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.32	0.09	0.60	0.20	0.07	0.07	0.57	0.05	0.41

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

	↗	→	←	↘	↙
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	78	625	803	40	35
v/c Ratio	0.33	0.20	0.34	0.08	0.05
Control Delay	37.0	4.2	5.3	19.6	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	37.0	4.2	5.3	19.6	3.8
Queue Length 50th (ft)	37	35	29	13	0
Queue Length 95th (ft)	m77	17	40	34	13
Internal Link Dist (ft)		1782	966	165	
Turn Bay Length (ft)	190			110	
Base Capacity (vph)	335	3186	2372	489	847
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.23	0.20	0.34	0.08	0.04

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

	↗	→	↙	←	↑	↗	↓	↙
Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	121	563	42	682	68	33	97	78
v/c Ratio	0.64	0.21	0.22	0.39	0.18	0.06	0.24	0.14
Control Delay	36.5	7.6	23.2	10.8	21.5	0.2	22.3	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.5	7.6	23.2	10.8	21.5	0.2	22.3	0.5
Queue Length 50th (ft)	40	57	17	91	23	0	33	0
Queue Length 95th (ft)	#94	97	20	11	53	0	69	0
Internal Link Dist (ft)		213		1171	331		132	
Turn Bay Length (ft)	240		250			50		
Base Capacity (vph)	217	2689	193	1737	381	547	400	547
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.21	0.22	0.39	0.18	0.06	0.24	0.14

Intersection Summary

\#   95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

7: Via Del Lago & Iris Avenue/Moreno Beach Drive

AM/PM Gasoline Service Station
Existing (2017) WP - PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBL	SBT
	↗	→	↙	←	↖	↗	↘	↓
Lane Group Flow (vph)	39	562	41	678	20	23	10	23
v/c Ratio	0.17	0.22	0.21	0.26	0.10	0.03	0.05	0.05
Control Delay	23.2	7.6	31.2	12.2	29.7	0.0	28.9	9.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.2	7.6	31.2	12.2	29.7	0.0	28.9	9.9
Queue Length 50th (ft)	14	14	17	40	8	0	4	1
Queue Length 95th (ft)	42	109	44	122	27	0	17	17
Internal Link Dist (ft)		1171		556				124
Turn Bay Length (ft)	110		300		95		50	
Base Capacity (vph)	249	2514	198	2655	193	892	193	448
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.22	0.21	0.26	0.10	0.03	0.05	0.05

Intersection Summary

Queues

AM/PM Gasoline Service Station

1: Hillrose Lane/Nason Street & Iris Avenue

Project Completion Year (2022) NP - AM Peak Hour

	↗	→	↙	←	↖	↖	↑	↘	↓	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	424	1081	19	930	102	24	65	134	17	350
v/c Ratio	1.13	0.52	0.09	0.66	0.17	0.12	0.13	0.77	0.02	0.36
Control Delay	119.3	17.7	31.5	8.2	0.5	30.0	17.4	60.3	17.1	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	119.3	17.7	31.5	8.2	0.5	30.0	17.4	60.3	17.1	3.0
Queue Length 50th (ft)	~111	115	5	27	0	10	17	57	4	11
Queue Length 95th (ft)	#170	179	m11	30	m0	27	40	#124	17	31
Internal Link Dist (ft)		469		1782			117		826	
Turn Bay Length (ft)	260		170		160	100		210		
Base Capacity (vph)	375	2084	203	1407	608	193	496	174	730	982
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.13	0.52	0.09	0.66	0.17	0.12	0.13	0.77	0.02	0.36

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Queues
2: Iris Avenue & Kaiser Hospital Entrance

AM/PM Gasoline Service Station
Project Completion Year (2022) NP - AM Peak Hour

	↗	→	←	↘	↙
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	165	879	897	8	27
v/c Ratio	0.36	0.27	0.56	0.02	0.03
Control Delay	9.6	0.7	9.6	19.3	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	9.6	0.7	9.6	19.3	3.0
Queue Length 50th (ft)	61	3	47	3	0
Queue Length 95th (ft)	m20	6	66	12	9
Internal Link Dist (ft)		1782	966	165	
Turn Bay Length (ft)	190			110	
Base Capacity (vph)	464	3223	1589	477	945
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.36	0.27	0.56	0.02	0.03

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues
6: Oliver Street & Iris Avenue

AM/PM Gasoline Service Station
Project Completion Year (2022) NP - AM Peak Hour

	↗	→	↙	←	↑	↗	↓	↙
Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	216	700	45	629	156	49	41	253
v/c Ratio	0.50	0.29	0.23	0.46	0.32	0.08	0.07	0.37
Control Delay	20.4	2.8	37.2	10.0	22.1	0.2	19.5	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.4	2.8	37.2	10.0	22.1	0.2	19.5	4.9
Queue Length 50th (ft)	91	21	21	83	55	0	13	0
Queue Length 95th (ft)	114	26	48	16	98	0	33	42
Internal Link Dist (ft)		213		1171	331		132	
Turn Bay Length (ft)	240		250			50		
Base Capacity (vph)	541	2401	193	1369	493	632	585	692
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.29	0.23	0.46	0.32	0.08	0.07	0.37

Intersection Summary

	↗	→	↙	←	↖	↑	↗	↘	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	27	689	22	591	28	2	51	16	50
v/c Ratio	0.12	0.34	0.11	0.27	0.15	0.00	0.06	0.08	0.09
Control Delay	23.7	4.0	29.8	15.7	30.3	17.0	1.1	29.4	7.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	4.0	29.8	15.7	30.3	17.0	1.1	29.4	7.5
Queue Length 50th (ft)	13	5	9	34	11	1	0	6	1
Queue Length 95th (ft)	36	39	27	102	32	5	6	22	22
Internal Link Dist (ft)		1171		556		319			124
Turn Bay Length (ft)	110		300		95			50	
Base Capacity (vph)	244	2024	193	2154	193	689	795	193	569
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.34	0.11	0.27	0.15	0.00	0.06	0.08	0.09

Intersection Summary

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Queues
1: Hillrose Lane/Nason Street & Iris Avenue

AM/PM Gasoline Service Station
Project Completion Year (2022) NP - PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	276	708	16	908	125	15	37	142	45	487
v/c Ratio	0.73	0.34	0.08	0.66	0.21	0.08	0.07	0.62	0.06	0.46
Control Delay	42.9	15.9	14.1	10.9	1.2	29.3	15.6	42.1	14.4	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.9	15.9	14.1	10.9	1.2	29.3	15.6	42.1	14.4	4.2
Queue Length 50th (ft)	60	69	6	46	0	6	8	59	10	28
Queue Length 95th (ft)	#111	127	m15	60	0	22	29	#125	36	66
Internal Link Dist (ft)		469		1782			117		826	
Turn Bay Length (ft)	260		170		160	100		210		
Base Capacity (vph)	380	2068	193	1385	602	193	555	237	798	1061
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.34	0.08	0.66	0.21	0.08	0.07	0.60	0.06	0.46

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	87	669	867	44	39
v/c Ratio	0.36	0.21	0.37	0.09	0.05
Control Delay	37.4	4.2	3.6	19.8	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	37.4	4.2	3.6	19.8	3.6
Queue Length 50th (ft)	42	38	21	14	0
Queue Length 95th (ft)	m83	19	31	37	13
Internal Link Dist (ft)		1782	966	165	
Turn Bay Length (ft)	190			110	
Base Capacity (vph)	335	3186	2349	489	849
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.26	0.21	0.37	0.09	0.05

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues
6: Oliver Street & Iris Avenue

AM/PM Gasoline Service Station
Project Completion Year (2022) NP - PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	88	648	48	716	67	38	35	90
v/c Ratio	0.19	0.24	0.25	0.41	0.17	0.07	0.07	0.16
Control Delay	18.0	7.8	24.4	8.5	21.2	0.3	19.9	1.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.0	7.8	24.4	8.5	21.2	0.3	19.9	1.2
Queue Length 50th (ft)	29	67	20	97	22	0	11	0
Queue Length 95th (ft)	69	110	24	9	52	0	32	6
Internal Link Dist (ft)		213		1171	331		132	
Turn Bay Length (ft)	240		250			50		
Base Capacity (vph)	541	2688	193	1740	403	547	479	547
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.24	0.25	0.41	0.17	0.07	0.07	0.16

Intersection Summary

	↗	→	↙	←	↖	↗	↘	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	27	600	46	729	22	26	11	22
v/c Ratio	0.13	0.25	0.24	0.29	0.11	0.03	0.06	0.05
Control Delay	18.8	6.3	32.0	14.4	29.9	0.0	28.9	10.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.8	6.3	32.0	14.4	29.9	0.0	28.9	10.1
Queue Length 50th (ft)	9	5	18	43	9	0	4	1
Queue Length 95th (ft)	32	113	47	131	28	0	18	16
Internal Link Dist (ft)		1171		556				124
Turn Bay Length (ft)	110		300		95		50	
Base Capacity (vph)	237	2354	194	2485	193	923	193	448
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.25	0.24	0.29	0.11	0.03	0.06	0.05

Intersection Summary

Queues
1: Hillrose Lane/Nason Street & Iris Avenue

AM/PM Gasoline Service Station
Project Completion Year (2022) WP - AM Peak Hour

	↗	→	↙	←	↖	↖	↑	↘	↓	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	424	1092	21	941	107	24	68	140	17	350
v/c Ratio	1.13	0.52	0.10	0.67	0.18	0.12	0.14	0.80	0.02	0.36
Control Delay	119.3	17.7	32.2	8.0	0.6	30.0	16.9	64.9	17.1	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	119.3	17.7	32.2	8.0	0.6	30.0	16.9	64.9	17.1	3.0
Queue Length 50th (ft)	~111	117	5	26	0	10	17	60	4	11
Queue Length 95th (ft)	#170	180	m13	30	m0	27	40	#131	17	31
Internal Link Dist (ft)		469		1782			117		826	
Turn Bay Length (ft)	260		170		160	100		210		
Base Capacity (vph)	375	2084	203	1407	608	193	496	174	730	982
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.13	0.52	0.10	0.67	0.18	0.12	0.14	0.80	0.02	0.36

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

	↗	→	←	↘	↙
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	165	897	914	8	27
v/c Ratio	0.36	0.28	0.58	0.02	0.03
Control Delay	9.9	0.8	11.2	19.3	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	9.9	0.8	11.2	19.3	3.2
Queue Length 50th (ft)	61	4	56	3	1
Queue Length 95th (ft)	m22	8	m75	12	9
Internal Link Dist (ft)		1782	966	165	
Turn Bay Length (ft)	190			110	
Base Capacity (vph)	464	3223	1588	477	944
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.36	0.28	0.58	0.02	0.03

Intersection Summary

m   Volume for 95th percentile queue is metered by upstream signal.

	↗	→	↙	←	↑	↗	↓	↙
Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	257	676	42	662	162	48	103	249
v/c Ratio	1.16	0.25	0.22	0.48	0.43	0.09	0.27	0.41
Control Delay	137.7	2.6	37.3	9.8	25.7	0.3	22.7	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	137.7	2.6	37.3	9.8	25.7	0.3	22.7	5.4
Queue Length 50th (ft)	~141	21	20	90	58	0	35	0
Queue Length 95th (ft)	#211	27	47	19	103	0	69	41
Internal Link Dist (ft)		213		1171	331		132	
Turn Bay Length (ft)	240		250			50		
Base Capacity (vph)	221	2702	193	1369	376	547	385	610
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.16	0.25	0.22	0.48	0.43	0.09	0.27	0.41

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

7: Via Del Lago & Iris Avenue/Moreno Beach Drive

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	43	706	22	607	28	2	51	16	53
v/c Ratio	0.27	0.35	0.11	0.31	0.15	0.00	0.06	0.08	0.09
Control Delay	29.9	6.0	29.8	17.2	30.3	17.0	1.1	29.4	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.9	6.0	29.8	17.2	30.3	17.0	1.1	29.4	7.3
Queue Length 50th (ft)	20	13	9	58	11	1	0	6	1
Queue Length 95th (ft)	50	51	27	104	32	5	6	22	23
Internal Link Dist (ft)		1171		556		319			124
Turn Bay Length (ft)	110		300		95			50	
Base Capacity (vph)	174	2024	193	1961	193	689	795	193	571
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.35	0.11	0.31	0.15	0.00	0.06	0.08	0.09

Intersection Summary

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	276	719	18	918	130	15	40	148	45	487
v/c Ratio	0.73	0.35	0.09	0.66	0.22	0.08	0.08	0.65	0.06	0.46
Control Delay	42.9	16.0	14.5	11.5	1.5	29.3	14.9	43.8	14.4	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.9	16.0	14.5	11.5	1.5	29.3	14.9	43.8	14.4	4.2
Queue Length 50th (ft)	60	70	7	55	0	6	8	61	10	28
Queue Length 95th (ft)	#111	129	m17	79	0	22	30	#132	36	66
Internal Link Dist (ft)		469		1782			117		826	
Turn Bay Length (ft)	260		170		160	100		210		
Base Capacity (vph)	380	2068	193	1385	602	193	494	237	798	1061
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.35	0.09	0.66	0.22	0.08	0.08	0.62	0.06	0.46

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m   Volume for 95th percentile queue is metered by upstream signal.

Queues
2: Iris Avenue & Kaiser Hospital Entrance

	↗	→	←	↘	↙
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	87	688	885	44	39
v/c Ratio	0.36	0.22	0.38	0.09	0.05
Control Delay	37.2	4.2	5.3	19.8	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	37.2	4.2	5.3	19.8	3.6
Queue Length 50th (ft)	42	39	32	14	0
Queue Length 95th (ft)	m82	20	43	37	13
Internal Link Dist (ft)		1782	966	165	
Turn Bay Length (ft)	190			110	
Base Capacity (vph)	335	3186	2349	489	849
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.26	0.22	0.38	0.09	0.05

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	129	624	46	750	73	37	102	87
v/c Ratio	0.72	0.23	0.24	0.43	0.19	0.07	0.26	0.16
Control Delay	45.1	7.7	24.0	7.9	21.7	0.2	22.4	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.1	7.7	24.0	7.9	21.7	0.2	22.4	1.0
Queue Length 50th (ft)	43	64	19	102	24	0	35	0
Queue Length 95th (ft)	#117	106	24	12	56	0	72	4
Internal Link Dist (ft)		213		1171	331		132	
Turn Bay Length (ft)	240		250			50		
Base Capacity (vph)	202	2688	193	1736	378	547	400	547
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.23	0.24	0.43	0.19	0.07	0.26	0.16

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	41	618	46	746	22	26	11	25
v/c Ratio	0.25	0.26	0.24	0.33	0.11	0.03	0.06	0.06
Control Delay	25.2	9.2	32.0	15.9	29.9	0.0	28.9	9.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.2	9.2	32.0	15.9	29.9	0.0	28.9	9.7
Queue Length 50th (ft)	14	14	18	74	9	0	4	1
Queue Length 95th (ft)	43	117	47	135	28	0	18	17
Internal Link Dist (ft)		1171		556				124
Turn Bay Length (ft)	110		300		95		50	
Base Capacity (vph)	175	2356	194	2290	193	920	193	449
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.26	0.24	0.33	0.11	0.03	0.06	0.06

Intersection Summary

Queues

AM/PM Gasoline Service Station

1: Hillrose Lane/Nason Street & Iris Avenue

Cumulative (2022) NP - AM Peak Hour

	↗	→	↙	←	↖	↖	↑	↘	↓	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	398	1202	30	915	152	20	93	207	17	313
v/c Ratio	1.06	0.63	0.15	0.65	0.25	0.10	0.19	1.22	0.02	0.30
Control Delay	97.3	21.5	35.4	7.3	0.8	29.7	12.3	171.3	14.8	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.3	21.5	35.4	7.3	0.8	29.7	12.3	171.3	14.8	2.0
Queue Length 50th (ft)	~99	132	9	26	0	8	14	~112	4	3
Queue Length 95th (ft)	#180	#250	m16	32	m0	27	47	#233	19	29
Internal Link Dist (ft)		469		1782			117		826	
Turn Bay Length (ft)	260		170		160	100		210		
Base Capacity (vph)	375	1915	203	1407	608	193	498	170	792	1046
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.06	0.63	0.15	0.65	0.25	0.10	0.19	1.22	0.02	0.30

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues
2: Iris Avenue & Kaiser Hospital Entrance

AM/PM Gasoline Service Station
Cumulative (2022) NP - AM Peak Hour

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	288	1090	1107	43	44
v/c Ratio	0.62	0.34	0.69	0.09	0.05
Control Delay	13.2	1.0	8.3	20.1	4.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.2	1.0	8.3	20.1	4.7
Queue Length 50th (ft)	115	6	42	14	4
Queue Length 95th (ft)	m42	m13	60	36	16
Internal Link Dist (ft)		1782	966	165	
Turn Bay Length (ft)	190			110	
Base Capacity (vph)	464	3223	1594	477	941
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.62	0.34	0.69	0.09	0.05

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

6: Oliver Street & Iris Avenue

Cumulative (2022) NP - AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	210	933	47	785	157	66	35	266
v/c Ratio	0.48	0.39	0.24	0.57	0.32	0.10	0.06	0.38
Control Delay	18.0	3.3	36.9	10.9	22.2	0.3	19.4	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.0	3.3	36.9	10.9	22.2	0.3	19.4	4.9
Queue Length 50th (ft)	89	30	23	108	55	0	11	0
Queue Length 95th (ft)	121	47	54	20	106	0	32	51
Internal Link Dist (ft)		213		1171	331		132	
Turn Bay Length (ft)	240		250			50		
Base Capacity (vph)	541	2398	193	1370	486	633	586	702
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.39	0.24	0.57	0.32	0.10	0.06	0.38

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	31	944	24	732	37	2	56	14	67
v/c Ratio	0.14	0.47	0.12	0.34	0.19	0.00	0.07	0.07	0.12
Control Delay	21.8	3.2	30.0	16.2	31.2	17.0	1.4	29.2	6.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.8	3.2	30.0	16.2	31.2	17.0	1.4	29.2	6.9
Queue Length 50th (ft)	14	5	10	44	15	1	0	6	1
Queue Length 95th (ft)	m38	57	30	132	41	5	9	21	28
Internal Link Dist (ft)		1171		556		319			124
Turn Bay Length (ft)	110		300		95			50	
Base Capacity (vph)	244	2023	193	2155	193	689	795	193	578
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.47	0.12	0.34	0.19	0.00	0.07	0.07	0.12

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	293	819	61	1213	238	14	53	234	42	516
v/c Ratio	0.77	0.47	0.32	0.88	0.39	0.07	0.11	0.99	0.05	0.49
Control Delay	45.9	20.6	18.1	18.5	2.1	29.2	12.8	90.2	14.4	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.9	20.6	18.1	18.5	2.1	29.2	12.8	90.2	14.4	4.6
Queue Length 50th (ft)	64	110	19	62	1	6	9	102	10	33
Queue Length 95th (ft)	#121	149	m34	#155	0	21	33	#233	34	77
Internal Link Dist (ft)		469		1782			117		826	
Turn Bay Length (ft)	260		170		160	100		210		
Base Capacity (vph)	380	1730	193	1385	605	193	484	237	798	1060
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.47	0.32	0.88	0.39	0.07	0.11	0.99	0.05	0.49

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	157	833	1230	206	123
v/c Ratio	0.55	0.26	0.60	0.42	0.15
Control Delay	39.6	3.2	3.7	24.2	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	39.6	3.2	3.7	24.2	8.7
Queue Length 50th (ft)	76	24	20	73	23
Queue Length 95th (ft)	m119	m31	28	130	48
Internal Link Dist (ft)		1782	966	165	
Turn Bay Length (ft)	190			110	
Base Capacity (vph)	335	3186	2059	489	838
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.47	0.26	0.60	0.42	0.15

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues
6: Oliver Street & Iris Avenue

AM/PM Gasoline Service Station
Cumulative (2022) NP - PM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	152	917	73	1071	77	43	34	121
v/c Ratio	0.32	0.36	0.38	0.62	0.19	0.08	0.07	0.22
Control Delay	18.1	8.0	32.6	8.6	21.6	0.3	19.9	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	8.0	32.6	8.6	21.6	0.3	19.9	2.8
Queue Length 50th (ft)	53	94	26	158	26	0	11	0
Queue Length 95th (ft)	94	120	m44	13	58	0	31	20
Internal Link Dist (ft)		213		1171	331		132	
Turn Bay Length (ft)	240		250			50		
Base Capacity (vph)	541	2522	193	1739	395	547	477	547
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.36	0.38	0.62	0.19	0.08	0.07	0.22

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

	↗	→	↙	←	↖	↗	↘	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	56	823	57	1088	38	28	10	33
v/c Ratio	0.26	0.35	0.29	0.47	0.20	0.03	0.05	0.07
Control Delay	19.2	5.9	33.0	17.4	31.3	0.1	28.8	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.2	5.9	33.0	17.4	31.3	0.1	28.8	8.8
Queue Length 50th (ft)	22	5	23	117	15	0	4	1
Queue Length 95th (ft)	50	144	55	205	42	0	17	20
Internal Link Dist (ft)		1171		556				124
Turn Bay Length (ft)	110		300		95		50	
Base Capacity (vph)	237	2348	196	2292	193	906	193	454
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.35	0.29	0.47	0.20	0.03	0.05	0.07

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	398	1211	32	924	156	20	95	212	17	313
v/c Ratio	1.06	0.63	0.16	0.66	0.26	0.10	0.19	1.25	0.02	0.30
Control Delay	97.3	21.6	35.8	7.3	0.8	29.7	12.1	184.8	14.8	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.3	21.6	35.8	7.3	0.8	29.7	12.1	184.8	14.8	2.0
Queue Length 50th (ft)	~99	134	9	24	0	8	14	~117	4	3
Queue Length 95th (ft)	#180	#254	m17	34	m0	27	47	#240	19	29
Internal Link Dist (ft)		469		1782			117		826	
Turn Bay Length (ft)	260		170		160	100		210		
Base Capacity (vph)	375	1915	203	1407	608	193	498	169	792	1046
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.06	0.63	0.16	0.66	0.26	0.10	0.19	1.25	0.02	0.30

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues

2: Iris Avenue & Kaiser Hospital Entrance

AM/PM Gasoline Service Station
Cumulative (2022) WP - AM Peak Hour

	↗	→	←	↘	↙
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	288	1106	1122	43	44
v/c Ratio	0.62	0.34	0.70	0.09	0.05
Control Delay	13.2	1.0	9.7	20.1	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	13.2	1.0	9.7	20.1	4.8
Queue Length 50th (ft)	116	6	50	14	5
Queue Length 95th (ft)	m43	m14	m69	36	16
Internal Link Dist (ft)		1782	966	165	
Turn Bay Length (ft)	190			110	
Base Capacity (vph)	464	3223	1592	477	941
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.62	0.34	0.70	0.09	0.05

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Queues
6: Oliver Street & Iris Avenue

AM/PM Gasoline Service Station
Cumulative (2022) WP - AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	245	913	45	812	163	65	88	263
v/c Ratio	1.30	0.34	0.23	0.59	0.44	0.12	0.23	0.42
Control Delay	190.3	2.9	37.2	10.5	25.9	0.4	22.1	5.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	190.3	2.9	37.2	10.5	25.9	0.4	22.1	5.4
Queue Length 50th (ft)	~146	29	22	115	58	0	30	0
Queue Length 95th (ft)	#241	46	52	22	112	0	64	51
Internal Link Dist (ft)		213		1171	331		132	
Turn Bay Length (ft)	240		250			50		
Base Capacity (vph)	189	2702	193	1368	372	547	389	620
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.30	0.34	0.23	0.59	0.44	0.12	0.23	0.42

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queues

AM/PM Gasoline Service Station

7: Via Del Lago & Iris Avenue/Moreno Beach Drive

Cumulative (2022) WP - AM Peak Hour

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	44	959	24	746	37	2	56	14	69
v/c Ratio	0.27	0.47	0.12	0.38	0.19	0.00	0.07	0.07	0.12
Control Delay	27.2	4.7	30.0	17.8	31.2	17.0	1.4	29.2	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	4.7	30.0	17.8	31.2	17.0	1.4	29.2	6.8
Queue Length 50th (ft)	21	14	10	73	15	1	0	6	1
Queue Length 95th (ft)	53	66	30	134	41	5	9	21	28
Internal Link Dist (ft)		1171		556		319			124
Turn Bay Length (ft)	110		300		95			50	
Base Capacity (vph)	174	2025	193	1963	193	689	795	193	580
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.47	0.12	0.38	0.19	0.00	0.07	0.07	0.12

Intersection Summary

1: Hillrose Lane/Nason Street & Iris Avenue

Cumulative (2022) WP - PM Peak Hour

	↗	→	↙	←	↖	↖	↑	↘	↓	↙
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	293	829	63	1223	243	14	56	239	42	516
v/c Ratio	0.77	0.48	0.33	0.88	0.40	0.07	0.12	1.01	0.05	0.49
Control Delay	45.9	20.7	18.7	19.0	2.3	29.2	12.5	95.5	14.4	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.9	20.7	18.7	19.0	2.3	29.2	12.5	95.5	14.4	4.6
Queue Length 50th (ft)	64	112	20	78	1	6	9	~106	10	33
Queue Length 95th (ft)	#121	151	m36	#249	0	21	34	#239	34	77
Internal Link Dist (ft)		469		1782			117		826	
Turn Bay Length (ft)	260		170		160	100		210		
Base Capacity (vph)	380	1730	193	1385	609	193	484	237	798	1060
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.48	0.33	0.88	0.40	0.07	0.12	1.01	0.05	0.49

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Queues

AM/PM Gasoline Service Station

2: Iris Avenue & Kaiser Hospital Entrance

Cumulative (2022) WP - PM Peak Hour

	↗	→	←	↘	↙
Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	157	851	1247	206	123
v/c Ratio	0.55	0.27	0.61	0.42	0.16
Control Delay	39.4	3.2	4.3	24.2	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	39.4	3.2	4.3	24.2	8.7
Queue Length 50th (ft)	75	25	32	73	24
Queue Length 95th (ft)	m119	m32	m41	130	48
Internal Link Dist (ft)		1782	966	165	
Turn Bay Length (ft)	190			110	
Base Capacity (vph)	335	3186	2059	489	837
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.47	0.27	0.61	0.42	0.15

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	193	894	71	1102	83	42	96	118
v/c Ratio	1.38	0.33	0.37	0.80	0.22	0.08	0.24	0.22
Control Delay	232.5	6.9	31.6	12.5	22.1	0.3	22.2	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	232.5	6.9	31.6	12.5	22.1	0.3	22.2	2.7
Queue Length 50th (ft)	~104	92	25	164	28	0	32	0
Queue Length 95th (ft)	#218	117	m39	15	62	0	69	19
Internal Link Dist (ft)		213		1171	331		132	
Turn Bay Length (ft)	240		250			50		
Base Capacity (vph)	140	2689	193	1369	371	547	399	547
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.38	0.33	0.37	0.80	0.22	0.08	0.24	0.22

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Queues
7: Via Del Lago & Iris Avenue/Moreno Beach Drive

AM/PM Gasoline Service Station
Cumulative (2022) WP - PM Peak Hour

	⤴	→	⤶	←	↰	↱	↳	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBR	SBL	SBT
Lane Group Flow (vph)	70	840	57	1104	38	28	10	36
v/c Ratio	0.61	0.36	0.29	0.53	0.20	0.03	0.05	0.08
Control Delay	46.1	8.2	33.0	19.2	31.3	0.1	28.8	8.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.1	8.2	33.0	19.2	31.3	0.1	28.8	8.6
Queue Length 50th (ft)	27	14	23	120	15	0	4	1
Queue Length 95th (ft)	#83	149	55	208	42	0	17	20
Internal Link Dist (ft)		1171		556				124
Turn Bay Length (ft)	110		300		95		50	
Base Capacity (vph)	118	2348	196	2097	193	905	193	455
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.36	0.29	0.53	0.20	0.03	0.05	0.08

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Queuing and Blocking Report
Existing (2017) NP - AM Peak Hour

10/18/2017

Intersection: 3: Iris Avenue & Project Driveway 1

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 4: John F Kennedy Drive & Oliver Street

Movement	WB	WB	NB	NB	SB
Directions Served	L	R	T	TR	LT
Maximum Queue (ft)	32	55	57	102	102
Average Queue (ft)	23	31	39	54	57
95th Queue (ft)	45	53	57	84	85
Link Distance (ft)		580	1351	1351	352
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 5: Oliver Street & Project Driveway 2

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Queuing and Blocking Report
Existing (2017) NP - PM Peak Hour

10/18/2017

Intersection: 3: Iris Avenue & Project Driveway 1

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 4: John F Kennedy Drive & Oliver Street

Movement	WB	WB	NB	NB	SB
Directions Served	L	R	T	TR	LT
Maximum Queue (ft)	50	31	58	55	55
Average Queue (ft)	27	29	29	25	40
95th Queue (ft)	47	39	51	48	59
Link Distance (ft)		580	1351	1351	352
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 5: Oliver Street & Project Driveway 2

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Queuing and Blocking Report
Existing (2017) WP - AM Peak Hour

10/18/2017

Intersection: 3: Iris Avenue & Project Driveway 1

Movement	SB
Directions Served	R
Maximum Queue (ft)	31
Average Queue (ft)	25
95th Queue (ft)	45
Link Distance (ft)	171
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: John F Kennedy Drive & Oliver Street

Movement	WB	WB	NB	NB	SB
Directions Served	L	R	T	TR	LT
Maximum Queue (ft)	51	55	55	57	96
Average Queue (ft)	21	31	41	48	59
95th Queue (ft)	47	47	59	66	84
Link Distance (ft)		580	1351	1351	352
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 5: Oliver Street & Project Driveway 2

Movement	EB
Directions Served	R
Maximum Queue (ft)	55
Average Queue (ft)	28
95th Queue (ft)	51
Link Distance (ft)	109
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Queuing and Blocking Report
Existing (2017) WP - PM Peak Hour

10/18/2017

Intersection: 3: Iris Avenue & Project Driveway 1

Movement	SB
Directions Served	R
Maximum Queue (ft)	55
Average Queue (ft)	24
95th Queue (ft)	51
Link Distance (ft)	171
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: John F Kennedy Drive & Oliver Street

Movement	WB	WB	NB	NB	SB
Directions Served	L	R	T	TR	LT
Maximum Queue (ft)	53	55	55	56	57
Average Queue (ft)	21	26	33	31	41
95th Queue (ft)	47	51	50	52	60
Link Distance (ft)		580	1351	1351	352
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 5: Oliver Street & Project Driveway 2

Movement	EB
Directions Served	R
Maximum Queue (ft)	30
Average Queue (ft)	26
95th Queue (ft)	40
Link Distance (ft)	109
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report
Project Completion Year (2022) NP - AM Peak Hour

10/18/2017

Intersection: 3: Iris Avenue & Project Driveway 1

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 4: John F Kennedy Drive & Oliver Street

Movement	WB	WB	NB	NB	SB
Directions Served	L	R	T	TR	LT
Maximum Queue (ft)	31	56	98	77	102
Average Queue (ft)	16	31	42	43	59
95th Queue (ft)	41	51	71	67	88
Link Distance (ft)		580	1351	1351	352
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 5: Oliver Street & Project Driveway 2

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Queuing and Blocking Report
Project Completion Year (2022) NP - PM Peak Hour

10/18/2017

Intersection: 3: Iris Avenue & Project Driveway 1

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 4: John F Kennedy Drive & Oliver Street

Movement	WB	WB	NB	NB	SB
Directions Served	L	R	T	TR	LT
Maximum Queue (ft)	53	31	53	31	78
Average Queue (ft)	16	27	22	22	39
95th Queue (ft)	45	42	48	45	61
Link Distance (ft)		580	1351	1351	352
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 5: Oliver Street & Project Driveway 2

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Queuing and Blocking Report
Project Completion Year (2022) WP - AM Peak Hour

10/18/2017

Intersection: 3: Iris Avenue & Project Driveway 1

Movement	SB
Directions Served	R
Maximum Queue (ft)	56
Average Queue (ft)	26
95th Queue (ft)	48
Link Distance (ft)	171
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: John F Kennedy Drive & Oliver Street

Movement	WB	WB	NB	NB	SB
Directions Served	L	R	T	TR	LT
Maximum Queue (ft)	31	56	75	82	141
Average Queue (ft)	21	35	44	55	64
95th Queue (ft)	45	50	68	78	96
Link Distance (ft)		580	1351	1351	352
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 5: Oliver Street & Project Driveway 2

Movement	EB
Directions Served	R
Maximum Queue (ft)	56
Average Queue (ft)	28
95th Queue (ft)	45
Link Distance (ft)	109
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report
Project Completion Year (2022) WP - PM Peak Hour

10/18/2017

Intersection: 3: Iris Avenue & Project Driveway 1

Movement	SB
Directions Served	R
Maximum Queue (ft)	55
Average Queue (ft)	24
95th Queue (ft)	51
Link Distance (ft)	171
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: John F Kennedy Drive & Oliver Street

Movement	WB	WB	NB	NB	SB
Directions Served	L	R	T	TR	LT
Maximum Queue (ft)	31	55	54	55	56
Average Queue (ft)	27	25	29	33	37
95th Queue (ft)	44	54	50	52	54
Link Distance (ft)		580	1351	1351	352
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 5: Oliver Street & Project Driveway 2

Movement	EB
Directions Served	R
Maximum Queue (ft)	54
Average Queue (ft)	32
95th Queue (ft)	45
Link Distance (ft)	109
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report
Cumulative (2022) NP - AM Peak Hour

10/18/2017

Intersection: 3: Iris Avenue & Project Driveway 1

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 4: John F Kennedy Drive & Oliver Street

Movement	WB	WB	NB	NB	SB
Directions Served	L	R	T	TR	LT
Maximum Queue (ft)	31	76	72	98	133
Average Queue (ft)	21	35	45	62	77
95th Queue (ft)	44	54	66	91	118
Link Distance (ft)		580	1351	1351	352
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 5: Oliver Street & Project Driveway 2

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Queuing and Blocking Report
Cumulative (2022) NP - PM Peak Hour

10/18/2017

Intersection: 3: Iris Avenue & Project Driveway 1

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 4: John F Kennedy Drive & Oliver Street

Movement	WB	WB	NB	NB	SB
Directions Served	L	R	T	TR	LT
Maximum Queue (ft)	55	32	79	68	74
Average Queue (ft)	29	29	33	37	43
95th Queue (ft)	47	40	54	61	64
Link Distance (ft)		580	1351	1351	352
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 5: Oliver Street & Project Driveway 2

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Queuing and Blocking Report
Cumulative (2022) WP - AM Peak Hour

10/18/2017

Intersection: 3: Iris Avenue & Project Driveway 1

Movement	WB	SB
Directions Served	T	R
Maximum Queue (ft)	56	31
Average Queue (ft)	3	16
95th Queue (ft)	22	41
Link Distance (ft)	224	171
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 4: John F Kennedy Drive & Oliver Street

Movement	WB	WB	NB	NB	SB
Directions Served	L	R	T	TR	LT
Maximum Queue (ft)	53	54	79	94	195
Average Queue (ft)	28	35	49	52	92
95th Queue (ft)	47	55	73	78	147
Link Distance (ft)		580	1351	1351	352
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 5: Oliver Street & Project Driveway 2

Movement	EB	SB
Directions Served	R	TR
Maximum Queue (ft)	77	31
Average Queue (ft)	27	1
95th Queue (ft)	52	12
Link Distance (ft)	109	1119
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Attachment: Appendix J - Traffic Impact Analysis (3309 : CONDITIONAL USE PERMIT FOR A GAS STATION)

Queuing and Blocking Report
Cumulative (2022) WP - PM Peak Hour

10/18/2017

Intersection: 3: Iris Avenue & Project Driveway 1

Movement	SB
Directions Served	R
Maximum Queue (ft)	53
Average Queue (ft)	23
95th Queue (ft)	48
Link Distance (ft)	171
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 4: John F Kennedy Drive & Oliver Street

Movement	WB	WB	NB	NB	SB
Directions Served	L	R	T	TR	LT
Maximum Queue (ft)	53	54	81	77	58
Average Queue (ft)	28	27	43	48	42
95th Queue (ft)	47	47	66	68	61
Link Distance (ft)		580	1351	1351	352
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	100				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 5: Oliver Street & Project Driveway 2

Movement	EB
Directions Served	R
Maximum Queue (ft)	55
Average Queue (ft)	26
95th Queue (ft)	45
Link Distance (ft)	109
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

This may affect your property

Notice of PUBLIC HEARING

Notice is hereby given that a Public Hearing will be held by the Planning Commission of the City of Moreno Valley on the following item(s):

Project: PEN18-0016 – Conditional Use Permit
Applicant: Sater Oil International, LLC
Owner: Sater Oil International, LLC
Representative: Ed Hale of Barghausen
A.P. No: 486-310-038
Location: Northwest corner of Iris Avenue and Oliver Street
Proposal: A Conditional Use Permit to establish a new 3,180 square foot ARCO AM/PM gas station, operating 24 hours, with 8 fuel islands, and an express carwash. A Type-20 alcohol sales license for beer and wine is also proposed. The property is zoned (NC) Neighborhood Commercial and is on a 1.31 acre parcel.

Council District: 4

Environmental Determination: The City of Moreno Valley has reviewed the above project in accordance with California Environmental Quality Act (CEQA) Guidelines Section 15070 and has determined that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because mitigation measures have been required of the project that will reduce potential impacts to a less than significant level. Therefore, a Mitigated Negative Declaration is recommended for the project.

A public hearing before the Planning Commission has been scheduled for the proposed project. Any person interested in commenting on the proposal and recommended environmental determination may speak at the hearing or provide written testimony at or prior to the hearing. The project application, supporting plans and environmental documents may be inspected at the Community Development Department at 14177 Frederick Street, Moreno Valley, California during normal business hours (7:30 a.m. to 5:30 p.m., Monday through Thursday and 7:30 a.m. to 4:30 p.m., Friday), or you may telephone (951) 413-3206 for further information.

The Planning Commission, at the Hearing or during deliberations, could approve changes or alternatives to the proposal. If you challenge any of these items in court, you may be limited to raising only those items you or someone else raised at the Public Hearing described in this notice, or in written correspondence delivered to the Planning Commission at, or prior to, the Public Hearing.

LOCATION N ↑

PLANNING COMMISSION HEARING

City Council Chamber, City Hall
14177 Frederick Street
Moreno Valley, Calif. 92553

DATE AND TIME: December 13, 2018, 7:00 p.m.
CONTACT PLANNER: Gabriel Diaz
PHONE: (951) 413-3226

Upon request and in compliance with the Americans with Disabilities Ac of 1990, any person with a disability who requires a modification c accommodation in order to participate in a meeting should direct suc request to Guy Pegan, ADA Coordinator, at 951.413.3120 at least 4 hours before the meeting. The 48-hour notification will enable the City t make reasonable arrangements to ensure accessibility to this meeting.